PROJECT EXPERIENCE IN POWER SYSTEMS

- SELECTED PROJECTS -

Ukraine

Master Plan for the South Ukraine Regional Transmission Network Development including Solar and Wind Power Integration

2012 - 2014

Activities:

- Demand forecast and generation expansion plan
- Review and assessment of existing network planning and operation in view of solar and wind power integration (grid code, operation, load dispatch & wind forecast, control & metering systems)
- Network planning (110 kV and above) of South Ukrainian grid for solar and wind power integration (load flow, N-1, stability analysis, mitigation measures) and related training
- Geographical Information System (GIS)
- Master Plan preparation with selection and definition of two priority investment packages
- Project preparation of the two packages (grid stability analysis, technical specifications, BoQ, line route review, technical, economic and financial analyses, ESIA, project feasibility, project tender documentation)

Client: NPC Ukrenergo

Financing: European Bank for Reconstruction and Development (EBRD)

Democratic Republic of the Congo

Feasibility Study, Detailed Design and Works Supervision for the 220 kV Line Ruzizi - Goma (DR Congo Part)

2012 - 2016

Activities:

- Feasibility studies
- Detailed design
- Environmental and social impact assessment (ESIA)
- Environmental and social management plan (ESMP)
- Resettlement action plan (RAP)
- Elaboration of tender documents
- Support to the client during tender procedure and contract award
- Follow-up of equipment manufacturing
- Participation in factory acceptance tests
- Monitoring and supervision of works

Client: Société Nationale d'Electricité (SNEL SARL)

Financing: African Development Bank (AFDB)

Mongolia

Consulting Services for Modernization and Rehabilitation of Thermal Power Plant #4, Ulaanbaatar (680 MW, coal-fired)

2012 - 2014

Activities:

- Finalization of scope and basic design of measures
- Tender documents, bid evaluation and contract negotiations for 3 lots
- Coordination of works execution

Client: Thermal Power Plant #4 Co.

Financing: Kreditanstalt für Wiederaufbau (KfW)
<table>
<thead>
<tr>
<th>Country</th>
<th>Location</th>
<th>Project Description</th>
<th>Start - End</th>
<th>Activities</th>
<th>Client</th>
<th>Financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mali</td>
<td>Monitoring and Works Supervision for the Implementation of the National Dispatching Center</td>
<td>2012 - 2014</td>
<td>Assistance to EDM during the award of contract, Review and approval of Contractor's documents during the execution of works, Factory acceptance tests for major equipment, Coordination and validation of testing and commissioning procedures, Budget control and final invoicing, Reporting</td>
<td>Energie du Mali - EDM (Mali Electricity Company)</td>
<td>West-African Development Bank</td>
<td></td>
</tr>
<tr>
<td>Mauritania</td>
<td>Feasibility Study for the Production and Transport of Electricity based on Gas</td>
<td>2012</td>
<td>Demand study identifying the future demand and its localisation, Financial analysis of three different variants, Detailed design for the generating and transmission facilities (combined cycle plant, gas skid, gas and water storages, HV substation and lines), Feasibility study for the chosen variant, Environmental and social impact study for the installations and proposal for an environmental management plan, Execution planning and risk analysis, Elaboration of technical specifications for the tender dossier</td>
<td>Ministry of Oil, Energy and Mines, Steering Committee of the Company for the Production of Electricity from Gas (CP-PSPEG)</td>
<td>Mauritanian Mining Operators</td>
<td></td>
</tr>
<tr>
<td>Nigeria</td>
<td>Consultancy Services for 2010 HV Transmission Lines and Substations, TCN-2010-PC / Group 1 / Lot 7: Consultancy Services for the Construction and Erection of</td>
<td>2011 - 2012</td>
<td>Project coordination, management and supervision, Technical control of designs</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Receipt of equipment in factory and supplies on site (FAT, type testing of towers, routine testing of major equipment)
- Monitoring of works execution on site
- Commissioning and tests upon works completion
- Assistance during the defects liability period and final taking-over
- Technology transfer (on-the-job training, overseas training, development programme for young graduates on project life cycle and professional software (NEPLAN))

Client: Transmission Company of Nigeria PLC (TCN)
Financing: Federal Government of Nigeria

**Nigeria**

**Consultancy Services for 2010 HV Transmission Lines and Substations, TCN-2010-PC / Group 1 / Lot 5: Consultancy Services for the Construction and Erection of**

Kaduna Power Plant - Mando Rd 330 kV DC Transmission Line (25 km) and Substation Extension at Mando
Akwanga - Lafia 132 kV Trx Line and 2 x 30/40 MVA Substation at Lafia

**2011 - 2013 Activities:**
- Project coordination, management and supervision
- Technical control of designs
- Receipt of equipment in factory and supplies on site (FAT, type testing of towers, routine testing of major equipment)
- Monitoring of works execution on site
- Commissioning and tests upon works completion
- Assistance during the defects liability period and final taking-over
- Technology transfer (on-the-job training and 2-week overseas training)

Client: Transmission Company of Nigeria PLC (TCN)
Financing: Federal Government of Nigeria

**Nigeria**


**2011 - 2013 Activities:**
- Contract/project management and administrative tasks
- Evaluation of tenders for EPC contracts, assistance in contract award
- Design approval
- Site supervision, quality assurance
- Handling of payment, variation order and claim procedures
- FATs and assistance during taking-over
- Assistance during defects liability period
- Transfer of Know-how

Client: Niger Delta Power Holding Company Ltd. (NDPHC)
Financing: Government of Nigeria

**Nigeria**

**Programme for the Promotion of Power Production Via Renewable Energy, especially Hydropower - Expert Opinion on the Proposed 20 MW Kiri Dam Hydropower Plant**

**2011 Activities:**
- Technical advice to a delegation of kW during their project appraisal mission
- Compilation of an investigation report on general technical aspects of the pro-
posed plant (size of the proposed HPP, dam safety and environmental issues), especially appraisal of technical options for power evacuation (transmission line, location of power house, etc.)

