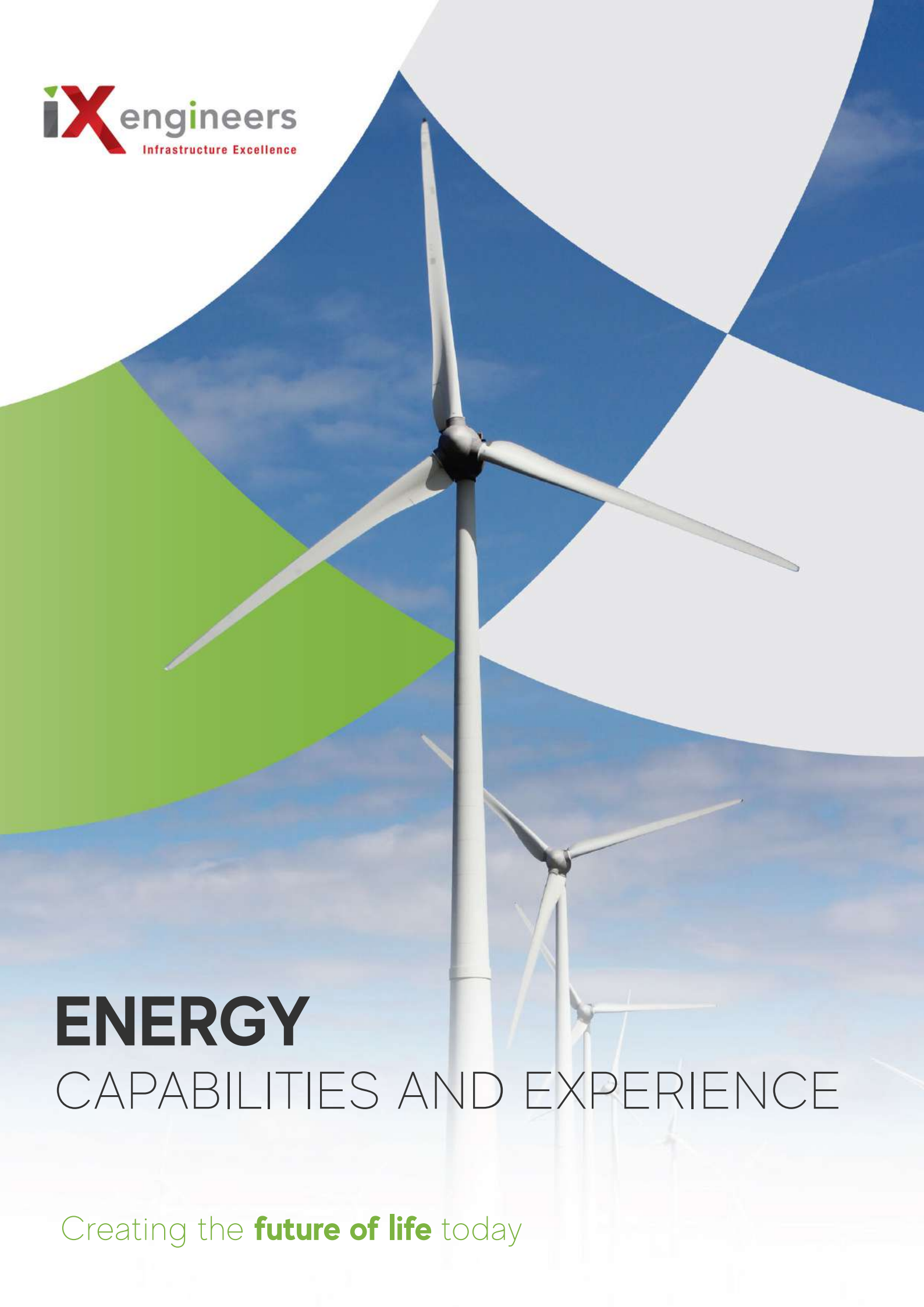
iX engineers
Infrastructure Excellence



ENERGY
CAPABILITIES AND EXPERIENCE

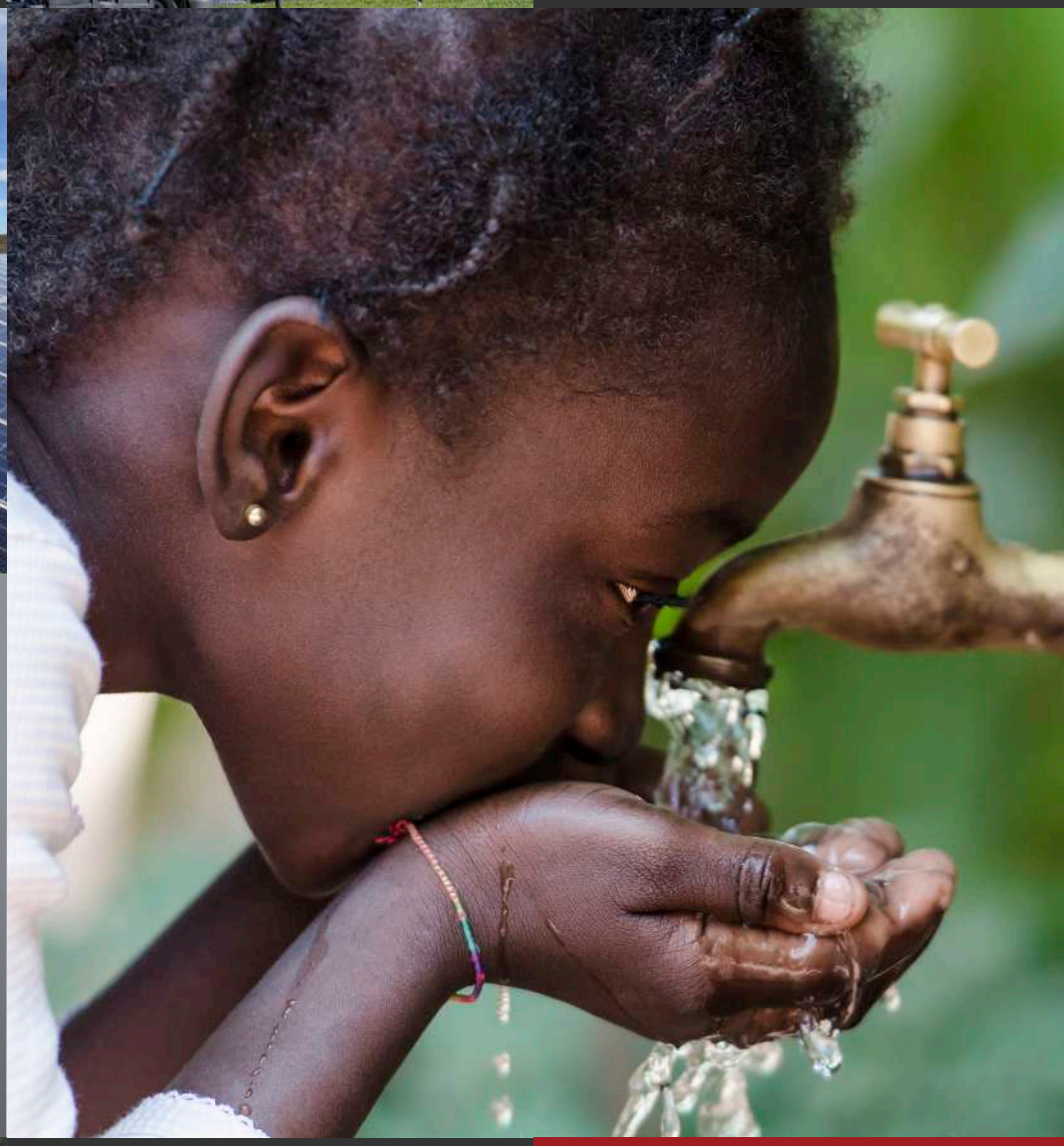
Creating the **future of life** today

OUR PURPOSE IS TO CREATE **THE FUTURE OF LIFE TODAY**

Table of Contents

Water

Oil and Gas



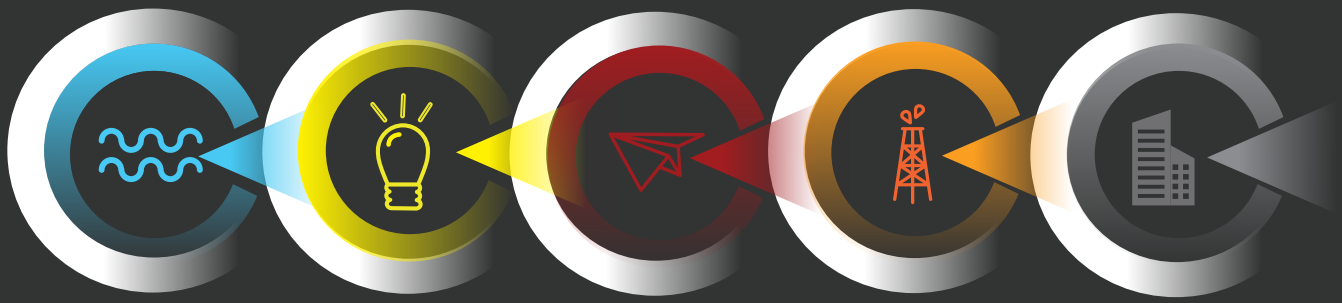
Energy

Transport

Development Services

Market Segments

iX engineers is an innovative multi-disciplinary engineering firm that provides integrated infrastructure solutions across the African continent and Middle-East. The company has vast experience in **five market segments**. These are:



Water **Energy** **Transport** **Oil and Gas** **Development Services**

With operations in Africa and the Middle East, our passion is to design and advise on infrastructure development projects that enable the creation of the future of life. Simply put, we get excited at carving out business-driven solutions that directly and positively impact humanity.

Our DNA, which is distinctly African, is harnessed by the concept of Ubuntu - an African proverb meaning "I am because you are." Ubuntu embraces the idea that humans cannot exist in isolation and that we depend on connections, community, and caring. We cannot be without each other.

Infrastructure Excellence

ABOUT US

- Established in 2016
- Company Core 47 Years experience
- Previously part of the WorleyParsons Infrastructure Business Group (KV3 & Black Jills Engineers)

V3
V3
1977-2001

KV3
KV3
2001-2011

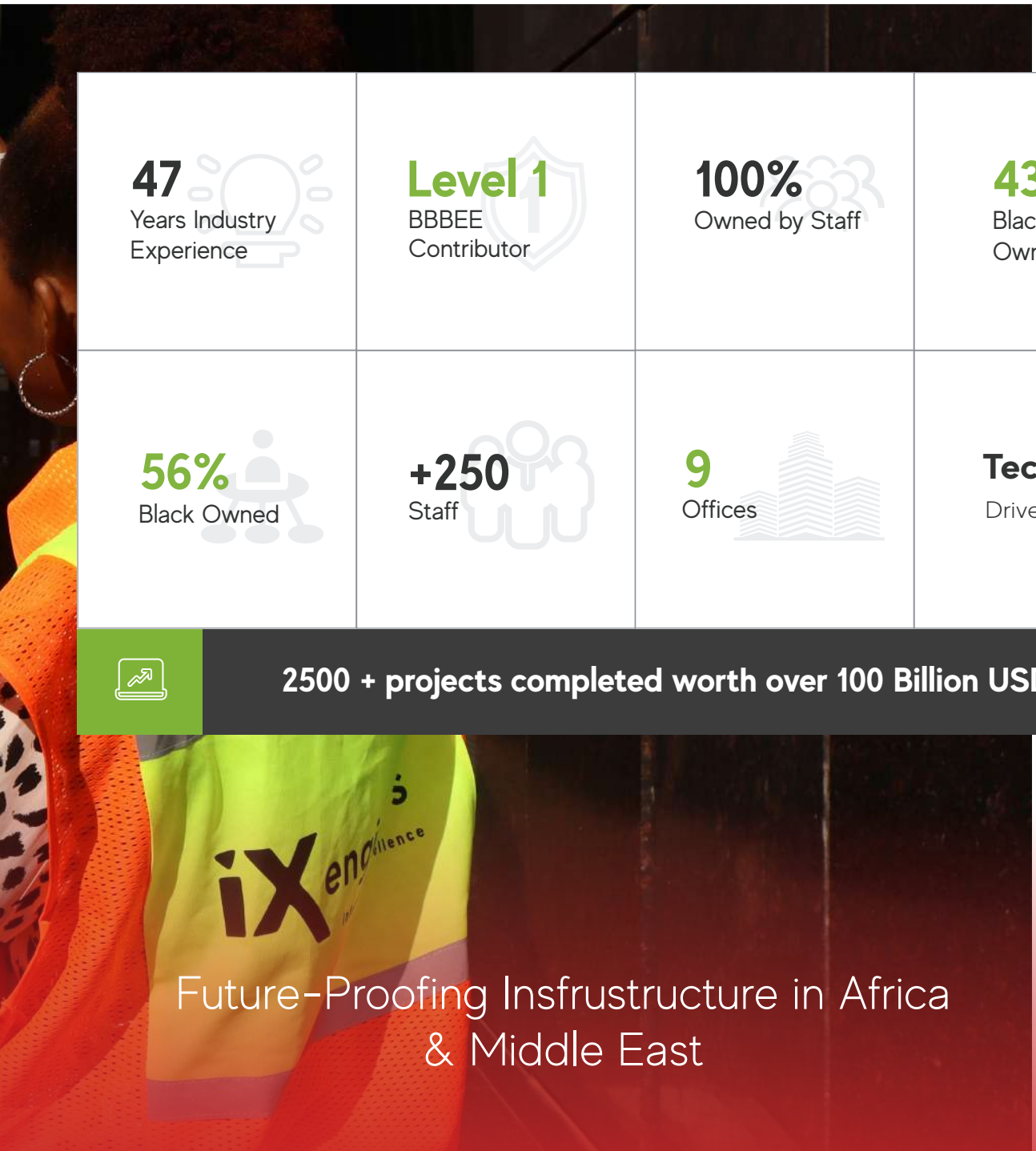
Worley Parsons
WorleyParsons RSA Infrastructure Business
2011-2016

Black JillsEngineers
Black Jills Engineers
