

# Horizon Energy Profile

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## **1 INTRODUCTION AND BACKGROUND**

Horizon Energy is a 100% Black Economic Empowerment (BEE) Company formed in 1999, which operates as an environmental, energy and engineering consulting company focusing on the power and related businesses in South Africa.

We are one of a few black economic empowerment companies, which operate as an investment, environmental, energy/renewable energy and engineering consulting company in South Africa. The current focus of the company is in the area of Renewable energy, Distributed and Grid energy technologies and alternative energy expertise.

Horizon Energy was created due to a concern over the increasing threat of climate change and high electricity prices. The focus is towards renewable energy sources and cleaner fuels, as well as using the existing resources more efficiently.

The current state of the economy has seen production cost of power increase drastically, and commitments made by governments such as the Kyoto Protocol, has seen industry scramble for solutions to not only reduce energy costs but to improve their social standings by reducing their carbon footprints. It is a well-known fact that listed companies who are responsible in their approach to energy conservation and management have enjoyed a considerable increase in market value. Taking all of this into account we have recently seen a dramatic increase in the number of energy efficiency companies in the marketplace many of whom are opportunistic in nature and do not have the requisite skills or tenure in the industry to offer clients the type of solutions they need. Horizon Energy differentiates itself in that we offer a turnkey and holistic energy efficiency solution covering all aspects of our client's business.

Each Energy Efficiency Solution is custom-built based on the special requirements of that specific client. With a number of products, covering every sector of our customers' energy needs, our solutions are geared to obtain an optimised energy saving, which in turn reduces their carbon footprint and raises their social responsibilities. The savings in utility bills is also substantial and significant given the international economic down turn experienced in recent years.

Horizon Energy offers consulting services and has a strong product research division, which is constantly striving to find the most innovative and cost efficient energy saving devices and systems. In their quest for perfection, Horizon Energy employs scientifically proven methods which utilize real time customer statistics, to establish a benchmark (ROI) return of investments for their clients. No "guess work" is employed.

Horizon Energy further partners with award winning industry specialists in energy efficiency products and solutions.

## **2 HORIZON ENERGY VISION**

To be the preferred provider of comprehensive Energy Efficient Solutions in Southern Africa.

## **3 HORIZON ENERGY MISSION**

To be a key catalyst in cementing a "GREEN" mindset within businesses across Southern Africa.

## **4 HORIZON ENERGY OBJECTIVES**

- To assist in reducing the demand for energy in Southern Africa;
- Reducing the carbon footprint for residential, industrial, corporate, commercial and government clients; and
- Reducing energy expenses for residential, industrial, corporate, commercial and government clients through the implementation of environmentally friendly solutions

## **5 HORIZON ENERGY VALUES**

- Integrity
- Mutual respect
- Trustworthiness
- Commitment to agreed-upon outputs
- Accountability
- Transparency in the way we conduct business

## **6 HORIZON ENERGY GREENING POLICY**

Horizon Energy is committed to a 'triple bottom line' measurement of success, i.e. assessing economic, environment and social performance. This also aligns with EPA's Energy Star programme which is predicated on optimising energy performance as the primary means of lessening environmental impact and enhancing asset value. The energy consumed by a building over its 40 -50 year life exponentially exceeds the energy and fossil fuels consumed for the buildings materials and development. Combine this with research showing that energy is the single largest and most controllable operating cost in an office building (representing 30% of a buildings total cost), and the importance of optimising energy performance becomes indisputable.

In this regard Horizon Energy provides an Environmental Impact reduction that helps an organisation to follow Health and Safety guidelines in the office. Our mission is to be a key catalyst in cementing a "GREEN" mindset within businesses and the public across Southern Africa. Hence our solutions and products are environmentally friendly and encourage a "GREENER" environment through a decrease in carbon footprint.

## **7 HORIZON ENERGY VALUE PROPOSITION**

The business expertise of Horizon Energy which includes the fields of electrical engineering, civil engineering, property management, telecoms, IT, project management, consulting services, general business management and strategic planning as well as execution, provides our clients with a broad range of skills and capabilities.

