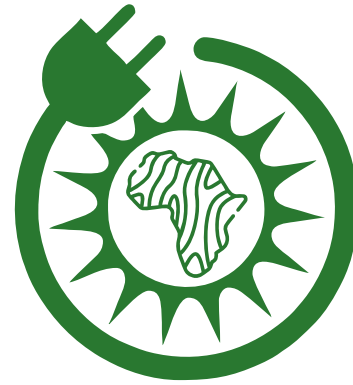


Skills for the
Renewable
Energy Sector
(SkiDRES)
Project Report



A Public-Private
Development Partnership

Foreword



Universal access to clean, safe, reliable and affordable energy is a key priority for the Government of the Republic of Zambia, to ensure achievement of its overall policy objective of sustainable and inclusive growth. Diversifying and expanding the energy mix provides an opportunity for the creation of decent jobs and development of small and medium enterprises. The Zambian National Energy Policy (2019) for instance, seeks to facilitate the development and deployment of renewable and alternative energy. Furthermore, the NEP 2019 also considers climate change mitigation and adaptation while advancing sustainable development of the sector. It has however been noted that having the right skills in the areas of Renewable Energy (RE) and Energy Efficiency (EE) to support demand for new products and services is today's critical challenge in southern Africa. Thus development in RE and EE requires specific expertise, skills, and attributes.

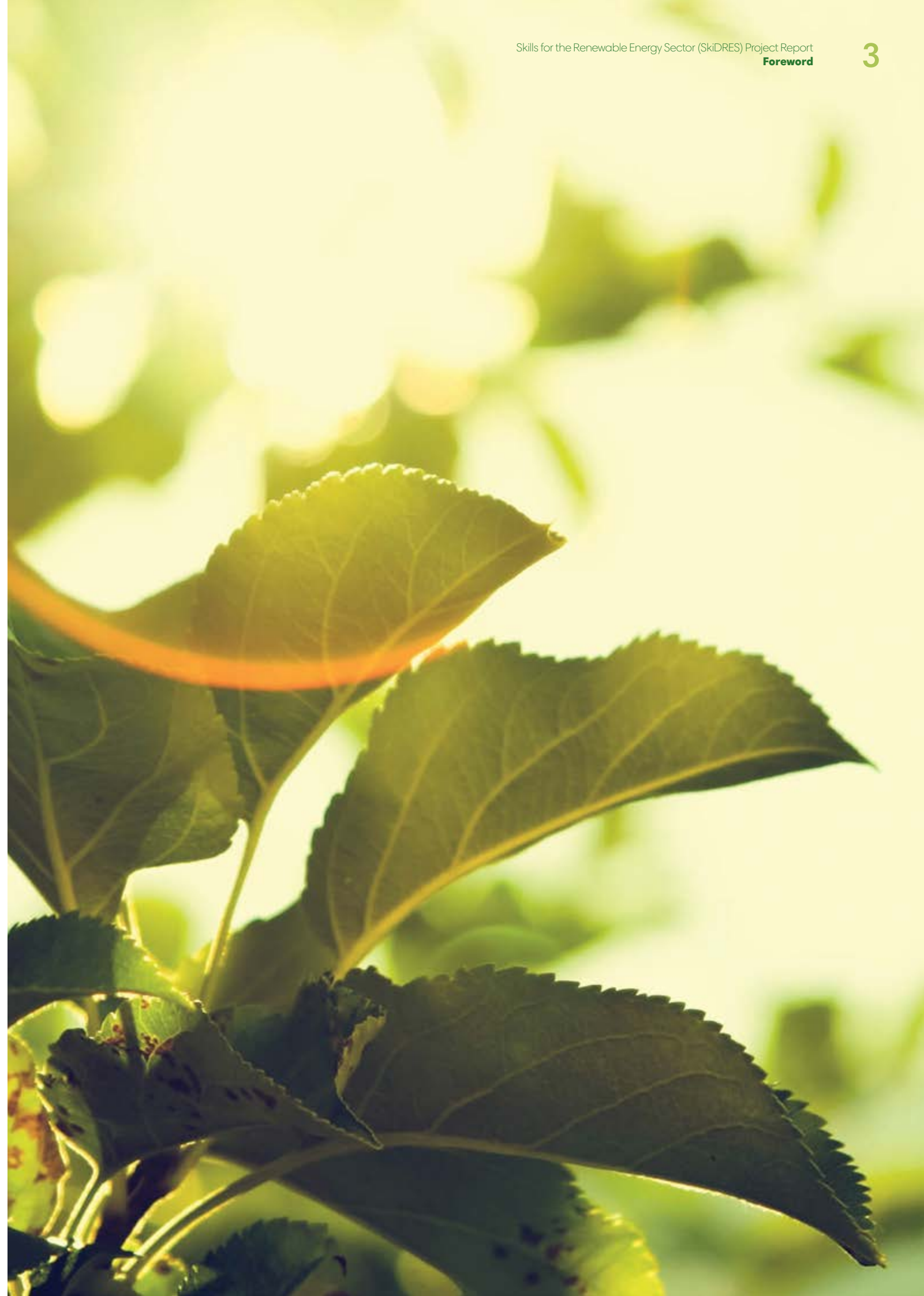
The International Labour Organization (ILO), with funding from the Swedish International Development Agency (Sida), has collaborated with the Kafue Gorge Regional Training Centre (KGRTC) to implement a project titled: Skills Development for Renewable Energy Sector (SkiDRES). The project objective is to bridge the skills gap in the Renewable Energy and Energy Efficiency (REEE) sub-sectors in Zambia and more generally in the SADC region. As a pilot intervention, the SkiDRES project was developed to test and validate the viability of a Public Private Development Partnership (PPDP) approach in the skills for REEE sub-sectors.

This 19 months pilot project was able to develop and build partnerships with the private sector at various levels among them national, regional and international levels as well as assess market needs through a Markets Systems Analysis (MSA). In addition, it developed and tested 5 demand-driven trainings, and prepared a three-year Public-Private Development Partnership, which will contribute significantly to enabling the Kafue Gorge

Regional Training Centre in Zambia to be a hub for sustainable provision of skill development in renewable energy and energy efficiency including regional integration of efficient energy technologies.

My sincere appreciation is extended to our partners within and outside Zambia who assisted us in this highly participatory process to implement the SkiDRES Pilot Project. I am particularly indebted to the Government of Sweden for the financial resources and to the International Labour Organization (ILO) of Zambia and Kafue Gorge Regional Training Centre (KGRTC) who committed time, financial resources and technical assistance to ensure that the pilot project was implemented successfully. It is my hope that, the commitment that ushered in the pilot project, will continue and we shall allocate time, resources and expertise that are required to build on the successes of the pilot and extend skill development in renewable energy and energy efficiency not only in Zambia but also in the region and beyond.

Trevor Kaunda
Permanent Secretary
Ministry of Energy
Chair - SkiDRES Steering Committee