2007-2016

iX engineers
2016-Present

47 Years Industry Experience	**Level 1** BBBEE Contributor	**100%** Owned by Staff	**43%** Black Women Owned
56% Black Owned	**+250** Staff	**9** Offices	**Technology** Driven

2500 + projects completed worth over 100 Billion USD



Future-Proofing Insfrustructure in Africa & Middle East

iX engineers AFRICA PROJECT EXPERIENCE

*Projects engaged in while **iX engineers** staff was still the Public Infrastructure Business Unit of Worley (previous **WorleyParsons RSA Infrastructure Business**)

1. Libya
- » Alkooms Housing Development Project
- » Dahman Residential Development
- » Surman Residential Development

2. Mauritania
- » Mining Development Infrastructure

3. Guinea
- » Roads - and Rail Logistics Options for Rio Tinto Iron
- » Ore Mine

4. Ghana
- » Low Volume Roads
- » New Gas Plant*

5. Nigeria
- » Concept Master Plan for industrial city.
- » New Building for Worley

6. Cameroon
- » Geotechnical Piling Work
- » Mbalam Iron Ore – Feasibility (Infrastructure) *

7. DRC
- » Hydropower Commissioning Testing
- » Low Volume Roads

8. Angola
- » GE Oil * Gas Manufacturing Plant

9. Namibia
- » Walvis Bay Container Terminal
- » Walvis Bay Oil Terminal

10. Zambia
- » PPP Road T005 BFS
- » North West Rail BFS

11. South Africa
- » Various Projects as per Capability Statement
- » Company Registered with 9 Offices in South Africa

12. Zimbabwe
- » Hopewell - & Umki Mines Water Supply
- » Master Plans for Mutare & Masvingo

13. Malawi
- » Low volume roads

14. Mozambique
- » Vale Rail Sections 6 & 7 PMC
- » Vale Rail Maintenance Workshop at Nacala
- » Afungi resettlement for Anadarko / Total

