

**POWER SYSTEMS**

**RENEWABLE ENERGY**

**SUSTAINABLE ENERGY**

**Engineering & Consulting**

## **The company**

intec in the world

## **Power systems**

Power transmission & distribution  
Power network key competencies  
Thermal power plants

## **Renewable energy**

RE resources and technologies

## **Sustainable energy**

Focal points of expertise in sustainable energy

# The company

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## A team with innovative power

Thanks to the vast know-how and advanced technological capability, and a highly qualified, multi-disciplinary team of experts, **intec** has a proven track record of more than 200 large scale projects, successfully carried out during the last years on five continents.

In order to meet the challenges and requirements of national, regional or interregional energy projects, **intec** combines the professional competence of its experts and their extensive international experience into a proven and reliable project management system.

**intec's** engineering competence covers electrical, mechanical and hydro-mechanical engineering, civil works, control, protection and telecommunications. Services include technical

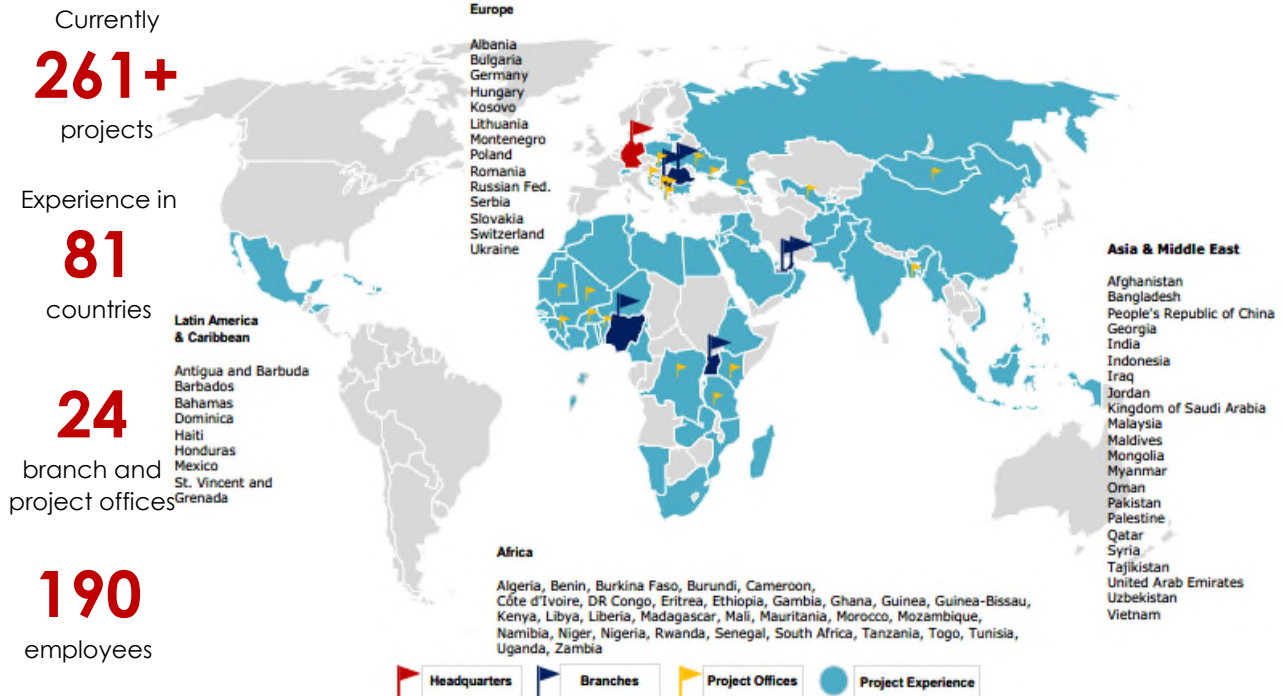
aspects, but encompass i.a. also economic and financial studies, social and environmental impact analyses, energy sector studies and capacity building.

