



Scoping Report

Project Title:

DEVELOPMENT OF A SCOPING STUDY FOR IMPLEMENTATION OF ENERGY EFFICIENCY WITHIN THE KWADUKUZA AND MANDENI MUNICIPALITIES

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LIST OF ACRONYMS

Abbreviation	Definition
AESA	Alliance for Accelerating Excellence in Science in Africa
AfDB	African Development Bank
AFR100	African Forest Landscape Restoration Initiative
AMRH	African Medicines Regulatory Harmonisation
ASTII	African Science and Technology and Innovation Indicators
AU	African Union
BIG	Building Inclusive Growth
CAADP	Comprehensive Africa Agriculture Development Programme
CAPEX	Capital Expenditure
cCR	carbon Climate Registry
CIPA	Climate Change Investment Program
CCPS	Center for Cooperation with the Private Sector
CSIR	Council for Scientific and Industrial Research
CSP	Concentrated Solar Power
CSR	Corporate Social Responsibility
DoE	Department of Energy
DST	Department of Science and Technology
DTI	Department of Trade and Industry
EDD	Economic Development Department
EnPIs	Energy performance indicators
EPO	Energy Process Optimisation
ESCOs	Energy Service Companies
ESO	Energy Systems Optimisation
GHG	Greenhouse Gas
GIZ	Gesellschaft für Internationale Zusammenarbeit
ICLEI	International Council for Local Environmental Initiatives
IDC	Industrial Development Corporation
IEE	Industrial Energy Efficiency
IEEP	Industrial Energy Efficiency Project
IFC	International Finance Corporation
ILO	International Labour Organization
INEP	Integrated National Electrification Programme
IOE	International Organisation of Employers
ISO	International Organisation for Standardisation
ITUC	International Trade Union Confederation
JICA	Japan International Cooperation Agency
KDM	KwaDukuza Local Municipality

KZN EDTEA	KwaZulu Natal Department of Economic Development, Tourism and Environmental Affairs
LED	Low Emission Development
LEDS	Low Emission Development Strategies
LEDs	Light Emitting Diodes
LPU	Large Power User
M&E	Monitoring and Evaluation
MLM	Mandeni Local Municipality
SMME	Small, medium and micro enterprises
MWh	Megawatt hour
NBI	National Business Initiative
NCPC	National Cleaner Production Centre
NEPAD	New Partnership for Africa's Development
NERSA	National Energy Regulator of South Africa
NGO	Non-Governmental Organisation
PCU	Programme Coordinating Unit
PFAN	Private Financing Advisory Network
PIDA	Programme for infrastructure development in Africa
PJ	Petajoule
PSEE	Private Sector Energy Efficiency Programme
PV	Photovoltaic
RE	Renewable Energy
RECP	Resource Efficiency and Cleaner Production
REEEP	Renewable Energy and Energy Efficiency Partnership
SACN	South African Cities Network
SADC	Southern African Development Community
SAGEN	South-African German Energy Programme
SANEDI	South African National Energy Development Institute
SASGI	South African Smart Grid Initiative
SECO	State Secretariat for Economic Affairs
SME	Small- and Medium-sized Enterprise
SSEG	Small-Scale Embedded Generation
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organisation
USAID	United States Agency for International Development
VSD	Variable-Speed Drives
WEHU	SECO Trade Promotion Unit
WWF	World Wildlife Fund

1 INTRODUCTION

The Energy Efficiency Scoping Study forms part of the Vuthela LED Programme, which was officially launched on 29 November 2017 by the iLembe District Municipality, the KwaDukuza Local Municipality (KLM) and the Mandeni Local Municipality (MLM), together with the Switzerland State Secretariat for Economic Affairs (SECO) as well as the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (KZN EDTEA).

Vuthela LED programme falls under the SECO Trade Promotion Unit (WEHU) and focuses on development cooperation with partners for a resource efficient private sector. The operation of the Vuthela iLembe LED Support Programme is managed by the Project Coordinating Unit (PCU), which is based in the town of KwaDukuza.

The overall aim of SECO in South Africa is 'Inclusive and green growth that will create jobs, ensure resilience and reduce disparities'. One of the main objectives of the programme is to create 'Climate-friendly and green growth through the development of a low-carbon industry'.

The approach of the Building Inclusive Growth (BIG) sub-component is to facilitate inclusive growth through interventions, specifically focussed on small- and medium-sized enterprises (SME) development, within the green economy space in iLembe (District Municipality). This aligns with the district's objectives as presented in their Integrated Development Plan (IDP), as well as with the province designating iLembe as the renewable energy hub of KZN. Targeted interventions through this programme in the Green Economy has the potential to create inclusive growth, jobs and business opportunities while at the same time resulting in cleaner industries and sectors, potentially resulting in further investment and competitiveness.

The Vuthela LED Programme is in the final steps of its Inception Phase, which focuses on the scoping, preparation and implementation-readiness for support projects during the Implementation Phase. The implementation phase of the project is expected to be three-four years in duration.

The Energy Efficiency Scoping Study forms part of the Inception Phase. The objective of the Energy Efficiency Scoping Study is to produce a report which will inform SECO's discussions and funding decisions for energy efficiency projects in the iLembe District. The energy efficiency focussed component of the programme will contribute towards the broad objective of improved resource efficiency in the iLembe District.

This Scoping Report presents the final deliverable of the *Development of a Scoping Study*, following the inception Report and Status Quo Assessment Report.

2 OBJECTIVES

The objective of the study was to produce a report which will inform SECO's discussions and decisions on implementation of work in the iLembe District during the implementation phase of the project (expected to be three-four years). The project is focused on resource efficiency in waste and energy with the broad objective being improved resource efficiency in the iLembe District covering the following specific objectives:

- To research and scope the study area and broad project focus areas to identify potential project(s) aligned with SECO and the Vuthela Programme’s mandate and objectives;
- To identify alignment with current or potential SECO and other national or international projects for implementation including work being done under the Municipal Infrastructure component of the Vuthela project;
- To identify specific geographic areas or businesses for the proposed project(s);
- To identify job or SMME creation opportunities linked to recommended projects or through value chain development linked to these projects where relevant; and
- To provide a description of the proposed project(s) with sufficient level of detail to enable implementation decisions (main outcomes for each proposal and indicate possible achievements in the short/medium term, validation of the main strengths, weaknesses, risks and opportunities of each proposal).

3 METHODOLOGY OVERVIEW

We executed the project according to the following methodology:

Existing energy efficiency programmes related to the study area were researched. Challenges and successes that have been identified and provide an overview of existing businesses within the study area who have implemented energy efficiency programmes (Section 0). This involved:

- Conducting a literature review;
- Conducting stakeholder engagements; and
- Conducting company surveys asking about:
 - Energy use;
 - Potential energy from waste streams;
 - Energy efficiency;
 - Overview of existing businesses;
 - Existing energy efficiency programmes; and
 - Assessment of awareness of energy efficiency.

Key energy consumers who could potentially be targeted for an energy efficiency and energy management programme in the district were identified (Section **Error! Reference source not found.**).

Potential energy efficiency projects types from national programmes were then analysed and prioritised for potential implementation in the study area and key legislation and policies supporting or hindering the uptake of energy efficiency technology and processes were considered (Section 6).

Key finding are presented as per the SECO credit proposal (Section 7).

4 EXISTING AND IMPLEMENTED ENERGY EFFICIENCY PROGRAMMES

This sub-task aimed to achieve the following:

- Review relevant studies undertaken within the iLembe District Municipality area
- Review existing and prospective SECO programmes for South Africa with implementation potential for the iLembe area
- Review international and national programmes to avoid project duplication and identify potential project partners
- Stakeholder consultation with: the Vuthela Project Coordinating Unit (PCU) team; SECO's WEHU unit members; identified businesses and management structures of the industrial park(s) (where relevant) as well as through organised business, informal business structures, labour organisations etc., as identified; national, international or NGO programme coordinators where relevant to the focus area of the scoping study; and others to be identified.

4.1 Methods

4.1.1 Document Review

The documents provided by the Vuthela PCU (Annexure 1) were examined for their geographic context and categorised accordingly in the following categories:

- International programmes;
- Regional programmes;
- National initiatives; and
- Local initiatives.

In addition to the documents provided, the following were also consulted: The Department of Energy Strategic Plan¹, the Private Sector Energy Efficiency Programme², Integrated National Electrification Programme³ (INEP), the Energy Grand Challenge^{4,5}, the Eskom Transmission Development Plan⁶, work

¹ DoE. 2015. *Strategic Plan 2015-2020*. Department of Energy, Pretoria.

² NBI. 2013. *The Private Sector Energy-Efficiency Programme. National Business Initiative*, Johannesburg.

³ NEAC. 2007. *Integrated National Electrification Programme (INEP)*. National Electrification Advisory Committee Meeting No. 2, 16 August 2007.

⁴ Department of Science and Technology. 2010. *Energy Grand Challenge*. Department of Science and Technology, 28 September 2010.

⁵ Department of Science and Technology. 2010. *Update on the Energy Grand Challenge*. Parliamentary Portfolio Committee on Science and Technology, 29 February 2012.

⁶ Eskom. 2018. *Transmission development plan 2019-2028*. Public forum presentation. Eskom Transmission Group, Sandton.

of the South African Cities Network^{7,8,9,10}, the South African National Energy Development Institute^{11,12}, and the State of energy in South African Cities Report¹³.

Further document analyses were undertaken which focused on the extraction of information related to existing energy-efficiency projects where available. This information will be used to assess their suitability for future roll-out in the iLembe District Municipality. The following information were considered during the review included: Company name, sector, project description, energy carriers (i.e. fuel, electricity, and bioenergy), technology types (e.g. LEDs, PVs), energy savings and rand savings.

4.1.2 Stakeholder engagements

We have contacted a number of stakeholders. These stakeholders were identified by both Vuthela and the project team. Topics covered in the stakeholder communication included energy consumption and industrial energy efficiency projects. We also cover other energy efficiency projects for potential future implementation as well as potential challenges related to the implementation of energy efficiency projects.

4.1.3 Company surveys

In order to obtain information about energy efficiency awareness and initiatives within the area a survey was developed to send to companies. The survey was sent to a list of companies in conjunction with the survey from a second Vuthela Scoping project regarding resource efficiency. This was to reduce the amount of surveys provided to companies in the area. Company names and details were obtained from the iLembe Chamber of Commerce, Industry and Tourism member list. The surveys were sent via email during on 18 January 2019 and companies were requested to return these via email by 1 February 2019.

The survey requested the following information from companies (Annexure 2):

- General information about the company;
- Raw materials used in business operations;
- List of major suppliers and related services;
- Production volumes;
- List of the main clients;

⁷ SACN. 2014a. *Modelling energy efficiency potential in municipal operations of the SACN member cities*. South African Cities Network, Johannesburg.

⁸ SACN. 2014b. *A case for renewable energy & energy efficiency*. South African Cities Network, Johannesburg.

⁹ SACN. 2015. *Water and sanitation: municipal water and sanitation infrastructure. Infrastructure dialogues*, 12 February 2015.

¹⁰ SACN. 2017. *Energy efficiency & renewable energy within SACN member cities: lessons learned and recommendations*. South African Cities Network, Johannesburg.

¹¹ SANEDI. 2016. *SANEDI Annual report 2015/2016*. South African National Energy Development Institute, Sandton.

¹² SANEDI. 2017. *SANEDI Annual report 2016/2017*. South African National Energy Development Institute, Sandton

¹³ Sustainable Energy Africa. 2015. *State of energy in South African cities 2015*. Sustainable Energy Africa, Cape Town.

- Waste generated by operations;
- Information regarding energy policies and strategies;
- Energy consumption per energy carrier;
- List of major energy consuming equipment with their efficiencies and capacity;
- Information regarding implemented energy efficiency projects; and
- Challenges identified in implementing energy efficiency projects.

Following a low response from the first survey, a second round of surveys was sent to a second list of companies. This company list was obtained by identifying industrial companies using an aerial map of the area (Google maps). This second round also yielded a low response from companies. Subsequently, the industrial companies identified on both lists were phoned to engage with them on their energy efficiency (Annexure 3). Although the responses rate could be increased, the information regarding energy efficiency at the respective companies was limited.

4.2 Literature Review

The review of existing energy efficiency concepts and programmes is grouped into three categories: International Programmes, National Programmes and Local Initiatives. The activity as part of each of the programmes and initiatives were split according to whether it delineates an actual project/programme or a conceptual framework (concept).

Each programme and initiative was analysed according to the status (existing or prospective), how relevant a project and/or organisation to iLembe could be and what kind of support could be provided (e.g. financial, tools, awareness, partnerships, and similar).

4.2.1 International Programmes

The international programmes listed below are programmes initiated at an international level. These programmes offer lessons learnt and identify potential partners to the Vuthela Local Economic Development Programme.

4.2.1.1 Carbon Trust

The Carbon Trust partners with leading organisations in various countries to assist in building a sustainable future through, for example, carbon reduction, resource efficiency strategies and commercialising low carbon technologies.

The Sustainable Supply Chain Services and Case Studies projects^{14,15}, rolled out in the UK, focus on reducing waste, cost, as well as reducing carbon emissions for both clients and suppliers, increasing companies' resilience to climate change impacts. Cumulative increases in the energy or carbon price along the supply chain can have major impacts on buyer profit margins. Therefore, simple efficiency measures can significantly reduce supply chain cost.

¹⁴ Carbon Trust, 2019. Sustainable supply chain services – overview (<https://www.carbontrust.com/client-services/advice/supply-chain/>). Accessed 19 February 2019.

¹⁵ Carbon Trust. Supply chain case study power point presentation (<https://www.carbontrust.com/our-clients/?show=case-studies>). Accessed 19 February 2019.

Beneficiaries from the project include: Taylor Wimpey who will be able to generate £29m cumulative savings by 2020 and £3m in annual material costs; A carbon footprint calculator was developed for the UK's catering sector; rail services installed a highly efficient, closely controlled heating system comprising over 400kW of radiant heaters.

This ongoing project focuses on resource efficiency strategies, commercialising low carbon technologies and sustainable supply chains. The project has low relevance to the Vuthela project for implementation opportunities. There may, however, be useful information related to technologies and strategies emanating from the project when complete. These could assist industries in the study area particularly in improving the efficiencies of industrial value chains.

4.2.1.2 Gesellschaft für Internationale Zusammenarbeit (GIZ)

The GIZ is a German development agency that provides services in the international development cooperation field. The GIZ provides assistance in various areas with a specific focus on sustainable development, such as economic and employment facilitation, energy and environmental topics as well as the promotion of peace and security.

GIZ provides regular support to government in South Africa by funding projects in the energy and climate change fields. GIZ could be a potential source of funding for the local municipalities in iLembe. More details on South African initiatives are discussed under the National Initiative section below.

4.2.1.3 International Council for Local Environmental Initiatives (ICLEI)

ICLEI is a global network of cities, towns and regions committed to building a sustainable future and has already impacted more than 25 per cent of the global urban population. The key focus is placed on the link between sustainable city development, climate change and urbanisation at subnational, national and global levels. More detailed information on ICLEI's activities regionally and nationally are provided in Sections 4.2.2.1 and 4.2.3.4.

ICLEI is an implementation partner in the existing Urban LEDS project in iLembe (please refer to Section 4.2.4 for more detailed information). The Vuthela LED programme may find ICLEI to be a continued valuable partner in collaborations in urban regions, shared learning from other cities and towns in its network and from the tools and guides they provide.

4.2.1.4 International Finance Corporation (IFC)

The International Finance Corporation (IFC) is part of the World Bank Group. It provides access to capital markets for investment opportunities¹⁶. The IFC has released its Climate Implementation Plan¹⁷ which guides its investments in climate related projects. The IFC views the transition to a low carbon economy as an investment opportunity. The plan was developed to respond to the dynamic external environment for climate investment while building on the IFC's current portfolio.

The IFC aims to reduce risk and capitalise on opportunities by increasing their investments in climate business. The IFC is also a leading funder for South Africa's Renewable Energy Independent Power Producer Procurement Programme. Several of the renewable energy projects supported though

¹⁶ IFC, 2016a. Climate investment opportunities in emerging markets: an IFC analysis. International Finance Corporation, Washington.

¹⁷ IFC, 2016b. IFC Climate Implementation Plan. International Finance Corporation, Washington.

funding by the IFC includes Xina Solar One, Kaxu Solar One and the Redstone solar projects as well as the Amakhala wind farm¹⁸.

The IFC faces significant competition within the market regarding energy efficiency. The IFC is building new approaches to help developing countries implement energy efficiency projects. The main role IFC plays within energy efficiency projects is providing financing through various options. The IFC's waste strategy focuses on waste-to-energy, refuse-derived fuel, e-waste recycling and integrated waste management. Refuse-derived fuel is waste processed into high calorific value fuel and is particularly useful in cement kilns.

Waste to energy projects do not include South Africa in the near-term. The plan currently focuses on select Sub-Saharan African countries and several other countries. The strategy focuses on e-waste recycling and hazardous waste particularly in China. Integrated waste management including landfill gas capture and use.

In partnership with the SECO the IFC supported and advised Sasfin Bank in developing financial products that can drive the sustainable energy market forward. The support for sustainable energy financing solutions is part of the IFC's Climate Change Investment Program (CIPA) in Africa. With financial aid amounting to \$10 million, especially smaller enterprises in South Africa are supported, increasing their efficiency and making them more competitive and to reduce operating costs. This project is now closed and the lessons learnt were used to develop the SUNREF II project in partnership with African Development Bank (AfDB), South African National Energy Development Institute (SANEDI) and (Industrial Development Corporation (IDC).

The IFC presents an opportunity for iLembe as a potential funder for energy efficiency and renewable energy projects in the region. In the longer term waste to energy and integrated waste management may also be considered for funding.

4.2.1.5 Japan International Cooperation Agency (JICA)

JICA focuses on social security and quality growth. JICA is collaborating and established strong partnerships with Europe, the USA as well as international organisations such as the United Nations Development Programme. JICA has also been establishing partnerships with emerging countries, in particular China, the Republic of Korea, Thailand, Indonesia, Brazil, and Turkey. The provision of capital as well as expertise and technological resources focus on the achievement of the Sustainable Development Goals.

In Africa, JICA has rolled out initiatives related to human resource development and infrastructure investment. In the energy space, JICA focuses on providing funds and cooperation to emerging countries to assist in elevating techniques, know-how, and even human resources in charge of policy planning and implementation. Their "3Ls" policy focuses on: (1) Promoting better access to electric power and more stable power supply by reinforcing national grids; (2) promoting of low-carbon power sources; and (3) pursuing efficient use of energy.

¹⁸ IFC, 2019. Partnering for increased sustainable energy finance in South Africa (https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+event_s/news/partnering_for_increased_sustainable_energy_finance_in_south+africa) Accessed 22 February 2019.

Although JICA currently focuses on emerging countries other than South Africa, JICA may provide some opportunities for the study area in terms of technology know-how, technology and funding in future.

4.2.1.6 Private Financing Advisory Network (PFAN)

The Private Financing Advisory Network (PFAN) is a global network of climate and clean energy experts hosted by UNIDO and REEEP. The network aims to build clean energy markets by offering free coaching and facilitating investments to entrepreneurs. PFAN helps entrepreneurs build their businesses by helping investors find the potential in them.

This network is relevant to small and micro enterprises within the Vuthela study area who may need guidance in setting up their clean energy business and introducing them to possible investors. Their website (<https://pfan.net/submit-a-proposal/>) provides links to submit project applications for PFAN's continuous open call for proposals as well as their regular regional and thematic calls for proposals.

4.2.1.7 The Renewable Energy and Energy Efficiency Partnership (REEEP)

REEEP is a worldwide network of Regional Secretariats that invest in clean energy markets. The partnership assists developing countries to expand modern energy services and quality of life. All activities undertaken are relevant and focused to specific locations. The REEEP Regional Secretariat for Southern Africa is hosted by the SANEDI. The interventions developed are sector specific and over 154 clean energy projects have been funded so far.

