LENZA
ENGINEERING

Electrical engineering for critical energy infrastructure

Substations · Data centers · BESS/PV · Power plants · Industry

SERVICE PORTFOLIO 2026

www.lenza-engineering.com

LENZA
ENGINEERING

About us

Lenza Engineering combines technical expertise with the flexibility of an international network of specialised engineers, from concept to commissioning.

We provide clearly scoped engineering services for network operators, EPC contractors, data center investors, PV and BESS projects, and industrial clients. Our team of specialists covers the full spectrum of electrical engineering, in compliance with the applicable standards and with documentation delivered to the project schedule.

Our engineers bring many years of experience gained at companies such as Siemens Energy, Uniper, GE and Hitachi, and contribute experience from European, Latin American and international projects.

Headquarters
Cali, Colombia

Reach
Projects worldwide

Working languages
Spanish · English · German

LENZA
ENGINEERING

Five reasons to work with us

01

Direct access to specialists

You work directly with our specialist engineers. No middlemen, so information reaches the team without loss.

02

Standards-compliant documentation

Deliverables comply with the applicable VDE, IEC, IEEE, EN, BS and DIN standards. Documentation is verifiable and ready for review.

03

Flexible engagement models

We adapt to your contract model: defined work packages, framework agreements or project contracts.

04

Scalable capacity

We take on well-defined work packages and work as a specialist subcontractor to larger engineering consultancies.

05

Specialised technical expertise

We bring expertise in protection and control, substation design, power system studies, PV/BESS integration, grid expansion and automation.

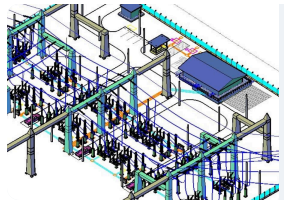
Clearly scoped engineering services

Electrical systems from the grid connection to the final circuit, combined to suit the project.



Power system studies

Grid connection, modelling and simulation of different scenarios.



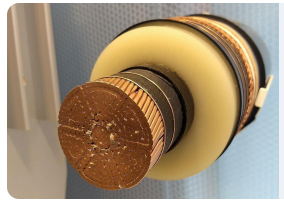
Substations

Primary and secondary engineering and auxiliary systems.



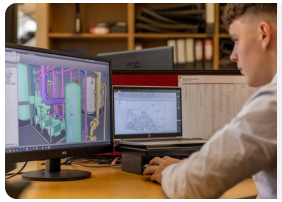
Data centers

HV/MV/LV planning, IT rooms, backup generation, UPS and power for cooling systems.



Cable systems

Sizing, routing and cable trays, including underground systems.



Structures & BIM

Supports, calculations and coordinated models.

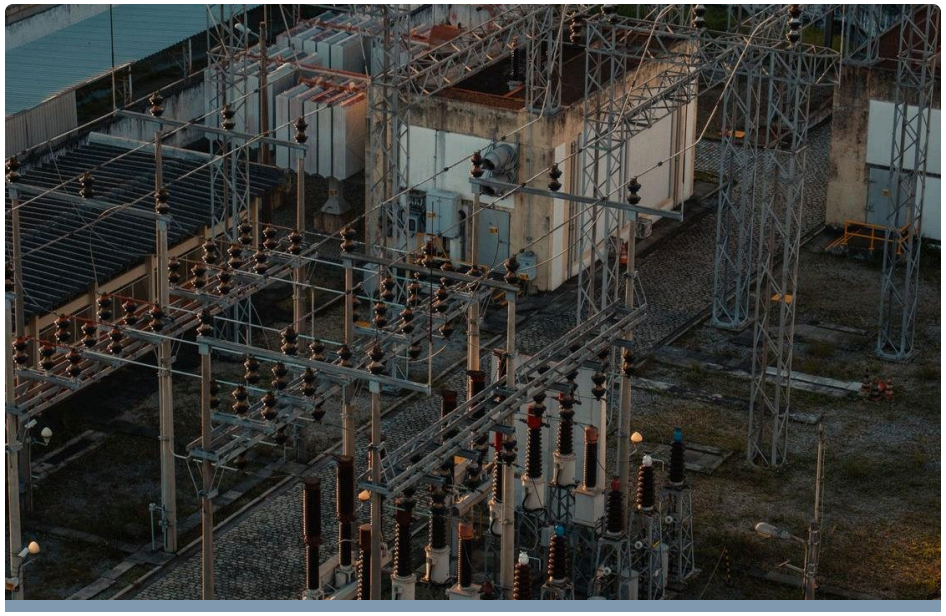


BESS & PV systems

PV/BESS, equipment specifications and requests for quotation.

