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SUSTAINABLE COMMUNITY DEVELOPMENT CONCEPT PLAN

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The purpose of this draft document is to elucidate the motivation and reasoning behind the developers, Real Green Estates, to commit to producing a real and genuine sustainable property development scheme – One that they believe will be ground breaking and ultimately revolutionize the way property development will be appraised and carried out in the future.

It will also form the foundations for the Charter that will eventually detail and govern all the working facets of the community. This is an extremely important feature of the scheme as it will not only determine the way the built form of the development takes place but will also serve to ensure the ongoing social, economic and physical fabric of the community remain true to its core focus of remaining 'sustainable' in the future.

We will initially preview the development team responsible for driving this concept from its embryonic beginnings all the way through to its ultimate built and completed form. Following on will be a more detailed synopsis of the development as a whole - Covering green building designs and construction, the use of mains & alternative services, the working land components that will accompany each stand and how the scheme will accommodate a number of mixed-uses in order to foster organic social, economic and neighborhood growth within the community. Penultimately dealing with some suggestions regarding the social component of the scheme and how the developers see social opportunities and upliftment to take place and percolate through to the community and its surrounds. Concluding with comments & statements.

It is understood that this working document will evolve and morph into more of a coherent shape as the scheme is taken forward and receives additional comments from other professionals, planning officials and the general public.

Developers

Real Green Estates (Pty) Ltd spawned from a collective view and belief of its 3 directors that a niche market exists for a genuinely well thought out and coherent rural sustainable property development. A development that is conscious of its carbon foot print, ecological impact and overall sustainability while still remaining attractive to a broad and conventional market audience.

John & David Higginson have over 20 years experience in the property development and investment markets in both the residential and commercial sectors here in South Africa and in the U.K. They pride themselves in staying ahead of the curve in regard to predicting market changes and trends – Being one of the first development companies in the East Midlands, U.K to sympathetically convert redundant inner city listed buildings into vibrant and successful residential and mixed-use developments in the 1990's.

These once run down and derelict buildings now represent a space where new communities have successfully evolved and now form a valuable socio-economic part of the inner city. The positive effects to percolate through from such a regeneration of an area are an increase in local employment and subsequent taxes paid, the preservation of old building stock that would of probably been demolished and most importantly the growth of a harmonious working neighborhood - to name but a few.

Our Vision

It is in our opinion that we have to be fundamentally aware of the fact that changes need to be made in the way we live, how we live and where we live. Science has confirmed what we are now witnessing first hand – Global warming, resource depletion, escalating population levels, mass extinctions and other world-wide events that demand we adopt a more sustainable lifestyle.[1] As stewards of the world we live in it is our personal decisions in daily living which are the key to changing the current course of events.

These changes must be made from grass roots up and that can be loosely translated to the environments and buildings we choose to live and work in. It is on this premise that we have decided to develop this alternative model for sustainability – A truly green scheme that we believe will create a synergy with modern society and the rural land. A development of the nature we are proposing can only be successful in every facet – Ranging from reducing our personal carbon emissions, promoting socio-economic growth, fostering genuine community spirits, self production of organic food crops and the use of alternative energies – When driven by a common community vision.

A keystone feature of our scheme is to promote resilience within the community as a whole – To qualify resilience in this context:

'*The capacity of a system to absorb disturbance and reorganize in response to external change, while retaining essentially the same function, structure, identity and feedbacks as before. This can be achieved by actively influencing and preparing for economic, social and environmental change – They have the*

[1] 'Creating a Life Together' By Diana Christian – Page 27

ability to call upon a myriad of resources that go to make them a healthy community'[2]

Resilience within a community is very dependent upon having a great diversity of people; essentially a broad base of livelihoods, demographics, skill bases, land use, enterprise and energy systems would all go to increasing the resilience of a community and in-turn its sustainable success. In order to achieve a high level of resilience within our scheme we intend to make our product offering as broad as possible – Wide range of building designs, plot sizes, residential & commercial mixes – In order to stimulate and attract a varied audience. We intend the scheme to be of interest to all demographics & socio-economic backgrounds - Ranging from first time buyers all the way through to active retirees.

Our research findings to-date indicate that many modern western society based communities are fast becoming socially fragmented – Essentially we are becoming dis-in-tuned with our communities. The advent of internet based social network platforms has only furthered our insular tendencies. Linden Homes, a top U.K home builder, recently completed a report that found friendly neighbours and a good sense of community are regarded as top priorities among British homebuyers – Indicating a revival in traditional neighbourly values.[3]

It is an objective for us to promote social cohesion and community spirit within our scheme and we believe this can achieved by ensuring our proposals will encompass an offering of variable sized eco housing stock that have been subject to stringent green design & construction parameters, the use of alternative energy, micro farms for food production, live 'n' work schemes, educational facilities, medical outposts and leisure based activities such as eco-tourism. Following on from the built form we see the introduction of social based programmes such as promoting work/experience exchanges, educational tours on low impact and self sustainable practices, LETS (Local Exchange Trading Systems), neighbourhood skills swapping workshops & community supported agriculture, to name but a few ideas. All geared towards building a sustainable and resilient community based lifestyle.