15. Tanzania
- » RSA Department of Foreign Affairs Building
- » Low volume roads
- » Dar es Salaam Mtwara Pipeline *

16 Rwanda
- » Lake Kivu Gas – Symbion

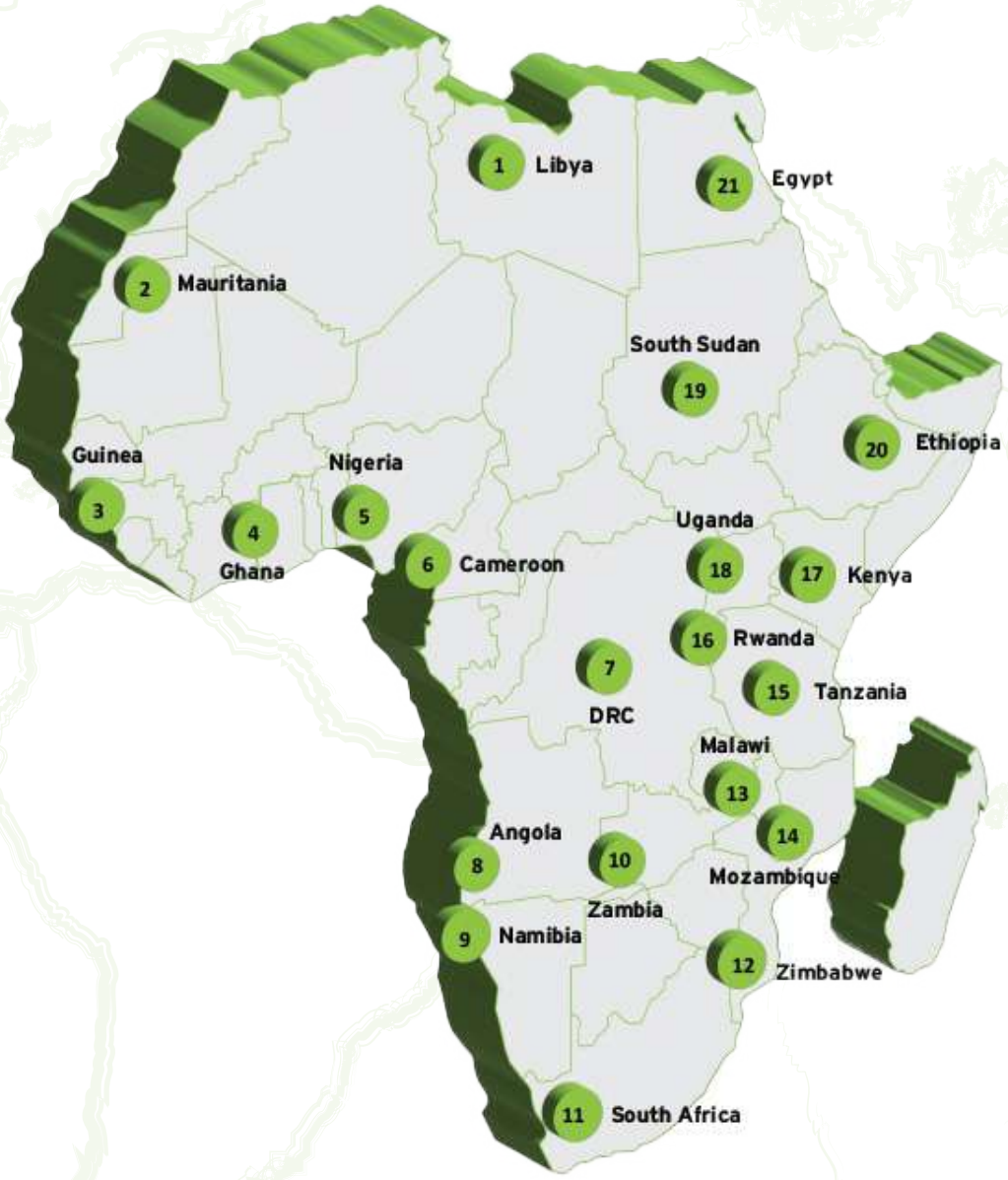
17. Kenya
- » Lake Turkana Wind Farm
- » Kipeto Wind Farm *

18. Uganda
- » Tullow Oil – Infrastructure Planning for Lake
- » Albert Development
- » Low volume roads

19. South Sudan
- » Master Planning for 9 Towns – World Bank

20. Ethiopia
- » Low Volume Roads

21. Egypt
- » Environmental, Social & Health Impact
- » Assessment for Refinery Expansion


1 Libya
21 Egypt
2 Mauritania
South Sudan
19
20 Ethiopia
Guinea
3
Nigeria
5
4
Ghana
6 Cameroon
Uganda
18
17 Kenya
16 Rwanda
7
DRC
15 Tanzania
Malawi
13
14
Angola
8
10
Mozambique
Zambia
9 Namibia
12 Zimbabwe
11 South Africa

PERSPECTIVE FROM THE CEO

We are obsessed with creating the future of life today

Ms Lebo Leshabane

Chief Executive Officer

The economies across Africa and the Middle East have been grappling with longstanding challenges, leading to a sharp rise in unemployment and an increasing number of jobless households. The business landscape in both regions is marked by significant hurdles, including soaring operational costs, power shortages, and a workforce that struggles with low morale. Recent global happiness reports have underscored this, ranking many African and Middle Eastern nations relatively low, revealing a deep dissatisfaction among their people.

At this critical juncture, the nations of Africa and the Middle East must balance the urgent need for economic and job growth with the responsibility to support their most vulnerable citizens. However, many countries face shrinking tax bases, widening inequalities, and persistent corruption, eroding public trust. The moral compass of these regions has been challenged, contributing to a pervasive sense of pessimism in certain areas.

In such times, leadership from the private and public sectors becomes crucial. Leaders must take decisive action to inspire progress and motivate everyone to strive for excellence. The people of Africa and the Middle East are resilient, vibrant, and resourceful. For every challenge, there are uniquely African and Middle Eastern solutions waiting to be implemented.

At iX engineers, we remain optimistic and deeply committed to the future of Africa and the Middle East, the regions we proudly call home. We believe leaders who draw lessons from the past and focus on the future can lead these regions toward a brighter tomorrow. This belief is not mere rhetoric–it is woven into our company's identity and reflected in every aspect of our work. iX engineers is more than just a provider of engineering solutions; we are the embodiment of the future of infrastructure on the African continent and in the Middle East. Our commitment extends far beyond the present–we are passionate about the lessons today provides as they prepare us for tomorrow's innovations. This commitment is evidenced by our investments in local talent, partnerships with regional educational institutions, and a focus on knowledge and skills transfer to the communities we serve.
Our vision for the future is centred on technology-driven solutions. Through our "hands-on" engineering approach, we deliver holistic infrastructure solutions that seamlessly blend traditional and non-traditional methods. Our goal is to add value to our customers, communities, businesses, and stakeholders across Africa and the Middle East through relentless innovation, sustainable practices, and a deep understanding of local needs and contexts.

We have strategically identified five key market segments to ensure our services are tailored to meet our customers' specific needs, operating environments, and long-term objectives. At iX engineers, we are committed to crafting infrastructure solutions that not only address today's challenges but also lay the foundation for a prosperous future across these regions.
Our commitment goes beyond our projects. We are actively engaged in corporate social responsibility initiatives that support education, environmental conservation, and community development in the regions we serve. We firmly believe that our success is inseparably linked to the well-being and progress of the communities we work within.

At iX engineers, we are not just operating in Africa and the Middle East; we are working for Africa and the Middle East. Our team, comprised of local and international experts, brings a wealth of global best practices, uniquely adapted to the challenges and opportunities of these regions. We are invested in the long-term growth and prosperity of Africa and the Middle East, and we are here to stay, grow, and help shape a brighter, more equitable future for all. This version emphasizes iX engineers' long-term investment in and commitment to Africa and the Middle East, highlighting their focus on sustainable development, community engagement, and regionally tailored solutions for enduring success.

