greenCrowd in Zambia

Enabling sustainable energy projects to happen across Southern Africa

greenCrowd®

www.greencrowd.energy

About Us

greenCrowd

Our experience

We have been active in Zambia since 2019 and enjoy working with clients to deliver profitable projects in a complex and evolving environment.

We focus on financing, enabling, advising, and operating clean energy projects in developed and frontier markets. Our experience spans every stage of project development, from pre-feasibility to refinancing, from advisory to ownership, operation and maintenance.

A collaborative mindset

We believe a creative and collaborative approach is required to support and deliver scalable and transformative projects, engaging key decision-makers and parties committed to a common purpose.

greenCrowd uses its international partnership to contribute expertise in finance, structuring, capital raising, business advisory, legal, engineering, stakeholder engagement and energy policy. Our team works closely with clients to ensure that projects and transactions of all sizes and complexity attract the correct form of funding.

Our focus

greenCrowd is independent, free-thinking, solution-driven and commercial.

We offer a new, simplified approach to interactions with the financing markets for those who want to borrow and those who want to invest.

We make investments in energy as accessible, cost-effective and transparent as possible for all stakeholders.

Partnerships

Experience in supporting our clients to structure and develop successful projects in Zambia shows that a flexible and independent approach is needed.

Our open and transparent partnerships plan strategically to deliver robust energy and infrastructure projects. We work with people and organisations who deliver.

greenCrowd is proud to be a participant of the UN Global Compact, a member of the Investor Confidence Project, and part of Innovate UK's Energy Systems Catapult and the UK's PACT.

United Nations Global Compact

CATAPULT Energy Systems

UK PACT

FCA Financial Conduct Authority

We work with Innovate UK

Investor Confidence Project

The way forward

Zambia is a strategically crucial regional hub connecting Southern and East African power pools. The proper funding and project management approach can realise many opportunities across the energy value chain.

Recent changes in the commercial and regulatory landscape have shown the value of our solution-driven approach.

After the introduction of the 2019 Electricity and Energy Acts and changes to commercial arrangements, notably between ZESCO and the Copperbelt Energy Corporation Plc (CEC), we see immense opportunities for investment and sector participation, which will have a profound and lasting impact within the country and the region.

Developments in Zambia are fluid and dynamic; we see a concerted drive across the energy value chain to address historic and legacy issues.

This document discusses recent developments and opportunities for investment and participation. It invites you to participate in a critical stage in Zambia's energy sector transformation.

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Zambia and Power Sector Developments

Current status

ZESCO Limited (ZESCO) dominates the supply/generation side of the Zambian power sector. This is counter-balanced by the country's strategically important mining sector, accounting for more than 50% of the power consumed in Zambia. ZESCO is complemented by two utilities, CEC and North West Energy Corporation (NWEC), and six Independent Power Producers (IPPs).

The country's total generation capacity is c. 3 GW (forecast to increase to c. 3.7 gigawatts (GW) during 2021), of which ZESCO accounts for 75% (rising to 80% during 2021), with the balance generated by IPPs. Five (soon to be six) large-scale hydroelectricity plants account for most of Zambia's power-generating capacity. These are accompanied by small-to-medium-scale hydro schemes, coal, solar and HFO.

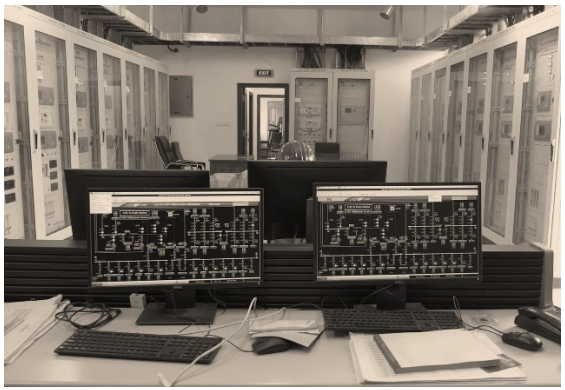
ZESCO and CEC own the Zambian National Grid, which comprises 11,595 km of transmission lines (ZESCO 91% / CEC 9%) and 44,279 km of distribution assets predominantly owned by ZESCO.