**Client:** KfW Entwicklungsbank  
**Financing:** Kreditanstalt für Wiederaufbau (KfW)

<table>
<thead>
<tr>
<th>Country</th>
<th>Project Description</th>
<th>Activities</th>
<th>Client</th>
<th>Financing</th>
</tr>
</thead>
</table>
| Kenya   | Feasibility Study for Development of Grid-Connected Solar Power Plants (160 MWP) | - Review of data and reports to identify potential sites  
- Review of suitable PV and CSP technologies  
- Detailed feasibility study for top-ranked sites  
- Conceptual design for 3 pilot plants  
- Knowledge transfer programme  
- Project management and reporting | Kenya Electricity Generating Company Ltd. (KenGen) | Kenya Electricity Generating Company Ltd. (KenGen) |
| Benin, Togo | Consulting Services for the Rehabilitation of the Lomé - Cotonou - Onigbolo Line | - Support for contract award to Contractors, including support in the publication of procurement notices in local and international media, participation in bid opening and analysis, assistance during contract negotiations and award  
- Control and supervision of project implementation works: supervision, coordination and management of the project, technical control of designs, supervision of construction works on site, coordination of commissioning and factory acceptance tests. | Communauté Electrique du Benin (CEB) | European Investment Bank (EIB) |
| Nigeria | Feasibility Study - Potential Construction of a Solar Power Generation Plant at Yola | - Collection of technical and environmental data and determination of regulatory framework for the proposed sites  
- Technical studies and recommendation of preferred technical concept (PV technology options, electricity generation profile, energy storage, network integration)  
- Economic, financial and regulation studies (cost estimates and economic evaluation, feed-in tariff, carbon trading, regulation, licensing and permits)  
- Preparation of project implementation (project structure, finance structure, geotechnical site survey, power plant, network and substation conceptual designs, time schedule) | EnBW Gas Midstream GmbH and Government of Adamawa State of Nigeria | EnBW Gas Midstream GmbH and Government of Adamawa State of Nigeria |
| Uzbekistan | Construction of 500 kV Power Transmission Line Talimarjan Thermal Power Plant - Sogdiana Substation with 500 kV Outdoor Switchgear at Talimarjan Thermal Power Plant | | | |

### Kenya

**Feasibility Study for Development of Grid-Connected Solar Power Plants**  
(160 MWP)  
**Activities:**  
- Review of data and reports to identify potential sites  
- Review of suitable PV and CSP technologies  
- Detailed feasibility study for top-ranked sites  
- Conceptual design for 3 pilot plants  
- Knowledge transfer programme  
- Project management and reporting  
**Client:** Kenya Electricity Generating Company Ltd. (KenGen)  
**Financing:** Kenya Electricity Generating Company Ltd. (KenGen)  

### Benin, Togo

**Consulting Services for the Rehabilitation of the Lomé - Cotonou - Onigbolo Line**  
**Activities:**  
- Support for contract award to Contractors, including support in the publication of procurement notices in local and international media, participation in bid opening and analysis, assistance during contract negotiations and award  
- Control and supervision of project implementation works: supervision, coordination and management of the project, technical control of designs, supervision of construction works on site, coordination of commissioning and factory acceptance tests.  
**Client:** Communauté Electrique du Benin (CEB)  
**Financing:** European Investment Bank (EIB)  

### Nigeria

**Feasibility Study - Potential Construction of a Solar Power Generation Plant at Yola**  
**Activities:**  
- Collection of technical and environmental data and determination of regulatory framework for the proposed sites  
- Technical studies and recommendation of preferred technical concept (PV technology options, electricity generation profile, energy storage, network integration)  
- Economic, financial and regulation studies (cost estimates and economic evaluation, feed-in tariff, carbon trading, regulation, licensing and permits)  
- Preparation of project implementation (project structure, finance structure, geotechnical site survey, power plant, network and substation conceptual designs, time schedule)  
**Client:** EnBW Gas Midstream GmbH and Government of Adamawa State of Nigeria  
**Financing:** EnBW Gas Midstream GmbH and Government of Adamawa State of Nigeria
2012 - 2014  Activities:  ▶ Contract monitoring and works supervision, i.e.
▶ Advice on design approval and quality control
▶ Supervision of installation, testing and pre-commissioning activities
▶ Monitoring of construction costs and payment schedule
▶ Recommendations to the Client for payment of bills and invoices
▶ Claim management and recommendations on variations.
▶ Project coordination and management
▶ Training / knowledge transfer

Client:  SJSC Uzbekenergo
Financing:  World Bank

Ukraine  Procurement and Project Management Support: 750 kV Zaporizhzhia - Kahovska Transmission Line

2011 - 2014  Activities:  ▶ Assistance to Ukrenergo during the tender stage (preparation of prequalification and tender documents, assistance during prequalification and tendering stages, and assistance in contract preparation)
▶ Technical and legal assistance during contracts' execution (review of design documentation and its compliance with the ESAP, supervision of contractors' works, assistance in project management, assistance during defect notification period)
▶ Assistance in loan agreement management (drafting of project implementation plan and all necessary reporting, assistance for disbursement to contractors)
▶ Assistance in the implementation of the ESAP/ESMPP
▶ Monitoring of the adherence to health and safety standards

Client:  NEC Ukrenergo
Financing:  European Bank for Reconstruction and Development (EBRD)

Mauritania  Study, Control, Coordination and Works Supervision for the Construction of a 120 MW dual-fuel Power Plant in Nouakchott

2011 - 2014  Activities:  ▶ Choice of site for the power plant
▶ Review, update and finalisation of the existing tender dossiers
▶ Assistance to SOMELEC during tendering, tender evaluation, contract negotiation and contract conclusion
▶ Follow-up, coordination and control of design studies and manufacturing
▶ Supervision, monitoring and coordination of site works
▶ Verification of equipment lists
▶ Implementation of the training plan for the future operating personnel
▶ Addendum: Preparation of tender documents for the power plant access road, assistance to SOMELEC during tendering, tender evaluation, contract negotiation and contract conclusion; supervision, monitoring and coordination of site works

Client:  SOMELEC - Mauritanian Electricity Company
Financing:  Arab Fund for Economic and Social Development (AFESD)

Mauritania  Study on the Development of the Power Generation Plant Grid Connection and Master Plan for the electrical Distribution Networks of the City of Nouakchott

2011 - 2012  Activities:  ▶ Electricity demand forecast for Nouakchott
▶ Study on the development of a power generation plant grid connection
Master plan on electricity distribution
Study on the location of a dispatch center
Preparation of the detailed design
Establishment of tender dossiers
Know-how transfer

Client: SOMELEC - Mauritanian Electricity Company
Financing: Arab Fund for Economic and Social Development (AFESD)