We offer our clients the following benefits:

- Competitive market related fees
- Professionalism in every aspect
- Cost effective operational outfit with efficient administration
- Competent and skilled staff
- Compliance to relevant legislation

- Dedication of our professional attention and cooperation in selecting the best qualified and most suitable project resources

## 8 HORIZON ENERGY BUSINESS PROCESS

The HORIZON ENERGY business process employed is designed to offer the client maximum value and peace of mind:

- ❖ Initial meeting:
  - Introduction to Energy Efficiency products and services
  - Establish client's needs, goals and objectives
  - Agree expectations and timeframes
- ❖ Energy Audit and Assessment:
  - Data logging of facility
  - Detailed assessment is carried out on the facility
  - Data collected from audit and assessment will include
    - Hours of operations
    - Square meters of facility
    - Types of measures in the facility
    - Location and quantities of measures
- ❖ Project Analysis
  - Electricity bills and tariffs are analysed
  - Data logger information analysed
  - Building audit and assessment analysed
  - Proposal formulated from above information
- ❖ Project Proposal
  - A meeting will be held to discuss the following:
    - Project Proposal
    - General scope of work to be performed
    - Financing options, if needed.
  - Once the client accepts the proposal and purchase order and deposits have been received, a pre – installation meeting will be scheduled.
- ❖ Pre- Installation Review
  - A meeting will be carried out with the client to establish a project plan for the installation of the proposed solutions
  - Financial payments will be scheduled according to installation project plan
- ❖ Installation
  - Working under close supervision from HORIZON ENERGY, the installation and retrofitting of the energy efficiency products and solutions will be carried out
- ❖ Post Installation Review
  - Upon completion of the installation, HORIZON ENERGY conducts a post-installation review with the client, to verify the installation has been carried out as stipulated and any snags encountered are programmed out for completion

#### ❖ Project Completion

- Upon completion of the encountered snag list, HORIZON ENERGY will conduct a final installation review with the client, to verify the installation has been carried out to client's satisfaction
- Final payments to be paid on completion, and final paper work to be finalised as needed

HORIZON ENERGY partners with its clients throughout the process to ensure a seamless installation.

## 9 IMPLEMENTATION FRAMEWORK

The following implementation framework applies to larger projects.

### 9.1 Project Management approach and Methodology

Horizon Energy uses and keeps up to date with latest developments in the project management profession and will use approaches and methodologies that fit the client needs.

Standard templates are used and customised, but where required, the client's documentation is used.

### 9.2 Interpretation of the Scope

Subsequent to receiving the Brief, scope is clarified with key stakeholders through several communication forums including specific meetings with client. Once agreed and finalized, the scope is captured in a Scope of Works (SoW) document, which is signed off by all key stakeholders. The content of the SoW are agreed upfront with the client.

### 9.3 Determination of Project Objectives

Key project milestones and objectives are established during the Scope interpretation phase and further streamlined through workshop forums, where the client's input is of critical importance for agreement.

### 9.4 Communication Strategy

Most importantly is the single point of responsibility, accountability and communication established with the appointment of the HORIZON ENERGY project manager. The project organogram, which includes HORIZON ENERGY and client staff, assists in establishing the communication lines and escalation processes that will be applied during the duration of the project. This addresses the elimination of miscommunication. A project contacts list is compiled with contact details of all key project and stakeholder personnel.

Key project communication channels include:

- Initiation, site handover and clarification meetings
- Progress meetings

- Steering committee meetings
- Monthly reports, the content and format of which will be jointly defined with the client. It is expected to reflect as a minimum, a comparative study of baseline consumption, cost and carbon footprint vs post implementation statistics. Where historical information is not available, data loggers will be installed to track and establish baseline values for comparison. Data collection intervals and analysis will be agreed with the client.
- Telephony: Cell phone and landlines
- Written: email and fax

All meetings are formally recorded. Where communication becomes more complex, a comprehensive Communication Plan is compiled with inputs from the client and relevant stakeholders.

Horizon Energy facilitates communication with all stakeholders as per the client's brief.

## **9.5 Project Parameters**

Project parameters are established during the scoping exercise and include workshop forums where goals, milestones, parameters are clearly defined and documented. All key personnel sign off the resulting reports.

## **9.6 High Level Programme**

Microsoft Project is applied extensively as a planning and scheduling tool. Both the high level programme and the detailed project plan will be developed using MS Project. Project programmes are agreed with the client through workshops and meetings from high level to detail taking into consideration all stakeholders, e.g. technical professionals, contractors, authorities, etc.