Our extensive international experience makes us a competent and reliable partner in delivering management, engineering and development solutions for public and private customers in the energy sector.

**intec** is present in selected regions – Abu Dhabi, Dubai, Romania, Nigeria, Uganda and Serbia – and is in the position to provide its customers with the best services in accordance with their needs and the particularities of the local power supply systems.

**intec**, GOPA-International Energy Consultants GmbH, is an independent German consulting engineers company focused on developing practical, innovative and cost-effective solutions for the design and improvement of **power systems** and the application of **renewable and sustainable energy** technologies.

# intec in the world



## A partner with global capabilities

intec's clients are manifold: **ministries and governments, national and international energy utilities, industrial corporations and private enterprises, project developers and investors.**

**Lending Institutions** include **multilateral development organisations** such as:

- African Development Bank (AFDB)
- Agence Française de Développement (AFD)
- Arab Fund for Economic and Social Development
- Asian Development Bank (ADB)
- Danish International Development Agency (DANIDA)
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
- European Bank for Reconstruction and Development (EBRD)
- European Commission (EC)
- European Investment Bank (EIB)
- FMO Entrepreneurial Development Bank - Netherlands
- Inter-American Development Bank (IDB)
- International Bank for Reconstruction and Development (IBRD)
- International Development Association (IDA)
- Islamic Development Bank (IDB)
- Kreditanstalt für Wiederaufbau / KfW Entwicklungsbank (KfW)
- Kuwait Fund for Arab Economic Development
- Ministry for Foreign Affairs, Finland
- National Bank of Kuwait
- OPEC Fund for International Development (OFID)
- United Nations Development Programme (UNDP)
- West-African Development Bank
- World Bank

# Power systems

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Source: intec

## A specialist with the depth of technical engineering

From conceptual & pre-feasibility studies to fully implementing projects, **intec** is your reliable partner

The planning, rehabilitation, extension, operation and control of power systems constitute one of **intec's** key activities. Our experts possess all the professional expertise and appropriate knowledge in the field of

electrical systems: **from governance, due diligence, strategy, system design, planning, construction to operating and maintaining electrical assets.**



# Power transmission & distribution

**7,000 +**

km HV  
transmission lines

**500 +**

substations



Source: intec

Using high-performance tools, **intec** offers its clients high quality consulting and engineering services in the field of ultra-high-voltage, high voltage transmission systems, medium and low-voltage distribution grids. This includes overhead lines, cables, substations, transformers, switchgear,

protection systems and electrical energy storage. Together with our clients, we define the tools to increase the availability of the network, to respond faster and more effectively to malfunctions, and to reduce the risk of system disturbances and outages

Over the **last 5 years** we have worked on more than **100 power network projects** such as electrical transmission and distribution lines and substations for utilities and industrial clients.

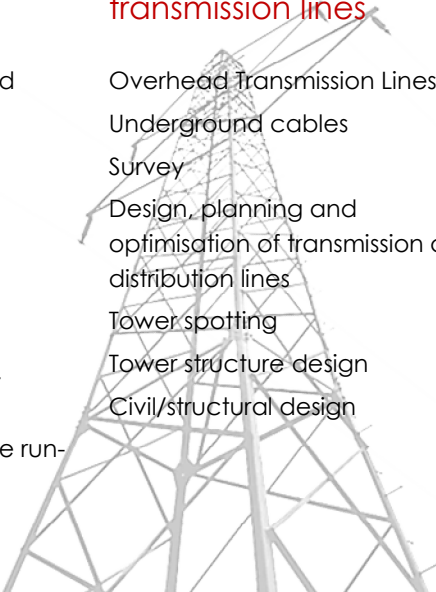
# Power network key competencies

## Network design

- Consumption and demand analyses and forecast
- Load flow studies
- Contingencies
- Load flow optimisation
- Short circuit calculations
- Stability studies
- Power quality - harmonics, flickers, etc.
- Analysis of dynamic engine run-up behaviour
- Reliability analyses
- Protection coordination