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**Mauritania**  
Demand Study and Elaboration of a Master Plan for the Development of Electricity Generation and Transmission in Mauritania for the Period 2010 to 2030  
2011 - 2012

**Activities:**
- Study on electricity demand
- Elaboration of the master plan on electricity generation and transmission
- Assessment of available electric energy
- Study on the electricity transmission network
- Study on the electricity distribution network
- Economic study
- Training

Client: Project for the Improvement of the Climate for Economic Activity ("PACAE")
Financing: World Bank

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**Burkina Faso**  
Project on the Reinforcement of Electrical Infrastructure and on Rural Electrification (PRIERLER): Consulting Services for the Monitoring and Supervision of Works  
2011 - 2014

**Activities:**
- Verification of existing studies and execution of additional studies
- Assistance in the finalisation of the tender dossiers
- Assistance in tender evaluation and contract award
- Technical control of designs
- Supervision of construction works, including FAT and acceptance of materials on site
- Project management, quality and budget control

Client: Société National d'Electricité du Burkina (SONABEL)
Financing: African Development Bank (AFDB)

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**Pakistan**  
Energy Efficiency Investments Program Tranche 2: Technical Diagnostic of the Thermal Power Plants belonging to the Pakistani Public Generation Companies (GENCOs)  
2010 - 2011

**Activities:**
- Due Diligence Report, i.e. diagnostic of the existing 4,800 MW power plants to determine the technical feasibility of upgrading options (comparison of GENCOs’ present performance with technological benchmarks, assessment of augmentation potential of existing infrastructure, recommendations for rehabilitation and replacement options)
- Elaboration of an investment plan including suitable financing mechanism

Client: Pakistan Electric Power Company (PEPCO)
Financing: Agence Française de Développement (AFD)

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**Guinea-Bissau**  
Multi-sectoral Infrastructure Rehabilitation Project (MIRP): Assistance for the installation and management of a prepaid electricity system
including provision of meters and accessories
Revision of the tender documents for a production capacity reinforcement by 5 MW

2010 - 2012 Activities:
- Assistance and verification of the tender documents for meters and a prepaid electricity system prepared by PMRI in collaboration with the AT-EAGB
- Assistance during the bidding period
- Assistance in bid evaluation
- Assistance to the government during contract negotiations
- Assistance and verification of the tender documents for the provision of 5 MW generator sets and the heavy fuel oil storage

Client: MIRP PMU
Financing: World Bank

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**Albania**

**Evaluation and Business Plan Supervision of Hydropower Plants**

2010 - 2013 Activities:
- Framework Contract:
- Assessment of documentation handed in by loan applicants (elaboration of guidelines for application documents; check of documentation)
- Evaluation of the planning data base (hydrological data, topographical and geological survey, legal situation)
- Evaluation of the technical concept
- Evaluation of the financial analysis (annual production, investment cost, assumptions, sensibility and risk analyses)
- Evaluation of the implementation plan
- Quarterly supervision of works
- Reporting to the Bank

Client: Raiffeisen Bank Sh.A. Albania
Financing: Raiffeisen Bank Sh.A. Albania

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**Guinea**

**Project for the Rehabilitation and Extension of the Electrical Networks of Conakry: Monitoring, Control and Supervision of Works**

Rehabilitation and extension of 305 km of LV lines
Extension of 5.74 km mixed MV / LV lines
Construction of 63 new kiosk substations 20/0.4 kV
Supply and connection of 20,000 mono-phase and 5,000 three-phase energy meters

2010 - 2013 Activities:
- Technical assessment of implementation studies
- Factory acceptance tests
- Works supervision on site
- Testing and commissioning
- Preliminary and final taking over

Client: Electricité de Guinée (EDG), Conakry
Financing: African Development Bank (AFDB)

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**Senegal**

**Study on technical, economic and financial Aspects of the regulatory Framework for Producing Electricity from renewable Energies in Senegal**

2010 Activities:
- Analyses (determination of the theoretical and technical potential for producing
electricity from renewable energies, inventory of the electrical network)

- Determination of development conditions for the production of electricity from renewable energies (production costs, interconnection costs, development requirements, study on the impact of the proposed measures, study on existing technical interconnection norms)

- Elaboration of concrete incentive measures and of interconnection prerequisites

**Client:** Ministry of Energy, Dakar

**Financing:** Agence Française de Développement (AFD)

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**Slovakia**  
**Bohunice International Decommissioning Support Fund: Consultancy to Support PMU in the Implementation of 400 kV Overhead Transmission Lines and 400 kV Substations. Stage 2: Project Implementation**

**Activities:**

- Overall project management
- Update of the PMU's organisational structure
- Overall project cost control
- Periodic update of project interface plan
- Risk assessment and management
- Monitoring of EPC contracts (engineering, manufacturing, construction and commissioning, deviations, claims, variation orders, defects and disputes)
- Supervision of installation, testing, commissioning and acceptance of works
- Establishment and periodic review of licensing process and plan
- Quality assurance plans

**Client:** Slovenska Elektrizacna Prenosova Sustava a.s. (SEPS, a.s.), Bratislava

**Financing:** European Bank for Reconstruction and Development (EBRD)

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**Nigeria**  
**JVPP - Joint Venture 500 MW Combined Cycle Power Plant Project - "FEED 1" (Front End Engineering and Design): Design and technical specifications for a 500 MW power plant, a 330 kV double circuit transmission line and associated substations**

**Activities:**

- Complete 330 kV transmission line design including technical specifications, routing, tower spotting, civil & structural tower design
- Preparation of the corresponding tender dossier
- Assistance to MPN/PHCN for transmission line right of way
- Agreement and coordination with PHCN on design data for the line and the involved substations
- Coordination with the EIA contractor and the surveyor

**Client:** JV Nigerian National Petroleum Company (NNPC) and Mobil Producing Nigeria Unlimited (MPN)

**Financing:** JV Nigerian National Petroleum Company (NNPC) and Mobil Producing Nigeria Unlimited (MPN)

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**Nigeria**  
**JVPP - Joint Venture 500 MW Combined Cycle Power Plant Project - "Early Works Phase of FEED 1" (Front End Engineering and Design). Studies on: the routing of a 330 kV double circuit transmission line of approx. 45 km length from the power plant to the new Ikot Abasi Substation the tie-in to Ikot Abasi Substation**