Abbreviations

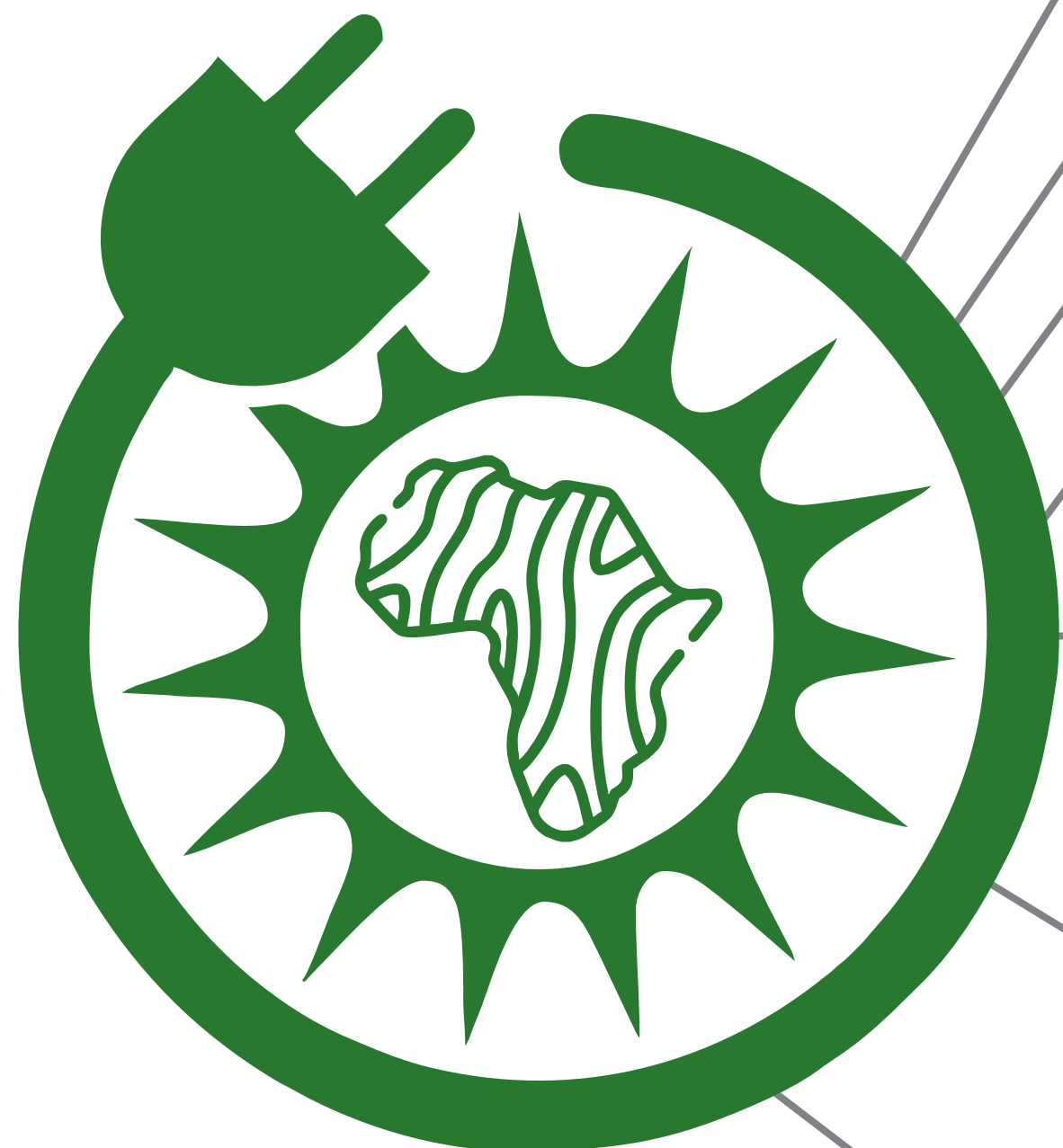
7NDP	Seventh National Development Plan
CBU	Copperbelt University
CEC	Copperbelt Energy Corporation Plc
EE	Energy Efficiency
ERB	Energy Regulatory Board
GRZ	The Government of the Republic of Zambia
IDC	Industrial Development Corporation
ILO	International Labour Organization
ILO-ITC	International Labour Organization – International Training Centre
KGRTC	Kafue Gorge Regional Training Centre
MSA	Market Systems Analysis/Assessment
NPC	National Project Coordinator
NPO	National Project Officer
PMT	Project Management Team
PPDP	Public Private Development Partnership
PSC	Project Steering Committee
RE	Renewable Energy
SACREEE	SADC Centre for Renewable Energy and Energy Efficiency
SADC	Southern Africa Development Community
SDGs	Sustainable Development Goals
SIDA	Swedish International Development Cooperation Agency
SkiDRES	Skills Development for the Renewable Energy Sector – Pilot Project for the Public-Private Development Partnership
UN	United Nations
ZARENA	Zambia Renewable Energy Association
ZCTU	Zambia Congress of Trade Unions
ZFE	Zambia Federation of Employers

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Skills for the Renewable Energy Sector (SkiDRES)

Project Report



Purpose of the project

The immediate objective of the forthcoming PPDP is that Zambia will have the necessary skilled people to be able to tap into the rapid development of technology in renewable energy and energy efficiency, thus decreasing costs, which in turn will contribute to poverty reduction and improved livelihoods through increased access to affordable, reliable and sustainable energy.



Duration and Timeframe

19 months (April 2019 – October, 2020)



Budget

\$803,762 USD



Skills Gaps Identified

Inadequate technician, technical and management levels with the Renewable Energy and Energy Efficiency value chain



No. of Trainings Conducted

- Five pilot trainings conducted under the project in partnership with the public and private sector at national, regional and international levels
- 194 people have been trained in 5 renewable energy and energy efficiency courses. Other RE/EE sector stakeholder capacity building activities undertaken



Key deliverables

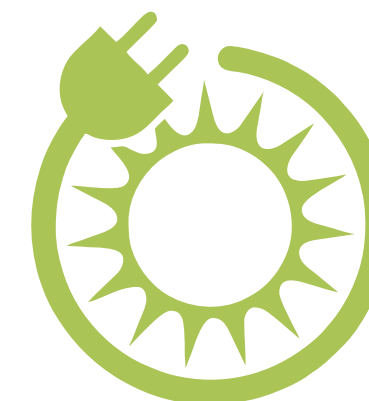
1. Agreements with private and public sector actors on commitments, roles and responsibilities in the forthcoming PPDP implementation, including in the region and in Sweden and other Nordic countries.
2. A market systems analysis (MSA)/mapping of the renewable energy and energy efficiency sub-sectors, and a gender-sensitive skills needs anticipation survey based on the needs and projections of actors engaged in RE/EE.
3. A Sustainability and capacity building plan for KGRTC as a Centre of Excellence on skills training in the RE and EE sector
4. Reports by KGRTC on at least two pilot training programmes in renewable energy and energy efficiency technologies.
5. A proposal for a continued skills development programme for renewable energy and energy efficiency, including project budget estimate and a tentative implementation plan
6. PPDP project design validated by key stakeholders



Key Stakeholders



Executive Summary



The Skills Development for the Renewable Energy Sector (SkiDRES) was a 19 months pilot project aimed at developing and building partnerships with the private sector, assess market needs, develop and test demand-driven training, and prepare for a three-year Public Private Development Partnership, with sub-regional coverage in Africa. The developed three-year PPDP project's goal will be to increase uptake of Renewable Energy, Energy Efficiency and Regional Energy Integration interventions in Southern Africa, leading to a more sustainable and low-carbon energy mix.

In addition, the pilot project would prepare to enable Kafue Gorge Regional Training Centre (KGRTC) to be the sustainable centre of excellence in provision of skills training in renewable energy and energy efficiency technologies for the energy sector in the region.

The pilot project achieved most of its deliverables within the project schedule. Three Memorandum of Understanding (MoU) signed with sector players including the private sector. The project also collaborated with other private sector companies even without signing any formal MoU. An assessment of market needs in the renewable energy, energy efficiency and relevant skills markets has confirmed that there is a shortfall of skills in the renewable energy and energy efficiency markets. Such lacking skills include basic electrical skills, wiring of buildings skills, skills in integrating direct and alternating current, skills in developing greenfield power projects, skills in developing power project proposals, and skills in energy efficiency technologies. The final Market System Analysis (MSA) report that was completed in March, 2020 showed that there are a number of systemic constraints that limit skills development in the renewable energy and energy efficiency sectors. Key among these is the limited collaboration between the private sector and training institutions that leads mainly to supply driven training offers.

A number of training courses were developed and offered. These have showed that while commercial appetite for the supply side exists the demand for the courses remains latent. The development and offer of the courses, through the Kafue Gorge Regional Training Centre (KGRTC) is testing the Public-Private Sector Development Partnerships model with respect to its viability and sustainability.

The project proceeded to support the capacity development of the KGRTC. A capacity assessment undertaken during the project showed that the centre has massive potential and yet capacity gaps exist in terms of its narrow customer base and service offer. The pilot project therefore experimented with an expanded training service offer focussing on the renewable energy and energy efficiency sectors and deployed an aggressive marketing and promotion campaign to address these capacity gaps and indications of favourable outcomes were recorded.

