

POWER SYSTEMS

RENEWABLE ENERGY

SUSTAINABLE ENERGY

ESHS

Engineering & Consulting

The company

intec in the world

Power Systems

Power transmission & distribution

Power network design

HV/EHV Power Transmission lines and Substations

Renewable Energy

RE resources and technologies

Sustainable Energy

Focal points of expertise in sustainable energy

Environment, Social, Health & Safety (ESHS)

Impact Assessment and Planning

Implementation Supervision

Performance, Assurance and Risk Management

Sustainability Support

The company



Germany Abu Dhabi Dubai Romania Nigeria Uganda Serbia



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 300 large scale projects, successfully carried out during the last years on four 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

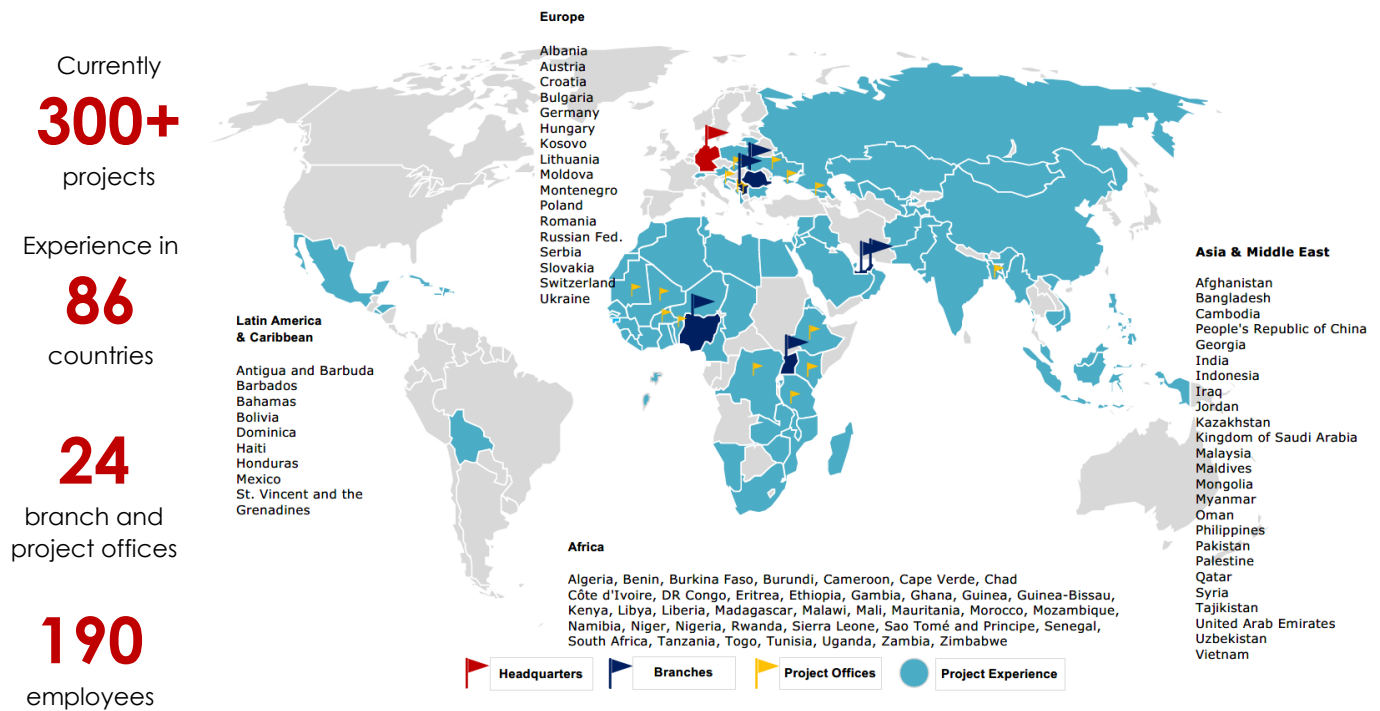
aspects, but encompass i.a. also economic and financial studies, social and environmental impact analyses, energy sector studies and capacity building.

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, Nigeria, Romania, Serbia and Uganda – 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**, the application of **sustainable energy** technologies and the integration of **renewable energy** resources with emphasis on **environmental and social** needs and expectations..

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 (AFESD)
- 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)

- International Bank for Reconstruction and Development (IBRD)
- Inter-American Development Bank (IDB)
- International Development Association (IDA)
- Kreditanstalt für Wiederaufbau / KfW Entwicklungsbank (KfW)
- United Nations Development Programme (UNDP)
- West-African Development Bank
- World Bank

Power systems



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

7,500 +

km HV
transmission lines

520 +

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.