## **9.7 Project Risk**

Risks are identified, quantified and proactive responses are developed in project risk workshops. Mitigating steps are agreed with the client and comprehensively documented. All the results are documented and signed off by all key stakeholders. Risks are monitored on an ongoing basis and reported on accordingly

## **9.8 Anticipation of the internal and external project environment**

Internal and external analysis forms part of the project risk assessment process and includes identification of key internal and external stakeholders, assessing potential risks with regards to obtaining buy-in from these stakeholders (including sponsors, technical experts, and contractors), potential conflict conditions as well as the impact of internal and external environmental conditions which may influence the project positively or adversely.

## 9.9 Asset Management

An asset registry will be developed in association with the client and maintained during the course of the project by Horizon Energy. A functional asset registry will be included in the hand over process at the end of the project

## 9.10 Operations and Maintenance Manual

An operations and maintenance manual will be supplied at project handover for field maintenance. Dedicated project managers that have the necessary skill set to execute the project effectively. Horizon Energy already has a database available of local installers in each province to execute the works.

## 9.11 Project Close Out

At project completion, a final project report summarizing the client's energy reduction/savings including reduction in energy emission on buildings, street lights, traffic light and billboards will be compiled for handover. Furthermore, a business case for the replacement of current energy inefficient client infrastructure will also be prepared and submitted for consideration.

# 10 HORIZON ENERGY CONSULTING SERVICES

HORIZON ENERGY offers the following consulting services:

- Renewable energy engineering
- Renewable energy management
- Energy management
- Power consumption management
- Facilities management
- Carbon Trading

# 11 HORIZON ENERGY EFFICIENCY SOLUTIONS AND PRODUCTS

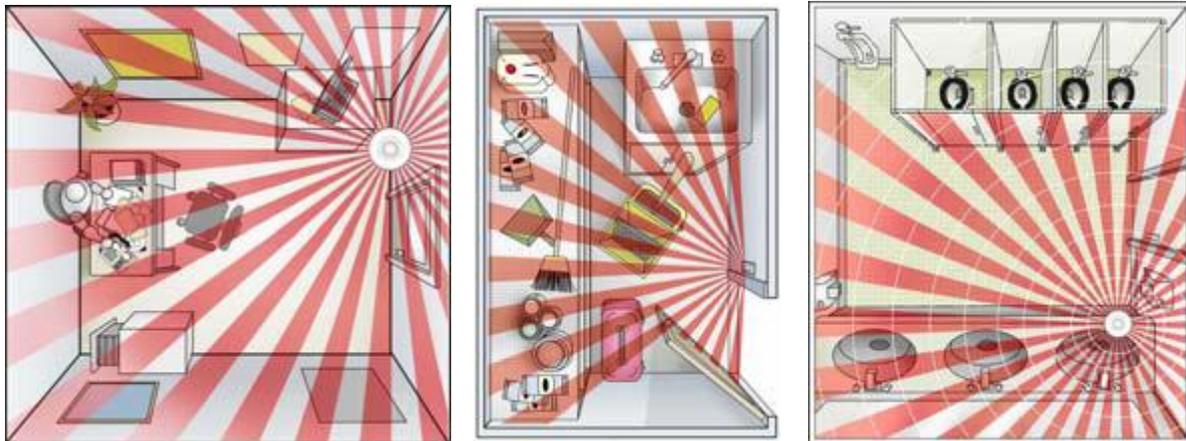
## 11.1 Lighting Solution

### 11.1.1 Occupancy Sensors

Horizon Energy implements an **Electro Sense Proactive Energy Management System™** that is based on cutting-edge sensor, light and electrical engineering. Occupancy Sensors detect occupancy in an area and switches on the lights, when there is no occupancy in the area the lights are automatically switch off.

This sensor technology utilises the fact that the human body radiates heat. Just as light, this heat is part of the spectrum of electromagnetic waves and is known as infrared radiation.

Three highly sensitive pyro sensors detect human infrared radiation; the light sensor measures ambient brightness. Microphonics and High Frequency technology is used where necessary.



In terms of modern building management, this lighting solution affords contemporary convenience and cost-cutting efficiency. The system is practical and simple to operate, and because it only switches on the light when it is actually needed. Occupancy Sensors could reduce your lighting portion of your energy bills by 40% - 90%.

The typical application for occupancy sensors would be in the Corporate, Commercial and Industrial Sectors. These sensors would be strategically installed in areas such as Offices, Open Plan Offices, Boardrooms, Storerooms, Kitchens, Bathrooms, Basements, Underground Parking, Passages, Warehousing and Storage Facilities.