Grid connection and power system studies

Electrical analyses for connection, expansion and reliable operation.

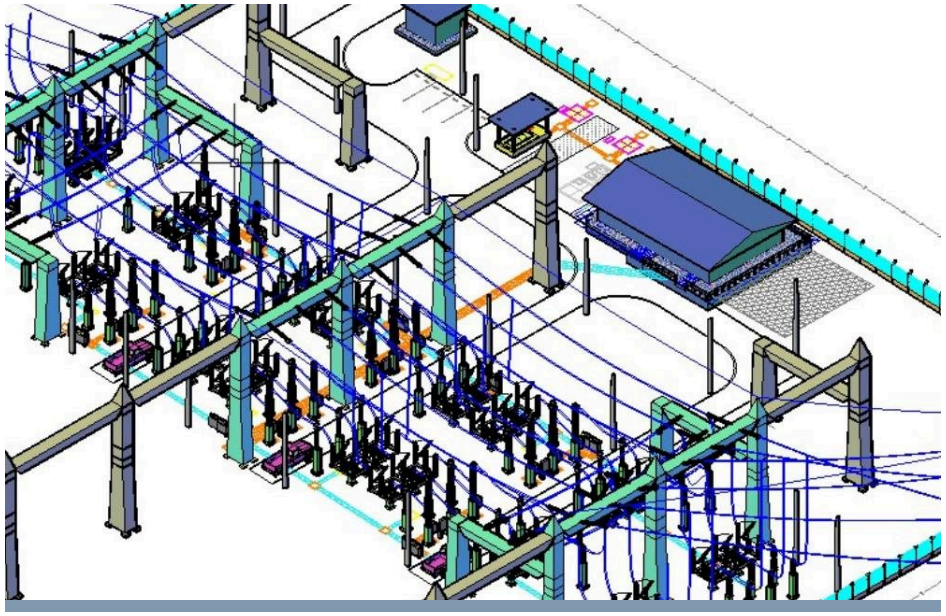


- Load flow and short-circuit calculations.
- Integration studies for grid-forming inverter-based resources (IBR).
- Harmonic analysis and harmonic stability.
- System stability and power quality analysis.
- Development of EMT and RMS models and system analysis.
- Electromagnetic transient (EMT) studies.
- Grid connection and compliance studies (from preliminary enquiries to the technical connection conditions / TAB).

Standards and guidelines	VDE-AR-N 4110, VDE-AR-N 4120, VDE-AR-N 4130, IEC 61000 series, IEC 62305-2, D-A-CH-CZ regulations, IEC 60909, G99.
Software and tools	DIgSILENT PowerFactory, PSCAD, Siemens PSS®E, NEPLAN, ETAP

Substation primary engineering

Coordinated AIS/GIS design and layout of high-voltage equipment.



Bays and equipment

Bay configuration, transformers, circuit breakers, instrument transformers, surge arresters, busbars, bills of materials and quantity take-offs.

Electrical design

Equipment ratings and sizing, insulation coordination, cables and routing, short-circuit forces, earthing and lightning protection.

Layout and connections

Layouts, safety and maintenance clearances, gantries and cable interfaces.

Installation model

2D/3D primary design with primtech 3D and AutoCAD; manufacturer data according to project requirements.

DELIVERABLES Single-line diagram · layout · calculation reports · equipment specifications

Protection, control and SCADA

Secondary engineering for selective protection and SCADA control systems.



Protection systems

Protection philosophy, selectivity studies, instrument transformer requirements, protection relay settings and parameterisation.

Control and interlocking

Bay control, interlocking matrix, schematics and terminal diagrams.

Communications

SCADA/RTU interfaces, signal lists and IEC 61850 engineering where applicable.

Technical review

Manufacturer documentation, functional descriptions and FAT/SAT documents.

DELIVERABLES Protection philosophy · setting list · schematics · signal and point lists · specifications

Auxiliary systems

Supply for all auxiliary services of substations and plants.



AC systems

MV/LV transformers, switchgear, main and sub-distribution boards and automatic transfer (ATS) concepts.

Buildings and rooms

Placement of switchgear and boards in substation buildings, technical rooms and outdoor areas; heat-loss calculation for electrical equipment.

Electrical calculations

Load lists, cable sizing, voltage drop, short-circuit and selectivity.

Equipment procurement

Data sheets and specifications for transformers, switchgear, DC and battery systems, UPS and diesel generators; technical RFQ support.

DELIVERABLES Auxiliary single-line · load lists · room layouts · calculation reports · specifications

DC systems, batteries and UPS

Secure supply for protection, control and essential auxiliary loads.