'To be able to thrive in the 21st century we will need to rebuild our social, economic and environmental systems, localize our communities and most importantly, we will have to learn to do all this together'[4]

Further to our research, we found there to be a direct correlation between concerns for reducing our impact on the environment and the current state of commercial food crop production. It is fair to state that conventional

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[2] The Village – CloughJordan, Ireland – 3 Year Strategic Plan – Page 5
[3] Linden Press Release July '09 – Return of Traditional Neighbourhood Values for the 21st Century Home Buyer
[4] Quote by Al Gore in his Nobel Prize acceptance speech.

commercial agriculture markets through-out the world place an unreasonable demand on farmers to produce crops at artificially low international pegged prices. Normally so low that without some form of government aid/subsidy it would be unfeasible to do so, often to the point of selling below the cost of production. These financial pressures drive farmers to be even more aggressive in improving their yields – It is with this unrealistic demand being imposed on the land coupled with monoculture cropping and the intense use of chemicals that comes the potential hazards for the final consumers of such 'fresh' & 'wholesome' produce being pushed onto the markets today. A study on "The Involuntary Consumption of Agro-chemicals of British Consumers" estimated that the average British consumer eats around five kilograms of pesticides, herbicides and fungicides per year with his or her vegetables and fruits. Add to that the hormonal overload from animal food sources. A potentially lethal cocktail over the long-term, especially for children.[5]

On a more macro-scale we have witnessed over recent years leaps in end-use food prices many of which have been linked to climatic changes. Most recently the drought in Brazil, the floods in Australia and the fires in Russia – The Russian & Ukraine droughts and ensuing fires sparked a rise of 80% in global wheat prices.[6] High food prices are clearly adding to global poverty issues and were considered to be a factor in triggering the uprisings in northern Africa before spreading across to the Arab world earlier this year – Arab Spring.[7]

It is with this in mind that we have decided to create a concept that will assimilate agriculture in ways that are palatable to our contemporary way of life. Effectively we have decided to rekindle the small holding concept and bring it up to speed with our modern day needs – Fundamentally, a new approach to community planning. A number of stands will have varying sized land components attributed to them in order for the owner/occupier to work in accordance with the land-use management plan that will form part of the final Charter. There will be 2 main farmland use classes: Arable and Pastoral use. Various land use classes will be assigned to various sized plots in order to appeal to a wider market of clientele. We envisage these micro farms encapsulating the epicenter of the development to soften the impact of the built form on the land as well as adding a very important ingredient to the developments sustainable mix.

Another very important facet of this development is the mixed-use components we intend to offer. An offering ranging from live 'n' work units in varying sizes and locations within the development to bespoke educational and health care centres that have a very strong holistic dimension to them while still remaining true to conventional health and educational agendas.

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[5] An extract of the Monaghan Farm's web site – Under sub section 'organic at heart'
[6] Iafrica web mail/page – 28-11-11
[7] Cape Times article – 13-3-11

Its clear that people's desires and expectations in modern societies are now shifting towards a more self-sufficient, sustainable and wholesome lifestyle – Both at home and at work. This change is manifesting itself in the type of homes we live in now and how we lead our lives – Clean water & wholesome food production & consumption is now at the fore of many peoples agendas. This development recognizes such contemporary needs and wants and has interpreted them into a concept that we believe will foster, through the built form we are proposing, the creation of a strong and lasting social adhesion upon which a successful sustainable community can evolve.

Building Design & Construction

The following guide lines merely detail some of the alternative design and construction ideas and methods that we believe will set this development apart from conventional mainstream developments and other currently green developed estates.

Although there are many approaches to adding sustainability to the architecture produced these days, many examples still tend to focus only on one or two key aspects with which are sustainable. Whether their focus is reusing materials, reducing imbedded energies in construction, high efficiency design, or integrated renewable energies, it is less common to find a project which chooses to tackle as many qualities as possible – bringing into question the extent of sustainability and the tendency for sensational design.[8]

The content of the above statement is something we want to address within our proposals – It is of critical importance to us that our design & construction processes do set new standards within the industry, if we want this scheme to be an ongoing sustainable success. Quite simply we want to complement cutting edge green architectural expression with the ultimate goal of real and genuine sustainability.