Growing interconnection

Zambia is bordered by eight countries, creating opportunities to export power to Angola, Botswana, the DRC, Malawi, Mozambique, Namibia, Tanzania and Zimbabwe. Zambia currently exports to seven of these countries, with power equating to 1.4 terawatt hours (TWh) per year on average over the last five years, comprised by ZESCO 71% (regionally) and CEC 29% (limited to the DRC).

There are several interconnection projects with projects in Tanzania, Mozambique and Malawi that are scheduled for completion by 2025. Once complete, the Zambia-Tanzania-Kenya (ZTK) interconnection project will further enhance trading opportunities through the linking of the Southern African Power Pool (SAPP) and the East African Power Pool (EAPP).

Interconnector projects such as the ZTK project backed by development banks such as AfDB will enhance regional trade. Opportunities to address supply deficits in the DRC create substantial commercial opportunities for near-term investments in Zambia-DRC interconnectors and infrastructure upgrades.



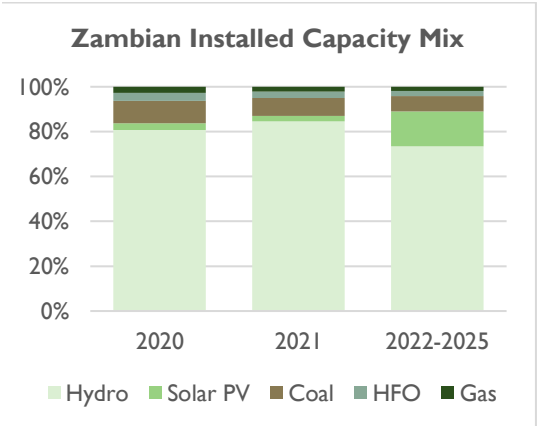
Diversification underway

The Government of Zambia's (GRZ) strategies to address climatic impacts include geographic and technological diversification of power generation projects.

Zambia's power generation has been heavily weighted towards large hydroelectric projects in the Southern regions. In addition to commissioning the 750 MW Kafue Gorge Lower (KGL) project through 2021, there are over 15 projects totalling 4 GW of installed capacity in various stages of development.

While exploration to harness wind and geothermal resources is underway, the bulk of the projects in development include solar and medium-to-small-scale hydro projects. This diversification of generation sources will contribute to the country's energy security.

Solar PV projects in development will be able to co-locate with operating hydroelectric power plants or be close to existing infrastructure, benefitting from existing investments in transmission.



An Open Framework

A post-BSA Era

In March 2020, the Bulk Supply Agreement (BSA) that had been in place between CEC and ZESCO since 1997 expired. This event has the potential to dramatically shift the economic future of ZESCO and Zambia's power sector. Combined with legislative changes in Q4 2019, this paradigm shift paves the way for a more liberalised and open electricity sector.

The new laws and policies now in place allow any party to develop or own a power generation project to supply a willing and able customer in Zambia. The framework allows any party to wheel power through ZESCO's and CEC's transmission networks without encumbrance. It also creates greater transparency in the setting of wheeling tariffs.

Introducing new legislation provides a cost pass-through mechanism, multi-year tariff setting, and regulatory oversight of PPA/PSA tariffs. These give a route to cost reflectiveness, with new tariffs reducing subsidies and increasing attractiveness for investment.

Legislative Changes

After the power sector in Zambia was liberalised in the 1990s, GRZ recognised some of the sector's challenges and has worked towards further revising the regulatory framework.

The Electricity Act No. 11 of 2019 (the Electricity Act) and the Energy Regulation Act No. 12 of 2019 (the Energy Regulation Act) came into effect in February 2020. These provide access to transmission and distribution networks owned by ZESCO and CEC.

ZESCO has confirmed that its transmission and distribution assets are available for third-party use. Section 14 of the Electricity Act enables power producers to access the existing transmission and distribution network.

The Energy Regulation Board (ERB) is responsible for licencing and tariff setting for non-mining customers and now has an additional role. It is empowered to facilitate investment in developing, constructing and operating electric plants using renewable energy sources.

What does this mean?

Where third-party infrastructure is used, and there is spare capacity, the new legislation allows the ERB to force discussions if an IPP feels they are not allowed free access or if the wheeling tariffs are set too high.

This new legal framework enables IPPs to produce and wheel power through existing grid infrastructure. This relieves ZESCO of being the sole off-taker of energy, opening the market for new IPPs to enter into bilateral agreements with counterparties.