DC distribution

Battery banks, chargers, main/sub DC boards and redundant feeds.

Battery sizing

Autonomy and load profile, voltage limits, end-of-discharge voltage drop and margins.

UPS supply

Topology, bypass, battery capacity and allocation of critical AC loads.

Physical integration

Battery/UPS rooms, layout, access, ventilation interface and specifications.

DELIVERABLES DC/UPS single-line · battery sizing · load lists · room layouts

Data centers: HV/MV architecture

Grid connection and medium-voltage distribution for scalable data centers.



Grid connection and transformation

Connection options, HV/MV switchgear, transformers and supply concept.

Distribution to buildings

MV rings or feeders to buildings and technical plants, with expansion stages.

Availability

A/B paths, redundancy requirements, maintenance and defined faults.

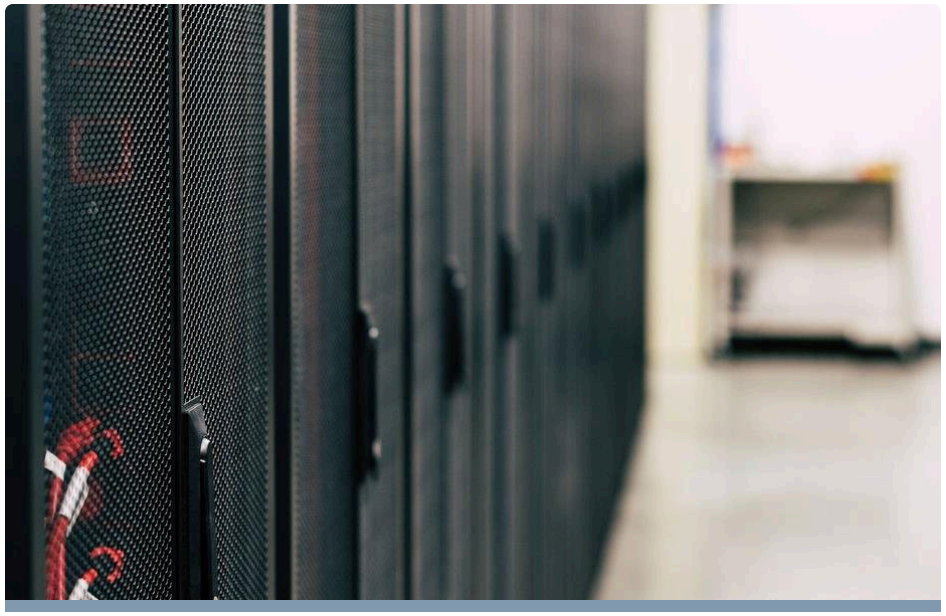
System studies

Load flow, short-circuit, protection coordination and voltage drop.

DELIVERABLES Data center single-line · power and load balance · equipment layouts · studies

Data centers: low voltage

Distribution across all buildings, plants and technical rooms.



Low-voltage distribution

Main switchboards, busways, PDUs/RPPs and final IT and services circuits.

Buildings and rooms

Transformer, switchgear, UPS/battery rooms, IT areas and auxiliary spaces.

A/B paths

Separate feeders, switching states, growth capacity and maintenance.

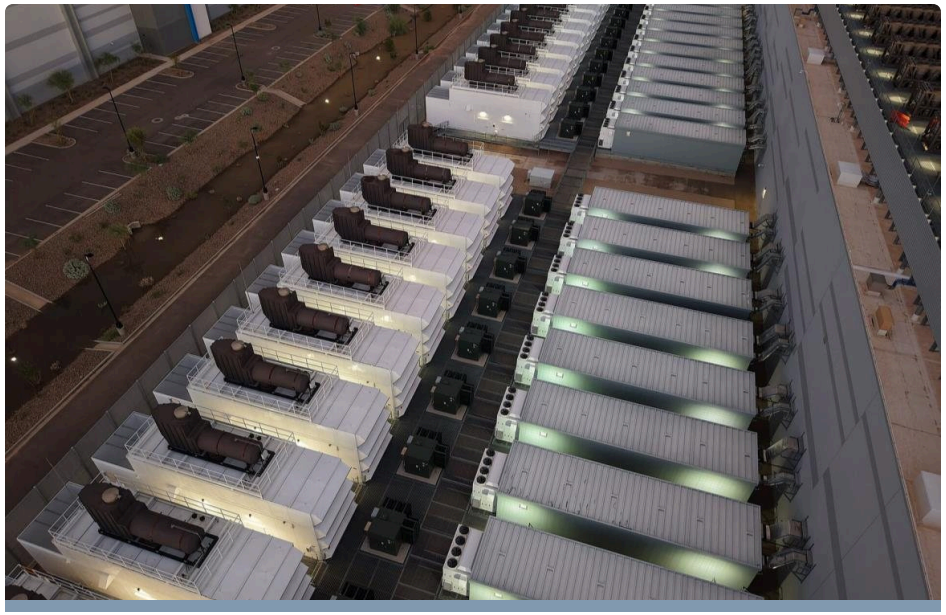
Sizing and layout

Circuit lists, cables, protection devices, room occupancy and MEP interfaces.