All these indicated outputs and outcomes have been discussed thoroughly within the project management team and with the project stakeholders, resulting in the development of a full PPDP project proposal. The PPDP project, named Skills for Energy in Southern Africa (SESA) is a three year project proposal that that is expected to contribute to increased uptake of Renewable Energy, Energy Efficiency and Regional Energy Integration interventions in Southern Africa, leading to a more sustainable and low-carbon energy mix.

The pilot project is scheduled to end in October 2020, having started in April 2019. The delay in the actual start date coupled with the advent of the COVID – 19 pandemic has limited full completion of the training cycle for some programmes developed by KGRTC. Whilst some course could not even be offered during the pilot project timeframe, the COVID-19 situation presented an opportunity for a number of training programmes that were initially planned to be delivered on-site to be redesigned and offered online as e-learning training courses..

Background Context

The importance of energy in Zambia's Vision 2030, Seventh National Development Plan (7NDP) and the 2019 Budget speech takes a central stage as energy is seen as an enabler for sustained economic growth. Access to affordable, reliable and sustainable energy is one of the main drivers for social and economic development, resulting in better living conditions and access to new employment opportunities and enterprise development. The overall percentage of households having access to electricity improved from 22 percent in 2010 to 31 percent in 2015; in urban areas, access to electricity increased from 53 percent to 67.3 percent.

According to the National Energy Policy of 2019, the installed generation capacity in Zambia as of September 2019 was 2,976.3 MW. The installed capacity comprising of 80.8 percent of hydro, 10 percent of coal, 3.5 percent of heavy fuel oil, 2.7 percent of diesel and 3 percent solar PV (Ministry of Energy, 2019;11).

The effect of the country's failure to diversify its electricity generation mix became marked in 2015 when the energy deficit resulted in unprecedented levels of electricity supply rationing to all consumers. Demand for electricity stood at 1,949 MW; however, the sector was only able to generate 1,281 MW. Climate change contributed to low supply due to low rainfall, given that Zambia has been highly dependent on hydro-power despite the envisaged growth of other sources of energy to about 15 percent by 2030. By 2030 demand increase is projected to reach 150MW to 200MW per annum.



The peak demand for electricity in the country is likely to be 3,000 MW by 2021 and is expected to increase to over 3,525 MW in 2030 (Seventh National Development Plan, 2017).

Renewable Energy (RE), such as solar, although having a huge potential to complement existing energy sources, are currently underexploited only providing limited amounts of energy to the Zambian population and the market penetration is very low.

Under the Seventh National Development Plan (7NDP), measures to grow and diversify the energy sector to enhance its contribution to economic diversification by expanding power generation and transmission capacities will be implemented. As a strategy to promote renewable and alternative energy, renewable energy resource mapping and promoting the development and use of renewable energy technology systems, including implementing a feed-in tariff and bidding system which is attractive for private investment into renewable energy generation, will be undertaken [GRZ, 7NDP (2017) pages; 68 & 69]

In addition, the Government has recognized Energy Efficiency (EE) as a priority issue because it can result in economic benefits, energy security, environmental protection and climate change mitigation. Enforcement of minimum energy performance standards for appliances, equipment and buildings can result in energy savings which could offer a unique opportunity to reconcile economic competitiveness with sustainable development and provide the added benefits of reducing the cost of energy and increasing energy productivity.

As a result, it is implementing the Renewable Energy Feed-in-Tariff Strategy (REFIT Strategy) aimed at bringing in an additional 200 MW to the national grid. Although the current energy transition towards RE and EE in Zambia is geared towards diversification, expansion of its energy supply and energy savings. This transition can, if managed well, also provide opportunities for social and economic development, in line with national development priorities.

Investment in Africa's RE and EE is growing. With a huge potential market and governments eager to expand their energy basket, investment opportunities exist. While the main driver and ambition of the Government of Zambia is to diversify and expand its energy basket and by doing so, reduce its reliance on hydropower, a skills gap or even absence of skills in renewable and energy efficient technologies has been observed. Domestically available skills are critical to ensure a smooth transition and diversification of the energy mix, while contributing to economic growth, jobs and opportunities for development of enterprises along RE and EE related value chains. As the RE and EE related skills in Zambia are largely absent, the full gains of investment in technology in RE and EE need to be harnessed.

The Kafue Gorge Regional Training Centre (KGRTC), with its existing experience and expertise in hydropower and its already existing private sector engagement portfolio, has the potential to become a key player in skills development for RE and EE technologies. In addition, KGRTC is well placed to address and build knowledge in EE, especially in areas such as metering and analysis, grid optimization, smart grids and energy audits within the industry. Partnership with the private sector will enhance the institutional capacity building of KGRTC through increased outreach, impact, diversification, good governance and financial sustainability.

The International Labour Organization (ILO), with funding from the Swedish International Development Agency (SIDA), partnered with the Kafue Gorge Regional Training Centre (KGRTC) to implement a pilot project titled: Skills Development for Renewable Energy Sector (SkiDRES). The project had the objective to bridge the skills gap in the Renewable Energy and Energy Efficiency (REEE) sub-sectors in Zambia and more generally in the SADC region. As a pilot intervention, the SkiDRES was developed to test and validate the viability of a Public Private Development Partnership (PPDP) approach in the skills for REEE sub-sectors.

The Approach

The project applied the Public Private Development Partnership (PPDP) approach which was considered an appropriate methodology to enable the private sector to partner effectively with KGRTC and to contribute sustainably to economic and environmental development. This in turn was pivotal in the development of the demand and supply side of the renewable and energy-efficient technologies. This approach was aimed at demonstrating a model for financial sustainability and replication within other training institutions and help promote achievement of inclusive green growth and development in Zambia.

The PPDP provided an opportunity for the private sector to provide expertise and innovative approaches to sustainable energy solutions. It supported skills development that will enable the Zambian and regional population benefit from job opportunities created through investments in renewable energy initiatives along value chains and market systems.

Therefore in the case of this skills development PPDP, it was agreed that the International Labour Organization (ILO) would play the role of third-party overall coordinator. The ILO had an overarching supervision of the project as a whole.

The problem that needs a solution

Energy is the main driver of economic activity and social development. At household level for instance, an estimated 67.3 percent of households in urban areas and about 4.4 percent of households in rural areas have access to electricity, translating into 31.4 percent at national level (National Energy Policy, 2019:12). This scenario seriously obstructs social and economic development in Zambia, further aggravating the social outlook.

Energy efficiency has also been recognized as a priority issue which can help reduce energy expenditure and increase the affordability of energy in poorer households by bringing down the per-unit cost of electricity, hence also, reducing pollution by lowering the need for generation and associated emissions. To ensure energy efficiency measures, the Government of Zambia, with support from the EU, is developing a National Energy Efficiency Strategy that aims to reduce energy usage by 2% per year until 2030. A capacity needs assessment undertaken under this initiative, identified the need for "vocational training to educate communities on RE/EE using education institutions in place such as TEVETA, but more so embracing aspects of entrepreneurship,

so that there are business models to promote uptake of RE and EE in communities". The assessment also identified the need for awareness creation and training around RE and EE installations in buildings and for productive use.

The PPDP was aimed at addressing the lack of technical and vocational training and skills, which is a major bottleneck for Zambia's and the sub-region's future transformation, mainly because of a mismatch between skills currently offered and the skills demanded by the private sector in the emerging area of RE and EE, where skills, except for hydropower, are nearly absent. This pilot project has assessed market needs, developed and built partnerships with private sector operators in Zambia and sub-regionally, developed and tested demand-driven training – and laid the foundation for the three-year PPDP that is anticipated to follow.