REEEP develops financing mechanisms and designs programmes related to energy efficiency and renewable energy generation with a focus on small- and medium-sized enterprises (SME). Programmes are advertised on their website (<https://www.reeep.org/>). Interested public and private organisations within the Municipality can apply to these programme opportunities. REEEP creates and shares knowledge to build sustainable markets for renewable energy and energy efficiency, advance energy access, improve economic opportunities and reduce environmental and climate damage. REEEP also close working relationships with other partners which companies within iLembe could draw from. The partners are listed (including their focus area) on the website and web links are attached.

4.2.1.8 Swiss Secretariat for Economic Affairs (SECO)

The Swiss Secretariat for Economic Affairs (SECO) is the federal government's centre of expertise for all core issues relating to economic policy. It aims to promote sustainable economic growth through fair and free trade, for example economic and trade policy measures, export controls and sanctions and international investments and matters relating to international economic law.

SECO funds the current Vuthela LED programme and this project and may assist in the funding of future energy efficiency and renewable energy projects.

4.2.1.9 United Nations Industrial Development Organization (UNIDO)

UNIDO is the specialised agency of the United Nations that promotes industrial development and environmental sustainability. As part of their mandate UNIDO has an Industrial Energy Efficiency (IEE)

Programme¹⁹ through which they assist in the implementation of energy efficiency projects within industry. The programme consists of three main areas, namely: policies and standards, energy management and efficient operation and energy efficiency design and manufacturing.

The IEE Programme can be of high relevance to the iLembe Municipality. Programme support in the iLembe area could be provided by UNIDO in the form of funding, skills and technology transfer, policy and institutional support, as well as demonstrating and upscaling sustainable practices. The thematic areas deal with (1) energy management and efficient operation and (2) energy efficiency design and manufacturing.

A concept called SEforALL Global Industrial Energy Efficiency Accelerator (UNIDO and Carbon Trust)²⁰ is of low relevance to the Municipality due to its high-level focus on supporting SDG goal 7, “ensuring universal access to modern energy services; double the global rate of improvement in energy efficiency; and double the share of renewable energy in the global energy mix.”

4.2.1.10 U.S. Agency for International Development (USAID)

The U.S. Agency for International Development leads international development and humanitarian efforts. These aim to save lives, strengthen democratic governance and reduce poverty. The USAID also aims to help people progress beyond external assistance. The agency provides foreign assistance with the purpose of furthering American interests while improving lives.

Power Africa is a USAID led partnership between various foreign agencies and governments including the World Bank, the African Development Bank, the Development Bank of Southern Africa, the United Nations’ Sustainable Energy for All Initiative and over 140 private companies. The goal of the partnership is to enable electricity access to all by adding 30,000 MW of new clean power generation throughout sub-Saharan Africa.

iLembe could draw from Power Africa’s provision of financial assistance for power-related projects as well as on-the-ground support. The Power Africa toolbox²¹ may also be of interest to the private sector within the Municipality. The toolbox can be used to find opportunities in transaction assistance, finance, policy/regulatory design and reform, capacity building, legal assistance and informational resources to assist in the implementation of energy efficiency and renewable energy projects.

4.2.2 Regional Programmes

The regional programmes identified below consider energy initiatives in Africa and Southern Africa.

4.2.2.1 International Council for Local Environmental Initiatives (ICLEI) Africa Secretariat

The ICLEI Africa Secretariat supports various activities, among others the Urban Energy Support, Urban Low Emission Development Strategies (Urban LEDS) and 100% Renewable Energy. The Urban Energy Support’s provides an information portal, resources, practical guides and tools as well as local case study examples. The focus areas are energy planning, energy efficiency, energy poverty, electricity services, renewable energy, household energy access, urban development and transport. The Urban

¹⁹ UNIDO, 2009. UNIDO and energy efficiency: a low-carbon path for industry. United Nations Industrial Development Organization, Vienna.

²⁰ UNIDO, 2018. What is the SEforALL Global Industrial Energy Efficiency Accelerator? United Nations Industrial Development Organization, Vienna.

²¹ USAID, 2019. (<https://www.usaid.gov/powerafrica/toolbox>). Accessed 27 February 2019.

LEDS strategy provides support for cities to transition to a low emission, green and inclusive urban economy. Please refer to Section 4.2.4.2 for more detailed information on the implemented Urban LEDS project in iLembe.

The project focuses on urban development in emerging countries. The 100% Renewable Energy (RE) Network provides support for cities that are willing to and make a commitment to moving towards 100% RE. The City of Tshwane was the first African city to join the 100% RE Network in the area of renewable energy in the transport sector.

ICLEI's Urban Energy Support provides case study examples, shared learning, cooperation, shared learning and funding access that iLembe and companies within the Municipality can draw from. An information portal with tools and guides with specific focus on *inter alia* energy planning, efficiency and renewable energy is also present that the private and public sector in iLembe may find useful for future project implementation.

4.2.2.2 *New Partnership for Africa's Development (NEPAD)*

NEPAD is an economic development programme of the African Union (AU). Their key focus areas lie in the coordination and execution of programmes that support the Agenda 2063, improve advisory support, support resource mobilisation and provide technical support. NEPAD is currently implementing 40 programmes. The following projects are implemented in South Africa: Food and nutrition security; African Medicines Regulatory Harmonisation (AMRH); Programme for infrastructure development in Africa (PIDA); Comprehensive Africa Agriculture Development Programme (CAADP); climate change fund; fish governance and trade; Alliance for Accelerating Excellence in Science in Africa (AESAs); rural futures; Presidential Infrastructure Champion Initiative (PICl); African Science and Technology and Innovation Indicators (ASTII); capacity development; African Institute for Mathematical Science (AIMS) – Next Einstein initiative; African Forest Landscape Restoration Initiative (AFR100); and gender.

The PIDA²² is the most relevant to regional energy infrastructure development, which focuses finding solutions to provide even and effective access to energy in Africa. Because the programme's focus is placed more on strategic regional energy security and also not specifically on energy efficiency and renewable energy, the programme itself as well as financial, advisory and technical support are of low relevance to the Vuthela project.

4.2.2.3 *Southern African Development Community (SADC)*

The aims of SADC include, amongst others, security, peace, economic growth, poverty alleviation and sustainable development. The Protocol on Energy, the Regional Infrastructure Development Master Plan and Energy Sector Plan provide a focus on energy policies, guidance for infrastructure development, cooperation and identify specific infrastructure needs. The responsibilities of the Directorate in the energy sector focus on electricity, renewable and hydropower development.

²² NEPAD, 2019. Programme for Infrastructure Development in Africa (PIDA) (<https://www.nepad.org/programme/programme-infrastructure-development-africa-pida>). Accessed 26 February 2019.

The Energy Sector Plan²³ and support relates mainly to infrastructure projects dealing with electricity generation plants, transmission lines and pipelines, coal depots and port facilities and nuclear demonstration plants, supported by regulatory frameworks and capacity building, for example. It is therefore of low relevance to the iLembe's transition towards a low-carbon future.

4.2.3 National Initiatives

The following national programmes have been reviewed: Private Sector Energy Efficiency Programme, Industrial Energy Efficiency Project, South African Industrial Energy Efficiency Project, and South African Cities Network.

4.2.3.1 Department of Trade and Industry (DTI): Industrial Energy Efficiency Project

The aim of the Industrial Energy Efficiency Project (IEEP)²⁴ was to increase South Africa's energy efficiency, while simultaneously addressing energy security and economic growth. The goal of the Industrial Energy Efficiency Project was: *"to increase industrial energy efficiency in South Africa in order to contribute to national efforts to improve energy security and electricity supply continuity while seeking that GDP growth is not constrained by energy shortages and rising prices"*. The project has contributed indirectly and directly in energy savings. Projects supported by the SA-IEE Project provided an estimated 491 GWh/yr in direct savings and 525 GWh/yr in indirect savings. The project concluded mid-2016.

The project's focus was on Industrial Energy Efficiency which is directly relevant to the Vuthela energy efficiency project. Lessons drawn from the project include that in general industrial parks are not ready to embrace the greener concepts. First stronger and longer term relationships need to be built to get buy in from the parks. Many of the tenants of the industrial parks' primary focus is on the bottom line of the business in the short term. Companies can also benefit from the implementation of energy management standards and the training courses prepared by the Industrial Energy Efficiency Project.

4.2.3.2 Energy Grand Challenge

In order to strengthen the National System of Innovation, the National Research Foundation has undertaken to invest in research related to several Grand Challenges. The Energy Grand Challenge^{25,26} comprises of energy efficiency, renewable energy, catalysis, hydrogen fuel cells and mineral and energy resources analysis. Funding is available for research into new technologies which address the energy aspect of the Grand Challenges.

The Department of Science and Technology (DST) has a key role in the Energy Grand Challenge relating to security of energy and environmental protection. The DST set out objectives which included developing and demonstrating alternative technologies to diversify energy resources away from coal

²³ SADC, 2012. Infrastructure – energy (<https://www.sadc.int/themes/infrastructure/en/>). Accessed 26 February 2019.

²⁴ UNIDO, 2014b. South Africa Industrial Energy Efficiency Project: Annex VII "Industrial Energy Efficiency Improvement in South Africa Project", executive summary. United Nations Industrial Development Organization, Vienna.

²⁵ DST, 2010a. Energy Grand Challenge – wind energy R&D [PowerPoint presentation]. Department: Science and Technology, Wind Energy Seminar, 28 September 2010.

²⁶ DST, 2010b. Update on the Energy Grand Challenge [PowerPoint presentation]. Department: Science and Technology, Parliamentary Portfolio Committee on Science and Technology, 29 February 2012.

to a low carbon economy and reduce the energy intensity of the economy to avoid high carbon penalties.

Numerous research institutions and universities were involved in research and some commercialisation in partnership with industry. Specific focus was given to technologies such as renewable energy and energy efficiency and various other cross-cutting issues. Due to its focus on research, the programme has a low relevance.

4.2.3.3 Gesellschaft für Internationale Zusammenarbeit (GIZ)

The GIZ rolled out the **GIZ Proklima project**²⁷ in Southern as well as South Africa. The South African specific project focuses on the entire chain of the refrigeration and air conditioning sectors, entitled “Climate-friendly cold chain for perishable goods in South Africa”. The aim is to move towards F-gas free technology. Projects provide policy advice on promoting sustainable and energy-efficient refrigeration technology, including revision of national standards.

The project is of low relevance to iLembe as the project focuses on sustainable and energy efficiency refrigeration technology and the additional policy support provided also focuses specifically on this area.

The **South African German Energy Programme (SAGEN)**²⁸ is a cooperation between South Africa and Germany. The programme is funded by the German Government and implemented by the GIZ. Additional funding is also provided by the Swiss State Secretariat for Economic Affairs. SAGEN focuses on renewable energy and energy efficiency and works in four main areas: large-scale grid-connected renewable energy, small-scale embedded generation, energy management systems in municipalities and providing investment into two selected energy efficiency technologies with potential for national energy savings.

SAGEN provides municipal support for small-scale embedded generation (SSEG), municipal electricity business models, energy efficiency technologies and funding support for projects. It is therefore highly relevant to iLembe.

4.2.3.4 International Council for Local Environmental Initiatives (ICLEI)

Energy efficiency related resources from South Africa are available from the Urban Energy Support (www.cityenergy.co.za). These relate to a guide on public buildings, greenhouse gas calculation tool, efficient public lighting guide, a guide for electricity efficient planning for built environment and how to implement renewable energy and energy efficiency options.

The above mentioned tools and energy efficiency guides are of relevance to assist energy efficiency project roll-out in the iLembe District.

²⁷ GIZ, 2017. GIZ Proklima in South Africa [PowerPoint presentation]. Gesellschaft für Internationale Zusammenarbeit, Bonn.

²⁸ SAGEN, 2019. About SAGEN (<https://www.sagen.org.za/about-sagen>). Accessed 06 March 2019.

4.2.3.5 National Business Initiative: Private Sector Energy Efficiency Programme (PSEE)

The Private Sector Energy Efficiency Programme²⁹ (PSEE) was administered by the National Business Initiative (NBI) on behalf of South Africa's Department of Energy (DoE) with financial support from UK Department of International Development and the Carbon Trust. The programme supported companies by paying for feasibility studies to determine potential energy savings, energy-intensity reductions, and improved economic competitiveness through resource and process efficiency, implementation of emission reduction projects, increase energy efficiency awareness and social benefits such as job creation. The programme published unique solutions to various energy management challenges in a variety of sectors.

Overall the programme resulted in 129.3GWh savings per year with lifetime savings of 646GWh from implementable projects. The estimated payback period was 0.9 years for potential projects. The CAPEX leveraged for the projects amounted to R69 million. The potential savings identified included 2 087GWh annual energy savings, 669.1MW grid capacity savings, 21 896GWh lifetime energy savings, and 2.3 years average payback period and 16.9MtCO₂e lifetime carbon savings. The programme identified several energy efficiency opportunities for different business sizes.

For small businesses the following opportunities were identified:

- Energy spend optimisation: tariff optimisation and bill accuracy; business's energy spend over a period comparison; consider energy cost as well as price when purchasing new machinery
- Regular maintenance to improve efficiency and performance
- Behavioural changes such as switching off lights, air-conditioning units, computers and other office machinery

For medium sized businesses the following opportunities were identified:

- Energy spend optimisation: energy efficient lighting and controls, improved metering on fuel/electrical consumption, replace geysers with heat pumps
- Management: developing and implementing energy-management policies and strategies; energy awareness training, review compressed air operation strategies, identify and repair air leaks, review and optimise refrigeration systems, insulation improvement and filter maintenance

While this project was completed in 2016, the results of the study are relevant to companies in the Vuthela study area. The project provides a set of initiative types, their payback period and emissions savings for a range of industries and company sizes.

4.2.3.6 State Secretariat for Economic Affairs (SECO)

The country strategy for South Africa³⁰ provides a high-level review and forecast for South Africa. Focus areas relate to South Africa's political, institutional, economic, social, humanitarian, security, economic relations background, and development context. Development challenges and SECO's response, programme implementation and management, financial resources and results monitoring

²⁹ NBI, 2013. *The Private Sector Energy-Efficiency Programme. Two years of focused energy-efficiency interventions in the private sector 2013-2015*. National Business Initiative, Johannesburg.

³⁰ SECO, 2017. *Swiss Economic Cooperation and Development South Africa 2017-2020*. Swiss Secretariat for Economic Affairs, Bern.

are further focus areas of the strategy. Specific energy efficiency-related projects are not discussed. However, the Vuthela programme falls under the strategy's third objective as part of the "resource-efficient private sector" priority. Potential funding by SECO will be dependent on the outcome of this scoping study.

4.2.3.7 South African Cities Network (SACN)

The South African Cities Network (SACN) is a network of South African cities. It establishes partnerships to encourage the exchange of information, experience and best practices on urban development and city management. In addition, SACN aims to promote good governance and management, provide and apply the experience of large South African city government and encourage shared learning partnerships within government. Thematic areas focus broadly on city development strategy, productive cities, inclusive cities, well governed cities and sustainable cities.

Programmes include the establishment of energy savings potential to be realised from energy efficiency interventions in municipalities and conceptual review of the green economy policy framework and city initiatives. Although no energy efficiency projects are present, the iLembe Municipality may benefit from partnerships and knowledge sharing that SACN provides.

4.2.3.8 South African National Energy Development Institute (SANEDI)

The South African National Energy Development Institute (SANEDI) directs, monitors and conducts energy research and development. SANEDI also promotes energy research and technology innovation and takes measures to promote energy efficiency within the economy. SANEDI administers Section 12L of the Income Tax Act which provide for a tax rebate on proved energy savings.

The Working for Energy Programme^{31,32} is run by the SANEDI and is aligned with the "New Growth Path" launch by the Minister of Economic Development in 2010. The programme aims to provide sustainable clean energy solutions in rural and low-income urban areas and makes use of locally applicable technologies. There is special emphasis on job creation, skills and community enterprise development. In combination with available technologies, the programme seeks to develop local skills to harness renewable energy resources to generate useable energy for the community. Various interventions are considered in the programme ranging from biomass to energy from invasive alien plants to mini-grid hybrid systems and renewable energy such as solar or wind.

An example of a project run as part of the Programme is the greening of two Early Childhood Development Centres in the iLembe District Municipality. The project implemented several technologies including a rainwater harvesting system, solar water heaters, energy efficiency lighting and a biogas system to use bio-waste to produce biogas for cooking.

The Working for Energy Programme is relevant as it looks at sustainable clean energy solutions and has conducted a project within the iLembe District Municipality. After discussions with Working for Energy it became clear that they are willing to partner for more projects in the area. This discussion is reviewed further in Section 4.3.1.3. Such a partnership could be beneficial as they have an extensive network in the iLembe Municipality.

³¹ SANEDI, 2016. *Annual report 2015/2016*. South African National Energy Development Institute, Sandton.

³² SANEDI, 2017. *Annual report 2016/2017*. South African National Energy Development Institute, Sandton.

The Energy Efficiency³³ is run by SANEDI and consists of energy efficiency projects which SANEDI implements in collaboration with stakeholders. These projects are conducted in partnership with international and national stakeholders who contribute through funding and knowledge support. The programme has a low relevance to this study as its main projects are the 12L tax incentive and the big EE project which provides advice about energy efficiency.

Programme: 12L Income Tax Incentive³⁴. As part of their energy efficiency programme, SANEDI administers the 12L Income Tax Incentive in accordance with the Section 12L of the Income Tax Act and related regulations. Other institutions involved with the incentive programme include the South African National Accreditation Systems and the South African Revenue Services. The programme provides a tax incentive based on energy efficiency projects that have been implemented. Companies who register a 12L project with SANEDI can receive a 0.95c/kWh tax incentive. The incentive has a low relevance as it does not directly focus on energy efficiency projects but rather incentivising them.

4.2.3.9 South African Smart Grid Initiative (SASGI)

SASGI is an initiative of SANEDI. Their Smart Grid programme³⁵ and vision focus on improvement in network availability and security, energy management facilitation, improved productivity and the ability to accommodate renewable energy sources.

The initiative is of moderate relevance to iLembe. SASGI can assist in facilitating implementation, address specific challenges pertaining to the roll out of smart grids as identified by the industry, and provides a platform for knowledge sharing Implementation.

4.2.3.10 The National Cleaner Production Centre (NCPC): Industrial Energy Efficiency Project

The NCPC is a national programme run by the South African government to promote the implementation of resource efficiency and cleaner production (RECP) methodologies. The programme is hosted by the Council for Scientific and Industrial Research (CSIR) on behalf of the Department of Trade and Industry. The services offered include raising awareness of the benefits for using the RECP methodologies, technical support to industry, facilitation the implementation of RECP in industry, capacity building and skills development. These programmes aim to assist industry with lowering costs through reducing energy, water and material consumption as well as with waste management.

The **Industrial Energy Efficiency Project**^{36,37} was conducted by the NCPC. The goal of this project is to demonstrate the impacts of energy management to reduce carbon-dioxide emissions. The project also aims to demonstrate the effectiveness and financial impact of in-plant energy management. The project provides several services namely industrial energy efficiency, energy management system and energy system optimisation. Funding is provided by the Global Environment Facility and delivered with

³³ SANEDI, 2018a. Energy Efficiency (<https://www.sanedi.org.za/Energy%20Efficiency.html>). Accessed 05 March 2019.

³⁴ SANEDI, 2018b. 12L Tax Incentives (<https://www.sanedi.org.za/12L.html>). Accessed 05 March 2019.

³⁵ SASGI, 2012. About SASGI (<http://www.sasgi.org.za/about-sasgi/>). Accessed 28 February 2019.

³⁶ UNIDO, 2014a. *Industrial Energy Efficiency Improvement in South Africa*. United Nations Industrial Development Organization, Vienna.