**Activities:**

- Line route study
- EIA - sampling points and reports
- Topographic survey
- Geo-technical investigations
Satellite imagery of the line route
Transmission line design

Client: JV Nigerian National Petroleum Company (NNPC) and Mobil Producing Nigeria Unlimited (MPN)
Financing: JV Nigerian National Petroleum Company (NNPC) and Mobil Producing Nigeria Unlimited (MPN)

**Syria**

**Consulting Services for the SMI Industrial Power Plant (170 MW), Phase 1**
- Technical and economic evaluation of bids
- Preparation of legal contract for the EPC contractor
- Assistance in final contract negotiations
- Environmental impact assessment study
- Study of the interconnection of the power plant to the national grid

2010 - 2011 Activities:
- Technical and economic evaluation of the received bids (reciprocating engines) according to established evaluation criteria.
- Review of the environmental impact assessment study.
- In cooperation with the client, preparation of a legal contract for the EPC contractor including technical annexes.
- Assistance to the Client in contract negotiations (clarification requests, finalisation of contract).
- Checking and approving the existing studies and investigations for the connection of the power plant to the national grid and steel plant.

Client: SMI Syria Metal Industries, Damascus, Syria
Financing: SMI Syria Metal Industries, Damascus, Syria

**Evaluation of the Deir Alzzoor Power Plant**

2005 - 2006 Activities:
- Tendering and Contracting

Client: Public Establishment of Electricity For Generation and Transmission - PEEGT
Financing: PEEGT, Kuwait Bank

**Consultancy Services for the Supervision, Extension and Conversion of Al-Nasserieh Gas Turbine Plant from Simple Cycle to Combined Cycle**
- 3 heat recovery steam generators,
- 1 steam turbine generator set (165 MWel) including all necessary accessories and equipment,
- a dry cooling tower including all necessary accessories,
- a water treatment plant.

2005 - 2008 Activities:
- Project management and related functions
- Approval of drawings submitted by the Contractor
- Supervision of design, electro-mechanical and civil engineering structural works and environment protection
- Attendance of factory acceptance tests, supervision of packing, shipment and transportation schedules
- Supervision of civil works, structural works, electro-mechanical and IC installation at site
- Testing during erection and commissioning, assistance during provisional acceptance, performance tests
- Technical assistance during the warranty period
Client: Public Establishment of Electricity for Generation and Transmission, Syria
Financing: Kuwait Arab Fund

Mongolia

Energy Efficiency Program I - New Turbine for Darkhan Thermal Power Plant (DTPP)

2009 - 2013 Activities:
- Preparation of the project
- Elaboration of tender documents
- Assistance in bid evaluation and evaluation reports
- Assistance in contract negotiations and contract award
- Assistance in checking and approval of contractor's drawings and specifications
- Assistance in the coordination and supervision of site activities, commissioning activities, including AQ and QC procedures, good quality of erection works, eventual insurance issues
- Organisation of as-built drawings and O&M manuals
- Checking and approval of suppliers' invoices

Client: Darkhan Thermal Power Plant (DTPP), and Ministry of Mineral Resources and Energy, Ulaanbaatar
Financing: Kreditanstalt für Wiederaufbau (KfW)

Albania, Kosovo

400 kV Transmission Line Albania - Kosovo (Tirana - Pristine)

Albania: Construction of a 400 kV OHL between Tirana and the Kosovo border, and extension of a 400/230/110 kV substation by one complete 400 kV feeder;
Kosovo: Construction of a 400 kV transmission line from 400/230/110 kV substation Kosovo B to the border to Albania, and extension of the existing substation Kosovo B by one complete 400 kV feeder

2009 - 2012 Activities:
- Phase 1:
  - Review of technical concept, data collection, reconstruction of missing drawings
  - Preparation of preliminary planning / schedule of supplies and services, review of the cost calculation
  - Review and amendment of tender documents for goods and services
  - Support during tender period / evaluation, bid evaluation report
  - Phase 2:
    - Approval of designs
    - Factory acceptance tests
    - Supervision of works
    - Assistance in the elaboration of an O&M concept
    - Consulting services during Defects Liability Period

Client: Albanian Transmission System Operator (OST)
Financing: Kreditanstalt für Wiederaufbau (KfW)

Nigeria

Consultancy Services for Obajana - Lokoja 330 kV Double Circuit Transmission Line and Associated Substation Project

Construction of 330 kV Lokoja - Obajana Transmission Line
Construction of 1 x 150 MVA, 330/132 kV Substation at Obajana
Construction of 2 x 330 kV line bays extension at Lokoja Substation
Construction of 1 x 60 MVA, 132/33 kV substation at Obajana
Construction of 2 x 132 kV line bays extension at Nsukka substation
Construction of Nsukka - Ayangba 132 kV double circuit transmission line
Construction of 1 x 60 MVA, 132 / 33 kV substation at Ayangba

2008 - 2011  
**Activities:**
- Project coordination, management and supervision
- Technical control of designs
- Factory acceptance and acceptance of supplies to site
- Supervision of works on site
- Commissioning and trial runs
- Assistance during defects liability period
- Organisation of supervision and management
- Training and know-how transfer

**Client:** Power Holding Company of Nigeria PLC, Abuja

**Financing:** Government of Nigeria

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Feasibility Studies for the 400 kV Interconnection Serbia - Romania and the 220 kV Substation Bistrica

2009 - 2010  
**Activities:**
- Feasibility Study for a 400 kV overhead line
- Feasibility study for a new 220 kV substation
- Environmental Impact Assessment
- Preliminary design

**Client:** EMS - Elektromreža Srbije, Belgrade

**Financing:** European Commission, Phare

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Consultancy Services - Technical Assistance in Procurement and Project Management: Rehabilitation of 11 Substations 330 to 750 kV and Upgrading / Construction of Related Transmission Lines

2009 - 2012  
**Activities:**
- Assistance in the preparation of final tender documents
- Assistance in the clarification of bidder's queries, evaluation of bids, award of EPC contract
- Coordination and supervision prior to start of construction works on site
- Review of contractors' design and documentation
- Coordination and supervision of construction and commissioning services at site
- Coordination and monitoring testing activities at site and at the factory
- Project management / contract administration
- Project quality assurance
- Training / knowledge transfer
- Assistance during the defects liability period