The following features are just some ideas that we feel will introduce added green capital value to our scheme:

- Highly efficient building envelopes – Super insulated structures
- Grey water systems
- Rain water harvesting systems
- Low use fixtures – Such as spray taps, low flush cycle toilets, LED lighting, etc
- Introduction of a suite of micro alternative energy providers - Solar water heating systems, PV panels and wind turbines

[8] Self Sufficient Design Competition – Institute for Advanced Architecture Catalonia – Terri Boake – Page 3

- Reuse & reclamation of materials – Redundant steel cargo containers to act as the super structures for certain buildings within the scheme, etc.
- Use of local labour & material base – Also the use of sustainably sourced materials such as FSC approved timber, etc
- Healthy building design – Avoidance of toxic materials e.g conventional paints, solvents, etc

We also see the value & importance in obtaining guidance and accreditation from specialist independent bodies within this field from early on in the planning stages - Organizations such as the Green Building Council of South Africa.

Services

Services to the scheme - water, electricity and sewerage – are to be connected to the municipalities mains systems in a conventional manner. However, we feel the mains systems should be complemented with more alternative forms of input – Such as borehole water systems and the use of TREC's. This along with measures that help reduce our energy consumption such as water & electricity saving devices and designs - As briefly covered above in building design & construction. We see there being a clear fusion between the use of conventional utilities and alternative forms of energy production and input that will eventually service the sites entire needs. A legitimate and sincere step closer to achieving a real 'Clean Energy District'.

Water is fast becoming a very valuable commodity in South Africa – By 2025 two-thirds of the world's population will be facing moderate to severe water shortages.[9] Questions are also being raised by consumers as to the quality levels of municipality supplied water – This is clearly elucidated in many homes opting to purchase and use water filters & purifiers. It is with this in mind that one of the major factors influencing the final location of this scheme will be the availability to underground water pockets/reserves. Thus allowing a network of borehole systems to develop throughout the scheme in order to alleviate the already high demand and sometimes over subscription requirements to municipality water supplies. This not only supports our ethos of remaining as sustainable as possible but also reflects the current shifts in peoples mind sets to want to produce and manage their own basic services.

Electricity production and supply – As already mentioned, we intend to introduce a whole suite of micro-sized alternative energy producing elements. These will range from roof & deck mounted solar water heating systems, roof & deck mounted photovoltaic panel/cells and wind turbines. All with the purposes of reducing the current dependency on fossil fuel based energy production that currently supplies most conventional homes. At this stage we

[9] CAT (Centre for Alternative Technology)

cannot detail the final specifications or savings that these devices would be able to achieve but we are certain that the take up rate will be high among the purchasers and in some cases mandatory to be included in their plans.

It was from the outset the wishes of the developers to construct some sort of in-house alternative energy production unit, either wind turbines or solar cells, that would serve all the electricity needs of the scheme as a whole. However, after very careful thought, research and consideration they believe such an undertaking is far beyond the scope of a development scheme of this size and would be fiscally unfeasible. Notwithstanding this decision, should at anytime in the future more economically driven and efficient alternative forms of green energy production come to the market place then we would be very happy to explore these options.

As sustainability and green issues clearly form the core ethos of this scheme we cannot condone the subscription to conventional fossil fuel based power production as a means to service the power needs of the development. Therefore, we have decided to find some common ground on this issue and that has been achieved by the use of TREC's – Tradeable Renewable Energy Certificates – See Appendix 1.

TREC's are essentially units of green electricity that are produced by various registered renewable energy resources and then fed back into the national grid for conventional consumption by the public. Consumers pay a small premium for this green & sustainable electricity and in return they are awarded with a certificate confirming such. TREC's provide a very cost effective mechanism in linking a renewable electricity supply to an end consumer and allows this to occur within an existing transmission & distribution infrastructure – The national grid. With this system of green power procurement it is effectively not necessary to have a renewable generator on one's premises in order to realise the benefits of green electricity.[10] During the writing of this report we have come across a similar scheme being offered by the City Council of Cape Town – See Appendix 2.

Sewerage & waste treatment – We see this being managed in a conventional manner by the Municipality. We envisage there to be a strong focus on recycling household & commercial waste with communal recycle drop off zones within the development – Including mandatory household recycling bins, as seen in many European countries today.

The idea of composting toilets were also initially discussed, however, they are in many cases alienated against by many potential customer bases. The possibility of introducing maybe 1 of these facilities in each home is a possibility and the use of them in common areas also has merit. This option is definitely open for further consultation and discussion as empirical data

[10] GreenXenergy – See Appendix 1

illustrates that toilet use in the average family home represents circa 30% of daily water consumption for an average family of 4 people – That equates to 110 litres of potable water literally flushed down the drain each day. As a matter of fact as far back as 1982, there were already 300,000 composting toilets installed in Scandinavia. At least one Swedish municipality currently equips 70% of all new housing with composting toilets.[11]

As previously touched upon in the buildings design and construction section, the introduction of low use water fittings and appliances are to be incorporated along with rain water harvesting and grey water systems which will fundamentally help reduce the drainage load on the mains system.