### 11.1.2 Lighting Ballast Retro-fitting

All Fluorescent lighting is controlled by what is called a “Ballast” to ignite the gas inside the tubes. Conventional Fluorescent lighting is fitted with Magnetic Ballasts (Old Technology) which require a large amount of energy to operate this ballast. Electronic Ballasts (New Technology) requires far less energy to operate. These Ballasts are around 30% more efficient than the old Magnetic Type Ballasts.

As part of our lighting solution, these inefficient Magnetic Ballasts are retrofitted with new technology Electronic Ballasts. Various leaders such as Phillips, Osram and BAG in the field of electronic ballast technology are used as suppliers. Each facility will be individually audited, and the best electronic ballast will be specified for the application.

### 11.1.3 Inefficient Globe Retro-fitting

With the advent of CFL (**compact fluorescent light** or **energy saving light**) we are able to replace standard inefficient incandescent lamps with CFL’s which greatly reduce energy costs. With the technology now available, we are able to retro-fit existing Low-bay, high-bay and flood light fittings that are generally fitted with high wattage Mercury Vapour, Metal Halide and Halogen globes, to energy efficient CFL globes. These halve the energy consumption, but yet produce the required lumens needed.

As part of our lighting solution, incandescent and high wattage globes are retro-fitted to energy efficient CFL globes. Horizon Energy has partnered with a leading manufacturer from Germany and Hong Kong and is their distributor and

installer of energy efficient CFL Globes. Each facility will be individually audited, and the most efficient CFL will be specified for the application.

#### **11.1.4 Retro-fitting Old T12 & T8 Fluorescent Globes**

Old technology T12 and T8 fluorescent globes found in most fluorescent light fittings are 40% more inefficient than the new technology T5 fluorescent globes. Horizon Energy supplies and installs a retrofit solution to existing fluorescent light fittings, that converts the T12 and T8 fluorescent globes to new technology T5 fluorescent globes.

No rewiring or new light fittings are required and there is no flickering from the globe as it starts up. This new T5 technology offers 30% more brightness watt for watt, than the old T8 or T12 technology. These T5 globes are longer lasting and have 80% less mercury than T8 and T12 globes. This retrofit carries SABS/IEC certification and approval.

This solution is an alternative to the electronic ballast retrofit solution. A savings of up to 70% could be realized with the new technology T5 retro-fit solution installed.

#### **11.1.5 LED Lighting Solution**

The lighting efficiency of the new high power LED light bulbs is nearly eight times that of incandescent lights, and twice as high as compact fluorescent lights. LED bulbs also emit a much higher percentage of light in the desired direction. This makes them even more efficient compared to either incandescent or fluorescent for task lighting, desk lamps, reading lights, spotlights, flood lights, and track lighting.

LED light bulbs also generate very little unwanted heat. The energy savings may be doubled in air-conditioned environments where each watt of incandescent lighting can add another watt or more to the power needed for air conditioning.

LED bulbs can operate for 50,000 hours or more. One LED light bulb can easily outlast 30 incandescent bulbs, or 6 compact fluorescents. LED bulbs cost less than the bulbs they replace. Operating 12 hours per day, LED light bulbs can last 7 years or more.

These lights are not sensitive to shock, vibration, or the extreme temperature changes that can quickly ruin fragile incandescent bulbs. And unlike fluorescent bulbs which wear out much faster if they are frequently turned on and off, LED bulbs are not affected by frequent on-off switching.

LED lights use 90% less energy than conventional incandescent bulbs and less than half the energy of compact fluorescent lamps. Consuming less energy, results in fewer greenhouse gas emissions being released into our environment.

Also, because each LED product is designed to last for 50,000 or more hours, there is less landfill waste from burned-out incandescent bulbs and no dangerous mercury waste from fluorescents.

**Before: 50 Watt Halogens**



**After: 5 Watt LED's**



Horizon Energy supplies and installs the full spectrum of LED lighting for every conceivable application tailor made to specific requirements

The LED's carry a 3 year swap out guarantee in the event of defect

## **11.2 Air-conditioning Solution**

### **11.2.1 Air-con Energy Saving Unit**

Air-Conditioning accounts for a significant portion of the electricity used in most offices, hotels, hospitals and other facilities across South Africa. In some cases Air-Conditioning accounts for almost 50% of a facilities monthly electricity bill.