**Client:** UKRENERGO, Kiev

**Financing:** World Bank

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Consulting Services for Energy Efficiency Program II:
Construction of new 132/33 GIS substations, a new 132 and 33 kV cable system and a 4 circuit 132 kV transmission line

2009 - 2013  
**Activities:**
- Assistance in evaluation of bids, contract negotiations and contract award
- Approval of design, final design and as-built documentation
- Participation in FAT
- Supervision of construction
- Budget control and review of invoices
- Monitoring of training programme

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- Assistance in establishing an O&M concept
- Assistance in commissioning and during defects liability and warranty period

**Client:** Dhaka Power Distribution Company Ltd. (DPDC), Dhaka

**Financing:** Kreditanstalt für Wiederaufbau (KfW)

<table>
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<tr>
<th>Country</th>
<th>Description</th>
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<tbody>
<tr>
<td>Cameroon</td>
<td>Consulting Services for AES SONEL Capital Investment Plan. Owner’s Engineer Services for:</td>
</tr>
<tr>
<td></td>
<td>New construction, rehabilitation and extension of transmission infrastructure</td>
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<td>Rehabilitation works on secondary networks and the distribution backbone (15-30 kV)</td>
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<td>Refurbishment of hydropower plants (units, dam and reservoir civil structures)</td>
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<td>Overhauls, capacity reinforcement and construction of HFO and diesel power plants</td>
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<tr>
<td></td>
<td>2009 - 2010 Activities:</td>
</tr>
<tr>
<td></td>
<td>- Project management</td>
</tr>
<tr>
<td></td>
<td>- Contribution to project feasibility studies and to the elaboration of bidding documents</td>
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<tr>
<td></td>
<td>- Construction schedules</td>
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<td></td>
<td>- Construction management, site supervision, contracts administration</td>
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<td></td>
<td>- Construction health and safety, quality assurance</td>
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<td>- FAT and related reports, commissioning and testing</td>
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<td></td>
<td>- As-built documentation, O&amp;M manuals</td>
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<tr>
<td></td>
<td>- Know-how transfer, training on the job</td>
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<td><strong>Client:</strong> AES SONEL, Douala</td>
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<td><strong>Financing:</strong> AES SONEL</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Burkina Faso</th>
<th>Preparation of a Complementary Feasibility Study, of the Preliminary Planning and of the Tender Documents for the Interconnections Ouagadougou - Ouahigouya, Kaya - Dori, Kongoussi - Djibo and Fada - Diapaga</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>90 kV line Ouagadougou - Ouahigouya</td>
</tr>
<tr>
<td></td>
<td>33 kV Kaya - Dori</td>
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<td>33 kV Kongoussi - Djibo</td>
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<td>33 kV Fada - Diapaga</td>
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<td>2008 - 2011 Activities:</td>
</tr>
<tr>
<td></td>
<td>- Review of documentation</td>
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<tr>
<td></td>
<td>- Data collection</td>
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<tr>
<td></td>
<td>- Demand analysis</td>
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<td>- Conceptual design</td>
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<td></td>
<td>- Economic study</td>
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<td>- Environmental and social impact study</td>
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<td></td>
<td>- Risk analyses</td>
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<td>- Detailed design</td>
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<tr>
<td></td>
<td>- Implementation planning and follow-up of the environmental and social management plan</td>
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<tr>
<td></td>
<td>- Proposals for reforestation and other mitigation measures</td>
</tr>
<tr>
<td></td>
<td>- Preparation of bidding documents</td>
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<td></td>
<td>- Assistance in contract award</td>
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<td></td>
<td>- Preparation of ToR for supervision of work</td>
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<tr>
<td></td>
<td>- Training</td>
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<td></td>
<td><strong>Client:</strong> Société Nationale d’Electricité du Burkina (SONABEL), Ouagadougou</td>
</tr>
<tr>
<td>Country</td>
<td>Description</td>
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<tr>
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</tr>
<tr>
<td>Slovakia</td>
<td><strong>Bohunice International Decommissioning Support Fund: Consultancy to Support PMU in the Implementation of 400 kV Overhead Transmission Lines and 400 kV Substations (Stage 1)</strong></td>
</tr>
<tr>
<td>2008 - 2010</td>
<td><strong>Activities:</strong></td>
</tr>
<tr>
<td></td>
<td>❖ Overall project management</td>
</tr>
<tr>
<td></td>
<td>❖ Development of the PMU's organisational structure</td>
</tr>
<tr>
<td></td>
<td>❖ Verification and/or validation of existing design requirements, calculations, supporting studies, specification of scope of supply, project schedules and cost estimates</td>
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<tr>
<td></td>
<td>❖ Verification and/or validation of compliance of existing studies with applicable codes and standards</td>
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<tr>
<td></td>
<td>❖ Preparation of additional supporting studies</td>
</tr>
<tr>
<td></td>
<td>❖ Preparation of tender specifications</td>
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<tr>
<td></td>
<td>❖ Supervision of contracted scope</td>
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<tr>
<td></td>
<td>❖ Follow-up of project planning and implementation</td>
</tr>
<tr>
<td></td>
<td>❖ Review of suppliers' documents and drawings</td>
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<tr>
<td></td>
<td>❖ Environmental due diligence</td>
</tr>
<tr>
<td></td>
<td>❖ Definition of scheduling and schedule management procedures</td>
</tr>
<tr>
<td>Client:</td>
<td>Slovenska Elektrizacna Prenosova Sustava a.s. (SEPS, a.s.), Bratislava</td>
</tr>
<tr>
<td>Financing:</td>
<td>European Bank for Reconstruction and Development (EBRD)</td>
</tr>
<tr>
<td>Serbia</td>
<td><strong>Supervising Engineer for the Construction of the 400 kV Overhead Line Nis - FYR of Macedonia Border</strong></td>
</tr>
<tr>
<td>2008 - 2010</td>
<td><strong>Activities:</strong></td>
</tr>
<tr>
<td></td>
<td>❖ Coordination and supervision prior to start of construction works</td>
</tr>
<tr>
<td></td>
<td>❖ Review of Contractor's design and documentation</td>
</tr>
<tr>
<td></td>
<td>❖ Coordination and supervision of construction and commissioning services at site</td>
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<td></td>
<td>❖ Coordination and monitoring testing activities at site and at the factory</td>
</tr>
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<td>❖ Project management / contract administration</td>
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<td></td>
<td>❖ Project quality assurance</td>
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<td></td>
<td>❖ Training / know-how transfer</td>
</tr>
<tr>
<td>Client:</td>
<td>EMS - Elektromreža Srbije, Belgrade</td>
</tr>
<tr>
<td>Financing:</td>
<td>European Commission</td>
</tr>
<tr>
<td>Nigeria</td>
<td><strong>Consulting Services for Site Identification, Feasibility and Design of High Voltage Distribution System (HVDS) in the South East Zone of Nigeria</strong></td>
</tr>
<tr>
<td>2008</td>
<td><strong>Activities:</strong></td>
</tr>
<tr>
<td></td>
<td>❖ Selection of model rural communities</td>
</tr>
<tr>
<td></td>
<td>❖ Determination of their power needs</td>
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<tr>
<td></td>
<td>❖ Preparation of technical specifications</td>
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<td>❖ Development of an O&amp;M program</td>
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<td>❖ Development of a sustainability programme</td>
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<tr>
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<td>❖ Cost estimates</td>
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<td>❖ Development of a project management framework</td>
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<td></td>
<td>❖ Environmental and social impact assessment</td>
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<td></td>
<td>❖ Development of a business model</td>
</tr>
<tr>
<td>Client:</td>
<td>Rural Electrification Agency, Abuja</td>
</tr>
<tr>
<td>Financing:</td>
<td>Rural Electrification Agency (REA)</td>
</tr>
</tbody>
</table>
Tanzania  
**400 kV Transmission Line Iringa - Dodoma - Singida - Shinyanga**

