ESTABLISHING THE REAL TIME MULTIDIMENSIONAL ENERGY MANAGEMENT SYSTEM ["RMEMS"] [ALSO KNOWN AS AN "ENERGY VAULT"] FOR THE KANNALAND LOCAL MUNICIPALITY AS THE FIRST ONE OF THE 120 IMPLEMENTATION PROJECT SITES IN SOUTH AFRICA

FEASIBILITY STUDY REPORT:

PART A: INTRODUCTION TO INTERVENTIONS

Submission Period: November 2018

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1. INTRODUCTION

1.1 Background

Most people recognize the importance of electricity as an essential input to manufacturing and to economic activity in general. Changes in electricity prices impact on each and every person, and it has an effect on economic activity. It is important to take cognizance of the strategic importance of the proposed development and to analyse the risk of reliance on foreign energy suppliers, the tariff hikes and the effect of perpetual interruptions on the South African economy.

South Africa has enjoyed low electricity tariffs for a long period of time. Investors have previously been attracted to the electricity intensive sectors as a result of price competitiveness. Low electricity prices compensated for other disadvantages such as volatile exchange rates and non-flexible labour. The price of electricity was often lower than the cost of producing it. Real electricity prices decreased significantly under the price compact announced in 1991. The main objective of decreasing the real price of electricity was to increase the South African economic growth rate. However, with the high economic growth levels of 5.6% in 2007, Eskom started to face new challenges, such as higher electricity demand by customers, reserve margin problems, capacity constraints resulting in an energy crisis, and shutting down strategic economic Sectors for days on end. Eskom has requested industry to voluntarily ration electricity consumption at 10% less than historical levels of electricity demand for at least the next five years.

Eskom found itself without financial provisions to react to the need for new generation capacity as demand for electricity began to near the available supply. Eskom was forced to look abroad for loans as well as to increase electricity tariffs to much higher levels.

Insufficient electricity supply and perpetual interruptions are increasingly recognized as serious constraints for sustained economic growth. In his memoirs, Alan Greenspan, the former Governor of the Federal Reserve of the United States of America, highlighted during his tenure that, while the amplitude of economic cycles seemed to be decreasing, the frequency of cycles were increasing (in other words, the lag between increased and decreased economic growth cycles was shortening). This implied that businesses were facing changing economic conditions occurring more frequently, albeit the impact was expected to be less pronounced. However, the challenge was that most of the major electricity consuming customers tended to have had more “static” production processes in terms of technology that made them less “nimble” to adjust in short periods of economic fluctuation.

Increasing electricity prices just after a world financial crisis and consequent slowing economic growth, resulted in many companies then and now facing challenges like maintaining and increasing their profit margins. What this translated to for the various energy intensive industries, was that in a three year period, electricity prices would have almost doubled and would increase further in the future. It would be a very difficult time for businesses and, although it was not expected to lead to a situation of closures, industries could struggle to maintain profitability levels.

It was found to be technically feasible for Renewable Energy Technologies (RET) to replace the present fossil fuel electricity infrastructure, however; economic barriers remained the primary impediment. Photo Voltaic (“PV”) power has been considered a clean, sustainable, renewable energy conversion technology, whilst reducing the adverse anthropogenic impacts of fossil fuel use.

It is considered that the tipping point for Solar PV adoption is when the technology achieves ‘grid parity’ given that conventional-powered electricity prices are rising whilst PV installed prices are falling. Grid parity refers to the lifetime generation cost of the electricity from PV being comparable with the electricity prices for conventional sources on the grid.

1.2 The Needs of the Kannaland Local Municipality

In developing the framework and content of this comprehensive Feasibility Report for the intended submission to the Development Bank of Southern Africa (DBSA), the needs of Municipalities were acknowledged.

To best understand the needs of Municipalities, the Kannaland Local Municipality Case is referred to in this Feasibility Report.

In the case of the proposed RMEMS development for the Kannaland Local Municipality a financial model was adopted that was purpose developed. The latter mentioned model[1] was developed in line with the original Memorandum of Understanding (MOU)[5] that was concluded with the Kannaland Local Municipality on 17 September 2012 by Sun Graft (Ltd) in order to have Sun Graft and its collaborators investigate all possible aspects of dealing with service delivery matters relating to power and water reticulation This MOU was approved by the Municipality.

The purpose of this MOU was as follows (extract from referenced MOU):

1 PREAMBLE

The purpose of this Agreement is to define the basis for the supply and funding of services and/or products to **KANNALAND** by **SUN GRAFT** concerning:

electricity, electricity generating products, electricity saving products and grey water treatment systems in all areas under the control of the KANNALAND local municipality;
(the "Field")

and whereas **KANNALAND** has a need and obligation to supply electricity and to manage grey water and the treatment thereof in all areas under its jurisdiction;

and whereas **SUN GRAFT**'s business is to critically evaluate possible solutions related to energy provision and to provide efficient energy solutions and energy saving products to clients in the areas of solar photovoltaic systems, solid state lighting, solar heating, energy-from-waste and waste treating systems;

and whereas **SUN GRAFT** is, through its leasing company, willing and able to fund the solutions and to provide these solutions and technologies to **KANNALAND** on a purchase-, take-off or lease basis;

[1] "Feasibility Reports: Financial Model, 00.4.1a and 00.4.1b Phase 1 & Phase 2 Rev G", dated November 2018
[5] "Memorandum of Understanding (MOU) 1", dated 17 September 2012

Sun Graft in due course transferred and delegated its rights in terms of the referenced MOU to **INOVASURE**, as the referenced "leased company" and suitable entity to perform the highly complicated tasks that the MOU required.

Following this transfer of the rights granted in terms of the referenced MOU, **INOVASURE** proceeded, in the years following the conclusion of the MOU, to carry out various Feasibility Studies with regard to the provision of electricity, potable water and other concomitant service delivery aspects such as education;

During the process of carrying out the various Feasibility Studies, INOVASURE designed various integrated systems and installations in order to fulfil the requirements of the MOU in terms of its referenced Project Proposals, as set out in clause 4 of the MOU. Over time it became clear to **INOVASURE** and its collaborators that in developing the various Project Proposals, their outcomes highlighted that the various solutions and proposed implementations worked best in an integrated manner as one system, which it termed an "Energy Vault" (and a "Water Vault" respectively);

INOVASURE, once it determined that the solution to the service delivery problems with the Kannaland Local Municipality, and in fact any other Municipality, lay in the design and implementation of an Energy (and Water) Vault, proceeded to refine the operation of the said Energy (and Water) Vault and to develop Financial Models to support the various aspects of the Feasibility Studies;

The developed **INOVASURE** Energy Vault has subsequently been refined to a unique large [20MW-53MWh] battery storage device supported by balance of systems [such as electricity meters and LTE communication devices] and renewable energy sources [such as 25MW Photo Voltaic plants]), as well as smaller versions of the Energy Vault used in informal settlements, and which will be installed at the Kannaland Local Municipality, or in fact any other Municipality in the RSA, in multiples as according to the size and needs of the relevant Municipality.

For clarity purposes, the **INOVASURE** Water Vault is a concomitant accumulation of water purification and / or desalination and / or management devices and installations, including water meters, which operate in conjunction with the **INOVASURE** Energy Vault.

For further clarification purposes, the **INOVASURE** Thin Client Technology devices are specific devices and systems, including unique server cloud technologies, which are designed and installed by **INOVASURE** to work in conjunction with the Energy (and Water) Vault/s and which provide WIFI capability to all home users which are fitted with pre-paid electricity and water meters as part of the Energy (and Water) Vault implementations and which also provide educational content. The Thin Client Technology also operates in informal settlements in providing shack electrification and concomitant educational content.

INOVASURE, in refining its Energy (and Water Vault) systems, also investigated the various laws and regulations that govern the provision of such, and determined that the Kannaland Local Municipality, and in fact any other Municipality in South Africa, may utilise its own constitutional right to generate, distribute, transmit and buy and sell power (as well as to manage its water resources and information communication technology needs). **INOVASURE** determined therefore that the Kannaland Local Municipality does not require a PPA (Power Purchase Agreement) with **INOVASURE** to operate is services and provide its products, nor is it an Independent Power Producer (IPP).

INOVASURE has, in carrying out its Feasibility Studies for the Kannaland Local Municipality, also secured the necessary collaborators to implement its Energy and / or Water Vault installations, coupled with the Thin Client Technologies.

INOVASURE, as specifically required by the referenced MOU in clause 1, has also secured the required funding and technological underwriting from its collaborators, services providers and suppliers to enable it to facilitate the funding of the Energy (and Water Vault) combined Project Proposals and the concomitant Thin Client Technology installations at the Kannaland Local Municipality, either in part or whole.

The financial requirement of the referenced combined Kannaland Local Municipality **INOVASURE** Energy Vault project is determined by the accumulated cost of all its components, the capital expenditure to develop the Energy Vault and the working capital to allow it to become operational. Similar financial requirements apply to the Water Vault technologies which may be employed at the Kannaland Local Municipality, which will range from desalination plants of various sizes and capabilities, purification plants of various types, water management meters, water savings devices, water extraction devices and suchlike. The Thin Client Technology and installations are similarly costed to apply to the **INOVASURE** Energy Vault project at Kannaland Local Municipality. Based on the research

and preparation that was done over the past 6 years at Kannaland Local Municipality, it has therefore been determined that the **INOVASURE** Energy Vault / Thin Client Technology project will cost approximately R1.03 billion per Energy Vault for a 25MW Photo Voltaic Power Plant, 20MW-53MWh battery storage device, electricity measurement and management devices (meters) in all houses (approximately 25 000 per Energy Vault), off-grid systems for the electrification of informal housing units, LTE communication devices and streaming of educational material and other systematically operational devices that provide Energy and Education Security to **INOVASURE's** clients – the Municipalities and their citizens. Two or more Photo Voltaic power plants of 25MW are contemplated for the Kannaland Local Municipality due to the unique location in terms of irradiation for Solar Power Plants, and the fact that electricity can be exported by Kannaland to other Local Municipalities in the District as an additional revenue stream. Further multiples of the **INOVASURE** Energy Vault model may also be contemplated, should the need arise in terms of the growth of the Kannaland Local Municipality or the surrounding other Local Municipalities.

For clarity purposes (since the Water Vault is not included in this Feasibility Study but intended as a separate phase) the financial requirements of the **INOVASURE** Water Vault are determined by the current needs of the Kannaland Local Municipality and its immediate status with regard to available water resources. The approximate cost of the proposed Water Vault system for Kannaland Local Municipality is linked to the cost of the Energy Vault, since approximately 80% of the cost of water is linked to the cost of the power to supply the water.

INOVASURE has recommended to the Kannaland Local Municipality that the Energy Vault referenced above be implemented as the first phase of the Project Proposal for energy, as a PPP, whilst the Water Vault be implemented as the second phase, once the required power capacity has been implemented.

Following extensive communications and presentations and feasibility studies, Kannaland Local Municipality concluded an Energy Security Management and Administration Agreement ("ESMA Agreement") with **INOVASURE** within which the project and its parameters were detailed.

It bears mention that the Kannaland Local Municipality believes that it has complied with the requirements of the Municipal Supply Chain Management (SCM) Regulation 32 of 2005 (Regulation 32) as according to the Municipal Finance Management Act 56 of 2003 in

recommending that any other Municipality could also make use of the services of **INOVASURE** and its various collaborators in the provision of the ***ENERGY SECURITY*** Program.

South Africa's power utility, Eskom, has stated in writing, over the years, that it supports **INOVASURE's** energy storage program with possible rebate programs. However, **INOVASURE's** need for support from Eskom is minimal in its business strategy provided in its Feasibility Studies to Kannaland Local Municipality, primarily since **INOVASURE** is not an IPP, whilst it in turn can provide Eskom (albeit indirectly) and the RSA as a whole (when a number of the Energy Vaults similar to the ones developed for Kannaland Local Municipality are installed countrywide), with a viable "black start" capability (the ability to restart the power grid in the event that it trips) and assist to take the pressure off the need to upgrade the distribution network of many of the other Municipalities in South Africa for at least another decade, benefiting both Eskom and the RSA as a whole.

The National Treasury of South Africa, through its Government Technical Advisory Centre (GTAC) Agency, handles, amongst other things, the manner in which Public Private Partnerships (PPPs) are approved and finalized. The GTAC has indicated its support of the various initiatives of **INOVASURE**, and in particular for the **INOVASURE** Energy (and Water) Vault Program that it has been developing at the Kannaland Local Municipality, provided that **INOVASURE** partners with the Municipality as a participant in a PPP. The referenced GTAC support includes specifically the period of 25 years required for the effective development, implementation and management of the proposed **INOVASURE** Energy and ICT Technology PPP projects (based on the abovementioned ESMA Agreement/s) for the implementation of the **INOVASURE** Energy (and Water Vault) Program, with the concomitant Thin Client Technology systems to provide Education Security, starting with the ESMA Agreement concluded between Kannaland Local Municipality and **INOVASURE**. The National Treasury's GTAC division has indicated its provisional willingness to approve the **INOVASURE** Energy Vault project with Kannaland Local Municipality as a PPP in the event that it requests it to register the project as a PPP under the auspices of the DBSA. In this regard, both the National Treasury GTAC PPP division and the BDSA have advised that they require suitable Transactional Advisors to carry out a due diligence process on behalf of the Kannaland Local Municipality to confirm the legal, technical and financial aspects of the proposed project to be viable and acceptable.

It bears mention that the African Regional Centre (ARC) of the New Development Bank (NDB) is an important contributor to sustainable infrastructure development in South Africa and is a participant in the development agenda of the continent. The ARC is the first regional office of the NDB that was established in August 2017 and as such represents the NDB in Africa. Assisted by the ARC, the NDB works with the Government of South Africa and other strategic partners, including development finance institutions such as the DBSA, on strengthening its project pipeline, focusing specifically on sectors such as water, transport, energy and urban development. The ARC specifically works closely with the Government, public and private sector agencies, and other relevant stakeholders in South Africa to identify projects that have strong development impact to be supported by the NDB. **INOVASURE** has received indication by the ARC that Energy Vault project funding, directed through the NDB, may be managed under the auspices of the DBSA for the **INOVASURE** Kannaland Local Municipality Energy Vault project, as well as further ensuing Energy Vault projects.

The Central Energy Fund Group of Companies (CEF) is a Schedule 2 State Owned national energy utility entity with a focus on oil, gas, coal and renewable and clean energy options reporting to the Department Of Energy (DoE) as its primary shareholder. The organisation operates in South Africa with strategic partnerships in Ghana and Mozambique. The company derives its mandate primarily from the *Central Energy Fund Act No. 38 of 1977.* The Act mandates the CEF Group to contribute to the national security of energy supply through commercial operations and projects, as well as investing in developmental projects, all the while operating in a highly competitive and capital intensive environment with the need to be a profitable entity through its subsidiaries and associates. The dual mandate of Commercial and Developmental obligations requires a tight balancing act between the two imperatives given the strategic nature of the national assets that The Group holds and its obligations as defined in the National Development Plan (NDP). The CEF Group thus has to contribute towards the triple challenges of Poverty Alleviation, Promoting Equality and Creating Jobs as well as supporting the economic growth efforts of the Shareholder. The CEF Group supports **INOVASURE** in its endeavours to develop and institute the Energy (and Water) Vault Program in South Africa.

Certain matters proposed were accepted by the Kannaland Local Municipality for **INOVASURE** to fund, construct, install and operate the proposed Energy Vault i.e: The Municipality would in due course own the installed power plant (received onto its balance sheet) which would be operated by **INOVASURE** for the period of 25 years in terms of the ESMA Agreement referenced above, as suitably converted to a PPP Agreement by the

relevant Transactional Advisors, and the Municipality would assist with the interconnection arrangements with Eskom and **INOVASURE** would carry the cost of the connection of the substation to the Energy Vault.

It is proposed by **INOVASURE** that the case study of the Kannaland Local Municipality Energy Vault Project, introducing the financial modelling and technology, should be reviewed during the next phases of the implementation and roll-out of the InovaSure Energy Vault projects in South Africa to other similar sites with funding that may be provided by institutions such as the NDB and other interested Development Finance Institutions and/or private companies.

1.3 The INOVASURE (PTY) LTD Submission to the Kannaland Local Municipality

The following process is acknowledged that has been, and is being, followed by **INOVASURE** regarding the Kannaland RMEMS / Energy Vault Project:

- The formation of a Public Private Partnership (PPP) between **INOVASURE** and the KANNALAND LOCAL MUNICIPALITY, proposed to be endorsed by NATIONAL TREASURY GTAC PPP division and managed under the auspices of the DBSA, covers all aspects of the implementation of the **INOVASURE** Energy Security Program as various energy infrastructure projects and will be arranged to be funded by the efforts of **INOVASURE,** including the installation of distribution and telecommunications devices and so-called Thin Client Technology ICT (Information Communication Technology) devices, as well as management systems;
- **INOVASURE** prepared Feasibility Reports[2] in parts that were submitted to the Kannaland Local Municipality as the initial pilot implementation project partner to the proposed PPP and the application for endorsement thereof in terms of the time period by National Treasury GTAC PPP division;
- The company **INOVASURE (PTY) LTD** (South Africa) has been registered with The Companies' and Intellectual Properties Commission (the CIPC")**;**
- A Special Purpose Vehicle (SPV) is in the process of being registered as part of the proposed PPP with the KANNALAND LOCAL MUNICIPALITY i.e **"INOVASURE** Kannaland Energy Vault Holdings (Pty) Ltd.; and

[2] "Kannaland Feasibility Reports: Executive Summary and Parts A, B and C", dated November 2018

- This DBSA PPDF Application[3] (which is intended to be utilised for concomitant applications to the other relevant funds managed by the DBSA) was prepared in compliance with the prescribed process with due acknowledgement of the Feasibility Reports that were prepared for the Kannaland **INOVASURE** Energy Vault project.
- Various other project specific SPVs are also in the process of being registered under the overhead umbrella of **INOVASURE Kannaland Local Energy Vault Holdings (Pty) Ltd**, being the following:
  - **INOVASURE** Kannaland PV (Pty) Ltd;
  - **INOVASURE** Kannaland Thin Client (Pty) Ltd;
  - **INOVASURE** Kannaland LTE (Pty) Ltd;
  - **INOVASURE** Kannaland Smart Meter (Pty) Ltd;
  - **INOVASURE** Kannaland Battery (Pty) Ltd;

An **INOVASURE** Community Trust is in the process of being registered for the receipt of a certain percentage of the income of the various SPVs, which entity will be utilised for the upliftment and development of various aspects of the community such as education, electrification of informal settlements, and many other community aligned projects.

[3] SADC & DBSA Project preparation and Development Facility (PPDF): Operational Guidelines", dated 8 August 2017

2. INTRODUCTION TO INOVASURE SA

2.1 Background[4] [5]

The **LIVESURE GROUP**, a collective description for contractually collaborative entities forming a group, is the culmination of the thought leadership applied by five (5) SOUTH AFRICAN founder members i.e. Messrs. Jaco De La Rouviere, Jacques Pauw, Max Lourens, Rudie Crous and Duncan Irvine. Together they redefined the underwriting of LIVING SECURITY NEEDS as well as the approach of the insurance industry in respect of its innovative and alternative underwring of LIVING SECURITY needs. The product range as presently offered by the insurance industry is inadequate and due for innovative changes. These seasoned businessmen and their team have vast experience in the innovation of products and services in energy, (Smart City development) and infrastructure and suchlike such as energy, water, educuation, governance, environment, housing, mobility, citynomics, leisure and the benefication of real rights.

The **LIVESURE Group** is the first South African **LIVING SECURITY** entity to offer Governments, Cities, Municipalities, Special Economic Zones ("SEZ's"), Private Households, Businesses and SOCs (State Owned Companies) a custom made range of protection plan products.

INOVASURE™ **(PTY) LTD** is a proud partner to the South African LiveSure™ *Living Security* "Ensurance" and Technology Company. As an enabler, **INOVASURE** has developed unique and innovative bolt-on Underwriting, Protection, Warranty and insurance aligned ("Ensurance") Products for the Municipal Community in South Africa. The core

[4] The "INOVASURE Company Profile", dated 2018
[5] INOVASURE SA Business Plan, November 2018

offering is the **INOVASURE** Real Time Multidimensional Energy Management System (RMEMS), also known as the "*Energy Vault*", which provides the backbone to *Energy Security* Products and Services that will power the new dawn of *Energy Efficiency* and *Storage*.

INOVASURE operates independently in South Africa as a Master Licensee under LiveSure (Pty) Ltd as the Master Licensee for Africa. **INOVASURE (**Australia) Pty Ltd operates independently out of Perth, also as a Master Licensee of **INOVASURE**, as do various other **INOVASURE** Master Licensees such as **INOVASURE** SGL Power & Gas Mozambique LDE, **INOVASURE** Zimbabwe Ltd, etc - as part of **INOVASURE's** global roll out process.

LIVESURE, as a Licensor to global operators, has appointed **INOVASURE (PTY) LTD** (South Africa) as the Master Licensee for all its operations in South Africa, operating from Stellenbosch, George and Johannesburg.

INOVASURE (PTY) LTD (South Africa) was implemented as an initiative of collaboration by passionate key individuals with dedicated skills. They bring experience, knowledge and opportunity in line with shared goals to succeed in the task at hand - providing ***ENERGY SECURITY*** to South Africa. The management style is innovative and integrates thought leadership with practical implementation strategies.

INOVASURE's Energy Security "*Ensurance*" package consists of bolt-on insurance aligned-, Protection Plan and Warranty Products and services which are custom designed and linked to the LiveSure *Trusted Centre* ("LTC") for cost-effectiveness, sustainability, resilience, relevance and accountability.

INOVASURE generates its "underwriting" ability in a self-sustaining manner from so-called "ensurance" plans to service level agreements in keeping it simple. Its "Seal of Excellence" represents its promise to authenticate and secure its products with corporate governance and to strive for service excellence in all aspects.

<u>The Proposed INOVASURE Concept</u>

Energy Security Management and Administration Services Agreements ("ESMA's")

INOVASURE enters into collaborative Energy Security Management and Administration

Services Agreements ("ESMAs") with selected and willing Municipalities to, amongst other things, provide them with ***ENERGY SECURITY*** and an on-going supply of reliable energy. These ESMA agreements are then embodied in Public Private Partnerships (PPPs) which are entered into with the relevant Municipalities and endorsed by National Treasury GTAC PPP division and managed under the auspices of the Development Bank of Southern Africa (DBSA).

The Product Range

The **INOVASURE** product range, under the banner of "enerGsure", consists of various services and "ensurance" (a service level agreement as incorporated in the PPP) related products and services designed to ensure *Energy* and *ICT Security* for its client base. Custom made solutions have been created subject to accreditation by the so-called LTC ("LiveSure Trusted Centre"). The LTC's role is to provide in-house Scoping and Due Diligence Client accreditation; determining client's requirements, creating a customised solution, which, upon acceptance by the Client Municipality as a PPP arrangement, is then embedded in an "Ensurance" / Protection Plan / Warranty which, as part of the PPP arrangement, is issued to the Municipality by **INOVASURE's** cell captive insurance operator, Centriq, which is wholly owned by Santam Insurance Company.

The **INOVASURE** RMEMS (*Energy Vault)* is effectively a large UPS (Uninterrupted Power Supply) and receives power during off-peak times of the day and introduces it back into the distribution network during peak times. **INOVASURE** augments the process of energy conservation and mitigation by means of integrated *Renewable Energy* dispatch resources, which is powered by means of multiple collaborative agreements with network partners in the field of renewables, disruptive technologies and other innovative forms of energy. The development of the Energy Vault implies that a systematic installation of patent and design protected equipment and systems are performed on the property of the relevant participating Municipality at **INOVASURE's** own cost.

As Custodian and Manager, **INOVASURE** operates and manages the equipment as a service to the Municipality. Generated data will be available as a management tool to receive, meter, store, shift, shave, distribute and transmit energy, as well as to introduce dispatchable Renewable Energy – on the distribution network.

INOVASURE does not own, buy or sell the power that is managed on behalf of the Municipality, but rather acts as its agent in the process of ensuring that the facility and its

operation is managed to its maximum capacity according to generally accepted global Utilities Practice and ISO (International Standards Organisation) guidelines.

2.2 The Vision, Mission, Goals and Objectives of INOVASURE

The Vision

The Vision of **INOVASURE** is to "ensure", manage, protect and warrant ***ENERGY SECURITY*** in South Africa and further afield into the African Continent and ultimately, globally.

The Mission

The Mission of **INOVASURE** is to provide ***ENERGY SECURITY*** to a range of users in South Africa and Africa by connecting Intellectual Property, proven systematic technologies, network structures, collaborators and contractors to energy users such as Municipalities, Special Economic Zones, State Owned Enterprises, the Government, as well as private, industrial and commercial users - all within the regulatory framework of the Energy Sector in South Africa.

The Goals and Objectives

The goals and objectives of **INOVASURE** are best described as follows:

- To promote a solution to overcome the current challenges of expensive and unavailable electricity for all users in South Africa and Africa and globally;
- To create a sound operating base in South Africa;
- To procure a high standard of quality and longevity in its unique technologies and to implement the same through reliable EPC collaborators;
- To execute a business model to the highest ethical standards through sustainability and social responsibility programs;
- Where possible, to ensure that the technologies are ISO aligned and comply with industry norms; and
- To embrace a long term goal to grow and extend the ***ENERGY SECURITY*** model into SADC, other African and BRICS countries, and finally, when the model has reached maturity, to venture internationally.

2.3 The INOVASURE Management Team

INOVASURE (Pty) Ltd (South Africa) was founded as an initiative of collaboration by passionate key individuals with dedicated skills. They bring experience, knowledge and opportunity in line with shared goals to succeed in the task at hand - providing *ENERGY SECURITY* to South Africa and the World. The management style is innovative and integrates through thought leadership with practical implementation strategies.

The **INOVASURE** Team consists of a Chairperson, a Vice-Chairperson, a Chief Executive Officer and Directors:

- Chairperson: **Mr. Jaco de la Rouviere**

The Chairperson of **INOVASURE**, Mr Jaco de la Rouviere, a Founder Member of LiveSure and **INOVASURE**, completed his Mechanical Engineering studies in Pretoria, South Africa, while in the employ of the South African Air Force.

He was seconded to the CSIR and conducted specialized research in the field of Material Science and Technology more specifically scanning acoustic microscopy, specialized loss wax vacuum casting technologies required for the production of single crystal super alloy castings.

The commercialization of the Arms Industry resulted in him focusing on Concurrent Engineering technologies inclusive of Rapid Prototyping using early Fused Deposition Modelling and Stereo-lithography. He started an engineering consulting company focusing on the optimization of complex dynamic structures using Finite Element Analysis, which resulted in several very successful designs of Pneumatic road tankers.

The South Africa Business Exchange evolved from the engineering business changing focus to information technology with the aim to develop thin client technology, which has only recently become popular as cloud computing. This company was later reversed as a listing on the JSE and he was appointed as MD of the Planit Technology group. He resigned this position during 2002 to act as trustee

and later chair the Board of Trustees of Renaissance Health and Medical Scheme and a group of companies conducting medical insurance underwriting in ten African countries.

Jaco returned to his passion in technology and furthered his education in Russia in the field of exploration using two advanced electromagnetic techniques, Tellurics and Tomography at the Department of Geo-Science at the Moscow University. He also accumulated extensive experience in the use of satellite imagery to detect the occurrence of natural resources.

Jaco founded SGL Power to pursue power generation in Africa after early identifying the imminent energy shortages. SGL Power successfully obtained several licenses to produce power in Africa.

The complexities of the regulatory environment as well as the funding limitations associated with power generation compelled him, in conjunction with like-minded individuals, to start an innovative insurance aligned company – **INOVASURE** - to promote financial services products and services to be deployed for the benefit of independent power producers as well as bulk buyers in Africa, including the municipalities, local authorities, towns, cities and villages of the continent.

- Chief Executive Officer: **Mr. Max Lourens**:

Mr Max Lourens, a Founder Member of LiveSure and **INOVASURE**, is the CEO of **INOVASURE** and as such sees to corporate governance and the interaction between the various operations within **INOVASURE** and its affiliates.

He also sees to the interaction with collaborators and clients. In short, he ensures that the operation is well oiled and maintained in terms of International Standards of Operation and along ISO guidelines.

A senior lawyer in his own right as well as a notary and global expert in alternative forms of property ownership and insurance related matters, Max has extensive

experience with international business operations in South Africa, Africa and abroad.

Max also has an Honours Degree in Journalism, and as such has spent many years focusing on the importance of product packaging and information communication.

Having been involved for many years in the fields of hospitality and mixed use property development, Max spent time in Africa and abroad developing systems, procedures, models and franchise units for the design, development, implementation and management of Smart City models.

Max is active in a number of other enterprises in South Africa and abroad that comprise Hospitality, Property Construction Training and Quality Control, Project Management and Property Development, development of Sustainable Energy products and the design and development of Global Smart Cities and New Towns in Africa.

- Vice-Chairperson: **Mr. Jacques Pauw**

After completing his school and tertiary careers at Paul Roos Gymnasium and Universities of Stellenbosch & UNISA in South Africa, Mr. Jacques Pauw, a Founder Member of LiveSure and **INOVASURE** and its Vice-Chairperson, began his business career in 1973 in the insurance industry as a financial consultant with one of SA insurance giants.

In 1977 he founded the Fintrust Group, initially active as an investment and insurance brokerage house, later as a real estate developer together with Nedcor Investment Bank / Syfrets as JV partner and is still active today as a family office in some areas of real estate investment.

Since the early 90's Jacques also served on various boards of start-up technology companies. This experience became very important in later years. Jacques also served for 3 years as the CEO of an international listed company, providing services in the SMART CITY space, amongst other to the Peoples Republic of China.

Jacques still holds numerous other Directorships and Trustee positions, encompassing operations of both a commercial and social entrepreneurship nature.

- Director: **Mr. Rudie Crous:**

Mr Rudie Crous is a Founder Member and Director of LIVESURE and INOVASURE and the CEO of **INOVASURE** (Australia). He started his career at Eskom Hendrina Power Station as a plant engineer. This challenging two-phase flow project that he completed, led to him becoming part of the Computational Fluid Dynamics team at the Eskom Technology Group.

Several years of consulting led to a broadening of horizons with the development of business software, image processing and technology product development in general. This business became part of Planit Technology. He subsequently established a software consulting company and developed specialised micro-footprint desktop computer SMS (text) messaging applications for MTN.

An opportunity presented itself to join the team at Bateman Engineering that had identified the future requirement for additional power generation capacity, focusing on industrial power projects. Several solutions using conventional and non-conventional energy sources were developed for a range of clients and over the whole African continent. Rudie then migrated to Perth, Australia where he became the Chief Mechanical Engineer at Worley Parsons, and was responsible for the delivery of the mechanical scope for Yarnima Power Station (BHP 190MW) as well as Stage 1 and 2 of the Binningup Southern Seawater Desalination Plant. He also led the multi-disciplinary engineering team at BP Kwinana Refinery for a very successful turnaround in 2014/5.

Subsequently and currently, Rudie focuses on developing conceptual solutions for power project opportunities pursued by LiveSure, **INOVASURE** and related companies, and consults to the power generation industry.

- Director: **Mr. Duncan Irvine**

Mr Duncan Irvine is a non-executive Director of LIVESURE and **INOVASURE** and is active in the field of media and broadcasting.

He founded a company called Rapid Blue in 1993 which has grown to become the biggest producer of prime time television programs in Africa.

In 2016 BBC World Wide became a significant shareholder which has helped Rapid Blue grow even further. Rapid Blue is operational across all of Africa and has won multiple awards both locally and international.

Duncan has a BCom and a HDip Finance. He is an investor, shareholder and director of businesses active in media, property and charities, and has operated in IT, retail and consulting. He has chaired associations and awards committees, and is a member of the Emmy's in the USA. His business activities extend across Africa, especially in Nigeria and Kenya, and Europe, Asia and the USA.

- Director: **Mr. Nsizwa Cromet Molepo**

Nsizwa Cromet Molepo is the Director of Business Development, Project Management and Municipal Infrastructure Management for InovaSure. He has been involved in the property industry and other strategic sectors (Energy, Transport, Water, ICT, etc) for most of 36 years. His career started at Murray & Roberts Engineering in 1975. In the 1980's he advanced his knowledge in properties at Tongaat-Hulett Properties and Development Bank of Southern Africa (DBSA). He has travelled extensively globally both as an expatriate and for undertaking strategic projects. He has worked as expatriate for three years, in

Nigeria where he established a subsidiary for Saab Grintek and conducted business in East and West African Countries within the areas of Energy and ICT.

Cromet has held several senior positions in both the public and private sectors. His vast experience in Real Estate includes the following:

1. Murray & Robert Engineering (Pty) Ltd for 8 years where he held several positions;
2. Tongaat-Hulett Properties 2 years;
3. Eskom for 6 years as Senior Manager and promoted to several positions until Executive Director in Eskom Enterprises.
4. Special Advisor on Real Estate matters to the Minister of Public Works (Hon Jeff Radebe) for 5 years (1994-1999)
5. Intersite Property Management Services and Prasa Cres for 4 years: Regional Manager and later CEO of both entities within Prasa (Passenger Rail Agency of SA). He was also appointed as the Acting Group CEO of PRASA, a position he held until his retirement at the end of March 2018.
6. Absa Bank for 2 years as GM Real Estate Asset Management;

Cromet's tertiary qualifications include:

- B.Com from Unisa;
- Graduate Dip in Engineering (Civil) Wits University;
- Special Programmes at IMD (Switzerland), Harvard University and Singapore National University;
- Havard University- Government School: Special Programme: Financing of Infrastructure in the Market Economy;
- Currently a PhD student at DaVinci Institute with a thesis titled "The Development of an Implementation Framework for a Regional (SADC) Inter-modal Transport System: The Systemic Approach".

Cromet's Membership of Professional Organisations includes the following:

- Institute of Project Management;
- Chartered Institute of Building (UK;
- Institute of Management Consultants (he is a Certified Management Consultant);
- Institute of Directors; and
- Urban Land Institute (USA).

2.4 Financial Metrics

Various project and program funding offers are currently being considered by the Board of Directors of **INOVASURE** that includes a high Internal Rate of Return on its Energy Vault Projects as veritable Power Purchase Agreements and, since the MUNICIPAL incomes are securitisable, it is foreseen that serviceability of debt would not be a problem. In this regard a Financial Model for an Implementation Project such as for the site at Kannaland Local Municipality, was developed and referenced in the parts to this Feasibility Report. The financial model for each of the remaining sites in South Africa has been developed along the same parameters and will be reviewed in detail for each site once each one has its Public Private Partnership arrangements completed under the auspices of the Development Bank of Southern Africa as endorsed by the National Treasury GTAC Public private Partnership (PPP) division.

The outcomes of the financial modelling for the Kannaland Local Municipality Energy Vault Project are referred to elsewhere in the different parts of this Feasibility Report but can be extrapolated for the future implementation roll-out of the remainder of the envisaged Energy Vault Projects across South Africa under the **INOVASURE *ENERGY SECURITY* PROGRAM.**

As part of this process**, INOVASURE** is assisted by its collaborators to ensure an energy project that delivers the envisaged acceptable return where the income could comprise of a percentage foreign income which will offset the potential currency risk of repayment of a dollar-based loan.

In addition, the **INOVASURE (South Africa**) various Energy Vault Holdings companies operations, as well as its Manufacturing Operations for the components of the Energy Vault, could be set up in any of the **Special Economic Zones (SEZs)** in South Africa, in which case there will be limited value-added tax (VAT), no import / export tax, business tax of 15%, employee grants, operational grants, asset depreciation escalations at 10% per annum and many other similar benefits that could accrue to parties doing business at the SEZs.

2.5 INOVASURE Business Metrics

No solution is worthwhile considering unless it can be supported by metrics that adequately provide sustainability, while at the same time rewarding commercial risk.

The General South African landscape

Given time and huge savings on the Government's Nuclear solution, Eskom, with the Political Will behind it, could possibly solve the energy problem in South Africa. However, the country does not have time to wait for this to happen, neither should it commit the funds to alternative strategies such as nuclear energy, as long as a solution, such as the one provided by **INOVASURE**, is available.

Based on the envisaged 120 installed storage units of 53.5 MWh each across the country, as the base for the model described here, the metrics of the **INOVASURE** project at T_0 (Time Zero) is to "**Generate 2400 MW of power into the grid at peak-times":**

- The total investment over time is estimated to be approximately R127 billion;
- The **INOVASURE** estimated an Internal Rate of Return ("IRR") of approximately 20+%;
- The estimated energy savings for Eskom will be between 5% and 8% equating to some R 8 billion in investment for Eskom;
- The Carbon footprint reduction will be enormous but initially difficult to quantify. A best guess is a number of 1 130 000 in CERs (**Certified Emission Reductions)** the type of emissions unit or carbon credits issued by the Clean Development Mechanism (also called CDM) Executive Board for emission reductions achieved by CDM projects and verified by a DOE (Designated Operational Entity) under the rules of the Kyoto Protocol;
- The Climate change impact measured in terms of reduction of traditional power use will be between 5% and 8%;
- The estimated jobs created in construction will be approximately 40 000 over a five (5) to seven (7) year period;
- The estimated number of permanent jobs created will be approximately 15 000; and
- In the case of the commercial ESMA Agreement which InovaSure promotes as the base for its Public Private Partnerships, the debt considered to be removed from the various Municipalities' balance sheets, as part of the **LIVESURE GROUP's**

program, will be equal to approximately R10 billion (the approximate current debt) within 3 years.

Since the targeted solutions are providing for the basic needs of people, being energy, water and jobs, it is normally expected that returns will not be commensurate with mainstream investor requirements. For example: Assuming an investor such as the PIC invests in the **INOVASURE** proposed Green Energy Bond program, it's expected return could be 10% to 15%, which is at the higher end of investments with an imbedded social content.

Because of the unique and innovative solution, **INOVASURE,** through the proposed bond issuer, can offer the capital market participants a very competitive return, presently estimated at marginally higher than Government stock. The rate of return on debt is secure and the risk spread over a large number of high income customers.

The ROI margins will always be under pressure because of the important role that NERSA, Eskom, the SEZs, Municipalities and Public Opinion play. One should also not forget political influence.

INOVASURE's present estimates for the CAPEX needed to create a constant demand and flat-lining cycle for Eskom with no blackouts or load shedding, except for a very narrowly defined Force Majeure event, dynamic tariffs, stability of transmission is approximately R127 billion Rand (R1.03 billion per Energy Vault installation).

Ideally the equity (first loss) amount would be around **R20 billion**. The balance of the funds will be sourced by **INOVASURE** as a mix of different types of debt instruments, credit lines, guarantees, securitisation options, grants, etc.

The Municipal Implementation Site: The Kannaland Local Municipality Case

INOVASURE's business model is predicated on COLLABORATION with its Customer and Partner, in this instance the chosen implementation project for the Local Municipality of Kannaland. Collaboration will occur in respect of identifying the opportunity, re-insurance, power generation, - storage, - shifting, - distribution, smart metering and maintenance and **INOVASURE** de facto becomes the ***ENERGY SECURITY*** Underwriter, Custodian and Manager.

Other alternative implementation projects besides Kannaland Local Muncipality are also available as a result of Resolutions taken by the Councils to do so, such as the various Local Municipalities in the Central Karoo District (Prince Albert, Laingsburg and Beaufort West), Oudtshoorn Local Municipality, Ulundi and Mkhondo Local Muncipalities, with many others in the process of signing up to become sites for the **INOVASURE** Energy Vault.

However, for purposes of this Business Case, INOVASURE's first project site in terms of which the feasibility and viability of the **INOVASURE *ENERGY SECURITY*** MODEL was developed as a model by means of the implementation of the ENERGY VAULT, is the **KANNALAND LOCAL MUNICIPALITY (KLM)**:

- The municipality covers an area of 4,758 square kilometres (1,837 sq mi) in the Little Karoo, stretching from the Swartberg in the north to the Langeberg in the south, and from the Anysberg in the west to the Gamkaberg in the east. It is drained by the Groot River and the Gourits River. It abuts on the Laingsburg and Prince Albert municipalities to the north, the Oudtshoorn Municipality to the east, the Hessequa Municipality to the south and the Swellendam and Langeberg Municipalities to the west.
- According to the 2011 census the municipality has a population of 24,767 people in 6,212 households. Of this population, 84.6% describe themselves as "Coloured", 9.9% as "White", and 4.7% as "Black African". The first language of 95.4% of the population is Afrikaans, while 2.5% speak English.
- The largest town and location of the municipal headquarters is Ladismith, which as of 2011 has a population of 7,127. Ladismith is at the foot of the Swartberg, as is Zoar (pop. 4,659) and Calitzdorp (pop. 4,284) to the east. Van Wyksdorp (pop. 833) is further south in the valley of the Groot River.
- The municipal council consists of seven members elected by mixed-member proportional representation. Four councillors are elected by first-past-the-post voting in four wards, while the remaining three are chosen from party lists so that the total number of party representatives is proportional to the number of votes received.

INOVASURE's rationale for the ***ENERGY SECURITY*** and underwriting agreement that is proposed to be entered into as a PPP under the auspices of the DBSA, is to protect the integrity of KLM's energy supply and demand cycles via "ensurance" services (guarantees supported by service level agreements) as well as Warranties and Protection Plans where required. Through careful analysis and legal opinions that were obtained, **INOVASURE** is

convinced that the business model to be implemented is in full compliance with all the South African Laws and by-laws.

The most important legal "no-go" for **INOVASURE** is to steer clear of regulatory impediments in respect of the buying and selling of power to Municipalities or even directly into the Grid. Therefore a structured solution was created, within the SA energy legal framework, which provides a Municipality, such as Kannaland Local Municipality with an **"ENSURED", LONG TERM, SUSTAINABLE, COST EFFECTIVE AND SCALABLE ONE VARIABLE (AFTER ADJUSTMENTS) MONTHLY SERVICE FEE SOLUTION.**

A legal OPINION was prepared on the various Acts and implications in respect of the implementation of the **INOVASURE** ESMA PROGRAM and proposed Public Private Partnership arrangement and is available upon request.

The high-level implementation steps and the responsibilities of **INOVASURE's** business model for Kannaland Local Municipality (or any other implementation site) are provided in term sheet format.

The reports for the Kannaland Local Municipality Implementation Project, will be reviewed further during the next phases of the implementation and roll-out of the **INOVASURE** Energy Vault program in South Africa with funding that may be provided by institutions such as the DBSA and other Development Finance Institutions and private financial institutions.

The total investment funding that is required for the RMEMS implementation at a Municipality such as The Kannaland Local Municipality is envisaged potentially to be funded by funding institutions such the New Development Bank (NDB), under the auspices and Mandated Lead Arrangement (MLA) of the syndication of the funding of the Development Bank of Southern Africa (DBSA). The funding of the Energy Vault that is due to be established for the Kannaland Local Municipality as the initial implementation site (it has two Energy Vaults) will be reviewed for the 118 other roll-out implementation sites in South Africa.