DELIVERABLES Building single-lines · board schedules · layouts · circuits and cables

Data centers: diesel and UPS

Coordinated emergency generation and uninterruptible power.



Diesel generators

Rating, number of units, redundancy, load steps, motor starting and paralleling.

Transfer and island mode

Grid/generator changeover, synchronisation, sequences and protection in island operation.

UPS and batteries

Rating, topology, bypass, autonomy and battery configuration.

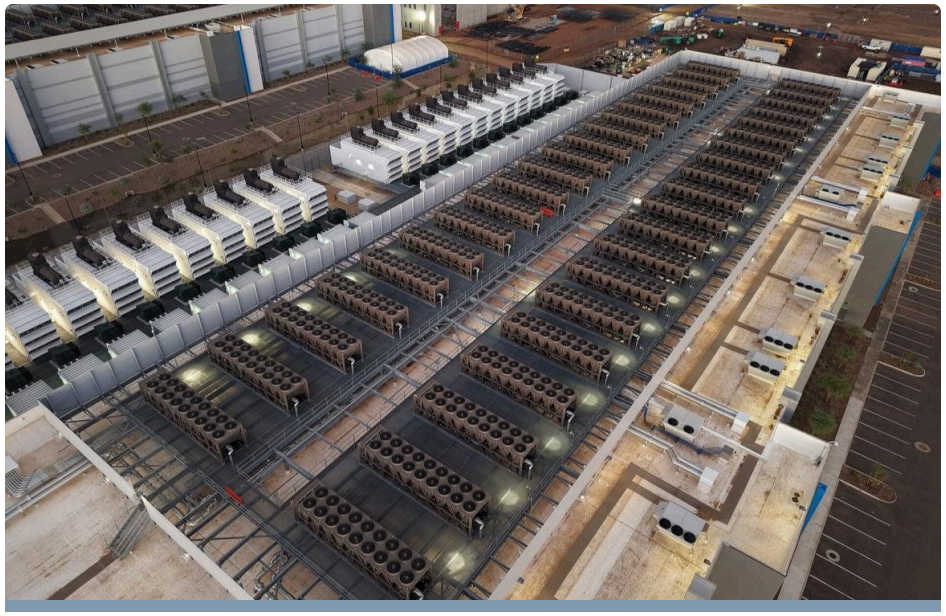
Plant interfaces

Rooms, fuel, exhaust and ventilation interfaces, and specifications for RFQ.

DELIVERABLES Backup single-line · load steps · UPS/battery calculations · functional description

Data centers: power for cooling

Electrical design for chilled-water production, air handling and heat rejection.



Cooling and heat rejection

Supply for chillers, dry coolers/towers and auxiliary equipment.

Pumps and air

Distribution for pumps, CRAH/CRAC units, ventilation, fans and drives.

Operating scenarios

Starting, load steps, redundancy, transfer to backup and protection coordination.