OUR LEADERSHIP

"Our leaders embody the characteristics of"

- Humility and Togetherness
- Corporate Governance
- Wealth in Knowledge
- Human Capital and Talent

Afrika Msimang

Chairperson of the Board

- Master of Public Administration: University of Cape Town
- Bachelor of Arts: Development Studies & Political Science: University of Johannesburg
- Bachelor of Arts, Honours: Political Science: University of Johannesburg

Lebo Leshabane

Chief Executive Officer

- BSc. Eng. Civil, Honours: Wits University
- Business Management: UNISA
- GDE Civil - Project Management, Property Law, Maintenance Engineering: Wits University
- Innovation is Strategy - Harvard School of Business
- Business Analytics: Wharton University of Pennsylvania
- IOT - Massachusetts Institute of Technology

Jannie van der Mescht

Executive Director

- BTech (Civil): Pretoria Technikon
- National Higher Diploma (Civil): Pretoria Technikon
- National Diploma (Civil): Pretoria Technikon

Ndinde Mashegana

Executive Director

- BCom, Honours: RAU
- BCom and Diploma in Education (UED): University of Venda
- Certificate in International Import/Export Trade Promotion for RSA: Pacific Resource Exchange (Prex): Osaka, Japan
- Certificate in Public Private Partnerships (PPP) Professional CP3P: APMG-International

Adrian Coetzee

Executive Director

- BTech (Civil): Cape Peninsula University of Technology
- National Diploma (Civil): Cape Peninsula University of Technology

VALUES

- Solution Orientated
- Driven
- Futuristic
- Team Player

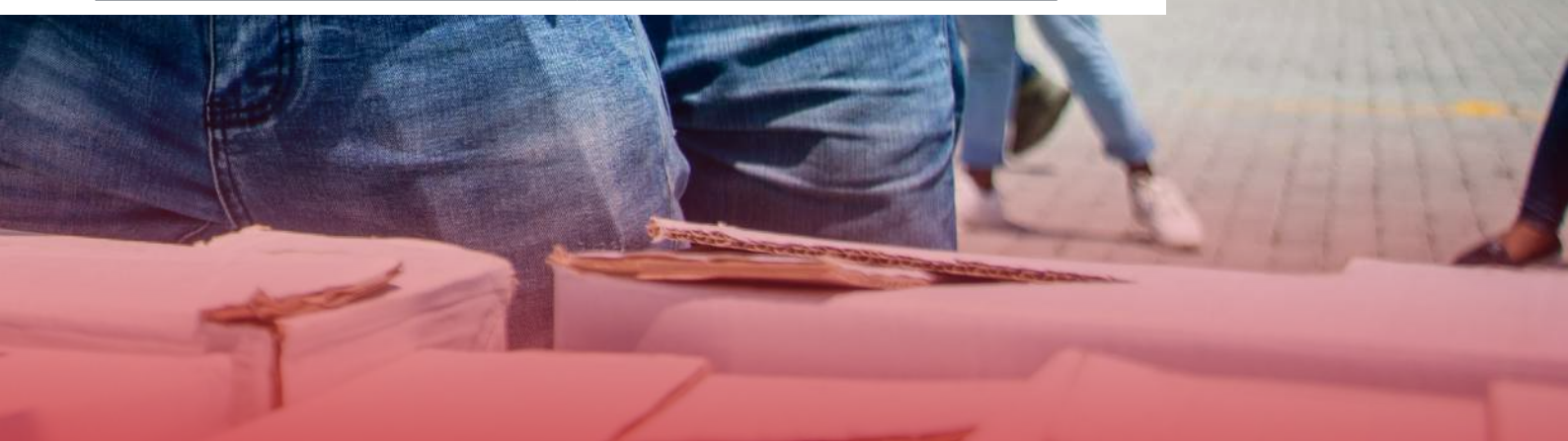
SOCIO ECONOMIC DEVELOPMENT

At iX engineers, we are deeply committed to skills development and social upliftment of disadvantaged communities. We believe in giving back to our communities through targeted programs that create meaningful and lasting impact.

- + 500 School Books
- + 500 Math Sets
- + 500 School Shoes
- + 50,000.00 Building Supplies
- + 50,000.00 Food Supplies
- + 100,000.00 Early Childhood Development

Accreditations; Associations and Membership Development

Institute of Safety Management	South African Institute of Occupational Safety and Health	Water Institute of Southern Africa
Consulting Engineers South Africa	International Organization for Standardization	Institute of Municipal Engineering of Southern Africa
Green Building Council of South Africa	The South African Council for the Project and Construction Management Professions	Association of Municipal Electricity Utilities
International Council on Large Electric Systems	South African Oil & Gas Alliance	



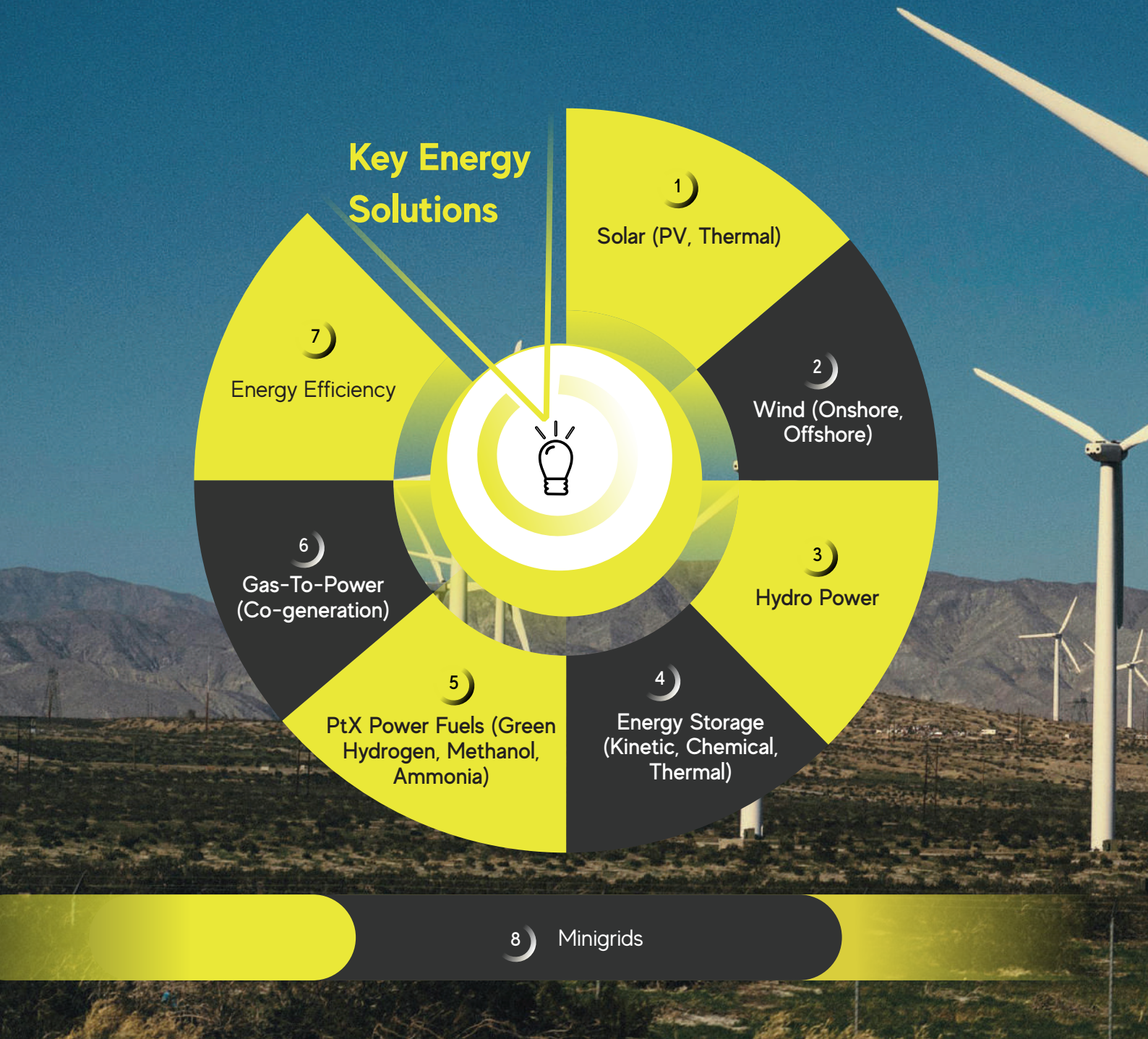
ENERGY

Creating a sustainable world for our future generations

Powering a Sustainable Future
At iX engineers, we are committed to a future where energy demand is met in real-time, and renewable sources like solar and wind are optimised for maximum efficiency.