³⁷ UNIDO, 2014b. South Africa Industrial Energy Efficiency Project: Annex VII “Industrial Energy Efficiency Improvement in South Africa Project”, executive summary. United Nations Industrial Development Organization, Vienna.

help from UNIDO. The project primarily focused on industrial energy efficiency in various sectors. The project ended mid-2016 but provides indications of projects which can be implemented in iLembe..

4.2.4 Local Initiatives

This sections covers projects executed in the study area via funding from international, national or local funding.

4.2.4.1 *iLembe District Municipality*

The iLembe Municipality is the district municipality consisting of the KwaDukuza, Mandeni, Ndwedwe and Maphumulo local municipalities. The scoping study, which this review forms part of only covers the KwaDukuza and Mandeni local municipalities. The Vuthela project, which mandated this study, forms part of the iLembe Municipality's initiatives for energy and resource efficiency primarily within the industrial sector.

The fourth **Component of Building Inclusive Growth in Key Sectors Green Economy Mapping**³⁸ lists opportunities in the cold storage market to replace inefficient equipment and invest in refrigeration to reduce food loss and spoilage. It has a low relevance as it focuses specifically on refrigeration and the replacement of inefficient equipment.

The **SECO local economic development assistance programme in iLembe – Value Chain and Cluster Development (VCD) component**³⁹ conducted a study on renewable energy (RE). Although the report was not approved by SECO, the findings indicated that there is potential for RE generation within the sugar and timber value chains within the municipalities. These potential projects range from biogas digesters to large scale ethanol for biofuel production. Small-scale biogas systems are an opportunity to generate energy for local use. There is also an opportunity to use wood chips and pellets for biofuel.

The programme focuses on the development of renewably energy in KwaDukuza such as biogas digesters and biofuel production from ethanol. The programme is of low relevance as the report recommendations were not approved and the report was replaced by the Building Inclusive Growth component.

4.2.4.2 *KwaDukuza Local Municipality*

The KwaDukuza Municipality is a local municipality within the iLembe district and is part of the Vuthela programme. There are various initiatives within the municipality relevant to energy and resource efficiency. Some of these include their greenhouse gas inventory which, after calculating their energy distribution and carbon footprint, made several recommendations for energy and emissions management. The municipality also has an urban low development emission strategy published which supports several other initiatives. An energy master plan as well as an integrated development plan has been developed with several themes relevant to energy efficiency and management.

³⁸ iLembe, Component 4 Building Inclusive Growth in Key Sectors Green Economy Mapping. Internal document. iLembe, KwaDukuza.

³⁹ UNIDO, 2017. SECO Local Economic Development Assistance Programme in iLembe – Value Chain and Cluster Development (VCD) Component: Supplementary Report Renewable Energy. United Nations Industrial Development Organization, Vienna.

The Urban Low Emission Development Strategic Framework and Action Plan (Urban LEDS)^{40,41} was rolled out by ICLEI and UN Habitat applying ICLEI's GreenClimateCities methodology to integrating low-carbon strategies into all sectors of urban planning and development. The plan was developed to understand the risks of and required responses to climate change. The Municipality is increasingly experiencing the impacts of climate change and is one of the most vulnerable to changing climatic conditions in KwaZulu Natal. KwaDukuza partnered with ICLEI Africa to develop the Urban Low Emissions Development Strategy (2012-2015), focusing on emissions reduction and increasing access to energy and other basic services. Several strategies are identified in order to increase energy efficiency, promote renewable energy and enhance access to safe, reliable and affordable energy for all.

The plan focuses on energy efficiency and renewable energy in the KwaDukuza local municipality. The project incorporates the development of greenhouse gas (GHG) inventories, awareness raising, peer-to-peer learning and capacity building workshops, rollout of mini-projects to demonstrate the benefits of low-carbon solutions, local implementation and the drafting and adoption of LED strategies.

The first strategy is to support initiatives within the sugar cane industry, for example the use of bagasse for the production of renewable energy. The second strategy is to reduce energy usage and explore options for renewable energy within municipal operations. Even though these associated emissions are a small portion of the total there will be operational cost savings which can be invested into additional projects. The third strategy involves supporting and incentivising efforts by the community to introduce energy efficiency and renewable energy improvements. The biggest energy consumer within the municipality is industry followed by residential, commercial and transport sectors. The municipality can only support and encourage efforts to introduce energy efficiency projects and installing renewable energy capacity.

The project does not focus solely on energy consumption and savings, but also addresses a broader spectrum of low-carbon economy issues at the local municipality level. A baseline assessment is conducted for each municipality, and based on that, the type of transformation pathway decided on (spatially, ecologically, institutionally, economically and with regard to energy demand and supply).

The framework and action plan support initiatives in the sugar cane industry for the production of renewable energy. Bagasse as a by-product of sugarcane production, for example, can be used as a valuable renewable energy resource. The key focus is on energy usage reduction and exploring options for renewable energy in municipal operations. Example actions include:

- Support Gledhow Sugar Mill's application for renewable energy co-generation project
- New street light installations to be LED
- Energy and sustainability retrofit of 20 orphanage homes.

The municipality has made the following progress to date: It is in the process of updating the greenhouse gas inventory, is evaluating the insulated passive cooker roll-out is ongoing, reported on

⁴⁰ KwaDukuza Local Municipality, 2015. *Low Emission Development Strategic Framework and Action Plan: executive summary*. KwaDukuza Local Municipality, KwaDukuza.

⁴¹ ICLEI, 2016. *KwaDukuza and Steve Tshwete Local Municipalities, South Africa. Comprehensive approaches to local low emission development: from engagement to planning to action*. International Council for Local Environmental Initiatives, Bonn.

its climate change actions in the carbon Climate Registry (cCR), and added a climate change officer post to its staff.

The Urban LEDS project is of low relevance to the Vuthela programme as it focuses on municipal, not public sector, low emission development.

The Electrical Master Plan completed in 2010 was reviewed by Aurecon⁴² to plan for the electricity needs within its licensed area of supply and to produce a new 10 year plan. The review takes the updated spatial development framework into consideration. The review focuses on key areas that can assist in maintaining and developing the electrical infrastructure, including: rooftop solar PV, solar water heating, incentivising energy efficiency and creating awareness, as well as implement an ISO 5001 energy efficiency management system; sustainable electricity generation.

The review is relevant as the measures mentioned in the review could be applied to the industrial sector within the iLembe Municipality. The review primarily focuses on renewable energy and investment into renewable technologies.

The Greenhouse gas inventory report 2012⁴³ was conducted in partnership with ICLEI and UN Habitat as part of the Urban LEDS strategies programme (see above). The transport sector is the greatest energy consumer and consumed 59% of the total energy. This is followed by the residential, industrial and commercial sectors. The sectors that generated the most emissions were the residential and industrial sectors accounting.

The inventory assisted in identifying electricity as the most used energy form. Electricity saving measures can be implemented in the residential, commercial and industrial sectors to have the most impact on reducing electricity consumption and the associated emissions. Recommendations as a result of the inventory include putting measures in place to reduce fuel consumption, initiate recycling initiatives, undertake energy savings campaigns, raise awareness for electricity saving by promoting for example Earth Hour, acknowledge and reward savings in the private sector and encourage alternative transport that increases energy efficiency.

The inventory is relevant as it provides an indication of the industry's which contribute the most to greenhouse gas emissions as well as the most energy intensive sectors. Further, the reporting on greenhouse gases can assist companies/organisations within the iLembe area to obtain a better understanding of energy use and main areas contributing to emissions. This can assist in identifying suitable energy efficiency and renewable energy projects/measures within the organisation.

The PSEE programme⁴⁴ mentioned earlier (see Section 4.2.3.5) in this report conducted a project at the Gledhow Sugar Company which has a plant in the KwaDukuza municipality. The project consisted of an energy systems optimisation project. The project yielded savings of R500,000 with a six month payback period. The PSEE programme has closed however similar programmes could provide benefits to companies. Please refer to Section 4.2.3.5 for more detailed information about the programme.

⁴² Aurecon, 2016. KwaDukuza Municipality Network Master Plan Review. Aurecon, eThekweni.

⁴³ ICLEI, 2013. KwaDukuza Municipality Greenhouse Gas Inventory 2012 Report. International Council for Local Environmental Initiatives, Bonn.

⁴⁴ NBI, 2013. *The Private Sector Energy-Efficiency Programme. Two years of focused energy-efficiency interventions in the private sector 2013-2015*. National Business Initiative, Johannesburg.

This project is highly relevant as it was conducted within the KwaDukuza municipality and focused on industrial energy efficiency. It can be used to inform the project identification stage of the Vuthela programme.

The Economic Development, Tourism and Environmental Affairs Department's **renewable energy and energy efficiency plan**⁴⁵ outlines the strategic approach to KwaZulu Natal's green economy. The strategy's focus areas are renewable energy generation and energy efficiency. A feasibility study was conducted to establish the Renewable Energy Hub Components Manufacturing Hub.

The feasibility study and plan identified potential projects including:

- Renewable energy options: wind, off-grid small wind turbines, limited utility scale wind projects, solar PV and CSP, embedded Solar PV systems (rural and urban), limited utility-scale solar PV, bioenergy, usage of biomass produced, deploy anaerobic digester, biofuel energy crops, hydropower, pyrolysis and gasification
- Co-generation systems and rural hybrid energy systems
- Waste recycling

The relevance to iLembe is that the proposed location for the hub is situated within the iSithebe Industrial Estate. The plan and feasibility study focus on the installation of renewable energy in the area.

The KwaDukuza **Final Integrated Development Plan for 2017-2022**⁴⁶ outlines principles, government priorities and interventions to transition towards a more sustainable competitive municipality. These include increasing environmental awareness, responding to climate change by greening low income homes. This consists of two fruit trees per household including compost and supporting materials. These are yearly programmes that are on-going. The plan specifically focuses on investment into renewable energy, greening low-income homes and raising environmental awareness. The plan is partially relevant as it considers investment into renewable energy and increasing environmental awareness can increase energy efficiency.

The Green Building Guidelines of KwaDukuza Municipality – Energy⁴⁷ give guidance on implementation of its principles. Implementing green building principles and practices provides an opportunity for demand reduction and energy efficiency measures. This can be achieved through the implementation of strong energy efficiency initiatives and the promotion and roll out of renewable energy sources. Large reductions in energy demand and increases in energy efficiency are possible through simple, low-cost energy conservation measures. For example, passive design and energy efficient lighting, heating and cooling systems in buildings, energy efficient processes in industry and municipal infrastructure provision and the promotion and rolling out of renewable energy sources are options to achieve the set out objectives.

⁴⁵ EDTEA, 2014. Renewable Energy and Energy Efficiency Plan. Department Economic Development, Tourism and Environmental Affairs Province of KwaZulu-Natal, Pietermaritzburg.

⁴⁶ KwaDukuza Local Municipality, 2017a. Final Integrated Development Plan for 2017-2022. KwaDukuza Local Municipality, KwaDukuza.

⁴⁷ ICLEI, 2017. Green Building Guidelines of KwaDukuza Municipality. International Council for Local Environmental Initiatives, Bonn.

Proposed passive design elements that can be incorporated into the planning process at an early stage or can be retrofitted during refurbishment include:

- Construction and materials: building orientation and building layout, wall and ceiling insulation, shading devices or roof overhangs; double glazed windows and glass with special coating (e.g. low-E coating), maximising natural light, roof materials (reflective or light coloured roofing materials or roof garden); roof design for the installation of solar water heaters (SWH), insulate all exposed hot water pipes, sealing windows (cheap option)
- Energy management: Energy sub-metering for all energy uses in a building of 100kVA or greater, building management systems (BMS; used to measure and manage building performance, effective control of building services and equipment, lighting and water for large and small buildings), lighting (only LEDs, design for lighting power densities of the lowest possible levels, lighting zoning to promote energy efficiency), motion occupancy and daylight sensors, use efficient and climatically appropriate mechanical cooling systems: variable air volume (VAV) HVAC system uses water for cooling and has a building management system that controls the air volume and fan speeds; good design of HVAC system
- Strategies for energy efficiency: clearly labelled and metered distribution boards to monitor and manage energy use, Consider compliance with mandatory requirements SANS 10400-XA Energy Usage in Buildings, SANS 204 Energy Efficiency in Buildings, SANS 50001:2011 for ISO50001, energy audit and benchmarking, meter monitoring and drafting an Energy Management Plan
- Co-generation: consider on-site electricity generation or co-generation (PVs, wind power, geothermal, biomass), also applicable to hot water provision;

The guidelines are relevant as they specifically look at incorporating energy efficiency into buildings. The primary focus is on energy efficiency in buildings and includes solutions such as replacing inefficient equipment, retrofitting and implementing management plans for increased energy efficiency. It also promotes investment in renewable energy. The guidelines provide various low cost and new installed energy efficiency options and management control plans. These can be applied to industry and the Mandeni and KwaDukuza Municipalities.

4.2.4.3 Mandeni Local Municipality

The Mandeni Municipality is a local municipality within the iLembe district and part of the Vuthela LED programme. The **Integrated Development Plan**⁴⁸ is a strategic five year plan to guide Mandeni's future development. It identifies alternative energy sources while securing coal-based electricity supplies to meet current and future development demands.

The strategy does not specifically mention any energy-reducing or energy-efficient programmes and/or technologies. The Municipality supports, however, the green environment approach and aims to look for new interventions to reduce electricity consumption within its area. A smart metering system has been implemented to assist in the municipal distribution area, reducing unaccounted for electricity. Mandeni is planning to implement a renewable energy hub at iSithebe Estate on condition that funding can be obtained. In addition, there is a broad focus on energy efficiency in buildings, industrial energy efficiency and the implementation of smart metering. The strategy specifically

⁴⁸ Mandeni Local Municipality, 2018. Integrated Development Plan 2017-2022 (2017/18). Mandeni Local Municipality, Mandeni.

focuses on projects that are easily implemented and cost efficient. The development plan is relevant as it guides the municipality's development. Any projects can therefore be aligned with this strategy to avoid overlap.

4.3 Stakeholder Engagement

4.3.1 Stakeholder Engagement Meetings

As part of the Scoping Study, the following stakeholders were engaged with: the National Cleaner production Centre (NCPC); Department of Trade and Industry (DTI); South African National Energy Development Institute (SANEDI); Enterprise iLembe; Whirlpool and Ithala Development Finance Corporation. The feedback from these meetings is summarised below.

4.3.1.1 NCPC

A meeting was held with the NCPC on 25 January. It was attended by Kevin Cilliers and Milisha Pillay from the NCPC and Promethium.

Key questions discussed related to what projects the NCPC has been involved in in the study area and what other projects the NCPC is aware of in the area. We also asked for suggestions of other stakeholders to contact.

The NCPC has had few projects in iLembe. Two interactions were mentioned: Hesto Harnesses and Whirlpool. There have been no definitive project results from these activities, but air compressor upgrades were identified as a potential opportunity at Whirlpool.

The NCPC suggested contacting Bernd Ollerman at DTI, Ithala - the landlord and electricity distributor to the iSithebe industrial park, Cobus Oelofse at the iLembe Chamber of Commerce, Industry and Tourism and Trevor Graham at Whirlpool for more information.

4.3.1.2 Department of Trade and Industry

A conference call was held with Bernd Ollerman, the Department of Trade and Industry, on 14 February 2019.

We enquired about the national programmes related to industrial development and energy efficiency as part of the industrial parks' revitalisation programme.

The DTI is investing in green/eco parks with the objective of improving the suite of material, water and energy efficiency. The general perception was that parks were not ready to embrace the greener concepts and stronger and longer term relationships need to be built to get buy in from the parks. Many of the tenants of the industrial parks primary focus is on the bottom line of the business in the short term. There are no current project run by DTI in the study area.

Another issue put forward that could contribute to implementation challenges relates to general existing economic challenges in South Africa (labour relations) and challenges at Eskom, which were reported to cause many companies not to respond to attempted engagements on energy efficiency.

4.3.1.3 SANEDI: Working for energy

We met with Barry Bredenkamp (General Manager EE) and Riaz Hamid (Project Officer: Working for Energy) at SANEDI on 14 February 2019.

SANEDI administers Section 12L of the Income Tax Act which provides tax rebates for energy savings. SANEDI did not identify any 12L projects within iLembe.

SANEDI engages with local communities and leaders in the Working for Energy Programme. There is no direct interaction with businesses. They do, however, have an established network, agreements and relationships – built over many years, in place. While they may not directly implement any industrial energy efficiency projects/programmes or have existing ones in the iLembe district in place, SANEDI could be a valuable project partner. It was suggested that there may be opportunities in the agro-processing sphere, or upscaling bio-digesters to an industrial scale.

4.3.1.4 Enterprise iLembe

A meeting was held at Enterprise iLembe on 22 February with Linda Mncube.

We asked about the role Enterprise iLembe plays in terms of industrial energy efficiency and local municipalities. We also asked about their awareness of any ongoing or planned projects.

The role of Enterprise iLembe was described as being an economic development agency for the iLembe District Municipality. The agency assists municipalities in accessing funds for local economic development. Enterprise iLembe is not currently involved in any industrial energy efficiency projects.

4.3.1.5 Whirlpool

We interviewed Richard Keet at Whirlpool was on 22 February 2019.

Whirlpool manufactures household appliances. They have a 33,000 m² factory in the iSithebe industrial park. Monthly electricity consumption is about 800 MWh and they have a maximum demand of about 1.5MW. They are the 2nd or 3rd largest consumer in the park. The highest energy consuming equipment in the plant is compressors (4x132 MW) and electric motors. The air compressors are considered a potential energy efficiency opportunity for Whirlpool.

Whirlpool has considered energy efficiency projects in the past with discussions with the NCP. The NCP initiated a monitoring programme to evaluate electricity demand. However, the evaluation was not completed. Whirlpool has implemented a lighting retrofit project at their plant.

The Whirlpool plant uses components sourced within the industrial park, such as gaskets and bearings, suggesting opportunities for improving efficiencies in a manufacturing value chain.

4.3.1.6 Ithala Development Finance Corporation

A meeting was held with Gideon, Senior Superintendent Electrical Services, at the iSithebe Industrial Park on 22 February.

Ithala Development Finance Corporation (Ithala) is the land lord and electricity distributor for the iSithebe Industrial Park. It manages about 200 customers in the park. The peak capacity of the park is 16MW with the current peak demand of 10 MW. Electrical energy consumption has varied between 8 and 13 GWh per month over the last 6 months.

The main energy consuming tenants in the park include Whirlpool, Inkunzi Foundry, Nampak, ITB Manufacturing, Taurus Packaging, Metso Minerals and Elangeni Soaps. The maximum demand of these plants is between 1.5 and 8 MW. The foundry is the largest consumer.

Inkunzi Foundry has considered replacing its arc furnace with an induction furnace. This would improve energy efficiency. Another project Ithala is aware of is the own generation which is being used Taurus by generating electricity from waste materials.

There may be potential for photovoltaic electricity generation within the park. The main concerns in this regard are the aging building structures and their ability to carry additional weight. Security in the park is also a concern with regular theft from unattended properties.

The park's electricity infrastructure is well maintained but aging. The billing system relies on manual reading and consolidation of meter data. Modernisation of the old electricity meters would enable the automation of billing and energy management.

The tariff structure (Table 1) in the park may contribute to a slower uptake of energy efficiency initiatives. This is particularly the case for the industrial tariffs which have a high basic charge but low energy charge compared to many municipalities and Eskom. This results in long payback periods for energy efficiency initiatives.

Table 1: Ithala iSithebe electricity tariffs (NERSA)

Commercial Conventional	Industrial Low	Industrial High	
	Industrial 400V	Industrial 11000V	Industrial >10MVA
Basic Charge R1207.53/month	Basic Charge R1207.53/month	Basic Charge R1207.53/month	Basic Charge R1207.53
Energy Charge 138.29 c/kWh			
	High Demand Season	High Demand Season	High Demand Season
	Energy Charge 51.14 c/kWh	Energy Charge 49.80 c/kWh	Energy Charge 107 c/kWh
	Demand Charge 272.30 R/kVA	Demand Charge 266.24 R/kVA	
	Low Demand Season	Low Demand Season	Low Demand Season
	Energy Charge 49.80 c/kWh	Energy Charge 48.34 c/kWh	Energy Charge 61 c/kWh
	Demand Charge 243.45 R/kVA	Demand Charge 235.19 R/kVA	Max Demand Charge 73.69 R/kVA
			Demand Availability Charge 32.32 R/month
			Energy reactive charge- 13.38 c/kvarh

4.4 Surveys

Companies were identified through the iLembe Chamber of Commerce, Industry and Tourism website (171 companies) and through internet searches of companies in the iLembe District Municipality (an additional 32 companies).