The proposed business model is shown diagrammatically:

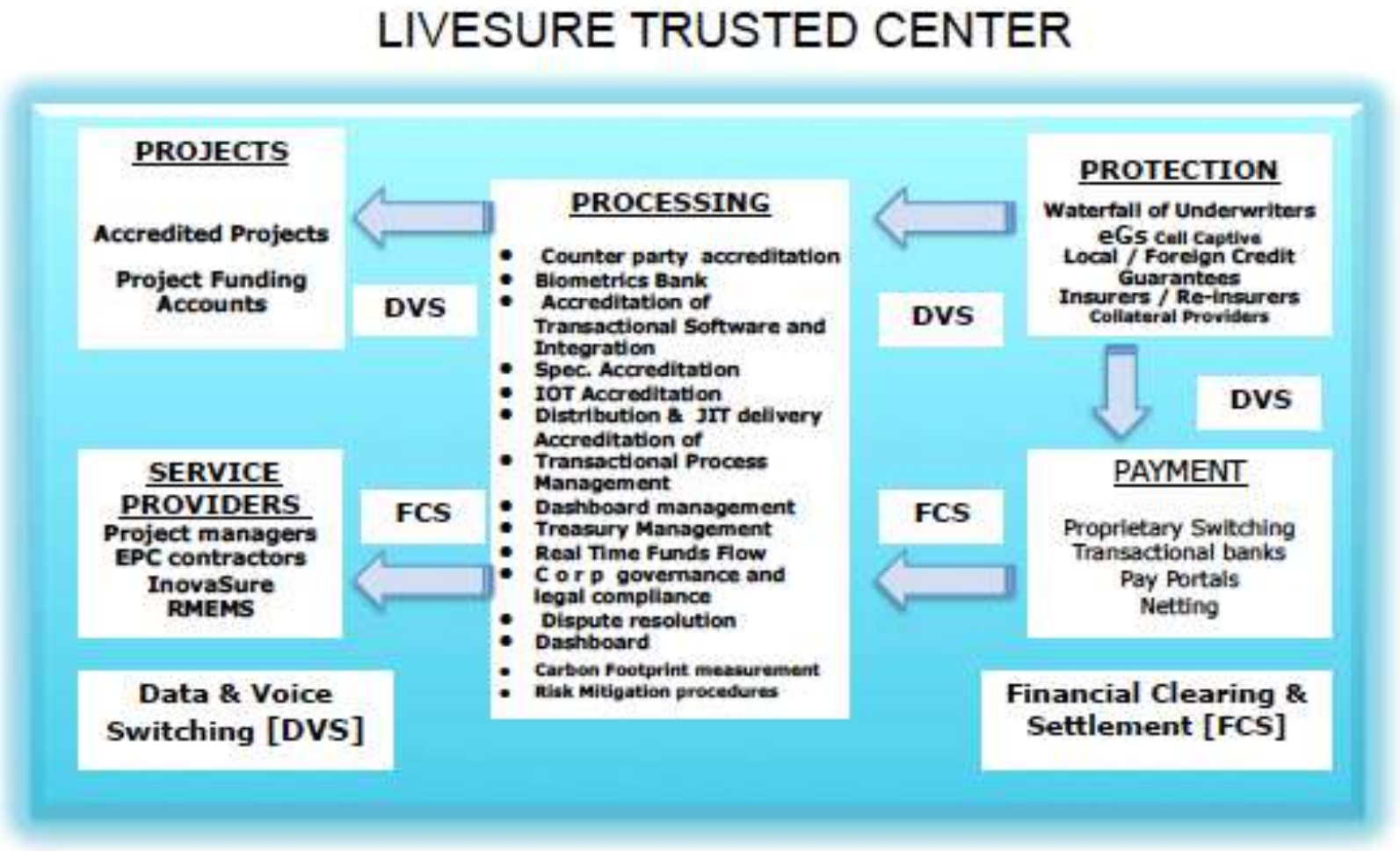

Figure 1: InovaSure's Business Model for the Kannaland Local Project

Proposed Implementation Steps for **INOVASURE's** Business Model (first deployment at Kannaland Local Municipality) are shown next:

IMPLEMENTATION STEPS: INOVASURE (South Africa) BUSINESS MODEL	
FINALISE **INOVASURE (Pty) Ltd (South Africa**) CORPORATE GOVERNANCE	1. Finalise the Company CIPC documentation and Governance in terms of B-BEEE matters; 2. Finalise and sign off the Operational Budget; 3. Finalise and sign off the Business Model; 4. Finalise the Master License Agreement with LIVESURE for the SA operations under **INOVASURE** (Pty) Ltd (SA); 5. Adopt all resolutions, implement all Business Plan strategies, set up office, staff and suchlike; 6. Finalise all agreements with collaborators and network partners.
FUNDING FOR ACTIVITIES	1. Finalise and implement Funding for Working Capital; 2. Ensure funding is taken account of in the Operational Budget.
IMPLEMENT INITIAL STRATEGIES	1. Implement all initial strategies with regard to SEZs, Treasury, **the dti**, and suchlike.
SPECIAL ECONOMIC ZONES (SEZs)	1. Finalise all activities to solicit SEZ support as a whole for the PPP application to the DBSA (as endorsed by the National Treasury GTAC PPP division) for endorsement of the PPP process and model and obtain approval of the purchase by **the dti** of Energy Vaults in the 11 SEZs; 2. Make contact with all SEZs in order to present the **INOVASURE** solution and PPP proposal; 3. Solicit Energy Vault orders in the 11 SEZs.
MUNICIPALITIES	1. Solicit ESMA Agreement finalisations and Energy Vault implementations by means of marketing and support solicited from SALGA / COGTA / Other Government departments and Key Stakeholders with all targeted Municipalities.
NATIONAL TREASURY	1. Finalise the proposed **INOVASURE** / Municipality PPP for presentation to the DBSA with endorsement by National Treasury GTAC PPP division on a Tier 3 basis; 2. Solicit and obtain Treasury confirmation for the approval of the spending by **the dti** on the proposed 11 SEZ Energy Vault implementations.
THE DEPARTMENT OF TRADE AND INDUSTRY (**the DTI**)	1. Solicit support in writing; 2. Approach all the SEZs for support actions from the CEOs and their teams; 3. Approach **the dti** DDG for approval and support of the Energy Vault Program as a PPP to present to National Treasury for all the SEZs or single SEZs – under the auspices of the DBSA; 4. Solicit confirmation that the funds from Treasury will be channeled to the proposed **INOVASURE** PPP and the SEZ Energy Vault purchases for the 11 SEZs; 5. Solicit **the dti** support for the Black Industrialist Program (BIP) [up to R50 million per Manufacturing project] and the 12I Tax Act grants (up to R900 million per Manufacturing Project).
ESKOM	1. Finalise Rebate Application Documents in conjunction with Eskom to NERSA as proposed by the Central Energy Group of Companies (CEF); 2. Address Interconnect Agreements for all relevant Municipalities.
GRANT AGENCIES	1. Finalise application to the GGDA (Gauteng Growth and Development Agency) for various assistances and grant activities; 2. Finalise applications with TEDA (Tshwane Economic Development Agency) for various assistances and grants; 3. Finalise application to all the relevant DBSA managed funding agencies such as IIPSA, Green Energy Fund, etc.
MANUFACTURING FACILITIES	1. Identify the SEZ's most prudent to implement Manufacturing Facilities for the various components of the Energy Vault; 2. Finalise costing and Feasibility for the various Manufacturing Facility SPVs of Battery, Smart Meter, Thin Client, Inverters, Balance of System, etc.; 3. Finalise Funding for manufacturing Facility; 4. Finalise Collaborators for Manufacturing Facility; 5. Finalise EPC for Manufacturing Facilities; 6. Devise strategy for implementation of the proposed Babelegi Facility in Tshwane for the Manufacturing aspects.
KANNALAND LOCAL MUNICIPALITY (OR OTHER IMPLEMENTATION SITE)	1. Finalise ESMA Agreement and PPP Agreement through Transactional Advisors and submit to the DBSA; 2. Register servitude and/or Lease over appropriately zoned land in terms of the contractual arrangement between Kannaland Local Municipality and **INOVASURE** for 25 + option for further 10 years; 3. Determine ESMA fee / service fee monthly in advance for contractual Energy Security provided; 4. Enforce claims / guarantees with penalties.
KANNALAND LOCAL MUNICIPALITY ENERGY VAULT	1. Get ESMA Agreement finalized as a PPP under the auspices of the DBSA; 2. Finalise Funding: 3. Finalise PM and EPC contractors for Kannaland Local Muncipality; 4. Finalise Term Sheets with collaborators; 5. Finalise Orders for Battery, Inverters, Cables, Smart Meters, Thin Client devices, etc.; 6. Arrange that **INOVASURE** nominated EPC contractor/s attend to the Sub-station to comply with SPV interface and dashboard compatibility; 7. Arrange that 5 independent meters are installed - 2 between **INOVASURE** and the Kannaland Local Muncipality and 3 between KANNALAND/ESKOM/**INOVASURE**; 8. ESKOM connection certified to be properly metered for power flow into Kannaland Local Municipality Substation.

IMPLEMENTATION STEPS: INOVASURE's BUSINESS MODEL (continued)	
ESKOM	In terms of present estimates, non-peak power will be injected into the Kannaland Local Municipality distribution network.
LIVESURE TRUSTED CENTRE	Through its Trusted Centre LiveSure / **INOVASURE** will: 1. Administer the ESMA agreement as a Public Private Partnership Arrangement / Service Fee and interface with the Municipality on all matters; 2. Administer re-insurance; 3. Dashboard-manage the SPV contractors - Generation / Energy Vault / Metering.
SPV EPC CONTRACTING MAINTENANCE	1. SPV Photo Voltaic Contractor; 2. SPV Battery Contractor; 3. SPV Smart Meter Contractor; 4. SPV Thin Client Contractor; 5. LiveSure / **INOVASURE** / InovaMedia Manages Dashboard Interface and Smart Meter / Content.
SPV SMART METERING	1. SPV Installation metering and settlement of Smart meters by Smart Meter Contractor Operator; 2. Manage Dashboard Interface in conjunction with Thin Client.
"ENSURANCE" CLAIMS / GUARANTEE PENALTY PAYMENTS	1. All causes of applicable "Ensurance" Claims / Guarantee Penalty Payments are well documented in the ESMA agreement and ensuing PPP Agreement; 2. The Municipality and **INOVASURE** will have a monthly Reconciliation meeting to sign off on any claims in respect of the product of Energy Security as provided through the Energy Vault; 3. Substantiated claims / guarantee penalties to be dealt with expeditiously by **INOVASURE** (through LiveSure TC) and credited to the daily compounded interest bearing Adjustment Account at JIBOR.
STATUTORY & REQUISITE LICENSING ACCESS BY INOVASURE	INOVASURE acts as a **Guarantor and Manager** for and on behalf of the Kannaland Local Municipality. In terms of legal advice obtained and to which the Municipality has access, the Municipality has followed the correct procedures to appoint **INOVASURE** to fulfill the responsibilities as assigned in terms of the ESMA Agreement as a future Public Private Partnership arrangement.
RISK ASSESSMENT AND MANAGEMENT	1. Implementation of risk mitigation and adaption methodologies are part of the **INOVASURE** operations; 2. The Kannaland Local Municipality has equal responsibility to comply with risk triggers; 3. **INOVASURE** actuarially determines the pricing of its policies / Energy Security Management and Administration Agreements; 4. **INOVASURE** chooses the best-of-the-best asset managers, professionals and technologies as well as EPC / BOT contractors; 5. **INOVASURE** (LiveSure) uses a DASHBOARD SYSTEM of reporting to key individuals, stakeholders in the MM and counter parties.
TECHNOLOGY CONTRIBUTION BY INOVASURE AND SPV	1. Ownership of proprietary communication protocol for purposes of effective and secure use of operational dashboards and interfaces with meters and stakeholders; 2. Obtaining very competitive funding for investment into SPV and operational capability of **INOVASURE;** 3. Asset management expertise; 4. OEM manufacturing discounts on proprietary storage technology installed by the SPV.
ASSET REGISTER / FINANCIAL STATEMENTS OF KANNALAND LOCAL MUNICPALITY	For financial statement purposes the Municipality will be the BARE DOMINIUM OWNERS of the land over which the Servitude of use / Lease is registered for purposes of Energy Security underwriting and management. **INOVASURE** will have the USE of the land and Improvements, effected by them over the term of the appointment. The book value of the land is the Net Present Value of the monthly Servitude amount payable over 25 years, discounted at a market related rate. Should the option at the end of 25 years not be exercised for another 10 years, the Kannaland Local Municipality will appoint independent auditors to revalue the residual value of the plant and equipment, the value of improvements, which now also reverts to the Kannaland Local Municipality.
LIVESURE TRUSTED CENTRE	LiveSure has created a Trusted Centre (the "LTC"), which is a proprietary platform to reduce transactional costs and risk through an ISO alignedplatform. In executing these functionalities the state of the art biometrics / internet of things / professionals relative to all actions are utilised together with real time funds tracking and a treasury / asset management platform. The ITC is also responsible for the administration of the Kannaland Local Municipality ESMA agreement and Public Private Partnership arrangement.
LEADERSHIP OF **INOVASURE (Pty) Ltd (South Africa)**	Jaco De La Rouviere – Chairman Jacques C. Pauw - Vice Chairman Max Lourens – CEO R Crous – Director DJ Irvine – Director NC Molepo - Director

Table 1: InovaSure's Business Model

2.6 Sources of Capital Available to InovaSure

There are a number of capital sources available to be procured by **INOVASURE**:

GRANT FUNDING

Securing the dti / DBSA / National Treasury / DST / NDB / DBSA / Other tenders for grant funding as a first loss, Due Diligence enhancer and possible program capitalisation for **INOVASURE** generation capacity is a target through collaborator resources.

OEM MANUFACTURERS

Various manufacturers have indicated that they will be willing to make, through appropriate structures, funds available in foreign direct investment (FDI) into the battery and other manufacturing entity/s.

SECURITISABLE ESMA INCOME

INOVASURE intends installing storage units at 20MW in terms of ESMA Agreements as Public Private Partnerships for as many of the Municipalities in South Africa as possible – 120 Energy Vaults altogether. The securitisation value of the operations minus Protection Plan costs amounts will be committed to the installation of equipment, maintenance and replacement in the event of non-functioning and breakdowns.

GREEN ENERGY BOND PROGRAM

Income streams such as the **INOVASURE** Protection Plan ESMA fees will further be securitized through the creation of an ICMA GREEN BOND PRINCIPLES (GBP) COMPLIANT issuance with Standard Bank as the proposed lead arranger / underwriter. The International Capital Markets Association (ICMA) (http://www.icmagroup.org/) has set out some principles, which have to be matched with that of the JSE Debt Market and others for local bonds:

> *"Green bonds should address climate change adaptation/mitigation, as is energy security; renewable energy, energy efficiency (including efficient buildings, sustainable waste 2 energy management solutions, sustainable land use (including sustainable mining, forestry and agriculture), clean transportation and sustainable water management (including clean and/or drinking water)."*

ICMA identifies four types of Green Bonds (additional types may emerge as the market develops and these will be incorporated by **INOVASURE** as it grows):

- **Green Use of Proceeds Bond** (a standard recourse-to-the-issuer debt obligation);

- A **Green Use of Proceeds Revenue Bond** (a non-recourse-to-the-issuer debt obligation);
- A **Green Project Bond** (a project bond for a single or multiple Green Project(s) for which the investor has direct exposure to the risk of the project(s) with or without potential recourse to the issuer); and
- A **Green Securitized Bond** (a bond collateralised by one or more specific projects, including but not limited to covered bonds, ABS, and other structures. The first source of repayment is generally the cash flows of the assets. This type of bond covers, for example, asset-backed securitizations of rooftop solar PV and/or energy efficiency assets).

Since the bond is a debt instrument, the amount thereof will have to be balanced according to generally accepted gearing ratios and more particularly what the underlying cession of the income stream can sustain. One of the biggest advantages of the **INOVASURE** Energy Security Program is the fact that it is scalable. The possible contracts to be negotiated with Eskom and possible rebates are also of such a nature that the arbitrage margin for producing peak power at maximum tariff and storing off-peak power at low tariff leaves enough of a manageable margin to allow **INOVASURE** to provide a saleable value proposition to Clients – the Municipalities.

IN SHORT*:** The ESMA Agreement and Energy Vault installation effectively SECURES ***ENERGY SECURITY protection for SEZs / MUNICIPALITIES / SOEs and other Corporate Clients, but at the same time creates the platform to provide Eskom / Municipalities with less PEAK DEMAND required, thereby contributing to a lower incidence for load shedding or even black-outs.

NATIONAL TREASURY

INOVASURE, with the help of its collaborators, has engaged with National Treasury under the terms of section 154(1) to intervene to solve the Municipalities debt crisis. As a PPP with a municipality under the auspices of the DBSA (such as the Kannaland Local Municipality) on the implementation program, it is understood by I**NOVASURE** that the ESMA Agreement and ***ENERGY SECURITY*** Program may enjoy Tier 3 status and be endorsed by Treasury.

PRIVATE FUNDERS

Various funders have indicated that they will be willing to make, through appropriate structures, funds available in support of the Municipality RMEMS Projects.

2.7 Core Business Practice of the LiveSure Group Entities

Whereas the purpose of this document is primarily to identify and provide a high level motivation for the feasibility and efficacy of a MUNICIPALITY's innovative ESMA Agreement solution (such as the Kannaland Local Municpality solution) as an implementation site to the full ***ENERGY SECURITY*** Program, by means of a Public Private Partnership under the auspices of the DBSA as an initiative underwritten by National Treasury GTAC PPP division and other underwriters, it will be necessary to highlight the ESG (Environment Social and Governance) accepted business practice that **INOVASURE** and its collaborators put forward as part of the offering:

- Committed, focused and passionate principals and Governance Boards / Thought Leadership;
- A TRUSTED CENTRE as the core project / program management & advisory INNOVATION ROOM (as opposed to a crisis driven "WAR ROOM") with focus inter alia on strategy, risk assessment (actuarial and financial), real time funds flow, evaluating technological advances etc;
- Goals Alignment & Communication with core partners such as Eskom, National Treasury**, the dti**, SALGA, COGTA, the Central Energy Fund (CEF) and other GOVERNMENT AGENCIES (also SDG), funders and other stakeholders;
- A Human Resource Centre of Excellence – LiveSure and **INOVASURE** source talented local people, provide training and skills, mentorship & entrepreneurship skills;
- A Marketing division with the best available CRM and in-house Call Centre – Centre of Excellence;
- Networking Collaboration and Information Communication and Technology (ICT) applications - Centre of Excellence;
- Outsourcing of non-core products and services to Best-of-the-Best EPC and other providers;
- Risk Assessment through a "Centre of Excellence" – the heart of **INOVASURE's** business;
- Strong Finance Centre of Excellence with dashboard governance on budgetary control, audit and dashboard driven reporting, managing a diversified but clean origin capital mix;
- Strong Program and Project management Team leadership – Centres of Excellence; and

- Technology and Research Centre of Excellence - Progression from raw data > information > knowledge > wisdom. Identifying proven technology for purposes of generation and storage is critical.

2.8 INOVASURE Boxes Ticked

- ✓ At **T0** (Time ZERO) and at full capacity, the **INOVASURE *ENERGY SECURITY*** solution will normalize the transmission, generation, dispatch and distribution of energy to the broad-based South African public via the auspices of Eskom's vertical transmission, generation and distribution network;
- ✓ On the generation and supply side, the ESMA Agreement and concomitant ***ENERGY SECURITY*** Program through the Energy Vault installation provides for energy shifting, dynamic tariffs, stability of transmission, flat-lining to the extent of creating constant demand, as well as frequency stability via frequency clamping. On the demand side, the requirement for power by all users will be met when needed. The combined result will cause a much-needed 'lifeline' for Eskom;
- ✓ The proposed battery storage and inverter technology in the ENERGY VAULT, as well as Photo Voltaic (PV) and other renewable / alternative technologies will generate thousands of permanent jobs including downstream service companies through EPC (Engineering Procurement and Construction) contractors and maintenance teams country wide;
- ✓ The Manufacturing Facility planned at the various Special Economic Zones (SEZs) will also created a parallel revenue stream for **INOVASURE** and its collaborators in terms of which off-take will be handled ex-South Africa at very favourable tax rates and with Manufacturing incentives and grants assisting further development;
- ✓ The **INOVASURE *ENERGY SECURITY*** solution is environmentally friendly and ticks all the green boxes. Carbon credit feasibility comes with the project design. To effect a value chain, **INOVASURE** will enter into agreements with Eskom / Municipalities / SEZs / SOEs / **the dti**, supported by the DBSA and the National Treasury, to create an articulated baseline and provide additional arguments for the Project Design Document. Then, implementation steps towards commercialization can be taken;
- ✓ **INOVASURE** endorses and uses the global 'Smart Grid' – a Smart meter and settlement drive to be more efficacious;
- ✓ **INOVASURE** has access to all the relevant inherent Municipal licenses to implement the proposed Energy Security program;

- ✓ **INOVASURE** is in compliance with all of the United Nations energy and water related goals, inter alia forging a valuable Public Private Partnership (PPP) with Municipalities / SEZs / SOEs and others on the UN's SDG (Sustainable Development Goals) Goal no 17;
- ✓ **INOVASURE** uses the "ensurance" and "capital markets'" model rather than the traditional bank, private equity or finance alternatives being deployed generally. With SA and Eskom's rating under pressure, this would present a welcome diversion;
- ✓ **INOVASURE** uses standard 'off the shelf ' structures conforming with regulatory requirements for its Programs. It complies with NERSA regulations, SA Revenue Services, Reserve Bank, Financial Services Board (FSB), National Treasury, Eskom, The Consumer Protection Act, Insurance Regulations, Government Departmental governance procedures and other relevant laws and regulations. It is the way in which these components have been linked that provides the uniqueness. Insurance categories have hitherto been created for virtually most insurable risks except the most basic of needs i.e. energy and water and suchlike;
- ✓ Through various agreements with collaborators, both local and International, **INOVASURE'S** bona fides is already known to the State and para-statal organisations such as Rand Water, SALGA (The South African Local Government Organisation), COGTA, the Central Energy Fund Group of Companies (CEF), National Treasury, **the dti**, GGDA, TEDA, some of the SEZs and various Municipalities and other key stakeholders in the industry;
- ✓ **INOVASURE** aligns Municipalities and 'decentralised' thought leadership innovation. It is in full alignment with Local Economic Development (LED) initiatives;
- ✓ **INOVASURE** creates a "value-chain" and not simply a footprint. With Municipalities, it is a 'conduit' to the green and carbon space, which has hitherto not been seriously on anyone's radar screen;
- ✓ The **INOVASURE** ***ENERGY SECURITY*** solution is a permanent one. It will slowly build up over time to become a trusted dispatchable energy stakeholder with the Municipalities – albeit restricted to dispatch and distribution;
- ✓ Building out the **INOVASURE** model will reduce Eskom's huge dependency on coal as its overwhelming source of supply and convert the same to renewable and alternative energy sources;
- ✓ The Private Sector, through the auspices of **INOVASURE** and its collaborators, can introduce energy parity for all much faster than Eskom - provided the Political Will is present with the major stakeholders;

- ✓ By initially using the ESMA Agreement "ensurance" / service fee route, later augmented by PPP arrangements, combined with ownership and control of critical components such as the Intellectual Property, battery, inverter and a host of other technology, Patents and the manufacturing thereof, **INOVASURE**, through the ENERGY VAULT, can conceivably in due course evolve into a Utility Provider "enhancer" within its own "ensurance" category: "ENERGY & WATER SECURITY"; and
- ✓ **INOVASURE** will consider facilitating Debt Conversion arrangements through its LiveSure financially aligned products for Municipalities to convert their obligations towards Eskom by means of entering into ESMA Agreements and augmented PPP arrangements with **INOVASURE.** It is envisaged that this transaction will leave the Municipalities with no debt and a competent private sector supplier of ***ENERGY SECURITY*** for the Municipalities in return for paying a monthly ESMA Agreement fee for the referenced ***ENERGY SECURITY.*** This initiative requires actuarial input for each project and can only be considered if dedicated funding is available and the **INOVASURE** sustainability / sinking funds are in balance.

2.9 Agreements

The **INOVASURE** group entities are in the process of negotiating exclusive agreements with collaborators, stakeholders, network partners, SPVs, Municipalities, Special Economic Zones, SOEs, funders, financial institutions, equity partners and other organisations in terms of which mutual partnering and provision of services will occur.

Amongst others, some of the negotiations are with SALGA (The South African Local Government Association) and COGTA (Cooperative Governance and Traditional Affairs). SALGA is an autonomous association of Municipalities with its mandate derived from the Constitution of the Republic of South Africa. This mandate defines SALGA as the voice of local government. SALGA interfaces with parliament, the National Council of Provinces (NCOP), cabinet as well as provincial legislatures.

COGTA's vision is to facilitate a functional and developmental local government system that delivers on its Constitutional and legislative mandates within a system of cooperative governance. This Vision is in line with the objectives of Chapter 13 of the National Development Plan: 'Building a capable and developmental State'. Their mission is to ensure

that all Municipalities perform their basic responsibilities and functions consistently by:

- Putting people and their concerns first;
- Supporting the delivery of municipal services to the right quality and standard;
- Promoting good governance, transparency and accountability;
- Ensuring sound financial management and accounting; and
- Providing institutional resilience and administrative capability.

Percentage payment negotiations, service cost realities and suchlike are in the process of being quantified so that a 5-year Business Plan and Forecast can be tabled for finalisation under the **INOVASURE *ENERGY SECURITY*** banner and allow for minimum liquidity levels, claims percentages and operational security.

2.10 Strategic Activities

INOVASURE's business provides innovative solutions for ***ENERGY SECURITY*** in South Africa, Africa and globally:

- By providing options for GOVERNMENT, CORPORATE ENTITIES and PRIVATE CITIZENS to level the energy playing field in the country with regard to LIVING SECURITY, specifically ***ENERGY SECURITY***;
- By having the solutions and the programs available for the above mentioned; and
- By keeping operational strategic activities concise and to the point.

STRENGTHS found in the SWOT analysis should be used by the **INOVASURE** Business:

- To aggressively target the **THREATS;**
- To utilise the **OPPORTUNITIES;** and
- To eliminate the **WEAKNESSES**

The SWOT (Strengths, Weaknesses, Opportunities and Threats) Analysis is shown below:

Strengths	Opportunities
1. **INOVASURE's** products and services are the most diverse and comprehensive of any similar operation of its kind in South Africa (and Africa); 2. Technological development with collaboration partners facilitates the penetration of **INOVASURE's** services to its target markets; 3. **INOVASURE's** products and services can be adjusted to facilitate strategic alliances and changing environments should the need arise; 4. **INOVASURE** has access to many strategic alliances; 5. The proven penetration of insurance related products and services in South Africa, as well as the attraction of innovative products that address the needs of the South African economy; 6. Niche market products, services and brands; 7. Systems approach (ISO 9001/2002 aligned); 8. Comprehensive training programs for all divisions; 9. Operational integrated technology, which allows for the provision of efficient services (dashboard managed); 10. Trained and qualified system orientated employees, consultants and key stakeholders; 11. Practical experience by key stakeholders and personnel in all relevant divisions; 12. Strong network partners both locally and abroad.	1. Generation of income through implementation of new and innovative products and services building on the core operation of innovative energy infrastructure development and "ensurance"; 2. Generation of income through launching bolt-on exclusive niche services and products; 3. Generation of income through strategic alliances with key stakeholders as value added services.
Weaknesses	**Threats**
1. Vulnerable to possible competitor "hi-jacking"; 2. Current Non-optimal staffing structure; 3. Full package of products and services unknown to Market; 4. Seed funding and working capital required to roll out.	1. Targeting of key stakeholders, products and services by competitors

Table 2: INOVASURE'S SWOT Analysis

2.11 The INOVASURE Growth Strategy and Flow of Funds Diagram

To foster a fast and controlled growth strategy, **INOVASURE** feels that it is important to concentrate all future activities of the **INOVASURE** its Thought Leadership & Action Team in **CENTRES OF EXCELLENCE** with an effective and flexible approach to the implementation of its objectives. The **LIVESURE TRUSTED CENTRE ("LTC")**, as licensed to **INOVASURE** is the brain of the **INOVASURE** program.

First and foremost, a controlled **INOVASURE** Business growth strategy can be realised through a holding structure, in which a Team Leadership model is embedded. Special purpose entities - also called **SPECIAL PURPOSE VEHICLES (SPVs)** - being bankruptcy remote, will be created as and when required. Where possible, **INOVASURE** will seek to be the bare dominium owner of rights and title and the receiver of **USUFRUCTURY** rights.

Secondly, further growth can possibly be realised through a **LICENSING APPROACH**. Granting licences and supplying an Intellectual Property portfolio of choice, keeps funding requirements low. Furthermore, the Licensing structure guarantees a homogeneous and constant quality of the products and services and a high level of production standards in South Africa, Africa and all over the world. At the same time, a high quality **ISO (International Standards Organisation)** approved platform will be provided.

As much as the technologies themselves are core to the **INOVASURE** business and its vast potential in terms of its goods and services, it is believed that the people behind the concept are core to its successful implementation and the actual realisation of this potential.

That is why it is important that the members of the core management team of **INOVASURE** and all its affiliates should have a good understanding of the company's business case.

In addition, the management model optimally promotes the objectives and facilitates a swift but controlled growth strategy.

The short Curricula Vitae (CV) of each of the members of the **INOVASURE** management team is found elsewhere in this report.

The **INOVASURE** Flow of Funds Diagram is shown next:

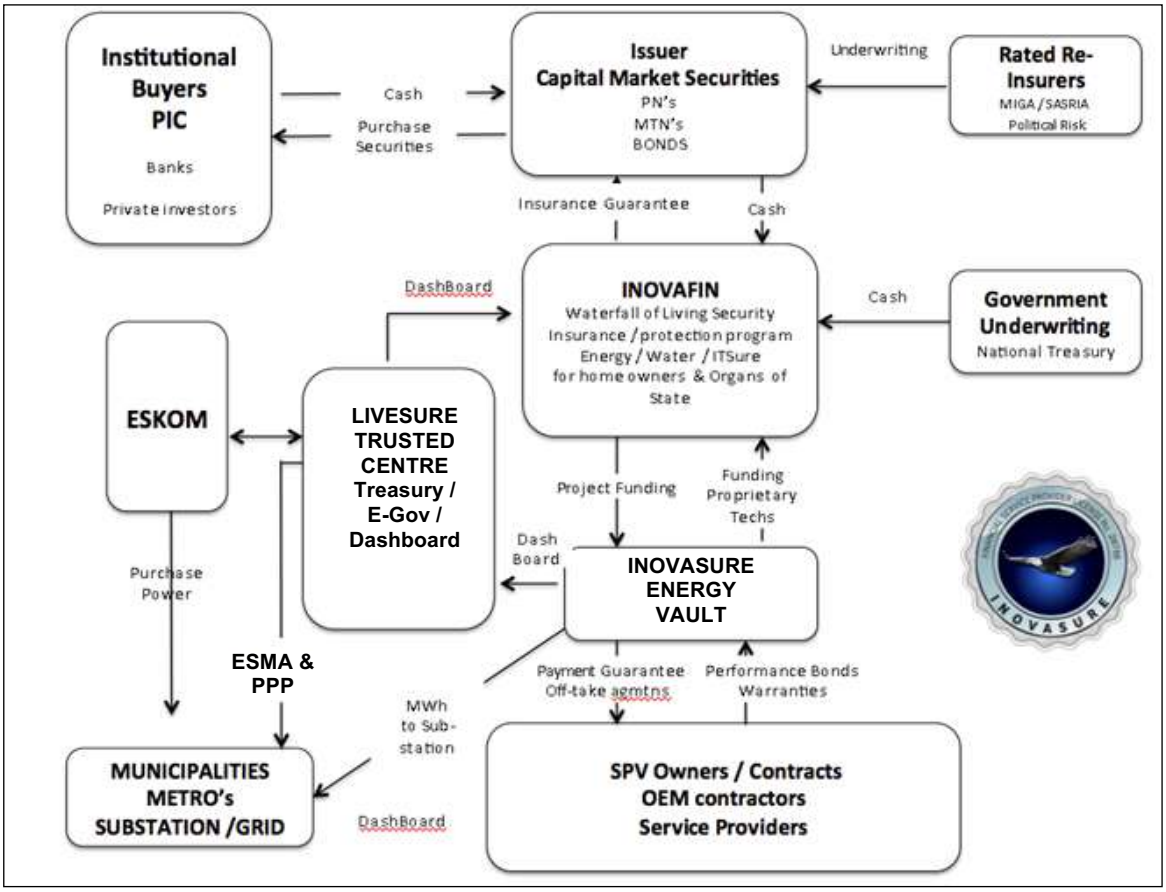

Table 3: INOVASURE (SA)'s Flow of Funds Diagram

In determining the overall feasibility and income streams of the respective projects and resultantly the income streams for **INOVASURE** the Team did a few sensitivities and has used a "T_0" methodology as a departure point:

- In terms of this, all projects, models and ensuing developments are researched, designed, built, "sold" and included as profit in the books of account, INSTANTANEOUSLY;
- The model is extrapolated with relevant time, escalation and other assumptions over a period of 25 years;
- A Net Present Value (NPV) is calculated at various percentages with a risk-adjusted set of pro-forma financials;
- These numbers are factored into a shareholding structure and the actual future share price calculated; and
- The robustness of the financial model is challengeable but provides at least some basis for evaluation. It is a perpetual model and therefore continuously updated with any metric that becomes available.

2.12 The INOVASURE Research and Development Options

The options to study and develop for utilisation and implementation by and for the **LIVESURE GROUP** and its subsidiaries in the Research and Development (the "R & D") for its products and services are numerous:

- A mix of polishing and filter technologies i.e. mist, electrical charges, carbon tax, including incentives and penalties, CO_2 sequestration and fuel production technologies i.e. algae and land plants producing biodiesel, hydrogen, air pressure engines and natural gas or coal-to-fuel technologies with zero emission;
- All waste streams should be converted to (cost) efficient energy;
- Utilization of Renewable sources should be utilised and refined to the maximum;
- Water security policies need to be implemented through technology applications;
- Clean Manufacturing must apply;
- Conversion of all waste streams to (cost) efficient energy sources must apply;
- Green spaces should become productive;
- Heat exchange and conversion should be harnessed;
- An on-going anti-pollution technology strategy should apply, resulting in zero emission;
- Utilization of renewable sources should be mandated;
- Water Security must obtain highest priority;
- (Mass) Transportation and Mobility methods should be safe, convenient & cost effective;
- Interconnectivity of different market participants should be implemented;
- Affordability and benefits of the **INOVASURE** products and services should be at the forefront of all R & D;
- Bankability of all lowest cost devices should be at the forefront of all activities;
- Best-of-Breed Zero Emission Transportation should be envisaged for all types of mobility;
- Best-of-the-Best cost efficient EPC (Engineering Procurement and Construction) should apply;
- Contractors and Maintenance of Best-of-the-Best Service Delivery should apply;
- Cost effective Education / Training / E-Learning are imperative;
- Cost efficiencies and Eco-compliance are required;
- Cost efficiencies of services delivery are applied;
- Economies of Scale / Product Clearing Settlement Platform applies;
- Employment opportunities should be sourced from adjacent communities;

- Energy Security / "Ensured" against the same should apply;
- Financial services / Bankability / Biometric authentication and verification should apply;
- Food Security / Nearest food supply source possible / vertical farming are promoted;
- Formal vs. Barter type markets should receive attention;
- Interconnectivity between different market participants should be studied;
- Lowest cost of capital sourcing must apply;
- Maintenance minimization should apply;
- Maximum Overground and Underground, as well as Air linkages should be investigated;
- Medical Services / Nutrition / Sanitation should be integrated;
- A Menu of Alternatives / transparency on awarding tenders with a Trusted Centre approach should apply;
- Adaptation & Mitigation of relevant risks should apply;
- On-going planning and stress testing of GOVERNANCE information should apply;
- Product Clearing and Settlement Platforms should apply;
- Real time forensic auditing and funds-tracking should apply;
- Reducing cost of GOVERNANCE without sacrificing income streams should apply;
- Road networks need to be appropriately planned for present and future uses;
- Scalability in all aspects should apply;
- Secure energy supply for all transportation sources should apply;
- Social networking / Connectivity / Entertainment / Recreation should apply;
- Sustainable Energy / Potable water supplies should apply; and
- A variety of suitable green / eco-Housing / accommodation and resort types should apply.

These environmental requirements have to be managed in synchronisation with **INOVASURE** *CITIZENS*:

- Lifestyles
- Mobility requirements;
- Governance expectations; and
- "Citynomics" (economies for smart cities) & Econometric sustainability

INOVASURE believes that it understands the principles of SMART CITIES and CITYNOMICS in all aspects and as such can draw on this knowledge and experience in

order to better design and apply Smart City principles to the development, implementation and management of its own products and services – all of which go to the heart of a sustainable and Smart City / Village / Municipality / Town – Energy, Water, Education and Housing Security, leading to concomitant Food, Employment, Mobility, Health and Social Security.

2.13 INOVASURE Risk Factors and Mitigation

The **INOVASURE** Leadership Team has unique, innovative ideas with regard to structuring, identification of sources of capital, debt and equity and the ability to align each of these in a financially productive and conservative way to achieve its objectives.

Since the various contracts at hand, including the PPPs, are capital intensive, they are all subjected to different types of risks. **INOVASURE** has the ability to identify and link these risk factors and influences of the market to its business drivers and profit motives, metrics, processes and methodology of creating outcomes and execution.

The **RISK STRATEGY** that **INOVASURE** employs is:

- Establish the full context possible of project or activity involvement that causes risk factors;
- Evaluate these risk factors and determine specific risks;
- Apply metrics to specific risk factors and incorporate this in the **INOVASURE** financial model;
- Apply a risk mitigation strategy to balance risk versus insurance expenses;
- Monitor and review the result of mitigation applications.

THE INOVASURE AND LIVESURE GROUP ENTITIES have identified the following **RISK FACTORS**:

- **ALM [Asset and Liability Management] Risk:** This is the practice of managing risks that arise due to mismatches between the assets and liabilities (debts and assets) of a company. ALM is a strategic management tool to manage interest rate risk and liquidity risk faced by companies. It takes into account the maturity pattern or the matching of the duration of perceived risks by hedging and by securitisation of income streams;

- **Business Risk:** This is, perhaps, the most familiar and easily understood risk. It is the potential for loss of value through competition, mismanagement, and financial insolvency. The biggest defense against business risk is the inclusion of license values. As such we are able to raise prices to adjust for increased labour, taxes or material costs;
- **Capital Risk:** (direct to equity) which is the forfeiting of any capital through bad financial times;
- **Commercial Risks:** These risks are a reality for any transaction with a commercial value;
- **Commodity Risk:** This refers to the uncertainties of future market values and of the size of the future income caused by the fluctuation in the prices of commodities such as gas, petroleum and electricity. This will include risk arising out of adverse movements in the world prices, exchange rates, difference between local and world prices;
- **Compensation Risk** of third parties for bodily injury or property damage caused during construction or refurbishment of Projects;
- **Concentration Risk:** This denotes the overall spread of **INOVASURE's** outstanding accounts over the number or variety of licensees with whom **INOVASURE** has contracted;
- **Counter Party Risk: INOVASURE** carries out comprehensive Due Diligence before entering into agreement with counterparties;
- **Credit Risk:** This refers to the risk that a borrower will default. It includes lost principal or interest or disruption of cash flows or increased collections costs. It is the responsibility of the lender but **INOVASURE** takes all steps necessary to ensure this will not happen to licensees itself;
- **Cross Border Legalities Risk and Governance:** This is a type of risk that means that a counter party is not legally able to enter into a contract. A concomitant legal risk relates to regulatory risk, i.e., that a transaction could conflict with a regulator's ESMA Agreement or, more generally, that legislation might change during the life of a financial contract;
- **Currency Risk:** This is a financial risk posed by an exposure to unanticipated changes in the exchange rate between two currencies. It is not always possible to be paid in in a currency of **INOVASURE's** choice and requires on-going attention;
- **Earnings Risk (income statement):** This is the risk of not being able to protect the bottom line. **INOVASURE** anticipates setting up a stabilisation fund from excess profits to provide earnings sustainability. Ensuring the bankability of the various

operations and projects is paramount – by providing levels of insurance protection sufficient to meet standards required for lenders' credit committee approvals;

- **Equity Risk:** This is the risk that our investments will depreciate because of stock market dynamics. Refer to the stabilisation fund as mentioned above in this regard. This is a powerful tool in **INOVASURE's** hands to counter this risk;
- **Insurability Risk:** Sovereign & City ratings in this instance are very important in mitigation;
- **Intellectual Property Protection Risk:** This is mitigated by proper registration procedures of such IP;
- **Interest Rate Risk:** This is the risk (variability in value) borne by interest-bearing assets, such as a loans or bonds, due to variances of interest rates. Close attention is paid to this for both our organisation and our licensees / franchisees;
- **Investment Risk:** This includes 3 types of risk that we will strive to avoid:
    - Liquidity risk - the risk that a given commodity or asset cannot be traded quickly enough in the market to prevent a loss (or make the required profit);
    - Market risk - the risk of losses in positions arising from movements in market prices. Any stock exchange company is subjected to this;
    - Multiple Insured / Non-vitiation provisions including waivers of subrogation, Assignment of insurance, Loss payee clauses, Obligations to notify lenders of changes to/cancellation of project insurance policies and Primary ESMA Agreement fee /non-contribution clauses.
- **Operational Risk:** This is a risk arising from the execution of a company's business functions;
- **Preservation of Debt Risk:** This encompasses the preservation of service capabilities whilst in operation;
- **Pricing Risk:** This related primarily to plant risk;
- **Profit Risk:** This is a risk management tool that focuses on understanding concentrations within the income statement and assessing the risk associated with those concentrations from a net income perspective;
- **Project Risk:** This is a risk with major implications and is fairly difficult to mitigate. It is intended that we set up a SUSTAINABILITY FUND for this purpose. The **INOVASURE** balance sheet will be protected by providing funds to re-instate any damage to any project or product range whether during conversion or whilst in operation during the term of the commercial agreements. In this regard, amongst others, the use of performance bonds in exchange for payment guarantees are envisaged;

- **Refinancing Risk:** This is the possibility that a borrower cannot refinance by borrowing to repay existing debt. Our licensees will be monitored on an on-going basis to mitigate this risk;
- **Regulatory Risks:** Regulations change regularly and decision-makers need to be mindful of any of changes – it will be ensured that they are;
- **Reputational Risk:** This is a type of risk related to the trustworthiness of a business. Damage to a firm's reputation can result in lost revenue or destruction of a shareholder's value. Attending to the possibility of this risk factor can be a matter of corporate trust, but serves also as a tool in crisis prevention;
- **Risks arising from the people, systems and processes of the company:** This also includes categories such as fraud risks, legal risks, physical or environmental risks. They are all identified and shall be attended to assiduously;
- **Security of end-product markets Risk:** This risk is attend to by means of constant vigilance in reading the market;
- **Settlement Risk:** When settlement has to take place it always has to be on a DVP (Delivery versus Payment) basis since short-term stock fluctuations can influence transactions;
- **Site, Refurbishment and Development Risks:** These are mitigated by proper underwriting;
- **Sovereign / Political Risk:** This is a type of risk faced by **INOVASURE.** It is a risk that can be understood and managed with reasoned foresight and investment. We can also revert to MIGA (Multilateral Investment Guarantee Association) in this regard if required;
- **Statutory Insurance Obligations Risk:** This is mitigated by understanding all the relevant legalities;
- **Systemic Risk:** This is the risk of collapse of an entire financial system or entire market, as opposed to risk associated with any one individual entity, group or component of a system. It can be defined as "financial system instability, potentially catastrophic, caused or exacerbated by idiosyncratic events or conditions in financial intermediaries". Typically in some of the markets **INOVASURE** intends to operate, this is a real risk and will be observed carefully;
- **Technology Pricing Risk: INOVASURE** follows a best-of-class policy. To be tied into contracts for too long can carry a risk ESMA Agreement fee which we will strive to avoid;
- **Valuation Risk:** This is an investment risk. Future growth prospects will increase **INOVASURE's** earnings yield and will be a definite risk driver; and

- **Volatility Risk:** This is the risk of a change of price of a portfolio as a result of changes in the volatility of a risk factor. Any such movement will enjoy close scrutiny.

A quantified risk-pricing model for all our products and services is presently being developed in order to apply relevant metrics to the different risk categories.

INOVASURE continually applies (on a dashboard basis) cash flow and asset and liability modelling – plus inserting this into a system-linked computational efficiency model:

- **INOVASURE** involves its funding partners in particular financial institutions, target funds and the like, on an on-going basis in the structuring of models;
- **INOVASURE** engages in 'crossbreeding comfort zones', which is beneficial for PPP relationships;
- **INOVASURE** utilizes appropriate capital raising vehicles, diversifying its industry risk profile. We constantly innovate as a team and we use flexible and dynamic service models;
- **INOVASURE's** approach and design for its models is one of innovation, structuring and alignment;
- **INOVASURE's** approach to Risk Management is comprehensive: i.e. funding, interest rate risk measurement, competitive assessments, liquidity requirement management, gap analysis, duration analysis, simulation models, derivative product accounting, match-funded liability management tolerances, ex ante (preventative) and ex post (punitive) links to budgeting and drawdown policy alignment] will be applied in all we do so that we are not caught in a "debtflation" cycle with no money at hand when operating or investing resources according to a strategic and tactical asset management strategy of all **INOVASURE (SA)** projects, operations and investments;
- **INOVASURE's** asset portfolio, liability assessment and investment optimization procedures are carried out through stochastic and other appropriate modeling parameters. The value of assets throughout their beneficiation cycles are measured and reflected in their financial statements;
- **INOVASURE's** entrepreneurial approach is to focus on "low hanging fruit" through differentiation from traditional perceptions. It looks for deployment of feasible technologies backed by appropriately costed capital sources available as well as, preferably rated off-take agreements for its projects. The objective is ideally to devise ways and means of finding the needle in its haystack as soon as possible;

- **INOVASURE's** key set of criteria to weigh financial results are defined through options, capital cost averaging, risk profiling and sharing profits equitably with investors;
- Capital market acceptance: in this regard it utilizes existing risk mitigating products such as insurance wraps, financial and product clearing and settlement platforms;
- Designing a sustainable asset management Policy with acquisition of profitable assets and beneficiation in mind;
- Diversification is one of the key objectives of **INOVASURE** and in this respect it will apply innovation capital;
- Econometric modeling "simulation" and annealing will be carried out;
- Economic Capital (development and implementation) will be employed;
- We will be engaging with investors on Risk-adjusted return on Capital versus actual mandate and benchmark to create a sustainable reverse engineered return;
- We will apply an Entrepreneurial Mindset and employing technology in defined areas of business where regulatory changes are the order of the day i.e. CleanTech;
- Global Policy action (i.e. Kyoto protocol) is another 'invention of the international community", which **INOVASURE** will understand and manage;
- Global urbanisation and environmental pressures drive our business and links to areas like property and real rights Beneficiation;
- Green Stimulus and Development Finance evolution will help us move and mobilize our initiatives in CleanTech applications in all our operations;
- In the current climate where uncertainty is key, **INOVASURE** approaches its origination of investment opportunities with a new way of thinking; and
- Investors will receive a Risk-adjusted return on capital versus actual mandate and benchmark to create, effectively, a sustainable reverse engineered return.

2.14 The Thin Client Technology

Insurance wrapping by the LiveSure Trusted Centre ("LTC") is carried out for **INOVASURE.** Apart from the governance and compliance benefits that the LTC holds, the net effect is that it brings down transactional cost dramatically in supplying the LiveSure and **INOVASURE** product range, such as the revolutionary Thin Client technology that also drives the workings of the Energy Vaults in conjunction with the overall management system.

The Client Base

The client base for the **THIN CLIENT TECHNOLOGY** is the **South African Government (Department of Education)**, **State Owned Enterprises** (SOEs) Local Authorities, **Special Economic Zones** (SEZs previously known as Industrial Development Zones or IDZs), **Corporates**, **Gated Communities, Schools** and **private individuals.**

The Thin Client technology is next discussed in more detail:

Figure 2: Thin Client Technology

The "One Payor" Program

This program is designed to replace the requirements of Local Authorities to provide energy to users and manage normal utility bill receipts. It will consolidate their outstanding debt to the Utility Provider.

The One Payer Program not only provides debt relief (where appropriate), but simultaneously is masterfully engineered to create the platform to provide Local Authorities with the generated capacity and trading mechanisms needed to prevent load-shedding or even *Force Majeure* black-outs without loss of income to Eskom or the Municipalities.

Benefits Through all Product Categories

Four benefits are identified of the application of the LiveSure / **INOVASURE** product range:

Benefit Number	Benefit Description
Benefit #01	Clients generally receive ***ENERGY SECURITY*** in exchange for a simplified One Payment Service Fee per time period in an "Ensurance" / Protection Plan / Warranty Policy / Service Contract substituting their normal utility bill payment. This program provides ***ENERGY SECURITY*** but is masterfully engineered to create the platform to provide Eskom and the various Municipalities in South Africa with the stored capacity and trading mechanisms needed to prevent load-shedding or even black-outs without the loss of income to Eskom, the Municipalities or other customers.
Benefit #02	A second benefit of this innovative solution is that a constant energy supply for providers of bulk water, such as Rand Water, provides the catalyst for them to be able to provide Water Security, which is an even bigger risk than ***ENERGY SECURITY*****.** In fact, energy has monetary and human livelihood implications with certain declared minimums, but water is a constitutional right.
Benefit #03	A third benefit to all clients is a 24-hour uninterrupted secured power supply (UPS) at an escalation of CPI (Consumer Price Index) instead of the unexpected and unaffordable 14% to 17% energy price increases we have been experiencing the past few years.
Benefit #04	A fourth benefit to all clients is that they receive ***ICT SECURITY*** due to the presence of the unique LiveSure Thin Client Technology and Smart Devices which are incorporated into all the Energy Vaults and households and which link all key stakeholders on a dashboard basis.

Table 4: Benefits through Product Categories

2.15 The INOVASURE Energy Product Range: EnerGsure

Energy Security Management and Administration Services Agreements ("ESMA's")

Along the lines of a Public Private Partnership Aagreement**, INOVASURE** enters into collaborative ***ENERGY SECURITY*** Management and Administration Services Agreements ("ESMAs") with selected and willing Municipalities / SEZs / SOEs and other selected Corporate Clients to, amongst other things, provide them with ***ENERGY SECURITY*** and an on-going supply of reliable energy.

Where appropriate and if required, **INOVASURE** also issues securities in terms of a program, underwritten by Treasury in terms of Article 216 Constitutional Obligations, and places the market related securities with institutional buyers.

The Product Range

The **INOVASURE** product range, under the banner of "enerGsure", consists of various services and insurance related products and services designed to ensure *Energy, Education, Health* and *ICT Security* for its client base.