Opportunities for Collaboration

A regional supply deficit is projected following the decommissioning of generation plants in South Africa and regional population growth. Completing new generation, transmission, and distribution projects to meet forecast demand will require significant capital. Leveraging the legislative changes, the private sector has an opportunity to support the development of the power sector in partnership with ZESCO.

ZESCO

Overview

ZESCO Limited was formed in 1970 under the Zambia Electricity Supply Act. It is a parastatal private limited company wholly owned by the Industrial Development Corporation Limited (IDC), the investment arm of GRZ. It is a vital Southern Africa Power Pool (SAPP) member.

Vertically integrated, ZESCO's principal business activities are generating, transmitting, distributing and supplying electricity.

It operates by Zambian legislation (principally the Electricity Act and Energy Regulation Act), the Zambian Grid Code and under licences issued by the ERB.

The company generates approximately USD 0.9 billion in revenues and employs around 6,740 staff across Zambia.

It has a combined book value of generation, transmission and distribution assets worth ZMW 58.7 billion (USD 3.2 billion equivalent) (as of 30 Jun 2020).

Power Generation

ZESCO owns 2.3 GW (soon to be c.3 GW) of generating assets (directly owned, through subsidiaries or joint ventures) through hydro and thermal-based electricity generating units.

ZESCO's four central large hydro plants currently in operation include (i) Kafue Gorge Upper - 990 MW; (ii) Kariba North Bank - 720 MW; (iii) Kariba North Bank Power Extension - 360 MW, (iv) Victoria Falls – 108 MW. It also owns 50% of the 120 MW Itezhi-Tezhi Power Corporation Limited in a joint venture with TATA Africa.

The Kafue Gorge Lower hydroelectric plant (KGL) will become ZESCO's second largest hydroelectric power plant, with an estimated 750 MW capacity, increasing ZESCO's electricity generation capacity by 33%. KGL could help improve the ability to respond to shocks to generation capacity (IMF: August 2019) and provide opportunities to generate high-value foreign exchange through bilateral trade agreements within the SAPP region.

The New ZESCO

ZESCO's strategic vision is to be the region's electricity trading hub by 2025. The ongoing demand for power in the area and Zambia's strategically placed location position ZESCO as a regional hub. ZESCO will increasingly be able to trade its excess capacity into high-value regional markets and wheel on behalf of other market participants.

Several areas are being explored to address historic inefficiencies in the power sector and to reach cost-reflectivity. These include improving net margins and rebalancing tariffs between off-takers and producers (including IPPs). Furthermore, the Cost of Service Study due for publication in 2021 will allow that process to be undertaken transparently.

Recent changes to the legislative framework and commercial agreements between key stakeholders in the sector support ZESCO's ambition to facilitate the growth of the power sector in Zambia and the region.

ZESCO
Powering the Nation & the Region

Long Term Mining Power Demand

Overview

Zambia has a long history of mining, principally in copper. It is of critical strategic importance, being the country's leading exporter and source of foreign exchange. Copper amounted to two-thirds of Zambia's total exports in 2018.

The country's copper reserves are 19-21 million metric tons (MT). In 2019, Zambia was the second-largest copper producer in Africa after the DRC and the seventh largest worldwide, producing 800,000 MT out of a total world production of 20 million MT, according to the U.S. Geological Survey (USGS).

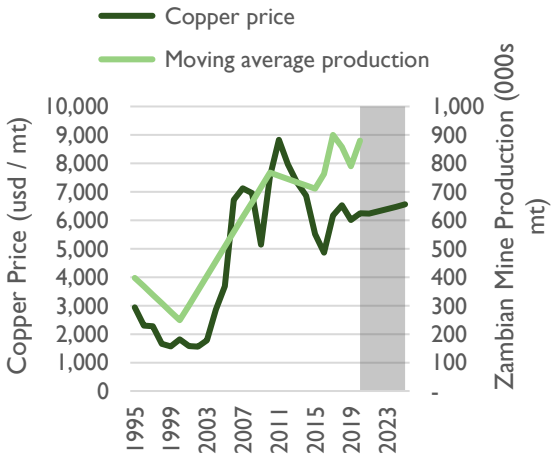
Historically, mining has been concentrated in an area renowned for its high-grade deposits known as the Copperbelt Province. However, mining activity in Zambia has recently diversified out of the Copperbelt Province into virtually all the other nine provinces - the North-Western Province (viewed mainly as 'the new Copperbelt'), followed by the Southern Province, Luapula Province, Central Province and Eastern Province. A GRZ diversification strategy is also looking to boost revenues from gold and other minerals.