Initially a waste and energy efficiency survey was sent to the companies listed on the Chambers website in collaboration with Triplo4. There were two responses received from this survey.

One response was received from Bloemendaal Flower Farm and one from One World Investment (Pty) Ltd. The latter submitted information for the waste part of the questionnaire only. The responses from Bloemendaal Flower Farm indicate that due to the nature of their business energy management strategies are not a priority. Major equipment used are pumps and motors. Stand-by generators have been installed to maintain productivity during power outages.

In response to this we identified 28 industrial companies which we contacted directly via telephone. These 28 companies were identified from the initial list of 203 companies excluding companies which Triplo4 had tried to contact but did not have any success or that had expressed no interest in the survey contacted. No surveys were returned despite there being an expression of interest in the calls made. We followed up on the calls with emails in the week 3-8 March 2019, yet no additional responses were received thereafter.

Through the literature review⁴⁹ and stakeholder engagements, the following large power users, located in Mandeni and KwaDukuza, could be identified:

Baton Rouge Estate CC	Dakot
Department Of Health	Desai Yusuf
Elangeni Soaps	Ging Super Stores/Ging Spar
Ilembe District Municipality	Inkuzi Foundry
Inyathi Timber Contracting Pty Ltd	ITB Manufacturing
Local Government Department	Mandini Trading Co Pty Ltd
Metso Minerals	Mtunzini Prawn Farms
Nampak	Parker, J William
Stanger Brick & Tile Pvt Ltd	Sundumbili Plaza
Taurus Packaging	Thamsanqa Sugar Estate CC
Toll Road Concessionaries (Pty) Ltd	Transnet Freight Rail
WG Brown Cash & Carries (Pty) Ltd	Whirlpool
Zululand Quarries Pty Ltd MAN	

⁴⁹ Iskihungusethu (PTY) Ltd, 2011. Mandeni Electricity Master Plan. Mandeni Local Municipality, Mandeni.

4.5 Results

4.5.1 Existing programmes for the iLembe, KwaDukuza and Mandeni

The result of the literature review and stakeholder consultations is that although many concepts are available for energy efficiency projects to be potentially implemented in future in the iLembe District Municipality, few projects and programmes are currently active in the iLembe, Mandeni and KwaDukuza Municipalities:

The URBAN LEDS project by ICLEI and UN Habitat in KwaDukuza is supporting initiatives within the sugar cane industry for the production of renewable energy, reducing energy usage and explore options for renewable energy within municipal operations, and support and incentivising efforts by the community to introduce energy efficiency and renewable energy improvements. Part of this programme was also the development of a greenhouse gas inventory for the KwaDukuza Local Municipality.

Lastly, to manage unaccounted electricity usage, a smart metering system has been rolled out in Mandeni, which can assist in informing usage and operations/tasks which consume most energy. Smart meters also enable consumers to manage their electricity consumption more effectively.

On a company level, Whirlpool has implemented a lighting retrofit project at their plant.

4.5.2 Projects with implementation potential

A limited number of projects with implementation potential could be identified as most organisations provide partnerships, fund programme ideas or provide assistance of other kind (tools, guides, knowledge sharing for example). The following prospective energy efficiency and renewable energy projects for implementation in iLembe of medium and high relevance are summarised below.

Programmes provided by REEEP can be accessed by both private and public entities. The programmes focus broadly on energy efficiency and renewable energy. Programme partners can also benefit from partnership establishment, knowledge sharing and advanced energy access.

Power Africa by USAID can provide power-related projects as well as funding and on-the-ground support. Information related to this can be accessed on their website (<https://www.usaid.gov/powerafrica/>).

Training courses through the DTI, as part of the IEEP, could be accessed that can assist in project identification and implementation.

Further, GIZ SAGEN provides project opportunities in the energy efficiency space which can be accessed and applied for online. Information about the application process and information access can be obtained from their website (<https://www.sagen.org.za/support-for-municipalities>).

An opportunity exists through the NCPC in implementing industrial energy efficiency, energy management systems and energy system optimisation programmes. Alternatively, the project can assist in providing potential project ideas.

Upgrading air compressors at Whirlpool was identified as a project opportunity to increase energy efficiency and reduce energy-related costs.

Areas which iLembe can focus on for potential future energy efficiency projects relate to building efficiency, energy management (systems), equipment efficiency and behavioural changes, such as:

- Energy spend optimisation: tariff optimisation and bill accuracy, business’s energy spend over a period comparison, consider energy cost as well as price when purchasing new machinery, energy efficient lighting and controls, improved metering on fuel/electrical consumption, replace geysers with heat pumps
- Management: developing and implementing energy-management policies and strategies; energy awareness training, review compressed air operation strategies, identify and repair air leaks, review and optimise refrigeration systems, insulation improvement and filter maintenance
- Maintenance: to improve efficiency and performance
- Behavioural changes: switching off lights, air-conditioning units, computers and other office machinery

Areas which iLembe can focus on for potential future renewable energy projects relate to:

- Large-scale grid connected renewable energy as well as small-scale embedded generation projects
- Implementation of biogas digesters to large scale ethanol for biofuel production
- Investment into various renewable energy projects, such as:
 - wind, off-grid small wind turbines, limited utility scale wind projects, solar PV and CSP, embedded Solar PV systems (rural and urban), limited utility-scale solar PV, bioenergy, usage of biomass produced, deploy anaerobic digester, biofuel energy crops, hydropower, pyrolysis and gasification
- Co-generation systems and rural hybrid energy systems

A feasibility study is currently being conducted by Dematrans Logistics, a recycling logistics company, to identify the implementation potential for the use of biofuels. Besides of managing the logistics of recycling plants, they are further planning to actively manage these.

4.5.3 Potential project partners

A number of project partners have been identified during the literature review and, but rather limited, in stakeholder engagements:

Carbon Trust	Can draw from information related to technologies and strategies emanating from the project when complete with a focus on the value chain.
DTI	The industrial energy efficiency project provides guidance and tools, offers training in energy efficiency and implements energy management systems.
GIZ	Can provide funding, municipal support, energy efficiency technologies as well as know-how.
ICLEI	Is a current project partner which could provide tools, guides and case study examples, as well as shared learning.
IFC	The IFC could offer a partnership, implementation facilitation and funding, although their main priorities in sub-Saharan Africa are infrastructure; financial inclusion; agribusiness; tourism, health and retail; health and education; and fragile and conflict-affected situations. Waste to energy and integrated waste management may also be considered for funding In the longer term.

JICA	JICA currently does not work on projects in South Africa, but may do so in future. JICA may provide technology know-how, technology and funding.
NBI	The learnings from the PSEE project can be useful for Vuthela relating to initiative types, their payback period and emissions savings for a range of industries and company sizes.
NCPC	Can provide technical support to industry and facilitate implementation.
PFAN	Facilitating financial investment between investors and companies implementing clean energy. Can provide guidance in setting up their clean energy business and introducing them to possible investors. If project ideas have been developed, a proposal can be submitted on their website (https://pfan.net/submit-a-proposal/).
REEEP	Can provide funding for energy efficiency, offer partnerships as well as knowledge creation and sharing.
SANEDI	Has an established network consisting of various players – local, university and industry, which one can draw from to fast-track implementation.
SASGI	Could potentially assist in enhancing and facilitating project implementation, address roll out of smart grids, and provide a platform for knowledge sharing.
SECO	Is currently a project partner; could provide financial assistance for both energy efficiency and renewable energy projects/programmes, as well as assist in the creation of environmental awareness and programme development.
UNIDO	Can provide skills and technology transfer, policy and institutional support for industrial energy efficiency programmes, demonstrating and upscaling sustainable practices and assistance in the implementation of these programmes.
USAID	Could be a valuable project partner for new clean power generation projects/programmes. Power Africa’s toolbox could provide assistance in the areas of transactions, finance, policy/regulatory design and reform, capacity building, legal issues for energy efficiency and renewable energy project implementation.

Another avenue through which energy efficiency and renewable energy projects can receive assistance and/or realise their implementation is via ClimatePlace (<http://climateplace.ch/>). ClimatePlace aims to bring public and private sector financing as well as low-carbon and climate resilient projects and technologies together. The platform will assist in raising funds for a climate change mitigation and/or adaptation project idea, while also facilitating negotiations, diligence processes and interactions.

4.6 Conclusion

The literature review and stakeholder consultations conducted to date indicate that although few energy efficiency and/or renewable energy projects are currently implemented in the iLembe, there is potential for future project roll-out. The potential ranges from cost-efficient retrofitting in buildings, energy management plans, strategies and policies, equipment efficiency optimisation across to a multitude of renewable energy installation measures (e.g. solar, biofuel) and co-generation opportunities.

Funding and funding access, implementation facilitation, partnership establishment, tools and know-how are only some of the many identified assisting tools in the implementation of energy-related projects in the area provided by international, national as well as local project partners. The iLembe District Municipality would be able to draw from the extensive existing expertise and partnerships to

drive improved resource efficiency contributing to the improvement of the economic future of the District.

An important barrier iLembe should be mindful of and consider going forward, as emphasised by stakeholders, is the need to establish long-term partnerships before a project or programme can be rolled-out. As presented in this document, some potential implementation partners have established these already. Partnering with these organisations could make use of these established relationships which could also fast-track project implementation. A further implementation challenge identified relates to tariff structures which may reduce the uptake of energy efficiency initiatives significantly and extends payback periods. It may be worth investigating to what extent tariff structures could affect energy efficiency project uptake by companies other than the ones within the iSithebe Industrial Park.

5 Identification of Key Energy Consumers to be Potentially Targeted for Energy Efficiency/Energy Management Programme

5.1 Methodology

We engaged with the following parties to identify key energy customers in the district:

- Enterprise iLembe;
- Eskom;
- iLembe District Municipality;
- Ithala Development Finance Corporation;
- iLembe Chamber of Commerce, Industry and Tourism and its members;
- National Cleaner Production Centre; and
- KwaDukuza and Mandeni Local Municipalities.

The energy tariff information from the Mandeni and KwaDukuza municipal accounts of large energy consumers were combined with non-municipal accounts from the top seven energy consumers in iSithebe (provided by Ithala; Section 4.1.2 above and Section 4.3.1.6) as well as from discussions with the NCPC (Section 4.3.1.1) to obtain a list of the top 100 largest power users (LPUs) in the Mandeni and KwaDukuza Local Municipalities. For this, the power consumption figures between January and June 2018 were used. The list was compared to the list of company contacts (iLembe Chamber of Commerce, Industry and Tourism and its members) and the list provided in Section 0 to ensure that no LPUs were disregarded. Yet very few companies from the contact list and from the list in Section 0 also appeared in the list of the identified top 100 energy consumers in the area.

The list of key energy consumers was further refined according to the companies' sector/activity type within which each of the companies operate. As the Vuthela Scoping Study focuses on industrial energy efficiency, companies in the sectors of, for example, schooling, retail, hotels and restaurants as well as body corporates were removed from the top 100 energy consumer list. In Mandeni, only 3 LPUs (between 50 000 and 100 000 R/m) were identified, but are not industrial companies and were thus removed from the list. Therefore, in Mandeni, the top industrial energy consumers are located within iSithebe, which is supplied by Ithala, and do not receive their electricity directly from the Mandeni Municipality.

No information in respect to energy consumption of companies within Mandeni and KwaDukuza could be obtained from Eskom.

Electricity consumption was categorised into the following consumption ranges (MWh/year):

- 9 600 – 60 000 MWh/year
- 3 000 – 9 599 MWh/year
- 1 200 – 2 999 MWh/year
- 0 – 1 199 MWh/year

Where no electricity consumption data was available for a particular company, this was indicated as “no consumption data available”.

We engaged with the following organisations to gather data:

- National Cleaner Production Centre (NCPC), with respect to possible RECP reviews done in the area;
- National Business Initiative (NBI), with respect to the Private Sector Energy Efficiency (PSEE) programme and possible investigations done with companies in the area;
- South African National Energy Development Institute (SANEDI), with respect to Standards and Labelling of Appliances, National Energy Efficiency Hub, Bridging Information Gap of Energy Efficiency In Buildings (bigEE) and 12L Income Tax Incentive; and
- iLembe Chamber of Commerce, Industry and Tourism, with respect to the identification of industries in the district.

5.2 Key energy consumers

Using the information from municipal and non-municipal accounts and focusing the company selection on industrial activities, a total of 33 key energy consumers were identified (Table 2; Annexure 4).

Table 2: List of companies in Mandeni and KwaDukuza Local Municipalities identified as key energy consumers

No	Company	Sector type (Industry Classification Benchmark)	Activity type	Energy consumption range (MWh/year)
1	Ithala - Development Finance Corporation	Real Estate Investment & Services	Property Development and Management	9 600-60 000
2	Lahaf (Pty) Ltd	Real Estate Investment & Services	Owens and operates shopping centres	9 600-60 000

No	Company	Sector type (Industry Classification Benchmark)	Activity type	Energy consumption range (MWh/year)
3	Menlyn Main Investment Holdings	Real Estate Investment & Services	Construction of Ballito Junction mall	9 600-60 000
4	Pioneer Foods (Pty) Ltd	General Industrial	Food packaging	9 600-60 000
5	Inkunzi Foundry	General Industrial	Cast iron product manufacturer	9 600-60 000
6	Whirlpool	Household Goods & Home Construction	Fridges, freezers and twin tub manufacturer	9 600-60 000
7	Nampak	General Industrial	Packaging manufacturer	9 600-60 000
8	ITB Manufacturing	General Industrial	Plastic packaging manufacturer	9 600-60 000
9	Taurus Packaging	General Industrial	Packaging manufacturer	9 600-60 000
10	Metso Minerals	General Industrial	Minerals processing	9 600-60 000
11	Elangeni Soaps	Household Goods	Soap manufacturer	9 600-60 000
12	Gledhow Sugar Company (Pty) Ltd	Food Producers (Food Products)	Refined sugar supply	1 200-2 999
13	Hesto Harnesses	Electrical Components & Equipment	Wiring Harness Manufacture	1 200-2 999
14	Amod Adam Construction cc	Construction & Materials	Building Contractors	0-1 199
15	Ballito Crusher	General Mining	Dolorite quarry and crushing	0-1 199
16	Dolphin Coast Landfill Management (Pty) Ltd	Support Services	Landfill Management	0-1 199
17	EM and EM Engineering (Pty) Ltd	Real Estate Investment & Services	Property Development	0-1 199
18	Simmons SA (Pty) Ltd	Household Goods & Home Construction	Mattress Manufacture	0-1 199
19	Avis Van Rental (Balito)	Industrial Transportation	Car rental	No consumption data available
20	ComProp Ballito	Real Estate Investment & Services	Industrial property company; sales, rentals and management	No consumption data available
21	Elan Property Group	Real Estate Investment & Services	Property Development	No consumption data available

No	Company	Sector type (Industry Classification Benchmark)	Activity type	Energy consumption range (MWh/year)
22	Glenart Trading	General Industrial	Christmas cracker manufacturer	No consumption data available
23	Glendale Distilling Co.	Beverages	Cane spirit product	No consumption data available
24	Hulett Development Company	Real Estate Investment & Services	Property Development	No consumption data available
25	IFA Hotels & Resorts	Real Estate Investment & Services	Property Development and Management	No consumption data available
26	Mfundo Projects and Services	Real Estate Investment & Services	Property Development	No consumption data available
27	Prodev Property Group	Real Estate Investment & Services	Property Development	No consumption data available
28	R & B Civils	Construction & Materials	Infrastructure development and construction	No consumption data available
29	Royal Palm Property Holdings	Real Estate Investment & Services	Manages Palm Lakes estate. Realtors	No consumption data available
30	Sappi Limited	Forestry and paper	Forestry, paper, paper products and pulp	No consumption data available
31	Tongaat Hulett Sugar Darnall	Food Producers (Farming, Fishing & Plantations)	Sugar mill	No consumption data available
32	Wasomi Enterprises	Electronic & Electrical Equipment	Electronics manufacturing service partner	No consumption data available
33	Winclo Spray Painters	Automobiles & Parts	Panel beater	No consumption data available

The discussion on the project/programme identification and prioritisation will provide more detailed information on which key energy consumers in the iLembe District Municipality could be targeted for energy efficiency and/or energy management programmes, also taking SECO's and the Vuthela programme's mandates and objectives into consideration.

6 IDENTIFICATION AND PRIORITISATION OF ENERGY EFFICIENCY PROJECTS

6.1 Methodology

The Energy Efficiency Guide⁵⁰ was used to prioritise suitable energy efficiency projects for the identified companies for the varying sector/activity types. The Guide provides an overview of eight different high-priority energy efficiency opportunities for nine different industry sectors based on payback periods. The data in the Energy Efficiency Guide was collected from the PSEE data from over 5 000 South African businesses over a two-year period. For each of the nine sectors, the top three energy efficiency opportunities yielding the lowest payback periods are listed. The guide provides information on average annual savings, costs and payback periods for the average-sized South African company per industry sector on a national scale (Figure 1).

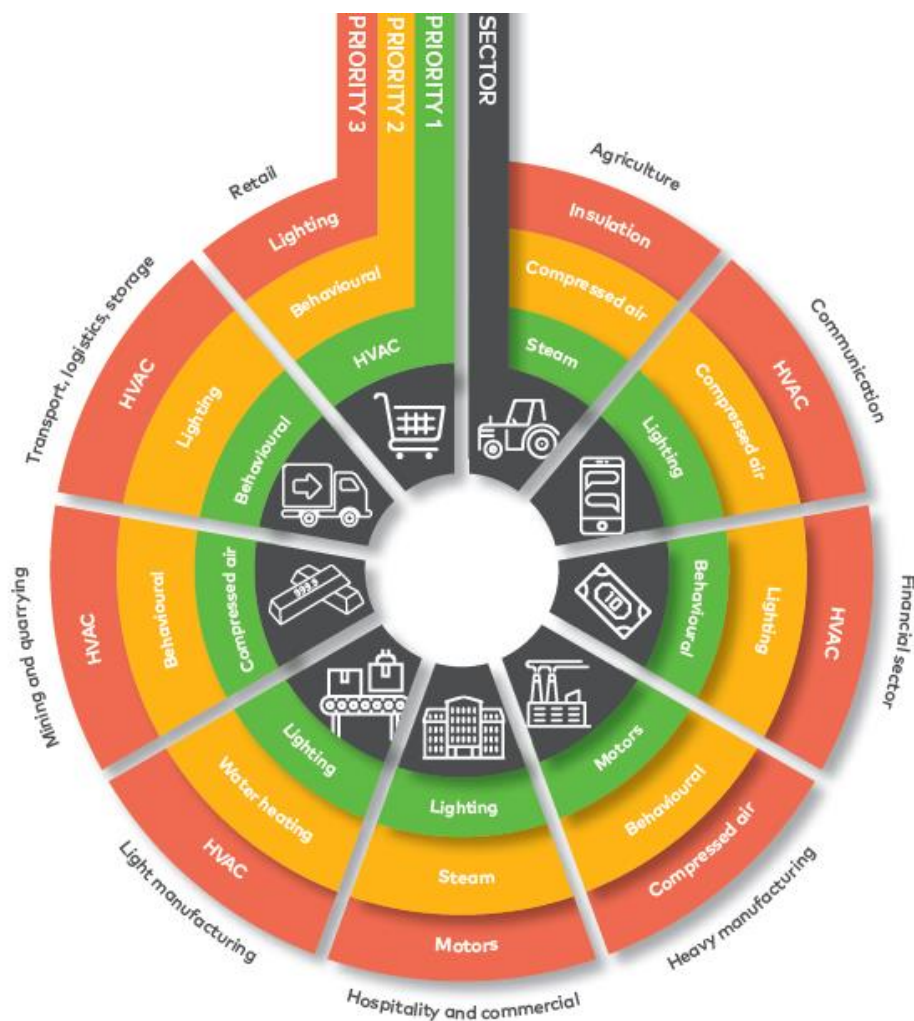


Figure 1. High-priority sectoral energy conservation and efficiency opportunities based on payback periods. Source: Nedbank, 2018

⁵⁰ Nedbank. 2018. *The Energy Efficiency Guide*. Nedbank, Sandton, South Africa.

