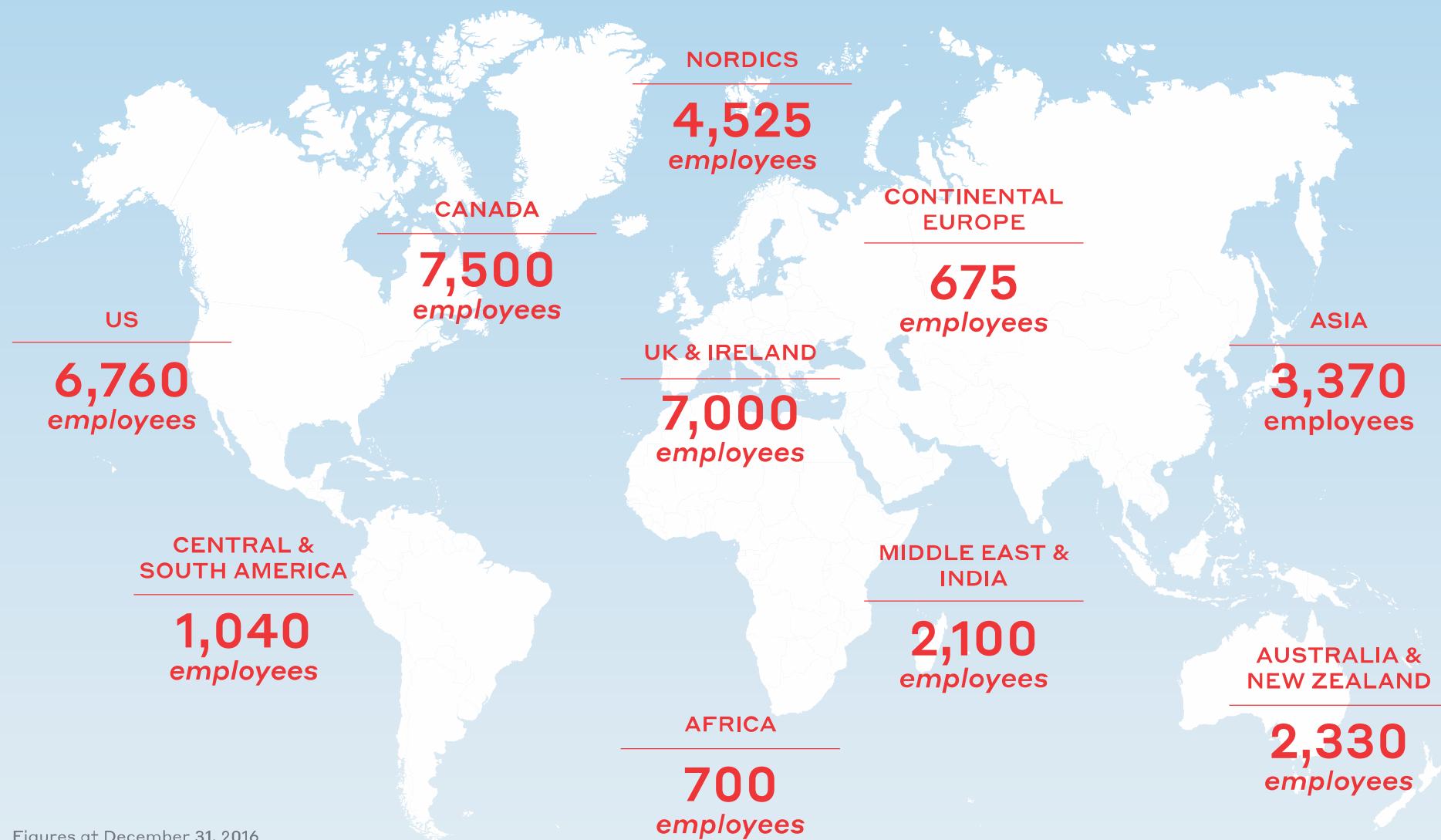




WSP Africa, Transmission
& Distribution
Capability Statement

people



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"As a global leader in the design and delivery of infrastructure for over 20 years, we have an unrivalled track record in delivering services to our clients' satisfaction."

Andrew Galbraith, WSP, Africa,
Technical Director (Transmission & Distribution)

WSP is one of the world's leading engineering professional services consulting firms.

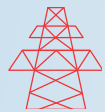
We bring together our 36 000 staff, based in more than 500 offices, across 40 countries to provide engineering and multidisciplinary services in a vast array of industry sectors, with a focus on technical excellence and client service.

Our expertise spans five divisions - Environment & Energy, Industrial, Property, Power and Transport & Infrastructure. Under Power, Transmission & Distribution encompasses planning, designing and engineering major transmission, distribution and renewable energy infrastructure projects throughout Africa for over twenty years.

We have assisted major power utilities across the African continent with significant transmission and distribution development projects. In addition, we have worked with many international and regional conventional and renewable power developers with power plant and grid integration feasibility studies.

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Power

Power System Studies / Power Economics & Generation Planning / Project Management / Power Line Design / Substation Design / HVDC & FACTS Studies & Design / Renewable Energy Studies & Design / Owners Engineer Services / Due Diligence Services / Lender's Engineer Services



Transport
& Infrastructure

Rail / Traffic / Roads / Water / Ports & Marine / Telecommunications



Environment
& energy

Acoustics / Air Quality / Applied Sustainability / Contaminated Land / Environmental & Social Impact Assessments / Environmental Health & Safety Systems & Compliance / Hydrogeology / Hydrology / Waste



Major Project
Management

FIDIC Engineer Capability / Construction Management / Project Management / Programme Management / Lean Planning Techniques / Commercial Management / BIM / Computerised Analysis & Visualisation Environment (CAVE) / Design Development & Implementation / Engineering Support / QA/QC Management & Implementation / Risk Management



Property

Electrical / Fire / Heating & Ventilation & Air Conditioning (HVAC) / Structures / Façade Engineering / IT & Electronic / Wet Services / Sustainability & Green Buildings / Vertical Transportation / Bulk Earthwork / Development Infrastructure / Traffic Engineering & Transportation Planning / Infrastructure Financing / Contract Management & Project Facilitation



Industrial

Electrical / Utilities / Industrial & Commercial Refrigeration / Control & Instrumentation

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Our engineers have extensive specialist experience in transmission and substations, including using the latest technological software to design and administer projects from inception through to completion.