It is expected that the skills gained, and resulting opportunities, will result in decent jobs, improved income levels and cleaner energy options, which are likely to reduce the burden on women in sourcing for household energy. Women are the most vulnerable and affected by energy deficiencies, because of their traditional gender roles. In addition, lack of resources and a limited entrepreneurship culture, among other things, results in women and youth being under skilled and unemployed. The PPDP initiative will seek to mainstream gender equality and diversity in training and outreach as a way of addressing some of these challenges. The concept of equity and inclusion approach that values the diversity and differences in the strategic needs of both men and women will be implemented.

It is evident from consultations with private sector RE and EE operators that there is a demand from private sector for new RE/EE specific skills, and that these range broadly. Also, it seems that there is an interest among private sector operators in engaging, designing curricula, offering internships, etc. Especially from emerging and scaling RE companies, and from consultancy companies active in the sector, it may be difficult to initially contribute with financial resources. There is a possibility that international companies may have more capacity to contribute financially and over a longer period as part of long-term strategy to expand markets and roll out their RE/EE technologies in Zambia and in the region.

Increased RE and EE will also put new demands on the regulatory framework, on licencing procedures, standards for energy efficiency, etc. Zambian authorities need trained staff in these areas as well as continued skills development for existing staff. Peer-to-peer learning and engaging with other countries' regulators, standards institutes, and energy authorities would be beneficial.

The PPDP is expected to enable companies to support young women and men with interest and potential to train for careers in RE and EE. It is likely that a relatively high level of education will be needed (secondary school graduates/university students). The companies may offer vocational training combined with internships for young persons from different areas and communities.



About SkiDRES

The pilot project for skills development in the renewable energy and energy efficiency sub-sectors in Zambia is driven by market needs. With strong engagement by the private sector, it aims to contribute to Zambia having the necessary skilled people to be able to tap into the rapid development of technology in renewable energy and energy efficiency.

The intervention has contributed to creating a cadre of youth and women with skills for employability in the sector, and to speeding up and decreasing costs for access to universal clean and sustainable energy, which in turn will contribute to poverty reduction and improved livelihoods through increased access to affordable, reliable and sustainable energy.

This 19 months pilot project has developed and build partnerships with the private sector, assessed market needs, developed and tested demand-driven training, and prepared for a three-year Public-Private Development Partnership, with sub-regional coverage in Africa that will enable Kafue Gorge Regional Training Centre to be the sustainable centre of excellence in provision of skills training in renewable energy and energy efficiency technologies for the energy sector in the region.

The project Governance Structure

A Programme Steering Committee (PSC) comprising key government ministries, private sector, civil society and social partners was constituted to not only steer the project but also improve RE and EE sector coordination for skills development and to promote stakeholder commitment to the planned PPDP. The PSC is chaired by the Ministry of Energy and vice chair is the Ministry of Labour and Social Security.

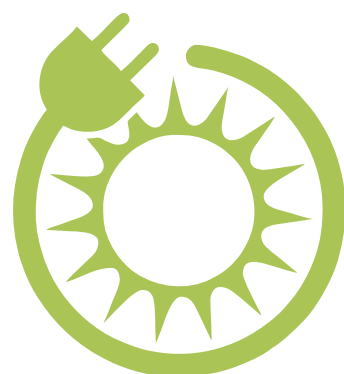
The project received endorsement from the ILO partners that is the government, the Zambia Federation of Employers (ZFE) and the Zambia Congress of Trade Unions (ZCTU) who affirmed their commitment to the project and the upcoming PPDP.

The Purpose of SkiDRES

To test and prepare for further skills development for the Renewable Energy (RE) and Energy Efficiency (EE) sector, which is relevant for the Zambian context and the region, which has strong ownership by key stakeholders

Key Deliverables Expected of SKIDRES

1. Agreements with private and public sector actors on commitments, roles and responsibilities in the forthcoming PPDP implementation, including in the region and in Sweden and other Nordic countries;
2. A market systems analysis (MSA)/ mapping of the renewable energy and energy efficiency sub-sectors, and a gender-sensitive skills needs anticipation survey based on the needs and projections of actors engaged in RE/EE;
3. A sustainability and capacity building plan for KGRTC as a Centre of Excellence on skills training in the RE and EE sector.
4. Reports by KGRTC on at least two pilot training programmes in renewable energy and energy efficiency technologies.
5. A proposal for a continued and scaled-up skills development programme for renewable energy and energy efficiency.



Achievements

The following outputs are the key project milestones:

Output 1:

Agreements with private and public sector actors on commitments, roles and responsibilities in the forthcoming PPDP implementation, including in the region and in Sweden and other Nordic countries

The project developed a five pronged partnership strategy. This included International, regional, local, government and social partner engagements conducted for purposes of collaborating on the pilot and main PPDP phase. The proposed partnership were premised on mutually beneficial and sustainable relationships. Private sector companies' commitment to providing technical expertise, equipment and their networks relevant for renewable energy and energy efficiency skills training at the Kafue Gorge Regional Training Centre (KGRTC) was tested.

In return, the project through KGRTC afforded the private sector companies a platform and an opportunity to contribute to skills development as well as showcasing and promoting their RE and EE technologies. Local private sector companies were, in addition, critical in informing local skills gaps and demands. Government and other public institutions ensured improved sector coordination, policy and strategic alignment and project visibility while the ILO's social partners ensured that employers and employees interests are represented



- The ILO signed three non- exclusive MOU's with the following;
 - Kafue Gorge Regional Training Centre (KGRTC). The ILO and KGRTC further signed and Implementation Agreement that enabled the KGRTC to conduct pilot trainings and other related activities.
 - Africa Green Regional Energy: Efficient, New and Credit Worthy Offtake (Africa GreenCo) – two trainings were delivered under this MoU and



- Metrum of Sweden for training delivery. Metering equipment for training donated and installed at KGTRC. Training postponed on account of COVID-19.



From left to right; Mr. Martin H. Hamanyanga – Consultant, Training & Research (KGRTC), Mr. Magnus Andersson – CEO (Metrum), Mr. Brian H.M. Makungo – Head, Training & Consultancy (KGRTC), and Mr. Ola Karlson – Head, Marketing and Business Development (Metrum).

- The project collaborated and delivered training with the SADC Centre for Renewable Energy and Energy Efficiency (SACREEE) and Siemens of Sweden.
- The KGRTC and the ILO's ITC signed a MoU and funding agreement, which resulted in KGRTC capacity building, delivery of digital training and development of a Learning Management Information System (e-campus).

Output 2:

A market systems analysis (MSA)/mapping of the renewable energy and energy efficiency sub-sectors, and a gender-sensitive skills needs anticipation survey based on the needs and projections of actors engaged in RE/EE

A consultant, Agora Global, from the UK was contracted to undertake the Market System Analysis (MSA)/mapping of the renewable energy and energy efficiency sub-sectors study. Specifically, the MSA intended to deepen understanding of the renewable energy, energy efficiency and RE/EE skills development market systems to clarify the underlying causes for the underperformance with respect to RE/EE skills demand and supply. The study had a focus on the gender dimension of the three market systems.

The study employed a participatory approach to ensure ownership by the project and key stakeholders and resulting in the incorporation of findings into the PPDP. Key findings specific to the skills development market are presented below:

Skills Development Market

- Curriculum is not sufficiently demand driven and leads to a mismatch with employer needs. The main constraint underpinning this challenge is the lack of any formal mechanism for skills providers to gather information on private sector demand, but also the lack of resources to be able to adapt curricula and respond accordingly;
- Curriculum is primarily technical and lacks on the job experience. The major constraint here is the limited availability of equipment at skills training institutions and the current lack of work-based learning opportunities available;
- Lack of coordination, collaboration between training providers and private sector companies. Whilst there are many good examples of collaboration between private sector companies and training institutions, there is no formal mechanism that supports these collaborations;
- Perception that women are not able to pursue training opportunities or careers in RE & EE. This is because of longstanding socio-cultural norms that suggest that being an engineer is a role for men, largely relating back to when most engineering jobs were in the mines, were manual and physically demanding, and as such considered unsuitable for women;
- Lack of supply and demand side financing:** Although the Skills Development Fund (SDF) funding is supporting greater collaborations between industry and skills development stakeholders this funding is limited and skewed to supporting those organisations who make the greatest contributions to the SDF (through the skills levy) thus disadvantaging those with little or no contribution to the Fund. On the demand side, many students are unable to access funding to pay basic tuition fees or, where government with tuition fees supports them, are not able to obtain the funds for the certification on completion of the course

and therefore complete the training but never receive formal certification;

- Poor marketing and lack of awareness of available opportunities:** Many training providers don't currently provide sufficient or appropriate information on their available courses and content or fail to present this information in a way that helps individuals and companies understand the benefits of the training. This mismatch also comes about as a result of the lack of adequate marketing resources available within training providers; and
- Lack of coordination, collaboration and joined up thinking between training providers and donors:** A number of donor funded programmes have provided varying types of support to training institutions in the form of equipment donation, capacity building, or curriculum development. Limited coordination between the different training providers and between training providers and donors This has resulted in a duplication of efforts or resources.