The initiative details and the type of energy for each of the eight opportunity types are outlined below.⁵¹

Table 3. Energy efficiency opportunities identified in the Energy Efficiency Guide⁵²

Opportunity type	Initiative details	Type of energy saved
Steam	Proper maintenance, Install steam traps to reduce steam loss, improve condensate return to the boiler, maintenance of pipework, insulate piping	Thermal
Behavioural	Policy and strategy, Training and awareness, Tariff optimisation, Metering and monitoring, energy management systems	Electricity
Motor	Optimise transmission systems, use better lubricating fluids, conduct proper maintenance, replace old motors with high efficiency motors, install variable-speed drives	Electricity
Insulation	Insulate piping for chilled water, steam and hot-water systems, use of geyser blankets, insulate industrial equipment, repair seals in cold rooms and fridges, install insulation such as polyurethane foam cladding in the roof of buildings.	Thermal
Water heating	Optimise boilers using insulation, heat recovery, control adjustment etc. Install heat pumps and localised heating systems, switch to a solar thermal geyser	Electricity
Compressed air	Manage leaks, optimise piping configuration to reduce losses, install better control systems for increased compressor efficiency, install variable speed drives	Electricity
Lighting	Switch off lights when not in use, Lighting retrofit to use LEDs, Luminaires retrofit	Electricity
HVAC	Upgrade or replace condensers, change refrigerants, replace units with more energy-efficient systems, upgrade or replace the chiller, change operating times of the chiller, upgrade screw chillers with variable speed or frequency drives, adjust the controls of the system, change temperature set point, install occupancy sensors	Electricity

Three energy efficiency opportunities were identified for each of the 33 identified key energy consumers in Mandeni and KwaDukuza. The identification and prioritisation of suitable energy efficiency projects was guided by the Energy Efficiency Guide's priority list (Figure 1), the experience

⁵¹ Based on national averages (average-sized South African company within its industry).

⁵² Nedbank. 2018. *The Energy Efficiency Guide*. Nedbank, Sandton, South Africa.

Promethium has gained from the work conducted for the PSEE Programme as well as the relevant sector/activity type and therefore, for example, what type of equipment used.

For each of the eight energy efficiency opportunities the following criteria were considered to further prioritise the opportunities:

- Implementation cost;
- Rand savings;
- Energy savings;
- Emissions savings;
- Payback periods;
- Job potentials;
- Time frames; and
- Potential project partners.

The three identified energy efficiency opportunities per company were ranked based on highest to lowest average annual energy savings.

6.1.1 Calculations

6.1.1.1 Implementation costs

Estimates were calculated for the above eight opportunities (Table 3) based on average annual Rand costs for the average-sized South African company. This was done by adding the average annual Rand costs for each of the listed recommendations/actions and divide this by the number of recommendations/actions. For example:

Average annual costs (Rand/years) for *Behavioural*. The following recommendations/actions are proposed in the Energy Efficiency Guide for behavioural change:

- Policy and strategy: R45 000
- Training and awareness – once-off: R20 000
- Tariff optimisation: R65 000
- Training and awareness – embedded: R35 000
- Metering and monitoring: R245 000

Combined annual savings: R410 000.

Total average savings: $\frac{410\,000\text{ Rand}}{5\text{ recommendations/actions}} = R82\,000$.

6.1.1.2 Rand savings

Estimates were calculated for the above eight opportunities (Table 3) based on average annual Rand savings for the average-sized South African company. This was done by adding the average annual Rand savings for each of the listed recommendations/actions and divide this by the number of recommendations/actions. For example:

Average annual savings (Rand/years) for *Behavioural*. The following recommendations/actions are proposed in the Energy Efficiency Guide for behavioural change:

- Policy and strategy: R195 000
- Training and awareness – once-off: R75 000
- Tariff optimisation: R180 000
- Training and awareness – embedded: R75 000
- Metering and monitoring: R150 000

Combined annual savings: R675 000

Total average savings: $\frac{675\,000\text{ Rand}}{5\text{ recommendations/actions}} = R135\,000$.

6.1.1.3 Energy savings

The average monetary saving (R/MWh) for each of the eight energy efficiency opportunities provided in the Energy Efficiency Guide was calculated as follows, based on an example for *Behavioural*:

$$\text{Energy savings}_{\text{Behavioural}} \left(\frac{R}{MWh} \right) = \frac{\text{Monetary saving}_{\text{Behavioural}} (R) \times 0.80 \left(\frac{R}{kWh} \right)}{1000}$$

The electricity price of R0.80 per kWh⁵³ is an average value to obtain an average annual energy savings value.

6.1.1.4 Emissions savings

The average annual emissions savings (tCO₂e/MWh) was calculated as follows, based on an example for *Behavioural*:

$$\text{Emission savings}_{\text{Behavioural}} \left(\frac{tCO_2e}{MWh} \right) = \text{Energy saving}_{\text{Behavioural}} \left(\frac{R}{MWh} \right) \times 0.97 \left(\frac{tCO_2e}{MWh} \right),$$

Where 0.97 tCO₂e/MWh is the current grid emission factor.⁵⁴

6.1.1.5 Payback periods

The average annual payback period (years) for each of the eight energy efficiency opportunities as outlined in the Energy Efficiency Guide was calculated by adding the average annual payback period for each of the listed recommendations/actions and divide this by the number of recommendations/actions. For example:

Average annual payback period (years) for *Behavioural*. The following recommendations/actions are proposed in the Energy Efficiency Guide for behavioural change:

- Policy and strategy: 0.2 years

⁵³ DoE. 2012. *Draft 2012 Integrated Energy Planning Report: Annexure A Technical Report*. Department of Energy, Pretoria, South Africa.

⁵⁴ Eskom. 2018. *Integrated Annual Report*. Eskom, Sandton, South Africa.

- Training and awareness – once-off: 0.2 years
- Tariff optimisation: 0.4 years
- Training and awareness – embedded: 0.4 years
- Metering and monitoring: 1.6 years

Combined payback period: 2.8 years

Total average payback period: $\frac{2.8 \text{ years}}{5 \text{ recommendations/actions}} = 0.6 \text{ years.}$

6.1.1.6 Jobs potential

Although the links between the transition towards a low-carbon economy and job creation are yet to be fully understood, attempts have been made to quantify this. There is a clear relationship between energy efficiency investment and job creation. Energy efficiency investments were even shown to create more employment per invested dollar compared to traditional energy supply investments.⁵⁵

The job potential resulting from energy efficiency can be split into **direct**, **indirect** and **induced** jobs. Direct jobs can be defined as jobs resulting from energy efficiency investments, e.g. installation and maintenance of technology by a service company. Indirect jobs can be created from related supply and service chains, e.g. building materials or manufacture for energy efficient products. A positive local contribution to job creation in the value chain can still be expected even if the energy efficient product is imported. Induced jobs are created from increased spending power of employees in the industry (increased spend on goods and services such as food, non-essential items, etc.; also called “cross-elasticity”).^{55,56} Generally speaking, employment opportunities are first created in the labour intensive industries resulting from energy efficiency measures and through year-on-year savings in the longer-term.⁵⁷

High-level links between industrial energy efficiency and the scale of employment opportunity were made based on United Nations Environment Programme (UNEP), International Labour Organization (ILO), International Organisation of Employers (IOE) and the International Trade Union Confederation’s (ITUC) research on green jobs.⁵⁸ Research conducted in Europe and North America in the late 1990s showed that around 40-60 jobs are created per Petajoule (PJ).⁵⁵ Given the difficulties in providing direct and quantitative links between energy efficiency and job potential and although their research is based on American and European Union circumstances and is based on older data, it provides some idea around the scale of potential employment creation per energy unit saved. The job potential per Megawatt hour (MWh) could therefore be calculated and a range (jobs) provided (due to the range of 40 to 60 jobs/PJ):

⁵⁵ USAID. 2019. Economic and employment impacts of energy efficiency (<https://www.usaid.gov/energy/efficiency/economic-impacts>). Accessed 25 March 2019.

⁵⁶ Borel-Saladin, J.M. and Turok, I.N. 2013. The impact of the green economy on jobs in South Africa. *South African Journal of Science* 109(9,10): 1-4.

⁵⁷ ACEEE. 2011. How does energy efficiency create jobs? Fact sheet. American Council for an Energy-Efficient Economy, Washington, D.C., USA. Available at <https://aceee.org/files/pdf/fact-sheet/ee-job-creation.pdf>.

⁵⁸ UNEP, ILO, IOE, ITUC. 2008. Green jobs: Towards decent work in a sustainable, low-carbon world. United Nations Environment Programme, Nairobi, Kenya.

1 Petajoule = 277 778 Megawatt hours,

Therefore:

$$\text{Jobs} = \frac{N_{\text{jobs created}}}{277\,778\text{MWh}} \times \text{MWh saved}_{\text{energy efficiency opportunity}}$$

The number of jobs created per MWh savings for each of the eight energy efficiency opportunities was calculated for both 40 jobs/MWh and 60 jobs/MWh and reported in ranges.

Further research on job potential in South Africa was conducted by the Industrial Development Corporation (IDC), Development Bank of Southern Africa, Trade and Industrial Policy Strategies, World Wildlife Fund (WWF), Green Building Council, the Economic Development Department (EDD) as well as private companies.⁵⁹ A green job is defined as “jobs that are created directly through activities that benefit the environment.” The job creation potential took potential job losses elsewhere into account and was calculated on a net basis. The numbers of jobs created in Borel-Saladin and Turok (2013) are reported for the long-term (eight years). An estimate can be provided for the national job potential per annum for energy and resource efficiency and their percentage share of total job potential in energy and resource efficiency (green buildings and industrial).

6.1.1.7 Other relevant factors

Time frames were allocated to each of the eight energy efficiency opportunities: immediate, short-term, medium-term and long-term. The split of energy efficiency opportunity types into different time frames allows the application of a phased approach to planning and implementing energy efficiency projects. Longer-term projects usually require a higher initial capital investment, more complex or greater effort to implement as well as company commitment to such a project. Preceding this long-term investment is usually an understanding of energy efficiency and related behavioural changes, requiring low capital investments and resulting in immediate savings benefits. The phased approach can also assist in identifying where each company is at in the process of transitioning towards a low-carbon future and at which point SECO and Vuthela can best engage based on their mandates and objectives.

The potential project partners identified in Section 4.5.3 were analysed on their suitability as project partners according to the energy efficiency opportunity type. The use of time frames would also facilitate the matching of potential project partners for each of the projects at different stages at which companies are assisted in transitioning towards a low-carbon future. The identification of potential project partners was also based on previous projects these organisations were involved with and the type of support they provided for these. The time frames for each of the eight energy efficiency opportunities are overall indications. At times, part of an opportunity type can be classified as rather medium-term, for example variable speed drives and transmission systems for motors, while the replacement of old with new high-efficiency motors is a long-term project. Overall, the time frame for motors was classified as medium-term.

⁵⁹ Borel-Saladin, J.M. and Turok, I.N. 2013. The impact of the green economy on jobs in South Africa. *South African Journal of Science* 109(9,10): 1-4.

Export markets/appliance labelling was another factor considered when prioritising energy efficiency projects.

A high-level analysis of potential opportunities and risks related to the identified energy efficiency projects for each of the time frames was conducted.

Two aspects of an enabling environment need to be considered when prioritising energy efficiency programmes. These are (1) tariff structures and (2) policy support (conflicting objectives). These, where relevant, are highlighted in Section 6 and 7.

The upcoming South African Carbon Tax is scheduled for implementation on 1 June 2019. The tax is linked, partly, to the mandatory greenhouse gas reporting regulations. The Carbon Tax boundary is therefore limited to direct emissions:

- From fossil fuel inputs (e.g. coal, oil and gas) combusted in stationary equipment; and
- Where the activity is above the threshold stipulated in the National Greenhouse Gas Emission Reporting Regulations (total installed capacity threshold is 10 MW thermal; resulting from e.g. standby diesel generators, oil combustion, LPG, coal boilers); and
- Located in facilities over which the taxable entity has operational control.

A carbon tax liability may be applicable if a company is required to report on its GHG emissions. The Carbon Tax boundary excludes all direct emissions from the combustion of petrol and diesel, even though emissions from combustion of these fuels (in stationary equipment only) must be reported to the Department of Environmental Affairs, where the activity is above the stipulated threshold. This is because emissions from diesel and petrol will be taxed directly at the pump at 9-10 cents per litre (i.e. not in tax submissions to the South African Revenue Service). Wastewater and waste sites are also exempted from the carbon tax. The carbon tax amount is calculated also taking allowances into account, which the law makes provisions for. Further, carbon tax liabilities can be offset with carbon credits. The tax could potentially have an impact on the price of electricity. National Treasury has however given a commitment that there will be no impact of carbon tax on the electricity tariff up to 2020. After 2020 the carbon tax impact could be in the order of 5 cents per kWh, increasing to a potential level of 12 cents per kWh by 2030. A higher electricity tariff could affect the tariff structure in favour of energy efficiency projects.

6.1.2 Assumptions

In order to obtain an estimate of the average Rand savings, energy and emissions savings as well as payback periods for each of the eight energy efficiency opportunities, the information provided in the Energy Efficiency Guide⁶⁰ was used. This information is based on data received from 5 000 South African companies within nine industries. Therefore, the data presents the South African national average savings/payback periods for the average African company per industry. As neither information on the size of each of the LPU within Mandeni and KwaDukuza was available nor detailed information on the data used to obtain the national averages (in the Energy Efficiency Guide) were available, the national averages were used to indicate potential savings and payback periods. The

⁶⁰ Nedbank. 2018. *The Energy Efficiency Guide*. Nedbank, Sandton, South Africa.

presented data for each of the 34 companies within iLembe therefore needs to be considered in this context. The presented data could not be scaled to the relative size of companies in iLembe.

Further, the average savings and payback periods would also need to be viewed in the context of the type of equipment used by companies within each industry as well as the time of usage, as this affects the energy consumption and price of electricity, thus the potential savings. The values presented may therefore be affected.

The job potential is based on international research and provides an average job potential per MWh. The MWh calculated are based on, as outlined above, on the average South African company.

Nevertheless, the data presented, although high-level, still provides guidance on which energy efficiency opportunity would most likely yield the greatest savings, job potential and/or shortest payback periods.

6.2 Prioritised energy efficiency projects

6.2.1 Average implementation cost, savings potentials, payback time, time frames and job potential

The calculations based on average national data provided in the Energy Efficiency Guide⁶⁰ illustrate that the energy efficiency opportunities of steam, behavioural and motor generate the largest amount of energy and emissions savings as well as the highest job potential (Table 4).

The job potential per year in South Africa for the following energy efficiency opportunities and their percentage share of total job opportunity for energy and resource efficiency are⁶¹:

- Insulation, lighting, windows: 918 jobs/year (10.8%)
- Solar water heaters: 2 203 jobs/year (25.9%)
- Energy-efficient motors: -71 jobs/year (-0.8%)
- Mechanical insulation: 83 jobs/year (1.0%).

The total number of jobs created per year was reported as 8 497 in the energy and resource efficiency category with a total of six sub-categories (rain water harvesting and bus rapid transport not reported here, as not applicable)⁶¹. The potential number of jobs in iLembe due to energy efficiency initiatives are likely to be in proportion to the economic output of iLembe relative to size of the national economy.

⁶¹ Based on the reported data in: Borel-Saladin, J.M. and Turok, I.N. 2013. The impact of the green economy on jobs in South Africa. *South African Journal of Science* 109(9,10): 1-4.

Table 4: Overview of implementation cost, savings, payback periods, time frames and job potentials for each of the eight high-priority energy efficiency opportunities for industrial companies

Opportunity type	Average implementation cost (Rand)	Average Annual Savings (Rand/year)	Expected Energy savings (MWh/year)	Expected Emissions Savings (tCO2e/year)	Average Payback period (years)	Time frame	Job potential (Jobs)
Steam	400 000	491 667	615	615	0.9	Long-term	0.089-0.133
Behavioural	82 000	135 000	169	169	0.6	Immediate	0.024-0.037
Motor	440 000	485 000	606	606	1	Medium-term	0.087-0.131
Insulation	128 750	71 250	89	89	1.8	Short-term	0.013-0.019
Water heating	203 333	100 000	125	125	2.1	Medium-term	0.018-0.027
Compressed air	280 000	329 000	411	411	0.8	Medium-term	0.059-0.089
Lighting	390 000	153 000	191	191	2.7	Medium-term	0.028-0.041
HVAC	634 000	245 000	306	306	2.7	Long-term	0.044-0.066

Immediate energy efficiency measures relate to once-off awareness creation and training. In the following stage (short-term) tariff optimisation, energy management systems, policy and strategy as well as energy audits can be implemented, succeeded by embedded awareness creation and training (for example maintenance programmes, leakage detection), retrofitting and component replacement (e.g. in compressors and motors; medium-term). The fourth stage (long-term) would involve the replacement of entire equipment. Long-term measures apply a systems approach (e.g. high-efficiency motors) and would usually require high capital investment. Thus, the different sub-activities within each energy efficiency opportunity (Table 3) can have multiple time frames compared to the time frames indicated in Table 4.

A summary of the 33 identified key energy consumers in iLembe and their three high-priority energy efficiency opportunities based on sector/activity type with associated costs, savings, payback periods, time frames and job potential are outlined below (Table 5).