Africa and the Middle East face growing climate challenges–droughts, floods, and energy shortages–demanding urgent action. With 60% of the world's unelectrified population in Africa alone, we have a responsibility to expand clean energy access. By harnessing solar, wind, and hydro resources, we can power remote communities and combat climate change.

Achieving a renewable future requires grid innovation and advanced energy storage. iX engineers is dedicated to driving these solutions across Africa and the Middle East, making sustainable energy a reality.



iX engineers Installed Energy Experience Completed Projects.

Jeffreys Bay Wind
138 MW

All Wind projects:
1,25 GW

Jasper PV
96 MW

All Solar projects:
861 MW

Lake Kivu Gas
76 MW

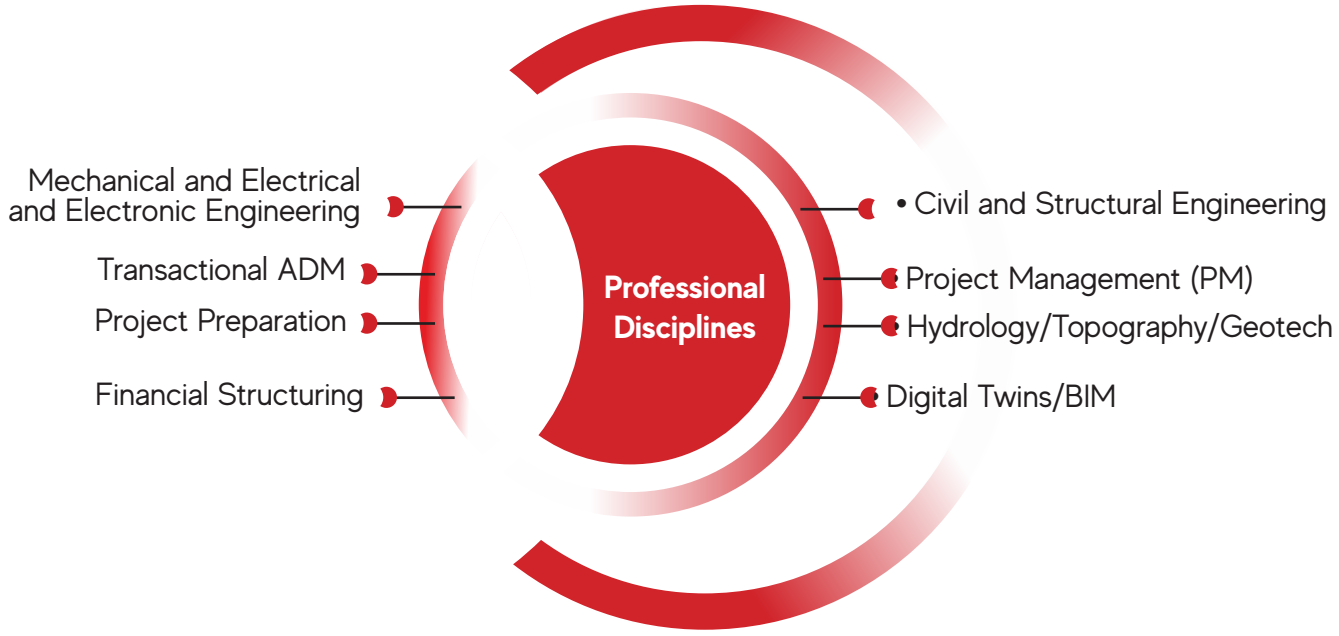
All Gas-to-Energy projects:
796 MW

Kaxu CSP
100 MW

All CSP projects:
150MW

Key Roles:

1. Co-Development
2. Lender's Technical Advisor (LTA)
3. Owner's Engineer (OE)
4. Managing Turnkey and Construction Projects
5. Engineering Procurement & Construction Management (EPCM)
6. EPC Professional Services Provider (PSP)



1. Renewable Energy Value Chain

iX engineers brings a wealth of experience to support Renewable Energy projects throughout the value chain:

Feasibility Studies & Master Planning

A well-structured business case is essential for making informed investment decisions. Our team is skilled in developing Pre-Feasibility and Feasibility Studies, incorporating the latest technological advancements to support your investment strategy. Placing investment decisions in the broader strategic framework is critical for long-term success. At iX engineers we are dedicated to helping you integrate cutting-edge technologies and develop a comprehensive master plan tailored to your needs.

#HowToMoveToCarbonNeutrality

Grid Access

Grid Code Analysis, Grid Code Compliance Studies, DIgSILENT PowerFactory Modelling, Substation & Collector Station Design, Overhead Line (OHL) Design, PLS-CADD Modelling.

Engineering Services – Wind Generated

Electrical: Layout Reticulation, Voltage Selection, Conductor and Cable Sizing, Single Line Diagrams, Lightning Protection, Utility Connection, Wheeling Calculations.
Foundation Design: Model ground and soil interaction with mass concrete pad foundations with advanced Finite Element software, Optimise the use of reinforcement by utilising advanced reinforcement CAD-based detailing software, Geotech coordination.

Engineering Services – Solar Energy

Electrical: Modelling (PVSyst, Homer, Helioscope), Layout Design and Optimisation, Modules, Inverter and Transformer sizing, Voltage Selection, Conductor and Cable Sizing, Single Line Diagrams, Lightning Protection, Utility Connection, Wheeling Calculations
Foundation Design: Load Calculations, Geotech coordination.

General Infrastructure Engineering

Full bulk and internal infrastructure engineering services including buildings, civil, roads, electrical, mechanical, water, stormwater, ICT, environmental & other services coordination.

Health & Safety

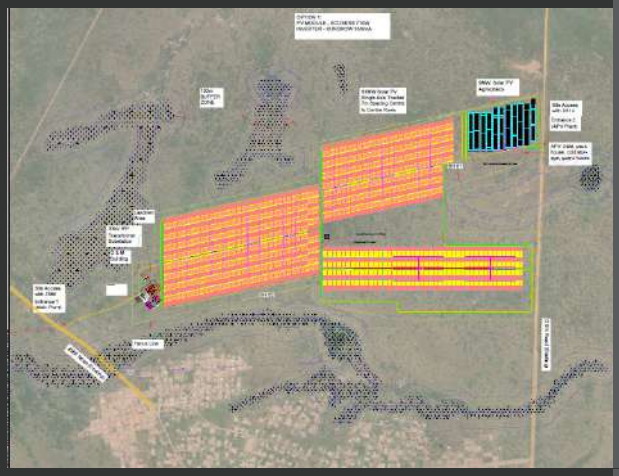
Our SHERQ department is ready to provide support services for the safe implementation of your projects.

Project Management & Document Control

As an EPCM iX engineers offers extensive Project Management and Project Supervision services including Eskom-approved Clerk of Works, Resident Engineers as well as on-site and off-site document control.

Project Reference

Baphalane Solar Farm 100MW Solar PV



Customer	Location
Baphalane Traditional Council	Elandsfontein 69JQ farm Moses Kotane Local Municipality North West, South Africa

Baphalane Traditional Council together with Fairmont Capital have identified Renewable Energy projects as a stable asset class for potential investment. To combine the investment with the creation of further local employment and business opportunities the team decided to develop a 100MW Solar PV project on their land. An element of Agrivoltaics or APV (farming + solar PV) was included in the project to further increase the macroeconomic impact and socio-economic stimulus for the local community.

Lake Kivu Bulk Earthworks 76 MW Gas-to-power

Customer	Location
Symbion Power	Rwanda

The project developed Gas Extraction facilities to extract methane gas from Lake Kivu and deliver it to on-shore facilities for processing and subsequent use in gas engines for power generation. The project comprised of:

1. Civil Works Contract for Bulk Earthworks with option for concrete foundation works.
2. Gas Extraction and Processing Design and Construction including associated civil works.
3. Power Generation Design and Construction Contractor including associated civil works.