Mining companies

GRZ transformed the parastatal agency that owned virtually all the productive mines and tenements before 2000 into an investment company known as Zambia Consolidated Copper Mines Investment Holdings (ZCCM- IH), which retains minority interests in most large-scale mining projects.

Since 2004, foreign companies have invested around USD12.3 billion in the sector, increasing Zambia's production to historic highs. In the last decade, copper production has risen more than threefold from about 250,000 MT in 2000 to an estimated 880,000 MT in 2020.

Planned projects would increase copper production further. Lubambe Copper Mine is asking GRZ to seek concessions, including tax incentives, to develop a significant new copper mine with exploration slated for 2021. Lubambe has completed a concept study on the extension project that would produce up to 160,000 MT of copper annually with a mine life of more than 30 years.



Mining power demand

Accounting for approximately 50% of the power consumed in Zambia, the mining sector is a critical component of the power sector's growth.

Mining depends on firm (non-seasonal), reliable (non-intermittent) power supply and typically depends on grid-connected power. Power use is a prerequisite for all mining companies, and the cost of energy as a proportion of total operating costs rarely constitutes less than 10% of mining operating costs and often exceeds 25%, according to the IBRD/World Bank.

Mines in parts of Zambia are some of the deepest and wettest in the world, with sunk and fixed costs creating relative inelasticity for power demand, notably large mines in the Copperbelt. As such, these mines are less sensitive to copper price changes and continue to source power even during low copper prices.

Copper outlook

While the COVID-19 pandemic has impacted copper pricing, the long-term global outlook for copper and cobalt is positive, driven by substitution.

Electric vehicles contain 5x more copper than their combustion equivalent. The switch to solar and wind, with higher requirements for copper/MW of power compared to gas or nuclear power, is also expected to drive future copper demand and demand for energy from Zambia's mining sector.

A Gateway

Overview

Africa's energy sector is set to become more diverse and dynamic. While governments are focusing on building generation capacity to meet the growing demand for energy and increasing electricity access, there is also an emphasis on expanding transmission assets.

Utilities across the continent are experimenting with new technologies and innovative construction techniques to resolve grid expansion challenges. However, given the fiscal burden faced by several African economies and governments, introducing competition in power transmission and public-private partnerships is being explored to address the financing challenges.

A trading hub

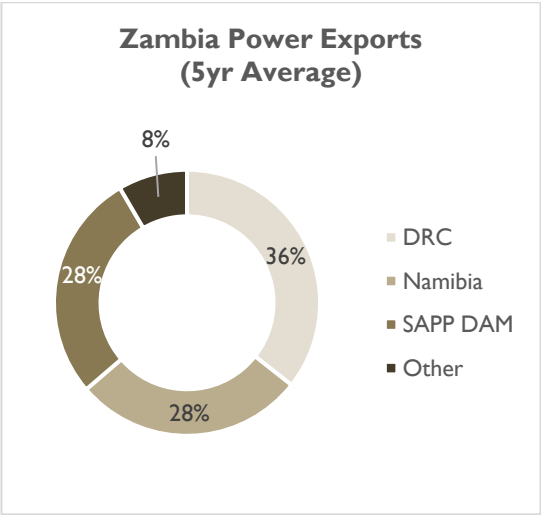
Within this context, ZESCO's strategic vision is to be the hub of electricity trading in the region by 2025. With planned aggregate excess power generation scheduled for 2021 and strategically located in the area, Zambia is well-placed to capitalise on this opportunity.

Regional markets

There is over 70 GW of installed capacity in the Southern Africa region. 2,054 GWh was traded within the SAPP on the competitive Electricity Market – trades worth USD 117 million - during SAPP's last reporting period, 2018-19. These trades constituted 32% of trades through the four portfolios/markets: (i) Intra-Day, (ii) Day Ahead, (iii) Week Ahead, and (iv) Month Ahead. 68% were undertaken bilaterally.