Table 5: Overview of the top three identified energy efficiency opportunities for iLembe’s 33 largest LPUs categorised per activity type and their related implementation cost, savings, payback periods, time frames and job potentials, ranked by energy savings potential (MWh/year)

Activity type and companies	Project Type	Average implementation cost (Rand)	Average Cost Savings (Rand/year)	Energy Savings (MWh/year)	Emission Savings (tCO ₂ e/year)	Payback Period	Timeframe	Job Potential (Jobs)
Property Development and Management: Ithala - Development Finance Corporation, R&B Civils	Behavioural	82 000	135 000	169	164	0.6	Immediate	0.024-0.037
	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131
	Lighting	390 000	153 000	191	186	2.7	Medium-term	0.028-0.041
Owns and operates shopping centres: Lahaf (Pty) Ltd, Menlyn Main Investment Holdings	Behavioural	82 000	135 000	169	164	0.6	Immediate	0.024-0.037
	Lighting	390 000	153 000	191	186	2.7	Medium-term	0.028-0.041
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Food packaging: Pioneer Foods (Pty) Ltd	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131
	Lighting	390 000	153 000	191	186	2.7	Medium-term	0.028-0.041
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Cast iron product manufacturer: Inkunzi Foundry	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131
	Compressed air	280 000	329 000	411	399	0.8	Medium-term	0.059-0.089
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Fridges, freezers and twin tub manufacture: Whirlpool	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131
	Compressed air	280 000	329 000	411	399	0.8	Medium-term	0.059-0.089
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Packaging manufacturer: Nampak	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131
	Compressed air	280 000	329 000	411	399	0.8	Medium-term	0.059-0.089

Activity type and companies	Project Type	Average implementation cost (Rand)	Average Cost Savings (Rand/year)	Energy Savings (MWh/year)	Emission Savings (tCO ₂ e/year)	Payback Period	Timeframe	Job Potential (Jobs)
ITB Manufacturing Taurus Packaging	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Minerals Processing: Metso Minerals	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131
	Compressed air	280 000	329 000	411	399	0.8	Medium-term	0.059-0.089
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Soap manufacture: Elangeni Soaps	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131
	Compressed air	280 000	329 000	411	399	0.8	Medium-term	0.059-0.089
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Refined sugar supply: Gledhow Sugar Company (Pty) Ltd	Behavioural	82 000	135 000	169	164	0.6	Immediate	0.024-0.037
	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131
	Compressed air	280 000	329 000	411	399	0.8	Medium-term	0.059-0.089
Wiring Harness manufacture: Hesto Harnesses	Water heating	203 333	100 000	125	121	2.1	Medium-term	0.018-0.027
	Lighting	390 000	153 000	191	186	2.7	Medium-term	0.028-0.041
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Building Contractors: Amod Adam Construction cc	Behavioural	82 000	135 000	169	164	0.6	Immediate	0.024-0.037
	Lighting	390 000	153 000	191	186	2.7	Medium-term	0.028-0.041
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Dolorite quarry and crushing: Ballito Crusher	Behavioural	82 000	135 000	169	164	0.6	Immediate	0.024-0.037
	Compressed air	280 000	329 000	411	399	0.8	Medium-term	0.059-0.089
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066

Activity type and companies	Project Type	Average implementation cost (Rand)	Average Cost Savings (Rand/year)	Energy Savings (MWh/year)	Emission Savings (tCO ₂ e/year)	Payback Period	Timeframe	Job Potential (Jobs)
Mattress manufacture: Simmons SA (Pty) Ltd	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131
	Lighting	390 000	153 000	191	186	2.7	Medium-term	0.028-0.041
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Car rental: Avis Van Rental (Ballito)	Behavioural	82 000	135 000	169	164	0.6	Immediate	0.024-0.037
	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Landfill Management: Dolphin Coast Landfill Management (Pty) Ltd	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131
	Compressed air	280 000	329 000	411	399	0.8	Medium-term	0.059-0.089
	Lighting	390 000	153 000	191	186	2.7	Medium-term	0.028-0.041
Christmas cracker manufacturer: Glenart Trading	Water heating	203 333	100 000	125	121	2.1	Medium-term	0.018-0.027
	Lighting	390 000	153 000	191	186	2.7	Medium-term	0.028-0.041
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Cane spirit product: Glendale Distilling Co.	Behavioural	82 000	135 000	169	164	0.6	Immediate	0.024-0.037
	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131
	Compressed air	280 000	329 000	411	399	0.8	Medium-term	0.059-0.089
Property Development and Management: Hulett Development Company, IFA Hotels & Resorts, Mfundo Projects and Services,	Behavioural	82 000	135 000	169	164	0.6	Immediate	0.024-0.037
	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131

Activity type and companies	Project Type	Average implementation cost (Rand)	Average Cost Savings (Rand/year)	Energy Savings (MWh/year)	Emission Savings (tCO ₂ e/year)	Payback Period	Timeframe	Job Potential (Jobs)
Prodev Property Group, Elan Property Group, EM and EM Engineering (Pty) Ltd	Lighting	390 000	153 000	191	186	2.7	Medium-term	0.028-0.041
Industrial property company; sales, rentals and management: ComProp Ballito	Behavioural	82 000	135 000	169	164	0.6	Immediate	0.024-0.037
	Lighting	390 000	153 000	191	186	2.7	Medium-term	0.028-0.041
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Realtors: Royal Palm Property Holdings	Behavioural	82 000	135 000	169	164	0.6	Immediate	0.024-0.037
	Lighting	390 000	153 000	191	186	2.7	Medium-term	0.028-0.041
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Sugar mills: Tongaat Hulett Sugar Darnall	Steam	400 000	491 667	615	596	0.9	Long-term	0.089-0.133
	Behavioural	82 000	135 000	169	164	0.6	Immediate	0.024-0.037
	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131
Electronics manufacturing service partner: Wasomi Enterprises	Behavioural	82 000	135 000	169	164	0.6	Immediate	0.024-0.037
	Lighting	390 000	153 000	191	186	2.7	Medium-term	0.028-0.041
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Panel beater: Winclo Spray Painters	Compressed air	280 000	329 000	411	399	0.8	Medium-term	0.059-0.089
	Lighting	390 000	153 000	191	186	2.7	Medium-term	0.028-0.041
	HVAC	634 000	245 000	306	297	2.7	Long-term	0.044-0.066
Forestry, paper, paper products and pulp: Sappi	Steam	400 000	491 667	615	596	0.9	Long-term	0.089-0.133
	Behavioural	82 000	135 000	169	164	0.6	Immediate	0.024-0.037
	Motor	440 000	485 000	606	588	1.0	Medium-term	0.087-0.131

Activity type and companies	Project Type	Average implementation cost (Rand)	Average Cost Savings (Rand/year)	Energy Savings (MWh/year)	Emission Savings (tCO₂e/year)	Payback Period	Timeframe	Job Potential (Jobs)
Total		36 890 667	26 882 333	33 603	32 595	1.6		4.839 -7.248

6.2.2 Proposed budget

The total average implementation cost was divided into awareness and training, energy audits, energy retrofits and energy capital equipment replacement projects based on the immediate, short-, medium- and long-term time frames as specified above (Table 6).

Table 6: Break-down of average implementation costs for various energy efficiency activity types per time frame

Component	Time frame	Activity type	Details	Cost (Rand)
1	Immediate	Awareness workshops	One half day workshop every 6 months for 2 people for each of the 33 companies over 4 years	99 000
		Training	Basic energy management training 2 people from each company (https://energytrainingfoundation.co.za/courses/basic-principles-energy-bpe/) once off	113 850
			Advanced energy management training 1 person from each company (https://energytrainingfoundation.co.za/courses/certified-energy-manager-cem-course/) once off	759 000
		Total		
2	Short-term	Energy Audits*	Energy Audits smaller companies	660 000
			Energy Audits larger companies	330 000
		Total		
3	Medium-term	Energy retrofits	Compressed air	2 912 000
			HVAC	10 651 200
			Lighting	5 928 000
			Motor	7 744 000
			Steam	640 000
			Water heating	325 333
		Total		
4	Long-term	Energy capital equipment replacement projects	Compressed air	728 000
			HVAC	2 662 800
			Lighting	1 482 000
			Motor	1 936 000
			Steam	160 000
			Water heating	81 333
		Total		
	Project management			4 787 483
	Grand total			42 000 000

* The budget for Component 2 includes energy audits only. The respective companies are to develop their own energy management/implementation plan. However, the energy management training courses included in the budget under Component 1 would enable companies to implement energy management systems.

The high mast street lights at the iSithebe Industrial Park are currently fitted with 400W High Pressure Sodium (HPS). A lighting retrofit replacing HPS lamps with LED luminaires will significantly reduce energy consumption, costs and related CO₂ emissions. LED lights provide the best opportunities for

energy efficiency in comparison to HPS⁶². The retrofit would require the following investment costs (Table 7):

Table 7: Lighting retrofit costs of HPS street lights at iSithebe Industrial Park*

Technology	Cost of luminaire (including lamp)	Number of lamps to be replaced	Total implementation cost (excluding installation cost)
LED 90W	R4 783	352	R1 683 616

* Calculations were based on: SEA. 2012. Efficient public lighting guide. Sustainable Energy Africa NCP, with funding from REEEP, in partnership with CESU, DoE and SALGA, Cape Town, South Africa. Note the prices provided are expected to have changed since 2012.

While the 400W HPS lamps have an energy consumption of 16 060 kWh over 10 years and would need to be replaced every 3.3 years, the 90W LED luminaires only consume 3 614 kWh and need no replacement over a 10-year time frame. Based on this, the cost savings over a 10 year period in switching 400W HPS lamps to 90W LED is R 8733 per lamp (or a total of 3 million Rand for all 352 lamps).

6.2.3 Potential project partners

As every energy efficiency opportunity type was linked to approximate time frames, the suitable project partners are discussed according to these time frames, as well as their specific strength, i.e. implementation, funding, expertise, etc. This will assist SECO and Vuthela in identifying which project partner is most suitable for which aspect of the industrial energy efficiency project. In some instances the link between the specific type of an energy efficiency opportunity and a potential project partner could be made if the relevant organisation provided detailed information or that information was accessible. In the case of behavioural initiatives, the link was relatively easy to make. At times organisations did not distinguish between the different types of energy efficiency opportunities and merely stated their organisational focus to be on “energy efficiency”. Nevertheless, as many details as possible are discussed below for each of the identified potential project partners based on the information available.

6.2.3.1 Immediate

The **Carbon Trust** could be a potential project partner for immediate (behavioural) energy efficiency projects, focusing specifically on training and awareness. Carbon Trust focuses on SMEs and can provide funding, implementation support, tools and advice.

The **NCPC** could be a potential project partner for immediate energy efficiency projects by providing services such as awareness raising, technical support, implementation facilitation, capacity building and skills development with particular focus on energy management systems.

REEEP could be a potential project co-funding partner, especially if capital expenditure (CAPEX) is required. Programmes focusing on SMEs are advertised and examined on the alignment to SECO and Vuthela’s project objectives.

⁶² SEAD. 2019. SEAD street lighting factsheet (https://staging.superefficient.org/uploads/site/SEAD-Street-Lighting-Factsheet_Final.pdf#asset:533). Accessed 8 April 2019.

SANEDI has established partnerships in place. SECO and Vuthela could draw from this to overcome the reported companies' reluctance to and/or limited awareness of energy efficiency. This could also fast-track project implementation.

Power Africa by **USAID** could provide a financial assistance and on-the-ground and capacity building support. The toolbox⁶³ could be valuable SECO, Vuthela and private companies in identifying potential funding avenues and informational resources that assist project implementation.

6.2.3.2 Short-term

The **Carbon Trust** could be a potential project partner for short-term (behavioural) energy efficiency projects, focusing specifically on implementation plans, tariffs and energy audits by providing funding, implementation support, tools and advice.

The **DTI** can provide technical, training and implementation support, access to funding as well as tools for energy management systems.

The **GIZ**, working both with government but also focusing on micro, small, medium-sized enterprises (SMME) and large enterprise development and relationship building, promotes cleaner production and corporate social responsibility (CSR), for example through the GIZ Center for Cooperation with the Private Sector (CCPS). Ownership of the project needs to be demonstrated. The GIZ could potentially assist in energy management systems and the implementation of energy efficiency measures. This organisation could further fund or partially fund a project, support investment into energy efficiency technologies, provide assistance with training and skills development, introduction to standards, technical advisory services and tools. A tendering process may be involved to access the outlined support services.

UNIDO, having partnered with the NCPC on the Industrial Energy Efficiency Project, can act as potential implementation partner for, for example, energy management systems.

6.2.3.3 Medium-term

As part of a previous energy efficiency projects, the **Carbon Trust** has been involved with retrofitting, replacing existing geysers with heat pumps and installing micro-sprayers on compressors. The organisation could therefore be a potential project partner for lighting, water heating and motors, and potentially for air compressors as well. The Carbon Trust could provide funding and implementation support, tools and advice.

The **GIZ** could be a partner for lighting and water heating related energy efficiency projects. The GIZ has previously worked on a solar water heating pilot project. Although this was in partnership with the Nelson Mandela Bay Municipality, GIZ's focus on SME development could indicate that these types of energy efficiency projects could be supported for industrial SMEs as well.

The **NCPC** has been involved in various projects focusing on energy efficiency opportunities associated with a medium-term time frame. For example, an energy efficiency improvement project was

⁶³ USAID, 2019. (<https://www.usaid.gov/powerafrica/toolbox>). Accessed 27 February 2019.

implemented at Altech UEC South Africa (electronic manufacture) in 2012/2013⁶⁴ focusing on lighting and compressed air.

PFAN has a broad focus on energy efficiency. PFAN advertises potential projects which proposals can be submitted for. Available project grants can be suitable for SECO and Vuthela if a co-funding and technical assistance partner is required to support an industrial energy efficiency project. PFAN may therefore be a potential partner for medium- to long-term energy efficiency projects.

REEEP. Please refer to the relevant paragraph in Section 6.2.3.1 for details.

SANEDI suggested that although they may not fund or implement industrial energy efficiency projects, they are looking to provide assistance/guidance and expertise. Their involvement with a biogas digester project in rural KwaZulu Natal shows that SANEDI could be a potential project partner for medium- to longer-term energy efficiency projects.

As outlined in Section 6.2.3.2, **UNIDO** can act as implementation partner and provide assistance in skills transfer, expertise, capacity building, technology transfer, methodologies and tools to implement system optimisation projects and practices.⁶⁵ UNIDO has been involved not only in projects focusing on energy efficiency in the short-term, but has been involved in industrial motor-driven pump systems. Further, as part of their focus on efficient operation and energy efficiency design and manufacturing and involvement in the Altech UEC project, this indicates that the organisation would be a suitable project partner for energy efficiency projects focusing on areas such as motor, water heating, compressed air and lighting.

The same applies to **USAID**. Please refer to the previous paragraph and Section 6.2.3.1 for more details on potential project support.

6.2.3.4 Long-term

The organisations listed below could be potential project partners for energy efficiency projects focusing on the long-term (e.g. steam, HVAC and process optimisation). To avoid repetition, please refer to Sections 6.2.3.1, 6.2.3.2 and 0 for more information on the type of project support.

- **Carbon Trust**
- **NCPC**
- **PFAN**
- **REEEP**
- **SANEDI**
- **UNIDO**⁶⁶ (also involved in the “Energy Efficiency Potentials in Industrial Steam Systems in China” project)

⁶⁴ DTI, DoE, UNIDO, SECO, UKAID. 2014. *Energy management system (EnMS): Altech UEC South Africa Electronics manufacture*. Council of Scientific and Industrial Research, Johannesburg, South Africa. Available at <http://ncpc.co.za/services-about-ncpc-2/case-studies-and-success-stories/case/case-study-altech>.

⁶⁵ UNIDO. 2009. *UNIDO and energy efficiency: A low-carbon path for industry*. United Nations Industrial Development Organisation, Vienna, Austria.

⁶⁶ UNIDO. 2014. *Energy efficiency potentials in industrial steam systems in China*. United Nations Industrial Development Organisation, Vienna, Austria. Available at https://www.unido.org/sites/default/files/2015-09/EE_Potentials_Steam_Systems_China__0.pdf.

- **USAID**

The **DTI** can provide technical, training and implementation support, access to funding as well as tools for energy systems optimisation (ESO).

The 12L tax incentive (Section 12L of the Income Tax Act 1962 (Act No. 58 of 2962)) implemented by, amongst others, **SANEDI** permits companies to save taxes of 95c/kWh after verified (SANAS) energy efficiency savings over a 12 month period compared to a baseline measurement. An incentive could provide companies with increased commitment and motivation to engage on industrial energy efficiency in the long-term.

The IFC may be considered as potential project partners for funding as well. The organisation has been contacted to confirm a potential partnership with SECO and for which components. Feedback has not been received when this report was finalised. EEP Africa could be a project partner and assist SECO in establishing partnerships between companies and facilitate knowledge and experience exchange in the region.

6.3 Key Findings

The Energy Efficiency Scoping Study forms part of the Vuthela LED Programme set out to inform SECO's discussions and funding decisions for industrial energy efficiency projects in the iLembe District. The Scoping Report is a high-level analysis of potential industrial energy efficiency opportunity types for the identified 34 key energy consumers in Mandeni and KwaDukuza. The estimates are based on national averages and provide a first baseline assessment on industrial energy efficiency opportunities in the iLembe District Municipality. More detailed assessment can be guided by this initial assessment and the energy audits will provide more precise estimates of implementation costs and savings for this.

The following savings, payback periods and job creation potential could be estimated if the identified opportunities (three per company) were to be implemented in all 33 identified companies:

- Total implementation costs: R37 212 517;
 - Awareness and training: R971 850;
 - Energy audits: R990 000;
 - Energy retrofits: R28 200 533;
 - Energy capital equipment replacement projects: R7 050 133;
- Rand savings per year: R26 882 333;
- Energy savings per year: 33 603 MWh ;
- Emissions savings per year: 32 595tCO₂e; and
- Average job potential: 5-8 jobs.

The Scoping Report highlights that few industrial energy efficiency projects are currently being implemented and that there is a great potential within the two local municipalities for implementing industrial energy efficiency projects. The implementation success will be highly dependent on the buy-in and participation of local companies. The lack of buy-in and availability/provision of information and company willingness to participate have been identified as a potential risk at the inception phase of this project, which has materialised. Partnering with organisations (e.g. SANEDI) that have established partnerships with industry in place can substantially mitigate this risk.

Another barrier to the uptake of energy efficiency measures related to policy and legislative frameworks are tariff structures and payback periods. High electricity prices offered by the municipality promotes the uptake of renewable energy measures (off-grid) and leads to defection from industrial energy efficiency. Whereas low electricity tariffs, as is the case in Mandeni, does not provide incentives for companies to take up energy efficiency measures.

Splitting industrial energy efficiency measures into immediate, short-, medium- and long-term time frames allows to prioritise each project component. Each component builds up industrial energy efficiency in stages, where one stage is dependent on the success of the previous one. This phased approach builds the required skills, awareness and management systems right at the start and are essential for long-term energy efficiency measures that are more capital and time intensive and require advanced technologies. Especially that data for the area is limited and calculations are based on national averages, this phased approach allows to gather more detailed information to assess the feasibility of energy efficiency projects. Tax incentives available (12L) could increase the uptake of more investment intensive energy-efficient technologies in the long-term. Companies are able to save taxes of 95c per verified kWh from a specific energy efficiency measure.

Benefits other than monetary, energy and emissions savings, relate to improved levels of communication and fostering public-private relationships in iLembe. Skills development and knowledge transfer can uplift employees, and these benefits may not be limited to the geographical and time boundaries of a funded industrial energy efficiency project. Employees' families and thus communities can benefit as well. This enables community members to partake in economic activities. The industrial sector is an important driver in the transitioning towards a low-carbon future. Industrial energy efficiency can increase competitiveness of local companies, address job creation concerns, foster sustainable socio-economic development of iLembe and its residents, assist in alleviating poverty and enable building resilience to climate change.

Only five to eight direct jobs were estimated to potentially be created based on the data for national averages. Although the number of jobs created through the above energy efficiency measures appears to be low, it should be taken into consideration that the Rand savings at companies can also have a positive impact on job creation. The moneys saved can be spent on creating additional job positions within the companies' core business, or on the supply chain, which may lead these to be able to employ more staff. In addition, the jobs created will have downstream effects on consumer spend, the ability of previously unemployed staff to partake in economic activities, uplift their families in the short- and long-term (e.g. afford education to increase their or their family member's employability) as well as their communities (i.e. increased spend at local stores/sops/businesses). One therefore should consider the wider positive implications of energy efficiency measures on job creation (indirect and induced jobs), not only the direct jobs created.

The number of jobs created from energy efficiency projects is generally low compared to other green initiatives⁶⁷. Instead of a main driving force, the potential job creation related to energy efficiency projects should therefore be viewed as an added benefit.

⁶⁷ USAID. 2019. Economic and employment impacts of energy efficiency (<https://www.usaid.gov/energy/efficiency/economic-impacts>). Accessed 25 March 2019.

7 PROJECT RECOMMENDATIONS

7.1 Description of the Project/Programme

The SECO project, *Industrial Energy Efficiency in iLembe*, is a programme that seeks to support the uptake and use of energy efficiency solutions.

The primary objective of this project is to improve the energy efficiency of industrial companies in the Mandeni and KwaDukuza Local Municipalities within the iLembe District Municipality, in order to enhance profitability, mitigate climate change, create job opportunities and foster skills development.

This project focuses on engagement and buy-in of local private companies, building relationships among companies as well as between local government and private companies, and on creating a conducive environment for implementing industrial energy efficiency measures. The Scoping Study, entitled “Development of a scoping study for implementation of energy efficiency within the KwaDukuza and Mandeni Municipalities” identified that only few energy efficiency projects exist in these municipalities. Industrial energy efficiency will play an essential role in meeting the ambitious low-carbon transition goals of the iLembe District Municipality.