Jefferys Bay Wind Farm 138 MW

Customer	Location
Murray & Roberts	Jeffreys Bay, Eastern Cape South Africa

The 3700 hectares Jeffreys Bay wind farm is located between Jeffreys Bay and Humansdorp in the Eastern Cape. The site's optimal wind conditions, relatively flat topography, minimal environmental constraints and its close proximity to the 132 kV Eskom grid line, make it an ideal wind energy resource. Arising from the South African Government's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), Jeffreys Bay Wind Farm signed a 20-year Power Purchase Agreement with Eskom as well as an Implementation Agreement with the Department of Energy.

The project reached Commercial Operations in mid-2014, having started construction in December 2012. The wind farm supplies 460,000 MWh per year, enough clean, renewable electrical energy to meet the needs of 100,000 average South African households. The project effectively reduces annual carbon emissions by 420,000 tonnes and lifetime carbon emissions by 8,400,000.

Project Reference

Loeriesfontein/Khobab 2(off) 140 MW Wind Farms

Customer	Location
Murray & Roberts (Mainstream)	Hantam Municipality area 60km north of Loeriesfontein, Northern Cape. South Africa

The project entailed the construction of two 140 MW Wind Farms, consisting of 61 wind turbines each and generating a combined 1 127 000 MWh/year of clean renewable energy per year. Each turbine has a height of 100 m above the ground (excluding the blades). Every component had to be delivered and assembled on site. This meant that a route analysis had to be done to determine the optimal route by which the turbine components could be delivered. The bases of the turbines had to be founded on suitable foundation material with the required strength and durability in order to counteract all static and dynamic loads applied to the turbine.

KAXU Solar One 100 MW Solar Thermal Plate

Customer	Location
Abengoa Solar	Pofadder, Northern Cape South Africa

EPCM Contract for a 100 MW Concentrated Solar Power (CSP) plant, with parabolic trough collector (PTC) technology with molten salts thermal energy storage (TES) system. The plant is located approximately 50 km North East of Pofadder in the Northern Cape province of South Africa. The plant uses PTC technology and works by tracking the sun from east to west, concentrating the direct irradiance and converting it into thermal energy.

The thermal energy is transferred through a closed Heat Transfer Fluid (HTF) circuit to produce steam, which drives a 100 MW steam turbine. The electricity generated is transmitted through a high-voltage substation and exported to the grid. The plant includes a thermal energy storage system that allows extending the electricity generation after sunset, the equivalent of 2.5 hours at nominal capacity.

Jasper Solar 96 MW Solar PV Plant

Customer	Location
Murray & Roberts	Postmasburg, Northern Cape, RSA

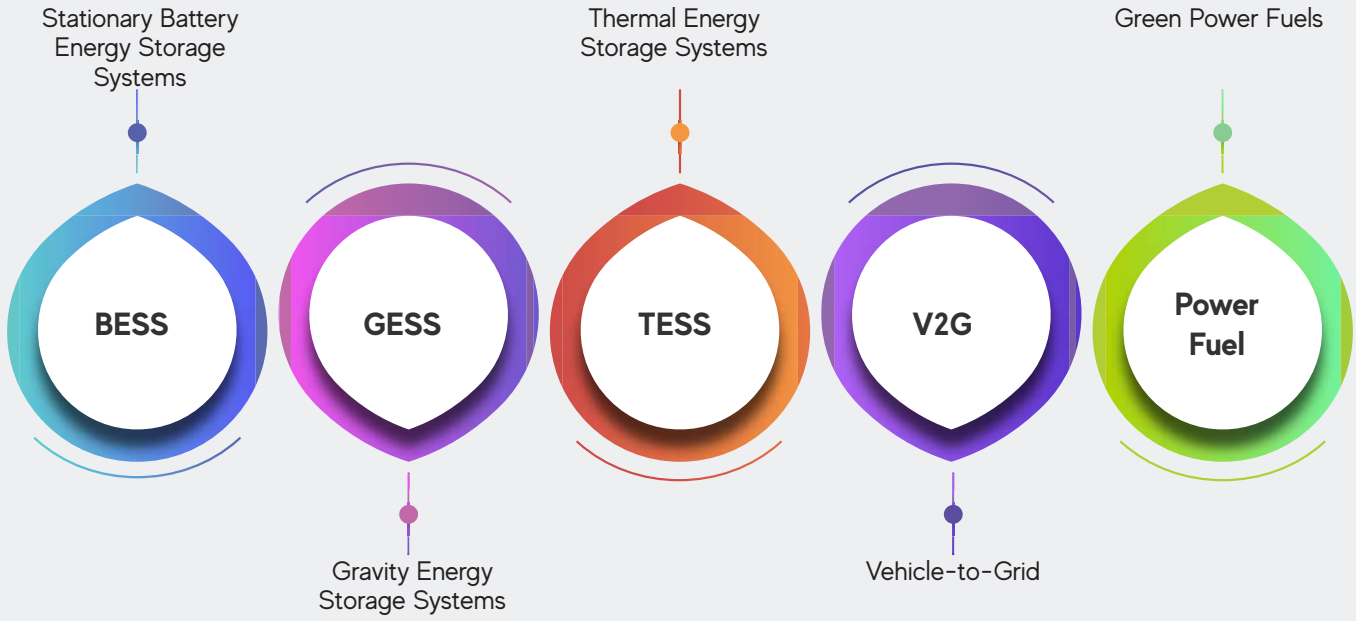
The Jasper PV Project is situated in the Northern Cape, east of Postmasburg in the Tsantsabane Local Municipal area. Blessed by an abundance of sunshine, resources and local and municipal stakeholder support, the site falls in the Northern Cape Solar Area and ideal to supply clean, renewable energy. The Jasper PV Plant comprises of 39 units of 2 MWac Ingeteam central inverter stations (each central inverter station consists of 2*1 019 kW inverters* .
WorleyParsons was appointed as Owner's Engineer by Solar Reserve for the 96 MWac PV project.

2. Innovative Energy Storage Solutions

Battery Energy Storage Systems (BESS) enhance grid stability and provide energy security while optimizing costs. **Gravity Energy Storage Systems (GESS)** convert waste into an energy asset, ideal for rehabilitating coal plants, water treatment facilities, and mines.

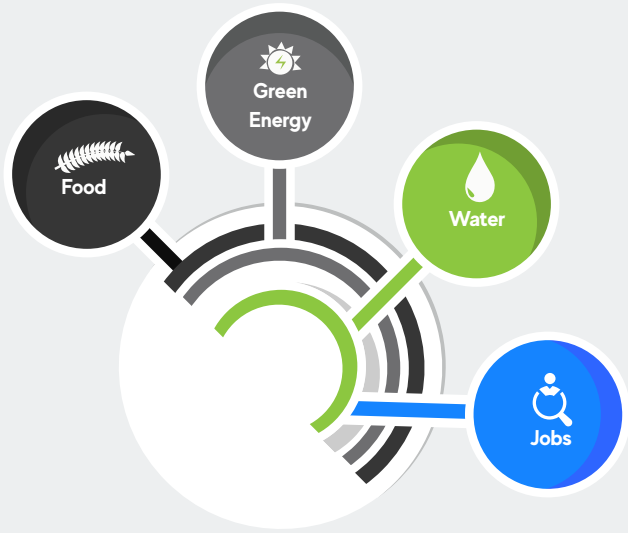
Thermal Energy Storage Systems (TESS) store solar energy using high-temperature materials, benefiting industries reliant on heat and cooling processes. **Vehicle-to-Grid (V2G)** technology leverages stationary electric vehicles as flexible energy storage for balancing the grid.

Green **Power Fuels**, such as hydrogen, methanol, and ammonia, will play a key role in decarbonizing heavy transport and industry, utilizing surplus renewable energy for production.