Power Line Design

- Route selection
- Functional, technical and performance design and specifications
- Tender documents
- Tower spotting
- Line templating design
- CADD and PLSCAD design
- Foundation and structural design reviews
- Conductor optimisation
- Insulator detection selection
- Corona performance
- Lightning performance

Substation Design

- Outdoor insulated and hybrid substations
- Indoor gas insulated substations
- Metal clad medium-voltage switchgear and substations
- High voltage DC substations
- Specialised substations for reactive power compensation applications
- Layout design
- Electrical design
- Control and protection design
- Auxiliary power supply design
- Civil and structural design reviews
- Earth electrode and outdoor air termination designs
- Inspection and testing services

Renewable Energy Studies and Design

- Project identification
- Feasibility studies
- Fatal flaw analysis
- Wind and ocean resources assessments
- Financial viability assessments
- Risk and sensitivity assessments
- Environmental and planning studies
- Project layout and micrositeing
- Grid interconnection studies
- Off-grid and grid connected system integration
- Electrical design and electrical integration
- Sub-sea cabling design
- Civil design (roads, foundations, offshore facilities)
- Geotech and seabed investigation
- Dynamic modelling of onshore/offshore turbines
- Mechanical design
- Due diligence and asset valuation
- Project implementation
- Performance and acoustic tests
- Owner's engineering
- Independent engineering
- Lenders' engineering
- Construction and management services
- Inspection services
- Project cost estimating
- Tender preparation and evaluation
- CADD, 3-D modelling and visualisation
- Integration of wind/solar/diesel hybrid systems

HVDC & FACTS Studies and Design

- Feasibility studies
- Preliminary design
- System studies
- Cost estimating
- Technology review
- Technical specification development
- Bid evaluation
- Factory quality inspection and witnessing services
- Owner's engineer
- Lender's engineer
- Independent engineer
- Construction and commissioning support
- Technical due diligence
- Project management
- Safety, Health, Environmental and Quality Management (SHEQ)
- Design conformance auditing
- Document control
- Risk management
- Commissioning management

We've engineered construction of the first
**480kV power transmission
 line in Kenya**



Power infrastructure rehabilitation - *Hwange, Zimbabwe*

We are Owner's Engineer for phase one and two of the rehabilitation of the Zimbabwe power network.

Our client's objective is to improve the availability and reliability of electricity supply through the rehabilitation of electricity generation, transmission and distribution facilities. The critical infrastructure facilities supply electricity to roughly 40% of Zimbabwe's population.

Our scope of services includes Project Management of individual component contracts. Other responsibilities on the project are rehabilitation of the Hwange Power Station ash plant, installation of transformers and circuit breakers at various sub-transmission substations, installation of PMTs, GMTs, underground cable and overhead lines, rehabilitation of transmission substations including new primary and secondary equipment and 175MVA, 330/132kV transformers.



Power network rehabilitation projects - *Cabo Delgado and Beira, Mozambique*

We are the Owner's Engineer for the EDM Rural Electrification Projects, which aim to support the growth of local industries, promote employment and improve the social welfare of local communities. The rehabilitation project caters for 110kV transmission lines, 33kV line and 110/33kV substations.

The Rural Electrification Project aims to distribute electricity to approximately 80 000 new customers per year. Over five years, our client will proceed with the process of rehabilitation and reinforcement of distribution network and household connections. This will in turn increase the reliability of the electricity supply with priority over urban and peri-urban areas.

Services provided include transmission and distribution studies, insulation co-ordination, transmission and substation line design, specifications and tender documents, completion of outstanding EIA activities, construction management and supervision, and full project management.



Transmission and distribution projects - Botswana

We are Owner's Engineer for the Botswana Transmission and Distribution Network expansion drive. We provided our services on several projects under this exercise, including Morupule 66kV distribution line and substation upgrades, Airport Road, Kgale View, Molepolole, Woodhall and Jwaneng 132 kV substations, and the Gaborone South 11kV switchgear and current limiting reactors.

Our services for these projects included project management, functional designs for the full scope of the project including the associated civil works, preparation of tender documents for construction works, procurement support for the construction works, construction management and supervision, design of the substations, supervision of commissioning, project management of the full scope of the project (civil, electrical and commercial management), quality assurance of the work provided by the contractor, as well as recommending and supervising appropriate design changes.



Transmission and distribution projects - Johannesburg, South Africa

We were Owner's Engineer for the expansion of the Johannesburg City Power 88kV substations. This included the Cydna Substation and Line and Tower Deviations, Mulbarton and Alexandra 88kV substations.

Our services included design basis document of the project upgrade, tender specifications and design documentation including design drawings, project management of the full scope of the design of the project (civil, electrical and commercial management), arranging and monitoring of the scanning, geotech and surveying services on site as well as quality assurance of the work provided by the contractors.

City Power's customer base is segmented into key customers, large power users, and prepaid, domestic, agricultural and commercial customers. The domestic segment forms the majority of the customer base. To meet the needs of corporate customers, City Power has concentrated on improving the wire network to reduce outages and power surges.

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