## HV/EHV Power transmission lines

- Overhead Transmission Lines
- Underground cables
- Survey
- Design, planning and optimisation of transmission and distribution lines
- Tower spotting
- Tower structure design
- Civil/structural design



## HV/EHV Substations

- Survey
- Substation siting
- Civil/structural
- Gas insulated substations
- Terminal design for HVDC
- System protection and control
- Protective relaying
- SCADA, RTU, EMS design
- Automation and communication
- Field support services
- Commissioning services

We assure quality, safety and compliance to all (inter)national standards that are relevant for your business. Being a recognized specialist in **Smart grids** we enable you to incorporate optimum design to be prepared for the electricity grid of the future.

## Thermal power plants



Source: intec

Diesel power plants – hybrid and non-hybrid

Rehabilitation of power plants

# Renewable energy

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## An enabler of the renewable based energy future

**intec** offers high-quality services in the design, planning and implementation of RE solutions of all major technology types, with a particular focus on **solar, wind, small hydro** and **biomass / biogas / waste-to-energy**.

Integration of renewable energies into traditional power systems, and hybridisation using different RE technologies belong to our core activities, not least thanks to our comprehensive competence in grid integration, T&D and power generation.



# RE resources and technologies

**intec** has extensive knowledge and experience with all renewable energy resources - solar, wind, hydro, biomass / waste and geothermal - and all relevant energy conversion technologies: photovoltaic, concentrated solar power (CSP), wind turbines and wind parks, hydropower plants, biomass and waste combustion plants, biogas generation, geothermal. Combinations of different technologies in a hybrid system like PV diesel, PV battery or wind-diesel, CSP + storage and mini grids belong thereto.

**6,000 +**  
MW in renewable  
energy projects

Analysing grid integration of renewable energies with state of the art software tools is one of our particular areas of competences – same as rural electrification with on- or off-grid renewable energy driven power supply schemes

## Our services

Based on our integrated solution approach, we are in position to cover all technical, commercial, regulatory and environmental aspects of renewable projects. Multidisciplinary engineering teams provides dedicated services for all RE technologies, from resource assessments, measurements and renewable resource mapping through designing, planning, and tendering to implementation supervision, technical assistance, O&M and operation optimisation.

## Energy storage systems

- Batteries
- Thermal storage (with CSP)
- Pump storage power plants
- Other storage types



# Sustainable energy

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## A think-tank and planner for energy policies and markets

Within sustainable energy, **intec's** key expertise lies within the economic and financial valuation of energy investment opportunities and the development of sustainable and strategic options at national and regional

levels. **intec's** sustainability assurance combines **technical, economic, environmental, and strategic expertise.**

# Focal points of expertise in sustainable energy

## Energy sector advisory

We provide expertise in economic and financial analysis for energy projects and programs aiming at providing decision makers with focused analytics and information. Our tools include Economic Analysis, Finance and Asset Management, Energy and Environmental Auditing as well as Energy Planning and Development.

## Energy efficiency

We understand Energy Efficiency to be more than single technical improvements, thus this subject is an integral part of our sustainable energy division. We therefore provide the technical, environmental, economic, social and policy understanding required to promote these activities.



## Energy strategies

Energy strategies and policies on a national and regional level are part of **intec**'s portfolio. In developing strategies, we provide expertise on policy, environmental, social and economic aspects. Our tools include project identification, portfolio optimisation, adaptation and mitigation potential analysis, development of banking criteria and optimized processes.

Economic & financial analysis incl. climate Finance advisory services  
Power system & renewable energy Integration:

- demand assessment
- power system expansion planning
- energy master planning
- power market studies
- regulatory and institutional advisory services
- tariff studies

Environmental and social impact assessments and monitoring in power projects  
Health & safety in power projects  
Energy efficiency  
Training and capacity building programs in the energy sector

# The Energy Professionals



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