- The study did not undertake a skills gap assessment, yet Indicative analytic findings show that the skills gap include:**

- basic electrical skills,
- wiring of buildings skills,
- skills in integrating direct and alternating current,
- skills in developing greenfield power projects,
- skills in developing power project proposals,
- solar installations and skills in energy efficiency.

Other skill gaps noted were in:

- negotiation,
- carrying out feasibility studies,
- developing power purchasing agreements,
- power trading, designing and implementing interconnections,
- transaction advisors,
- project management,
- project preparation,
- power integration (mixed sources),
- financial modelling of RE projects,
- commercial contracts and
- especially risk allocation between the public utility company and private sector.

Other skills gaps are in:

- RE resources assessment,
- RE power plant design,
- RE connections and
- bidirectional supply and
- power quality.

Proposed Areas of Intervention incorporated in the proposed long term PPDP Project proposal

- Improved access to information, through greater coordination and collaboration between renewable energy and energy efficiency market actors and skills delivery system.
- Improving relationships with and engagement of private sector companies in skills delivery
- Increased coordination between skills delivery institutions at all levels and private sector

Output 3:

A Sustainability and capacity building plan for KGRTC as a Centre of Excellence on skills training in the RE and EE sector

The ITCILO conducted an Institutional Capacity assessment (ICA) of the KGRTC. The purpose of the assessment was to identify areas of improvement for KGRTC to be able to offer technically and financially sustainable learning services in compliance with international standards of good governance.

Institutional Capacity Assessment Criteria

- Development dimension: the Development (or technical) dimension, specifically the service outreach and service impact.
- Finance Dimension: Income areas vs Expenditure (cost centres)
- Governance Dimension: the capacity of the organization to operate according to standards deemed acceptable by market stakeholders.

The capacity assessment showed that the centre has lots of potential and yet capacity gaps existed in:

- The narrow customer base, which currently focusses on power utilities producing, transmitting and distribution hydro-power was identified as a gap.
- The equally related to the current service offer that is similarly narrow.
- The centre has equally not taken full advantage of the existing ICT tools to enrich its teaching experience and service offer and upgrading its quality control services



Additionally, the report recommended fostering a culture of learning and innovation and embedding gender and youth aspects as key strategy drivers.

- The Institutional Capacity Assessment (ICA) of KGRTC Report was shared with relevant stakeholders including KGRTC and SIDA in December 2019.

The outcome of this ICA and its recommendations have been twofold:

- Development of a KGRTC sustainability plan for the implementation of the recommendations in key strategic areas to support the path for KGRTC achieving a higher degree of self-sustainability.
- Incorporation of recommendations that require further project support into the planned PPDP as well as the KGRTC Business Plan implementation. This includes the following aspects;
 - Increasing the customer base;
 - Differentiating the service portfolio: this includes among other elements, training portfolio management (new training products, new technology, trainer development etc.), enhancing consultancy & other services;
 - Upgrading of the quality control processes: digital migration of the M&E system and enhancement of the reporting by planning for a business intelligence dash board; and
 - Stronger emphasis on cross-cutting drivers: This includes fostering a culture of innovation and mainstreaming gender equality and diversity
- ITCILO and KGRTC further signed a MoU to support the KGRTC sustainability plan to undertake some of the recommended capacity building actions. This is aimed at assisting the KGRTC to elaborate a strategy for it to transition into a centre of excellence in provision of RE and EE training in the region.

Key Implemented Recommendations:

A number of actions and achievements have been made in this regard:

- Upgrade of the KGRTC website for increased outreach to learners, institutional, clients, and development partners and the wider public,
- Implementation of IT-enhanced marketing activities, set up an electronic campus with a range of distance learning modalities, addition of new training offers especially in RE and EE, and
- Training and exposure of KGRTC staff to modern and innovative methods and technologies for efficiency.
- Capacity building for digital migration to establish e-campus
 - Development of the KGRTC Learning Management Information System (e- campus) in partnership with ITCILO
 - Pilot the course Diploma in Hydropower Management and Technology – September, 2020

Output 4:

Reports by KGRTC on at least two pilot training programmes in renewable energy and energy efficiency technologies.

The project through KGRTC in partnership with the private sector companies intended to pilot at least two training programmes in Renewable Energy (RE) and Energy Efficiency (EE). This would validate the basis of the PPDP in as far the private sector committing to this model. Through the partnerships developed in output 1 above, KGRTC in collaboration with the private sector identified and designed, a number of training courses. These include:

- Network Stability (with ABB)
- Energy Efficiency/Energy Audits (with SADC Centre of Renewable Energy and Energy Efficiency (SACREEE)
- Full draft Course outline developed on Entrepreneurship – financial modelling & Bank Financing & Renewable Energy IPPP's (with IDC, ZARENA, Linkoping University).
- Gas Turbine Technology with Green Fuels (with Siemens of Sweden)
- Power Quality with Renewable Energy for Energy Efficiency (with Metrum)

This scaled down version was developed in partnership with and delivered by Africa GreenCo. This was designed to cover two thematic areas namely; *Financial Modelling and Bank Financing for Renewable Energy IPPs in Africa and Renewable Energy Independent Power Producers (IPPs) Project Documentation*

Trainings Conducted

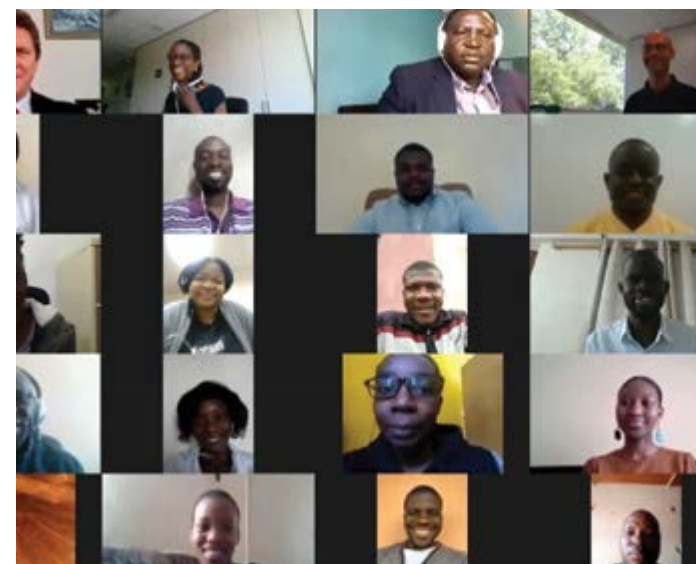
The project conducted three training courses in RE and EE:

Gas Turbines with Green Fuels Course: 18-22 November, 2019



The course delivered in partnership with **Siemens AB of Sweden** aimed of the course was for participants to be able to operate and manage gas and steam turbines in energy production systems in an environment with increasing demands towards improved grid stability and lower carbon footprint. The course attracted 12 participants from both public and private resulting in further discussion on future ready gas turbines. The course was aimed at ensuring that the [participants would be able to identify different parts of a gas turbine power production system, Conceptualize a robust power supply system, Design future-ready systems and carry out financial evaluations for turbine-based energy production systems once they completed the course.