Innovative Solutions: Floating Solar PV

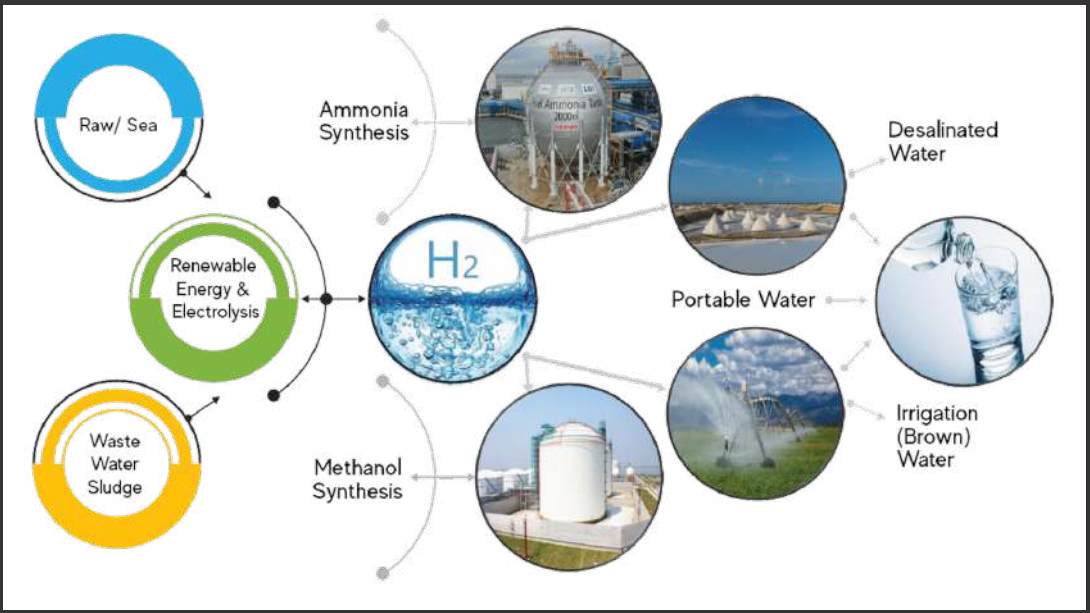
In our global quest for decarbonisation, building new renewable energy plants is crucial to meet rising electrical demand. To address the Food-Energy-Water (FEW) Nexus, we must use resources like land and water intelligently. Innovative technologies, such as Agrivoltaics and Floating Solar PV, are key to this solution.



Floating Solar PV utilises underused water bodies for electricity generation. This not only boosts energy yield but also reduces water evaporation from dams and lakes, preserving this vital resource in our water-scarce country. By improving land use efficiency and generating additional income, these technologies positively impact municipal revenues and uplift local communities

3. Green Hydrogen

iX engineers has the ability to conceptualise, develop a master plan, conduct pre-feasibility studies with high-level engineering designs and full feasibility studies with detailed engineering designs for the development of green hydrogen solutions.



Enabling Circular Economy

Sustainable resource efficiencies

Main benefits of decentralised rollout

- Modular/scalable investment steps
- Standardised project implementation per *site/"Line"
- Positive water & sanitation impact around each *site/"Line"
- Skills & Job creation in and around each *site/"Line"
- Main bankability via international Green Hydrogen Off-take
- Green hydrogen enabling green transportation for the logistics value chain

4. Gas-To-Power

At iX engineers, we provide comprehensive Gas-to-Power solutions, integrating civil, structural, and infrastructure expertise to support energy projects across Africa and the Middle East. Our services cover the full project lifecycle, from feasibility to execution, ensuring efficient and reliable power generation.

- **Lender's Technical Advisory**
  - Independent civil engineering support for EPC projects.
  - Feasibility assessments, compliance, and risk management.

- **Gas Power Plant Infrastructure**
  - Site selection, bulk earthworks, and foundation design.
  - Structural and civil works for gas extraction, processing, and storage.

- **Power Generation & Grid Integration**
  - Design of gas-fired power plants.

- **Supporting infrastructure, including substations and transmission connections.**

Gas-To-Power Projects: South African Experience

Project Reference

Development Corporation Coega LNG to Power

Customer	Location
Coega	South Africa

Duration: 2008 – 2009 (under KV3)
iX Responsibility: Feasibility Study
Project Scope: Technical assessment of proposed 3.2GWe CCGT Power Station at Coega (using LNG fuel).

Gas-To-Power Projects: Sub-Saharan Experience

Project Reference

Lake Kivu Bulk Earthworks

Customer	Location
Symbion Power	Rwanda

iX Responsibility: The project developed Gas Extraction facilities to extract methane gas from Lake Kivu and deliver it to on-shore facilities for processing and subsequent use in gas engines for power generation. The project comprised of:

1. Civil Works Contract for Bulk Earthworks with option for concrete foundation works.
2. Gas Extraction and Processing Design and Construction including associated civil works.
3. Power Generation Design and Construction Contractor including associated civil work.

Client: WorleyParsons Infrastructure Business

Project: 40MW Kuvaninga Gas Power Plant
Location: Mozambique
Duration: 2014 to 2019
Project Scope:

* Civil engineering support as the Lender's Technical Advisors for this EPC project.
* The project involved the design and construction of a gas power plant adjacent to the ROMPCO gas pipeline (Temane to Secunda) at Chokwe in Mozambique.

5. Electricity Infrastructure

HOW DOES iX engineers ASSIST?

Master Planning

- Revise electricity master plan in terms of RE opportunities
- Revise electricity master plan in terms of EV opportunities
- Develop map of Renewable Energy opportunities
- Grid assessment for ESS opportunities
- Develop a map of EV infrastructure (Vehicle-2-Grid)
- Develop wheeling and financial revenue model
- Water infrastructure assessment for power generation opportunities
- Assess opportunities for Floating Solar PV
- Assess opportunities for Agrivoltaics
- Develop integrated energy (electricity and thermal energy) master plan

Generation & Supply-side Management

- Develop renewable energy policies
- Co-Develop renewable energy and/or energy storage projects for municipalities (Owner's Engineer for the Municipalities, Source funding)
- Purchasing renewable energy from IPPs outside the Municipality
- Purchasing renewable energy from generators within the Municipal network
- Hybrid desalination and renewable energy plants

Load & Demand-side Management

- Demand shifting by thermal energy load control
- Tariffs, shift to time-of-use and introduce real-time pricing
- Power factor correction

Energy Efficiency

- Wastewater treatment (aeration), streetlights (high efficiency and correctly designed lenses LED)
- LED traffic lights
- Energy efficiency in buildings
- Reduced system technical losses
- Public awareness of energy

6. Transmission and Distribution

Our teams work with network service providers to support grid connections throughout Africa. Our highly experienced and qualified team of engineers are well-placed to negotiate and perform connection and GPS studies.

We deliver

- ◊ Connection studies – PSSE and PSCAD modelling
- ◊ Network Service Provider connection liaison and support. Delivery EHV, HV & MV infrastructure EHV – Extra High Voltage (275kV and above) HV – High Voltage (66kV, 110kV, 132kV) MV – Medium Voltage (11kV, 22kV, 33kV)

Our team provides turn-key solutions, comprehensive project and site management, and principal contractor agreements for installations.

We have extensive experience and expertise in design, manufacturing, installation testing and commissioning across a variety of operations, including primary plant, civil and structural, secondary systems, protection and control, as well as communications and metering. We offer state of the art in house testing and commissioning capability

Overhead powerlines:

1. Dedicated project and construction management

Feasibility Studies

Network planning and studies

Engineering Investigations

Certified design and engineering

Foundation and earthing installation design

2.

3.