**2007 - 2009**

**Activities:**
- Planning activities in the pre-construction phase
- Establishment of questionnaires for the collection of baseline data
- Participation in field survey along the transmission line corridor
- Ensuring comprehensiveness of the environmental and social impact assessment
- Participation in analysis of routing alternatives
- Evaluation of mitigation and compensation measures for a Resettlement Action Plan (RAP)
- Participation in institutional capacity building in social impact assessment
- Preparation of a detailed RAP

**Client:** Tanzania Electric Supply Company Ltd. (TANESCO)

**Financing:** World Bank

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Cameroon  
**AES SONEL Long Term Capital Investment Project**

**2007 - 2009**

**Activities:**
- Determination of project feasibility and construction schedules for planned investments
- Project management activities
- Preparation of bidding documents
- Tendering and contracting
- Supervision of works
- Testing and commissioning of works
- Training in technical and managerial fields

**Client:** AES SONEL, Douala

**Financing:** AES SONEL

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Nigeria  
**Consultancy Services for the implementation of**
the new 132 kV Ihiala Substation (green field)
132 kV double-circuit transmission line Nnewi - Ihiala - Orlu
two new 330/132/33 kV 150 MVA transformers and line bays (green field) at Nnewi
extension of the 132 / 33 kV Orlu Substation

**2007 - 2008**

**Activities:**
- Project coordination, management and supervision
- Technical control of designs
- Factory acceptance and acceptance of supplies to site
- Supervision of works on site
- Commissioning and trial runs
- Assistance during defects liability period
- Organisation of supervision and management
- Training and know-how transfer

**Client:** Niger Delta Power Holding Company

**Financing:** Federal Government of Nigeria

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Kosovo  
**Consulting Services for Upgrading the 110 kV Line Is-tog and Peja 1 to Skenderaj and for Defining the Scope of Works for Additional / Optional Works for the New Substation Skenderaj and the Respective 110 kV Transmission Line**
2007 - 2009 Activities:
- Feasibility study
- Preparation of tender documents
- Tender evaluation
- Contract negotiation
- Design approval
- Factory acceptance tests
- Site supervision
- Commissioning

Client: KOSTT, Transmission, System and Market Operator J.S.C
Financing: Kreditanstalt für Wiederaufbau (KfW)

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**Kosovo**

Construction of Peja 3 Substation (400/110 kV) and Associated Transmission System Works (60 km of 110 kV Overhead Transmission Line)

2006 - 2010 Activities:
- Review of existing documents, data and technical concept
- Examination of technical condition of existing facilities
- Preparation of the preliminary planning and the schedule of supplies and services
- Review of cost calculation and update of the investment cost estimate
- Preparation of the implementation concept and financing schedule
- Preparation of tender documents
- Support to PIU during tendering period
- Bid evaluation
- Assistance in contract award
- Monitoring of construction time schedule
- Design approval
- Factory acceptance tests
- Site supervision
- Preparation of design for interconnection of new electrical equipment
- Budget control
- Monitoring of training
- Support in preparation of an O & M concept
- Commissioning and handing over

Client: KOSTT Transmission, System and Market Operator JSC, Pristine
Financing: Kreditanstalt für Wiederaufbau (KfW)

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**Tanzania**

TANESCO Distribution System Reinforcement Project for Dar Es Salaam, Arusha and Kilimanjaro - Phase 1

2006 - 2009 Activities:
- Preparation of a detailed project control programme
- Preparation of conceptual design and technical specifications
- Training of counterpart staff
- Preparation of tender documents
- Assistance during bidding process
- Evaluation of tenders
- Assistance in contract award

Client: Tanzania Electric Supply Company Ltd. (TANESCO), Dar Es Salaam
Financing: World Bank

**Nigeria**
Consultancy Services for High Voltage Transmission Lines and Substations
- two 330 kV line bays at Alaoji Substation
- 75 km of double circuit 330 kV line Owerri - Onitsha
- two 330 kV line bays at Onitsha Substation
- 60 km of double circuit 330 kV line Omoku - Egbema - Owerri
- two 150 MVA, 330/132/33 kV transformers at Owerri Substation
- 30 km 132 kV single circuit line Owerry - Nnewi and Nnewi - Onitsha
- two 60 MVA, 132/33 kV transformers at Owerri Substation
- two 150 MVA, 330/132/33 kV transformers at Omoku Substation

2005 - 2013 Activities:
- Project coordination, management and supervision
- Technical control of designs
- Factory acceptance and acceptance of supplies to site
- Supervision of works on site
- Commissioning and trial runs
- Assistance during defects liability period
- Organisation of supervision and management
- Training and know-how transfer

Client: Niger Delta Power Holding Company
Financing: Niger Delta Power Holding Company