INOVASURE has created custom made solutions subject to accreditation by the LiveSure Trusted Centre ("LTC"). The LTC's role is to provide in-house Scoping and Due Diligence Client accreditation; determining client's requirements, creating a customised solution, which, upon acceptance by the Client, is then embedded in an "Ensurance" / Protection Plan / Warranty to be issued to the Client.

The Energy Vault

The **INOVASURE** RMEMS (otherwise known as the "Energy Vault"), essentially a large UPS, is the cornerstone to the ***ENERGY SECURITY*** Product as well as the *ICT Security* Products and services. The development of the Energy Vault implies that a systematic installation of patent and design protected equipment and systems is performed on the property of the relevant participating Municipality / SEZ / SOE or other Corporate Client at **INOVASURE's** own cost.

As Custodian and Manager, **INOVASURE** operates and manages the equipment as a service to the Municipality / SEZ / SOE or other Corporate Client. Generated dashboard based data will be available as a management tool to receive, meter, store, shift, shave, distribute and transmit energy, as well as to introduce generated Renewable Energy.

The Energy Vault is shown diagrammatically:

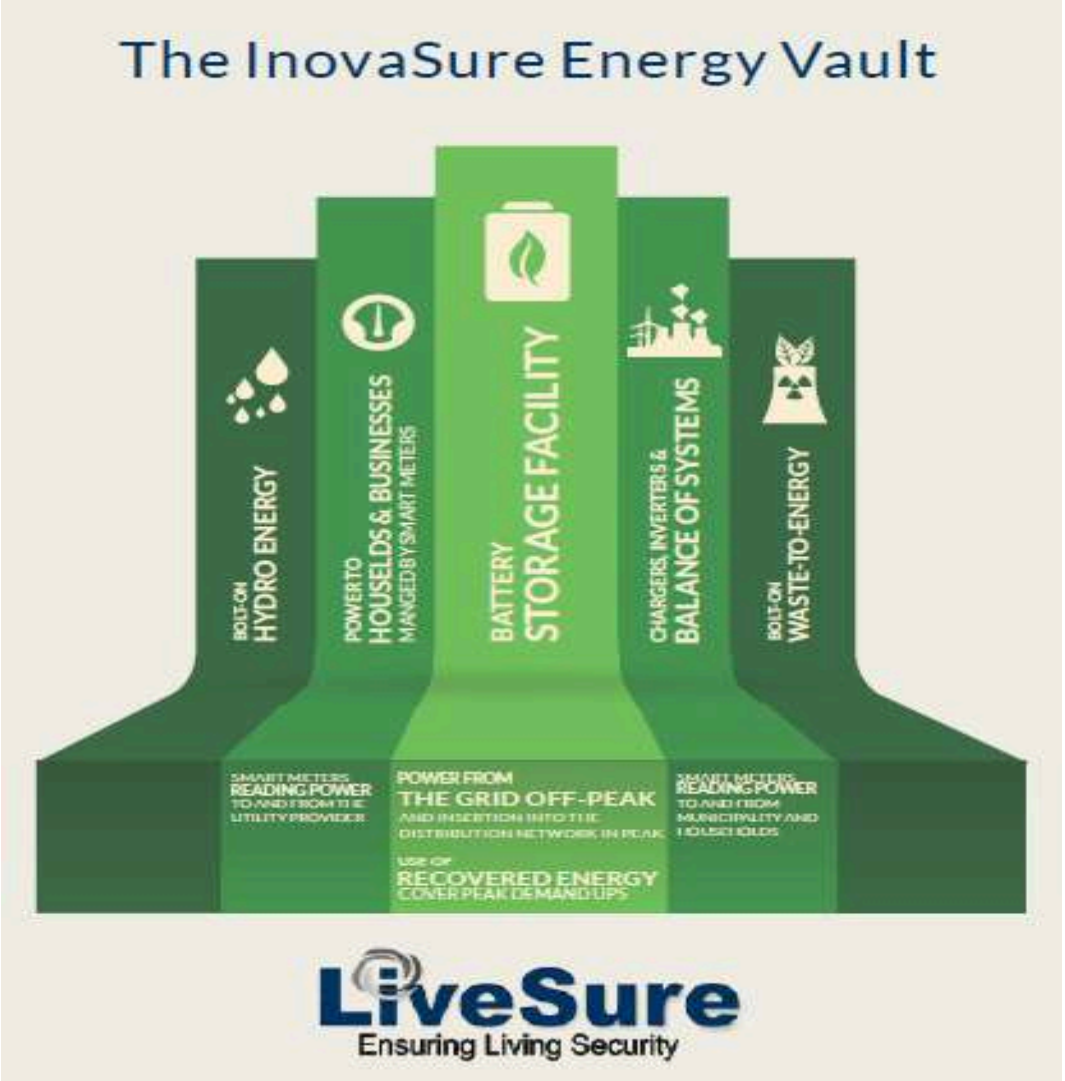

Figure 3: The INOVASURE Energy Vault

INOVASURE does not own, buy or sell the power that is managed on behalf of the Municipality / SEZ / SOE or other Corporate Clients, but rather acts as its agent in the process of ensuring that the facility and its operation is managed to its maximum capacity according to generally accepted global Utilities Practice and ISO (International Standards Organisation) guidelines.

The RMEMS (Energy Vault) comprises unique utility scale storage units (batteries) and "balance of systems" components such as inverters, transformers, switchgear, Smart meters and unique Thin Client Technology devices and related devices and the like, all of which have been developed and successfully deployed and tested worldwide through reputable and successful collaborators with whom **INOVASURE** has secured long lasting and valuable relationships

Benefits Provided by Collaborators

Peak-Saving and Demand Management

INOVASURE uses state of the art and unique batteries as part of the Energy Vault to store excess efficient base-load generation and energy produced off-peak. By discharging during peak hours, the Energy Vault obviates the need for new, dirty, inefficient peaking generation and reduces carbon emissions.

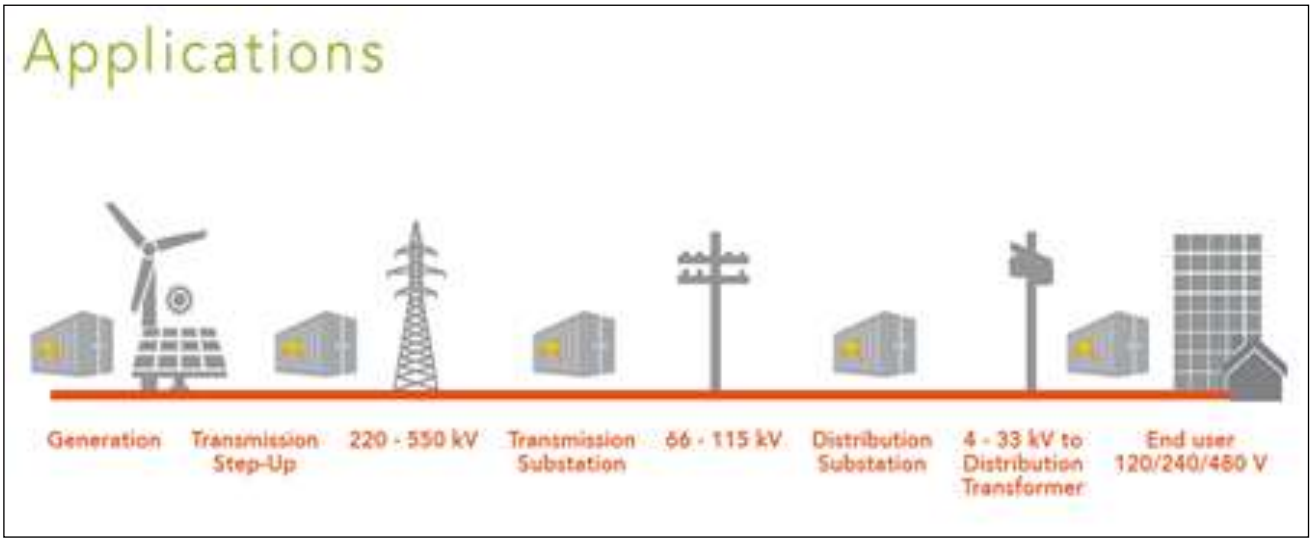

Figure 4: Applications

Eskom and Renewable Energy Integration using energy time-shifting

Renewables such as wind, hydro and solar are intermittent, potentially introducing instability into the Eskom grid and limiting their viability as a firm, dispatch-able power source.

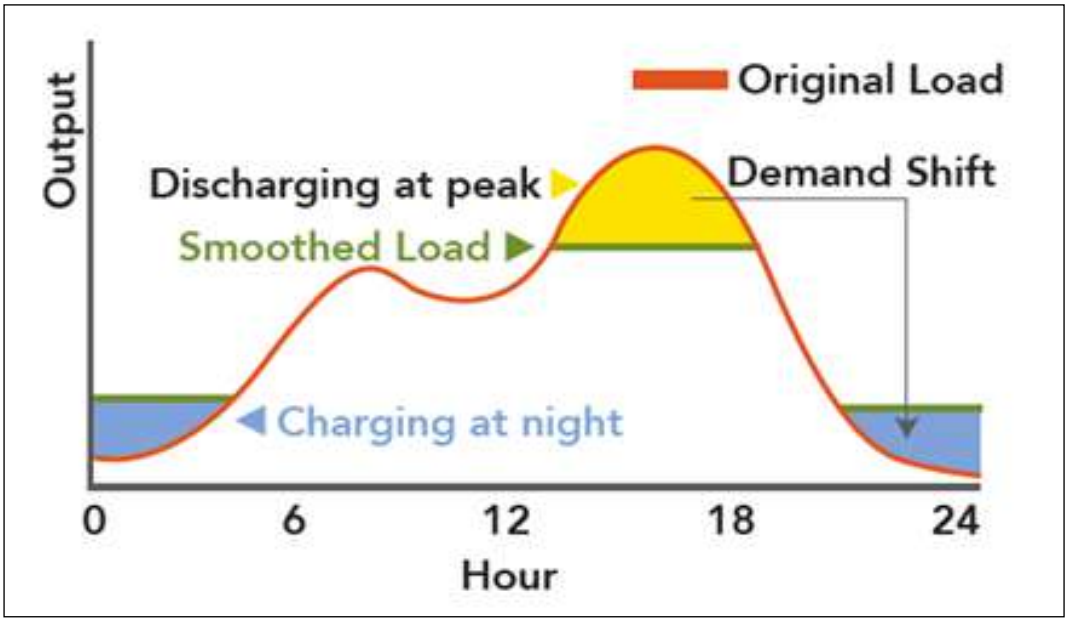

Figure 5: Energy Integration using Energy Time Shifting

Eskom Power, as well as Renewable Energy such as solar electricity produced at noon, can be stored and deployed into the distribution network as a stable power source at peak demand in the evenings

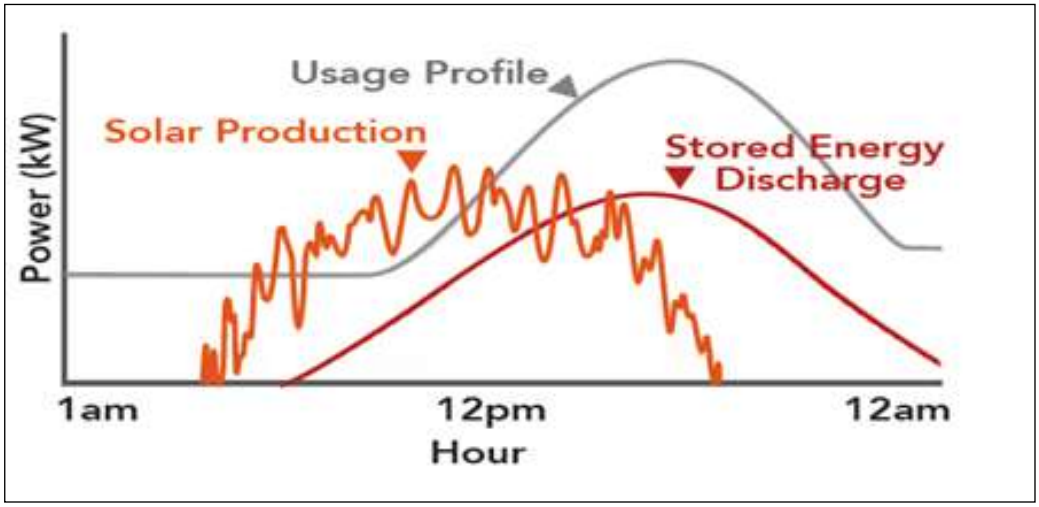

Figure 6: Energy stored and deployed as Stable Power Source

The **INOVASURE** RMEMS (Energy Vault), through its systems and battery storage capability as a large UPS, allows the participating Municipalities to smooth production and time shift the energy.

2.16 The LiveSure Trusted Centre ("LTC")

The core of operations, and the basis on which **ENERGY SECURITY** services, warranties, insurances and guarantees are issued and provided, is the **LIVESURE TRUSTED CENTRE ("LTC")**. Insurability is created through a process to enhance the profitability of the 'trade cycle'.

All governance matters are dealt with in the LTC on the basis of transparency and the use of tools such as "internet of things / everything" applications, real time funds tracking, a biometrics bank, secure communication, external audits, ISO standard procedures and suchlike which are top of the priority list in the LTC.

As was stated before in this report, insurance wrapping of the **INOVASURE** products qand services is carried out by the LiveSure Trusted Centre. Apart from the governance and compliance benefits, the net effect is that it brings down transactional cost dramatically in supplying the LiveSure and **INOVASURE** product range, such as the revolutionary LiveSure Thin Client technology that also drives the workings of the Energy Vaults in conjunction with the overall dashboard management system.

The LiveSure Trusted Centre is discussed in more detail in the remainder of this report.

2.17 Closing Remarks

South Africa loses an estimated R11 billion per month during load shedding periods. Blackouts are much worse. In fact, the word "devastating" describes it more appropriately. This has created, effectively, a new insurable (**INOVASURE** calls it "ensurable") risk category to be provided for – ***LIVING SECURITY***. The solution is a Public Private Partnership (PPP) between **INOVASURE** and Government stakeholders such as the participating Municipalities / Special Economic Zones / State Owned Enterprises, as well as the Department of Trade and Industry.

INOVASURE ticks all the boxes in respect of green philosophy and impact investment, job creation, PPP promotion, and providing a very crucial solution to ***ENERGY SECURITY*****,** far quicker than Eskom or the Government can currently do.

It should be emphasized that on a T_0 ("Time Zero") or Net Present Value basis, the metrics for the **INOVASURE** ***ENERGY SECURITY*** program meet the social needs fulfillment nature of the Program, but also create sustainability and commercial return parameters for its PPP partner (the Municipality) and stakeholders.

The Program requires as much grant funding as can be obtained - primarily for First Loss underwriting purposes and initial generation infrastructure. Grant funding *unlocks better sales (lower Protection Plan packages), a higher coupon on capital market trading instruments and increased manufacturing capacity, which in turn, after implementation of the Energy Vault, causes the Municipalities to be in a position to utilise off-peak power during peak times and to be remunerated for the same at realistic rates from citizens and thus ultimately generate underwriting profits for each participating Municipality - thereby ensuring* ***ENERGY SECURITY*** *in South Africa*.

Manufacturing and deployment funding can more readily be obtained through securitisation (bond / MTN programs).

Bridging and permanent capital for **INOVASURE** in respect of the various manufacturing plants i.e. battery packs, inverters, PV panels, smart meters, thin client devices, heat exchangers, etc. will be easier to source because of the discountable and 'off-take' production nature thereof.

Once deployed, the **LIVESURE TRUSTED CENTRE** (which is effectively the Treasury division of LiveSure and **INOVASURE** and all the affiliate companies of the Group) manages funds under administration. Real time Funds-tracking, external auditing and a cloud-based dashboard will keep the INOVASURE team and its collaborators, donors and key funders informed and working around the clock.

INOVASURE will brand, roll-out, introduce and manage the Energy Vault's at participating Municipalities through the conclusion of the ESMA Agreements as Public Private Partnership arrangements under the auspices of the DBSA through appropriate SPVs and will also ensure, augmented through PPP arrangements, through Joint Venture partners, that the appropriate equipment is installed, by means of a separate financing deal with stakeholders. **INOVASURE** will be responsible to ensure that the "ensurance" operation and its products and services are operational at all times, as well as maintained and secured against theft and damage.

Insurance and re-insurance will be provided at all times for **INOVASURE's** products and services despite the perceived low risk (both Eskom and the **INOVASURE** alternative energy installations cover the client's premises for most contingencies except for perils such as fire and lighting), whilst the cost of the equipment to be installed is underwritten / guaranteed by the suppliers.

An **INOVASURE** Call Centre will be mobilized in conjunction with the dashboard management system for follow up repairs and maintenance, as well as various Contractor ("Master Care type operator) to maintain the relevant equipment. Marketing and Sales operations are also in process, which comprises mainly overhead agreements with various bank brokers, insurance brokers for mutual partnering.

In its current structure, **INOVASURE (SA)** will function as a WARRANTOR (escaping most of the burdensome insurance requirements for a full blown insurance product) receiving the master license to operate from **INOVASURE** with regard to its IP. An effective Protection Plan will be provided to Municipalities / SEZs / SOCs / Other Corporate Clients against the loss of electrical power and resulting damages.

The participating Municipality will at all times be assured of control of quality of service and the efficiency of the Collaborator installations network since it will be developed along International Standards Organisation ("ISO") guidelines and obtain certification as such. The SPV's, people, network partners, service providers, licensees, contractors, consultants, engineers, professionals and brokers involved will perform their functions according to determined procedures and international standards.

INOVASURE's counterparty and PPP partner, the Municipality (or the SEZ / SOE in the case where the SEZ / SOE falls inside a municipal area), pays INOVASURE a monthly ESMA fee to provide it with ***ENERGY SECURITY*** on its behalf in a legally competitive manner, all managed in a Public Private Partnership arrangement under the auspices of the DBSA and endorsed by the National Treasury GTAC PPP division .

INOVASURE AIMS TO CHANGE SOUTH AFRICA, AFRICA AND THE WORLD FOR THE BETTERMENT OF MANKIND!

3. INOVASURE'S VIEW OF THE ENERGY SITUATION

3.1 Managing Non-availability of Energy[67]

INOVASURE addresses the key risks that the Nation's critical energy infrastructure is facing and the ways in which the insurance industry can help manage these risks, including how it identifies, assesses and manages them and their potential impacts.

Today, weather-related incidents account for the majority of economic losses in the insurance industry as well as in the critical infrastructure sectors. In addition to the traditionally-recognized natural hazards, critical energy infrastructure faces non-availability of energy, i.e. load shedding, breakdowns and blackouts.

Power outages / load shedding in South Africa over the past few years have demonstrated an increasing likelihood of regional and long-lasting blackouts resulting in high economic losses. Due to the growing interconnectedness in combination with aging infrastructure, this risk is expected to increase in both frequency and severity. Power blackouts are most certainly one of the emerging risks in South Africa and Africa that need to be urgently addressed.

There are numerous potential causes for power blackouts, including storms, transmission failure, heat waves, and aging infrastructure to name a few. Relatively short term power disruptions (a few hours to a few days) are experienced frequently on a local or regional level around the country. However, we in South Africa are still not completely familiar with large-scale, long-lasting, power blackouts, caused by high-impact, low frequency events.

Current risk management mechanisms in South Africa and Africa are not adequate to mitigate losses following a blackout. That is because risk transfer via insurance has usually required physical damage to either the insured's assets or the assets of specific service providers to trigger a business interruption claim. However, only 20 to 25 per cent of business interruptions are related to a physical loss, which means that should a major power blackout occur, even insured persons or businesses could potentially face a significant uninsured loss. To better mitigate such potential losses, new risk transfer solutions related to power blackout risks from current and evolving threats are needed.

[6] The "INOVASURE (SOUTH AFRICA) Company Profile", dated November 201
[7] INOVASURE (SOUTH AFRICA) Business Plan, dated November 2018

The following diagram illustrates how a blackout occurs:

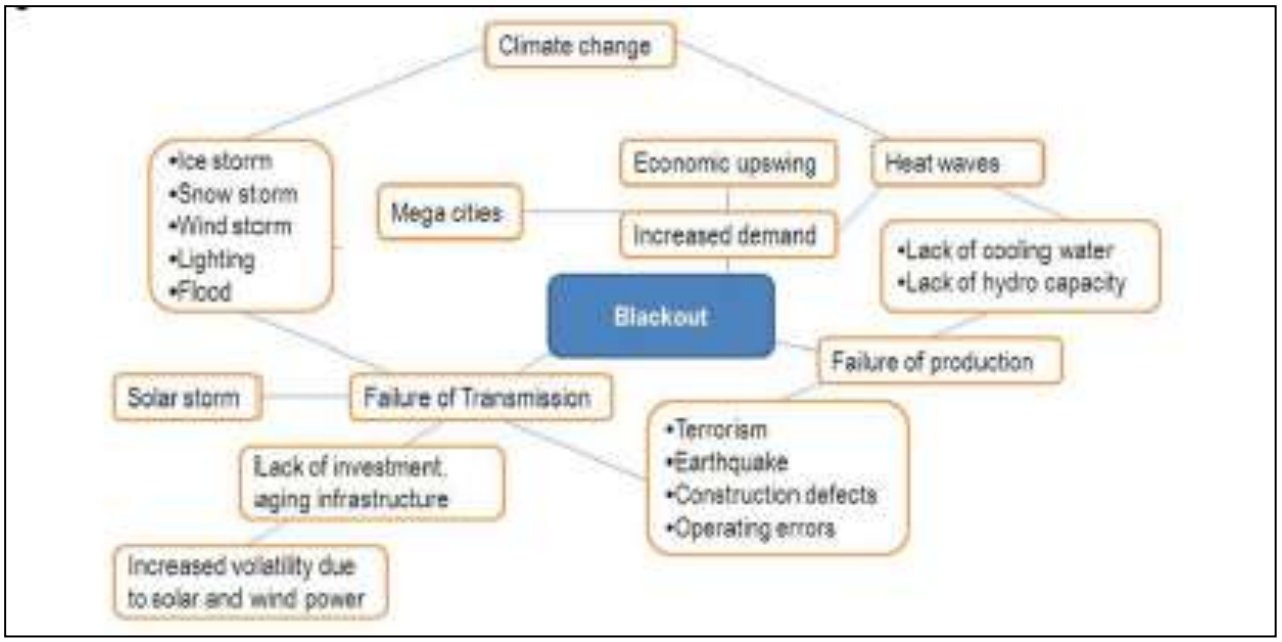

Figure 7: Illustration of how a Blackout occurs

These events illustrate how high and low-frequency can cause wide-ranging blackouts that can have a significant impact that is far reaching and effects other critical infrastructure elements that are vital to human life and the economy.

While South Africa has a large, mature insurance market, developing insurance mechanisms for protecting critical infrastructure from these emerging risks remains a significant challenge. The lack of historical data on the frequency and severity of these events, the changing nature of technologies impacted by them, as well as the inherent uncertainties posed by these risks make it difficult to accurately assess these emerging risks and develop proper insurance products.

Insurance instruments can be useful risk-mitigation tools for critical infrastructure by encouraging resilience-enhancing investments and facilitating recovery after a disaster. However, due to the increased interdependencies across various critical infrastructure systems and sectors as well as the growing dependence of today's society on the critical infrastructure functions and advanced technologies, the question of insurability of critical infrastructure against emerging risks faces new challenges.

The next diagram illustrates what the far-reaching consequences of a blackout are:

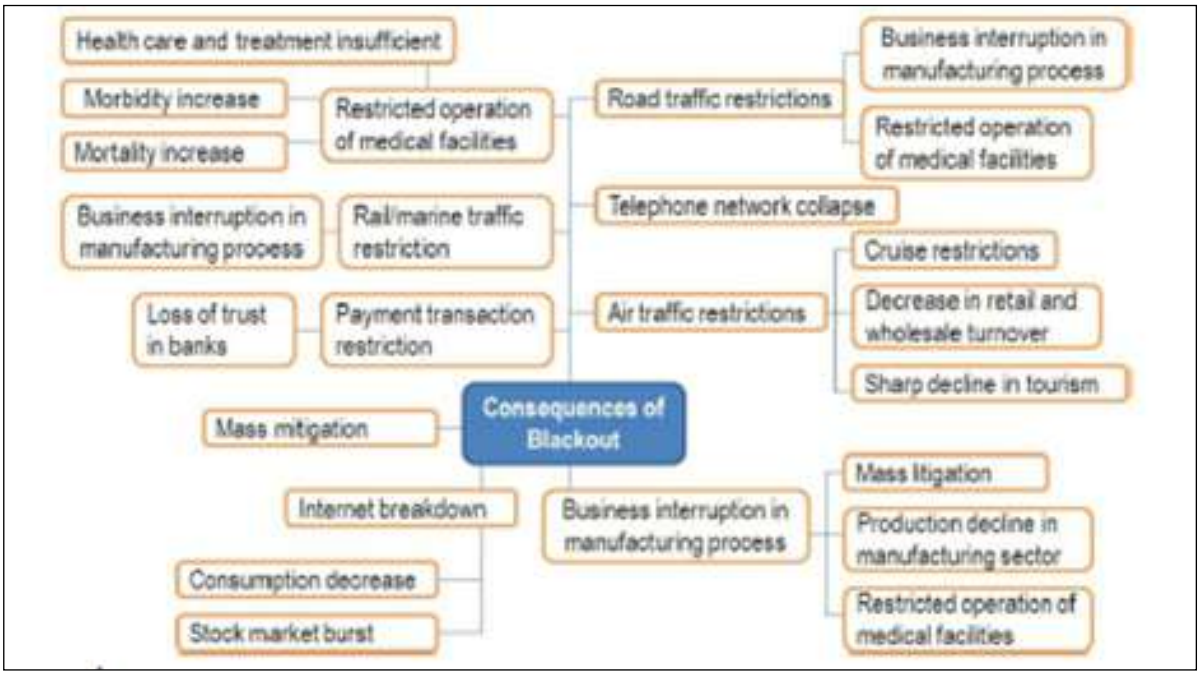

Figure 8: Far-reaching Consequences of a Blackout

3.2 Redefining the Traditional Insurance Landscape through Innovative Products

Developing ***LIVING SECURITY*** products (warranties / protection plan / etc.) to cost efficaciously protect / "ensure" energy supply comes with specific challenges. It is important to define credible manufacturing for energy and water as organizations, which have the capacity to produce sufficient products required at a high level of quality as well as a very high level of reliability.

The recent failure of Eskom to produce sufficient product resulted in South Africa understanding the cost of failure. In time, this failure, in collaboration with long-term neglect, has now expanded to the failure of the clean water supply as well as sanitation.

In addition to the natural disaster risks that have affected energy infrastructure for centuries, the Energy Sector faces new, emerging risks that threaten the operation and resilience of its critical infrastructure. An "emerging risk" indicates that the frequency and consequence of the risk is uncertain or unknown. Because of the challenge the insurance industry faces in understanding and quantifying such a risk, it has been difficult for the energy industry to use insurance instruments as an appropriate risk management tool for emerging risks.

For the insurance industry, emerging risks present a considerable challenge, as they are perceived to be potentially significant but may not be fully understood or addressed in existing insurance terms and conditions. Although the potential loss can be large, emerging risks are characterized by a high degree of uncertainty and lack of basic information to adequately assess the frequency and severity of the risk. To minimize the impact, it is important to identify, analyze, quantify, and communicate the reality of emerging risks and to foster a stakeholder dialogue with representatives of a community that shares such risks. However, due to the lack of available data, pricing and clarifying insurance coverage and products remains a challenge for the insurance industry.

INOVASURE, however, has risen to this challenge and came up with solutions that address the needs of the Energy Sector, the consumer and South Africa as a whole.

Managing emerging risks is a challenge for policymakers as well as owners and operators, particularly due to the general lack of understanding and historical data pertaining to the impacts associated with those risks. In addition to the lack of supportive information, the insurability - or transferring of risk to the insurance industry - of many emerging risks is often questionable.

The following four criteria must be met for an event or risk to be insurable:

(1) **Randomness**: The time and location of an insured event must be unpredictable and the occurrence itself must be independent of the will of the insured (i.e. accidental);
(2) **Assess ability**: The frequency that an event will occur and the severity of the resulting damage can be estimated and quantified within reasonable confidence limits;
(3) **Mutuality**: A sufficient number of endangered parties must join together to build a risk pool in which risk is shared and diversified at economically fair terms;
and
(4) **Economic Viability**: Insurers must be able to charge a Fee that corresponds to the underlying risk including capital costs and expenses

In addition to ***LIVING SECURITY*** as such falling short of meeting the traditional requirements for insurability, a number of obstacles remain concerning emerging risks, including the following:

- The general public's low level of familiarity with emerging risks;
- Uncertainty about what risks are being insured;
- The fluctuation in risks and threats driven by technology advancement;
- Lack of adequate reinsurance or government's intervention as the - insurer of last resort;
- The risk of a global catastrophic event, resulting in overwhelming number and costs of claims;
- The misconception by the insured that existing insurance products or self-insurance are sufficient to cover the risks; and
- The price volatility of insurance products due to the nature of evolving threats and the uncertainty in the potential effects of emerging risks.

Developing traditional insurance mechanisms for protecting critical infrastructure from emerging risks remains a significant challenge. The Energy Sector continues to progress in advanced technology solutions, including wireless control and data transfer applications. Such a wireless application may enable a faster, more efficient recovery from a disaster; however, it may also increase the vulnerability of the system, because wireless technologies are more susceptible to space weather events and cyber attacks than the traditional wired systems.

With increased interdependencies across various critical infrastructure sectors and systems, as well as the growing dependence of the society on critical infrastructure and advanced technologies to function, the question of insurability faces a new set of challenges in critical infrastructure protection.

The **INOVASURE (South Africa)** Business Plan deals with methods developed by LIVESURE, the **INOVASURE** Group and its network partners and collaborators to establish a process to bring stability back to the industry in South Africa, Africa and the World by supplying financially aligned services as well as focussed management of risk mitigation procedures to recapitalise the production and storage of power and supply quality energy to business, government and households alike for ***LIVING SECURITY*** purposes.

3.3 Ensuring Supply: Value of Off-setting Energy Security Risk to Organs of State

The Intergovernmental Panel on Climate Change (IPCC) unveiled the third and final Working Group report from its landmark Fifth Assessment. This, together with the Second Working Group Report released on 31 March, 2014, is required reading for those wishing to examine the societal impacts of climate change and the potential pathways for twenty-first century resilience. For the first time, the IPCC included a chapter on human security. This is a significant achievement that should increase understanding of the increased threat and impacts on individual livelihoods that climate change is bringing, particularly in the developing world. It is clear that the connections between environmental security and human security run deep, but it is less clear just how societies can build resilience and whether the political will exists to pursue it.

Adding to the complexity is the fact that these challenges manifest themselves uniquely across the world. Due to factors of geography, history, politics, and social development, each region and country experiences climate change in a distinctive way. For Africa, the picture is predictably bleak. The region as a whole has contributed the least to greenhouse gas emissions, faces some of the worst consequences of climate change, and has the weakest capacity to cope with the impacts.

The country of South Africa provides a fascinating example of how difficult building ecological resilience can be. Already the 30th driest country in the world, it is expected to experience further drying trends, and an increase in extreme weather events, including cycles of extreme drought and sudden excessive rains. In relative terms, the country has in fact been a significant contributor to global climate change due to its energy-intensive economy. As such, the country has a global responsibility to engage fully with the IPCC reports and begin developing robust responses to environmental insecurity. However, doing so presents major challenges for a country that remains a "dual economy" with one of the highest rates of income inequality (and inequality of opportunity) in the world. This is all the more troubling given the country's progressive stance on environmental issues. In fact, environmental security has been, and will remain, a vital component of the evolving South African identity following the end of apartheid in 1994.

The issue of environmental security in South Africa is one that has for years resonated across diverse sections of the population. There are strong cultures of conservation and environmentalism running throughout the country. However, the "Rainbow Nation" continues

to suffer from sustained environmental degradation in ways that alter the natural landscape, destroy necessary biodiversity, and hinder social development.

Choosing a *custom made* ***"Ensurance"*** / ***Protection Program*** route to solve our ***LIVING SECURITY*** problems is a definite first for South Africa, but not disruptive because the same rationale applies for a customer to protect him/herself/it against a specified loss such as car damage, medical insurance or death in return for payment of premium.

INOVASURE, through its own group of companies and collaborators, provides an **"Ensurance" / *"Power Protection Plan"*** product and service which is combined with a ***Capital Markets Program,*** offsetting capital requirements and referencing the risks and economic realities as well as complying with all the relevant Government and Industry stakeholders' regulatory requirements and Government Departmental Governance Procedures.

The **INOVASURE** products and services will provide, through proprietary means, ***ENERGY SECURITY*** to the **Special Economic Zones** (SEZs), other **State Owned Enterprises** (SOEs), **Local Authorities** (Municipalities) and other Corporate Clients in South Africa in exchange for a monthly Service Fee.

INOVASURE and its collaborators and partners will introduce Energy Vault related assets onto the Local Authority's balance sheet and become the ***USUFRUCTURY*** user of the assets (over a 25 year Servitude period) and provide generation, storage, shifting, shaving distribution, metering and regulatory issue on their behalf.

With reference to the co-operation with the Kannaland Local Municipality (that is referred to in this report) and the Kannaland Local Municipality (described in this report) **INOVASURE** enters into ESMAs with selected and willing Municipalities to, amongst other things, provide them with ***ENERGY SECURITY*** and an on-going supply of reliable energy by means of Public Private Partnership arrangements.

3.5 Custom-made ESMA for SEZs, Municipalities, SOEs and Corporate Clients

"LIVING SECURITY", per the **INOVASURE** definition, includes human / citizen needs for ***ENERGY SECURITY*** as well as security for users of water & food production, education, mobility (transport), telecommunication connectivity, health services and financial inclusion.

ENERGY SECURITY for Special Economic Zones (SEZs), State Owned Enterprises (SOEs), Municipalities and other Corporate Clients is provided by **INOVASURE** through its so-called "**EnerGsure"** custom made solution, which makes use of an "ENERGY VAULT" as a risk mitigation device.

The ENERGY SECURITY MANAGEMENT and ADMINISTRATION AGREEMENT ("ESMA Agreement") is unique in that it is custom made product for Clients in terms of which the **INOVASURE** group provides ***ENERGY SECURITY*** in the form of a warranty for daily use of power according to the power usage of the relevant Municipality in exchange for a fixed monthly ESMA fee (service fee) adjusted by surpluses / shortfalls as per the contract.

"Ensurance", warranties, service level agreements protection plans and other risk mitigation measures are taken or entered into by **INOVASURE** to "ensure" / protect the core risk managed through the ESMA agreement.

INOVASURE can only achieve solutions on this scale and at this time through its joint venture partnerships with Special Purpose Vehicles (SPVs) for non-core power generation, distribution, metering and the like, OEMs, Insurers and Re-Insurers, suppliers and operators and has for this reason chosen the best available contractors and service providers ("Best-of-the-Best" policy).

INOVASURE's initial client base is the South African Government, State Owned Enterprises, Local Authorities (Municipalities), Special Economic Zones, Corporate Companies, Gated Communities and Private Individuals and it provides these clients with risk solutions to ***LIVING SECURITY***, infrastructure needs and commensurate financial losses faced daily by almost everyone in society.

INOVASURE's full product range will in due course consist of most aspects of the protection of daily human needs ***("LIVING SECURITY"),*** taking into account the regulatory environment, existing service delivery and Constitutional rights, Central-, Provincial- and

Municipal obligations of the public at large as well as the requirements of private individuals and corporate companies. Since ***ENERGY SECURITY*** plays such a major role with regard to LIVING SECURITY needs, it is **INOVASURE's** first focus to maintain the "Ensurance" / Protection Plan / Warranty tools to underwrite the relevant risks.

Energy is the catalyst for a number of other human sustainability / LIVING SECURITY needs. It provides the backbone for the delivery of clean water and sanitation, food production, medical facilities, ICT connectivity and commercial & industrial activities as part of Local Economic Development ("LED") initiatives, also providing villages / towns / cities / provinces with access to power, new or existing housing projects for their energy supply, as well as schools and other similar institutions with power and connectivity.

Choosing an "Ensurance" / Protection Plan / Warranty route to solve a power generation, distribution, shifting, shaving, metering, load shedding, outage problem is innovative. It is the same rationale for a customer to protect him / herself / itself against a commercial risk / medical loss, damage, illness, disability or death, in return for payment of a specified monthly fee - except it has not yet been done before in Africa.

4. THE ENERGY VAULT SOLUTION

4.1 Introduction to the SA Energy Security Program

INOVASURE provides an integrated power solution package[8] that allows for the production of Green Energy combined with off-peak energy from Eskom which is then stored and shifted through an energy demand / supply Real Time Multidimensional Energy Management System ("RMEMS") [otherwise known as the **INOVASURE** "Energy Vault"] of which the end result is a constant supply of cost effective energy to Municipalities / SEZs / SOEs and other Corporate Entities such as Mines, large construction companies and suchlike.

The Energy Vault comprises of unique Utility Scale storage units (batteries) and "balance of systems" components such as inverters, Smart meters and unique Thin Client Technology devices, LTE communication networks and the like, all of which have been developed and successfully deployed and tested worldwide through reputable and successful collaborators with whom **INOVASURE** has secured long lasting and valuable relationships.

In order to maintain a stable supply, a Measurement and Compensation method was designed by **INOVASURE** as a hybrid / protection plan / warranty / "ensurance" product, i.e. the "Local Authority Energy Security Power Protection Plan" ("LAEP").

4.2 The RMEMS Concept

INOVASURE'S long term goal[9] is to provide ***ENERGY SECURITY*** to South Africa, Africa and World by means of a range of Services and Products that are backed by a waterfall of underwriting mechanisms and the installation of risk mitigation devices.

INOVASURE's risk mitigation devices are termed "Energy Vaults" which are in essence 20MW – 53MWh Utility Scale storage devices introduced at substation level and which are coupled with the concomitant balance of systems required to shift energy from off-peak periods into peak periods.

[8] The INOVASURE "Ensurance" Presentation: "The Real Time Multidimensional Energy Management System ("RMEMS")["Energy Vault"], dated 2018
[9] Document: "RMEMS Summary" by LiveSure, dated 24 May 2017

In South Africa, 120 such Energy Vault installations are required to effectively normalise the grid demand curve of Eskom. These Energy Vaults will target energy delivery during peak periods – typically 2 hours in the morning and 3 hours in the evening. Injecting at each of the 120 site's at a rate of 20MW, the result is a total injection of 20MW x 1200 = 2,400MW five hours per day. The current maximum demand in South Africa is 28,000MW. **INOVASURE** has agreed to make available to Eskom at least 25% of the installed capacity of all the Energy Vaults to dispatch on their demand through Simmerpan.

In the case of the Kannaland Local Municipality which is one of the first Energy Vault implementation sites in South Africa in the Province of the Western Cape (with two Energy Vaults)**, INOVASURE** controls the balance of the capacity, on behalf of the Municipality, to protect the distribution network against overload. This value may vary on a per-project basis with the other 118 Energy Vaults at various other Municipalities, but since injection will occur during peak demand, 100% of the capacity goes toward normalising the grid demand profile. It is conceivable that the total network support could be 2,400MW / 28,000MWh = 8.5% of the current national demand. Eskom currently has 5,000MW in cold reserve.

The **INOVASURE** relationships with the Municipalities, Special Economic Zones (SEZs), State Owned Enterprises (SOEs) and other Corporate Clients are executed as Public Private Partnerships ("PPP"") by means of an Energy Security Management and Administration Agreement ("ESMA Agreement"). These agreements are in effect Public Private Partnerships under the auspices of the DBSA and are underwritten by National Treasury.

Besides the internal capability of the DBSA to choose and implement pilot implementation projects to the benefit of the country, the Regulation 32 Procedure in terms of Supply Chain Management applies as according to the Municipal Finances Management Act, which can in addition allow any willing Municipality to participate in the **INOVASURE** Energy Security program and install an Energy Vault(s) with immediate mobilisation as a PPP arrangement.

INOVASURE's primary objective – taking the interests of the Municipalities into consideration - is the protection of the distribution network. It is also in the interest of the participating Municipalities, SEZs, SOEs and other Corporate Clients that **INOVASURE** maximises localised renewable energy production whilst minimising peak energy consumption from the Grid – this implies maximising utilisation of stored energy.

The capacity allocated to Eskom will be traded as a peak production capacity, typically using a "capacity charge" plus "generation charge" cost structure, which is not as dependant on actual generation produced. Eskom supports the **INOVASURE** Energy Security Program by means of an underwriting rebate for installed storage capacity.

The capacity allocated to Eskom is for the benefit of the whole National Grid, not just the local area where the capacity resides. Practically all energy management technologies available are focussed on demand-side management, whilst none make provision for *the control of generation from the Utility Grid side*.

The control system required for the full 120 **INOVASURE** Energy Vaults in South Africa will be implemented over the course of the implementation of the referenced projects. It is more than just balancing overall capacity on the National Grid – there are several complexities related to line stability caused by highly localised generation and long non-symmetrical transmission routes. The **INOVASURE** overall ***ENERGY SECURITY*** solution will resolve these issues.

The National Energy Regulator (NERSA) was approached by the industry leaders to mitigate the poor quality of energy in South Africa and ranked the following important objectives:

- Reliable provision of service;
- Quality of supply and service, in accordance with appropriate standards;
- Customer satisfaction with the participants in the industry; and
- Resolution of complaints and disputes.

INOVASURE has been focusing on insuring quality of living – ***"LIVING SECURITY"*** as it were - which translates to quality of basic services to individuals, Corporate Companies, Municipalities, Special Economic Zones and organs of state. The sureties have been extended to several financial services and to the organs of state and its para-statals. The resulting systems being developed by **INOVASURE** therefore will have a profound impact on the South African Energy System:

The quality of energy supply and delivery is informed by the following:

- The introduction of the **INOVASURE** Multidimensional solution will have a profound effect on the energy generation and supply system in South Africa;

- The total pump storage capacity of South Africa is in total 2,732 MW:
  - Palmiet: 2x 200 MW;
  - Ingula: 4x 333 MW; and
  - Drakensberg: 1,000 MW;
- The Ingula Power Station was completed recently at a cost of approximately R35 billion, which translates to a cost of R27,000/kW or USD1,750/kW;
- The cycle efficiency of these systems is between 73% and 76%.

The **INOVASURE** Energy Vault solution presents 2,400MW of dispatchable energy available in milliseconds as opposed to minutes and also can be a balancing load with the same response time. This is invaluable for normalisation of the load profile, voltage and frequency stability as well as balancing non-symmetric network loads while reducing dynamic load stresses on base-load power stations. This represents an unequalled solution to the National Grid problems at a cost substantially below conventional peak load capacity.

The **INOVASURE** value proposition of the Energy Vault offered to the Municipalities and other clients has several facets. Firstly there is the intervention negotiated with Eskom, dealing with legacy financial situations. Then the utilisation of Smart meters offers demand side management as well as pre- and post-paid settlements and collections ensuring an appropriate revenue stream to service commitments

The **INOVASURE** intervention secures the management of Renewable Energy into the Energy Vault, optimises intelligent dispatch which maximises value and preserves distribution hardware. In most cases, the **INOVASURE** Energy Vault eliminates the need for significant substation expansion programs. As a balancing contributor, it also maximises Eskom output by shifting off- peak power into peak times.

The total **INOVASURE** Energy Vault intervention of 120 Energy Vaults will:

- Present a capacity increase of at least 34% in the distribution networks:
  - The liability to upgrade the capacity has recently been calculated at USD 4.6 Billion by National Treasury; and
- Provide Energy Reliability:
  - Have a profound impact on the reliability of the energy delivery and generation system in South Africa;

- Allow Eskom to control the Energy Vault's load as well as the generation accurately to execute a "black start". This is currently not possible. The value of this cannot be calculated adequately; and
- Increase reliability of energy significantly for shorter interruptions and due to the enhancement of the distribution capacity and the quality of supply, will impact positively to the reliability of the delivery.

It is contended by **INOVASURE** that the incidental value of the ***ENERGY SECURITY*** Program and the introduction of the Energy Vaults is as important as the value of the direct interventions.

It is also clear that all aspects of the technology required to deliver this intervention by **INOVASURE** and its collaborators requires careful consideration and implementation coupled with on-going development over the period of deployment of the Energy Vault solution.

4.3 The RMEMS Process

The RMEMS concept applies the following process that is shown diagrammatically:

- The need is identified for the capturing of the abundance of Sun / Hydro / other renewable energy;
- The Energy Vault Storage Device (a Utility Scale battery) is introduced with the innovative Technology as identified;
- Power is captured and produced from various sectors; and
- Off-peak energy is used during peak times with the co-operation of Eskom and participating Municipalities, SEZs, SOEs and other Corporate Clients.