Procurement and logistics

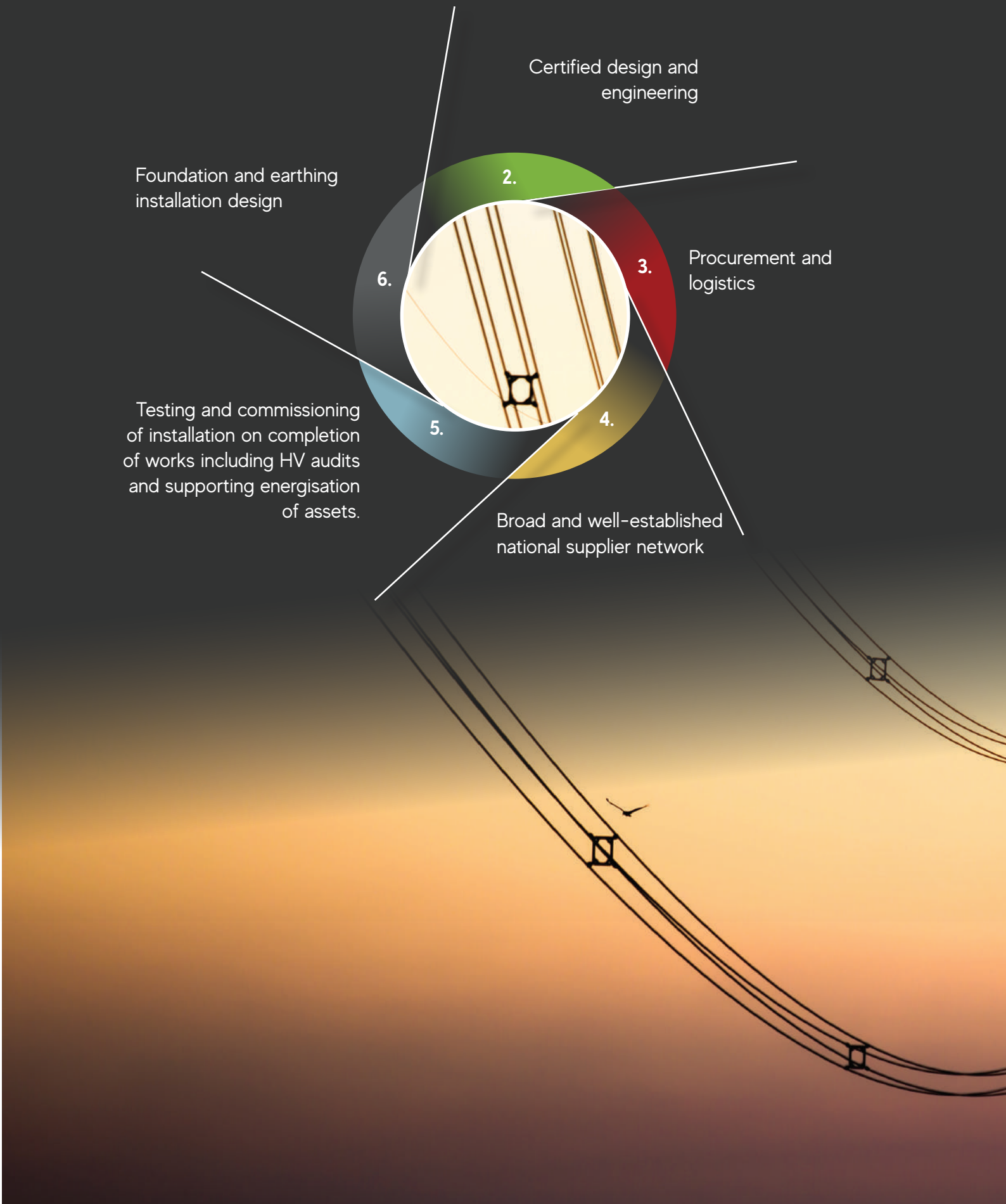
6.

5.

4.

Testing and commissioning of installation on completion of works including HV audits and supporting energisation of assets.

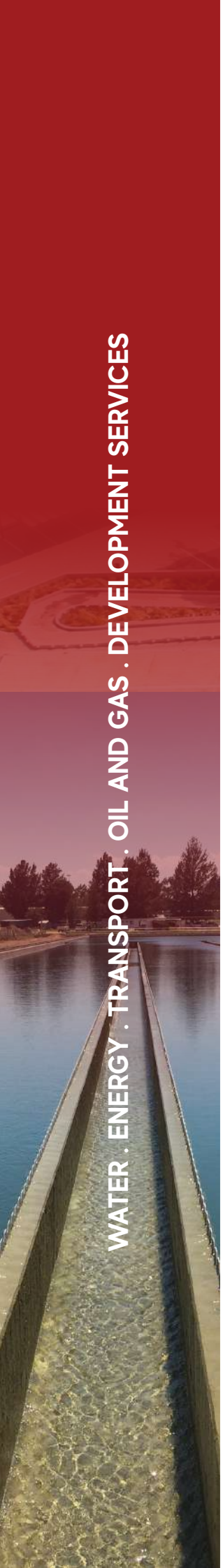
Broad and well-established national supplier network



Our presence

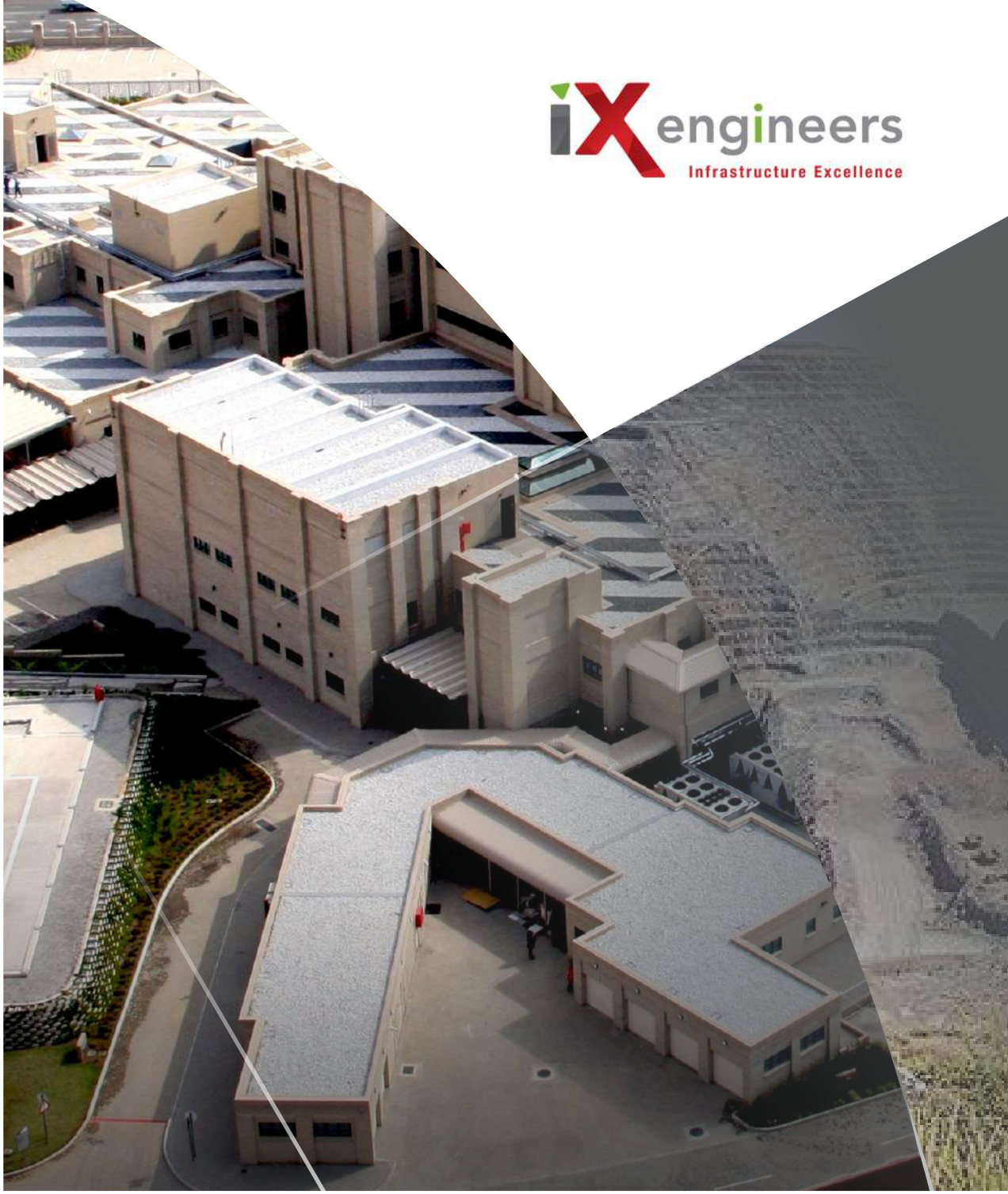
in Africa and Middle East


engineers
Infrastructure Excellence
012 745 2000 | info@ixengineers.co.za | www.ixengineers.co.za



WATER . ENERGY . TRANSPORT . OIL AND GAS . DEVELOPMENT SERVICES

iX engineers
Infrastructure Excellence



CREATING THE
FUTURE OF LIFE
TODAY