Industrial Energy Efficiency Training (IEET) Course – 20 July to 14 August, 2020



The IEET course which was anchored by the ITCILO, was delivered in partnership with **SADC Centre for Renewable Energy and Energy Efficiency (SCREEE)** was offered as the first ever E-learning training by KGRTC. The migration of this particular course from on-site to E-learning was partly compelled as a response to the COVID – 19 situation and the need for KGRTC to increase its outreach by delivering both on-site and e learning. The course which enrolled 39 participants from 6 countries covered key subject matters such as *Energy Management Systems Implementation, Energy Audit Guidelines, Energy Saving Opportunities and Energy Performance Measurement and Indicators*. One course participant said the following about the course;

“The course had a significant impact on me. The knowledge unpacked on the webinars were quite informative and an eye-opener on a lot of aspects I have ignored and side-lined in my personal and professional life. It is a life-changing experience to gain such insight on; Energy Management System, Energy Performance Measurement, Energy Saving Opportunities, Energy Audits and Assessments”.

Sandile Mamba, African Union Youth Club-Eswatini Chapter

Financial Modelling and Bank Financing for Renewable Energy IPPs in Africa – 20 August, 2020

Conducted in partnership with **Africa GreenCo** was conducted as an online course. This training provided an opportunity for participants to develop or improve skillsets for organizing financing for developing capacity in renewable resources. The course introduced participants to a range of methods and tools and enable them to use and analyse a project finance model, specifically for the renewable energy industry. The course participants included those who work with development and

evaluation of renewable energy projects, professionals in the financial sector as well as those involved in financial packaging of renewable energy projects. The course had 64 participants (59 males and 5 females) from 8 countries

Renewable Energy Independent Power Producers (IPPs) Project Documentation (25 August 2020)

Conducted in partnership with **Africa GreenCo** was conducted as an online course. This training provided an opportunity for participants to hone unique skills to organise renewable energy projects. These extend from project documentation to structures of frameworks for the management of various stakeholders. The course introduced participants to risk identification, allocation and mitigation techniques that are incorporated in renewable energy project finance. The participants were drawn from people that work with development and evaluation of renewable energy projects, as well as those involved in stakeholder management and risk management. The course had 50 participants (37 males and 13 females) from 3 countries.

In addition, the project facilitated the following trainings for sector stakeholders:

1. Skills for Green Jobs training: 25-28 November, 2019

A 4-day seminar representing a number of countries namely Zambia namely Zambia, Somalia, UK, Tanzania and Kenya,

provided an open and multi-stakeholder space for meeting and networking with a range of partners committed to support skills training in Renewable Energy and Energy Efficiency technologies. The stakeholders had the opportunity to share knowledge and raise awareness on:

- Skills policies for green jobs and the identification of current and anticipation of future skill needs in the different areas of Electricity Generation in the country;
- The opportunities for the private sector to mainstream green jobs in sectoral strategies and within the global and local value chains, with a focus on how companies are reskilling and upskilling their personnel to promote low-carbon societies
- How TVET Centres are responding in the country, in the Region and in the world to the green skills challenges
- Concrete ideas for building skills development PPPs for green jobs, more particularly in the Renewable Energy and Energy Efficiency sector.

The meeting identified three concrete areas of intervention;

Capacity Building: Through skilling, re-skilling and upskilling in the green sector specifically for Wind farm site managers and Wind energy engineer, Solar Photovoltaic Technician and Solar Panel



Installer, Solar wiring and testing skills, engineering procurement and construction (EPC) skills, solar circuit system design skills.

Ideas of contributions to addressing the skills gaps: Revising and developing curricula to meet the demand of industries, support from business of responsive training, improve the capacity of trainers through Training of Trainers (TOT), bring in more advanced equipment to TVET institutions to meet industry standards.

Willingness to collaborate: the 4-day seminar was an opportunity to establish institutional linkages and networks with social partners, public and private sector actors in the Renewable Energy sector and confirmed their interest in continuing the dialogue and be further involved. Most of the participants were positively surprised about the actions and project that are already implemented in the country, thus communication and coordination between project and stakeholder should be enhanced.

2. Energy Transition: perspectives and opportunities for the world of work Course supported & conducted – ITCILO, Turin –2-6 December, 2019

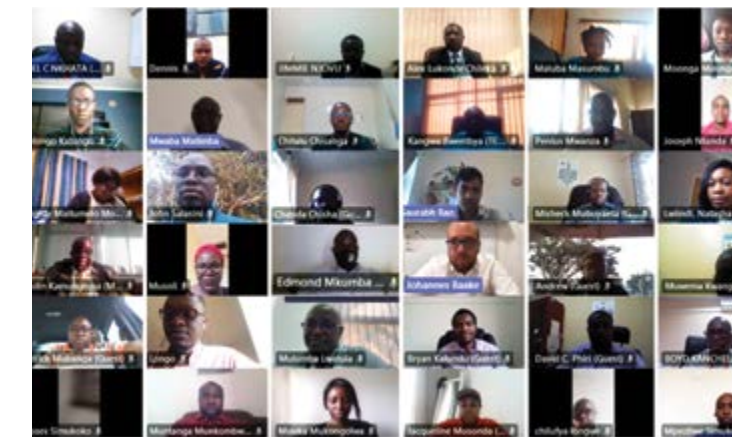
The project supported 5 course participants from the Zambia Federation of Employers (ZFE), Zambia Congress of Trade Unions (ZCTU), Ministry of Energy (MoE) and Zesco Ltd on the Energy Transition Course which included thematic areas such as Green Jobs, Energy Transition and Social Justice. Other participants were



from South Africa, Cameroon, Jordan and Indonesia thus allowing for an exchange of information and best practices. The outcome of this course was the development of an action plan to raise awareness on RE and EE in Zambia.

3. Modular content creation and e-pedagogy in TVET – Digital TEVET management course – 6 -31 July, 2020

The project supported MOHE, TEVETA & KGRTC supported to participate in the above course which was conducted by the ITCILO. This course on the Modular content creation and e-pedagogy in TVET covered the most essential elements, quick tips and hands-



on practice allowing participants to rapidly shifting face-to-face content of a module into an online offer. This was mostly a self-paced combined with hands-on activities, supported by qualified tutors. The course was aimed at supporting the stakeholders to transition to E-Learning in the face COVID-19.

The offering of a number training courses were delayed and in some cases cancelled on account of the advent of the COVID -19 global pandemic. Due to restrictions in air travel and local movements globally coupled with company closures and national lockdowns. These include the Power quality course designed with Metrum and the Entrepreneurship Course (Linköping University) and Network Stability (ABB – cancelled due to restructuring of the company).

The pilot trainings were successful in confirming the PPDP model because private companies were investing their own resources in partnership with project stakeholders to enable the training courses to be held. Siemens invested approximately USD 10,000 in expert staff time plus in direct costs and value of the training materials in the Gas Turbines with Green Fuels training course. Metrum investment through the donation and installation of metering equipment at KGRTC valued at over 10,000 USD to be used for power quality training courses is a significant demonstration of private sector confidence in collaboration for technical capacity development. The advent of the COVID19 pandemic, has unfortunately delayed the commencement of the related courses. Both Africa GreenCo and the SADC Centre for Renewable Energy and Energy Efficiency (SACREE) are estimated to have invested in excess of 10,000 USD each through their expert staff time and other direct costs.

This represents a significant share of the development and offer costs of the pilot training courses in Renewable Energy and Energy Efficiency. It confirms the private sector commitment to the PPDP model.

The response of the market to the new training offers by the KGRTC is promising. The IEET course for instance attracted 100 registrations from 10 countries. This was against a target of 30 participants. The percentage of participants that were paying the required course fees was however low as it stands at less than 10%. Although the limited marketing and short promotional periods of the courses in addition to the COVID – 19 situation has been a formidable combination limiting paid up participation, it is evident that more focussed marketing will help in resolving this problem which undermines the sustainability of these training offers. This is reflected in the planned support to the KGRTC marketing capacity in the new PPDP proposal..