The expected project impacts are:

- Industrial energy savings of 33 603 MWh per year;⁶⁸
- Cost savings of R26 882 333 per year⁶⁸ (or R107 529 332 over a 4-year project period);
- Avoided greenhouse gas emissions of 32 595 tCO₂e per year⁶⁸ (or 130 380 tCO₂e over a 4-year project period);
- Potential job creation of 5-8 jobs; and
- An estimated R42 000 000 are required to implement three industrial energy efficiency opportunities for each of the 34 companies including administration costs
 - R37 212 517 to implement the energy efficiency measures
 - Awareness and training: R971 850;
 - Energy audits: R990 000;
 - Energy retrofits: R28 200 533;
 - Energy capital equipment replacement projects: R7 050 133;
 - R4 787 483 for project administration; and
- An estimated R1 683 616 (based on 2012 prices) would be required for a lighting retrofit at iSithebe Industrial Park.

7.2 Activities and Expected Results

The activities as part of this programme are following a phased approach from immediate, to short-, medium- and long-term energy efficiency measures which build upon each other. This ensures the programme’s long-term success and sustainability.

The project contains four components:

Component 1: Awareness and Training

⁶⁸ Based on national averages calculated from data provided by the Energy Efficiency Guide.

Outcome 1: Providing a baseline for more advanced industrial energy efficiency measures and technologies

This component will engage directly with companies to increase awareness of industrial energy efficiency and train company staff on energy management, such as switching off lights and equipment when not in use and clearly labelled and metered distribution boards to monitor and manage energy use. This component is low risk and relatively low cost to business operations with simple payback periods and can significantly reduce wasteful energy consumption.

The target is to provide awareness and training to 34 companies in Mandeni and KwaDukuza, which have been identified based on their energy consumption per year (LPUs) and industry/activity type.

With associated approximate implementation costs of R971 850, SECO could grant-fund the component and partner with the NCPC as an implementation and co-funding partner. SECO could further partner with SANEDI who can assist in establishing partnerships. EEP Africa could assist SECO in establishing partnerships between companies and facilitate knowledge and experience exchange.

Component 2: Energy Management Systems, Implementation Support, Energy Audits

Outcome 2: Setting out a framework for industrial energy efficiency measures that enables effective monitoring and evaluation and project impact evaluation

This component will support energy spend optimisation such as tariff optimisation and bill accuracy, business's energy spend over a period comparison and consider energy cost as well as price when purchasing new machinery. Further, metering and monitoring allows to measure energy consumption accurately.

In a next phase within Component 2, energy management systems are set up. This involves the implementation of standards such as ISO 50001: Energy Management System. This will also enable companies to set up a monitoring and evaluation (M&E) process at the very beginning of the energy efficiency programme and facilitate the implementation of future energy efficiency measures. At the same time, it will allow SECO to track the project's progress and success before proceeding with subsequent project components.

Energy management systems will enable significant energy savings. A year's energy consumption data will provide a baseline to measure performance against. Energy performance indicators (EnPIs) is a useful tool in tracking energy performance. For smaller companies which do not require complex metering systems, it is recommended that regular (possibly monthly) evaluation of energy costs is done.

In a final step, an energy audit will be conducted that provides companies with a detailed assessment of their recommended measures, total energy and economic savings, total investment as well as payback period. Audits assist greatly in identifying and prioritising areas of efficiency improvements and also facilitates the M&E process.

To implement Component 2, SECO could provide funding to outsource component aspects such as energy audits to smaller companies (e.g. Promethium Carbon, energy service companies (ESCOs)). Implementation support can also be provided by the NCPC and the Carbon Trust. The budget of R990 000 includes energy audits only. The respective companies are to develop their own energy

management/implementation plan. However, the energy management training courses included in the budget under Component 1 would enable companies to do so.

Component 3: Maintenance Programme and Retrofitting

Outcome 3: Long-term sustainable behavioural changes and adding new technologies to older systems

This component will support companies in embedded awareness and training and replacing single components in equipment. Integrated training and awareness will ensure long-term behavioural changes and therefore long-term energy savings/reduced energy spend. More specialised training would focus on maintenance programmes and leakage detection, reviewing and optimising systems, improvements and equipment maintenance. Companies should also consider energy costs and price when purchasing new machinery.

Retrofitting measures include, but are not limited to, geysers to be replaced with heat pumps, lights retrofitted with light emitting diodes (LEDs) and Luminaires, installation of variable-speed drives (VSD; highly cost effective), optimising conveying systems, voltage regulation and/or power factor correction. Further, measures could also include the replacement of the condenser component of HVAC system and the evaluation and redesign of piping configuration to minimise losses.

In iSithebe, current sodium lamps in high mast lighting could be replaced by LED Lights to significantly reduce energy consumption, costs and related CO₂ emissions. LED lights provide the best opportunities for energy efficiency in comparison to High Pressure Sodium (HPS) or Metal Halide (MH) luminaires⁶⁹. The lumens from a 90W LED will be similar to the average lumens of a 400W HPS over its life. At R4 783 per 90W luminaire (2012 prices⁷⁰), the retrofit for all 352 high mast lamps would require R1 683 616. While the 400W HPS lamps have an energy consumption of 16 060 kWh over 10 years and would need to be replaced every 3.3 years, the 90W LED luminaires only consume 3 614 kWh and need no replacement over a 10 year time frame. The cost savings over a 10 year period in switching 400W HPS lamps to 90W LED is R 8733 per lamp (or a total of 3 million Rand for all 352 lamps). More detailed information on the various light technologies and efficiencies (traffic, street and building) including costs, lifespan and energy savings, is available in the Efficient Public Lighting Guide.⁷¹ The Super-efficient Equipment and Appliance Deployment (SEAD) Initiative also provides a SEAD Street Lighting Tool to lower energy consumption.

These measures are energy efficiency options if the capital for new, energy efficient equipment is not available, yet equipment efficiency can be greatly improved. CAPEX will still be required by companies, estimated amounting to R28 200 533, and may be accessed through loans (e.g. IDC) or co-funding mechanisms (NCP). CAPEX could also be raised through a challenge fund published through partnerships with municipalities. Co-funding through IDC and the dti as part of the industrial parks revitalisation programme may also be a possible funding route.

Component 4: Replacement of Less Efficient Equipment and Energy Process Optimisation (EPO)

⁶⁹ SEAD. 2019. SEAD street lighting factsheet (https://staging.superefficient.org/uploads/site/SEAD-Street-Lighting-Factsheet_Final.pdf#asset:533). Accessed 8 April 2019.

⁷⁰ SEAD. 2019. SEAD street lighting factsheet (https://staging.superefficient.org/uploads/site/SEAD-Street-Lighting-Factsheet_Final.pdf#asset:533). Accessed 8 April 2019.

⁷¹ SEA. 2012. Efficient public lighting guide. Sustainable Energy Africa NCP, with funding from REEEP, in partnership with CESU, DoE and SALGA, Cape Town, South Africa.

Outcome 4: Transition towards an advanced energy efficient industrial sector

Long-term oriented industrial energy efficiency practices that essentially reshape industry practices will enable the transition towards a low-carbon future and reduce greenhouse gas emissions. This Component supports a systems approach to long-term industrial energy efficiency in iLembe. Once shorter-term measures such as awareness, energy management plans, energy audits and retrofitting have been put in place, companies should consider the replacement of energy inefficient-equipment with energy-efficient options.

This requires high initial CAPEX and is associated with greater risk than immediate and short-term energy efficiency measures, payback periods can be relatively short although to some extent: for example, the installation of high-efficiency motors has a payback period of less than two years. The use of boilers for steam generation, solar water heating installation, HFCs free HVAC technology and upgrading air compressors are further measures to be considered for the implementation of Component 4.

Energy process optimisation (EPO) can result in increased production capacity and reduced production costs. Companies would be able to benefit from an optimal control strategy which aims to maximise productivity at minimal costs.

Tax incentives could increase the uptake of more investment intensive energy-efficient technologies, such as the 12L tax incentive, through which companies can save taxes of 95c per verified kWh from a specific energy efficiency measure over a 12 month period compared to a baseline measurement.

Funding would need to be accessed through a challenge fund, bank loans, the IDC and IFC. While SECO provides implementation support.

7.3 Sustainability

Sustainability of results of this intervention is based on the following elements:

A phased (step-by-step) approach to industrial energy efficiency, building on awareness and training, the establishment of effective frameworks and management plans to support long-term monitoring and evaluation, retrofitting as well as use of high-efficient, new technology will lead to the adoption of long-term energy efficient practices. These have the potential to reduce greenhouse gas emissions significantly, contributing not only to the District's transition towards a low carbon economy, but to South Africa's NDC as well. The project assists in the mitigation of climate change that is sustainable. Awareness raising can have positive effects on behavioural changes far exceeding the geographical boundaries of industrial companies in iLembe and the timeframe of the project. Knowledge-sharing and communication can translate into behavioural changes of commercial as well as residential actors. This may lead to these actors taking up energy efficiency measures as well.

Sustainability is also addressed through the information exchange and establishment of public-private relationships by employing project members at the iLembe Chamber of Commerce, Industry and Tourism. If two project management members were to be employed at the Chamber, it would create sustainable structures and longer-term awareness of energy efficiency in the Chamber. This is to be considered in light of more than half of the Chamber's members are head of companies in iLembe. This will have knock-on effects outside the scope of the project and its timeframe. The exposure of Chamber members to energy efficiency information could potentially promote further

information dispersal and/or the uptake of energy efficiency measures of companies not part of the project. The public-private sector relationship would also be fostered, benefiting communication between parties, improve understanding and needs, result in faster implementation of projects and better project quality standards, to name but a few.

Industrial energy efficiency can be linked to the creation of direct, indirect and induced employment opportunities. Energy efficiency investments into installation and maintenance of technology by a service company, spend on related supply and service chains (building materials or manufacture for energy efficient products) as well as increased spending power lead to job creation. SMEs are the largest employer in South Africa. Also given the high unemployment rate and strong social disparities, job creation resulting from this project will greatly assist in addressing these challenges.

Training as part of Component 1, 2 and partially 3 can upskill employees, which is essential in fighting poverty in South Africa. Especially access to education and training for the poorer is highly limited, keeping them in the poverty trap. Skills development would lead to increased pay, access to the job market and with better pay the ability to partake in the South African economy. This will have knock-on effects and uplift entire families and communities. In the work environment, skills development can increase employee motivation, increased efficiencies in processes (leading to financial gains) as well as increased innovation in products and strategies.

7.4 Beneficiaries

The main beneficiaries are the industrial companies in Mandeni and KwaDukuza Local Municipality with whom SECO will engage to provide training, implementation, advisory, management and auditing support. The project will target small- to medium-sized iLembe-based (local) companies. These companies represent a significant share of electricity consumption and thus carbon emissions in the District Municipality. SMEs provide the backbone of South Africa's economy, are drivers in reducing unemployment and diversification.⁷²

The second beneficiary is the iLembe District Municipality. The project will contribute to its transition towards a low-carbon future, improve the economic future of the District and create higher, better and more inclusive employment.

Finally, knowledge-sharing activities will target a broader range of beneficiaries, including industry associations and employees. The employment of two administrating agents at the iLembe Chamber of Commerce, Industry and Tourism, funded by the programme, would enable interactions, communication and knowledge-sharing between actors at the Chamber, especially considering that the Chamber's composition is made up of >5-% local business owners. The level of exposure of energy efficiency awareness can therefore be greatly enhanced.

The broader community within which the companies operate can benefit from employee training, related increased employability and pay. The additional capital available can uplift families and the community due to increased spending in the area and improved access to education of family and community members. Rather than the direct jobs that could be created from energy efficiency project (found to be generally low), the annual companies' Rand savings, the sustainability of the company

⁷² The Banking Association of South Africa. 2019. SME enterprise (<https://www.banking.org.za/what-we-do/sme/sme-enterprise>). Accessed 27 March 2019.

and skills development would have a greater indirect and induced positive impact on sustainable job creation.

7.5 Project Budget

An estimated R42 000 000 are required to implement three industrial energy efficiency opportunities for each of the 33 companies including administration costs. This is split into R37 212 517 for the implementation of the energy efficiency measures and R4 787 483 for project administration. The energy efficiency measures can be split according to the time frame and thus their component affiliation:

- Component 1 – awareness and training: R971 850;
- Component 2 – energy audits: R990 000;
- Component 3 – energy retrofits: R28 200 533;
- Component 4 – energy capital equipment replacement projects: R7 050 133; and
- Lighting retrofit at iSithebe Industrial Park: R1 683 616.

7.6 Project Management

7.6.1 Project organisation/governance

The project will be implemented over a period of 3 to 4 years.

Vuthela will act as the programme coordination unit for SECO interventions, which will reduce the cost for project management and administration. A satellite office would be required for the management of the project.

The NCPC and ESCOs could be valuable project partners to assist SECO in the implementation of the project components and provide expertise. Vuthela could further partner with SANEDI which has a network of partnerships in place in the region, which could reduce the time investment needed to establish long-term partnerships and gain buy-in. The GIZ and Carbon Trust may provide tools, know-how and implementation support for the more advanced components of the energy efficiency project (Components 3 and 4). The IFC may be considered to partner with for grant funding. More specific information was requested, yet at the finalisation of this report, no feedback has been received. While the programme coordination unit can oversee Components 1 and 2, the individual companies would be responsible for the procurement for Components 3 and 4 of the project. Energy audits can be implemented through a collaboration of the Chamber, ESCOs, the NCPC and a potential energy management office.

7.6.2 Monitoring and evaluation

By applying a phased approach to industrial energy efficiency in Mandeni and KwaDukuza Municipalities that firstly involves awareness creation, training and the setting up of energy management systems, a monitoring and evaluation process is being embedded in company energy efficiency management right from the start. It automatically defines the M&E process and energy audits provide companies as well as SECO with the tool for monitoring progress. The facilitation of training on standards such as ISO 50001 and/or training staff to become a certified energy manager assists capacity building at companies. The oversight of this process could be embedded in the

Chamber and assists companies in overcoming current energy-inefficient behaviours and management systems.

The management systems and audits conducted at companies as part of the project allow SECO to review project outcomes and evaluate their effectiveness. The implemented M&E systems allow to follow the plan, do, check, act cycle (Figure 2).

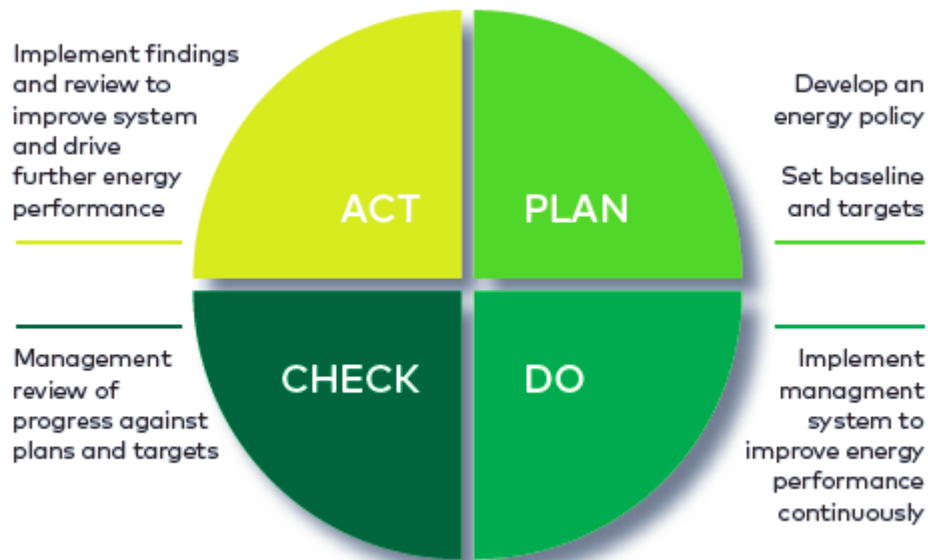


Figure 2: Plan, do, check, act cycle of ISO 50001. Source: Nedbank Energy Efficiency Guide

7.6.3 Summary of Management Components

A summary of the project components, time frames, and project partners are presented below (Figure 3).

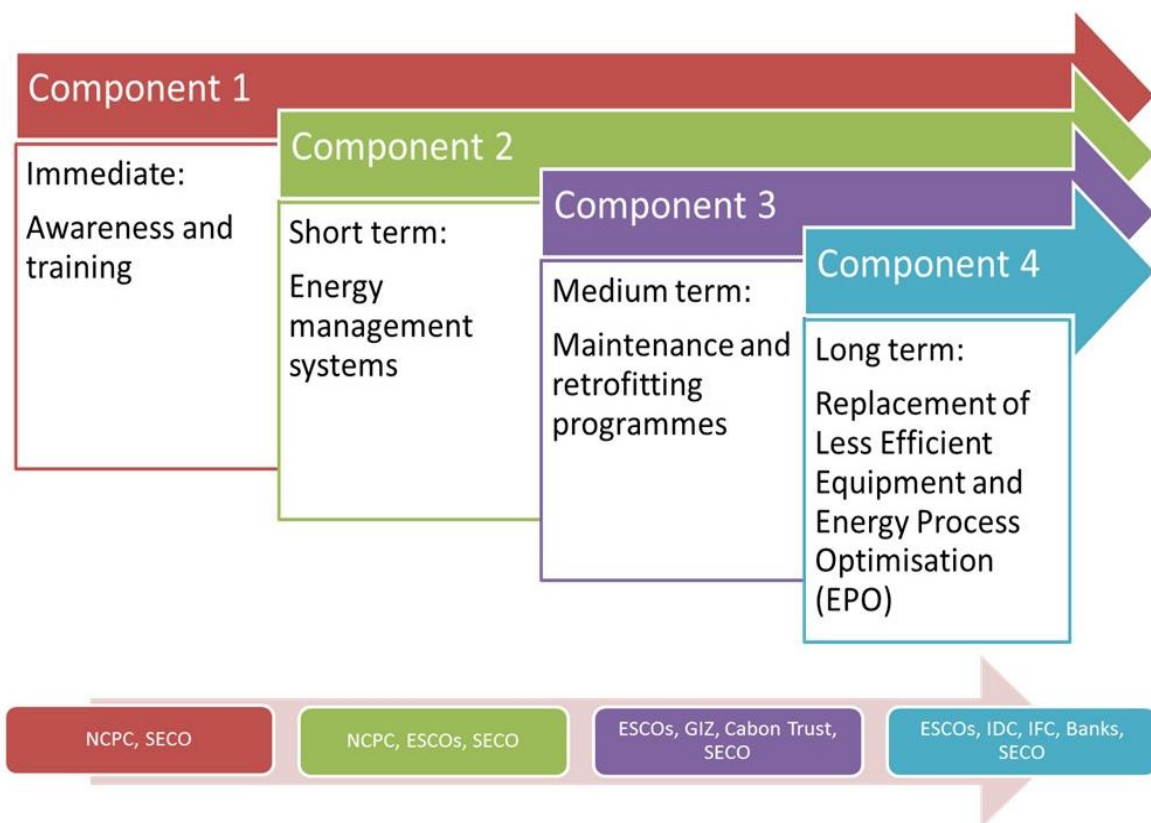


Figure 3: Summary of project recommendations

7.7 Opportunities and Risks

7.7.1 Opportunities

The implementation of industrial energy efficiency in iLembe presents the opportunity to become one of the leaders in the energy transition in the area through energy and emissions savings, improved public-private sector collaboration and through the creation of sustainable jobs. The contribution towards increased energy efficiency will relieve the grid and make products and services less coal intensive. South Africa’s electricity generation and therefore related CO₂ emissions, is still heavily dependent on coal, making it the 14th largest emitter of GHGs globally. Emissions savings from energy efficiency measures directly contribute to climate change mitigation locally, regionally, and globally. It will contribute to meeting the NDC on a national scale.

The phased approach to energy efficiency implementation in iLembe offers the opportunity of creating a long-term, sustainable transition towards a low-carbon future.