Working Land Components

In our preamble we briefly discussed the clear and apparent need for an organic based food production system to take place within the scheme. We believe the best way of achieving this is by means of a network of micro-sized farms that would encapsulate the development. These farms will of course form an integral part of the development and its working community, they will also serve to illustrate how modern sympathetic green development can blend seamlessly into rural settings without compromising the aesthetics or traditional food crop production. These working land parcels will further the level of autonomy at which people are able to produce and manage their own 'wholesome' & 'organic' food production – Thus confronting contemporary concerns of food security directly.

'Today more and more people are beginning to question how and where their food has been produced, and they want to take control, to a lesser or greater extent, of the food they eat. For many, the most obvious way of doing this is to grow their own fruit & vegetables and keep their own animals and poultry'[12]

Various land use and classes need to be carefully determined & assigned to all the land components to ensure a wide diversity of food production takes place as well as enhancing the overall aesthetics and biodiversity of the rural-scape.

Extensive land management directives will be required to be drawn up detailing exactly the scope of arable or pastoral (or a mix of both) use that is permitted to be employed on the varying pockets of land. We see the use of comprehensive guides within this package that detail ethical and organic ways in which to work the land as valuable information resources for the owner/occupiers of these micro-farms. Biodynamic and permaculture farming disciplines need to be explored in more depth here as they offer great opportunities within the context of this scheme.

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[11] www.greensense.com/gr_mod.htm
[12] Self Sufficiency – Liz Wright – Page 10

Clearly it is imperative that we steer clear of traditional & conventional based farming methods and practices and promote a much more organic and lower impact set of farming principles.

'We are some fifty years into a mass experiment into human nutrition. We are all eating basic foods that have been stripped of the antioxidants, trace elements and essentially fatty acids that once promoted good health. Is it any wonder that many of our body maintenance systems are breaking down in our middle age or earlier ? '[13]

The above statement by Graham Harvey, a leading expert on farming & nutrition, is very much in line with the findings and views of a multitude of other leading figures within this field. We see the proposals in this model as addressing these key issues and concerns that relate to existing farming practices and a way of putting forward realistic 'green' options and frameworks that can be achieved without compromising crop production or yield. It is not the intention at all of this development to take existing valuable farm land out of the food chain loop for non-sympathetic property based development to take place but merely to offer an alternative & softer green approach to convention that will ultimately enhance food crop yields on existing farm lands.

Mixed-Uses

In line within our theme of endeavouring to achieve a dynamic cultural, social, economic, environmental, architectural and fiscal mix within the model we believe the incorporation and promotion of various mixed-use building classes are of extreme importance in regard to the overall success of the development. We are very mindful that our scheme does not fall into any conventional mono-style or mono-use development class.

Live 'n' work offerings should be highly diverse and range from business start-up's, commercial incubators, cottage-based industries, NGO's, pre-retirement individuals (soft transition to retirement – down scaling!), light use professionals, etc. We see these components as extremely instrumental features in adding value to the model and its eventual ability to perform as a functioning sustainable community. Such mixed use buildings were introduced into certain areas of the East-end of London in the 1990's in order to act as catalysts for the regeneration of such nodes – They were a complete success and still remain a fundamental feature of these areas.

We also envisage an educational facility to form part of the mix – Possibly a Montessori styled learning centre. There seems to be a growing trend among many parents to want to explore alternative learning based activities for their

[13] Sufficient – Guide to Sustainable Living – Tom Petherick – Page 21

children. It is hoped that the final educational centre to be proposed will accommodate such trends whilst still preserving more traditional based curriculums.

Another cornerstone feature of any sustainable community is its ability to offer some sort of healthcare component. A fusion of a traditional medical service combined with a more holistic based approach to healthcare would lend itself to this model very well. Offering a wide suite of services that not only the immediate community would benefit from but of course the surrounding communities too.

Traditional offerings of retail and hospitality opportunities will also be catered for in order to complete the diverse operational mix of the scheme. Following on from the commercial applications of such building stock, we see the introduction of certain vocational training centres – Such as a hotel school, etc. Another area of strong focus will be on alternative retail type concepts such as 're-use centres' – For anything from computers to farm machinery. Offering people previously used and salvaged materials & equipment that would have otherwise ended up in land-fill sites. Such green cutting edge enterprizes would be imperative to the retail success & sustainability of the area.