Typical air-conditioning systems operate continuously until the room thermostat is satisfied. During this time it will run the compressor and produce greater cooling capacity than the air can absorb. This is a waste of energy. The Air-con Energy Saving unit detects this wastage and switches off the compressor, leaving the fan to continue blowing over the cooled condenser. Once the Air-con Energy Saver unit detects that the air temperature has risen, the compressor is switched on to cool the condenser. This Air-con Energy Saver unit removes the inefficient part of the cooling cycle.

The Air-Con Energy Saver unit saves electricity by reducing your air conditioning costs between 10% to 40%.

The Air-con Energy Saver unit is retro-fitted to existing Split Air-conditioner, Window and Packaged Air-Conditioner units, in the Residential, Commercial, Corporate and Industrial Sectors. There is no need to replace costly new Air-Conditioning Units.

Horizon Energy has a partnership with a U.K based Company for the supply and installation of the Air-con Energy Saver Unit. This unit has won the National Energy Efficiency Awards run by UK CEED in partnership with EDF Energy 2006 and Hong Kong Awards for Industries: Innovation and Creativity Award 2007.

## **11.3 Power Factor Correction Solution**

Power Factor is the percentage of electricity that is delivered to your facility by the supplier, which is used effectively compared to what is wasted. An example of this is a perfect power factor of 1.0. This means that all the power being

delivered to your facility is being used. However most facilities today have a less than 0.76 power factor. This means you are paying for that other 24%, even though you are not using it, and that 24% of power is being wasted. With a Power Factor Correction Device installed the power factor of the facility is increased above 0.96 in most cases, therefore increasing the effectiveness in which you use your electricity, and reducing the amount of electricity supplied, therefore lowering your energy bills and carbon footprint.

Power Factor Correction units can be fitted to any sector and facility i.e.: Residential, Commercial, Corporate and Industrial. These units can reduce your total energy consumption by 10% to 30%.

Horizon Energy has partnered with a leading manufacturer from South Africa, as their distributor and installer of Power Factor Correction Units. Each facility will be individually audited and the most efficient unit will be specified for the application.

## 11.4 Geysers

### 11.4.1 Geysers Controllers

A geyser is responsible for up to 60% of a residential homes electricity bill. Every time the temperature drops 2 to 3 degrees, the thermostat switches the element back on and heats the water back up to 65 – 70 degrees. The geyser switches on and off 24 to 30 times a day. Every time the geyser switches on, it uses the equivalent power of 50 light bulbs.

The geyser controller is installed either in or next to your distribution board, and is programmed to switch off your geyser when hot water is not required in large amounts. It is not the same as a timer because it detects current and not time. Unlike the timer, the geyser controller will ONLY be active for the period of time necessary to get the water to the pre-set temperature and will then cancel the rest of the time period. This means that you will have sufficient hot water to wash dishes or hands etc, until the next pre-set time segment is activated. The Geyser Controller's micro-processor is multi-programmable with up to 8 different daily heating periods.

With the Geyser controller installed, the Geysers consumption could be reduced by up to 40%. Horizon Energy Energy has partnered with a **South African based Company**, who has designed and manufactures these controllers. The controllers are SABS and Eskom approved.

### 11.4.2 Geysers Blankets

A Geyser Blanket consists of an insulating material, assisted by an air gap and an outer reflective coating. The whole essence of fitting a geyser with a geyser blanket is to minimize thermal energy (heat) loss and thereby save energy. Eskom DSM has supported the installation of geyser blankets for the past few years.

With the Geyser Blanket and the Geyser Controller installed, the energy consumed by the geyser will be as efficient as possible.

## 11.5 IT and Computer Solution

A typical PC consumes **535kWh** of electricity a year, two-thirds of that energy is wasted when the computer isn't in active use, primarily outside of business hours.

The "program" used is one of the market's most comprehensive PC network energy management solutions, helping organizations significantly reduce PC energy usage while simultaneously increasing cost savings. Organizations can contribute significantly to their green initiatives through reduced carbon emissions, while never having to worry about impacting business continuity or IT productivity.

A "program" is installed onto the server to monitor PC's connected to the network. The "program" intelligently places PCs and Monitors into lower power settings when not in use by centrally controlling the power settings residing within each networked computer. The program includes many unique capabilities that help achieve maximum energy savings while effectively eliminating impact to business users and IT. The patented Wake on WAN feature allows IT to reliably wake machines across varied network topologies while a comprehensive set of reporting tools provides accurate views of energy savings.