The DRC could produce over 2.0 MT p.a. of copper within the next five years, compared with 1.3 MT p.a. today, overtaking China as the third largest copper producer after Chile and Peru.

One of Zambia's key export markets for its power is the DRC, which is set to be the most significant growth country for copper through 2025. This will offer Zambia one of its most important opportunities to generate high-value revenues from excess power and expand its existing supply agreements with SNEL (DRC's national utility).



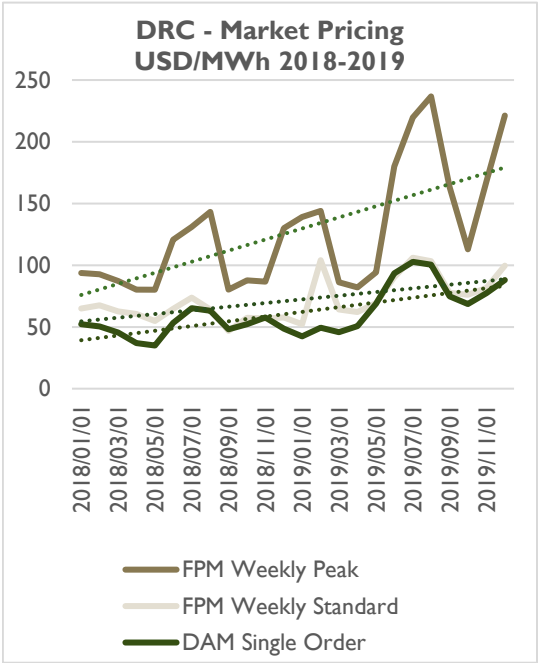
Future demand

Southern Africa has significant untapped resources, and using these could increase the reliability of power supply for the entire region.

The region's energy demands are set to increase from 400 TWhs per annum to 565 TWhs between 2017 levels and 2030 - an increase of 41% over the period.

The interconnection through the Zambia-Tanzania-Kenya project, expected to be completed in 2025, will further enhance trading opportunities between various SAPP members by linking the SAPP and East African Power Pool.

Power pricing in the region is also on an upward trend, offering valuable trading opportunities.



Pathway to Energy Access

Developing infrastructure

There are several initiatives underway to broaden access to electricity. Grid extension and intensification are being undertaken across five regions.

Due to the land area of Zambia and the low population density - 22 people/sq km (compared to 500 people/sq. km in Rwanda) - Zambia will require significant investments in off-grid solutions to increase access from the current 40% levels.

Additionally, power reliability for those already connected remains a key focus, and the economic impacts of load shedding have been well documented and reported. In terms of positive developments, in Q1 2021, load shedding was reduced to Level 1 (translating to 1 to 4 hours per day), and it is expected that Level 0 will be implemented across the country by Q2 2021.

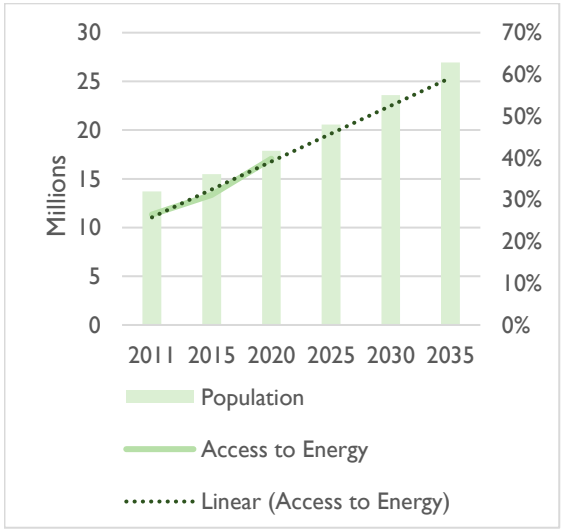
Through careful stewardship of water resources, the commissioning of new projects such as Kafue Gorge Lower and the diversification of generation technologies, a Level 0 load-shedding program is projected to be implemented through 2021 and beyond.

Population growth

Current power demand is further augmented by the population increase, resulting in a need for more energy access. The population of Zambia is projected to rise from over 18 million in 2020 to 24 million by 2030. The shift to urbanisation is well underway, with the population of Lusaka having already expanded from one million in 2010 to 2.6 million in 2019, with further year-on-year growth of 5% per annum expected.