Gender equity in terms of numbers of females compared to males in the RE and EE sectors is low. The project therefore used a deliberate strategy to increase the participation of females. The project was successful in increasing the participation of female engineers in its latter training courses through collaborating with universities offering engineering courses in the region and offering scholarships to final year young female engineers. It is further proposed in the PPDP to build on this success by increasing these partnerships between KGRTC and universities and also showcasing these young engineers as role models to encourage others.

Output 5:

A proposal for a continued skills development programme for renewable energy and energy efficiency, including project budget estimate and a tentative implementation plan

The project, through a process of internal learning from the pilot activities, stakeholder consultations, and market analysis developed the PPDP project proposal named, Skills for Energy in Southern Africa (SESA). SESA is a three-year, USD\$5.8m USD (Including USD\$2.0m USD private sector and other entities' contributions and USD3.8 requested as funding from Sida) project proposal that will contribute to increased uptake of Renewable Energy (RE), Energy Efficiency (EE) and Regional Energy Efficiency Integration (REI) interventions in Southern Africa, leading to a more sustainable and diversified energy mix.

This will be achieved through two outcomes:

- a “More power technicians, engineers and managers in the SADC region have enhanced technical capacity to apply, manage and promote Renewable Energy, Energy Efficiency and Regional Energy Integration technologies”, and
- b “KGRTC has built its brand and reputation as the region’s Centre of Excellence for competitive skills training in Renewable Energy, Energy Efficiency and Regional Energy Integration technologies”.

Conceptualisation of the Project document commenced initial information gathered through the pilot training feedback and literature review. This proposal has since been submitted to SIDA for funding consideration after undergoing a rigorous appraisal and being cleared internally by the ILO.

Output 6:

PPDP project design validated by key stakeholders

The project has been active in stakeholder engagements to ensure that sector stakeholders validate all key outputs and outcomes. The SESA project document was presented to the Project Steering Committee for endorsement. The Market System Analysis report (MSA) and the Institutional Capacity Assessment (ICA) report were validated through thorough stakeholder consultative processes.. The MSA and ICA reports were further reviewed in multi-stakeholder workshops to ensure that all key stakeholder inputs were taken on board. The SESA project document was validated through the project steering committee

- Both the MSA and ICA reports have since been published and distributed to various stakeholders for their use.

Project Management

1. The Project team:

The Project was led by the National Project Coordinator and supported by a National Project Officer, Finance and Administrative Assistant and Driver. The Project Management Team (PMT) was composed of the Technical Teams from KGRTC and ILO and was hosted at the two organisations.Governance Structure

This was done through a project Steering Committee (PSC): This constituted key government ministries, private sector and social partners. This was aimed to not only steer the project but also improve RE and EE sector coordination for skills development and to promote stakeholder commitment to the planned PPDP.

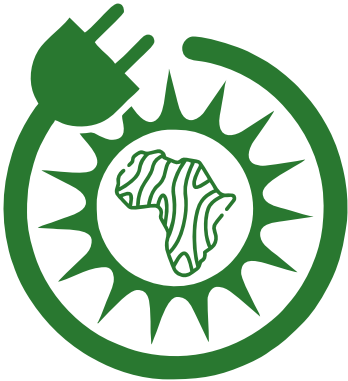


Table 1: Composition of the Project Steering Committee.

CATEGORY	ORGANIZATION	NAME	POSITION
Government	Ministry of Energy – Department of Energy Ministry Energy – OPPPI	Ms Anna Banda Chandipo Eng. Chifundo Phiri	Principal Energy Officer Principal Engineer
	Ministry of Higher Education	Ms Khadija Sakala	Assistant Director
	Ministry of Labour and Social Security	Mr Moffat Bili	Director – Planning and Research
	Energy Regulation Board (ERB)	Mr Boyd Chilembo	Manager – Renewable Energy
	ZESCO	Eng. Kangwa Bembya	Manager – Renewable Energy
	Technical Education Vocational Entrepreneurship Training Authority (TEVETA)	Ms Phyllis Kasankomona	Director – Development
Sector Associations	Zambia Renewable Energy Association (ZARENA)	Mr Michael J Tamey	Chairperson
Private Sector	Copperbelt Energy Corporation	Mr Daka	Manager – Talent
Donor	Embassy of Sweden, Lusaka – observer	Ms Magdalena Svensson	Programme Manager, Energy
Implementers	ILO Country Office, Lusaka supported by DWT- Pretoria – (Secretariat)	Mr George Okutho	Director – CO Lusaka
		Ms Olga Strietska-Illina	Sr Specialist
	Kafue Gorge Regional Training Centre (KGRTC)	Eng. Kaela K. Siame	Director
Social Partners	Zambia Federation of Employers (ZFE)	Mr Harrington Chibanda	Executive Director
	Zambia Congress of Trade Unions (ZCTU)	Mr Bonface Phiri	Director – Research

2. A functional project monitoring and evaluation system was established at the beginning of the project.

3. Awareness raising on RE and EE

a. Communication plan;

b. Information, Education and Communication (IEC) and promotional materials in place



c. Media – Senior Editors' Breakfast :



This was done to ;

- Raise awareness among various stakeholders whilst linking energy, skills and investments
- Use media to direct public interest towards topical issue of energy thereby generating interest from decision makers to address issues that are in the lime light.
- Provided Project visibility and as a tool for partnership engagement
- Provide a platform for RE/EE training offer marketing
- 21 senior media practitioners from 18 media institutions attended the media breakfast

d. **Media Kit:** developed as a tool to increase information among media practitioners and raise awareness about RE and EE.



e. **Stakeholder engagement:** Throughout the Project duration, the PMT conducted several stakeholder engagements to not only raise awareness but to create opportunities for partnerships in line with the Public Private Partnership (PPDP) Approach. The key stakeholders included various actors within the energy value chain including industrial and or commercial use of energy.



Challenges, Actions and Lessons Learned

Challenges and Corrective Actions

Delayed inception of the project and staff recruitment

The inception of most project activities were delayed due late recruitment of project team and departure/resignation of the first National Project Coordinator (NPC). The complete project team was only set up in October 2019. However, the project experienced another resignation of the Finance and Administration Assistant in March, 2020 this contributed to the low financial delivery of the project.

To mitigate this, a consultancy for the duration of the project was engaged to initiative and deliver on two outputs of the project. In addition, an Action Plan was developed to ensure an increase in project activity and delivery. This was coupled with increased planning strengthened coordination and relations with the donor and the main external implementing partner. 7 months No Cost Extension (NCE) to recover lost time.

Advent of COVID – 19 Global Pandemic

The advent of the COVID – 19 global pandemic at the beginning of the year 2020 disrupted the momentum of the project. This restricted air travel, local travel, lockdowns and social distancing enforced by the state authorities limited the strategies and activities planned by the project.

In response, new strategies and activities for implementation. Such as E – Learning instead of on-site training offers. In addition, reliance on ICT for most project coordination and monitoring activities including post-training monitoring. Furthermore, new partnerships were explored that would respond on time and appropriately to ensure project delivery.

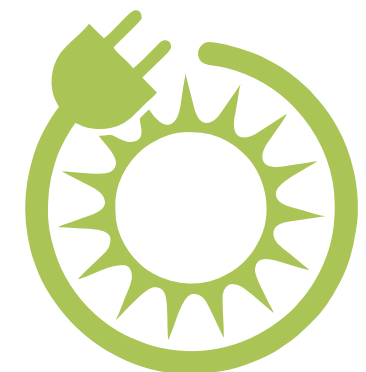
Monitoring and Evaluation

The project undertook a number of scheduled internal project reviews jointly with the implementing partner – Kafue Gorge Regional Training Centre (KGRTC).

These project reviews included quarterly and monthly review meetings where the project objectives, achievements, and challenges were reviewed and new workplans adapted. Other Key M & E activities included the external project evaluation, and various monitoring visits.

The project evaluation concluded that the “SKIDRES project has been able to raise interest and even enthusiasm in Zambia (and to some extent in the region); and engage stakeholders in agreeing to share their time, skills and resources for training and events in the area of Renewable Energy and Energy Efficiency.