The associated positive socio-economic effects that percolate through to the community and its surrounding areas must also be appreciated when factoring in these mixed-use features. There is a positive correlation between the generation of new & far reaching business activities within an area and the upliftment in the local employment rates, opportunities and subsequent improvements in local training and skill bases. This is just another dimension to the model that demonstrates a different approach to conventional rural regeneration and its upliftment.

There is clearly a strong desire by the development team to create and build on social opportunities for the immediate community and its surrounds. There are two fundamental ways to generating local social benefits/opportunities out of a property development scheme of this nature; firstly from the resources directly invested into the development itself & secondly by attributing a percentage of the developments profits to assist with local developmental needs.

The resources invested directly into the development that are likely to cultivate social opportunities/benefits could range from:

- Community based buildings – Community hall, community market centre, community health & educational components.
- Ensuring local job opportunities arise from the procurement of the development – Such as making sure certain sub-contracts works are small enough so they can be tendered for by local artisans, etc.
- Vocational training facilities – Such as a hotel school, etc.

- Offering small work/industrial premises at discounted rents in order to kick start local industries/entrepreneurs.

Alternatively attributing some of the developments profit back into the surrounding communities to assist with local developmental needs – This could range from:

- Subsidizing an orphanage or crèche
- Improving local infrastructure
- Subsidizing/improving a local healthcare facility
- Creation of local Trusts that administer scholarships/bursaries for local individuals.

The above offers a brief insight as to our commitment, however, I think it is fair to surmise that the social component of a scheme of this size is one that is clearly very convoluted and dynamic by nature and will require the input and advice from the relevant authorities and parties in order to achieve optimal effectiveness. We ultimately need to achieve a sincere level of 'community-buy-in' for any successful social program to work.

Concluding Comments

There are many definitions and there are many different ways for communities to attain a more sustainable future. The sustainability of a community depends on creating and maintaining its economic and environmental health, promoting social equity, and fostering broad-based citizen participation in planning and implementation. Communities that engage citizens and institutions to develop sustainability principles and a collective vision for the future and that apply an integrative approach to environmental, economic, and social goals are generally likely to be more successful.

Job creation, energy use, housing, transportation, education and health are considered complementary parts of the whole. Since all issues are interconnected they must be addressed as a system. The process includes:

- Broad and diverse involvement of citizens
- The creation of a collective vision for the future
- The development of principles of sustainability
- Clear & measurable goals
- The development of community indicators to evaluate progress
- Open and transparent communication
- Early & visible results
- Celebration of success

Sustainability is a process of continuous improvement so communities constantly evolve and make changes to accomplish their goals. The initiatives and resources mentioned in this report have been selected to help elucidate the ways to make communities healthier, safer, greener, more livable, and more prosperous.[14]

As part of my research for this scheme I travelled to the U.K in order to visit a number of existing alternative sustainable & intentional communities - I thought it to be of great value to explore the actual working nuts 'n' bolts of such communities first hand. There was one overriding theme that seemed to resonate from all the communities/developments I visited throughout Scotland, Ireland, Wales & England – One of general market alienation. Such communities are still viewed by much of the mainstream public as being hippie like communes with strong spiritual undertones. Its these synonymous, which are not always founded, views that fundamentally alienate their building stock from the conventional market place – Often resulting in lower demand & prices. This is an element we are very conscious and concerned of addressing in order to ensure our scheme will not be subject to such marginalizing sentiments & comments when its launched to the public. The underlying commercial success of this scheme will rely on our ability to ensure it is well received by the general market place without any negative preconceptions.

We feel environmental awareness is no longer optional. The legal, Fiscal & planning frameworks, as well as the demands of increasingly informed building occupiers and owners, make it essential for property developers to understand the issues affecting sustainability. The key success to this model lies within its ability to be environmentally & personally sustainable within a coherent community framework that will in itself organically promote & foster socio-economic development & enhancement.

Quite simply, we believe we all have to refocus the lens we use to view our planet and the way we live if we want positive changes to happen. What we are proposing here is a platform for those positive changes to materialize and one that is currently well in advance of prevailing political leadership and planning frameworks.

[14] http://www.sustainable.org/about

APPENDIX 1

SOME FREQUENTLY ASKED QUESTIONS

What is Green Electricity or Green Power?

Green Electricity – also called Green Power – is electricity which is derived from *renewable energy resources* and which is generated in a *sustainable manner*. The Association of Issuing Bodies (http://www.aib-net.org/) defines green electricity as that generated by wind, solar, water (small hydro, wave, tide), geothermal, biomass. It excludes electricity generated from nuclear energy and landfill waste.