An overview of "How it is done?" is provided below:

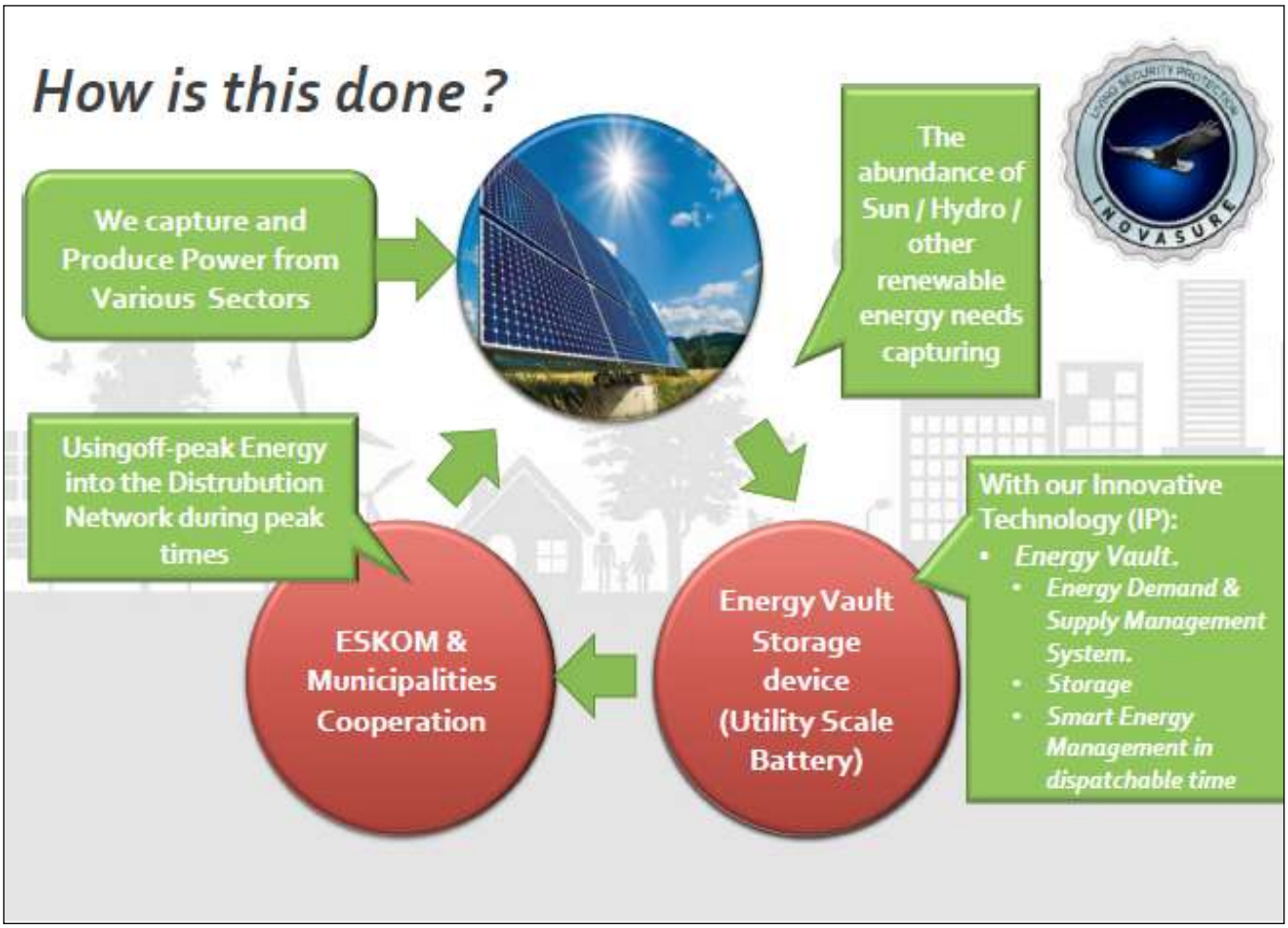

Figure 9: The RMEMS Concept applies a Process

An overview of the **INOVASURE** RMEMS (Energy Vault) Process is provided next:

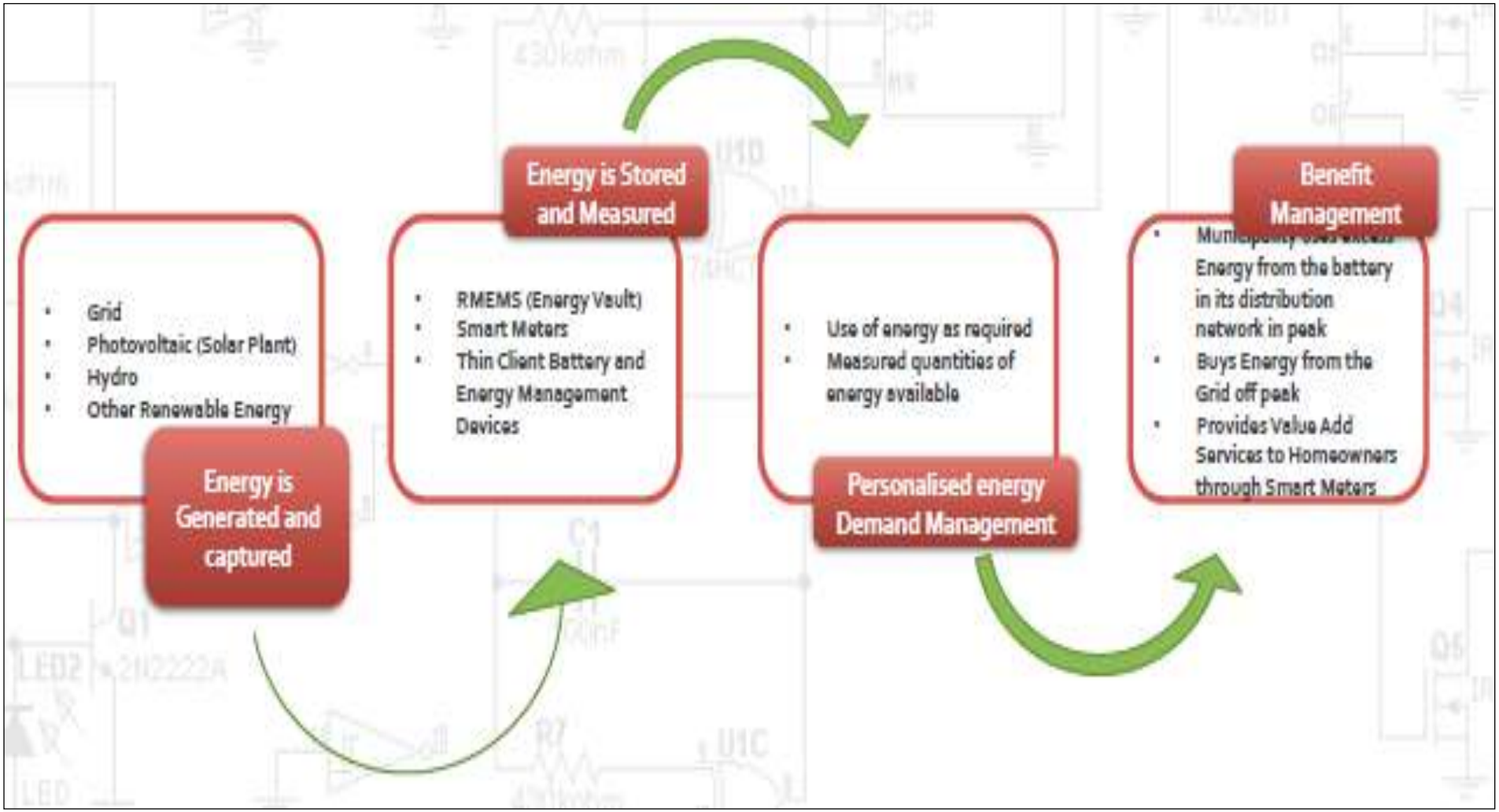

Figure 10: Overview of the INOVASURE RMEMS (Energy Vault) Process

4.4 Components of the INOVASURE RMEMS (Energy Vault)

The Components of the RMEMS are shown diagrammatically:

Figure 11: Components of the RMEMS (Energy Vault)

4.5 The Total Solution for Municipalities and Eskom

The deployment of the Energy Vault installation program for a specific Municipality, such as the Kannaland Local Municipality, provides a "**Total Solution for Municipalities**" as shown:

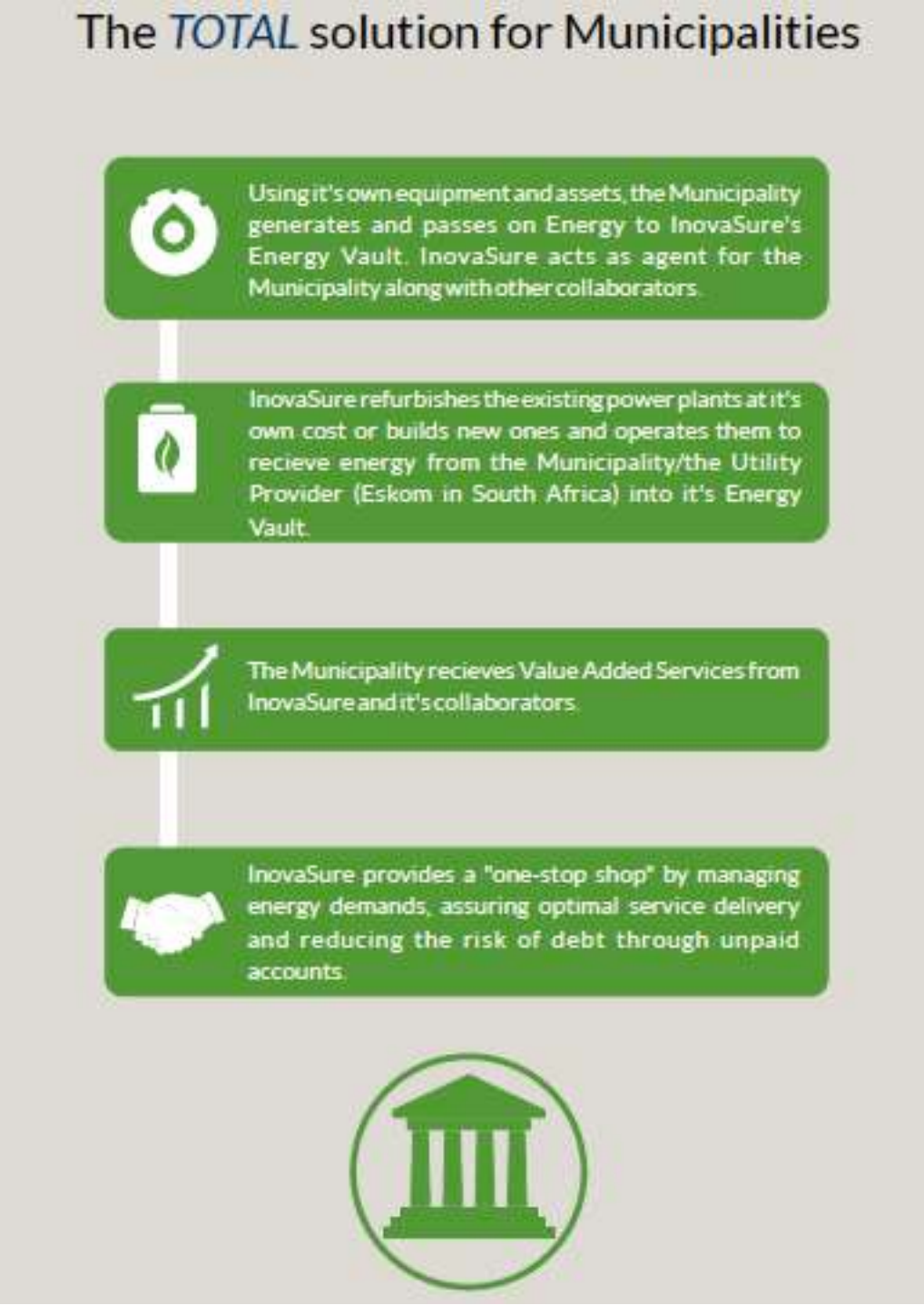

Figure 12: The Total Solution for Municipalities

The Energy Vault installation provides a "**Total Solution for Eskom**":

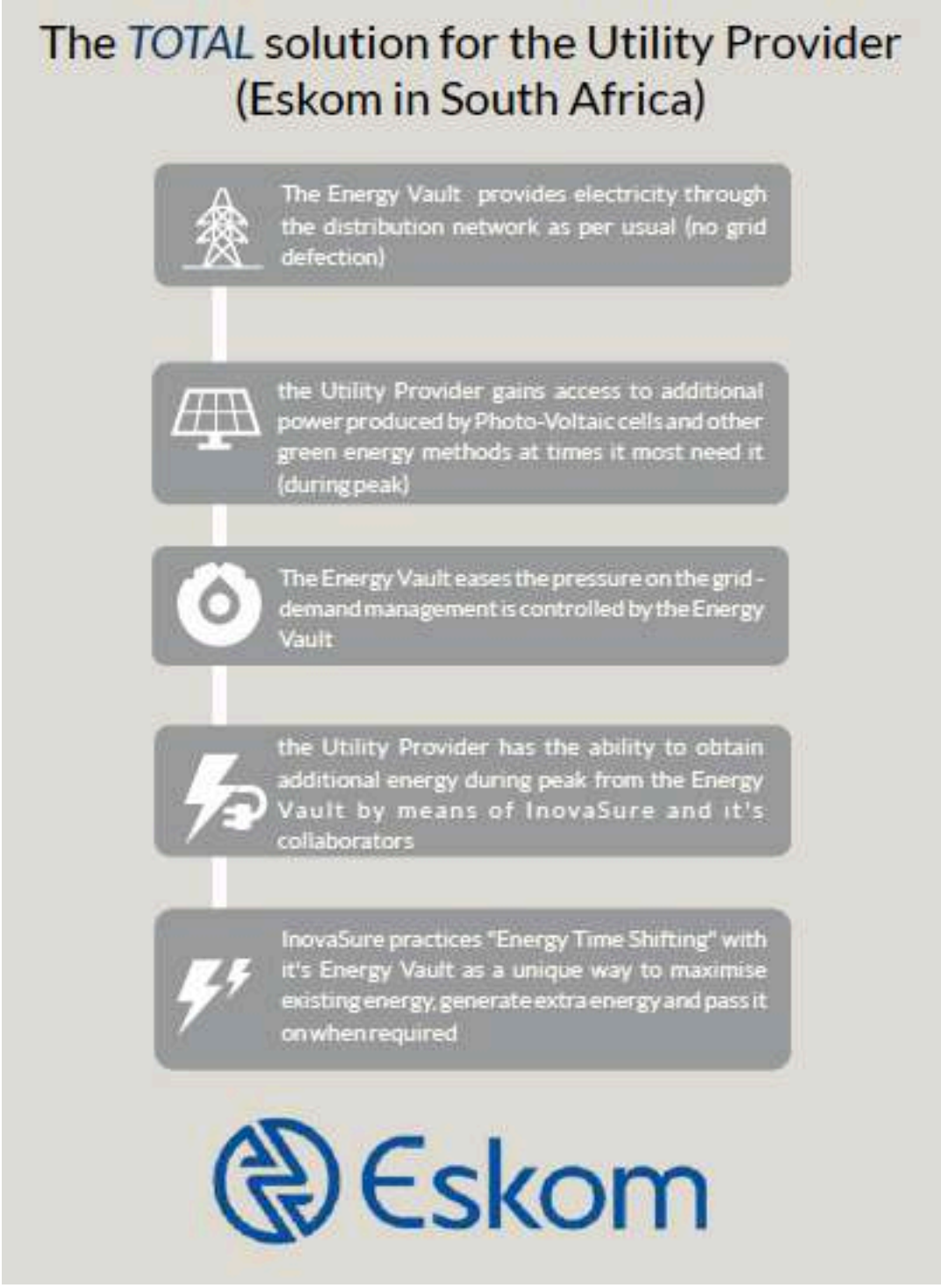

Figure 13: The Total Solution for Eskom

The solutions that are provided to Municipalities and Eskom form the **TOTAL ENERGY VAULT (RMEMS) SOLUTION** that is shown next:

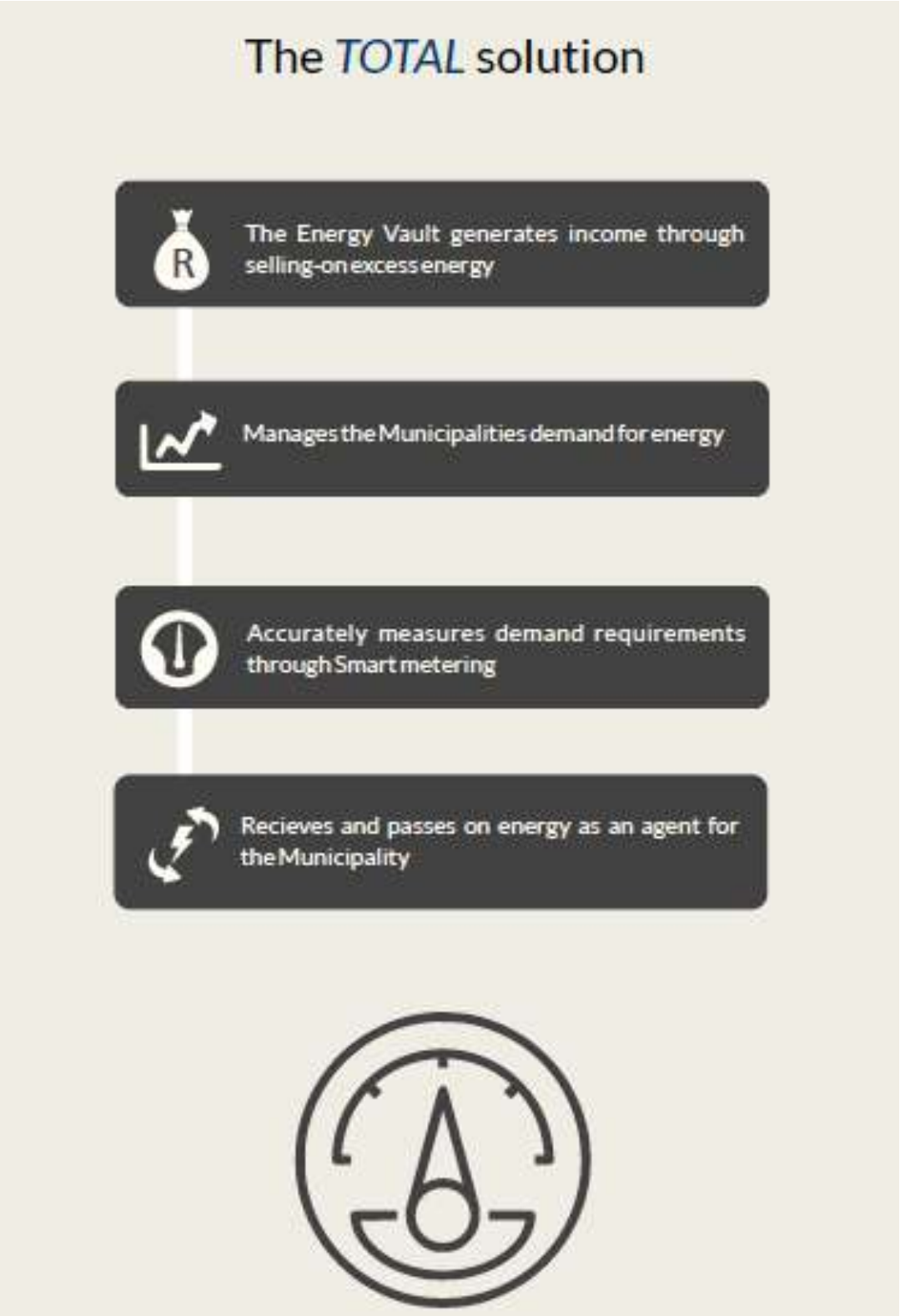

Figure 14: The Total Solution

4.6 Key Benefits of the Energy Vault (RMEMS)

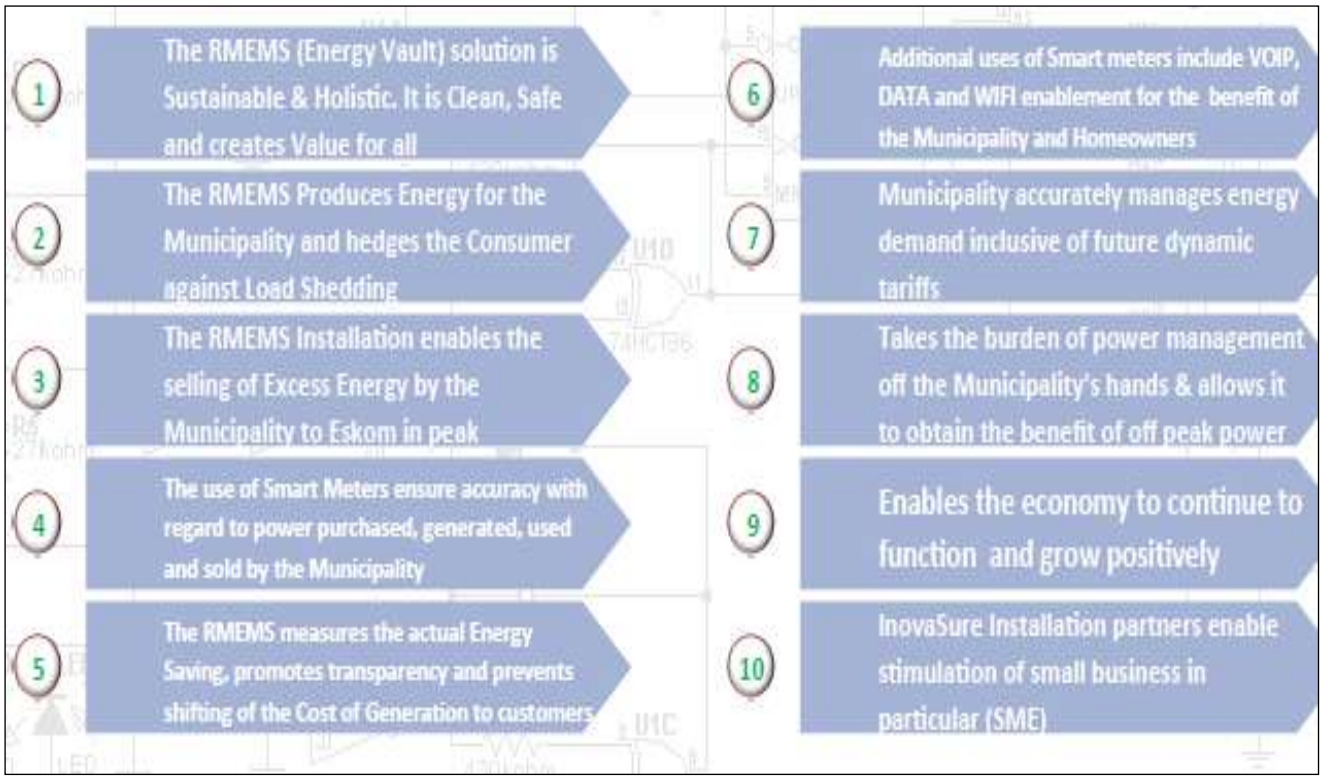

Figure 15: Ten (10) Key Benefits of the RMEMS (Energy Vault)

4.7 The Total Energy Security Solution

The **Total Energy Security Solution** is shown below:

Figure 16: The Total Energy Security Solution

4.8 The Municipal Financial Solution

The Municipal Financial Solution is provided by the implementation of the Energy Vault installation:

- **INOVASURE** has created the first of its kind ISO based "Ensure a process system" designed in the form of "Ensurance" Products, namely the ***LIVING SECURITY*** Program**.**
- It is an ***"Ensurance" / Power Protection / Warranty Program*** combined with a ***Capital Markets Program (Debentures/Bonds/Medium Term Notes [MTNs])*** thereby offsetting capital requirements, referenced obligations as well as mitigating risks and economic realities; and
- It complies with all the relevant Government and Industry stakeholders, regulatory requirements, Departmental Governance Procedures and other relevant Laws and Regulations as administered by the entities that are shown next:

Figure 17: Compliance with Requirements, Procedures, Laws and Regulations

The **Financial Solution** follows four (4) Steps to **Solving the Municipal Debt Problem:**

- **STEP 1:** InovaSure approaches the defaulting Municipalities to offer "**ONE PAYOR PROTECTION PLAN**" solution on a DVP [Delivery versus Payment] settlement basis:

Figure 18: Step One (1) of the Financial Solution to solving Municipal Debt Problems

- **STEP 2:**

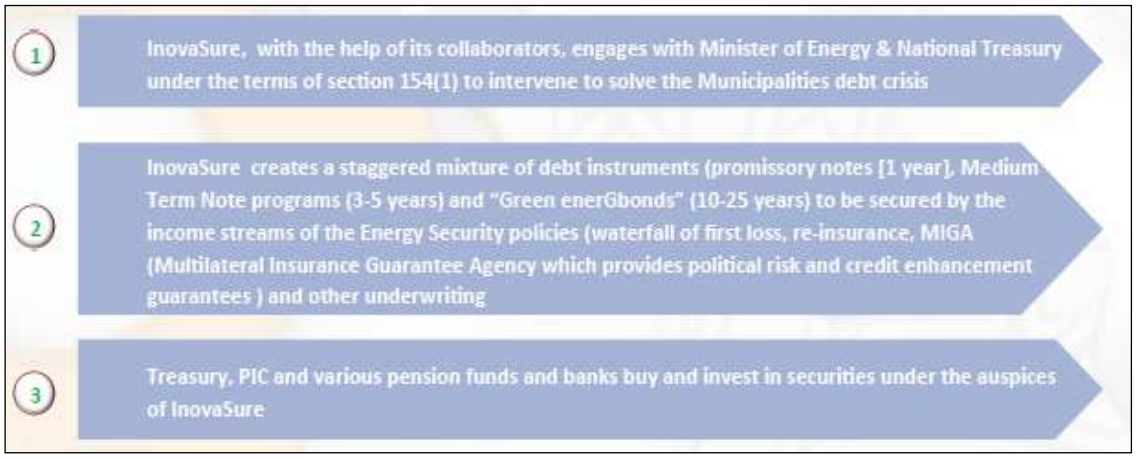

Figure 19: Step Two (2) of the Financial Solution to solving Municipal Debt Problems

- **STEP 3:**

Figure 20: Step Three (3) of the Financial Solution to solving Municipal Debt Problems

- **STEP 4:**

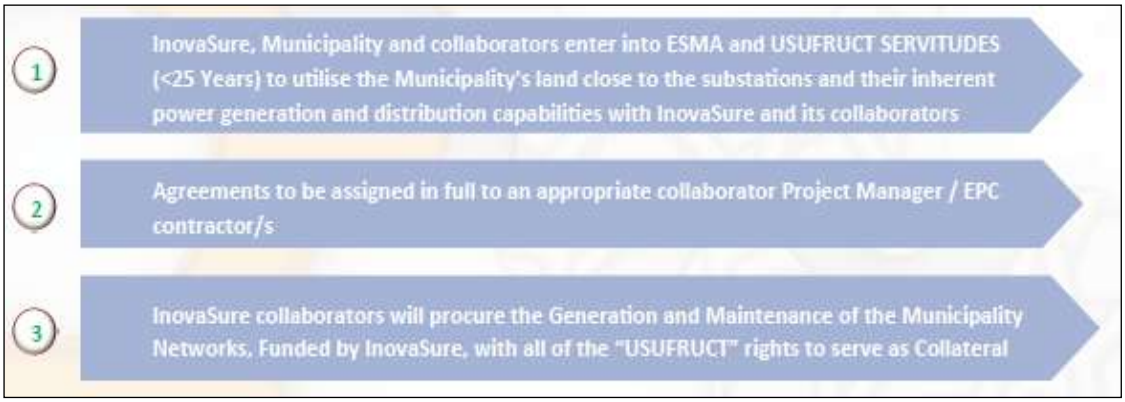

Figure 21: Step Four (4) of the Financial Solution to solving Municipal Debt Problems

4.9 INOVASURE's View of the Future

INOVASURE created *innovative* solutions that will no doubt re-write the **LIVING SECURITY** needs of citizens of South Africa:

- **INOVASURE** has secured underwriting for approximately R127 billion with the New Development Bank (NDB), National Treasury, Financial Institutions and Private Investor support;
- **INOVASURE** will become the de facto preferred licensed supplier of LIVING SECURITY services to the designated villages / towns / cities, Special Economic Zones, SOEs, Municipalities and other users and supply services for profit, including its Smart City Technologies in (South)Africa;
- **INOVASURE** will facilitate a Green Energy Bond Issuance Program with Standard Bank;
- **INOVASURE** may participate as a principal and / or co-investor in any spin-off of Smart City Technology businesses and renewable / alternative energy solutions;
- **INOVASURE** will unlock value from its licensing of SAPP (http://www.sapp.co.zw/) through one of its collaboration partners; and
- The doors of Africa and the world will be open once **INOVASURE** has proven a track record in South Africa.

4.10 The Result of Implementation of the RMEMS (Energy Vault) Solution

Seven implementation strategy actions are identified from signing up selected Municipalities to the implementation of the USUFRUCTUARY based management of the Municipal Generation, Distribution and distribution network – augmented as PPP arrangements:

Figure 22: Seven (7) Implementation Strategy Actions for USUFRUCTUARY Takeover

4.11 Conclusion on the Implementation of the Energy Vault implementation (RMEMS) Solution

INOVASURE has created *innovative* solutions that will re-write ***LIVING SECURITY*** needs of the citizens of South Africa, Africa and around the globe.

5. THE LIVESURE™ TRUSTED CENTRE™ CONCEPT

5.1 Introduction to the LiveSure™ Trusted Centre™ ("LTC")[10] Concept

The LiveSure Trusted Centre (the "LTC") Intellectual Property has been availed by LiveSure (Pty) Ltd to **INOVASURE** under license, as its proprietary, secure, services' clearing and settlement platform. It consists of embedded superior standards of real-time business compliance, governance, security, risk management, asset management, auditing, on-going monitoring and reporting that are essential for the success of disbursement of project funds as required by the LTC.

LiveSure (Licensor) is presently in the process of creating ISO accreditation for this PROCESS INSURED MODEL and all the subsidiary components, affiliates, companies and Special Purpose Vehicles (SPVs), rather than a conventional banking transactional platform for closure of transactions.

The LTC is the secure link between its allocated project funds being available and the final audited report to the funds provider (through the LiveSure Group) as to the application of funds. This is a very secure route of ensuring sustainable development and responsible Environmental, Social and Governance (ESG) Management.

The LTC is unique since a service / project transactional platform is provided in terms of which the transactional PROCESS is insured and provides financial security to project owners / investees as well as service providers (Project Managers / EPC contractors / RMEMS deployment, etc.)

The LTC removes the need for costly outsourced specialists and frees business and thought leaders from time consuming, laborious but essential fiduciary responsibilities and tasks.

The LTC process implementation is also ESG (Environment Social and Governance) compliant which is one of the top priorities of the UN's SDG program.

[10] "Report by LiveSure and INOVASURE: "The Livesure™ Trusted Centre ™: An Insured Services Clearing & Settlement Transactional Platform Managed by Livesure for the INOVASURE Group", dated 24 February 2017

The LTC process is best illustrated by the following diagram:

Figure 23: The Livesure Trusted Centre (the "LTC") Process

The following stakeholders are best served by the implemented LIVESURE TRUSTED CENTRE (LTC):

- Funders / Investors;
- Project owners / Investees;
- Underwriters;
- Purchasers of Services and Products;
- Providers of Services and Products;
- Donors;
- Governments;
- Attorneys (Due Diligence);
- Auditors (external audits);
- Corporate counter parties;
- Directors;
- NGOs;
- Re-insurers;
- Shareholders;
- Staff; and
- Suppliers

The potential impact of LTC deployment is found in the following:

- Real-time funds tracking;
- De-risking deployment of funds;
- Greater access to capital, financing and insurance;
- A stronger brand and greater pricing power;
- Enhanced ability to attract, retain and motivate employees;

- Enhanced ability to enter new markets;
- Greater employee productivity;
- Greater operational efficiencies;
- Lower costs of finance;
- Lower market, balance-sheet and operational risks;
- More efficient use of resources;
- New potential sources of revenue; and
- Supply chain optimization.

A number of LTC Processing Platform Components are acknowledged:

- Accreditation of:
  - Counter party Due Diligence;
  - Partner Risk Mitigation Procedures;
  - Real time Funds Tracking software adjudication and compatibility;
  - Partner Dashboard Management Software;
  - Services Clearing and Settlement Platform;
  - Partner Transactional Software; and
  - Partner Treasury and Funds Transfer procedures;
- Assessment and engagement of legal practitioners;
- Best Practice Corporate Governance Code adjudication;
- Biometrics Bank authentication and verification of Platform Partner;
- Carbon Footprint measurement;
- Dashboard Management Software (BIS);
- Data Base Management;
- Data Mining;
- Dispute resolution through panel selection;
- DVS for data and voice switching;
- ESG audits;
- ICS (Insurance Policy Clearing and Settlement);
- IFRS Accounting procedures for Platform Partners;
- Internet security and interface audits;
- Panel of top legal firms for Compliance Stress testing;
- Platform Integration of "InovaTrust" Funds Tracker;
- Pro-Active Forensics;
- Product / Service Specification Validation;

- Real time forensic auditing;
- Risk Clearing and Financial Settlement;
- Risk Mitigation Profiling;
- Specs and Accreditation of Product Identification (IoT - Internet of Things) methodologies;
- Stakeholder Management; and
- Treasury and Funds Transfer procedure management

The (LTC) Platform will enable the following:

a) The LTC Platform as envisaged will be a proprietary system to serve the needs of the **INOVASURE** and the LiveSure Group;
b) Control of INTERNET GATEWAY AND SWITCHING PORTALS with Project principals;
c) Development of an UNBIASED DATABASE MANAGEMENT SYSTEM on behalf of LTC accredited counter parties;
d) All involved parties to be SECURELY interconnected;
e) An accredited MENU OF BIOMETRIC IDENTIFICATION methods / mechanisms will be used for verification and identification of the people who are transacting with one another (on their own behalf, or on behalf of another entity);
f) An accredited menu of product auto identification methods / mechanisms, where appropriate, will be used for verification and identification (and central loss control) of the products or services or financial instruments to be provided;
g) Effecting the payment of funds (pre-agreed, secure, irreversible and "economic") in the shortest space of time;
h) All verification and authentication provided on a read-only basis; and
i) Process insurance guarantee of the entire transaction to all involved parties.

These results can be achieved by the ingenious merging of a number of technologies, most of which have already been commercialised. This will be done via licensing of the necessary rights of the LiveSure Trusted Centre, "development" and patenting of certain procedures, forming of strategic partnerships, and the development of the business of the company to implement the LTC Platform.

An LTC Intellectual Property ("IP") related license / management fee will be payable to LiveSure on the various projects initiated by the LiveSure affiliates and the **INOVASURE** Group.

5.2 Mission and Objectives of the LTC

The LiveSure Trusted Centre is, in essence, a proprietary in-house SERVICES CLEARING AND SETTLEMENT PLATFORM. The platform ensures secure transfer of funds to INVESTEES, matched with financial requirements of the Funder. The intention is to develop a proprietary platform which interfaces with Project owners / investees and Service providers alike.

The LTC will be augmented through electronic authentication (biometrically identified), securing the identities of the parties but most importantly the underwriting of the TRANSACTIONAL PROCESS. Furthermore, non-fraudulent direct payment will be ensured, and product / services delivery will be verified through a single certified authority (i.e. the LTC).

The fundamental objective in any online or wireless transaction is to have or create trust amongst the transacting parties, so that all of them will feel comfortable about all the various aspects of the particular transaction. However, trust in a digital world depends on the assurance of authenticity and on non-repudiation. Licensees of the LTC platform will facilitate such trust amongst the involved parties. This will be done by protecting the digital identity of the users through biometric identification methods. Furthermore, the purchased items / service delivery will be identified and tracked through the IoT [Internet of Things / auto identification] methods. These transactions will then be wrapped by an insurance cover, guaranteeing the processing component of the platform.

Some of the specific objectives of the LTC are mentioned here:

a) Remove obstacles (paper-based) to electronic transactions by adopting relevant principles from the United Nations Commission on International Trade Law (UNCITRAL);
b) Permit parties to a transaction to determine the appropriate authentication technologies and implementation models for their transaction, with assurance that such technologies and implementation models will be recognised and enforced;

c) Enable the involved parties to prove in court that their authentication techniques and their transactions are valid; and
d) Take a non-discriminatory approach to authentication methods.

5.3 Essential Elements of the Transactional Model of the LTC

Essential elements of the Transactional Model of the LTC are identified:

a) PROCESS UNDERWRITING

LiveSure, through its collaborating re-insurer, will provide its underwriting capacity to INSURE the PROCESSING component of the 5 pillar TRANSACTIONAL TRUSTED CENTRE. In essence it means that the FUNDS provider has a financial guarantee to fall back on should funds, earmarked for a project, not be applied for the purposes intended and to claim damages for any losses suffered as a result thereof.

b) COUNTERPARTY AND DEALFLOW ASSESSMENT

Detailed workflow analysis of every step of the transaction or exchange of data / information / knowledge.

c) DATABASE MANAGEMENT

All relevant information (re personal, product and financial instruments) will be ordered in such a manner that the retrieval of such information can lead to the verification / authentication of people + products + financial instruments, and the comfortable use thereof.

d) INTEGRATION OF BIOMETRIC IDENTIFICATION

The BIOMETRICS BANK, via a "menu" of accredited methods, through strategic partnerships and capturing of personal (i.e. biometrical) information by appointed licensees will be operated on an on-going basis;

e) DATA and FINANCIAL SWITCHING

Software options which will enable the LiveSure Trusted Centre to do verification / authentification / instruction of people + products + financial instruments + payment mechanisms for flow of funds, products, insurance, and tracking

The term "Software as a Service" (SaaS) is considered to be part of the vocabulary of cloud computing, along with "Infrastructure as a Service" (IaaS), "Platform as a Service" (PaaS), "Desktop as a Service" (DaaS), "Backend as a Service" (BaaS), and "Information Technology Management as a Service" (ITMaaS). Software options will also link the ICT database with the user (purchaser), sub-user, merchant, sub-

merchant, bank, insurer, distributor, sub-distributor, and interlinks these parties with one another to the extent necessary for the particular transaction.

f) CENTRAL DATA CONTROL OF INFORMATION / PRODUCTS FLOWING THROUGH THE LTC SYSTEM

This is the source of DASHBOARD information to be distributed;

g) Product identification via a "menu" of accredited auto identification methods, (Internet of Things) through strategic partnerships;

h) Protection / "Ensurance" cover (i.e. wrapping) of various risks, i.e. Financial (i.e. payment) to the merchant; Product identification / quality / definition to the purchaser; and On-time delivery without breakage to the purchaser; and

i) Establishment of a legal relationship by the LTC with the Insurer. This will also apply to the legal relationships amongst the other insured / connected parties in a particular transaction.

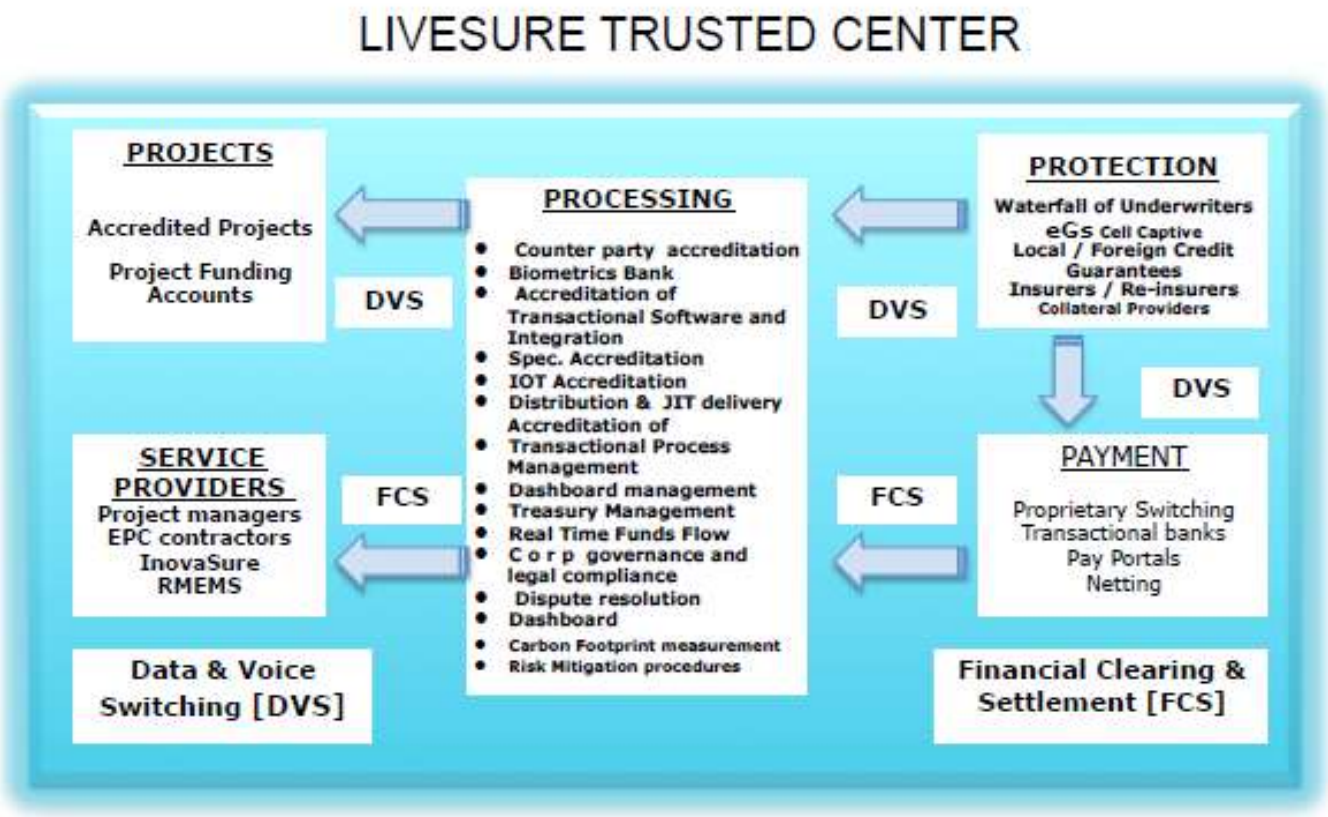

Figure 24: The Livesure Trusted Center (the "LTC")

5.4 Digital Security Provided

The LTC Platform provides security to the biometric depositors in the following areas:

a) **Digital Identification**: By way of background, there are various existing systems for transaction security. Digital ID's provide a means of proving your identity in electronic transactions much like a driver's license or a passport does in face-to-face interactions. With a Digital ID you can assure businesses and online services that the electronic information they receive is authentic. However, The LTC uses more comprehensive authentication/authorization;

b) **Information Network Security**: Information infrastructures are critical to public safety and national well-being. The Organisation for Economic Cooperation and Development (OECD) guidelines for security information systems will be the basis for The LiveSure Trusted Centre's approaches to information security. Information structures are critical and should be protected through awareness, industry-solutions and effective partnerships with government agencies;

c) **Network Security**: Web security is a complex topic, encompassing computer system security, network security, authentication services, message validation, personal privacy issues, and cryptography. The LTC Platform will provide the most extensive network security for all involved parties in every respect;

d) **User Security**: The LTC Platform will ensure that the information about the user will not be used in any way other than through specific and authorised/authenticated instructions by the particular user;

e) **Purchaser Protection**: Through the LTC Platform, the purchaser will receive effective legal (and other) protection in the online environment. The LTC will ensure that existing consumer protection laws and regulations are being enforced to protect its purchasers. Some of these laws and regulations may need modification to accommodate the unique characteristics of the online environment, which will also be addressed as the need arises. Furthermore, the company will assist with consumer education. It will also contribute to the establishment of industry-supported mechanisms to empower consumers and to resolve consumer complaints and concerns; and

f) **Legal**: The LTC will develop and implement effective service level agreements. All the elements in all the relationships amongst the parties to a transaction will be carefully investigated and strategically implemented. Patents, trademarks, and copyright will be pursued.

5.5 Proven Methods and Mechanisms Accredited for use in the LTC Platform

Commercially proven methods and mechanisms are to be accredited for use in the LTC Platform:

a) *Biometric Identification Methods*: The LTC will be the applicator of methods which will define and measure certain characteristics of an individual. Such characteristics will be based on the individual's physiological features or behavioral patterns, which will be used to recognise or verify such individual's identity. These biometric identification methods are focused on automising the measurement and comparison of the particular characteristics for recognising or verifying individuals. The methods which will form part of the MENU of TECHNOLOGIES in the LTC over the short and medium term, are the following:

i) Voice Inflection / Identification: The world's best voice "inflection" technology, capable of verifying the identity of an individual based on his/her voice inflection, will be used. This proprietary voice inflection identification system needs to be accurate in several languages, virtually infallible, and requires one training entry only to achieve full operating status and

ii) Signature Verification: The affixing of a signature should be an affirmative act which serves the ceremonial and approval functions of a signature, and which establishes the sense of having legally consummated the particular transaction. Signer authentication and transaction authentication are tools used to exclude impersonators and forgers, and are essential ingredients of what is often called a "non-repudiation service". A non-repudiation service provides assurance of the origin of delivery of data in order to protect the sender against false denial by the recipient. Thus, a non-repudiation service provides evidence to discourage one of the parties from unilaterally modifying or terminating legal obligations arising out of a transaction effected by computer-based means. Active and passive signature verification methods will be a part of the menu, available to be used by member cyber depositors.

b) *Product Auto Identification Methods (IoT)*: A need exists for *the identification of project documentation and disbursement procedures*. Such product identification will ensure the following:

- protect companies against theft;
- enhance speedy (and secure) delivery to the Project owner;
- give comfort to funders;
- eliminate fraud across various borders;

- enable the issuing of an insurance wrapper (for all parties); and
- form the basis for the insistence on payment guarantees (in favour of the Project owners).

There are two methods that are employed:

i. **"Two Dimensional" Auto Identification Methods**: The use of "two dimensional" matrix symbols have become commonplace. It contains much more information than a barcode and in much less space. Such "two dimensional" symbols can be "scaled" up or down to fit the needs of the particular member cyber depositor. Furthermore, it can be read in any orientation, has error detection and correction capabilities, and can be encrypted directly on the product for greater security; and

ii. **RFID ["Radio Frequency Auto Identification"] Methods**: This is a simple, fast and versatile radio "barcode". It contains all the features of barcodes, but with the benefits of radio communication. It reads through packaging, line of sight is unnecessary, and it deflects around metal. Hands-off reading can be done, and a high velocity read rate is possible;

c) *Paper Fibre Structure Identification*: A method has been identified whereby the structure of paper fibre can be identified. This will enable the ICT to identify the fibre of a particular document (e.g. financial instrument), encode such fibre structure on a matrix symbol on the particular document, and/or on a radio barcode on the particular product.

5.6 Case Study 1: Project ABC

THE PARTIES AND THEIR ABRIDGED ROLES AND RESPONSIBILITIES AS PARTICIPANTS IN THE LTC TRANSACTION

a) THE PROJECT OWNER / DEVELOPER / INVESTEE

A Municipality wishes to appoint CONTRACTOR ABC to provide certain services. The full specification as provided by the DEVELOPER is evaluated and signed off by both the MUNICIPALITY and LTC (ON BEHALF OF THE FUNDS' PROVIDER) authorised signatories. The DEVELOPER obtains funding from the INOVASURE GROUP which works with LiveSure for the ICT to oversee the TRANSACTIONAL PROCESS. Every cent provided for by the FUNDER to reach its ultimate goal and to be dash-board reported in real time to the FUNDER.

b) THE PROVIDER

The service providers ['PROVIDER'] in this instance will the EPC Contractor, professional engineering group, the technology suppliers, legal team, etc.

c) THE PROCESSING

In the PROCESSING UNIT of the LTC verifies all aspects and role players in the transaction. Details of authorised individuals to sign off on a transaction are captured as well as the responsible LTC representative. The PROCESSING UNIT represents the interests of the PROJECT OWNER / DEVELOPER / INVESTEE and the SERVICES PROVIDER as well as ALL SUPPLY CHAIN PARTICIPANTS (generation / storage / distribution / metering / maintenance) who have to sign off (biometrically verified). This UNIT's operational methodology is insured and by doing so brings down transactional cost.

d) THE PROTECTION

INOVASURE issues, under its auspices and appropriately re-insured, the Master agreement in terms of which all of the relevant parties are guaranteed to fulfill their obligations**. It should be stressed that transaction is** based on **PROCESS INSURANCE / PROTECTION** rather than using expensive and timewise unproductive bank credit / collateral / transactional guarantees. **INOVASURE** uses FSB approved financial services providers for the issuance of personal and commercial lines of short term insurance. Different re-insurance companies will be used in different jurisdictions.

e) **THE PAYOR**

In this instance the PAYOR is the LiveSure Group which gives an instruction to the ICT platform to settle the funding requirement of the INVESTEE as submitted LiveSure. The LiveSure nominated BANK therefore receives an instruction from LiveSure to transfer the funds to the LTC account for further settlement by the ICT.