**Burkina Faso**
Reinforcement of the Regional Centre of Ouagadougou: New Generation Capacity and 90/33 kV Loop to Ouagadougou

2005 - 2007 Activities:
- Planning
- Follow-up of implementation planning
- Control of manufacture
- Factory acceptance of equipment
- Control of shipments
- Supervision of work
- Preliminary acceptance
- Final acceptance
- Technology transfer

Client: Société Nationale d'Electricité du Burkina (SONABEL)
Financing: DANIDA

**Benin**
Second Rural Electrification Project: Electrification of 57 Townships

2005 - 2009 Activities:
- Data collection
- Application of GIS and GPS
- Planning of the LV and MV line routings
- Preparation of tender documents
- Contract award
- Participation in factory acceptance tests
- Works supervision

Client: Société Béninoise d'Energie Electrique (SBEE), Cotonou
Financing: African Development Bank (AFDB)
Benin  Reinforcement of the Electrical HV Networks of Cotonou, Porto-Novo and Zopa (Calavi)
Reinforcement of 3 63/115 kV substations by a transformer bay
Laying of 4.6 km 63 kV cable
Construction of a 63/15 kV transformer station and its connection to the 63 kV line
Construction of 10 15/0.4 kV indoor transformer stations and laying of 11 km 15 kV cable

2004 - 2009  Activities:
- Draft and final conceptual design
- Definition of the preliminary routings by means of GPS-based data
- Environmental study
- Tender documents
- Evaluation of bids
- Assistance in contract negotiations
- Supervision of work
- Acceptance tests
- Commissioning

Client: Société Béninoise d’Énergie Electrique (SBEE), Cotonou
Financing: World Bank

Guinea-Bissau  Updating of the Documents of the Analysis of the Balance of Energy Generation and Demand and of the Programme for the Rehabilitation and Reinforcement of the MV and LV Networks of the City of Bissau and Updating of the Environmental Audit and Environmental and Social Assessment of New Investments

2004 - 2008  Activities:
- Evaluation of the investment programme
- Planning of the study
- Localisation of the information by means of a GPS
- Preparation of tender documents
- Planning and tendering for the conversion of the network from 6 to 10 kV
- Planning and implementing the tender procedure for a leasing contract for 15 MW generation capacity
- Planning and tendering of a system of new meters for accounting
- Update of the environmental audit and the environmental and social assessment of new investments
- Assistance in the procurement of 2 diesel units (1500 kW) as emergency measure

Client: Projet de Réhabilitation et Développement du Secteur Privé (PRDSP), Bissau
Financing: World Bank

Burkina Faso  Supervision of Construction, Supply and Turnkey Installation of a 14 MW Power Plant at Kossodo

2004 - 2007  Activities:
- Review and approval of drawings and plans
- Control and follow-up of manufacturing
- Factory acceptance of equipment
- Follow-up and control of the work on site
- Supervision of tests and commissioning
- Provisional and final acceptance
- Follow-up and supervision of all outstanding works and services
CLIENT: SONABEL - Société Nationale d’Electricité du Burkina, Ouagadougou
FINANCING: World Bank

**Benin**

**Technical Assistance for Factory Acceptance of Equipment for a MV Underground Distribution Network in Cotonou and Porto Novo**

**Activities:**
- Factory inspection of electrical equipment

**Client:** Société Béninoise d’Electricité et de l’Eau, Cotonou
**Financing:** SBEE

**Burkina Faso**

**Rehabilitation of the Small Hydropower Plants of Tourni and Niofila and Assistance in their Operation**

**Activities:**
- Preparation of tender documents
- Evaluation of bids
- Assistance in contract negotiations
- Verification of suppliers’ plans and documents
- Factory acceptance
- Supervision of work
- Acceptance and commissioning
- Missions to site for assistance in plant operation
- Training on-the-job
- Collection and analysis of information on operation
- Verification of contracts
- Visual inspection of dams

**Client:** SONABEL - Société Nationale d’Electricité du Burkina, Ouagadougou
**Financing:** Kreditanstalt für Wiederaufbau (KfW)

**Mauritania**

**Study and Follow-up of the Electrification Works for New Non-Developed Settlements in the City of Nouakchott**

**Activities:**
- Preparation of the cartography (by means of GPS) and site investigations
- Study and preparation of the tender documents
- Evaluation of bids
- Contract negotiations
- Construction supervision
- Acceptance tests
- Commissioning
- Project management

**Client:** Société Mauritanienne d’Electricité (SOMELEC), Nouakchott
**Financing:** World Bank
Mauritania  Interconnection of SOMELEC MV networks to the OMVS substations in Kaédi, Rosso and Boghé
2003 - 2004  Activities:  Revision of preliminary studies
                        Factory acceptance tests
                        Supervision of construction
                        Commissioning tests and provisional acceptance
Client:  Société Mauritanienne d'Electricité (SOMELEC), Nouakchott
Financing:  Arab Fund for Economic and Social Development (AFESD)

Mongolia  Development of 6 Small Hydropower Plants within the Renewable Energy Programme and Assessment of Wind Power Development Opportunities
2002  Activities:  Feasibility studies
                        Establishment of a hydrological database
                        Assessment of wind power development opportunities
                        Environmental impact assessment
Client:  Ministry of Infrastructure Development, Ulaanbaatar
Financing:  Kreditanstalt für Wiederaufbau (KfW)

Kosovo  Major Repair of Unit 5 of Kosovo A Thermal Power Plant
2001 - 2002  Activities:  Preparation of tender documents
                        Evaluation of bids
                        Assistance in contract award
Client:  Korporata Energjetike e Kosoves (KEK), Pristine
Financing:  Korporata Energjetike e Kosoves (KEK)

Liberia  Rehabilitation and Frequency Conversion of the Luke Diesel Power Plant (3 x 16 MVA) and all Auxiliary Subsystems
2001 - 2002  Activities:  Technical investigations
                        Tender documents
                        Evaluation of bids
                        Assistance in contract award
Client:  Liberia Electricity Corporation (LEC), Monrovia
Financing:  Gov. of the Republic of China (Taiwan)