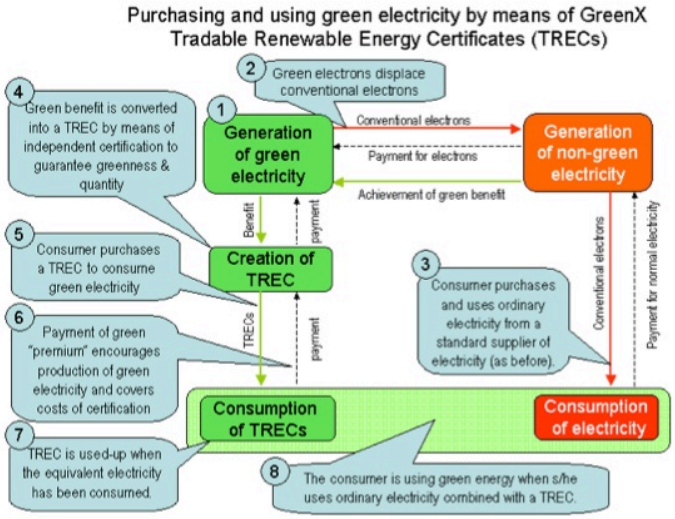
What are TRECs and how do they work?

Tradable Renewable Energy Certificates (TRECs) represent the non-energy value of units of certified green electricity. In essence, a TREC is an auditable financial instrument that reflects the attributes of green energy independently of the actual units of energy – i.e. the 'greenness' value is separated from the electrons. TRECs are normally denominated in 1 MWh units.

A green generator (suitably registered as such) produces electricity which is supplied into the national grid for distribution and is consequently 'mixed up' with undifferentiated electricity such as from coal, nuclear and diesel generated electricity. However, under a TREC system, the green generator is also issued a certificate (a TREC) at the time of generation which certifies the quantity and type of green electricity produced. This certificate can be marketed and sold separately from the associated electricity which has gone into the grid. Discerning customers are then able to purchase the certificate(s) and, when electricity is consumed from the grid it may be re-combined together with the purchase of the green certificate, effectively allowing for green electricity to have been used. The TRECs are redeemed at

this point and the customer is able to claim the benefits (environmental and others) of the Green Power at this stage.

The flow diagram below illustrates the process which enables customers to procure green electricity by means of a TREC system.



Why the TREC approach?

The choice by customers to use renewable resources of energy directly avoids climate change emissions and stimulates the development of a more sustainable energy economy. However, many potential RE customers are unable to generate their own renewable energy on (or adjacent to) their premises and consequently TREC's provide an effective mechanism of transferring the value because the certificates allow the consumption to be physically separated from the generation while maintaining the value – effectively it is not necessary to have a renewable generator on one's premises in order to realise the benefits of green electricity.

The approach is designed to stimulate investment in new renewable energy projects by providing a revenue stream for developers thus stimulating the renewable energy generation industry. Furthermore, the TREC approach directly matches buyers and sellers in the most efficient and cheapest way, and finally enables customers to use any quantity of green electricity up to 100%. The green benefits experienced by the consumers are as real as they would be with direct local supply.

What are the benefits of purchasing TRECs?

TRECs provide internationally accepted proof of an enterprise's procurement choice in terms of energy. Using green electricity, as reflected in terms of TRECs, makes a significant contribution to a company's sustainability targets and triple bottom line reporting. TRECs have the additional practical advantage that there is no physical impact on the customer – no additional equipment required. It is the cheapest way to procure renewable energy as it optimises the use of existing transmission and distribution infrastructure.

By outsourcing the local carbon and resources issues to achieve economy of scale, the TREC based certificate system allows generation to be at optimal sites and the benefits to accrue at a customer site anywhere. Further, greater system diversity provides protection against future fossil fuel price uncertainty as well as supply security in the economy.

How does a generator get registered in order to produce TRECs?

Renewable energy generation plant may be registered as a Green Power Generator (known as a Renewable Energy Production Device) by completing the Renewable Energy Declaration process and the Registration of a Renewable Energy Production Device. This document is completed on the basis of a technical inspection of the generation system under the

auspices of the South African Tradable Renewable Energy Certificate Issuing Body (SATIB). Currently SATIB is in the process of being formed - the Department of Minerals and Energy (DME) in South Africa commissioned a study to examine the industry and confirm the appropriate governance mechanism and this initiative is being formalised by the SA National TREC Team which is convened by the DME.

(http://www.dme.gov.za/energy/renew_TRECS.stm).

How are TRECs priced?

Currently, electricity generation in South Africa is predominantly undertaken by the state utility, Eskom, and is based on low-grade coal and diesel production. Until recently, Eskom electricity has been amongst the cheapest electricity worldwide. Although the differential is reducing, the costs of renewable energy generation are still higher than that supplied by Eskom. Consequently, TRECs are priced at the differential between the cost of new renewable energy generation (say large-scale windpower generation) and the Eskom supplied cost for existing coal-fired plant. This premium provides a revenue stream to stimulate the investment in new RE generation infrastructure.