Zambia's rising population can be a valuable asset for achieving the goals outlined in Vision 2030, the comprehensive strategy for attaining upper-middle-income country status. A Willingness to Pay for improved electricity supply reliability in Zambia survey (Batidzirai et al. 2017) has demonstrated that 50% of customers are willing to pay at least ZMW 0.09 per kWh more in favour of reduced load shedding and improved reliability of supply, signalling local appetite for tariff increases towards cost reflectivity.

Population and Access to Energy



Enhancing access

In addition to off-grid solutions, grid enforcement and rehabilitation projects are underway as part of plans to improve power quality and availability where the grid already exists. Projects underway are replacing obsolete and aged 0.4kV, 88kV and 330kV lines to eliminate failures which have historically caused financial loss to ZESCO due to the cost of emergency replacement of equipment and ZESCO's loss of business due to prolonged outages.

An example is the Lusaka Transmission and Distribution Rehabilitation Project (LTDRP), a USD 246 million World Bank and European Investment Bank-backed program - a high-status project scheduled for completion in 2023.

Rehabilitation of infrastructure through projects like the LTDRP will ensure enhanced system security and reliability of supply while meeting the increased load demand. Multiple opportunities exist in the development of this critical infrastructure.

Opportunity to Participate in the Transformation of the Zambian Power Sector

Why now?

Is there a need?

Zambia's power sector is undergoing a once-in-a-generation transformation.

A combination of macroeconomic events, the end of the BSA and a new open legislative framework have created a demand for strategic partnerships and a collaborative approach that will address historic inefficiencies, a rebalancing of commercial incentives and an approach to serving the needs of off-takers in Zambia and the region. Developers, investors and funders have a unique opportunity to be part of a reshaping of the Zambian power sector.

Is there a supportive framework?

Recent supportive policy announcements provide a more straightforward pathway for sponsors and developers to develop new projects.

The increasing demand for power and the new framework outlining the mechanism for engaging with the system operator allow new means to develop projects.

Is ZESCO supportive?

Yes, absolutely. We believe that having a financially robust ZESCO is a pre-requisite to establishing a long-term, competitive and sustainable power sector, not just in Zambia but across all of the eight Southern African countries that share their borders with Zambia.

Through our work in Zambia, we have established three things:

1. The financial markets (and the financial press) are not up to date with ZESCO's strategy; funders/investors want to find out more and want to understand ZESCO's long-term economic plan and what this means for ZESCO's future profitability, liquidity and the growth of Zambia's power sector.

2. Funders/investors who take a long-term view are excited by and see the tangible project opportunities that the Zambian power sector offers; conversely, those who take a short-term view only see challenges that appear on the surface to be intractable.

3. The importance for all market participants to maintain an open dialogue and engagement with each other to make projects happen.

Is there capital available?

The short answer is a (qualified) yes. The right project in the right place with the right people will always attract capital, irrespective of the project's size. However, against a challenging economic backdrop, the proper steps must be taken to unlock the correct form of capital from the right partner.

The Opportunities Ahead

The anticipated economic gains from investments in the power sector are expected to translate into both a direct source of economic development and an enabler of future growth.

For these gains to be realised, investments will be needed in small to large-scale on-grid generation, off-grid electrification, modern transmission and distribution, smart metering and additional intelligent grid infrastructure.

For example, opportunities with estimated funding requirements include:

- Interconnectors into the DRC and Tanzania: USD c.210m and USD c.250m respectively;
- Transmission & Distribution assets: USD c.49m;
- Various power generation projects.

For more details and to find out about these and other investment opportunities, greenCrowd contact details are provided on page 11.