Liberia  Modification of the Bushrod Power Plant Diesel Units (5 x 1.7 MVA) and Conversion of the Plant System to Distillate Diesel Oil (DDO)
2001 - 2002  Activities:  Tender documents
                        Evaluation of bids
                        Assistance in contract award
                        Supervision of construction
                        Acceptance tests
                        Commissioning
Client:  Liberia Electricity Corporation (LEC), Monrovia
Financing:  Gov. of the Republic of China (Taiwan)
<table>
<thead>
<tr>
<th>Country</th>
<th>Project Description</th>
<th>Year</th>
<th>Activities</th>
<th>Client</th>
<th>Financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sao Tome and Principe</td>
<td>Relocation of the 7.5 MW diesel power station of Sao Tomé</td>
<td>2001</td>
<td>Activities: Project appraisal report</td>
<td>Client: INDES - Instituto para o Desenvolvimento Económico e Social, Sao Tomé</td>
<td>Financing: OPEC Fund for International Development</td>
</tr>
<tr>
<td>Kosovo</td>
<td>Emergency Measures at the thermal Power Station Kosovo A for increasing the Capacity of Unit 5 to 150 MW</td>
<td>2000</td>
<td>Activities: Definition of required equipment, Tender documents, Evaluation of bids, Assistance in contract award, Supervision of the installation of the equipment, Acceptance tests, Commissioning</td>
<td>Client: Korporata Energjetike e Kosoves (KEK), Represented by UNMIK</td>
<td>Financing: Kreditanstalt für Wiederaufbau (KfW)</td>
</tr>
<tr>
<td>Liberia</td>
<td>Emergency Programme: Rehabilitation of Monrovia’s Electricity Sector after the Civil War</td>
<td>2000 - 2002</td>
<td>Activities: Technical assistance to LEC and institutional strengthening, Procurement of equipment and tools for transmission and distribution, Support to SKODA diesel power plant and training of operation staff, Establishment of a power supply policy and development plan, Implementation of a computerised billing system</td>
<td>Client: Liberia Electricity Corporation (LEC), Monrovia</td>
<td>Financing: European Commission</td>
</tr>
</tbody>
</table>
**Tanzania**

**Improvement of Energy Efficiency by:**

Rehabilitation of 220 and 132 kV transformers and switchgears in substations of high priority

Rehabilitation and extension of 33 and 11 kV distribution networks in the regions Mwanza, Kinondoni and South Temeke

**2000 - 2004 Activities:**
- Planning
- Tender documents
- Evaluation of bids
- Assistance in contract award
- Supervision of construction
- Acceptance tests
- Commissioning
- Training

**Client:** Tanzania Electricity Supply Company Ltd.
**Dar Es Salaam**

**Financing:** Kreditanstalt für Wiederaufbau (KfW)

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**Benin**

**Rural Electrification**

Extension of the power supply in 15 villages and townships (distribution networks and diesel power stations)

Electrification of 15 new townships

**1999 - 2002 Activities:**
- Preliminary planning
- Environmental study
- Socio-economic appraisal
- Feasibility study
- Feasibility study

**Client:** Société Béninoise d'Electricité et d'Eau, Cotonou

**Financing:** African Development Bank (AFDB)

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**Benin, Togo**

**Master Plan for Electricity Generation and Transmission for Togo and Benin**

**1999 - 2001 Activities:**
- Updating of the CEB master plan
- Socio-economic appraisal

**Client:** Communauté Electrique du Bénin (CEB), Lomé, Togo

**Financing:** World Bank

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**Benin**

**Supply of Emergency Generators for the 26 MW Diesel Power Station Akpakpa and of electrical Equipment for the Realisation of the 63 kV Cable Connection between the Diesel Power Station and the Substation Gbegamey in Cotonou**

**1998 - 2001 Activities:**
- Planning
- Tender documents
- Evaluation of bids
- Assistance in contract award
- Supervision of construction
- Acceptance tests
- Commissioning

**Client:** Société Béninoise d'Electricité et d'Eau (SBEE), Cotonou
<table>
<thead>
<tr>
<th>Country</th>
<th>Project Description</th>
<th>Duration</th>
<th>Activities</th>
<th>Client</th>
<th>Financing</th>
</tr>
</thead>
</table>
- Training needs assessments  
- Planning and design of training facilities  
- Procurement of training equipment  
- Preparation of training curricula  
- Preparation of training material and aids  
- Execution of specialized training on electrical and mechanical engineering  
- Management support  
- Elaboration of a marketing and financial concept  
- Development and implementation of a training monitoring and evaluation system | Energy Research and Development Center (ERDC), Ulaanbaatar | Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) |
| Benin, Togo | Uniform Norms and Standards in the Field of Electricity Distribution for the Countries Togo and Benin | 1997 - 2000 | - Preparation of the norms and standards | Compagnie Energie Electrique du Togo, Lomé, and Société Béninoise d’Electricité et d’Eau, Cotonou | World Bank |
| Rwanda | Rehabilitation of the electrical Infrastructure of ELECTROGAZ | 1997 - 1999 | - Final design  
- Tender documents  
- Training | Ministère des Travaux Publics and ELECTROGAZ, Kigali | World Bank |
| Guinea | Construction of a Dispatching Centre for the electric Network System Conakry-Kindia | 1995 - 1997 | - Final design  
- Tender documents  
- Evaluation of bids  
- Assistance in contract award | Entreprise Nationale d'Electricité de Guinée, Conakry | Kreditanstalt für Wiederaufbau (KfW) |
Togo

Electricity Supply of the Region Kpalimé - Atakpamé - Notsé
Rehabilitation of the 1.6 MW hydropower station Kpimé
60 km new transmission line 33 kV Amlamé - Kpalimé
69 km new transmission line 33 kV Atakpamé - Notsé
Rehabilitation and extension of the distribution network 20 kV of Kpalimé (24 km)
New substation 161/20/33 kV in Atakpamé (10 MVA)
3 new substations 33/20 kV in Amlamé, Kpalimé and Notsé (3.15 MVA)
Rehabilitation of the substation 33/5.5 kV in Kpimé
Rehabilitation and transformation of the transmission line (30 km) Atakpamé - Amlamé from 20 kV to 33 kV

1987 - 1988 Activities:
- Socio-economic appraisal
- Feasibility study
- Final design
- Tender documents
- Evaluation of bids
- Assistance in contract award
- Supervision of construction
- Acceptance tests
- Commissioning
- Training of operation personnel
- Assistance in the operation of the new lines

Client: Compagnie Energie Electrique du Togo, Lomé
Financing: Kreditanstalt für Wiederaufbau (KfW)