Normal administration and marketing costs are added to arrive at the final TREC price. The cost of Eskom power will rise significantly in the near future as the costs of investment in new capacity are factored into the pricing structure. This will have the effect of reducing the apparent premium on Green Power.

Is there an independent governance body and, if so, what is its role?

The green electricity certificate industry is in its infancy in South Africa. The first Green Power transactions for venues of the World Summit on Sustaibnable Development in 2002 were effected through a register provided by the National Electricity Regulator (now NERSA). Since then, the DME commissioned a TREC study to determine the most effective way to stimulate the growth in renewable energy generation. This study made recommendations for he establishment of a TREC Issuing Body and this is currently in the process of formalisation. The Issuing Body and will ultimately be the governance authority for the industry. It will be based on the European Association of Issuing Bodies (AIB). In the meantime, the registration of Production Devices is undertaken by suitably qualified energy consultancies and the central certificate register is maintained by Nano Energy.

Where does GreenX Energy source TRECs?

TRECs can be sourced from any green generator that has completed the Renewable Energy Declaration process and has been registered as a Renewable Energy Production Device as laid out in the Principles and Rules of Operation of the AIB.

GreenX Energy currently sources TRECs which are based on electricity generated in the sugar industry in South Africa. Green electricity is produced from burning of bagasse (fibrous residue from the sugar production process) in boilers to produce steam which is converted into electricity in turbine alternators. Bagasse is a renewable energy source as the sugar cane plant is an annual crop which absorbs carbon dioxide in its growth cycle. Each turbine has a calibrated meter which records the production output.

Currently, GreenX Energy is negotiating to purchase wind generated TRECs from a new wind turbine in Namibia, as well as TRECs generated from a rural solar electrification project, and also looking at sourcing TRECs from a small hydro plant.

Who are some of GreenX Energy's clients?

GreenX Energy numbers amongst its client base multinational corporations such as oil major, BP, and pharmaceuticals giant, Johnson & Johnson. The agreements vary in duration but generally extend for between 3-6 years. Longer term contracts are attractive because they recognize the essence of green electricity - price consistency over a long period.

In addition, GreenX Energy supplies TRECs to numerous conferences that desire to operate on Green Power.

Emissions saving in South Africa from green electricity generation

Electricity in South Africa is produced primarily by the state-owned utility, Eskom, using fossil fuels, mainly low-grade coal. The resource savings and emissions eliminated per 1 MWh (per TREC) by the displacement of 'dirty' electricity green electricity are as follows:

- Water consumption saved: 1320 liters
- Coal consumption saved: 560 kg
- Ash production avoided: 161 kg
- Ash emitted avoided: 0.23 kg
- SO_2 emissions avoided: 8.69 kg
- NO_x emissions avoided: 4.39 kg
- CO_2 emissions avoided: 1,200 kg (based on UNFCCC/CDM methodology) (Source: Eskom Annual Report 2008)

What is the difference between TRECs and carbon offsets via CDM?

Certified Emission Reductions (CERs) form part of the Clean Development Mechanism (CDM) process establish at Kyoto. TRECs and CERs are different but complementary in as much as TRECs provide a mechanism to supply green electricity within a voluntary market (at present in Southern Africa) and CERs provide a framework for funding and transacting global emission reductions in terms of the Kyoto Protocol.

In essence, CERs can be generated from any project that reduces emissions (the project needs to be duly registered as part of the CDM process) whereas TRECs access the broader benefits associated with green electricity generation and utilization, namely increased price certainty, generation diversification, better job creation opportunities and the establishment of a viable renewable energy generation industry in addition to the emissions reductions associated with RE.

How long has GreenX Energy been in business?

GreenX Energy was established in 2003 based largely on the experience derived from a pilot Green Power trading project in 2002 for the World Summit on Sustainable Development. The Green Power for the WSSD project supplied 854 TRECs (corresponding to 854 MWh of electricity) to two of the main venues for the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002. Glynn Morris, one of the founders of GreenX Energy, secured a budget from USAID and was the project leader of the Green Power for the WSSD Project. The project was implemented by AGAMA Energy and other partner organisations including the National Energy Regulator (now the National Energy Regulator of SA, NERSA).

GreenX Energy is a privately owned company (operating as a 100% subsidiary of AGAMA Energy (Pty) Ltd) with offices at the Green Building in Westlake, Cape Town, South Africa.

What is the nature of the GreenX Energy business?