A Finance First Approach

Successful financing steps

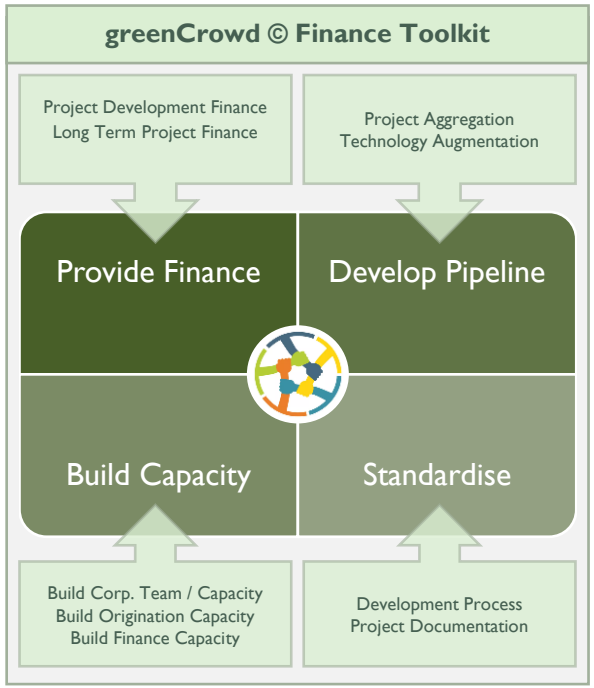
We apply the following discipline to ensure successful projects:

- The greenCrowd Finance-First Toolkit: *rigorous project evaluation, due diligence and preparation so that there are no surprises.*
- Creativity and a finance-first approach *so that issues/obstacles can be tackled ahead of time.*
- Open and transparent project management *so that all stakeholders are engaged.*
- Marketing materials target a broad audience *so that the investment rationale for debt and equity speaks for itself.*
- A targeted fundraise *so that competitive tension is created among debt and equity funders to achieve optimal capital.*
- A well-managed process *with agreed milestones to efficiently reach financial close.*

Our Finance Toolkit

Power projects succeed when they are planned well, commercially viable, the detail is understood, they are carefully assembled by experienced professionals who understand the risks and how to mitigate them and, as significantly, where the source of capital, both external and internal, matches the project's business plan.

greenCrowd has developed a Finance-First Toolkit for its clients that enables the preparation of bankable projects and transaction opportunities:



What we cover

The Finance-First Toolkit draws from the greenCrowd team's experience in the following areas:

- Project feasibility/evaluation
- Corporate / finance strategy
- Commercial, technical and legal advisory
- Financial modelling
- Project/transaction management
- Capital raising (debt and equity, green bonds, impact investment)
- Due diligence
- Mergers & Acquisitions
- Environmental, ESG, and regulatory compliance
- Energy transition frameworks

We understand what it takes to develop a bankable project and what investors and lenders require to satisfy their credit/investment committees.

Having advised both sides of investment transactions, we are well placed to support and sponsor developers, help authorities and satisfy investor requirements across the various stages of a transaction and project's development cycle.

Our Services

Who do we work with

We work across the whole energy value chain. Our clients include:

- Public Sector: parastatals, governments, local authorities
- Power companies: utilities, transmission and distribution companies
- Private Sector: developers, generators, suppliers, commercial and industrial consumers, technology companies
- Capital: equity investors, debt funders, strategic and industrial investors
- Third Sector: NGOs, community energy groups.

We encourage long-term thinking open and transparent partnerships to deliver robust projects and transactions. Above all, we work with people who deliver on their promises.

How we work

Our clients like working with us because we are open, problem-solving, practical and efficient. They also like that we are not afraid to advise them on what to do and how to do it in any situation.

Moreover, we have the confidence to use our knowledge and experience to act as a sounding board for guidance when asked.

Areas covered:

- Power generation, transmission and distribution networks
- Hydroelectric
- Solar PV - rooftop, ground mount, floating
- Onshore & offshore wind
- Storage - domestic, commercial, utility
- Biomass / Anaerobic digestions / Biogas
- Energy efficiency
- Electric transportation
- Hydrogen

Collaboration is key

We strongly advocate for the strengthening of local markets, expertise and know-how. We therefore make it a central tenet of our engagement to work with local experts, institutions and organisations, reinforcing local capacity and capabilities.

Supporting the local economy

We recognise that many solutions are local and work at melding this know-how with international best practices.

We aim to stimulate and encourage the development of capital markets, capacity and expertise.

In working with local finance institutions and partners, we can improve the creditworthiness of projects that generate local currency income and avoid foreign exchange risk.

This can reinforce existing market indices while curbing unhedged currency mismatches on balance sheets. From a local economic perspective, it can help generate liquidity, stimulating local activity.

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Creativity is at the heart of everything we do at greenCrowd. To find out more about our Africa strategy and our market-leading services, please register at www.greencrowd.energy.com or contact the greenCrowd team.

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