The creation of sustainable direct, indirect and induced jobs can have knock-on effects that are not limited to the boundaries, both geographical and temporal, of the company locations. Knowledge is disseminated and behaviour changed outside the scope of the project.

The carbon tax may favour industrial energy efficiency. The tax could potentially have an impact on the price of electricity. National Treasury has however given a commitment that there will be no impact of carbon tax on the electricity tariff up to 2020. After 2020 the carbon tax impact could be in

the order of 5 cents per kWh, increasing to a potential level of 12 cents per kWh by 2030. A higher electricity tariff could affect the tariff structure in favour of energy efficiency projects.

7.7.2 Risk management

Company buy-in from and support of companies is low. This concern has been raised at the inception phase of the scoping project. This may be related to limited human capacity to collect and provide data, the technologies available to companies in order to collect and manage data, or related to other immediate pressures to maintain their business processes and services. Interviews with stakeholders have also identified the need for establishing long-term relationships in order to receive both support and buy-in.

A further risk relates to a potential limited company commitment to the especially longer-term components of the project. This risk can be minimised following the suggested phased approach (four project components) that enables companies to begin their company's energy transition with behavioural changes, moving towards management plans and energy audits. These initial energy efficiency measures require relatively low capital investment, effort and risk. It is suggested that companies are invited to workshops focusing on energy efficiency education and behaviour. Subsequent workshops can address energy management systems and energy audits. Companies which will not seriously be involved in medium- to longer-term energy efficiency measures can be identified. This can save project costs and focus interventions and funding on committed companies.

Capacity and availability of funding to implement identified efficiency measures may be limited post project (3-4 years). The scale of the impact on long-term sustainable changes could therefore be limited or jeopardised.

Electricity tariff structures may lead to deflection from energy efficiency or to a lack of incentives for companies to take up energy efficiency measures. High electricity tariffs promote the uptake of renewable energy options while low tariffs will not provide companies with an incentive to participate in industrial energy efficiency programmes. As the tariff structure in Mandeni is low, the risk of only few companies participating in the project is relatively high and should be mitigated. This will enhance the project's impact on energy and emissions savings, job creation potential and the Municipality's ability to move towards a low-carbon economy.

Some companies may be liable to report under the *National Greenhouse Gas Emission Reporting Regulations* and have a carbon tax liability with potential negative financial implications. The Carbon Tax boundary is limited to direct emissions:

- From fossil fuel inputs (e.g. coal, oil and gas) combusted in stationary equipment; and
- Where the activity is above the threshold stipulated in the *National Greenhouse Gas Emission Reporting Regulations* (total installed capacity threshold is 10 MW thermal; resulting from e.g. standby diesel generators, oil combustion, LPG, coal boilers); and
- Located in facilities over which the taxable entity has operational control.

A carbon tax liability may be applicable if a company is required to report on its GHG emissions. The Carbon Tax boundary excludes all direct emissions from the combustion of petrol and diesel, even though emissions from combustion of these fuels (in stationary equipment only) must be reported to the Department of Environmental Affairs, where the activity is above the stipulated threshold. This is

because emissions from diesel and petrol will be taxed directly at the pump at 9-10 cents per litre (i.e. not in tax submissions to the South African Revenue Service). Wastewater and waste sites are also exempted from the carbon tax. The carbon tax amount is calculated also taking allowances into account, which the law makes provisions for. Further, carbon tax liabilities can be offset with carbon credits.

The carbon tax may have a negative impact on the price of input materials and products. The tax could potentially have an impact on the price of electricity. National Treasury has however given a commitment that there will be no impact of carbon tax on the electricity tariff up to 2020. After 2020 the carbon tax impact could be in the order of 5 cents per kWh, increasing to a potential level of 12 cents per kWh by 2030. The increased electricity price could therefore negatively affect the pricing of products and services.

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ANNEXURE 2: SURVEY

Questionnaire for: Vuthela Energy Efficiency Scoping Project

Promethium has undertaken to conduct a scoping study of energy efficiency within the iLembe District. This scoping study forms part of the Vuthela LED Programme which aims to improve the economic future and quality of life through sustainable growth within the municipalities. The study aims to gain an understanding of energy efficiency projects that are feasible in the area so that future energy efficiency project may be supported appropriately.

Please complete the questionnaire below and return it to philip@promethium.co.za by 1 Feb 2019.

Please do not hesitate to contact us with any queries regarding the questionnaire

General Information

Name of company:	
Number of employees:	
Type of industry:	

Operational Information

Information on raw materials: <i>(Provide quantities of major raw materials used in your business in a typical year)</i>	Raw material	Typical annual quantity
	<i>E.g. Anthracite coal</i>	
	<i>...add rows as necessary</i>	<i>...add rows as necessary</i>
Major suppliers: <i>(Provide a list of major suppliers to your business and a brief description of the related products/ services)</i>	Major supplier	Product/Service
	<i>E.g. Eskom</i>	
	<i>...add rows as necessary</i>	<i>...add rows as necessary</i>

Information on production volumes: <i>(Provide production volumes relevant to the company's operations in a typical year)</i>	Company output		Typical annual production volume
	<i>E.g. Clay bricks</i>		<i>50,000 million</i>
	<i>...add rows as necessary</i>		<i>...add rows as necessary</i>
Main clients: <i>(Provide a list of your major clients)</i>	Main clients		
	<i>E.g. Nestle</i>		
	<i>...add rows as necessary</i>		
Waste generated by the company's operations: <i>(Provide quantities of waste generated by the company's operations)</i>	Type of waste	Typical annual quantity	Quantity recycled (if any)
	Paper and cardboard		
	Wood/biomass		
	Organic materials		
	Hazardous waste		
	Other <i>(please specify)</i>		
	Total solid waste		

Energy Policies and Strategies

Please provide information on the company's energy policies and strategies related to energy management systems, awareness programmes, maintenance procedures, equipment downtime, etc.

Energy Information

<p>Energy consumption:</p> <p><i>(Provide information on all forms of energy consumed)</i></p>	Energy Carrier		Quantity Consumed	
	Electricity (MWh)			
	Diesel (litres)			
	Petrol (litres)			
	LPG (litres)			
	Paraffin (kg)			
	Wood (kg)			
	Other, please specify			
<p>Energy consuming equipment:</p> <p><i>(Provide information on all major energy consuming equipment)</i></p>	Major energy consuming equipment	Efficiency	Capacity	
	<i>E.g. Coal fired boiler</i>	<i>36%</i>	<i>2 MWe</i>	
	<i>...add rows as necessary</i>	<i>...add rows as necessary</i>	<i>...add rows as necessary</i>	
<p>Energy efficiency projects:</p> <p><i>(Provide information on current or proposed energy efficiency projects. The description should differentiate between savings from retrofitting and savings from behaviour changes. The savings can include savings in fuel or electricity etc.)</i></p>	Energy efficiency project	Description and status	Energy savings	
	<i>E.g. Variable speed drives</i>	<i>Energy savings were achieved by retrofitting the old furnace with a variable speed drive.</i>	<i>10 MWh electricity/year</i>	
	<i>...add rows as necessary</i>	<i>...add rows as necessary</i>	<i>...add rows as necessary</i>	
<p>What challenges have been identified in implementing EE projects?</p>				

ANNEXURE 3: COMPANIES CONTACTED BY PHONE

Company	Contact no.	Email address	Response after call	Comment from call
Igneous Furniture	0824625553	byouens@mweb.co.za	Requested to send questionnaire via email which was done.	Emailed questionnaire
Hesto Harnesses (Pty) Ltd	0324376700	john@hesto.co.za	Requested to send questionnaire via email which was done.	Emailed shakoor@hesto.co.za will send to relevant people
Monoblock Cobbles	0329470716	rshuttle@mweb.co.za	Requested to send questionnaire via email which was done.	Secretary advises to send him an email - done
Alifurn Outdoor Living	0329470011	tamsyn@alifurn.co.za	Not interested.	Not interested.
Caresa Meubels SA	0837863050	shumaiz@zululunge.co.za	Requested to send questionnaire via email which was done.	Emailed questionnaire
Sembcorp Siza Water	032 946 7200	info-sizawater@sembcorp.com	Requested to send questionnaire via email which was done.	sent email to sheritha.parthab@sembcorp.com
Urban Management	083 324 3367	brian@urbanmgt.co.za	No response to call or number not available but sent survey via email.	Went to voicemail. Sent email anyway.
Ballito Service Park North	032 946 0680	info@robowdev.co.za	Have not started any operations in the area	Have not started any operations in the area
Dematrans Logistics	072 770 8541	dematrans71@gmail.com	No response to call or number not available but sent survey via email.	Went to voicemail. Sent Email anyway.
Dolphin Coast Waste Management	032 947 2979	chris@dcwm.co.za	Requested to send questionnaire via email which was done.	Directed to email Jonathann on jonathann@dcwm.co.za

Company	Contact no.	Email address	Response after call	Comment from call
Dolphin Coast Landfill Management	082 353 3895	James@dclm.co.za	Requested to send questionnaire via email which was done.	Sent email to sino@dclm.co.za
Ample Power cc	083 777 7775	james@amplepower.co.za	No response to call or number not available but sent survey via email.	No answer. Sent email to james@amplepower.co.za
Gledhow Sugar Company (Pty) Ltd	032 437 4400	afrancis@gledhow.co.za	No response to call or number not available but sent survey via email.	Phone back. Ask for Steve Markham (factory manager). Did not pick up after multiple tries. Sent email anyway.
Amatikulu & Emoyeni Mill Group	0353371349		No projects; wasn't interested	Number is for non profit farmer association. Gave 035 331 9000 for the Mill. Gave another number for Snethemba at Tongaat 032 439 5805. No projects, wasn't interested
Bloemendaal Flower Farm	0836615177	sean@bloemendaal.co.za	Requested to send questionnaire via email which was done.	Interested in funding-> email (municipality disappointing, infrastructure decay, reliable source required)
Dakot Milling Media	0353370053	info@dakot.co.za	Requested to send questionnaire via email which was done.	Going to a meeting, asked for an email
Great Railroad Brewing Company	0329470136	greatrailroadbrewing@gmail.com	Requested to send questionnaire via email which was done.	Email.

Company	Contact no.	Email address	Response after call	Comment from call
Holland Farm Guest House	(0)32 942 9042	guesthouse@hollandfarm.co.za	No response to call or number not available but sent survey via email.	Number does not exist. Sent email anyway
Impact Engineering	+27 32 947 1054	impact@saol.com	Requested to send questionnaire via email which was done.	Does not have current projects but is interested in the questionnaire, email
L & P Springs	0325524030	bernard.hattingh@leggett.com	Requested to send questionnaire via email which was done.	Email. Have LED and Motion sensor project in action
PJ Plastics	0325511697	pjplastics@yahoo.com	Requested to send questionnaire via email which was done.	Not big on energy efficiency. But converting to LEDs. Sent email
R & B Civils	+27 32 552 2760	markm@randbpipeline.co.za	Requested to send questionnaire via email which was done.	Email. Don't have projects but said send an email with more detail to their company director
Sharp Steel Trading	0836534049		Not interested for at least the next 2 months.	Not interested for at least the next 2 months.
Stanger Textile Industries	0325523310		Call Wednesday after 7am. Tried on Thurs but says "Number does not exist"	Call Wednesday after 7am. Tried on Thurs but says "Number does not exist"
Thekwini Reinforcing	0325523910	info@thekwini.co.za	Requested to send questionnaire via email which was done.	Email. Interested in solar developments.
Tongaat Hulett Sugar Amatikulu	+27 35 331 9000		See Amatikulu above. Was not interested	See Amatikulu above. Was not interested
Tongaat Hulett Sugar Darnall	+27 32 439 9111		See Amatikulu above. Was not interested	See Amatikulu above. Was not interested

Company	Contact no.	Email address	Response after call	Comment from call
Truck and Trailers	0849220000		Doesn't work at Trucks and Trailers anymore	Doesn't work at Trucks and Trailers anymore

ANNEXURE 4: LIST OF IDENTIFIED COMPANIES

The list below contains 171 companies identified through the iLembe Chamber of Commerce, Industry and Tourism website and an additional 32 companies identified through internet searches of companies in the iLembe District Municipality.

Company	Sector	Company	Sector
Glendale Distilling Co.	Agricultural Processing	LA Consulting Engineers	Business Services
Industrial & Consumer Plastics	Manufacturing	Prodev Property Group	Property & Infrastructure Development
Macphersons Office Furniture	Manufacturing	Mfundo Projects and Services	Property & Infrastructure Development
Igneous Furniture	Manufacturing	Hulett Development Company	Property & Infrastructure Development
Hesto Harnesses (Pty) Ltd	Manufacturing	Elan Property Group	Property & Infrastructure Development
P & O Fabrications cc	Manufacturing	IFA Hotels & Resorts	Property & Infrastructure Development
NPC Concrete	Manufacturing	Enterprise iLembe	Property & Infrastructure Development
Monoblock Cobbles	Manufacturing	FDKL Engineering Consultants (Pty) Ltd	Civil Engineering
Metier Mixed Concrete	Manufacturing	North Coast Water Utility	Infrastructure Development
Whirlpool South Africa	Manufacturing	Archilever (Pty) Ltd	Architecture
Unifoam	Manufacturing	Avis Rent a car (KSIA)	Transport
Rosati Manufacturing	Manufacturing	Avis Van Rental (Balito)	Transport
Wasomi Enterprises	Assembly	Ballito Self Storage	Storage
Powertrans Sales and Services	Assembly	Packnow Ballito	Warehousing
Monoblock cc	Manufacturing	Debonairs Pizza Ballito	Catering
Alifurn Outdoor Living	Manufacturing	Numz Island	Tourism
Fillmore Cans (Pty) Ltd	Manufacturing	Gijima Holdings	Business Services
SEC Electrical	Manufacturing	Impressive Signs	Business Services
Classic Collections	Manufacturing	Greenlands Real Estate	Property Management
Caresa Meubels SA	Manufacturing	Zimbali Estate Management	Property Management
Balwin Properties Ltd	Property Development	The Circle Business Centre	Property Management

Company	Sector	Company	Sector
Sembcorp Siza Water	Business Services	Lahaf (Pty) Ltd	Property Management
Urban Management	Property & Infrastructure Development	Ballito Estates (Pty) Ltd	Property Management
Black Balance Projects	Property & Infrastructure Development	Holloway Properties	Property Sales
Avon Peaking Power	Energy	Ithala - Development Finance Corporation	Property Sales
Ballito Service Park North	Property Development	Simbithi Eco Estate	Property and Related Services
ACSA - King Shaka International Airport	Transport	Paintsmiths Ballito	Retail
Dematrans Logistics	Transport	BBS Mica	Retail
Dolphin Coast Waste Management	Transport	Kwethu Investment Holdings – Build It Ballito	Hardware
Dolphin Coast Landfill Management	Property Management	Tyre Track Ballito	Retail
Ample Power cc	Property & Related Services	Singh's Mutton Market	Retail
Gledhow Sugar Company (Pty) Ltd	Agricultural Processing	Pick 'n Pay	Retail
Gledhow Farmers Association	Agriculture	Paintec	Retail
Farley Farms	Agriculture	SMD Group t/a Ballito Auto	Vehicle Trade
Cappeny Estates	Agriculture	Ballito Autohaus - BMW	Vehicle Trade
Jarman Office Furniture	Manufacturing	NGS Buying Group	Agriculture
Blaize Point	Manufacturing	Annie Sloan South Africa	Manufacturing
Sappi Southern Africa	Manufacturing	Taurus Packaging	Manufacturing
Winclo Spray Painters	Assembly	Fat Rabbit Bakery	Manufacturing
Pioneer Foods	Retail	CA Architects	Architects
Boxer Superstore (Pty) Ltd - Meat Plant	Manufacturing	Coote ClarksonArchitects	Architects
Adamastor Engineering	Manufacturing	Gerhard Architect	Architects
SWB Projects	Construction	Royal HaskoningDHV	Business Services
Ricinz Construction	Property Development	Royal Palm Property Holdings	Property Development
Ndungane Construction	Construction	Ukobona Consulting	Property & Related Services
HBR Projects (Pty) Ltd	Construction	Talisman Plant & Tool Hire	Construction

Company	Sector	Company	Sector
Chapman Building cc	Construction	Musa's Plumbing	Plumbing and Construction
Delca Systems (Pty) Ltd	Property Development	Cyber View Letting	Accommodation
Extra Dimension 85 (Pty) Ltd	Property Development	Ezulwini Guest House	Accommodation
Prince's Grant Homeowners Association	Property and Related Services	Ocean Gorge Seafront Getaways	Accommodation
Wiesinger O'Dwyer	Business Services	DVS Business Solutions	Business Services
B Square Financial (Pty) Ltd	Business Services	Valbridge	Business Services
Bloom Consulting	Business Services	Officiency	Business Services
ConFab	Business Services	2H Consulting	Business Services
De Rauville Attorneys & Conveyancers	Business Services	Bidvest Bank	Business Services
Etna Trading 65 (Pty) Ltd	Business Services	De Wet Leitch Hands Inc.	Business Services
Standard Bank Ballito	Finance	Union Tiles	Retail
Ballito Accommodation cc	Accommodation	Studio 63 Digital Creations	Media
Canelands Beach Club and Spa	Tourism and Accommodation	Media 24 (Pty) Ltd - Famous Publishing	Media
Holla Trails	Tourism	Senzo Mthembu	Media
The Litchi Orchard	Tourism	Outsmart Outdoor Advertising (Pty) Ltd	Media
Tidal Tao	Tourism	Cox Yeats	Business Services
Villa Jaime	Accommodation	Adams & Adams	Business Services
Ocean Blue Guest House	Tourism	Warrick de Wet Attorneys	Business Services
Vuka Mzali School Enrichment Programme	Education	Bradshaw LeRoux Consulting	Business Services
Edge Training North Coast	Education	Derik Jaftha Attorneys	Business Services
Trio Training and Development Solutions	Education	Kruger Attorneys	Business Services
Ashton International College	Education	Mantis Network (Pty) Ltd	Business Services
Curro Mount Richmore	Education	Penpro Administrators	Business Services
SATIB Insurance Brokers	Business Services	Serviam Africa (Pty) Ltd	Business Services
Capitec Bank Limited	Business Services	Service Royale Hygiene Specialists	Business Services

Company	Sector	Company	Sector
Natalie Wocke & Associates (Pty) Ltd	Business Services	Skin Evolution	Business Services
LLG International	Financial	Smoken Consulting	Business Services
C&H Accounting Inc	Financial	Strydom Attorneys	Business Services
Quaestor Wealth Management	Business Services	Sunil Pranpath Inc	Business Services
Roberts & Chaplin Accounting Services	Business Services	Targeted HR Solutions	Business Services
Sasfin Commercial Solutions	Business Services	The Production Line	Business Services
The Robert Group	Business Services	Fab Functions	Business Services
Deloitte and Touche	Business Services	Travel Pals	Business Services
Mitsol (Pty) Ltd	IT & Communication	The Inside Edge	Business Services
Graphic Gurus	Media & Marketing	Homezone	Property Management
The North Coast Courier	Media	ComProp	Property Management
T Top Media	Media	Fiona Crago Real Estate	Property Sales
Marketing Works	Media	Glenart Trading	Retail
The Sandstone Story	Retail	The Ironmonger	Retail
Saltrock Surf	Retail	PJ Plastics	Construction
Afrox	Manufacturing	R & B Civils	Construction
Amatikulu & Emoyeni Mill Group	Agriculture	Sharp Steel Trading	
Bloemendaal Flower Farm	Agriculture	Stanger Textile Industries	
Dakot Milling Media	Manufacturing	Thekweni Reinforcing	Business Services
Great Railroad Brewing Company	Brewing	Tongaat Hulett Sugar Amatikulu	Agriculture
Holland Farm Guest House	Accommodation	Tongaat Hulett Sugar Darnall	Agriculture
Impact Engineering	Manufacturing and business services	Truck and Trailers	Retail
L & P Springs	Manufacturing		