One key limitation faced by the project’s M & E function was that the training courses outcomes could not be effectively monitored because the courses were lately offered towards the project end due the COVID – 19 pandemic. Training feedback was still recorded immediately after the trainings.



Lessons learnt by the Project include

- More awareness on RE/EE in general and the SkiDRES project required for meaningful engagement of project stakeholders. The media training as an example should have been embedded within the initial project activities.
- More engagements with stakeholders are required to increase and improve project visibility and participation.
- Improved project offer to local private sector required to clarify and incentivise would-be project partners.
- Delayed start up of project activities due to delayed recruitment affected the project adversely.
- A number of stakeholders noted that the project was weakly anchored in the sector
- The project implementation was slow especially with regards setting the governance structures
- The project stakeholder MOU's were reported to lack clarity in some instances and yet their formal establishment took much time and effort
- Some concerns on gender equality and diversity were noted especially at the male dominated KGRTC.

The project undertook an final end of Project Independent evaluation starting in end of June to End of August 2020.

In addition, the project identified a number of opportunities:

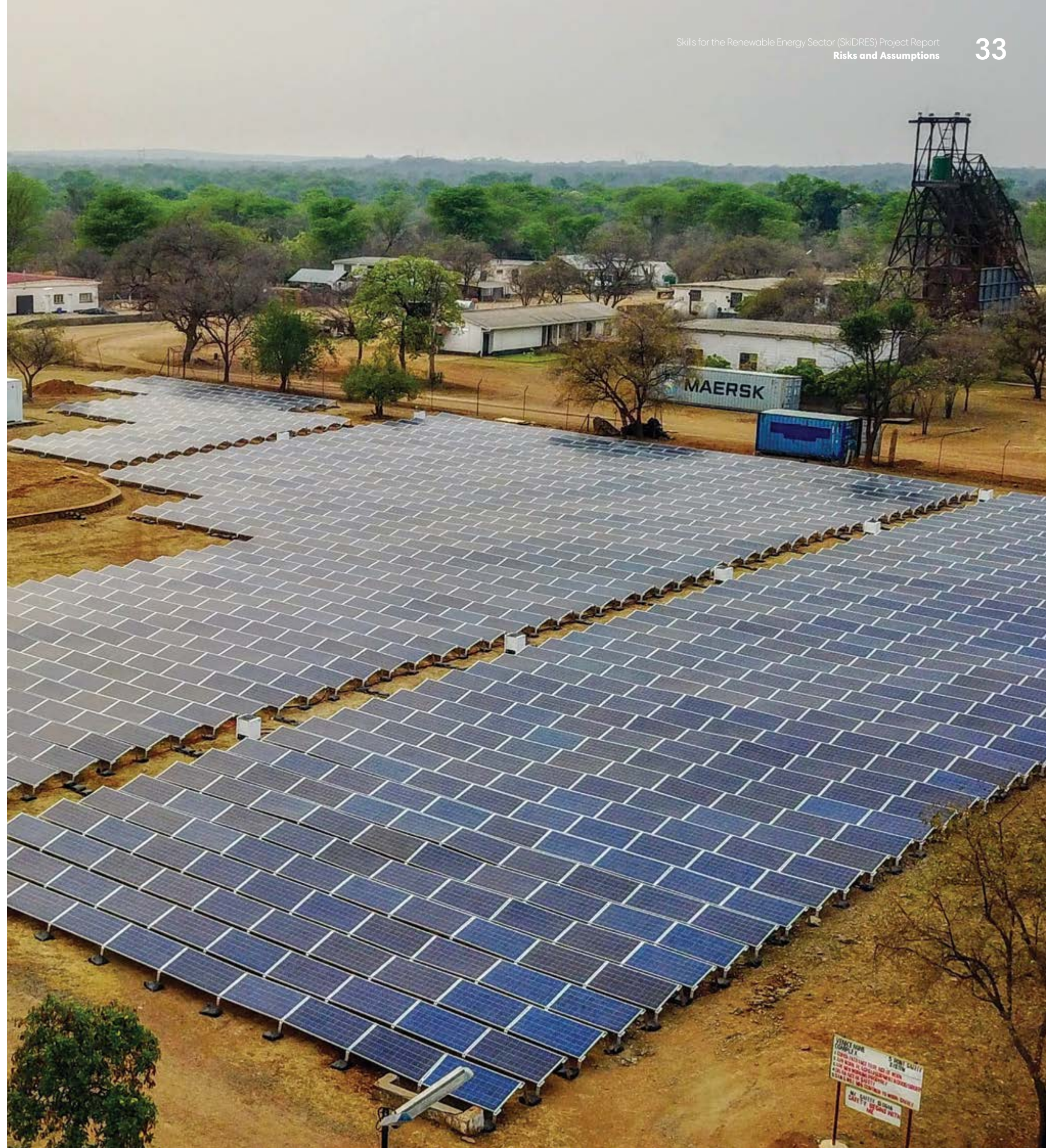
- Prevailing energy deficit situation in the country with a huge supply gap is conducive for engagement.
- Project relationships can be further leveraged to implement project activities.
- The Skills Development Fund backed by an Act of parliament has both flexibility for the PPDP approach and presents an opportunity for sustainability.



Risks and Assumptions

- The risk of COVID-19 pandemic
- The possibility of the private sector not willing to contribute in cash or in kind to the PPDP, with the associated effect that there will be no PPDP – just a traditional DC project
- Regional commitment to energy mix diversification after new hydro-power installations or improved water levels and generation capacity from existing hydro-power plants reduces power deficits.
- Difficult stakeholder collaborations resulting in fragmented capacity building efforts

Mitigation and risk reduction actions were undertaken throughout the project life to ensure successful project delivery, such as redesigning pilot training, change of training delivery and developing strategies for stakeholder engagement.



Closing Remarks

Remarks from the ILO and KGRTC

Skills development is a fundamental development priority, key component of the decent work agenda and is central to people's well-being. Skills development is everyone's business: Governments, employers and workers all have a stake in it. Governments need to adopt more relevant skills policies to develop the skills required by rapidly evolving labour markets. Education and training systems will also need to take advantage of new educational technologies and give greater attention to digital skills. This will sustainably contribute towards increasing the employability of workers, transition young people into productive and decent work, and increase the productivity of enterprises through better quality and relevant training.

In responding to the increasing energy demand and drive to pursue sustainable and renewable energy sources in Zambia and the Southern African Development Community (SADC) region in general, the International Labour Organization (ILO), with funding provided by the Swedish International Development Cooperation Agency (Sida) and in close collaboration with Kafue Gorge Regional Centre (KGRTC), has implemented a 19-months pilot project, the Skills Development for the Renewable Sector (SkiDRES) Pilot Project, to contribute to the development of skills for the Renewable Energy and Energy Efficiency sub-sectors in Zambia and in the region.



Mr. George Okutho
Director
ILO Country Office for Zambia,
Malawi and Mozambique, Lusaka, Zambia

With strong buy-in from the private sector, both foreign and domestic, the project has contributed to Zambia and southern Africa having the necessary skilled workforce to tap into the rapid development of technology in renewable energy and energy efficiency.

Supported by the Government of Sweden and the Government Republic of Zambia, the ILO and KGRTC are delighted to have worked together with the private sector through the SkiDRES Pilot Project.

The project emphasized on private sector involvement in skills development through the Public Private Partnership Development Partnership (PPDP), the SkiDRES Pilot Project has been **able to raise interest and engage stakeholders in agreeing to share the skills, time and resources for training and events in the field of Renewable Energy and Energy Efficiency.**

The excellent project results achieved so far, and confirmed by the final independent evaluation, reflect a high degree of public and private sector ownership and market uptake.

We look forward to the scale up long-term project to succeed the SkiDRES pilot Project.



Eng. Kennedy Kaela Siame
Director
Kafue Gorge Regional Training Centre
Namalundu, Zambia





“Skills development for the Renewable Energy Sector – SkiDRES” Project

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