Essentially GreenX Energy markets and sells green electricity certificates, Tradable Renewable Energy Certificates (TRECs). The primary aim of the company is to value the 'greenness' or non-energy benefits of renewable energy production and engage in a commercial mechanism for trading this value in a Green Power market. Initially, GreenX Energy's customers are predominantly multi-national corporations (in retail, manufacturing and commerce). We are currently looking at ways to provide Green Power solutions to the individual household customers.

What products does GreenX Energy market?

As already mentioned, GreenX Energy sells Tradable Renewable Energy Certificates (TRECs) which attest to the fact that the customer is paying for the benefits of green (or cleaner) electricity.

Where can I get more info?

For additional info about green energy, TRECs or GreenX Energy, contact Glynn Morris at GreenX Energy (Pty) Ltd, The Green Building, 9b Bell Crescent Close, Westlake Business Park, 7945, South Africa (email: glynn.morris@greenxenergy.com) or visit the website on www.greenxenergy.com.

APPENDIX 2

THIS CITY WORKS FOR YOU

Renewable Energy

Delivered to Your Door

The Cost of Conventional Electricity

Cost to generate conventional electricity ≈ 14c per kWh

Not the true cost-need to factor in:

Cost of replacing aging infrastructure (new coal energy 60c-70c per kWh)

The Environmental cost

- Global warming (carbon emissions)
  - Eskom supply: 1 kWh ≈ 1 kg CO_2
- Pollution (e.g. acid rain, ash, smog)
- Community health
- Finite resource

Cost of carbon ≈ €10 - €30 per ton CO_2 ≈ 1c-3c (ZAR) per kWh.

Why buy Renewable Energy when it costs more?

A. Because you have to (Legislated)

B. Because you want to (Voluntary)

- Good business sense- economic pressure, long term sustainability
- Moral obligation “It’s the right thing to do!”
- Foresight- children’s legacy

Network Arrangements

THIS CITY WORKS FOR YOU

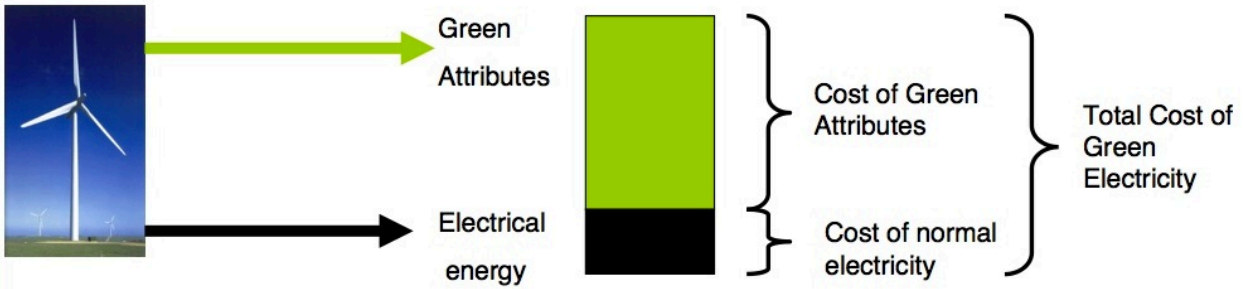
It is impractical to lay separate powerlines from R/E sources to consumers

Renewable electricity generally injected onto the utility electrical grid

Consumers

Components of Renewable Electricity

THIS CITY WORKS FOR YOU



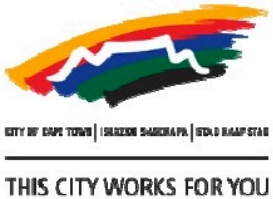
Green characteristics and electric energy are separated, the green attributes represented by a financial mechanism called a “Renewable Energy” or “Green Electricity” Certificate

Renewable Energy Certificates

Renewable Energy Certificates

- A financial mechanism representing intangible assets
- Usually exists only as an electronic record
- Represent all the benefits of the renewable energy and excludes the supply of the electrical energy itself.
- Purchasing Green Electricity Certificates transfers the right to claim the benefits of the Green Electricity from the seller to the purchaser.
- Usually 1 certificate=1 MWh
- Separate from Carbon Emission Reduction certificates (CER's)
- Usually transferable/tradable

The AIB Pro



Use of EECS Certificates

Certification of the quality and method of energy output provides an efficient mechanism for accounting for: the quality of energy supplied to consumers and its method of production; the progress made towards targets for the use of sustainable energy technologies; and the production and consumption of energy for the purposes of stimulating investment in sustainable energy plant. Moreover, certification enables a value to be accorded to specific types of energy output and traded separately from the energy itself.

For a system of energy certification to discharge these functions effectively, users of the Certificates – producers, traders, suppliers, consumers, NGOs and governments – must be satisfied that the Certificates provide reliable evidence of the qualities to which they relate. The EECS framework functions to ensure that all such users have confidence in the Certificates issued and processed by AIB Members under EECS.