This program has been endorsed by Microsoft, HP and Intel.

Horizon Energy has partnered with the developer of this software in the U.S.A, as their distributor and installer. Each facility will be individually audited.

## **12 SOLAR STREET LIGHTS AND RETROFITS, SOLAR BILLBOARDS AND SOLAR TRAFFIC LIGHTS**

### **12.1 Scope of Works**

The scope of works generally includes:

- a. Developing the Energy Efficient (EE) roll-out implementation plan for the client, and to implement the retrofitting of public street lights, traffic lights and client owned billboards with energy efficient lighting and / or install solar panels.
- b. Collect review and analyze existing (historical) information sources on energy consumption by the client (expenditure) of public street and traffic lights, and client owned bill boards – i.e. establish the baseline.
- c. Collect data on energy savings post the retrofitting of the street, traffic lights and billboards and hand over data to the project and the relevant client for a period of at least six months.
- d. Maintain project management criteria and standards.
- e. Develop an Operations and Management (O & M) manual for future maintenance
- f. Prepare an asset registry for all assets funded in the project
- g. Prepare monthly progress reports .

### **12.2 Deliverables**

Deliverables include:

- a. Successful and timely implementation of the EE project component in accordance with the project objectives, planned schedule and within the planned budget.
- b. An Inception Report which describes the service providers' response to TOR's, a detailed methodology and work plan of the service provider;
- c. Monthly progress reports, energy consumption review report of client, and any other relevant project documents;
- d. An energy efficient operations and maintenance manual.

Prepare an Inception Report which describes the consultants response to the ToR's, a detail methodology and time frames for implementation

## **13 HORIZON ENERGY BACK-UP AND EMERGENCY BACK-UP POWER PRODUCTS**

### **13.1 Diesel Generator Units**

With all the unfortunate power outages we are experiencing across South Africa, we are forced to look at backup alternatives for electricity. All units can either be open or enclosed in a sound attenuated enclosure and are fitted with AMF (Automatic Mains Failure) panels built in, this allows the units to automatically start-up when there is a power failure and shut down when the power is restored by the supply authority.

Our units are sourced from various manufacturers around the globe for any sized facility. All our units are made of the highest quality diesel engines, alternators and AMF (Automatic Mains Failure) Panels available.

Horizon Energy can supply, install and maintain Diesel Generator units of Between 12 Kva – 3000 Kva units, as well as any larger custom made units for larger facilities.

### **13.2 UPS/Inverter Battery Back-up Units.**

UPS and Inverter Back-up units are ideal for applications where diesel generator units are not able to be used. They are silent, don't require any fuel to run, do not pollute and are more environmentally friendly.

The battery units are charged while the electrical supply from the supply authority is available and stored in the batteries, ready to be used when there is a "Power Failure". When the unit senses that there is a "Power Failure" the energy stored in the batteries is utilised. With Inverter Unit, the low voltage power from the batteries is converted, by the Inverter, to 240volts or 400volts, as supplied by the supply authority, to the installation allowing operations to go on as per normal. When the electrical supply has been switched back on from the supply authority, the unit charges the batteries and stores the energy ready for the next "Power Failure"

Horizon Energy can supply, install and maintain any configuration or size of UPS and Inverter Back-up units for any application or size facility.

## **14 SUSTAINABLE PROCUREMENT**

In terms of sustainability and ROI, Horizon Energy prides itself in retrofitting existing inefficient buildings. Therefore reducing consumption cost significant and shortening the ROI. The manner in which this is achieved is through scientifically proven, tried and tested products approved by Eskom. All products carry a minimum 12 month swap out and workmanship guarantee. The lighting solutions, ballast retrofitting have a twelve month guarantee on product and workmanship. Motion sensor technology has a three year swap out guarantee on product and 1 year guarantee on workmanship. LED's have 3 year swap out guarantee. Aircon and Water Heating solutions have a twelve month guarantee on product and workmanship.

**15 HORIZON ENERGY IS COMMITTED TO:**

- Helping customers achieve maximum profitability by reducing the operating cost of their facilities
- Helping customers reduce their Carbon Footprint.
- Helping South Africa conserve energy and prolong its energy supplies.
- Providing outstanding customer service and support before, during and after installation.

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