THE TRANSACTIONAL PROCESS IS (RE) INSURED and should any one of the platform participants suffer a loss of service delivery / corruptive practices / internet security breaches / financial, a claim will be lodged with the ICT and legal proceedings kicks in.

5.7 ICT Pro-Forma Alliance Partners

ICT Pro-Forma Alliance Partners are acknowledged:

a) *Insurance partnerships* with the LiveSure INSURECO such as Abax, Willis Re, Marsh McClellan, RBS, Credit Guarantee and others are presently being considered;
b) *Strategic Platform Partners*: In principle, approval of MAJOR CONTRACTORS, PROJECT OWNERS / INVESTEES, SOVEREIGNS, SALGA, COGTA, National Treasury, **the dti**, SEZs, Energy Purchasers / Providers, etc.;
c) *Software Partners*: Best-of-the-Best available Process and Transactional Software, in time to be proprietary to the system;
d) *Hosting and Management Partners*: Industry leading hosting services will be used, which will include web hosting on shared or dedicated web servers. These will also provide security solutions and virtual private networks to member cyber depositors. Hosting services will be decided by LiveSure; and
e) *Support and Asset Management Services*: Partnerships will also be formed with industry leading companies for networking, technical services, and after-sales services.

5.8 LTC Source of Income

Income will be generated by means of a mutually negotiated scaled transaction based fixed fees.

5.9 Strengths, Weaknesses and Opportunities

Competitors

There are *bank focussed* entities such as EULER / BOLERO and others who, over the years, have moved closer to an insurance based platform. A number of credit guarantors focus on securing the payment ability of the debtors but do not complete the full trading cycle.

SWOT

- *Strengths*: The IP owner, LiveSure, has direct and indirect control over cutting-edge and patented biometric and product auto identification technologies, which enables it to provide a unique service. Furthermore, the merging of biometric and product

identification methods into a workable solution will provide to the LiveSure Trusted Centre, via the **LiveSure** GROUP companies, a unique industry niche to curtail e-commerce transaction fraud.

- *Weaknesses*: Critical mass (leverage), first loss funds, time, competition. Can be seen as competition by potential partners.
- *Opportunities*: Business-to-Business (e.g. ***ENERGY SECURITY*****:** Municipal energy security). Business-to-Consumer (e.g. Users purchasing over the internet, auctions). Commercial Use (e.g. Money Orders).

5.10 Current Status

The current status of the LTC Platform is:

a) The **INOVASURE** need for the LTC Platform is understood;
b) **INOVASURE** has a cooperation framework agreement with LiveSure;
c) **INOVASURE's** licensing has been agreed;
d) **INOVASURE's** capitalisation of OPCO / "ENSURECO" / BONDCO is in process; and
e) Negotiations are ongoing with energy supply chain providers in respect of generation / storage / distribution / metering and maintenance matters which utilize the LTC's services.

6. THE CENTRAL OPERATION MANAGEMENT SOLUTION

6.1 Introduction to the InovaSure Dashboard Management Concept[11]

The LiveSure Group has developed a central operations platform solution entitled *LiveSure Dashboard Management Services* to ensure business continuity and operational effectiveness by integrating and connecting access control, CCTV, alarms, perimeter security, operational functionalities and business policy execution with operational and security functionality. This in turn creates a smarter, more cost-effective way to operate the various InovaSure Energy Vault Projects, and more specifically the selected Municipality Projects, such as the Kannaland Local Municipality Energy Vault Project.

A unified platform will be customized and implemented at the specific Project in conjunction with collaborators such as *RT Soft AO,* a company established under the laws of the Russian Federation, to integrate different systems from different vendors within an identified project's operational network adding procedures and auditing tools to sustain ongoing operational standards and requirements. The operational and command centre software allows an increase in productivity of the project organization by implementing procedures, allowing the operator to control various operational functions from the same platform and provide valuable information through dashboard management tools.

RTSoft
SOFTWARE FOR INTELLIGENT THINGS

RT Soft AO[12] is an innovative, fast developing engineering company offering solutions to electric power, oil and gas, nuclear power, metallurgy and transportation industries with its stated goal of launching industrial automation systems technologies as well as embedded computer systems to its markets and clients in the following fields:

- Software Design Centres;
- Embedded Computer Technologies;
- Energy Automation; and
- Industrial Automation

The Central Operation and Command Centre solution connects the operational nodes of

[11] RTSoft - Energy Management for Industrial Enterprises_Dated 2017 10 30 and RTSoft GmbH Brochure_Dated 2017 10 30 and RTSoft GmbH Company Profile_Dated 2017 10 30
[12] http://www.rtsoft.ru/en/

selected Municipality Projects, such as the Kannaland Local Energy Vault Project, providing Project Management with an operational platform, report system and dashboard functionality that would be controlled and managed independently by the *LiveSure Dashboard Management Systems opco*. The system would allow the following:

- Independent operational management across the connected areas;
- Operational and security insight, dashboard functionalities and up to date reporting;
- Systematic integration into key operational functions as defined between the parties on an ongoing basis; and
- Technology capability, scalability and future integration towards current and future projects of similar scale.

6.2 The AMIGO Energy Management System

In a Commercial Proposal (a "CP") RTSoft offered its AMIGO energy management system to INOVASURE as a top-level automatic control system having studied the feasibility study for establishing the RMEMS for the selected Municipality Projects, such as the Kannaland Local Energy Vault Project.

The AMIGO system comprises hardware and software elements and performs integration management of heterogeneous systems and primary power equipment to make the RMEMS work as a whole by:

- coordinating working modes, set points of energy storage system, hydro turbines with asynchronous generators, PV inverters and multiple flexible loads;
- enabling automatic and semi-automatic control of active power, generated at HPP, consumed/generated by the energy storage system and load shedding along with loads and PV- production forecasts;
- securing Nominated Maximum Demand by the selected Municipality Projects, such as the Kannaland Local Municipality Energy Vault Project to avoid penalties from Eskom;
- providing ancillary services such as spinning reserve and demand response for Eskom;
- providing secondary control of active and reactive power of multiple neighboring RMEMS along Eskom transmission lines and providing required transmission capacity on demand; and
- coordinating multiple Off-Grid Solar within the RMEMS in order to enhance reliability of electric power supply

The **AMIGO** system structure is represented diagrammatically:

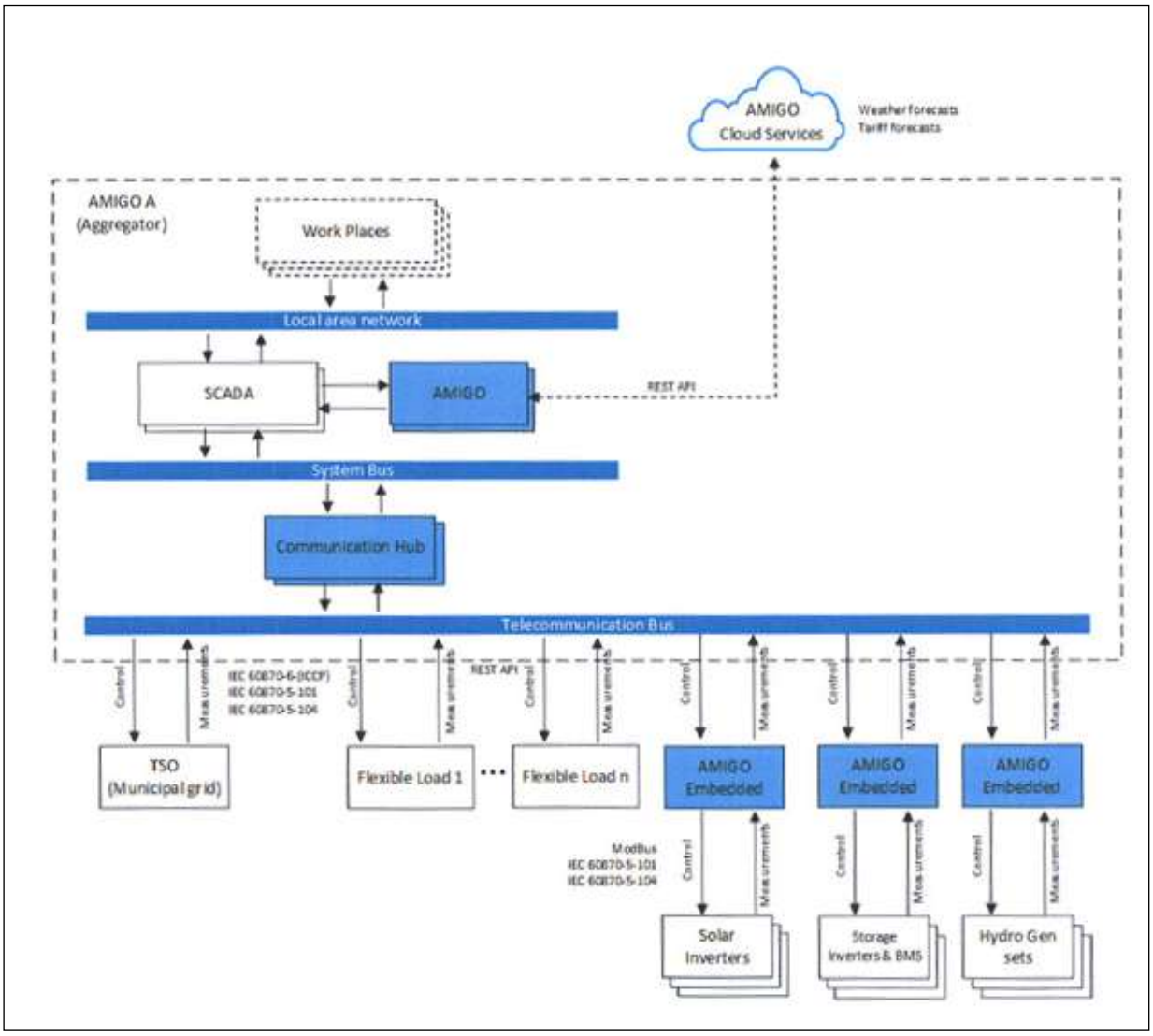

Figure 25: The AMIGO Energy Management System

Risks

Parties acknowledge that the following risks may affect the suggested project schedule and initial budget estimation and both parties do the best to mitigate those risks:

- A reactive power availability and balance analysis will be done considering the features of the proposed HPP asynchronous generators and requirement to overcome utility grid outages (i.e. asynchronous generators inherently consume reactive power). Hence, the RMEMS simulation and various working modes study is included as a part of project design. Furthermore, the results of such simulation may reveal additional economic effect and show methods to improve the RMEMS' project financial model;
- IT networking infrastructure is understood to having to be deployed and operating.

The later stands for availability and protocol compatibility of metering and control circuits (both wired and wireless) of energy storage system inverters, PV inverters, hydraulic turbine governors and utility grid meters, having sufficient bandwidth to transfer AMIGO signals. If not, then additional costs may arise;

- The proposal offered by RT Soft covers design, installation and commissioning works related to major RMEMS nodes only (electric energy storage inverters, PV inverters and HPP's genset control cabinets) and the final contract price may be amended based on detailed project design. However, since AMIGO was designed to cover flexible loads, hence no additional charges will be applied when the network bandwidth is enough and protocols are mutually compatible;
- The issue of certification requirements applied to AMIGO hardware equipment is unclear at this stage and is subject to an additional study that may cause a final contract price amendment, but not exceeding 10% cost of the hardware; and
- The standard warranty that is given is for 1 year with technical support services included. Further technical support is a subject for negotiation and will be managed by **INOVASURE.**

Project Duration

The overall project duration for implementing the AMIGO System is 31.9 calendar weeks. The Project milestones are defined as follows:

Milestone		Period	Description
MS1	Onsite inspection	1 week	AMIGO server deployment, metering & control cable routing, power lead routing, work station deployment
MS2	Design	10.5 weeks	Power system simulation, hardware / software documentation design
MS3	Manufacturing and delivery	3 weeks	All necessary hardware / AMIGO software license delivery
MS4	Installation	2 weeks	Onsite installation
MS5	Pre-commissioning	4 weeks	Software deployment, AMIGO configuring, checkup & corrections of top-level control algorithms for hydro turbines, Tesvolt, PV invertors, report & display form check-up
MS6	Semi-commercial operation	10 weeks	Troubleshooting, acceptance check-out
MS7	Commissioning	0.4 weeks	
M S8	Training	1 week	

Table 5: Project Milestones for Amigo System Deployment

Services and Wok Products

The result of implementing the RTSoft services and products will contain:

- Hard ware / software for operating the AMIGO system in compliance with the stated program and methods of testing; and
- Documentation package

INOVASURE is expected to supply the following to RTSoft:

- Data concentrator software architecture description;
- All existing documentation related to the data module;
- Current data module implementation source code;
- At least 1 (one) Data Concentrator;
- At least 1 (one) Meter; and
- Data module defect list; and
- Allocation of a person with sufficient technical knowledge in the project area to provide necessary consultancy support

Third Party Technology & Software (including open source)

Initially, this project assumes that no any additional third -party technologies and software, except equipment encapsulating metering and control channels with corresponding interfaces, and power supply are required for running RTSoft software to work with. If, during the project implementation, this necessity will be defined, the availability of such product should be fulfilled by **INOVASURE.**

Intellectual Property assessment

Source code, developed or added by RTSoft should have RTSoft copyright. RTSoft will not be held responsible for any Intellectual Property claims in this project unless they happen as a result of RTSoft work.

Business Trips

In order to proper performance of onsite works along with corresponding MS the following business trips are to be done by RTSoft team: All travel expenses including airplane tickets and accommodation according to standard business class related to the mentioned business trips are to be covered by **INOVASURE**.

Changes in Project Scope

INOVASURE will have the continuing right to request changes, modifications or enhancements ("Change(s)") to the scope of the Services under the CP. To request a Change, **INOVASURE** will provide a written notice to RTSoft specifying the proposed

Change. In return, RTSoft will promptly provide a written response specifying how the proposed Change would be implemented and what effect, if any, the Change would have on the schedule or charges. All changes to the Services must be agreed to by RTSoft and **INOVASURE,** and shall be subject to execution of an amendment as further outlined in Section 10 hereto. RTSoft can also request a Change in the case of achanging project scope or increasing list of requirements to be complied with and **INOVASURE** should respond to such requests (accepting or reasonable rejecting).

Support Requirements

- MS2: single-line grid diagram, technical datasheets of interconnecting equipment (PVs, HPPs, controllable loads and these, related to energy storage system), utility grid characteristics in the point of a Municipality's connection (also stability margins of an upper grid}, load profiles (intra-day, intra-month, intra-year for several years);
- MS3: All existing documentation related to interfaces of abovementioned equipment, forms of control perturbations to adjust preset values of equipment regulators, dimensional outlines of related premises (with electrics,) applicable grid codes and other related legislation, metering and control circuits' characteristics and routing.

Project Organization & Staffing

Contact Information for **INOVASURE**: Communications regarding this CP shall be made through the following **LNOVASURE** managers or their designated liaison parties

InovaSure	Contact Name	Email Address
Project Manager	To be specified	To be specified
Business Manager	To be specified	To be specified

Table 6: InovaSure Contact Information

Contact Information for RTSoft: Communications regarding this CP shall be made through the following designated liaisons:

RTSoft	Contact Name	Email Address
Project Manager	To be specified	To be specified
Business Manager	To be specified	To be specified

Table 7: RTSoft Contact Information

Payment terms and schedule

Reimbursable Expenses: **INOVASURE** shall reimburse RTSoft pre-authorized reasonable expenses that were incurred. Travel expenses should be on an acceptable (for **INOVASURE**) level, and **INOVASURE** reserves the right to book flights, hotels and other means of transportation for such business trips. RTSoft shall invoice **INOVASURE** for actual substantiated expenses

Invoice Procedures: RTSoft shall submit all invoices through the **INOVASURE** procurement system which is indicated by the **INOVASURE** Business Manager. Invoices for reimbursable expenses, agreed with and confirmed by **INOVASURE**, shall be submitted counter documents specified in the CP.

Fixed Price Effort: The offer that was made to **INOVASURE** by RTSoft is a fixed price CP. The deliverables and Services identified under the CP will be delivered to **INOVASURE** based on the "Deliverables and Milestone" table. **INOVASURE** shall make payments to RTSoft according to the schedule below:

Milestone	**Payment Schedule** (from the date of RTSoft's invoice)	**$ (VAT excl.)**
MS1	Payment due net fifteen (15) Calendar days	4 737,60
MS2	Payment due net fifteen (15) Calendar days	41 947,50
MS3	Payment due net fifteen (15) Calendar days	143 620,97
MS4	Payment due net fifteen (15) Calendar days	6 316,80
MS5	Payment due net fifteen (15) Calendar days	13 265,28
MS6	Payment due net fifteen (15) Calendar days	19 345,20
MS7	Payment due net fifteen (15) Calendar days	1 184,40
MS8	Payment due net fifteen (15) Calendar days	1 974,00
	Sub-Total	**232 391,75**
	18% VAT for Hardware	2 016,29
	Grand Total	**234 408,04**

Table 8: Milestone Payment Schedule Amounts

Delivery penalties**: INOVASURE** reserves the right to raise the question about changing the payment amount in the case where the level of services that were rendered is low.

Acceptance

The works and services' acceptance criteria are the following:

- MS1 to MS3: The counter work report;
- MS4 to MS6: The counter acceptance certificate;
- MS7: The counter report; and
- MS8: The counter certificate.

The business trips expenses acceptance criteria is the following:

- BT1 to BT5: The submitted counter travel, hotel and other relevant documents.

6.3 Overview of the Operational and Command Centre Platform

The operational platform is a powerful central operational management solution designed to give complete site control. The Operational and Command Centre platform is fully configurable to suit the unique needs of the selected Municipality Project Site, such as the Kannaland Local Municipality Energy Vault Site, and will allow **INOVASURE** to define, manage and report on all aspects of the systems integrated with its Operations Management Centre. Everything that happens on-site is relayed to the **INOVASURE** operators in real time, enabling a swift and appropriate response to security and operational threats. Complete site control and operational intelligence is provided with a fully configurable platform that allows Project Management to define, manage and report on all aspects of Project Operations.

Functionalities include:

- Zone entry rules, know who, how, when and why people access the site;
- Use schedules to automate access and alarm state changes;
- Set entry and exit delays for intruder alarm zones;
- Configure guard tour checkpoints and arrival times;
- Program perimeter security fencing activation settings and alarms; and
- Program building automation and control features including maintenance SLAs.

Management

The operational platform gives unparalleled control of every aspect of the site's security and operational solutions:

- Manage cardholder information and set access rights and responses at individual cardholder or group level;
- Challenge cardholder identities anywhere, any time;
- Check zone and site status in real time;
- Monitor and acknowledge alarm activations;
- Oversee system operators and their management privileges;
- Trust in encrypted peer-to-peer communication with access system controllers;
- Live operation and monitoring of on-site guard tours;
- Fully integrated visitor management capability;
- Video integrations allowing you to see what's happening on your site; and
- Options for remote or off-site monitoring.

Reporting

The INOVASURE operational platform provides advance reporting features to retrieve data and make informed decisions:

- Efficiently retrieve and present information;
- Exchange data with third-party products;
- Data is automatically distributed to areas of the system where it is required; and
- Automate and schedule reports to distribute information for those who need it.

6.4 Other Central Operations Centre Financial Model Inputs

A number of financial modelling inputs are provided for consideration and confirmation. The modelling inputs include the following:

- Operational Platform and software;
- Monthly Operations Management Fee (1 to 25 years);
- CCTV Pricing; and
- Access Control (Optional).

Each of the four sets of inputs are discussed next

The **first set** of the inputs relates to the **Operational Platform and Software**:

Item A - Operational platform	Quantity	Total Cost (ZAR)
Business Analysis, business case, Requirement analysis, solution mapping, scope of work, technical design and process flow design	3	1, 597, 210.00
Central dashboard management, central operations platform development with CCTV, Access Control, Alarm, integration, operational procedure management, reporting and dashboard integration. Variances to other systems, devices and infrastructure to be integrated are included in the price as variances and estimates and are subject to change based on final Business analysis.	1	19, 712,980.00
Server and operational centre hardware x 2 mirror screens (1 x main site and 2 x Independent sites) allows for additional systems data to be identified in BA phase	1	1,258,032.00
Sub total		22,568,222.00
VAT		3,159,551.08
Total		R 25,727,773.08

Table 9: Item A: Operational Platform and Software

The **second set** of inputs relates to **Monthly Operations Management Fee** (1 to 25 years):

Item B: Description: Monthly Operations Management Fee (1 to 25 years)	Cost per month	Cost per year (ZAR)
Operations management, reporting, SLA monitoring and dashboard management **(OM)**	R45,000.00	R540,000
CCTV maintenance **(CCTV)**	R20,000.00	R240,000
Software support **(SS)**	R15,000.00	R180,000
SUB TOTAL excluding VAT	**R80,000.00**	**R 960,000**
VAT	R11,120.00	R134,400
TOTAL	**R91,120.00**	**R 1,094,400**

Table 10: Item B: Monthly Operations Management fee (1 to 25 years)

The **third set** of the inputs relates to the **Operational Platform and Software**:

Item C: Description: CCTV Pricing	List Price	Unit	Total
23" Monitor	R 3 871	50	R 193 550
8port Video Management Server with MC software 4TB	R 25 500	50	R 1 275 000
2MegaPixel IR dome camera with 2.8mm lens	R 1 337	50	R 66 850
2MegaPixel IR Bullet camera with 2.8-12mm lens	R 3 561	140	R 498 540
UTP 6 cable	R 9	20k	R 170 000
15" Equipment rack with UPS	R 3 500	50	R 175 000
Steel Saddles and conduits	R 5 000	50	R 250 000
Installation	R 2 500	100	R 250 000
Project management	R 2 500	100	R 250 000
SUB TOTAL excluding VAT			**R 3 128 940**

Table 11: Item C: CCTV Pricing

The **fourth set** of the inputs relates to **Access Control**:

Item D: Description: Access Control (Optional)	List Price	Units	Total
Database PC	R 19 500	50	R 975 000
Controller 6000	R 12 550	50	R 627 500
Combination Power supply & Bridge	R 4 244	50	R 212 200
Supervised Reader Interface	R 9 556	50	R 477 800
Proximity card Readers	R 2 906	50	R 145 300
Software	R 22 455	50	R 1 122 750
Installation	R 5 500	50	R 275 000
Commission and Setup	R 6 500	50	R 325 000
Installation Material ,Sundries and enclosures	R 6 999	20	R 139 980
SUB TOTAL excluding VAT			**R 4 300 530**

Table 12: Item D: Access Control (Optional)

7. THE SPECIFIC MUNICIPALITY LOAD PROFILE

7.4 Development of the Mkhondo Local Municipality Local Load Profile[13] as a parallel Case Study for the Kannaland Local Municipality

A detailed historic load profile for the Kannaland Local site was found not to have been available by the time this report was finalised. A similar site was utilized for modelling purposes where **INOVASURE** has also spent a lot of time in developing an Energy Vault program – the Mkhondo Local Municipality in Mpumalanga. The design load profile described in this report was developed using information obtained from a number of Eskom resources. The load profile for each identified other municipality, such as the Kannaland Local Municipality, is being reviewed on the same basis.

South African Grid Load Profiles

The following South African grid load profiles were extracted from historic Eskom documents:

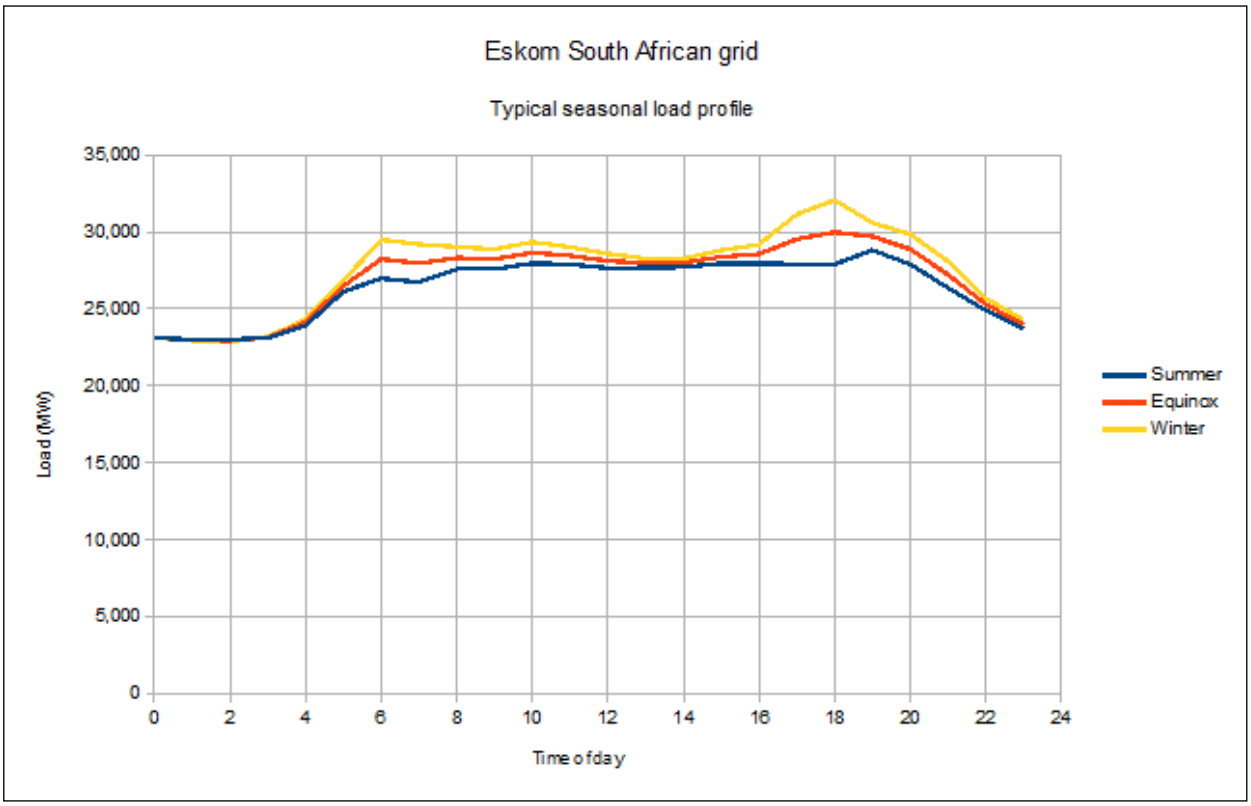

Figure 26: Typical Seasonal SA Grid Daily Load Profile

[13] Report by Mr RJ Crous of SGL Power Pty Ltd (Perth): "Mkhondo Local Municipality: Development of load profile", dated 3 March 2017

Domestic load profile

On the Eskom web site, there are a number of modeling tools for consumers to analyse and optimise their power consumption options. One such tool considers the merits of solar equipment installation and the Excel workbook "Audit Questionnaire and Calculations_v3.xlsx" models the expected individual loads then constitutes the energy consumption of a typical South African household (see the illustration below):

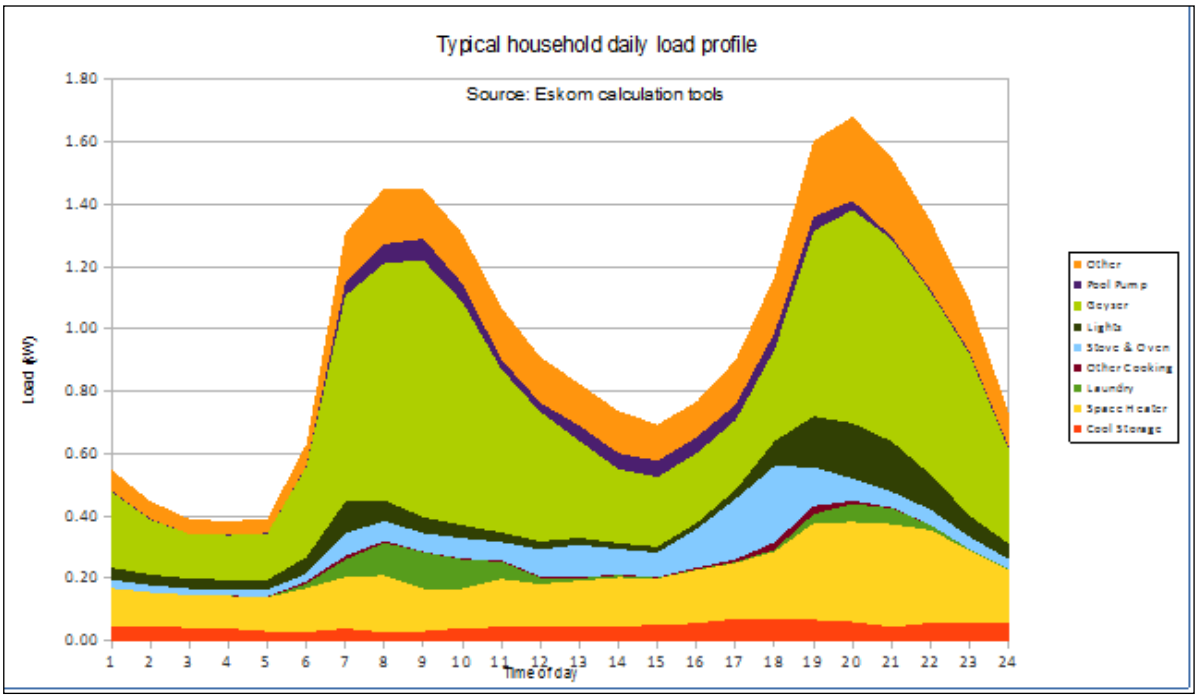

Figure 27: Typical Household Daily Load Profile (Eskom)

7.2 Adaptation of Load Profiles

Using data collected from the previous year's Eskom invoices any Municipality, the monthly maximum and average loads are extracted then averaged for each season. This then renders target average and peak values for the scaled result load curve.

Load profile adapted from Eskom grid data

The Eskom seasonal load profiles are offset to achieve the required average load then scaled to meet the expected peak requirement. It is noted that the morning peak is less pronounced than the evening peak, most likely due to Demand Side Management programs at large-scale industrial consumer sites.

The result is presented in the illustration of the Seasonal Scaled Grid Load Profiles for the relevant Local Municipality that is shown below: Note the higher volatility relative to the original curves due to the dominant domestic segment of the demand:

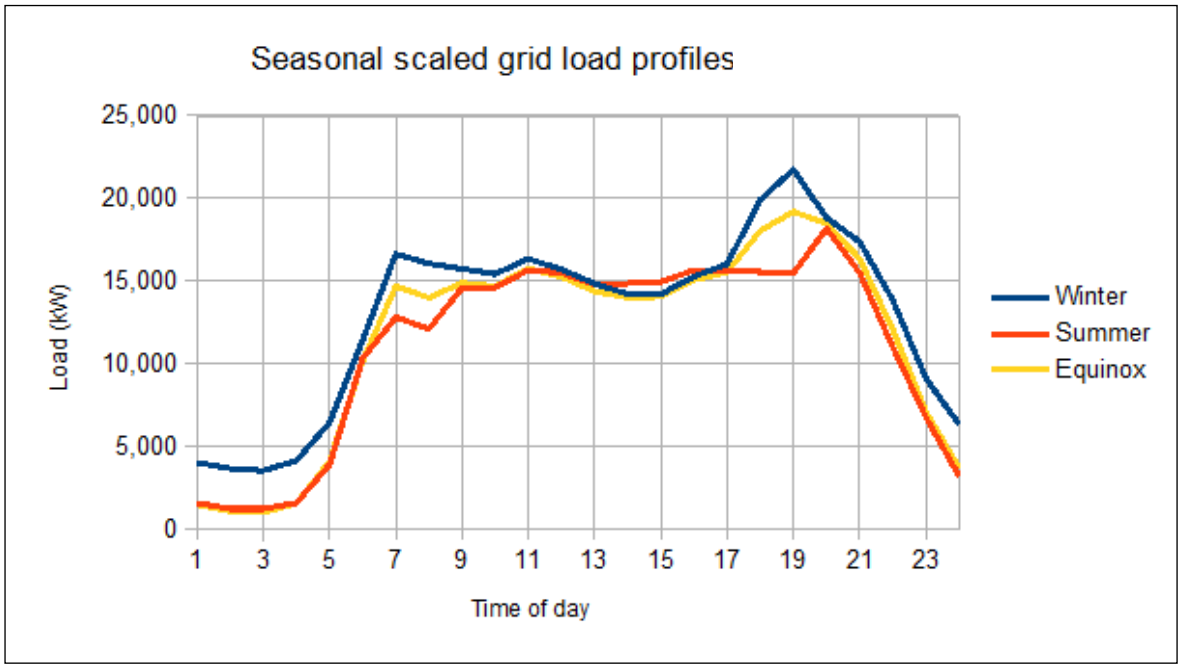

Figure 28: Scaled Seasonal Grid Load Profiles for a Municipality

Load profile adapted from Eskom domestic consumption model

Considering the individual contributors to the load, the normalised residential load profile is used as the winter scenario. Relative to this, the summer scenario deducts the indicated "space heater" load and reduces the hot water heater (geyser) load by 30%. The equinox scenario is assumed to be the average of the winter and summer scenarios.

The load profiles thus obtained are then scaled and offset to render the average and peak loads as reflected by the average values for the appropriate seasons from the historic data of a Municipality's invoices from Eskom.

The Projected Daily Seasonal Grid Load Profiles for the relevant Municipality is adapted from the Eskom residential consumption model, scaled and offset to align with historic invoices:

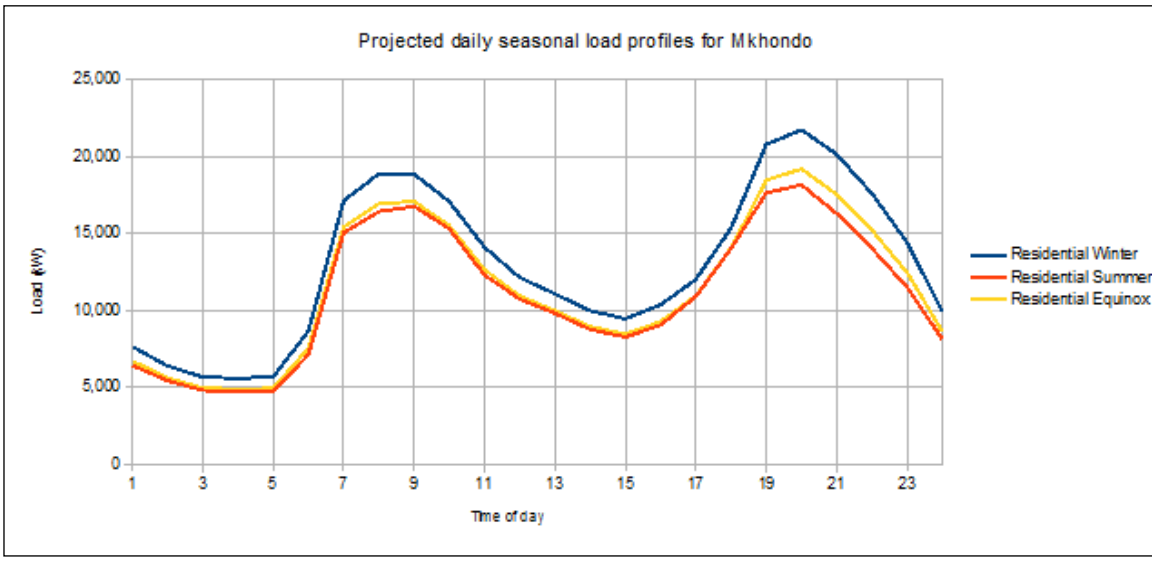

Figure 29: Projected Daily Seasonal Residential Load Profiles for a Municipality (Mkhondo sample)

Superimposing the previous two sets of projected load curves renders the next illustration:

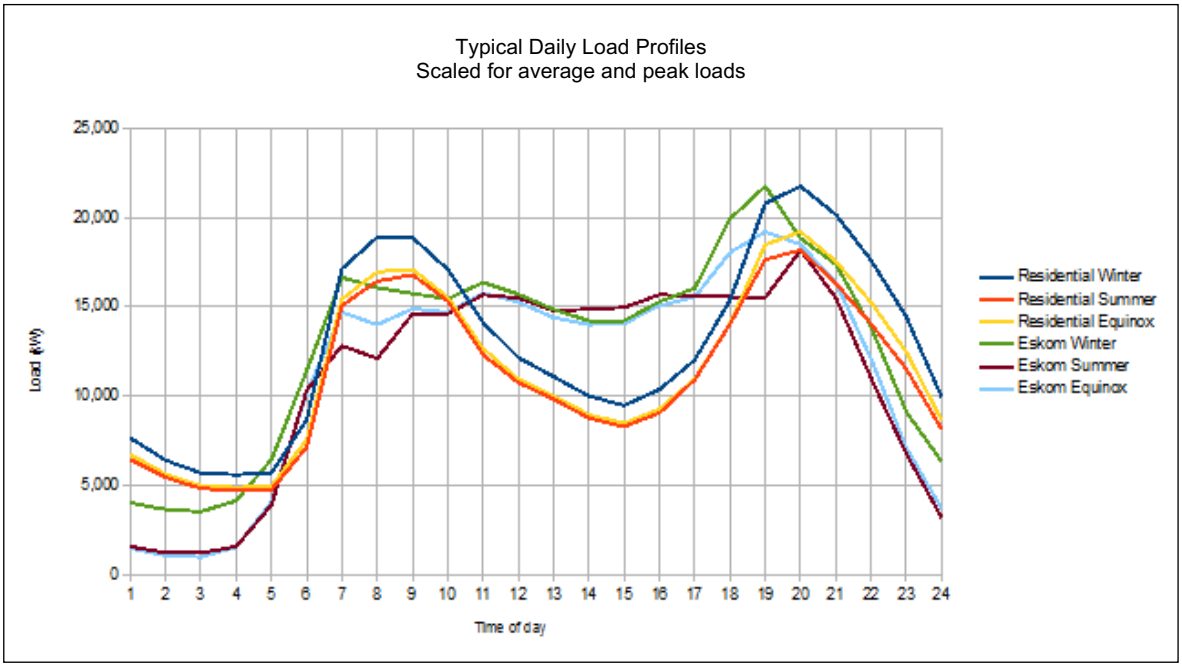

Figure 30: Scaled Load Profiles using both Eskom Grid and Eskom Residential Profiles

Using the Mkhondo Local Municipality as an example in a parallel feasibility study, there is little evidence of industry, much like Kannaland, with the residential load then indicated as dominant and the load profiles as presented in the above illustration of "The Projected Daily

Seasonal Grid Load Profiles" that is used as design seasonal load profiles. This is similar in the case of the Kannaland Local Municipality.

7.3 Project Power Generation Sources

The Kannaland Local Municipality project contains storage and generation and monitoring and telecommunications technologies, each being developed as a separate Special Purpose Vehicle (SPV) company:

- 25MW Solar PV plant (DC generation supplied directly to storage);
- 20MW/53.5MWh battery storage facility;
- Distribution and telecommunications device ("Smart meter") technology;
- LTE and Broadband Technology; and
- Thin Client telecommunications and Virtual Private Network (VPN) Technology.

The above will be introduced for all **INOVASURE** Energy Vault Municipality Projects,

7.4 Loading Objectives

Cap NMD Exceedance

NMD Exceedance is currently not a problem in the case of the Kannaland Local Municipality Energy Vault, but it needs to be addressed for many of the other Energy Vault projects that will be introduced at other Municipalities.

In using Mkhondo as a parallel example for a standard **INOVASURE** Energy Vault, the substation servicing Mkhondo Local Municipality, as a case study, was found to have design limitations (which is the case in many other Municipalities) that leads to a Nominated Maximum Demand (NMD) in the Eskom supply agreement.

The NMD in Mhkondo is typically exceeded in summer, somewhat during the two equinox seasons and severely in winter. This is the case in many other Municipalities in South Africa.

Exceeding NMD overloads the substation and generates substantial financial penalties for the relevant Municipality.

Injecting stored power on the Municipal side of the substation reduces the demand on the substation.

The Eskom tariff structures provide incentives for minimisation of peak energy. From a simplistic viewpoint and economically speaking it would be most advantageous to minimise the use of peak power, and maximise output from battery storage during such periods.

However, the overage projected load profiles in South Africa indicate that NMD can be exceeded outside official peak periods, and the tariff penalties incurred with such events are significant.

Minimised Peak Power Consumption

With peak period rates higher than other periods, it is an attractive objective to minimise Eskom grid loading during peak times.

While it is possible to simply maximise output during peak periods, the capacity is of more value to Eskom as dispatchable capacity as opposed to non-dispatchable load reduction.

Battery Capacity Management Strategy

The operational strategy is then to allocate battery output to ensure NMD is not exceeded as non-dispatchable load reduction during winter, with the economic benefit of the avoidance of exceedance of NMD as well as avoidance of purchase of power from Eskom; and:

- Provide a suitable portion of available MW of dispatchable capacity to Eskom as peaking power. Remuneration is suggested to be as a "capacity charge", with "generation charge" reflective of purchasing power off-peak ("standard time" during the day) to provide energy when the generation is dispatched. Such energy may be received from the solar PV plant or Eskom, and the source will be dependent on weather conditions.

- Ensure that the Utility Scale batteries are 100% charged 1 hour before the peak period begins.

7.5 Expected Impact of 120 Units on Grid Profiles

For the impact analysis, a general configuration is considered consisting of a 20MW/53.5MWh battery combined with a 25MW Solar PV with production targeting smoothing of the grid load profile.

In addition, the impact is measured on the "grid profile" rather than the "domestic profile", as the units would be connected as such.

In the model utilized as an average, the demand peak support required in winter peaks at 18.5MW, but the battery system output is limited to 20MW as per the **INOVASURE** Energy Vault specification.

This restriction leads to the 29,677MW peak in evening peak vs. constant 27,639MW load for the bulk of the day; with an inverter output of 18.5MW the load profile would be flat at 27,639MW (see the next illustration).

No additional generation energy inputs are included in this model, with all the energy for the whole cycle stored during the evening off-peak period.

For the WINTER Scenario then:

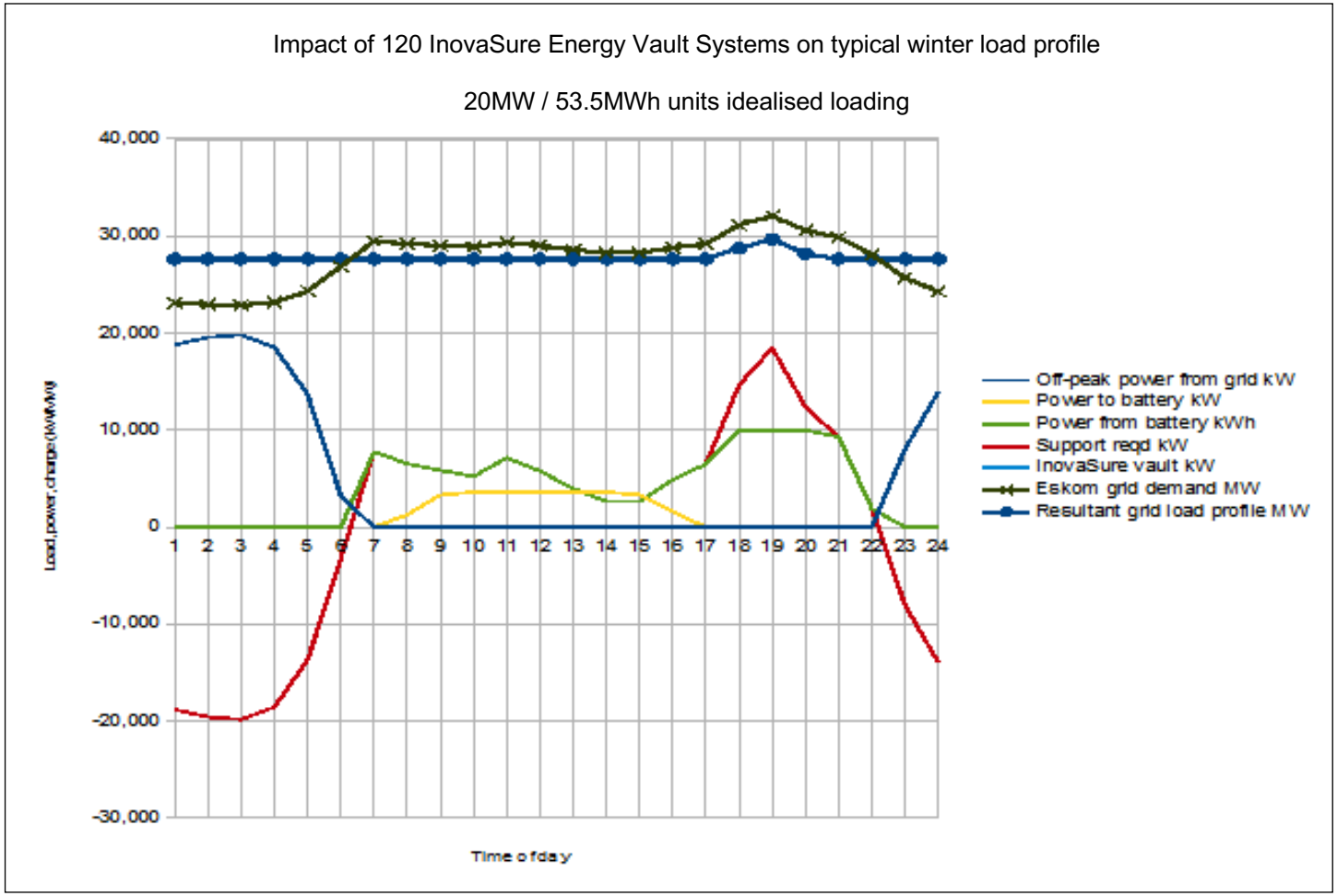

Figure 31: Potential Impact of Installation of 120 INOVASURE Vault Systems

Note: *The potential impact of the installation of 120* ***INOVASURE*** *Energy Vault systems, with rating of 20MW/53.5MWh capacity under ideal conditions, on the typical WINTER load profile is shown above.*

For the SUMMER SCENARIO, the demand support only just exceeds the 20MW output cap at 10.1MW at the end of evening peak, with the result that the summer grid load profile is essentially flattened at 26,402MW (See the next illustration).