Renewable energy



Mauritania - 120 (180) MW dual-fuel power plant in Nouakchott

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



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

Environmental and Social Services



Source: intec

A specialist

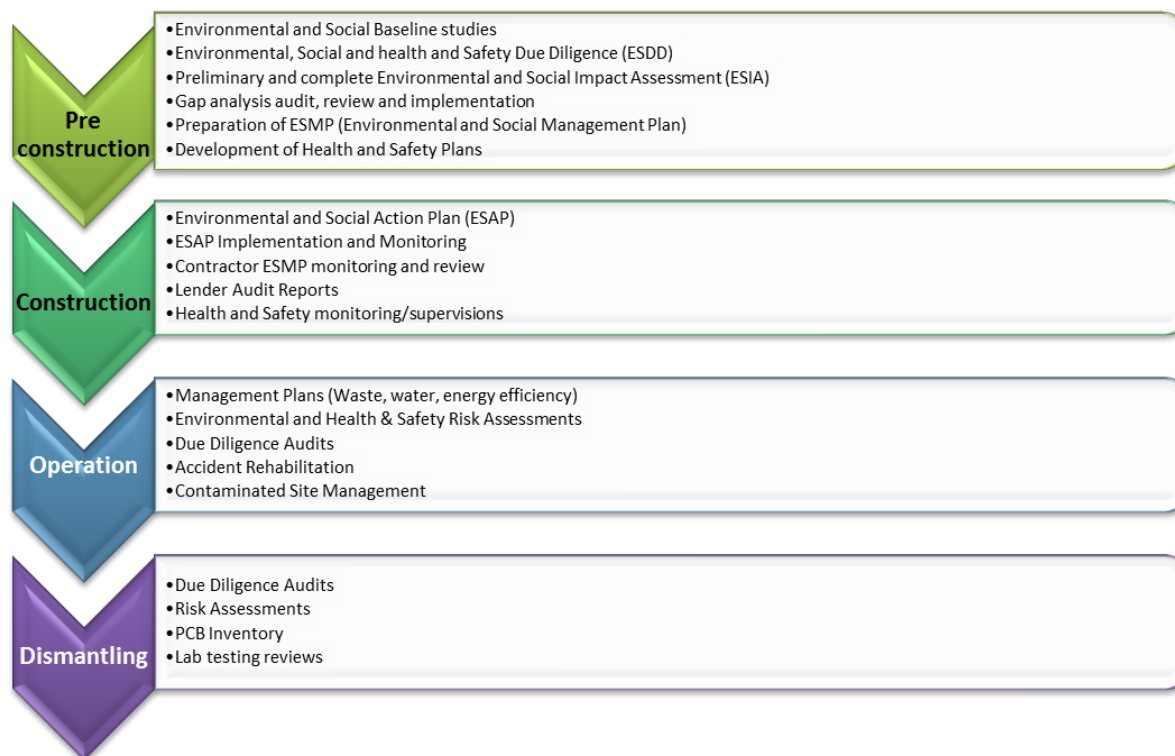
with depth of technical engineering & consultancy skills

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

Provision of competent technical advisory services for planning, rehabilitation, extension, operation and control of complete **power systems, including renewable power plants and other sustainable energy related projects** constitute **intec's** key activities. For all such kind of projects in the power sector, our experts possess the professional expertise and appropriate knowledge to deal with the related environmental, health & safety and social aspects: from governance, environmental and social due diligence studies,

environmental and social impact assessments (including stakeholder identification and engagement), health and safety plans to the supervision or monitoring or the implementation of environmental and social management plans. Our environmental, safety and social team is always supported by our technical engineers specialised in system design, planning, construction to operating and maintaining any assets in the power sector.

Environmental and Social Services provided by intec:



Intec services can be considered in the following broad practice areas related to environmental, health, safety, risk, and social concerns.

- Impact assessment and planning
- Implementation supervision
- Performance, assurance and risk management
- Sustainability services

Impact Assessment and Planning: *achieving project approvals by managing environmental, social and health & safety impacts*

intec has almost 10 years' experience of providing environmental and social impact assessment and planning for projects in the power sector, including renewable and sustainable energy projects. Our goal is to assist our clients to get their projects planned, built, and operating on schedule, while meeting their own expectations for the management of impacts on the local population and environmental, social, and cultural resources. By helping clients bring these issues into the project planning process early, we achieve environmental, health and social

objectives; enable savings in capital and operating costs; and avoid significant approval and other delays.

intec combines experience with global standards, such as the Equator Principles and International Finance Corporation's Performance Standards, with a thorough understanding of local regulatory systems and cultural sensitivities. We apply state of the art assessment tools, from GIS to noise and air dispersion modelling and visualisation techniques. Where appropriate, we can also integrate social and health & safety impact assessments into the process.

Performance, Assurance and Risk Management, ESMP implementation supervision/monitoring: *helping corporations reach their EHS performance potential and manage EHS risks*

intec helps its clients achieve their environmental, health and safety compliance obligations, reduce accident and injury rates, and minimise impacts on the environment. During the initial phases of projects we develop ESMPs and during

implementation we supervise, monitor or verify that ESMP are adhered to – by this means we help companies to design and implement processes and manage change to achieve this desired performance and reduce costs through the use of IT as well as operational and resource efficiency programmes. Independent assurance of EHS performance can also be provided for our clients' stakeholders

Sustainability: *supporting the development and implementation of sustainability strategies, programmes and tools*

Technology, management insight, and behaviour all need to be simultaneously in play to unlock the full business value of sustainability. Our services are focused on helping clients to integrate sustainability into their core business decision-making processes and culture. By doing this, clients can then identify and prioritize specific sustainability opportunities across the value-chain. **intec** offers advice in areas such as Waste Management, Water Management, Energy Efficiency Management

Over the **last 5 years** we have worked or been involved in more than **50** environmental and social **projects** such as renewable and conventional power plants, electrical transmission and distribution lines, substations for utilities and industrial clients.

The Energy Professionals



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intec is owned by GOPA Consultants and is part of GOPA Consulting Group, one of the strongest consulting groups in Europe, which can draw on some 50 years of experience in the development field



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