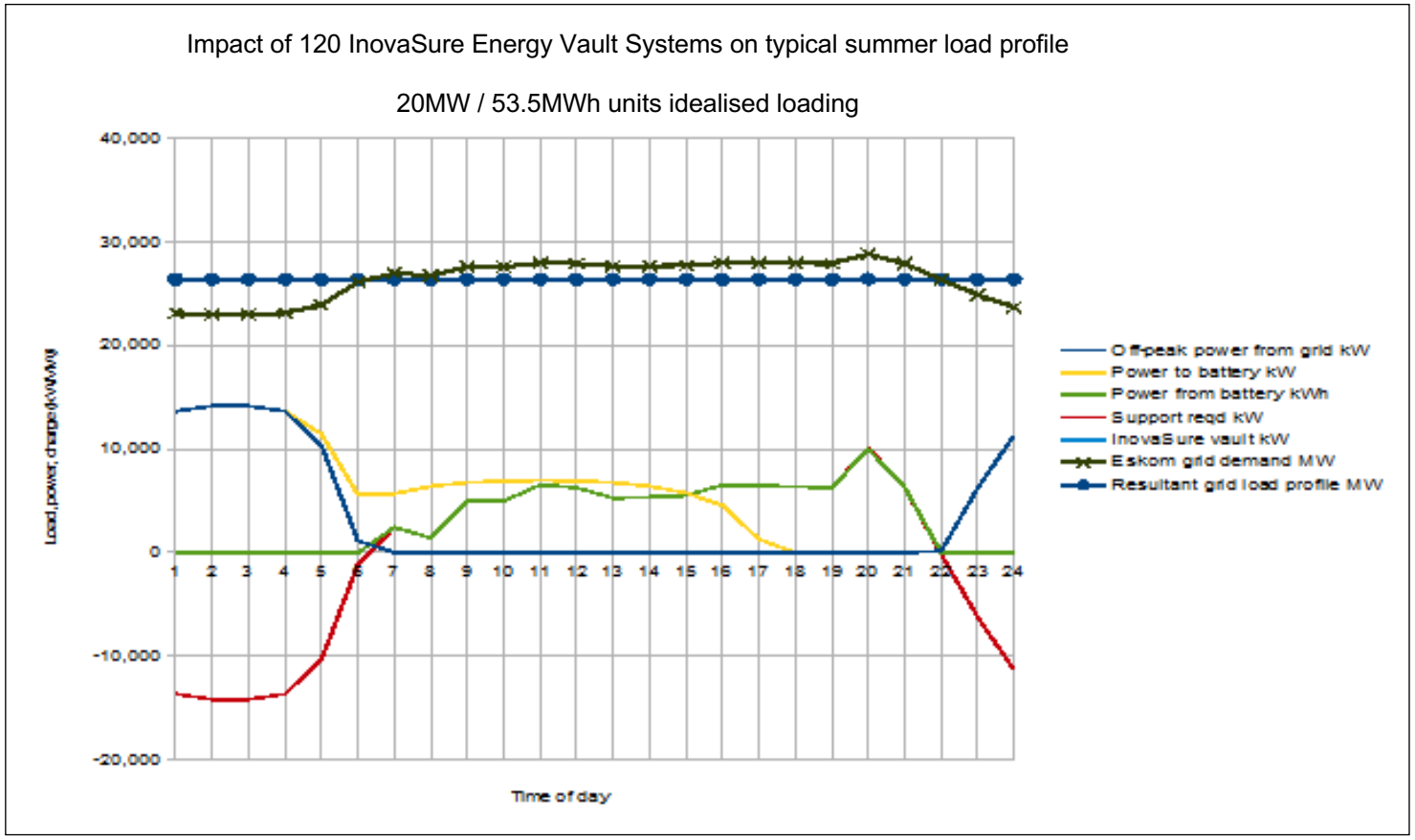

Figure 32: Potential Impact of Installation of 120 InovaSure Vault Systems

Note: *The potential impact of the installation of* ***120 INOVASURE*** *Energy Vault systems, with rating 20MW/53.5MWh capacity under ideal conditions, on the typical SUMMER grid load profile is shown above. The conclusion from the latter is that 120 units with a capacity of 20MW/53.5MWh could satisfy all non-base load requirements of the South African grid.*

7.6 Expected Impact of 120 Units on Grid Profiles

The typical solar radiation energy for each of the characteristic seasons is presented below:

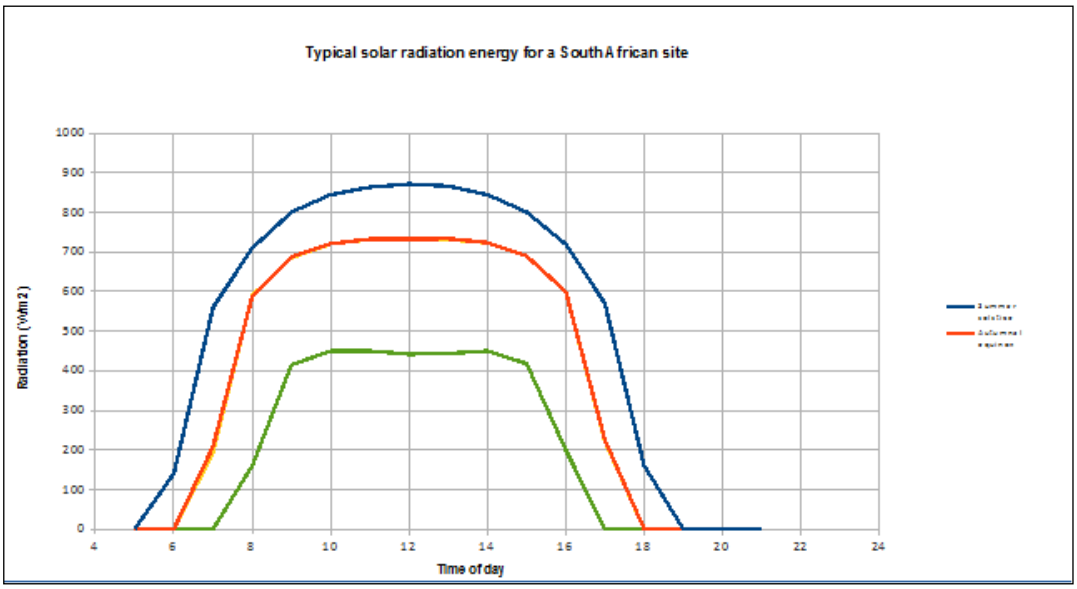

Figure 33: Typical Seasonal Solar Insulation for a Municipality in South Africa

The above then renders the typical output illustrated next for a solar PV installation with a rated output of 8MW:

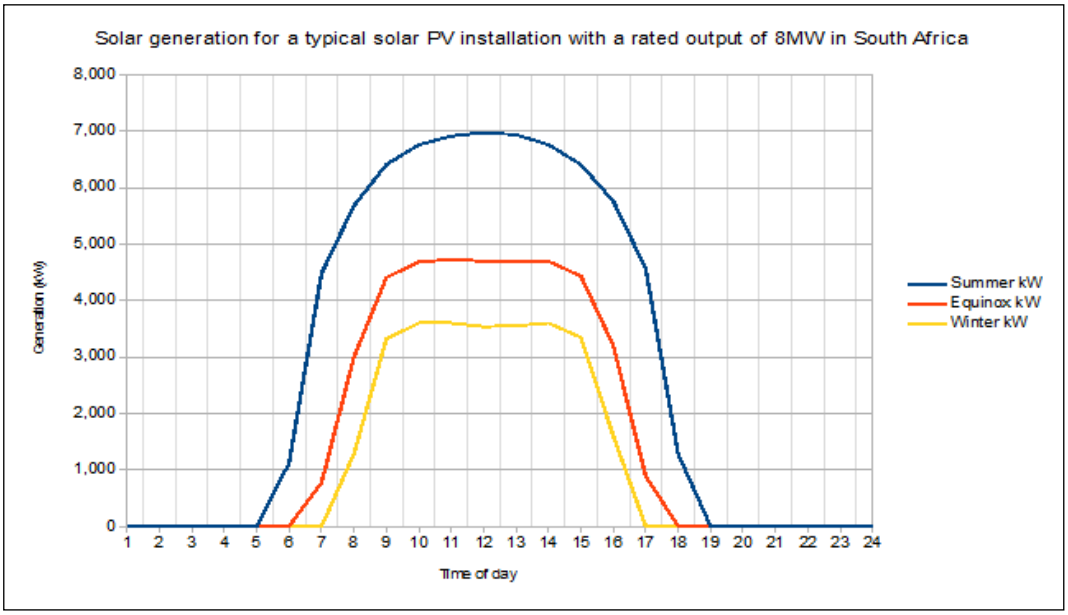

Figure 34: Typical Seasonal Output for Solar PV Plant rated at 8MW

7.7 Kannaland Local Municipality Commercial Strategy

There are several modes of operation and power generation and storage employed at the Kannaland Local Muncipality site, but each mode is viewed as a separate stand-alone business (Special Purpose Vehicle or "SPV"). While the various modes are developed in synergy with others, no reliance is made on other modes per se in the financial projections. The exception is the Solar PV plant, which supplies DC power to the **INOVASURE** Energy Vault.

The Solar PV plant generates power in Direct Current format, which is also the native format for storage in the battery system. As a stand-alone technology, Solar PV is not attractive to the grid as it is non-dispatchable, variable and reliant on weather conditions, but most importantly only starts producing after morning peak and stops producing before evening peak. Solar PV power is most valuable when stored or "time-shifted" into peak periods where more attractive rates are available. Sending the PV generated power directly into the battery system provides an additional advantage in that DC-to-AC equipment is not required, providing a significant cost saving (up to 50% of solar PV installation costs are associated with Balance of Plant ("BOP") systems, consisting mainly of DC-to-AC inverters). This reduces the CAPEX for the solar PV system significantly, making it an economically attractive proposition. The Solar PV plant produces power at a constant tariff as it is "time shifted" by the Energy Vault.

The Energy Vault stores lower-cost power during off-peak periods and provides it back to the grid during peak times. Doing so also reduces the maximum peak demand, which impacts both the Eskom charges as well as the restrictions on the current substation. The economic model for the vault is based on using off-peak power as well as "standard tariff" power (between morning and evening peak) to ensure a full charge of 53.5MWh is available at the start of both morning and evening peak times. Using Solar PV power instead of "standard tariff" power constitutes a more economic option, but due to the variability of the solar power on a day-to-day basis as well as with seasonal changes ensures economic robustness of the business.

The Energy Vault fulfills two roles:

- Prevent the exceedance of NMD; and
- Provides peak power generation capacity to the Grid.

Through providing peak power generation, the maximum demand on the substation is reduced. However, analysing the likely load profile for the substation, it is clear that depression of demand may be required prior to and subsequent to peak periods. On average for a 18MW cap on a substation, a total of 3MW for 1 hour per day or 3MWh of storage is required to limit the peak demand below NMD. Limiting the maximum output of the vault at 20MW, using a 3 hour morning peak and 2 hour afternoon peak, the system can make available to Eskom dispatchable peak power generation of 106MWh/day.

Using the Energy Vault as a peak power generation capability, the appropriate tariff would consist of a combination of a "capacity charge", which is remuneration of the generation capacity available and independent of actual generation; combined with a "generation charge" which is intended to cover the cost of energy procured to be stored in the vault, i.e. off-peak power or "standard" rate power from Eskom or from the solar PV provider. All power generated is viewed as "peak power".

The three scenarios developed for summer, winter and equinox are utilised in determining capacities.

7.8 Determination of Financing Requirements

The following principles are applied in determining financing requirements:

1. Loan values minimized;
2. Debt-equity ratio of a maximum of 80%; and
3. Due to delays in generating cash flows during construction, operational capital is added to CAPEX and value obtained by solving for an Annual Debt Service Cover Ratio better than 1.0

7.9 Navigating the Financial Model

In the report by Mr RJ Crous of **INOVASURE**, i.e. *"Mkhondo Local Municipality: Development of load profile*" (dated 3 March 2017). A parallel scenario was developed which is used as the base model for the Kannaland Local Municipality. In this report, reference is made to the several financial models contained in the one worksheet with relevant pages that are grouped together. The exact details of the financial model is not

described here again as the financial model discussion in **Part C** to this Feasibility Report provides the final modeling outcomes for each of the proposed interventions for the **INOVASURE** Kannaland Local Municipality Energy Vault Project.

However, the descriptions of the mentioned pages from the financial modeling that are referred to in the original report are repeated here for referencing purposes:

- **In general:** Pages contributing technical background information are on the right (tabs at the bottom), while financial inputs flow from the left;
- **Technical inputs:**
  - On the very right, the first page is "Household load" which presents an analysis of typical domestic power consumption extracted from an existing Eskom domestic solar potential analysis tool;
  - Second from the right is a page dedicated to analysing solar PV potential using solar insulation values widely published; and
  - The next 3 pages use the Domestic load profile and solar generation potential to analyse scenarios and likely load flows to determine equipment capacities and test tariff impacts.
- **High-level option assessments:**
  - The page "Substation" analyses the likely project life cycle costs of the alternative project – upgrading the existing substation; and
  - The next page "Kannaland compare" is a high-level assessment of the proposed project value vs the status quo for Kannaland Local Municipality.
- **Financial pages:**
  - These pages present the financial projections for the proposed SPV companies associated with the various components of the proposed project;
  - The first 2 pages present the generation / technical / input page followed by the financial model for the solar PV venture;
  - The next 2 pages present the inputs then financial model page for the InovaSure Energy Vault; and
  - The next 2 pages include the sale of power through the oversized PV plant as a revenue stream;
  - The next 2 pages present the inputs then the financial model page for the Kannaland Local municipality.

7.10 Comments

All SPV company models assume zero production in the first project year. This is yet to be implemented for the Kannaland Local Municipality model, as it would require a separate energy consumption model with higher reliance on Eskom. This will be implemented in due course.

There is no IRR value for the Kannaland Local Municipality model, as there is no CAPEX investment.

All SPV ventures have, in addition to equipment CAPEX components, a "working capital" component to allow for successful accommodation of the requirements of the first year of construction while maintaining adequate financial cover ratios.

The total investment funding that is required for the RMEMS implementation at a Municipality, such as the Kannaland Local Municipality, is envisaged to be funded by the New Development Bank (NDB) under the auspices of the Development Bank of Southern Africa (DBSA) as the Mandated Lead Arranger for the syndication of the funding. The funding of the Energy Vault that is due to be established for the Kannaland Local Municipality as the initial implementation site will be reviewed for the 119 other roll-out implementation sites in South Africa.

The Parts to the Feasibility report and the Financial Model will be reviewed in the implementation roll-out process for the proposed development of the RMEMS for other project sites based on the experience with the Kannaland Local Municipality Energy Vault Project. During the financial modelling process, each of the financial modelling of each of the SPVs was conducted. The financial modelling outcomes of each of the SPVs[14] are available upon request and not included here.

This narrative report was created for purposes of completing the DBSA application for funding support for the project and also for consideration to become the proposed Mandated Lead Arranger (MLA) for the envisaged REAL TIME MULTI-DIMENSIONAL ENERGY MANAGEMENT SYSTEM (the RMEMS, also known as an Energy Vault) that is

[14] 04.01a & 04.01b Stage 1 & Stage 2 Kannaland Rev G November 2018

due to be established for the Kannaland Local Municipality as the initial implementation site and 118 other roll-out implementation sites in South Africa.

The financial modelling and reports for the Kannaland Local Municipality Energy Vault Implementation Project will be reviewed further during the next phases of the implementation and roll-out of the InovaSure Energy Vault program in South Africa with funding that may be provided by institutions such as the NDB under the auspices of the DBSA.

8 ENVIRONMENTAL ASSESSMENT

8.1 Environmental Desktop Screening[1] - The Kannaland Local Case Study for Review

The Environmental Screening is performed on a desktop basis with the goal of identifying suitable sites for the Kannaland Energy Vault

8.2 Introduction and Basic Environmental Background

PHOTO VOLTAIC PLANTS OF 25MWp

(To be upscaled to 50MWp or more for export power)

IDENTIFIED SITES: SITE 1 RIETFONTEIN RE/28

SITE 2 JAGTBERG RE/33

The 2 areas identified are:

Figure 35: Rietfontein RE/28

Figure 36: Jagtberg RE/33

RIETFONTEIN IS 5 kms South West of the small village of Bufferlskoof and 15 kms east from Calizdorp and accessible via the R62 AND 1.6 kms away from Rietfontein Substation 16/28.

JAGTBERG is 10 kms west of the village of Calitzdorp, accessible via the R62 and 9 kms away from Rietfontein Substation 16/28.

Figure 37: Photograph of Kannaland Area

This report is a pre-assessment aiming to identify potential sites to erect the 25MWp **INOVASURE** Energy Vault (planned to be upscaled to 2 x 25MWp) within the Kannaland Municipality borders.

Figure 38: Map of Kannaland Area

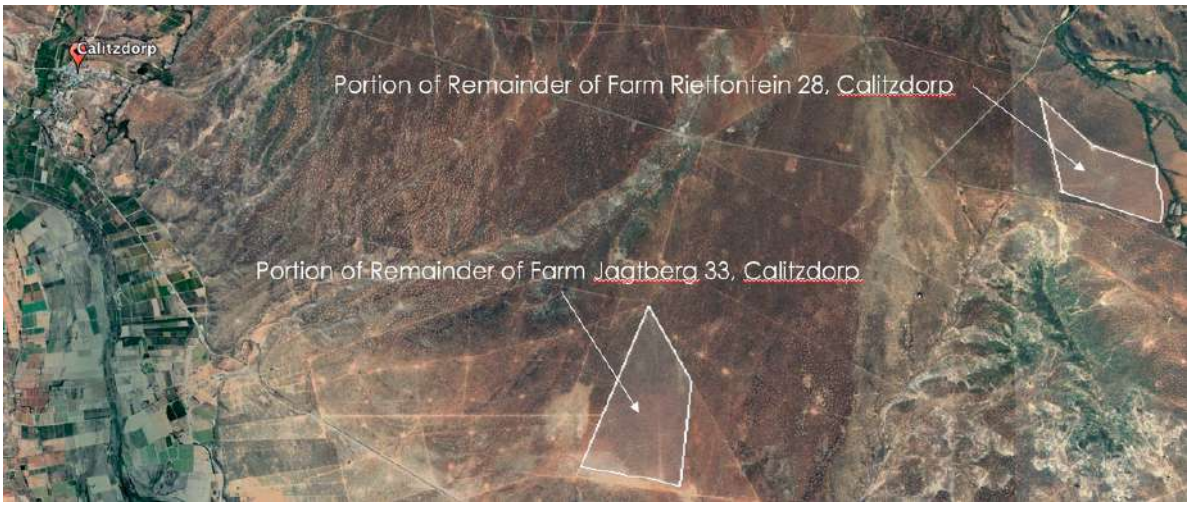

Figure 39: Depiction of 2 identified sites

8.3 Site 1 - Rietfontein

SITE 1 – RIETFONTEIN RE28
33°32'40.57" S / 21°51'16.63" E

INTRODUCTION:

The Proximity of the Rietfontein substation (estimated 40 to 60MVA with 88kV lines) makes the Rietfontein RE/28 a first choice to erect the 50MWp solar field for the 2 vaults. The second reason for the pre-identification of this land is the very low level of wet lands and water presence. The third reason is the fact that this land is made of one large portion instead of being fragmented into multiple small agricultural land.

Following studies made with Cape Farm Mapper software shows that the land is facing North with a neglectable slope (less than 5%) making the land usable for solar application. PVGiS software used to calculate the irradiation shows good performances below.

PVGIS-5 estimates of solar electricity generation:

Provided inputs:		Simulation outputs	
Latitude/Longitude:	-33.542, 21.849	Slope angle:	1 (opt) °
Horizon:	Calculated	Azimuth angle:	0 (opt) °
Database used:	PVGIS-CMSAF	Yearly PV energy production:	1600 kWh
PV technology:	Crystalline silicon	Yearly in-plane irradiation:	2000 kWh/m²
PV installed:	1 kWp	Year to year variability:	27.40 %
System loss:	10 %	Changes in output due to:	
		Angle of incidence:	-3.5 %
		Spectral effects:	0.4 %
		Temperature and low irradiance:	-8.3 %
		Total loss:	-20 %

Figure 40: Rietfontein PVGIS-5 estimates of solar electricity generation

The only potential substation usable as Point of Connection (PoC) is the RIETFONTEIN 16/28 which seems to be a 40 to 60 MVA fed from a 88kV line (to be confirmed).

It was not possible to find the level of load of this substation.

Research of other PoC on the Calitzdorp side as well as on the Oudtshoorn side has not yet shown any other possibility to connect the vaults power output.

IMPACT ON THE BIOLOGICAL ENVIRONMENT (FAUNA AND FLORA)

The following considerations and assessment are extracted from the Cape Farm Mapper software.

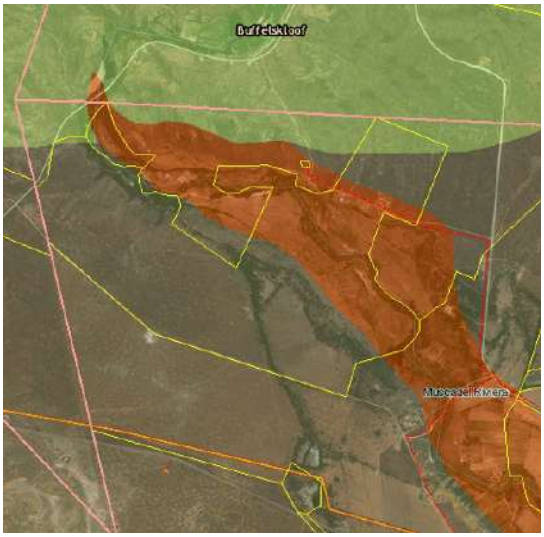

Figure 41: Rietfontein Map of Fauna & Flora

Maintenance activities such as vegetation clearing as well as the amount of disturbance created during construction will leave the site vulnerable to degradation through alien plant invasion and soil erosion. Limited potential ecological impacts resulting from the construction and operation of solar vault as the land is away from the Vlei River. Erection of the solar plant will have a very low impact on possible protected species if any.

On the faunal impacts, the solar plant and energy vault will not produce noise or pollution disturbance that are detrimental to fauna.

Only during the construction can one foresee that sensitive and shy fauna would move away from the area during the construction phase as a result of the noise and human activities. This impact is, however, transient and there is not likely to be any long-term consequences on terrestrial fauna during the operational phase.

POTENTIAL IMPACTS ON HERITAGE RESOURCES

An Integrated Heritage Impact shall be performed by a specialist.

Cape Farm Mapper software describes the environment of the potential sites as an "arid, gently sloping plain". The land is very sparsely vegetated. No structures or ruins were noted.

No basic historic background has been identified. No significant historic or other heritage-related themes have been found so far.

ASSESSMENT OF IMPACTS ON AGRICULTURAL RESOURCES

VEGETATION

The potential land is situated in the Calitzdorp-Buffelkloof area marked by Low Shrub land type of grass. Tree density is less than 5%. The Normalized Difference Vegetation Index (NDVI) is low. Grazing capacity is low.

CLIMATE

This is an arid zone with few perennial rivers. Summers are hot, while winters may cool down to -5°C. Frost occurs from late April through to October, thus rendering is a very short growing season for frost–sensitive crops. Summer rainfall peaks in March, ranging between 0-200mm in this specific area. Unpredictable drought is a feature of the entire zone.

SOILS

Soils associated with arid landscapes and mineral composition presence in this area, are Red-yellow apedal, freely drained soils.

LAND CAPABILITY AND SUITABILITY FOR AGRICULTURE

The potential agricultural capability of the project based on the natural resources identified shows that the site is largely unsuitable for cultivation due to the low annual rainfall.

POTENTIAL IMPACTS ON AGRICULTURAL RESOURCES

Not suitable land for agriculture due to roughness of the soil low rain waterfall and high wind velocity.

The proposed PV Power plants, will have limited impacts on agriculture on site.

WATER AND WETLANDS

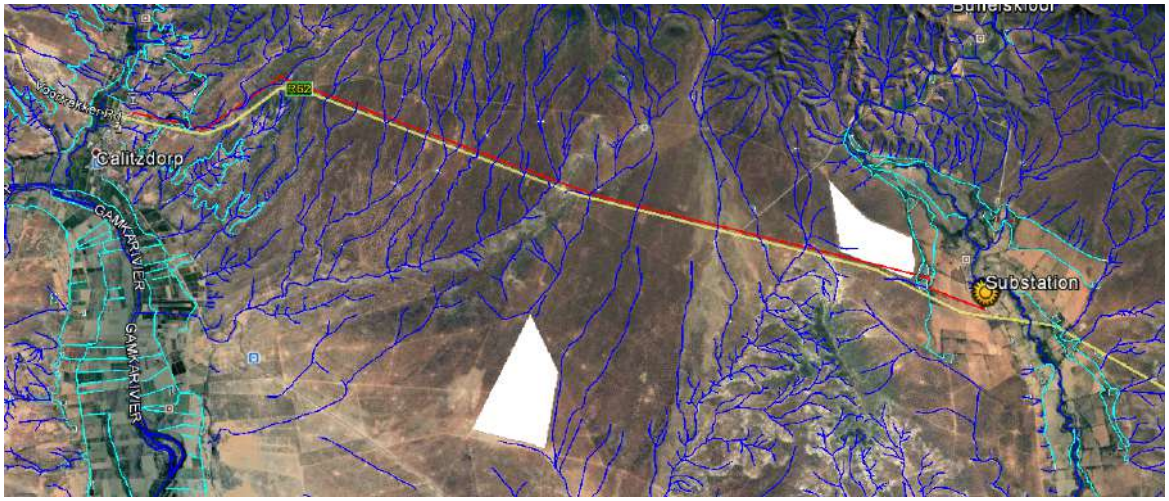

Figure 42: Rietfontein Map of Rivers

Gis specific software identifies rivers all around the identified sites but no rivers (NGI or DWA) are visible on the site (non-perennial rivers).

Figure 43: Rietfontein Map of Wetlands

Two wetlands are identified at the South East portion of the identified land. The Mitigation plan will be to create an exclusion zone between them and the solar field.

ASSESSMENT OF IMPACTS ON VISUAL RESOURCES

KEY LANDMARKS

Based on the 17km zone defined between Calitzdorp and Buffelskloof, the following landmarks have been identified in defining the surrounding areas characteristic landscape:

- Vlei River (in the South);
- Gamka River (at Calitzdorp);
- Existing 88 kv distribution Line along R62;
- Transnet fret/passage line (not electrified).

No degradation of scenic resources is foreseen during the construction and the operation of the Solar plants and InovaSure Energy Vaults.

CONCLUSION SITE 1 – RIETFONTEIN RE/28

A Draft Basic Assessment Report is sufficient to confirm that the potential land identified so far is acceptable to erect two solar plants and energy vaults - including the grid connection.

As Solar specialists, Biorex confirms that the preferred potential site is the RIETFONTEIN RE28 due to the proximity to an existing substation REITFONTEIN 16/28.

Aside from potential negative impacts, it is submitted that the proposed Photo Voltaic Plant and Energy Vault with its Grid Connection has positive impacts, in that it aligns with national, regional and local strategies to support alternative / renewable energy projects.
These include the distribution of much-needed 'clean' electricity into the national grid, provision of local electrical infrastructure for use in long-term, and the provision of employment opportunities during the construction and operation phases for members of local communities.

A detailed Environmental Impact Assessment (EIA) will include the risk mitigation to reduce potential negative impacts to an acceptable level.

8.4 Site 2 - Jagtberg

SITE 2 – JAGTBERG RE33
33°32’40.57” S / 21°51’16.63” E

INTRODUCTION:

The Rietfontein substation (estimated 40 to 60MVA with 88kV lines) located 9 kms approx. from this site makes the Jagtberg RE/33 a second option to erect the 50MWp solar field for the 2 Photo Voltaic plants and energy vaults. The second reason for the pre-identification of this land is the very low level of wet lands and water presence. The third reason is the fact that this land is made of one large portion instead of being fragmented into multiple small agricultural land.

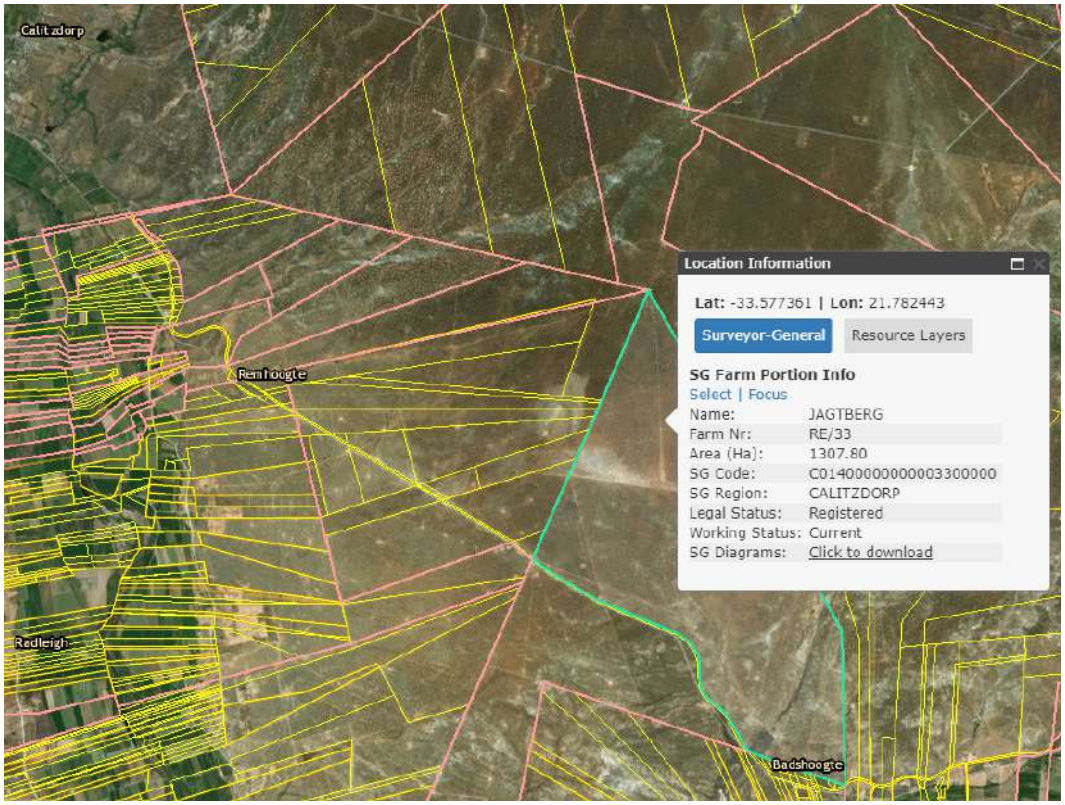

Figure 44: Farm Portions and Parent farm around Jagtberg RE/33

FARM PORTION LIST

Print | Save/View RTF | Email PDF

3 match(es) found for the criteria specified.

Date Requested	2018/10/29 15:52
Deeds Office	CAPE TOWN
Farm Name	JAGTBERG
Farm Number	33
Registration Division	CALITZDORP RD
Portion Number	-

Portion	Owner	Title Deed	Registration Date	Purchase Price (R)
0	MEIRING PHILIPPUS JOHANNES ANTONIE	T10309/1899	1899/12/27	R0.00
1	TRANSNET LTD	T2464/1997	1997/01/14	R0.00

Figure 45: Printout of Title: Jagtberg RE/33 belongs to a single owner - Mr Meiring Philippus - and to the SoE Transnet

Following studies made with Cape Farm Mapper software, it appears that the land is facing North with a neglectable slope (less than 5%) making the land usable for solar application. PVGiS software used to calculate the irradiation shows good performances below.

PVGIS-5 estimates of solar electricity generation:

Provided inputs:		Simulation outputs	
Latitude/Longitude:	-33.572, 21.780	Slope angle:	1 (opt) °
Horizon:	Calculated	Azimuth angle:	0 (opt) °
Database used:	PVGIS-CMSAF	Yearly PV energy production:	1610 kWh
PV technology:	Crystalline silicon	Yearly in-plane irradiation:	2010 kWh/m²
PV installed:	1 kWp	Year to year variability:	24.10 %
System loss:	10 %	Changes in output due to:	
		Angle of incidence:	-3.4 %
		Spectral effects:	0.4 %
		Temperature and low irradiance:	-8.1 %
		Total loss:	-19.8 %

Figure 46: PVGIS-5 estimates of solar electricity generation: Jagtberg RE/33

POWER LINE ALIGNMENT:

The only potential substation usable as Point of Connection (PoC) is the RIETFONTEIN 16/28 which seems to be a 40 to 60 MVA fed from a 88kV line (to be confirmed). It was not possible to find the level of load of this substation. Research of other PoC on the Calitzdorp side as well as on the Oudtshoorn side have not shown any other possibility to connect the Photo Voltaic plants and energy vault's power output.

IMPACT ON THE BIOLOGICAL ENVIRONMENT (FAUNA AND FLORA)

The following considerations and assessment are extracted from the Cape Farm Mapper software:

Not a protected area / belongs to the Gouritz Cluster Biosphere reserve (not critical).

Area not identified as a priority but retains most of the natural character and performs a range of biodiversity and ecological infrastructure functions. Although not prioritized, is still an important part of the natural ecosystem.

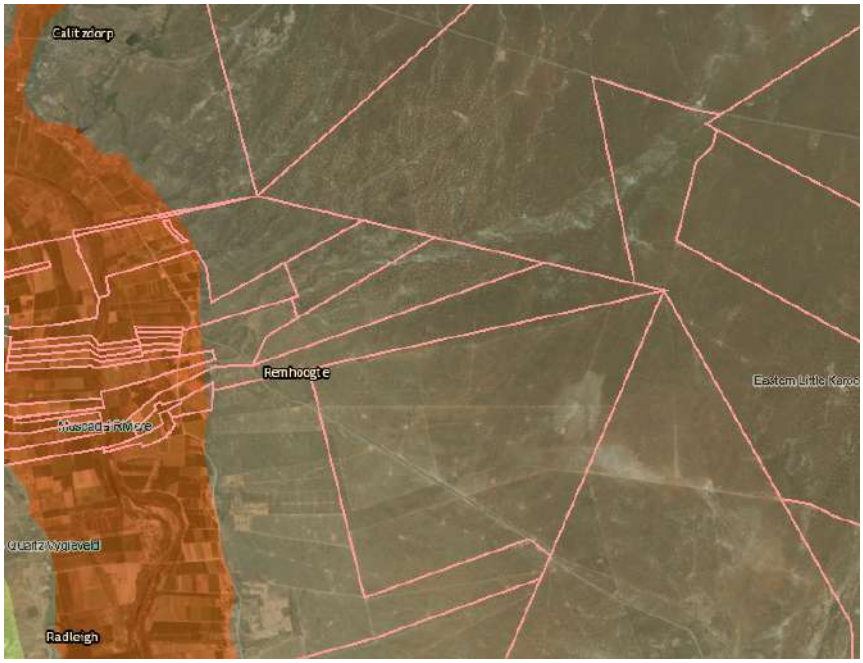

Figure 47: Map of Fauna and Flora: Jagtberg RE/33

Maintenance activities such as vegetation clearing as well as the amount of disturbance created during construction will leave the site vulnerable to degradation through alien plant invasion and soil erosion. Limited potential ecological impacts resulting from the construction and operation of the solar farm and energy vault as the land is away from the Gamka / Nelsrivier. Erection of the solar plant and energy vaults will have a very low impact on possible protected species if any.

On the faunal impacts, the solar plant and energy vaults will not produce noise or pollution disturbance that are detrimental to fauna.

Only during the construction we can foresee that sensitive and shy fauna would move away from the area during the construction phase as a result of the noise and human activities. This impact is, however, transient and there are not likely to be any long-term consequences on terrestrial fauna during the operational phase.

POTENTIAL IMPACTS ON HERITAGE RESOURCES

An Integrated Heritage Impact has yet to be performed by a specialist.

Cape Farm Mapper software describes the environment of the potential sites as an arid, gently sloping plain. The land is very sparsely vegetated. No structures or ruins were noted.

No basic historic background identified. No significant historic or other heritage-related themes found so far.

ASSESSMENT OF IMPACTS ON AGRICULTURAL RESOURCES

VEGETATION

The potential land is situated in the Calitzdorp area marked by Low Shrub land type of grass. Tree density is less than 5%. The Normalized Difference Vegetation Index (NDVI) is low. Grazing capacity is low.

The agricultural land is basically non arable with moderate potential grazing land.

CLIMATE

This is an arid zone with few perennial rivers. Summers are hot, while winters may cool down to -5°C. Frost occurs from late April through to October, thus rendering is a very short growing season for frost–sensitive crops. Summer rainfall peaks in March, ranging between 0-200mm in this specific area. Unpredictable drought is a feature of the entire zone.

SOILS

Soils associated with arid landscapes and mineral composition presence in this area, are Red-yellow apedal, freely drained soils.

Geology: Manly calcrete and hardpan / Uitenhage group.

Soils with limited pedological development i.e soils with minimal development, usually shallow on hard or weathering rock, with or without intermittent diverse soils. Lime generally present in part or most of the landscape.

LAND CAPABILITY AND SUITABILITY FOR AGRICULTURE

The potential agricultural capability based on the natural resources identified shows that the site is largely unsuitable for cultivation due to the low annual rainfall.

POTENTIAL IMPACTS ON AGRICULTURAL RESOURCES

Not suitable land for agriculture due to roughness of the soil and low rain waterfall (Mean Annual rainfall: 220mm) and high wind velocity.

The proposed PV Power plants, will have limited impacts on agriculture on the site.

WATER AND WETLANDS

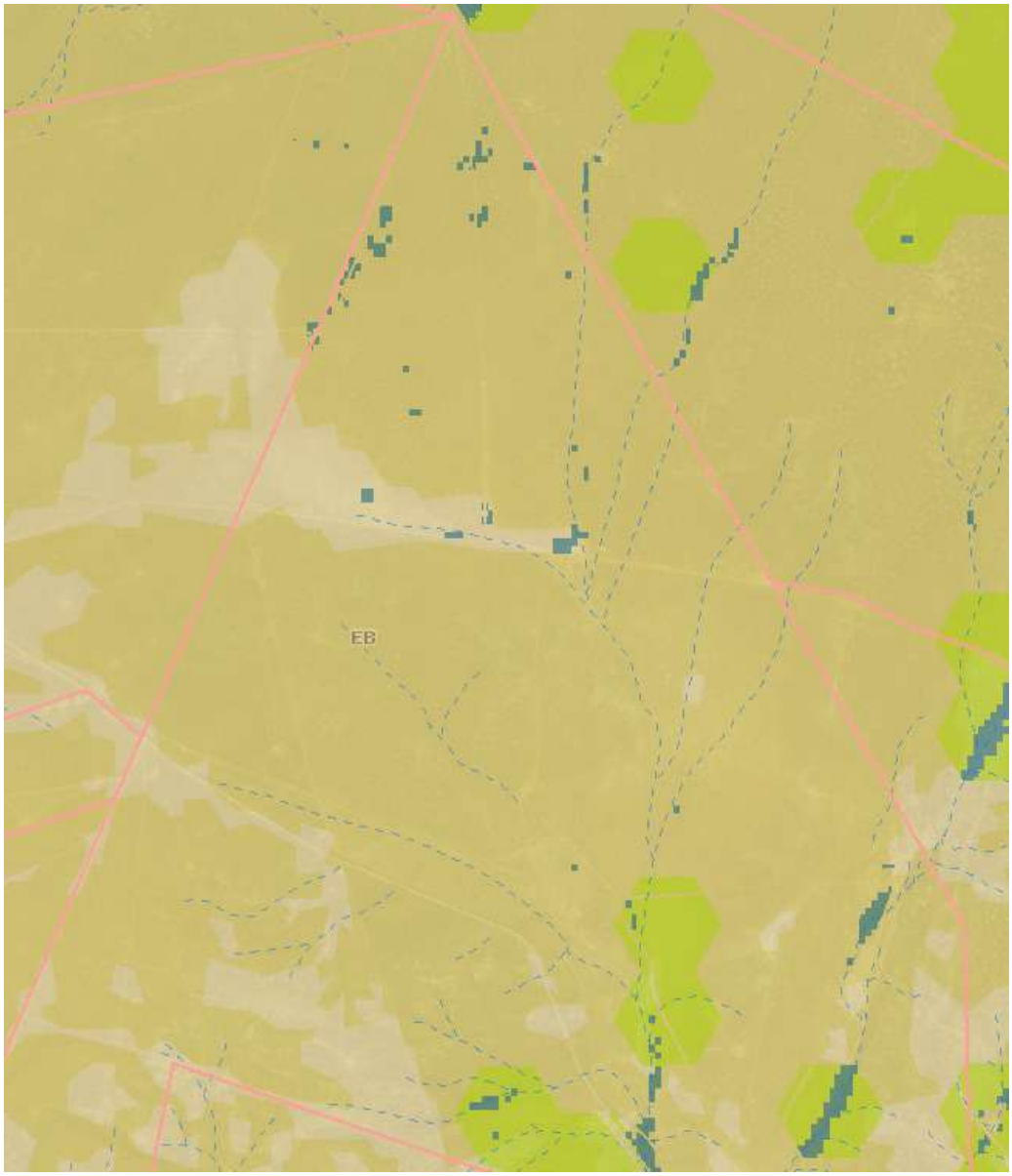

Figure 48: Map of Rivers: Jagtberg RE/33

Department of Water Affairs (DWA) rivers as well as National Geo Spatial Information (NGI) rivers shown on Cape Farm Mapper software. Exclusion zone will be considered.

Rivers (NGI) : Non-perenial rivers

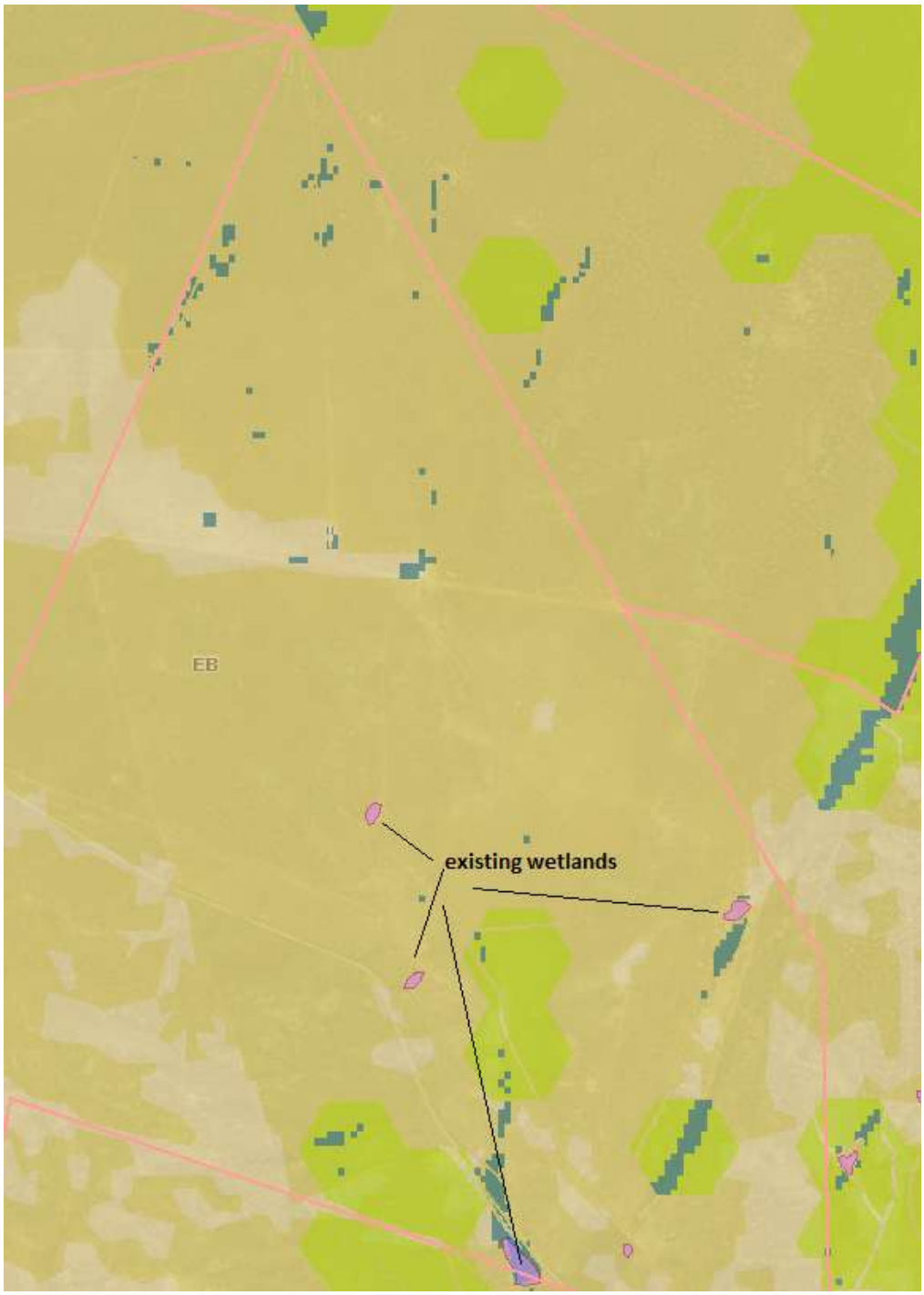

Figure 49: Map of Wetlands: Jagtberg RE/33

Wet lands identified at the south portion of the potential land but far from the construction zone. The mitigation plan will be to create an exclusion zone between them and the solar field. Wetlands: Cat. 1 ESA Aquatic: requires a water use license assessment / presence of 3 artificial wetlands (NFEPA)

ASSESSMENT OF IMPACTS ON VISUAL RESOURCES

KEY LANDMARKS

Based on the 9.8 km approx zone between Calitzdorp and the Jagtberg site the following landmarks have been identified in defining the surrounding areas characteristic landscape:

- Gamka River (at Calitzdorp);
- R62 north of the land;
- Transnet fret/passage line (not electrified) in the south of the land.

No degradation of scenic resources is foreseen during the construction and the operation of the Solar vaults.

CONCLUSION SITE 2 – JAGTBERG RE/33

A Draft Basic Assessment Report is sufficient to confirm that the potential lands identified so far are acceptable to erect a solar power plant and two energy vaults including the grid connection.

As Solar specialists, Biorex confirm that the reserved potential site is the JAGTBERG RE33 due to the long distance to the existing substation REITFONTEIN 16/28.

Aside from potential negative impacts, it is submitted that the proposed Energy Vault with its Grid Connection has positive impacts, in that it aligns with national, regional and local strategies to support alternative / renewable energy projects.

These include the distribution of much-needed 'clean' electricity into the national grid, provision of local electrical infrastructure for use in long-term, and the provision of employment opportunities during the construction and operation phases for members of local communities.

A proper and detailed EIA will include the risk mitigation to reduce potential negative impacts to an acceptable level.

8.5 Social Aspects

The upgrading / construction of a solar photovoltaic plant at Kannaland Local Municipality will have an overall positive impact on the local community. During the construction phase of the project some localised economic stimulation may be observed through short term job creation.

Some negative impacts on the local community can also be encountered during the construction phases of the solar photovoltaic plant. The area earmarked for development may impact on agricultural grazing and cultivated lands and skilled construction labour needs to be imported.

Visual Impact

Visual impact and "sense of place" is primarily a subjective concern. The aesthetic amenity must be considered in any land use change, especially in the more rural areas or where landscape management is of prime concern. The visual impact is a function of the visual landscape, receptors and the magnitude of change (IEMA United Kingdom).

The local residents are considered to be the primary receptors in this area, living and working in the rural environment. Secondary receptors include the users of the roads which bypass the proposed sites, any change in land use or construction activities may be noticeable from the road.

Noise

The proposed solar photovoltaic plant development area is situated within an area with very little noise emanating from the rural community. During the construction phase an increase in noise levels will occur due to an increase in vehicles moving in and out of the area and machinery operating on the site to construct the solar photovoltaic plant. This increase in noise levels will be temporary, lasting only as long as the construction phase.

Solid Waste

During the construction phase solid waste will be generated which will need to be disposed of. Waste will be in the form of building rubble, plastics and paper used in packaging and some organic waste. The cost factor for the removal of this waste from such a rural area is of

concern. The following measures can be implemented to reduce the amount of waste that need to be carted away:

- Sorting of waste into organic and inorganic materials. Organic waste can be buried or used as compost material;
- Recyclable waste must be reclaimed and can be a temporary source of income to the local residents;
- Plastics and building rubble must be removed from site and disposed of at a registered landfill site; and
- Although no hazardous waste is expected, any such waste must be removed from site to a registered landfill site that can accept hazardous material.

8.6 Legislative Requirements

During the review of the National Environmental Management Act (NEMA), Act 107 of 1998 and associated Environmental Impact Assessment (EIA) Regulations of 04 December 2014 as amended on 07 April 2017, Regulation R325, R326 and R327 certain listed activities could be triggered by this solar photovoltaic plant at the Kannaland Local Municipality.

Renewable Resource Electricity Generation

Regulation 325: No 01 (Requires Environmental Impact Assessment)

The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs -

(a) within an urban area; or

(b) on existing infrastructure.

Spatial Area

Regulation R327: No 28 (Requires Basic Assessment)

Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:

(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or

(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;

excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.

Storm Water

No mention is made for the construction of any storm water canals or pipes as part of the project development. If storm water management with associated infrastructure is planned the following regulations will come into effect.

Regulation R327: No 9 (Basic Assessment)

The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water-

- *(i) with an internal diameter of 0,36 metres or more; or*
- *(ii) with a peak throughput of 120 litres per second or more; excluding where-*
  - *(a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or*
  - *(b) where such development will occur within an urban area.*

If at all possible, any storm water infrastructure should be limited to the road reserve and / or below the internal diameter threshold of 0.36m.

Sewage Disposal

If the recommendations for the project are to install VIP latrines, no sewage will be treated, thus no authorisation is required. If the recommendations for the project are to install waterborne sewage systems and a sewage treatment facility it may trigger the following listed activities:

Regulation 327: No 10 (Basic Assessment)

The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes

- *(i)* with an internal diameter of 0,36 meters or more; or
- *(ii)* with a peak throughput of 120 litres per second or more; excluding where-
  - *(a)* such infrastructure is for bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or
  - *(b) where such development will occur within an urban area.*

Regulation 327: No 25 (Basic Assessment)

The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2000 cubic metres but less than 15000 cubic metres

Regulation 325: No 25 (Environmental Impact Assessment)

The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 15000 cubic metres or more

Roads

If the construction of roads is part of the proposed development it may trigger the following listed activities:

Regulation R327: No 24 (Requires Basic Assessment)

The development of a road-

(i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or

(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters;

But excluding a road-

(a) which is identified and included in activity 27 in Listing Notice 2 of 2014; or

(b) where the entire road falls within an urban area or

(c) which is 1 kilometer or shorter.

Vegetation

If during any stage the development requires the removal of large portions of indigenous vegetation the following listed activities will be triggered.

Regulation R327: No 27 (Requires Basic Assessment)

The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-

(i) the undertaking of a linear activity; or

(ii) maintenance purposes undertaken in accordance with a maintenance management plan.

Regulation 325: No 15 (Environmental Impact Assessment)
The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-

(i) the undertaking of a linear activity; or
(ii) maintenance purposes undertaken in accordance with a maintenance management plan.

Bulk Services

No mention is made regarding the provision of bulk services such as the provision of water and electricity for the development. If bulk services are to be provided, then the following activities may be triggered:

Regulation R327: No 9 (Basic Assessment)
The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water-

(i) with an internal diameter of 0,36 meters or more; or
(ii) with a peak throughput of 120 litres per second or more; excluding where-
  (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway reserve; or
  (b) where such development will occur within an urban area.

Regulation 327: No 10 (Basic Assessment)
The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes

(i) with an internal diameter of 0,36 meters or more; or
with a peak throughput of 120 litres per second or more;

excluding where-

  (a) such infrastructure is for bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway reserve; or
  (b) where such development will occur within an urban area.

Regulation 327: No 11 (Basic Assessment)

The development of facilities or infrastructure for the transmission and distribution of electricity-

(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or

(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.

excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —

(a) temporarily required to allow for maintenance of existing infrastructure;

(b) 2 kilometers or shorter in length;

(c) within an existing transmission line servitude; and

(d) will be removed within 18 months of the commencement of development.

Regulation 327: No 47 (Basic Assessment)

The expansion of facilities or infrastructure for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.

Regulation 325: No 9 (Environmental Impact Assessment)

The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —

(a) temporarily required to allow for maintenance of existing infrastructure;

(b) 2 kilometres or shorter in length;

(c) within an existing transmission line servitude; and

(d) will be removed within 18 months of the commencement of development.

Water Use Licensing

The National Water Act (NWA) guides the management of water in South Africa as a common resource. The Act aims to regulate the use of water and activities which may impact on water resources through the categorisation of 'listed water uses' encompassing water extraction, flow attenuation within catchments as well as the potential contamination of water resources, where the Department of Water Affairs (DWA) is the administering body in this

regard. Should the proposed activities associated with the proposed project impact on water resources e.g. cross through rivers, the applicant would be responsible to obtain a WUL from the DWA.

Section 21 of the NWA defines various water uses, while Section 22 requires that a person may only use water if licensed in terms of the NWA. The use of water does not necessarily mean the consumptive use thereof, but covers any aspects that have or could have an impact on a watercourse. The water uses associated with the construction and operation of the proposed solar photovoltaic plant may triggers the following water uses:

- Section 21 (c) Impeding or diverting the flow of water in a watercourse
- Section 21(i): Altering the bed, banks, course or characteristics of a watercourse

Cultural Heritage

The National Heritage Resources Act protects South Africa's unique and non-renewable archaeological and paleontological heritage sites that may not be disturbed at all without a permit from the relevant heritage resources authority. Categories of heritage resources recognised as part of the National Estate in Section 3 of the Heritage Resources Act, and which therefore fall under its protection, include:

- geological sites of scientific or cultural importance;
- objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects and material, meteorites and rare geological specimens;
- objects with the potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage.
-

No archaeological or paleontological significant records were found during the desktop study on or near the proposed development areas.

8.7 Environmental Management

It is recommended that an Environmental Management Plan (EMP) be developed to control the construction phase activities and impacts. The EMP is a detailed plan of action to manage the implementation of specific measures to enhance positive impacts and minimise potential negative impacts during the construction phase of the proposed development.

The contractor appointed do to the construction of the houses must enter into a contractual agreement with the applicant to conform to all conditions set in the EMP. The contractor must also handle all notifications regarding any Environmental Authorisations, departmental communications, compliance reports and liaison with other government departments. An Environmental Control Officer (ECO) must be appointed to oversee compliance by the contractor to the EMP and / or any Environmental Authorisations.

8.8 Conclusion

Environmental issues were identified to be considered during the design and effectually construction phases of the Kannaland Local Municipality solar photovoltaic plant. The following environmental management matters will be investigated further pending the design outcomes:

- Application to the Western Cape Department of Environmental Authorisation(s). This will be confirmed once project specifications were available;
- If watercourses were to be crossed or impacted by the planned development an Integrated Water Use Licensing Report would have to be compiled for the relevant water uses triggered and authorisation obtained from the Department of Water Affairs;
- Application may need to be made to the Department of Mineral Resources for Mining Permit(s). This will be confirmed once project specifications were available;
- An Environmental Management Plan (EMP) will be developed for the construction phase of the development to mitigate potential environmental impacts;
- If watercourses were to be crossed or impacted by the planned development specific construction method statements will be compiled for working safely and sustainable in a watercourse;
- A Storm Water Management Plan (SWMP) will be developed for the project; and
- A Rehabilitation plan for the project will be be compiled.

9 SPATIAL PLANNING & INFORMATION SYSTEM

9.1 The Suggested Approach[16]

A spatial planning and information system was considered for the Kannaland Local Municipality Energy Vault site. The approach serves as a case study for any other selected Energy Vault Sites. The system and approach of the Kannaland Local Municipality will be prepared for other Energy Vault sites during the next phases of the implementation and roll-out of the InovaSure Energy Vault program in South Africa with funding that may be provided by institutions such as the NDB under the auspices of the DBSA.

A report was submitted as a supplementary proposal by PULA STRATEGIC RESOURCE MANAGEMENT and SCION as supplementary planning, management and integration tasks for a Real Time Energy Management System (RMEMS).

The intention was to provide support for the planning and management process with an Integrated Spatial Information & Management System, with associated land use zoning and operational dashboards to effective management by the identified SPVs and to support good governance by the Local Municipality.

The report was prepared with proposed conceptual plans, costs and projections that were based on requirements known at the time of compilation and with making use of generic costs and principles to propose the Information system and tools required for effective planning, construction, commissioning, operation and maintenance of the multi-faceted energy project. The suggested web-based spatial information system (powered by P-Systems) offers compatible data linking between the separate energy generating SPVs, the battery vault, a centralized control room, external stakeholders, while also offering a spatial interface to residential, industrial and commercial users being served with electric power,

[16] Report: "Kannaland Local RMEMS - Spatial Planning & Information System (Pula proposal)", dated November 2018

broadband and associated serves through a smart meter system and user-friendly mobile and web-based customer interface.

The report addressed planning and management elements which may in full or in part be required for the successful project implementation and post-construction operations based on functional needs and legislative requirements which may have to be refined, expanded or reduced during final scoping and inception of the project:

- Spatial Planning:
  - Integration of RMEMS into SDF
  - Updating of other development plans *(optional)*
  - Land use zoning for RMEMS projects
  - Integrated Land Use Management & e-lodgement System *(optional)*
- Integrated Spatial Planning and Management System for the RMEMS.

The intention was for professionally registered town planners, information system specialists and development engineers to undertake the identified tasks in a cost-effective and professional manner

9.2 Spatial Planning Needs and Requirements

Planning Application Requirements

A number of Land Use Applications are required for the development of the proposed Solar Power Stations, Energy Vault and transmission lines of a site, such as the Kannaland Local Municipality project and similar future projects.

The proposed approach made provision for the costing of the proposed land use change that would be processed through the Spatial Planning and Land Use Management Act (SPLUMA, Act 16 of 2013). Detailed actions per application, report and plan type would be discussed in more detail under the PROJECT COSTING and TIME FRAMES section.

In addition to the submission of the application the following amendments would be required to allow for the approval of the application:

- Amendment of the existing Spatial Development Framework (SDF) to accomodate the proposed land uses (and ancillary uses);

- Development of a Transportation and Infrastructure Services Plan(s) to accomodate and support the proposed development (high impact development);
- Review and or Development of a Sustainable Human Settlements Plan to plan and accomodate new housing needs that would be created through the respective projects that could improve the overall housing situation of the Municipality;
- Detailed land use survey to obtain current land uses and this could include the capturing of existing metering systems that is ought to be linked to the Smart Metering and electronic management system. This would allow for sustainable Monitoring and Evaluation of electricity, water and broadband services in the Municipality; and
- Optional addition: to provide unique electronic lodgement and land use management system to the municipality to facilitate, manage and monitor all land use applications. This solution called E-Lodgement is the first fully integrated SPLUMA compliant platform and will drastically improve land use management, economic development and external investment in the Municipality. This solution was successfully implemented across all municipalities in the Free State and Northern Cape and was recently also endorsed by the Mpumalanga Province. Implementation in the Kannaland Local Municipality (KLM) will be an ideal pilot and simultaneously benefit the fast-tracking of the land use planning (SDF), land use rezoning (e-lodgement) and property management of the Kannaland Local Energy Vaut project.

Assessment of the Spatial development Framework

The Kannaland Local SDF and identified key projects and initiatives identified in the SDF were briefly assessed. These will further be investigated to propose improvements to the SDF resulting from the Kannaland Local Energy Vault project. The framework will also be reviewed for application at other future InovaSure Energy Vault Sites.

Linkages were identified and would be further investigated by the team to review and update the SDF of the Kannaland Local Municipality (the KLM):

LINKAGES FOR REVIEW	SOLUTIONS
Expanding the involvement in and benefit from farming activities in the KLM • SDS 1-1: A project to ensure optimisation of the possible Agri-park status afforded to the KLM. • SDS 1-2: A programme to establish and strengthen collaboration, • support and mentoring between established and emerging farmers. • SDS 1-3: A well-planned, well-supported and well-executed land reform programme. • SDS 1-4: A holistic financial, input and market support programme in support of emerging farmers.	• Improving access towards water and electricity and effective management of use. • Improved land reform program through the land use survey ought to be done that would capture all land uses, other questions could be included in the capturing excersise to improve the municipal data base • Electronic management of the land reform program though realtime reporting and asset management solutions provided by PULA.
Ensuring that the sensitive ecological systems and the Strategic Water Source Areas in the municipal area are not compromised • SDS 2-1: A programme for ensuring enforcement and implementation of the national, provincial and district environmental management laws, regulations and frameworks. • SDS 2-2: A detailed plan and programme for future settlement design, establishment upgrading, maintenance and expansion in the KLM. • SDS 2-3: A comprehensive master plan and programme for providing municipal services, notably refuse removal, sewerage and sewerage treatment services to all the major settlements in the KLM.	• Development of Infrastructure Master Plans which includes Roads, Stormwater, Sanitation, Water and Electricity • Development of a Water Services Development Plan (WSDP) • Electronic integration of all plans to improve monitoring and evaluation of solutions through our real-time spatial management system.

Enhancing, strengthening and maintaining the economic vitality, attractiveness and quality of life of the main towns in the KLM • SDS 3-1: A land-use management system for the KLM. • SDS 3-2: An urban design and local economic development plan for each of the main towns in the KLM. • SDS 3-3: A beautification and municipal service provision programme for enhancing and maintaining the physical appearance of the main towns in the KLM. • SDS 3-4: A safety and security programme for the main towns in the KLM	• Enhancing the Land Use scheme with the PULA Electronic land use management system that is directly linked to the E-Lodgement solution (this solution integrates and land use management processess) • Development of local Precinct development plans for all the major urban areas, the precinct development plans could also be electronically alligned to improve horizontal and vertical allignment of all planning documents • Development of urban regeneration plans to aesthtically improve all central business development areas (this could include business plans for funding towards the IUDF and other Urban regneration grants)
Improving and maintaining the road and rail connectivity on the KLM on the local, provincial, national and international level • SDS 4-1: A master plan for improving and managing the main road-interface with the towns within Kannaland. • SDS 4-2: A roads-building, maintenance and improvement programme for the KLM. • SDS 4-3: A programme of land use management enforcement along the main road and the railway line. • SDS 4-4: A project to explore and propose way of enhancing rural access and connectivity in the KLM.	• Development of a Transport Master Plan to enhance connectivity in the Municipality • Land Use Survey can make provision for legal and illegal land uses that would be electronically captured
Developing and expanding manufacturing, agro-processing and beneficiation in the KLM beneficiation in the KLM • SDS 5-1: A study into the opportunities for manufacturing, agro processing and beneficiation in the KLM. • SDS 5-2: A project aimed at identifying land,	• Review of the LED Strategy to possibly allign the strategy towards the Agripark model as well as other public/private iniatives that could support the betterment of manufacturing and

buildings and existing infrastructure that could be used in manufacturing, agro processing and beneficiation in the KLM. • SDS 5-3: A programme of enhancement of municipal infrastructure and service provision to enhance manufacturing, agro processing and beneficiation in the KLM. • SDS 5-4: A programme of support to large, medium and small-scale investors and entrepreneurs in the manufacturing, agro processing and beneficiation sector.	agro-processing sectors • Development of an electronically enabled land audit to identify land ownership, government and municipal owned land can be used for this betterment. Each land parcel could be linked towards potential usage and development potential that could be the most sustianable.
Developing and enhancing the ecological, cultural and historical tourism opportunities in the KLM • SDS 6-1: A study into the tourist attractions and tourism development opportunities in the KLM. • SDS 6-2: An upgrading, beautification and sign-boarding programme for the main tourist attractions in the KLM. • SDS 6-3: A tourism safety and security programme for the KLM. • SDS 6-4: A study into the potential for the development of luxury residential estates in the KLM.	• Review and or development of a tourism master plan • Development of a Municipal Investment Framework to attract development in all sectors
Developing a viable, affordable, efficient and effective settlement model for the villages in "Non-Urban Kannaland Loca Municipalityl" • SDS 7-1: A programme that will establish a multi-stakeholder forum to ensure deliberation on the servicing of the villages in "Non- Urban Kannaland Local Municipality". • SDS 7-2: A study into the challenges, opportunities, costs and benefits of various options for attending to the connectivity and municipal service needs of the inhabitants of the villages in "Non-Urban Kannaland Local Municipality". • SDS 7-3: A programme for the implementation of the decisions taken by the KLM after the study and the conclusion of the engagements	• Development of a Rural Development Plan for the municipality to specfically target sustaionable development in all sectors, mores pecfically housing, industires and economic development

by the multi-stakeholder forum.	
Strengthening and enhancing skills development, training and a culture of inquiry, learning and research in the KLM • SDS 8-1: A study into the introduction of tertiary education and research centres/facilities in the KLM. • SDS 8-2: A study to identify sites and existing structures/buildings that could be used as teaching, skills development and research facilities and student accommodation. • SDS 8-3: A multi-stakeholder programme to introduce and fund skills development, education and research facilities to the KLM.	• Compiling a detailed skills audit of the Municipal workforce and to identify skills gaps and oppertunities for teriary insititutions within the local and district area • Developing skills programs to meet in the demands of the local energy projects to be implemented (Solar Energy and storage) – improving the skills set of the local people could allow entry to the project needs which could improve local benficiation / radical economic transformation.

Table 13: Proposed Linkages and Solutions

Integration of the Proposed Projects into the SDF

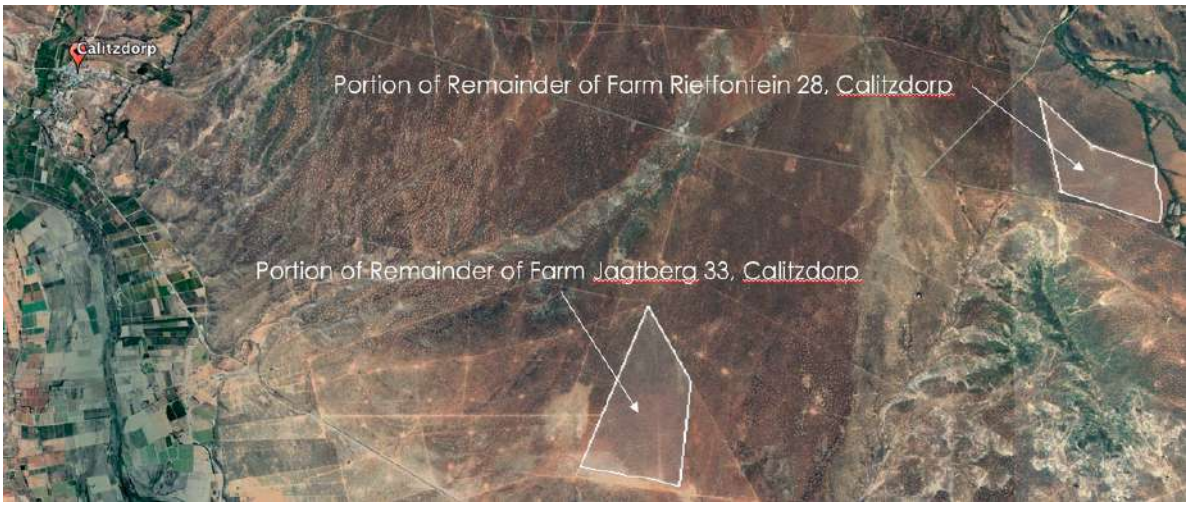

Figure 50: Location of Proposed Projects

The map above provides an overview of the location of the proposed projects within the existing power grid, local water resources and other spatial boundaries. Clearly the project is within proximity of major road and electrical service connections and hence suited for integration.

The following map presents the area of the proposed projects in terms of the draft Spatial Development Framework (the SDF).

Figure 51: Area location for Projects in relation to the SDF

Proposed Planning Needs: Identified Projects

- A land use management system for Kannaland Local Local Municipality:
  - A consolidated land use - transportation and engineering and social services plan
  - A human settlements plan attending to:
    - Unmanaged settlement on proclaimed and planned townships
    - Informal Settlement upgrading and relocating
    - Traditional and new settlements
    - Rural settlements
    - Housing projects
  - The integration of the draft SDF and Land Use Scheme into an electronic LUMS system linked to other municipal systems such as finance, services, rates and taxes, metering, other
  - Urban restructuring within all development nodes supported by :
    - Local Precinct Development Plans
    - Local Human Settlement Plans
    - Local Economic Development Plans
    - Urban Design Frameworks
    - Budgets
    - A development maintenance programme
- A Rural Development Plan involving:
  - A Sustainability model for rural development
  - Projects supporting the Agripark model and agri villages
  - A land reform programme
  - A settlement model for rural settlements in collaboration with Mondi
  - Connectivity enhancement plans
- An economic development plan attending to:
  - Manufacturing
  - Agro-processing and beneficiation
  - Tourism
- Other Projects:
  - A comprehensive master plan and programme for providing all municipal services to all the major settlements in the KLM.
  - A transportation and roads infrastructure plan
  - A Safety and security plan
- A study into the introduction of tertiary education and research centres/facilities in the KLM

Land Use Applications for Energy Vault Projects

A priority action of the Energy Vault projects is the approval of re-zoning of land from agricultural to industrial use applicable for the respective power generation, energy vault and power transmission uses.

An application for Rezoning will typically involve the following:

- Application Fees
- Specialist Studies (EIA, Traffic, Civil etc.)
- Rezoning application
- Notifications
- Promulgations

A Unique LUM and e-Lodgement System

An integrated Land Use Management and e-Lodgement System is offered. This is a first comprehensive SPLUMA compliant system which has successfully been implemented in all LMs of the Free State and Northern Cape Provinces. The following diagram illustrates the functions which could be adopted in full or phased-in over time:

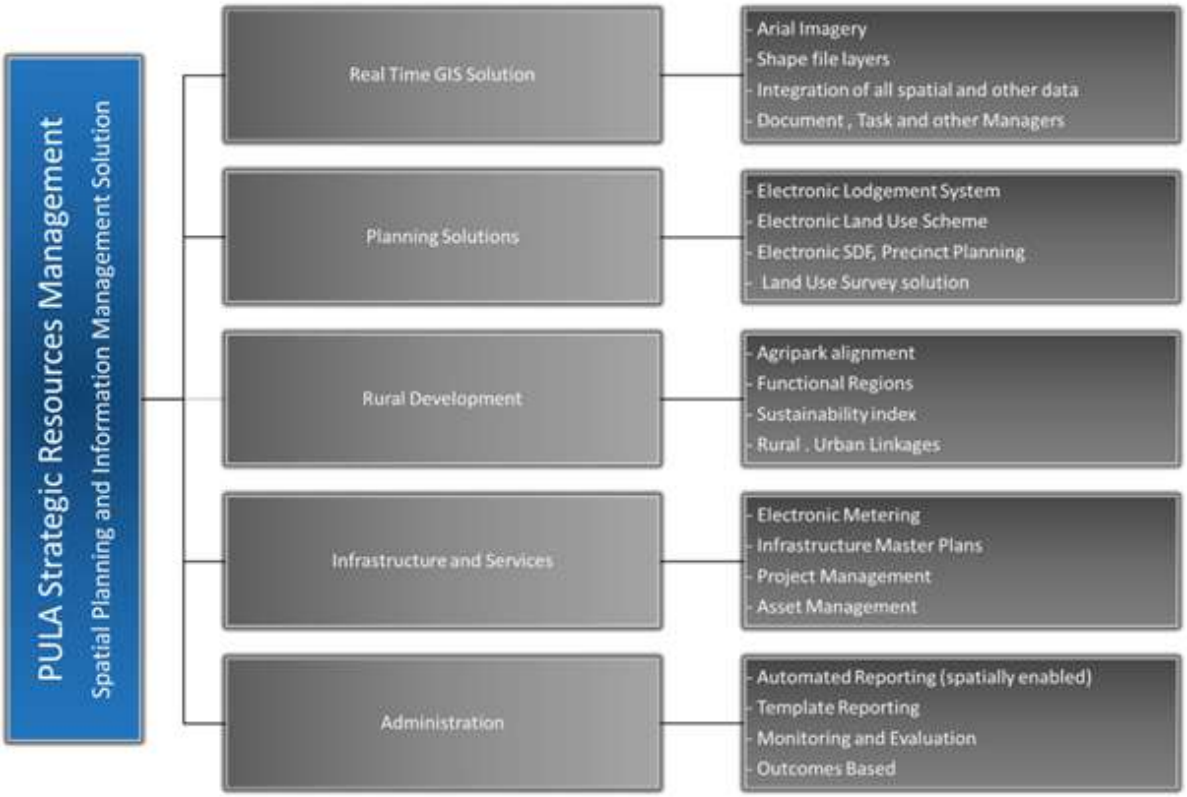

Figure 52: Land-use Management and e-Lodgement

The Mpumalanga Province has endorsed the e-lodgement system. The Kannaland Local Municipality would serve as an ideal pilot in the Western Cape Province and simultaneously benefit the land use zoning for the Kannaland Local Energy Vault project/s.

The next section lists the planning and land use rezoning actions which could be applicable to the InovaSure Energy Vault projects.

Essential Planning Tasks

The table below presents the essential (minimum) spatial planning tasks to be conducted in support of the Energy Vault projects. Optional additions are listed in the next section.

PRIORITY	PROJECT NAME	DESCRIPTION	COSTING (± R)	TIME FRAMES (±)
1	Review or Amendment of the Kannaland Local SDF	To review or amend the existing draft SDF to accomodate the proposed Energy and related projects as proposed. This includes: • Mapping changes • Policy development • Project amendments • IDP allignment	R 100 000.00	1 MONTH
2	Application for Land Use Rezoning	Applications for Rezoning of Land Use for the RMEMS projects. Thiss would include: • Application Fees • Specialist Studies (EIA, Traffic, Civil etc) • Rezoning applications • Notifications • Promulgations	R 550 000.00	6 to 12 MONTHS (subject to lodgement system in use)
3	Land Use Survey	Land Use Survey to include the capturing to gather essential information for the Smart Metering and Thin-client projects (includes about 10000 stands and 2000 farm portions): • Land Use (legal/illegal) • Metering and position • Capacity building in using the P-Systems Offline App to capture and update recrods • Automated linking of data to GIS platform	R 500 000.00	2 MONTHS
		TOTAL 1 (Essential)	**R1 150 000.00**	

Table 14: Essential (minimum) Tasks

Recommended Integrated Land Use Management & e-Lodgement System

As indicated before, PULA offers a unique SPLUMA compliant Land Use Management and e-Lodgement System and proposes to implement this for the municipality to ensure timeous compliance to the new act. Other associated functions such as

PRIORITY	PROJECT NAME	DESCRIPTION	COSTING (± R)	TIME FRAMES (±)
4	GIS Solution	Establishment of a real-time GIS solution to be used as platform for all projects to follow. The solution provides a functional GIS package to facilitate all GIS responsibilities in the Municipality. It includes the following: • Capturing of existing as built plans (digitising) • Upload and cleaning of spatially enabled data • Capturing of critical non spatial data • Training and capacity building • Unlimited users • Reporting Templates	R 500 000.00	2 MONTHS
5	Electronic Lodgement System	Implementation of our successfull E-Lodgement System that would support all application procedures and administration in the Municipality. This includes: • Training • All role players being setup • Capturing of SDF, LUS and other planning documents	R 300 000.00	2 MONTHS
6	Electronical enabled Land Use Scheme	To capture the existing or draft LUS inot the E-Lodgement Environment and further adding value as follow: • Electronically enabled land use register- automated • Issuing of Zoning Certificates • Automated Land Use Mapping • Link to GIS for other data overlays	R 250 000.00	1 MONTH
		TOTAL 2 (Recommended)	**R 1 050 000.00**	

Table 13: Associated Functions

Optional Planning Tasks

PRIORITY	PROJECT NAME	DESCRIPTION	COSTING (± R)	TIME FRAMES (±)
7	Electrical Master Plan	To develop a detailed Electrical Master Plan to uderstand the existing infrastructure challanges, upgrades, rufurbishments and futre needs linked to the SDF proposals. This plan would also be directly linked to the Energy projects to determine and monitor services provision. This plan would also increase the existing revenue base and improve the issuing of municipal account management.	R 900 000.00	6 MONTHS
8	Sustainable Human Settlements Development Plan	To review the existing human settlements plan to determine the future housing needs that needs the be serviced. This plan needs to guide the electrical and other serices master plans towards the future housing need expected by the municipality. It needs to provide detailed information on what, where, how, who and services needs.	R 450 000.00	6 MONTHS
9	Water and Sanitation Master Plan	To develop a detailed Water and Sanitation Master Plan to uderstand the existing infrastructure challanges, upgrades, rufurbishments and futre needs linked to the SDF proposals. This plan would also be directly linked to the Energy projects to determine and monitor services provision. This plan would also increase the existing revenue base and improve the issuing of municipal account management.	R 900 000.00	6 MONTHS
10	Water services development Plan (WSDP)		R 300 000.00	3 MONTHS
11	Land Audit	A detailed land Audit will provide detail on all Municipal and Government owned land whereby the land audit needs to present oppertunities for the best utilisation of the land in ownership of the before mentioned. Optimal use of public owned land could improve economic and other oppertunities in the Kannaland Local Local Municipality.	R 450 000.00	3 MONTHS
12	Transportation Plan		R 350 000.00	4 MONTHS

PRIORITY	PROJECT NAME	DESCRIPTION	COSTING (± R)	TIME FRAMES (±)
13	Roads and Stormwater Master Plan	To develop a detailed Roads and Stormwater Master Plan to uderstand the existing infrastructure challanges, upgrades, rufurbishments and futre needs linked to the SDF proposals. This plan would also be directly linked to the Energy projects to determine and monitor services provision. This plan would also increase the existing revenue base and improve the issuing of municipal account management.	R 800 000.00	6 MONTHS
14	Rural Development Plan	A Rural development linked to the Agripark model could improve development oppertunities and allignment in the Municipality. The plal would include the following: • Prioristation of projects and actions • Sustainability model (GIS enabled) to optiamlly utilise the land available • Identification of projects that are sustainable • Allignment of project needs towards service requirements to enable the proposed projects • Improving rural-urban linkages • Improved Intergovernmental relations	R 350 000.00	6 MONTHS
15	Precinct Development Plans	The development of Precinct development plans would provide more in depth planning proposals to improve the urban built up areas, especially in around the central business areas. The plan would provide structure towards the improvement of the business areas and would improve allignment towards the more rural areas. This would be required for the quantification of the service needs for future business expansion in the areas where high business activity are evident. Provision for future development would be required in the calculation of future services needs (Energy and water)	R 300 000.00	4 MONTHS
16	Municipal Investment Framework	A merketing strategy can be developed to attract investors towards the Municipality (especially with all of the above plans in place) that would target the following	R 600 000.00	6 MONTHS

PRIORITY	PROJECT NAME	DESCRIPTION	COSTING (± R)	TIME FRAMES (±)
		investment sectors: • Leisure Estates • Tourism • Industries • Manufacturing • Economic development • Agriculture and • Mining Potential in the Energy Sector would be realistic bearing in mind that the proposed projects could unlock further development oppertunties.		
17	Skills Development Audit	Certail skills would be required to effectivley develop the proposed energy projects. This would nessesitate certain skills requirements that could be developed locally.	R 350 000.00	4 MONTHS
18	Tourism Plan	Tourism development could further unclock sustainable job oppertunities in the municipality. The proposed energy projects could be seen as tourism attractions and should be used to attract visitors in the Province. The Kannaland Local Local Municipality has a reach history where cultural and other tourism oppertunities lie and wait to be explored.	R 350 000.00	4 MONTHS
		TOTAL 3 **(Optional; phase over time)**	**R 6 100 000.00**	

Table 16: Optional Planning Tasks

9.3 Integrated Spatial Information Management System

A Municipality such as the Kannaland Local Municipality requires an Integrated Spatial Planning and Management Information System to ensure that planning is integrated, construction is coordinated and operation is effectively controlled.

A suitable platform is proposed to setup such a system on the web where all stakeholders can participate, collaborate and share information on a spatial platform in real-time. It has successfully been used in large user-based projects across vast areas and institutional complexities.

This chapter presents conceptual tasks, processes, tools and infrastructure to setup and operate the total Kannaland Local Municipality InovaSure Energy Vault Project with spatial, mathematical and strategic dashboards. It is proposed that the system is set up at the start of the project in support of a coordinated construction phase where after it will continue as the operational management and control system for the envisaged 25 years or more.

The web-based spatial information system offers compatible data linking between the separate energy generating SPVs, the battery vault, a centralized control room, external stakeholders, while also offering a spatial interface to residential, industrial and commercial users being served with electric power, broadband and associated services through a smart meter system and user-friendly mobile and web-based customer interface.

The following setup tasks are envisaged and included in the provisional costing:

1. Integration design;
2. Setup of user interfaces;
3. Setup of essential process management tools;
4. Construction M&E;
5. Data connections (micro-wave & other);
6. Setup of data loggers & data streaming;
7. Equipping of central control room;
8. Training of all users;
9. Commissioning; and
10. Ongoing operations

Integration design

This task entails spatial layout plans to stream data from each SPV to the Central Control Room. It will also establish the specific technologies used by each SPV, the linking options and possible standardization.

Design will consider data types, data volumes and transmission frequency and establish a secure data transmission coding for integration into the central Integrated Spatial Information Platform.

The result is a detailed user requirement and functional spec to setup the system

Setup of user interfaces

This entails the following action:

- Setup a secure project environment
- Load spatial base data
- Setup all the attributes required by the SPV's
- Setup SPV specific topic views
- Setup SPV-specific and integrated management dashboards
- Setup standard reporting
- Setup user profiles with user rights and security protocol

At conclusion the user interfaces will be reviewed and refined by each SPV and stakeholder group.

Setup of essential process management tools

If required, specific management processes can be set up. Typical examples are:

- A standardized construction monitoring and reporting process, prompting each user to submit data of specific construction activities at specific times. Examples could be excavation inspections, formwork inspections concrete casting inspections, etc. This keeps a full record of all inspections approved or declined during a construction period, with essential overview of progress, quality control and fault-finding ability during commissioning. It is also an essential audit trail across roles and responsibilities and can save time and costs of litigations; and
- SPV specific operation or maintenance processes can also be setup, prompting O&M teams to undertake specific preventative maintenance and follow specific operational protocol.

Finally, it will be essential to implement a proper infrastructure asset management system where all equipment is recorded, valued, depreciated and managed along its life-cycle. The suggested approach and systems have successfully been used for infrastructure asset management at local, regional and national scale and is well suited for this function. It is proposed that all equipment be labelled with bar-codes to enable effective condition assessments and accountability of where each asset is located. The infrastructure can be viewed spatially, take users via an off-line App to the asset on the ground or trace an asset

from the floor back to the system using a bar-code scanner function on the cellphone or tablet in use.

Construction M&E

Cellphones and tablets have been successfully applied to monitor and quality ensure construction work via the proposed platform.

It is proposed that all construction work is supervised and inspected to ensure effective supervision and quality assurance is applied across all SPVs. Progress reporting can then feed back to the BoQs and assist in approval of payment certificates to contractors and inform financial management of expenditure.

The following actions form part of the construction M&E setup:

- Setup offline projects per SPV
- Setup inspection sheets (attributes)
- Purchase rugged devices (Tablets or cellphones) - 4 per SPV
- Setup & link devices
- Conduct daily data management and dashboard reporting
- Enable quality control by management
- Enable daily, weekly and monthly progress reporting with a spatial view and graphs

Data connections (micro-wave & other)

It is envisaged that a dedicated data connection must be established between the SPVs and the Central Control Room (with a cashing and backup server). From where it streams the Internet and gets processed at the cloud servers for general viewing and reporting.

Provisional costs show that a micro-wave connection could be cheaper than a dedicated fiber-optic line.

Additional tasks include:

- Setup & commissioning of micro-wave streaming
- Linking to the WiFi in the urban area
- Linking to the Smart-Meter technology
- Linking to the security system (e.g. video-streaming and alarms)

- Other related setup and integrational testing

Setup of data loggers & data streaming

It is unsure if the InovaSure Energy Vault SPVs will have specific data loggers for their generating technology. Where possible, data loggers should be standardized across the SPVs to enable effective maintenance in the long term. These tasks will look into:

- Best-suited data logger technology across SPV's
- Purchase of data loggers (currently not included in costing)
- Setup of data loggers
- Setup of emergency alarms
- Commissioning of data streaming via data loggers to Control Room

Equipping of central control room

It is envisaged that there will be a central control room in town, most likely situated in the Municipal premises, to give specialist controllers full access to the entire power generating and distribution network at a centralized location.

The following equipment has been provided in provisional costs:

- Secure server rack with cashing and backup servers
- 4 user PCs
- Printer and other office equipment
- Basic furniture

Training of all users

Users will require basic training to use and interface with the system. The following training sessions are planned:

- Administrator training (2 sessions)
- Management training to access dashboards and reporting (10 users)
- Construction team training (15 to 20 users)
- O&M team training (10 to 15 users)
-

User help desk and follow-up training is also provided in the annual hosting and licensing cost.

Commissioning

Final integrated commissioning will require dedicated time from the system experts and may be phased in (starting with one SPV, then the next, etc.) to ensure that everything is working and responding as required.

It is also envisaged that the system experts will remain in a mentoring role for at least 6 months where after the normal help desk and user support services will remain.

Ongoing operations

For the entire operational period (25 years plus), the system will be hosted, maintained and upgraded as required as part of an annual hosting and licensing fee. This will also make provision for a provisional sum (e.g. R150,000 per year) for additional customization and enhancements over and above the normal maintainance and upgrade of the existing system functionality. This also provides a user support help desk and refresher training.

st Estimates for Integrated Spatial Information & Control System

a similar project at a paralle; project in Mkhndo Local Municipality, the following table provides a costing base-line for above bout R3.6 million up to operational phase, whereafter an annual license, hosting and maintenance fee of about R700 000 to ed. Note that Hydropower has been included which may be removed if not applicable and / or replaced for similar Energy Vault Projects with other for nergy generation

Mkhondo RMEMS: Integrated Spatial Planning, Management & Control System — Provisional Scope and Costing

	Task Description	Note	Unit	Rate	Quantity	Hydropower	PV plant	Battery	Smart metering	Management	External (Eskom +)	Cost Estimate
						R 523 200	R 523 200	R 523 200	R 433 200	R2 364 000	R 176 800	
1	**Design, Setup & Implementation Phase**											
1.1	Integration design											R275 200
	location plan	fee	hr	R 1 000	8	R 8 000	R 8 000	R 8 000	R 8 000			
	SPV technology links	fee	hr	R 1 000	16	R 16 000	R 16 000	R 16 000	R 16 000			
	M&E technology integration	fee	hr	R 1 000	8	R 8 000	R 8 000	R 8 000	R 8 000			
	data type, volumes & frequency	fee	hr	R 800	16	R 12 800	R 12 800	R 12 800	R 12 800			
	customers & users	fee	hr	R 1 000	8	R 8 000	R 8 000	R 8 000	R 8 000	R 8 000	R 8 000	
	User requirement & functional spec	fee	hr	R 1 000	8	R 8 000	R 8 000	R 8 000	R 8 000	R 8 000	R 8 000	
1.2	User interfaces (topic views)											R820 800
	project setup	setup fee	hr	R 1 000	8	R 8 000	R 8 000	R 8 000	R 8 000	R 8 000		
	spatial setup & uploads	setup fee	hr	R 800	8	R 6 400	R 6 400	R 6 400	R 6 400	R 6 400		
	attribute setup	setup fee	hr	R 800	16	R 12 800	R 12 800	R 12 800	R 12 800	R 12 800		
	SPV view setup (topic views)	setup fee	hr	R 1 000	16	R 16 000	R 16 000	R 16 000	R 16 000	R 16 000		
	dashboard setup	setup fee	hr	R 1 000	32	R 32 000	R 32 000	R 32 000	R 32 000	R 32 000	R 32 000	
	report setup	setup fee	hr	R 1 000	40	R 40 000	R 40 000	R 40 000	R 40 000	R 40 000	R 40 000	
	user profiles	setup fee	hr	R 1 000	16	R 16 000	R 16 000	R 16 000	R 16 000	R 16 000	R 16 000	
	profile links & security settings	setup fee	hr	R 800	16	R 12 800	R 12 800	R 12 800	R 12 800	R 12 800	R 12 800	
1.3	Setup management processes											R152 000
	construction process	setup fee	hr	R 1 000	24					R 24 000		
	financial management process	setup fee	hr	R 1 000	24					R 24 000		
	operating process	setup fee	hr	R 1 000	32					R 32 000		
	maintenance process	setup fee	hr	R 1 000	40					R 40 000		
	asset management process	setup fee	hr	R 1 000	32					R 32 000		
1.4	Construction M&E											R489 600
	setup offline projects	setup fee	hr	R 800	4	R 3 200	R 3 200	R 3 200	R 3 200			
	setup M&E attributes	setup fee	hr	R 800	16	R 12 800	R 12 800	R 12 800	R 12 800			
	purchase rugged devices	capital	no.	R 7 500	4	R 30 000	R 30 000	R 30 000	R 30 000			
	setup & link of devices	setup fee	hr	R 800	8	R 6 400	R 6 400	R 6 400	R 6 400			
	data management	operating fee	mths	R 5 000	20					R 100 000		
	quality assurance	operating fee	mths	R 1 000	20					R 20 000		
	construction reporting	operating fee	mths	R 2 000	20	R 40 000	R 40 000	R 40 000	R 40 000			
1.5	Data connections											R746 000
	micro-wave data connection to SPVs	capital	sum	R 90 000	5					R 450 000		
	setup & commission micro-wave	setup fee	hr	R 1 000	80					R 80 000		
	link to Mkhondo WiFi network	setup fee	hr	R 1 000	40				R 40 000	R 40 000		
	link to smart meters (ELSTER, EDMI)	setup fee	hr	R 1 000	40				R 40 000			
	link to broadband data use meter	setup fee	hr	R 1 000	32				R 32 000			
	link to security system	setup fee	hr	R 1 000	16	R 16 000	R 16 000	R 16 000		R 16 000		
1.6	Data loggers											R288 000
	R&D data loggers & integrated M&E	setup fee	hr	R 1 000	32	R 32 000	R 32 000	R 32 000				
	setup of data loggers	setup fee	hr	R 1 000	40	R 40 000	R 40 000	R 40 000				
	setup of alarms & emergency streaming	setup fee	hr	R 1 000	8	R 8 000	R 8 000	R 8 000				
	setup of data streaming	setup fee	hr	R 1 000	16	R 16 000	R 16 000	R 16 000				
1.7	Control room (Mkhondo)											R280 000
	cashing servers & rack (security, backup)	capital	sum	R 150 000	1					R 150 000		
	user PC's	capital	no	R 15 000	4					R 60 000		
	printers & office equipment	capital	sum	R 30 000	1					R 30 000		
	furniture	capital	sum	R 40 000	1					R 40 000		
1.8	Training of users											R390 000
	train admin teams	fee	users	R 15 000	2					R 30 000	R 30 000	
	train management teams	fee	users	R 3 000	10					R 30 000	R 30 000	
	train construction teams	fee	users	R 3 000	10	R 30 000	R 30 000	R 30 000				
	train operational teams	fee	users	R 3 000	10	R 30 000	R 30 000	R 30 000				
	train maintenance teams	fee	users	R 3 000	10	R 30 000	R 30 000	R 30 000				
1.9	Commissioning											R256 000
	SPV commissioning	fee	hr	R 1 000	24	R 24 000	R 24 000	R 24 000	R 24 000			
	integration commissioning	fee	hr	R 1 000	40					R 40 000		
	Dedicated start-up mentoring	fee	mths	R 20 000	6					R 120 000		
	Total Setup & Commissioning Cost											R3 697 600

9.5 Conclusion

This proposed approach to developing the Spatial Planning, Land Use Registration and Integrated Spatial Information System for an RMEMS Energy Vault Project such as the Kannaland Local Municipality Project serves as a scoping of the required spatial planning and information system tasks and tools to oversee, manage and quality control the multi-faceted power generation, storage and distribution project.

The provisional costs are summarized below:

Essential Action (required for RMEMS)		
1	Key Spatial Planning & Land Use Application Tasks	R1 150 000
2	Integrated Spatial Planning, Management & Control System	R3 697 600
		R4 847 600
Optional Action (can be phased over time)		
3	Recommended use of e-Lodgement tools for SPLUMA compliance	R1 050 000
4	Additional spatial, town and engineering planning (phased over time	R6 100 000

Table 15: Provisional Costs

The costs can be split over the SPVs. The monthly dashboard management amount is estimated at R850 000 per annum / 12months = R70 000 per month.

The costs serve as provisional budgets and may be revised if some of the functionalities are not required. It is recommended that the essential components are provided for as far as possible. The system functionality can however be reduced if certain parts are found to be overlapping with SPV budgets or are agreed to be not needed.

10 THE ENERGY VAULTS (RMEMS) and SPECIAL ECONOMIC ZONES (SEZs)

10.1 Introduction to the SEZ Programme

During the business planning process for one of the latest developments[17] to have been designated as a Special Economic Zone, **the dti** team reported on issues pertaining to the development of SEZs.

The South African Government seeks to transform the South African economy into a globally competitive industrial economy, built on the full potential of all citizens and regions. The National Development Plan (NDP) outlines a long-term development path towards a prosperous and successful economy characterised by high levels of economic growth, employment generation and an equitable society. Both the New Growth Path (NGP) and the Industrial Policy Action Plan (IPAP) outline the Government's industrial agenda and the identification of critical jobs drivers, prioritised industrial sectors and a range of interventions required to accelerate economic growth, create jobs and fight poverty and under-development.

One of the key tools for accelerating the country's industrial development agenda is the Special Economic Zones Programme (SEZP) in respect of which a new policy as well the SEZ Bill was processed and written into law by February 2016. Special Economic Zones were introduced as a tool that can help to:

- Promote industrial agglomeration;
- Build the required industrial infrastructure;
- Promote coordinated planning among key government agencies and the private sector; and
- Use the zones to guide the deployment of other necessary development tools.

A key objective of the SEZs is the acceleration of industrialization in general, and the promotion and development of targeted industrial capabilities in order to promote economic growth and creation of sustainable enterprise and sustainable jobs in support of the IPAP, NGP, NDP, NIP and regional development strategies.

[17] The "MAP SEZ Technical Feasibility Report..", dated September 2014

The IPAP targets the enhancement of local industrial capability and support mechanisms from government involvement through to financial support. Economic Sectors and Employment Clusters targeted by the IPAP include the following transport and agriculture related sub-sectors:

- Automotive;
- Metal Fabrication, Capital & Rail Transport Equipment;
- Agro processing;
- Forestry, paper, pulp and Furniture;
- Biofuels; and
- Aquaculture.

The South African Government adopted a National Infrastructure Plan (NIP) in 2012 that has as main goals the transformation of the South African economic landscape while simultaneously creating a significant number of new jobs, strengthening the delivery of basic services as well as supporting the integration of African economies.

Based on this, the SA Government identified eighteen Strategic Integrated Projects (SIPs), to take place in South Africa in the 10 to 20 years beyond 2012. These were developed and approved to support economic development and address service delivery in the poorest provinces. The SIPs cover social and economic infrastructure across all 9 provinces (with an emphasis on lagging regions). SIPs cover catalytic projects that can fast-track development and growth. Work is being aligned with key cross-cutting areas: human settlement planning and skills development. The SIP's comprise of:

- 5 x Geographically-focussed SIPs;
- 3 x Spatial SIPs;
- 3 x Energy SIPs;
- 3 x Social Infrastructure SIPs;
- 2 x Knowledge SIPs;
- 1 x Regional Integration SIP; and
- 1 x Water and Sanitation SIP

10.2 Generic SEZ Incentives

The value proposition of each of the SEZs across the country is enhanced by the inclusion of a number of generic SEZ incentives such as:

- A **broader SEZ incentives strategy** allowing for 15% corporate tax, a building tax allowance, an employment tax incentive, a customs controlled area (VAT exemption and duty-free) and accelerated 12I tax allowance;
- An **enhanced funding strategy**, including a comprehensive SEZ fund, mix of funding instruments, Public Private Partnership (PPP) arrangements, and other funding support from state owned enterprises such as the IDC and DBSA;
- **Infrastructure Development Support strategy**. Accommodation of bulk infrastructure requirements by the government through the SEZ fund and involvement of various stakeholders' roles in providing infrastructure in and out of zone;
- **Skills and supplier development**. Skills development strategies and frameworks for SEZs are being formulated jointly by **the DTI** and relevant international experts and national authorities. These include supplier development programmes to develop South African-based businesses in and around SEZs; and
- **A One-stop shop strategy**. To reduce the bureaucracy and red tape (cost of doing business) of government approvals and applications processing, a single point of investor contact will be implemented within each SEZ. This platform aims to reduce information search and transaction costs for investors located within SEZs, to facilitate permits and licences for investors, to reduce steps in approvals and to provide a more effective and sustainable investor aftercare service.

Of particular interest to the logistics industry is the promotion of the development of multi-modal and inter-nodal rail-based container end bulk handling terminals at an SEZ to support road-to-rail for inbound and outbound commodities as well as rail-to-road transhipment capacity for commodities and a variety of consumer luxury goods). The geographic location of an SEZ is ideal to act as central distribution warehouse for a number of industries and retailers in South Africa that service the different markets across the country.

The following needs to be confirmed for a specific SEZ that could be targeted for the development of an INOVASURE ENERGY VAULT development hub:

- The SEZ may be funded with an SEZ Grant fund for infrastructure (bulk electricity, water and sewage as well as the fencing, gatehouse and internal roads) and to finance initial losses as the SEZ commences with operations until it reaches a breakeven point;
- The proposed SEZ operational model and funding structure / mechanisms need to be resolved to enable finalisation of the SEZ operational structure and sources of funding. Of particular interest is the SEZ Fund rules and regulations. The use of these funds to bolster the balance sheet will contribute towards the financial viability of the SPV, the SEZ Management Company;
- Should the SEZ Operator be in the form of a Public Private Partnership, the SEZ Operator will be able to generate income from levies and lease agreements. It will also be able to obtain finance from other sources to supplement the Government SEZ Funds. Gearing of the SEZ funding in this manner will introduce a multiplier effect on the government funds invested. It could generate as much as double the investment in the SEZs; and
- An SEZ may have implemented eligibility criteria for allowing tenants to invest in and establish facilities in the SEZ that would enable various types of logistic and utilities' support functions to be established in the SEZ. With regards to manufacturing entities, a different set of criteria may have been established, such as additionality (adding new capacity to the industry, thereby limiting mere transplant of existing business from outside the SEZ into the SEZ), value addition (minimum value percentage added to locally resources, i.e. manpower, utilities and materials) and local content (minimum local content akin to automotive industry incentives).

The funding requirement of an SEZ is usually divided into three (3) parts:

- Funding for the establishment of the infrastructure, such as the bulk electricity, water and sewage supply, roads and fencing etc. to be spent over a number of years;
- Operational funds to part finance the operations of the SEZ for the first 5 to 6 years. Based on the financial projections, the breakeven point should be reached in the 5th year; and
- Funding for top-structures where an SEZ can secure these funds as external loans or loans from the National Treasury depending on the SEZ rules and guidelines at the time.

10.3 Regulations applicable to SEZ Development

A number of regulations that apply to SEZ Developments need to be considered in contemplating the development of an **INOVASURE** Energy Vault at a specific SEZ.

National Building Regulations and Building Standards Act, 103 of 1977

The requirement, in terms of the National Building Regulations and Building Standards Act, 103 of 1977 ("Building Standards Act"), to obtain written approval from the relevant municipality prior to erecting any building is unlikely to apply in relation to SEZs because the Building Standards Act does not apply to buildings erected by or on behalf of the state except to the limited extent set out below.

The State must, before erecting the buildings concerned, submit the plans and particulars in respect of any building to be erected by or on behalf of the State, accompanied by a certificate, signed by the head of the State Department concerned or an officer designated by him, setting out in full details regarding the respects in which the plans deviate from the requirements of the Building Standards Act to the relevant municipality for its information and comment.

Major Hazard Installation Regulations made under Occupational Health and Safety Act

The Major Hazard Installation Regulations are made under the Occupational Health and Safety Act and places the responsibility on an employer to protect employees and the general public who may be exposed to significant health and safety risks due to that employer's workplace.

There are two instances in which a facility may qualify as a major hazard installation. Firstly, where more than the prescribed quantity of a notifiable substance described in regulation 8 of the General Machinery Regulations is or may be kept and secondly, where substances are produced, used, handled or stored in such a form and quantity that it has the potential to cause a ‘major incident’, which the regulations describe as an occurrence of ‘catastrophic proportions.’ An incident is of catastrophic proportions if it has the potential to affect the public beyond the boundaries of the facility.

Mineral and Petroleum Resource Development Act, 28 of 2002

The Mineral and Petroleum Resource Development Act 28 of 2002 ("the MPRDA") is the principle Act regulating South Africa's minerals and petroleum resources. The Act provides

that the State is the custodian of these resources and seeks to promote the development of mineral and petroleum resources for the benefit of all South Africans.

Consequently, any person who intends to use the surface of any land in any way which may be contrary to or which is likely to impede the development of mineral and petroleum resources must apply to the Minister of Mineral Resources for approval. This requirement does not apply to the land to be used for agricultural or related purposes or that lies within a proclaimed township (land use/zoning scheme) that has been approved by Minister of Mineral Resources in terms of the MPRDA.

National Environmental Management Act, 107 of 1998

There is a broad range of environmental legislation that applies in South Africa, which is administered by all three spheres of government. For the purposes of this section we consider the potential environmental regulatory approvals and compliance responsibilities associated with selecting a site for the SEZ and the construction and installation of infrastructure required to establish it. The National Environmental Management Act ("NEMA") is the national framework law on the environment and all other environmental laws must be read together with it.

Environmental Authorisation

NEMA allows the National Minister responsible for the environment ("the Environment Minister") to list certain activities (in what are referred to colloquially as Listing Notices) that may have a significant detrimental impact on the environment and that may not commence without an environmental authorisation. The Environment Minister may also prescribe the application process for environmental authorisation. The Environment Minister has published three listing notices and regulations that prescribe the authorisation process (referred to as "Listing Notice 1", "Listing Notice 2" and "Listing Notice 3" and "the EIA Regulations, 2010" respectively). An environmental authorisation will be necessary in respect of each listed activity that forms part of an SEZ. In practice, environmental authorities issue a single document containing all of the necessary authorisations referred to as a Record of Decision (ROD).

National Environmental Management: Air Quality Act, 39 of 2004

Many of the requirements in the National Environmental Management: Air Quality Act, 39 of 2004 ("NEMAQA") are unlikely to have direct relevance to the establishment (construction)

of an SEZ but will likely be pertinent in relation to the proposed manufacturing activities businesses who locate to the SEZ will undertake.

National Environmental Management: Waste Act, 59 of 2008

South Africa's waste laws are based on the concept of the "waste hierarchy" in terms of which should waste be minimized. If waste cannot be minimized, it must be reduced, re-used and recycled. The disposal of waste should be the last resort in terms of the management of waste.

The National Environmental Management: Waste Act, 59 of 2008, ("NEMWA") establishes a general duty in respect of waste management. The duty requires holders of waste to take all reasonable measures for effective waste management, which include avoiding the generation of waste, minimising the toxicity and quantity, reducing, re-using, recycling and recovering waste, ensuring environmentally sound treatment and disposal of waste, refraining from endangering health, the environment or causing a nuisance through noise, odour or visual impacts and preventing waste from being used for an unauthorised purpose. Thus the generator of waste that is likely to cause pollution bears responsibility to ensure that all waste is correctly disposed in a way that does not harm or damage the environment.

National Environmental Management: Biodiversity Act, 10 of 2004

The development of a SEZ may involve the disturbance or destruction of, or damage to, listed protected species of plants or animals, which is regulated in terms of the National Environmental Management: Biodiversity Act, 10 of 2004 ("the Biodiversity Act"). The Biodiversity Act binds all organs of state in the national and local spheres of government; and in the provincial sphere of government, subject to section 146 of the Constitution. Chapter 4 of the Biodiversity Act deals with threatened or protected ("TOP") plant and animal species. No one may carry out a restricted activity involving a specimen or a “listed protected or threatened species” without a permit. The restricted activities relating to TOP species include killing, picking, uprooting, damaging or destroying, having in possession, growing breeding, moving or trans locating specimens of TOP’s.

National Water Act, 36 of 1998

Depending on the nature of the site chosen, the SEZ Governance Entities may carry out certain water uses during the construction or operation of the SEZ that require a water use license. The National Water Act, 36 of 1998, ("the NWA") is the principal Act regulating the use and protection of freshwater resources while the supply of water is regulated primarily by

the Water Services Act. The NWA applies to any “water resource” and regulates “water use”. Both these terms are defined widely. Water resource is defined to include aquifers, surface water, the banks and beds of watercourses, wetlands, and estuaries (but not the sea). Water users are also required to register with the Regional Office of the Department of Water Affairs.

National Forests Act, 84 of 1998

The development of an SEZ may involve the disturbance or destruction of, or damage to, protected tree or trees in a natural forest, which is regulated in terms of the National Forests Act, 84 of 1998 ("the NFA"). The Minister responsible for forestry may declare individual trees, groups of trees, woodlands, forests or species of trees as protected. Trees in natural forests are also protected under the NFA. A natural forest is a group of indigenous trees whose crowns are contiguous, or a natural forest declared by the Minister. The effect is that no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of the tree or any product of the tree without a licence or an exemption from the requirement to obtain a licence. The Minister has declared certain species of trees as protected and certain individual trees or groups of trees. The list includes species such as camel thorn, baobab and white milkwood.

National Heritage Resources Act, 25 of 1999

The National Heritage Resources Act, 25 of 1999 ("NHRA") provides, among others, for the identification, management, protection and conservation of heritage resources in South Africa. "Heritage resources" are broadly defined in the NHRA as "any place or object of cultural significance". The NHRA is significant in the context of the establishment of any SEZ because if the SEZ site is itself a heritage resource or objects are found on the SEZ site that are heritage resources the processes required to be followed and the approvals required to be obtained may delay or limit the nature and extent of development that may be undertaken on that site.

10.4 Procurement Legislation applicable to SEZ Development

Procurement legislation that applies to SEZ Developments need to be considered in contemplating the development of an **INOVASURE** Energy Vault at a specific SEZ.

The SEZ Governance Entities will have to procure goods and services to establish the SEZ, for example construction services and materials. The entity most likely to procure would be the Operator, since one of its responsibilities is developing the SEZ. In view of the institutional arrangements provided for in the SEZ Act, it is probable that the operator will be a private company (as the Operator will either be appointed through a competitive process or will be the SEZ entity in circumstances where the SEZ is operated as a PPP). It is also possible that other SEZ Governance Entities will procure goods and services to facilitate the establishment, some of which may be government entities.

There are a number of significant impacts that flow from the application of legislative procurement requirements. Below follows a brief consideration of the constitutional and legislative requirements relating to procurement that will apply to Government SEZ Governance Entities and the extent to which any of those requirements will apply to private sector SEZ governance Entities when they procure on behalf of the SEZ.

The Constitution of the Republic of South Africa, 1996

The Constitution provides that "when an organ of state in the national, provincial or local sphere of government, or any other institution identified in national legislation, contracts for goods or services, it must do so in accordance with a system which is fair, equitable, transparent, competitive and cost-effective”. Generally this means running a public tender process which is open and hence subject to public scrutiny. The public interested in bidding must be given an equal opportunity at bidding and a fair chance at winning the bid. In other words, bid documents should not be biased in favour of particular competitors. Furthermore, the tender process should result in the most cost-effective outcome (which is not necessarily awarding the bid to the cheapest tenderer).

Only "organs of state in the national, provincial or local sphere of government" are required to comply with this requirement. All the government entities that may act as SEZ Governance Entities would be required to comply with this constitutional requirement when procuring goods or services. Although there is some scope for argument on this point, the preliminary view is that a private company acting as an SEZ Governance Entity would not be required to comply with the constitutional requirements relating to procurement. This is so because it is unlikely that they would fall "within a sphere of government" since none of the spheres will exercise effective control over them. It would be advisable to obtain a legal opinion on this point once the structuring of governance arrangements for particular SEZ governance arrangements have been finalised.

The Public Finance Management Act, 1 of 1999

The accounting officer of each national and provincial government department and the accounting authorities of each public entity is required to develop a 'procurement and provisioning system' that is fair, equitable, transparent, competitive and cost effective ("the SCM policy"). All procurement decisions must be taken in terms of the SCM policy.

The detailed requirements of each process will be determined by each particular SCM policy and generally at least three quotations must be obtained when goods and services are procured by way of quotations rather than competitive bidding. Further detailed requirements, set out in the Treasury Regulations, apply to government departments and public entities that are not national or provincial government business enterprises (in other words, national and provincial business enterprises are given more flexibility in designing their SCM Policy). However, while the Treasury Regulations do not apply to these government enterprises they are still required to follow a procurement process that complies with the constitutional principles set out in section 217(1) of the Constitution.

The Municipal Finance Management Act, 56 of 2003

Similar, but more detailed and restrictive requirements apply to Municipalities and municipal entities in terms of the Municipal Finance Management Act and the Municipal Supply Chain Management Regulations ("the SCM Regulations"). Similarly, some form of quotation or bidding process will be required to procure goods or services valued at more than R2 000.

While the contents of SCM policies in terms of the PFMA vary considerably, the Municipal SCM regulations exhaustively regulate the contents of municipal SCM policies and all such requirements must be incorporated into municipal SCM policies and applied in respect of any procurement. In addition, the SCM policies of municipal entities must be aligned with the SCM policy of their parent municipalities. It should be noted that the prescriptive nature of the SCM Regulations will impact on procurement processes and will require municipal entities to capacitate itself simply to comply with such regulations. This includes setting up a committee system to evaluate and adjudicate bids.

However, in the light of the Regulation 32 designation of the Mhkondo Energy Vault, it is possible for **INOVASURE** to utilise this process as a means to duplicate the project with interested Municipalities within the SEZs.

The Preferential Procurement Policy Framework Act, 5 of 2000

The Preferential Procurement Regulations ("PPR") apply to the different forms of Government Entities that may act as SEZ Governance Entities and to all procurements of good and services valued at over R30 000. However, it will only apply to a SEZ Entity that is listed as a public entity in one of the Schedules to the PFMA. These regulations are however fully applicable to Municipalities and municipal entities.

The PPR provide for a potential two stage process for the evaluation of tenders. In the first stage tenders are evaluated for functionality and must reach a minimum score for functionality in order to advance to the next stage of evaluation. At the second stage, tenders are evaluated on the basis of price and preference (where preference points are calculated based on B-BBEE status level verification certificates).

Land and Immovable Asset Management

It is apparent from the SEZ Act that one of the key requirements for the establishment of the SEZ is that the Licensee acquires or controls the immovable property on which the SEZ is to be established. The land may be purchased or leased by the Licensee from another government entity or from a private sector entity. This will trigger certain regulatory processes on the part of the purchaser or lessee, if that entity is a government entity. If the immovable property were to be purchased or leased from another government entity, that entity (the seller or lessor) would also have to comply with certain regulatory processes to transfer or lease out that government immovable property. It is also contemplated in the SEZ Act that the Licensee will transfer ownership and control of the immovable property to the SEZ entity which may trigger similar obligations. Further, the SEZ Governance Entities are likely to lease immovable property (which is likely to be government-owned) within the SEZ to companies seeking to operate their businesses there, which would also trigger regulatory obligations if that immovable property is government owned. These regulations and procedures are covered under the following acts and regulations:

- Public Finance Management Act, 1 of 1999 and specifically obligations relating to the sale and letting of immovable assets by the national government, provincial government or a public entity;
- Municipal Finance Management Act 56 of 2003 and obligations relating to the sale or letting of immovable property by a municipality or municipal entity;
- Government Immovable Assets Management Act, 19 of 2007;
- Prevention of Illegal Eviction Act, 19 of 1998; and
- Restitution of Land Rights Act, 22 of 1994.

10.5 Economic Benefits Generally associated with SEZs

This section provides a brief discussion and assessment of the likely benefits associated with the SEZ's. In the main it draws on the international literature and other sources to illustrate potential impacts which can then be the subject of further assessment in the feasibility phase. In this regard it focuses mainly on the potential impact of successful SEZ's. It needs to be recognised that numerous examples of failures are also to be found. It provides brief overviews of:

- The sources and types of economic impacts that have materialised from other SEZ's; and
- Results of impact assessments conducted on SEZ's.

Types and categories of economic benefit

Relatively recently, the Facility for Investment Climate Advisory Services (FIAS) that services the World Bank Group and IFC conducted a review of Special Economic Zones focusing on their performance and lessons learned for zone development (FIAS, 2008). This review noted that the economic benefits from zone development are both static and dynamic. Static benefits are generally more straightforward and include (FIAS, 2008):

- Direct employment creation and income generation;
- Export growth and export diversification;
- Foreign exchange earnings;
- Foreign direct investment (FDI); and
- Government revenues.

Dynamic benefits, on the other hand, are recognised as much harder to measure. However, according to FIAS, they are often more important to the long-term contributions from zone development. These benefits include (FIAS, 2008):

- Indirect employment creation;
- Skills upgrading;
- Technology transfer;
- "Demonstration effect" arising from application of "best practices"; and
- Regional development.

Farole (2011) further distinguishes between economic benefits according to the stages at which they emerge over time. Static benefits such as investment and job creation are

generally derived in the relatively short term. SEZ programs that are successful in contributing to long-term development leverage these static benefits into dynamic economic benefits such as technology transfer and the encouragement of domestic entrepreneurs.

Results of benefit assessments

This section focuses on the results of assessments of the economic benefits that are associated with SEZs. It draws primarily on the FIAS review along with the research by Farole on the economic impacts of SEZs in Africa (see FIAS, 2008 and Farole, 2011). Together, these sources provide comprehensive data on impacts drawing on other sources in the process.

Foreign direct investment

Attracting foreign direct investment (FDI) is widely recognised as one of the key rationales behind the establishments of SEZs. According to FIAS (2008), supporters of SEZs claim that by offering world-class facilities and best practice policies, zones can offset some aspects of an often otherwise adverse investment climate.

Unfortunately, the impact of zones on FDI (Foreign Direct Investment) is hard to gauge given the lack of data. Many zones do not track foreign investment flows separately, and data is uneven.

While data is generally lacking, that which is available suggests that SEZs are an important destination of FDI in some countries. China is the prime example in this regard where SEZs have been successful and account for over 80% of cumulative FDI (FIAS, 2008). Recent research using Chinese municipal datasets has also shown that the SEZ program increased FDI not merely through firm relocation, and did not crowd out domestic investment.

In addition, most SEZs were found to achieve agglomeration economies and generate wage increases for workers more than the increase in the local cost of living (Wang, 2013).

Other successes include the Philippines where the share of FDI flows going to the country's eco-zones increased from 30% in 1997 to over 81% in 2000 and Bangladesh where $103 million of the total $328 million of FDI inflows were registered in EPZs (UNCTAD, 2003 in FIAS, 2008).

The next table shows FDI into SEZs focusing on African countries and three other countries for comparative purposes. Within Africa, Ghanaian, Kenyan and Tanzanian SEZs have managed to attract relatively significant FDI while Nigerian SEZs have largely been a failure in this respect (Farole, 2011).

FDI statistics			
	Total SEZ FDI stock (2008) (US$m)	**SEZ FDI per capita (2000-2008)(US$)**	**SEZ FDI as % of total national FDI (2000-2008)**
Bangladesh	1 435	6	30
Dominican Republic	2 611	141	18
Vietnam	36 760	325	100
Ghana (Tema)	68	3	48
Ghana (single units)	2 806	120	
Kenya (EPZs)		6	20
Kenya (single units)	155		
Nigeria	N/A	<1	<1
Tanzania	210	5	18

Table 19: FDI flows into SEZs for selected countries (Source: Farole, 2011)

The next figure elaborates on the FDI data above by showing the number of firms that are located in SEZs per country.

As one would expect, countries with significant FDI flows into SEZs are also characterised by greater numbers of firms within SEZs with Honduras having close to 600 such firms.

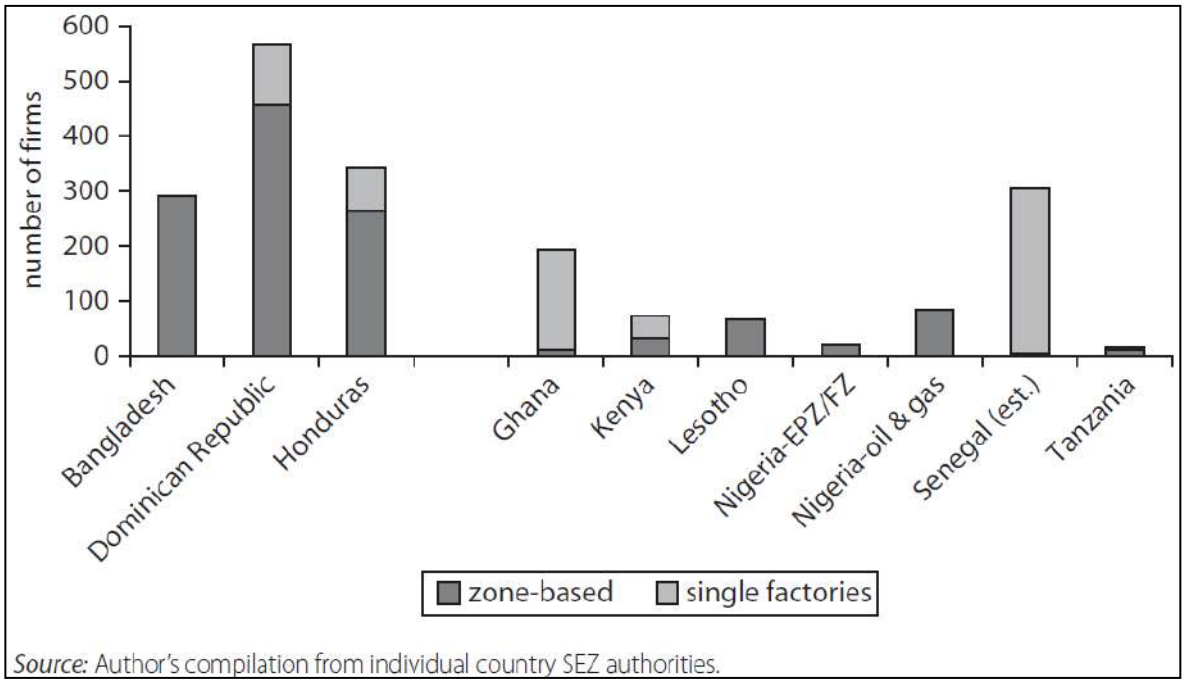

Figure 53: Number of firms per SEZs for selected countries (Source: Farole, 2011)

Employment creation

SEZs have been found to play a major role in employment creation in certain countries. The table below shows that, globally, approximately 68 million jobs are in firms located within SEZs. In addition, research has shown that the rate of job creation in a number of SEZ programs has been rapid. Employment in the Dominican Republic's industrial free zones, for example, rose from 500 in 1970 to almost 200,000 in 2008 (FIAS, 2008). Aside from direct employment, indirect employment effects can also be substantial.

Direct Employment Impact of Special Economic Zones		
	Direct Employment (millions)	**Percentage of National Employment**
Global	68.441	0.21%
Asia and the Pacific	61.089	2.3%
Americas	3.084	1.15%
Western Europe	0.179	
Central and East Europe and Central Asia	1.590	0.001%
Middle East and North Africa	1.458	1.59%
Sub-Saharan Africa	1.040	0.20%

Table 20: Direct employment associated within SEZs globally (Source: FIAS, 2018)

Note: Estimates from FIAS database were formulated on ILO data. In some cases where discrepancies arise due to inclusion of indirect employment figures (as identified by WEPZA), a revised direct employment figure was calculated using a standard ration of 1:2; that is, for every one direct job created, two indirect jobs are in turn created. Sources: BearingPoint; ILO database; WEPZA (2007); FIAS research

The next table shows that employment within individual countries can be high for those countries with successful SEZ programmes. Within Africa, Kenya stands out as a country with a significant proportion (i.e. 15%) of total jobs to be found within SEZs:

	SEZ employment (2008)	**SEZ employment as % of national industrial sector employment**
Bangladesh	218,299	3%
Dominican Republic	124,517	30%
Honduras	130,000	30%
Vietnam	1,172,000	19%
Ghana (Tema)	2,025	3.50%
Ghana (single units)	26,534	
Kenya (EPZs)	15,127	15%
Keny (single units)	15,551	
Lesotho	45,130	>80%
Nigeria (Calabar)(est.)	1,156	<1%
Nigeria (Onne, oil & gas)	20,000	N/A
Tanzania	7,500	2.50%

Table 21: Direct employment associated with SEZ programmes (Source: Farole, 2011)

Export growth and diversification

In many countries, SEZ programmes account for a major share of exports. Using 2005 data, FIAS (2008) lists the following examples of shares in total exports:

- Americas: Nicaragua (79.4%); the Dominican Republic (77%); Panama (67%);
- Asia and the Pacific: Bangladesh (75.6%); Sri Lanka (67.1%); the Philippines (78.2%); Pakistan (50.3%); and
- Middle East and North Africa: Lebanon (36.3%); Bahrain (68.9%); Morocco (61%); and
- Sub-Saharan Africa: Ghana (22.4%); Madagascar (80%); Mauritius (34.4%).

Aside from increased volumes, SEZ programs (especially those focused on Export Processing Zones - EPZs) have also been able to catalyse export diversification in particular from a reliance on primary commodities to manufactured exports. Key examples of this trend include (FAIS, 2008):

- Costa Rica, where the EPZ share of national manufactured exports jumped from less than 10% in 1990 to 55% in 2003;
- Tunisia, where the EPZ share of national manufactured exports has more than doubled since 1990; and
- Kenya, where the share of national manufactured exports has increased from 3.5% in 1997 to 19.3% in 2003

The next table that globally, exports from SEZs totalled approximately US$851 Billion in 2007. As one would expect, Asia made the largest contribution to this total.

Impact of Zones on Exports		
	Zone Exports (US$ millions)	**Percentage of Exports**
Global	851,032	40.8%
Asia and the Pacific	510,666	41.0%
Americas	72,636	39.0%
Central and East Europe and Central Asia	89,666	38.7%
Middle East and North Africa	169,459	36.4%
Sub-Saharan Africa	8,605	48.7%

Table 22: Exports associated within SEZs globally (Source: FIAS, 2018)

In reviewing the Indian experience with SEZs, Aggarwal (2010) finds that, "while SEZs are stimulating direct investment and employment, their role appears to be more valuable in

bringing about economic transformation from a resource-led economy to a skill and technology-led economy; from low value added economic activities to high value added economic activities; from low productive sectors to high productive sectors; and from unorganised to organized sectors, both at the national and regional levels."

With regard to export growth trajectories, the figure below compares the export growth paths of two successful SEZs (Suzhou in China and Costa Rica) to three African SEZ programs (Ghana, Kenya, and Lesotho) and three non-African programs (Bangladesh, the Dominican Republic, and Vietnam).

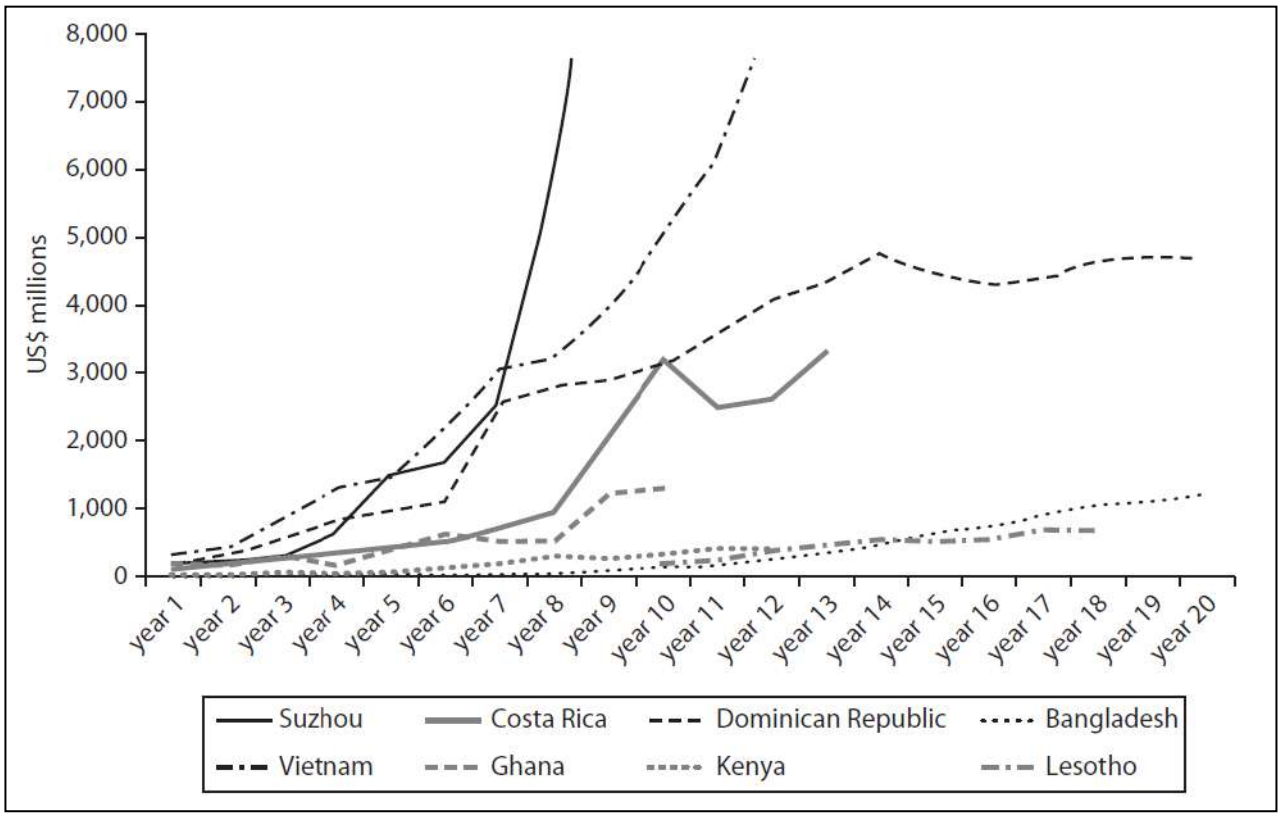

Figure 54: SEZ export growth trajectory (Source: Farole, 2011)

The figure shows that most zone programs start slowly, growing linearly in the initial stages, before hitting a growth inflection point. At this point the more successful SEZ programs seem to have grown exponentially (Farole, 2011).

Industrial upgrading, technology transfer and dynamic effects

With regard to the catalytic role of SEZ's in industrial upgrading and technology transfer, evidence of success is less clearly defined.

- On the one hand, there is clear evidence of the catalytic role played by EPZs in the East Asian newly industrialized economies, especially the Republic of Korea and

Taiwan (China). FIAS (2008) also cites the technology parks in India which "were critical to the expansion and upgrading of ICT activities, not just in terms of routine data entry and software coding operations, but also in much more complex software development, content development, and multimedia operations"; and

- On the other hand, surveys have not been able to find a significant difference between EPZ and non-EPZ-based export-oriented firms in terms of technology transfer and linkages (UNCTAD, 2003).

With regard to the longer term aim of SEZs in fostering wider economic development, the below figure provides a schematic of the transition between a so-called 'island' SEZ (or SEZ's) in which linkages to the domestic economy are severely limited or inexistent and 'catalyst' SEZ (or SEZ's) in which technological capabilities are being upgraded and domestic linkages are created (Farole and Ackini, 2011). It is this transition that has the potential to amplify static benefits and ensure that dynamic benefits also emerge.

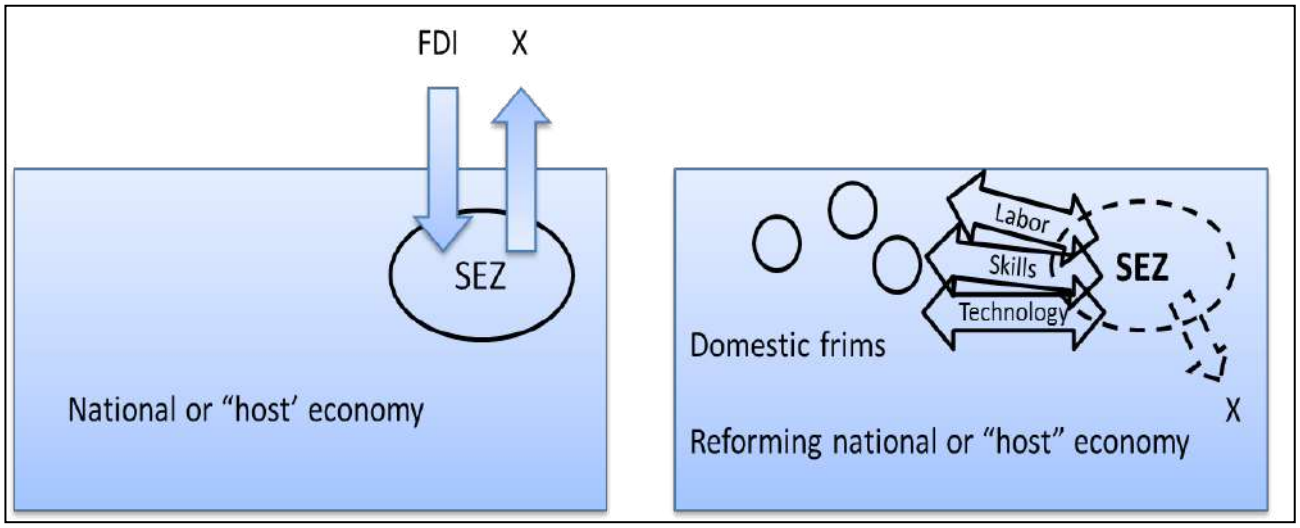

Figure 55: SEZs – islands to catalysts (Source: Farole and Ackini, 2011)

Government revenues and costs

SEZ development can have particularly complex impacts on government revenues and budgets. The use of incentives is especially important in this regard and, as pointed out by FIAS (2008) and other observers a key issue is whether investors would have located in a zone or region without the provision of incentives in the first place?

This is generally an extremely difficult question to answer particular in the planning and feasibility phase of SEZ development.

The following figure provides a basic overview of potential complexities by showing the main revenue gains commonly associated with SEZs alongside the costs.

Government Revenues and Costs from Zone Development
Revenues • Corporate income tax (if no tax holiday) • Personal income tax on direct and indirect employment • Permit fees and service charges • Rental or sales fees (from sale or rental of public land to developers) • Import duties and taxes on zone products sold to the domestic customs territory • Concession fees for other facilities (port, power plant, and so on), linked to zone development
Costs • Wage bill of government workers needed to regulate zone activity or operate the zone and other operating expenditures • Public sector capital outlays for external infrastructure (and internal infrastructure and facilities in the case of a publicly developed zone • Import duties and charges lost from smuggling • Taxes forgone from enterprise relocating from the domestic customs territory to the zone • Subsidies

Table 16: Government revenues and Costs from Zone Development

10.6 Conclusion: INOVASURE Energy Vault (RMEMS) at an SEZ

In considering the special status of SEZs locally in South Africa and abroad the development of an Energy Vault at an identified Special Economic Zone (SEZ) will provide mutual benefits to the SEZ, the suppliers of electrical power and the development of power generation and distribution infrastructure.

11 SPECIAL PURPOSE VEHICLE (SPV) GOVERNANCE

11.1 Setting up the Special Purpose Vehicle (SPV)

The following process is acknowledged that has been, and is being, followed by **INOVASURE** regarding the Kannaland Local Municipality:

The following process is acknowledged that has been, and is being, followed by **INOVASURE** regarding the Kannaland RMEMS / Energy Vault Project:

- The formation of a Public Private Partnership (PPP) between **INOVASURE** and the KANNALAND LOCAL MUNICIPALITY, proposed to be endorsed by NATIONAL TREASURY GTAC PPP division and managed under the auspices of the DBSA, covers all aspects of the implementation of the **INOVASURE** Energy Security Program as various energy infrastructure projects and will be arranged to be funded by the efforts of **INOVASURE,** including the installation of distribution and telecommunications devices and so-called Thin Client Technology ICT (Information Communication Technology) devices, as well as management systems;
- **INOVASURE** prepared Feasibility Reports[18] in parts that were submitted to the Kannaland Local Municipality as the initial pilot implementation project partner to the proposed PPP and the application for endorsement thereof in terms of the time period by National Treasury GTAC PPP division;
- The company **INOVASURE (PTY) LTD** (South Africa) has been registered with The Companies' and Intellectual Properties Commission (the CIPC")**;**
- A Special Purpose Vehicle (SPV) is in the process of being registered as part of the proposed PPP with the KANNALAND LOCAL MUNICIPALITY i.e **"INOVASURE** Kannaland Energy Vault Holdings (Pty) Ltd.; and
- This DBSA PPDF Application[19] (which is intended to be utilised for concomitant applications to the other relevant funds managed by the DBSA) was prepared in compliance with the prescribed process with due acknowledgement of the Feasibility Reports that were prepared for the Kannaland **INOVASURE** Energy Vault project.

[18] "Kannaland Local Feasibility Reports: Executive Summary and Parts A, B and C", dated November 2018
[19] SADC & DBSA Project preparation and Development Facility (PPDF): Operational Guidelines", dated 8 August 2017

- Various other project specific SPVs are also in the process of being registered under the overhead umbrella of **INOVASURE Kannaland Local Energy Vault Holdings (Pty) Ltd**, being the following:

    - **INOVASURE** Kannaland PV (Pty) Ltd;
    - **INOVASURE** Kannaland Thin Client (Pty) Ltd;
    - **INOVASURE** Kannaland LTE (Pty) Ltd;
    - **INOVASURE** Kannaland Smart Meter (Pty) Ltd;
    - **INOVASURE** Kannaland Battery (Pty) Ltd;

An **INOVASURE** Community related entity will be registered for the receipt of a certain percentage of the income of the various SPVs, which entity will be utilised for the upliftment and development of various aspects of the community such as education, electrification of informal settlements, and many other community aligned projects.

11.2 Setting up the Special Purpose Vehicle (SPV)

In developing a proposed **INOVASURE** Energy Vault, the setting up of an overhead Special Purpose Vehicle (SPV) to manage, plan and control the related developments is crucial. The SPV will be set up by applying the checklist provided in the annexures to this report.

The SPV will look after the setting-up of the Energy Vault Development Company at the corporate (Board of Directors), Business (Executive Committee) and Functional Area (Finance / Administration, Commercial / Marketing / Business Development, as well as Development / Construction / Operations) Levels.

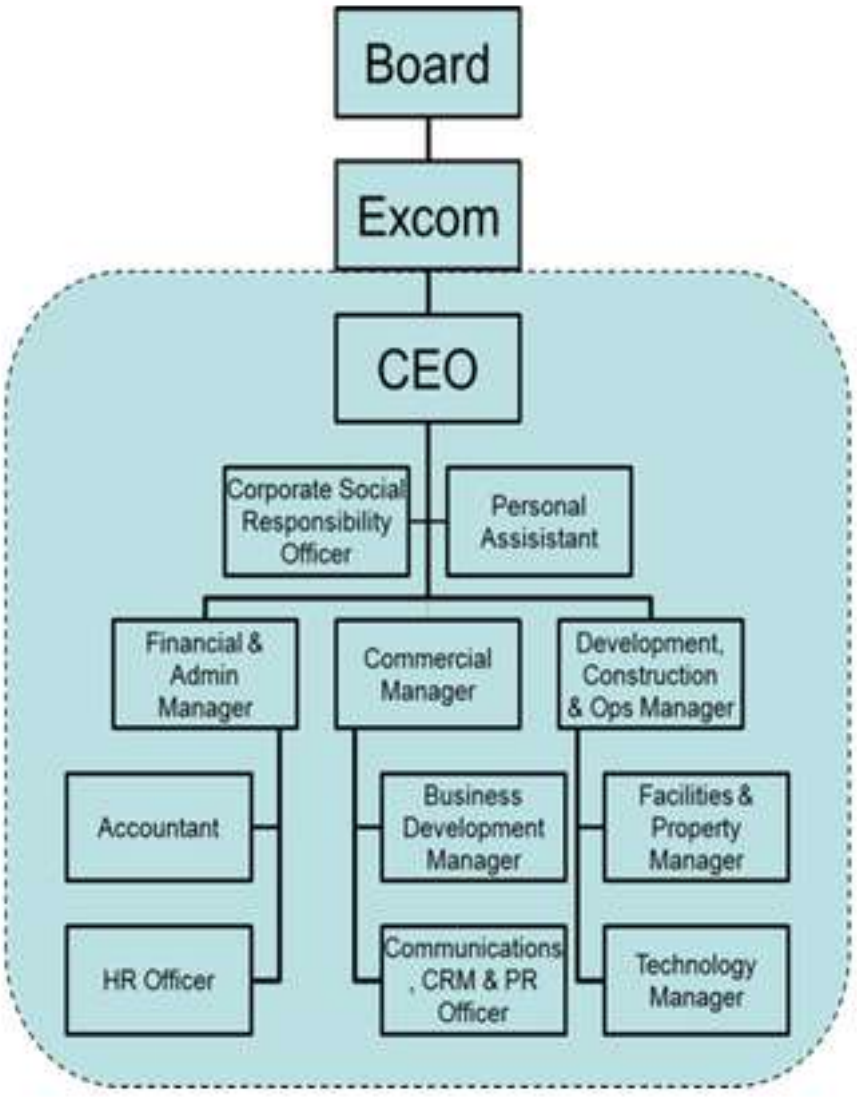

Figure 56: A Proposed Business Structure

11.3 Structuring of the SPVs and the Board

The setting up of the overhead **INOVASURE** Kannaland Local Energy Vault Holding SPV will be done with the required consideration of issues of centralised / decentralised control from the relevant Municipality, the District and the Province, access to public and private funding, procurement practices, as well as representation by levels of government, organised labour, organised (and small) business, etc.

The structure of the overhead SPV and the various sub-SPVs (affiliate companies) will take cognisance of both the legal constraints placed on the levels of Government, as well as by the Companies Act. Initially the SPVs will be registered with CIPC as companies.

The provisions of the Companies Act pertaining to the directors and governance will be adopted within the Memorandum of Incorporation (MOI) of each of the SPVs except where the restrictions on the levels of identified Government structure (above) has express stipulations regulating matters pertaining to the Board of the relevant SPV.

The Board of Directors may be comprised of sixteen (16) directors of which twelve (12) will be appointed by the shareholder/s, thereby fulfilling the requirements of section 68(1) of the Companies Act. In appointing the directors, the shareholder/s will follow the following guidelines:

- Six (6) directors by INOVASURE;
- Two (2) directors by the Municipality;
- Two (2) directors representing the Funding Institution (e.g. the NDB / DBSA / Other);
- Two (2) directors by National Government (of which one may be appointed by SARS and one by National Treasury);
- Two (2) directors by other Government institutions; and
- In addition to the above, two (2) non-voting directors shall be appointed in an advisory capacity after consultation with the relevant stakeholders to possibly include representation of the following parties:
    - ESKOM; and
    - Academia

The **INOVASURE** Kannaland Local Energy Vault Holdings SPV will be an entirely independent entity with its own infrastructure, offices, and financial and human resources. The SPV will operate as an independent company.

It is not intended for the SPV to have any dependency on the Local and District Municipal Authorities, the Provincial Government or National Government. Consequent to the SPV being an independent entity, no resource or asset sharing with its government partners will take place.

11.4 Relationship between Stakeholders

The overall relationship between the **INOVASURE** Kannaland Local Municipality Energy Vault Holdings overhead SPV and its identified stakeholders and partners will be structured consisting of one or more of the following:

- The overhead SPV itself;
- A Steering Committee;
- A Government and Advisory Panel;
- An Operations Committee; and
- Sub-SPVs

The prescribed and anticipated governance structure is acknowledged with planned interaction between the Engagement Team and the deployed **INOVASURE** Kannaland Local Municipality Energy Vault Holdings SPV officials. The latter will provide overall control, leadership and direction to the project team and will serve as a forum where feedback on project progress will be provided as well as details on proposed tasks and activities for the next reporting period and issues arising from the project which could impact on the successful completion of the assignment.

11.5 *Access to Information*

The setting up of the Special Purpose Vehicle (the SPV) for the **INOVASURE** Kannaland Local Energy Vault Holdings entity will be planned and meticulously executed to allow for the migration of the SPV to a full-blown company with all its structures in place.

12 CONCLUSION

As was stated throughout this report, the outcomes of the Feasibility Process as part of the broader business planning process is strictly for business planning process information purposes. Projections in the report have been compiled for illustrative purposes and do not constitute final forecasts.

The eventual outcome of the business planning roll-out process may be more or less favourable than that portrayed in the report

The process and the reported outcomes for the intended pilot site financial models (i.e. Kannaland Local Municipality) and for each of the subsequent implementation site models will be reviewed during the next phases of the implementation and roll-out of the InovaSure Energy Vault program in South Africa.

13 CONTACT DETAILS

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