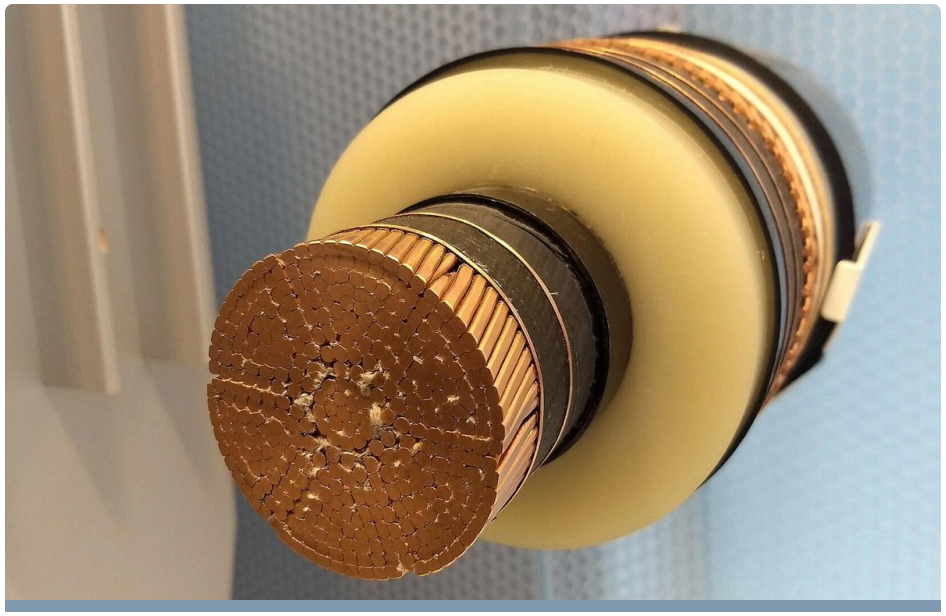
Building integration

Location of boards, routes and power/control interfaces with HVAC and BMS.

DELIVERABLES HVAC load list · single-lines · cable/board lists · layouts

HV/MV/LV/DC cable sizing

Electrical and thermal calculations based on the actual installation method.



HV/MV cables

Ampacity, soil properties, thermal interaction, sheath currents and load cycles.

LV and DC circuits

Design current, voltage drop, protective measures, short-circuit and final DC voltage.

Installation conditions

Direct burial, ducts, duct banks, trenches, trays and grouping.

The right tools

CYMCAP for thermal cable models; ETAP for system and protection studies and DC cables; Caneco/Simaris for LV circuits.

DELIVERABLES Cable calculations · cross-section list · installation assumptions · report

Underground cable routes

Spatial and thermal design of buried HV, MV, LV and DC circuits.



Route systems

Direct burial, duct banks, trenches, joint bays and crossings.

Occupancy and spare capacity

Circuit allocation, segregation, access, future capacity and cross-sections.

Thermal conditions

Soil temperature and resistivity, depth, spacing and mutual heating.

Civil interface

Location of ducts/joint bays, bending radii, pulling lengths and coordination with civil works.

DELIVERABLES Route drawings · cross-sections · occupancy drawings · thermal calculations

Cable containment in buildings

Coordinated routes from the building entry to the equipment and final load.



Cable support systems

Trays, ladders, risers, raised floors and trunking.

Routes and capacity

Occupancy, spare capacity, access, branches and bending radii.

System segregation

HV/MV/LV/DC/control as required; EMC and fire-protection interfaces.

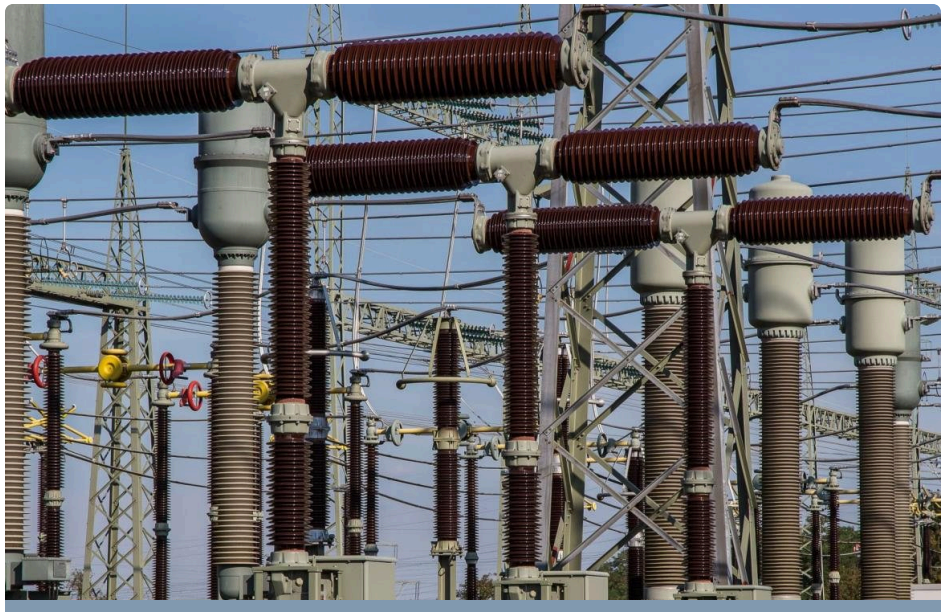
Spatial coordination

Penetrations, fire compartments, maintenance and interfaces with civil works and MEP.

DELIVERABLES Route drawings · occupancy tables · cross-sections · penetration and cable lists

Mechanical calculation and structures

Supports for HV equipment, switchgear and cable systems.



Mechanical design

Frames, busbar and cable supports, steel and aluminium components.

Load cases

Dead load, wind, ice, erection/maintenance loads and short-circuit forces.

Analysis and model

3D design in Autodesk Inventor; stresses and deformations in ANSYS where required.

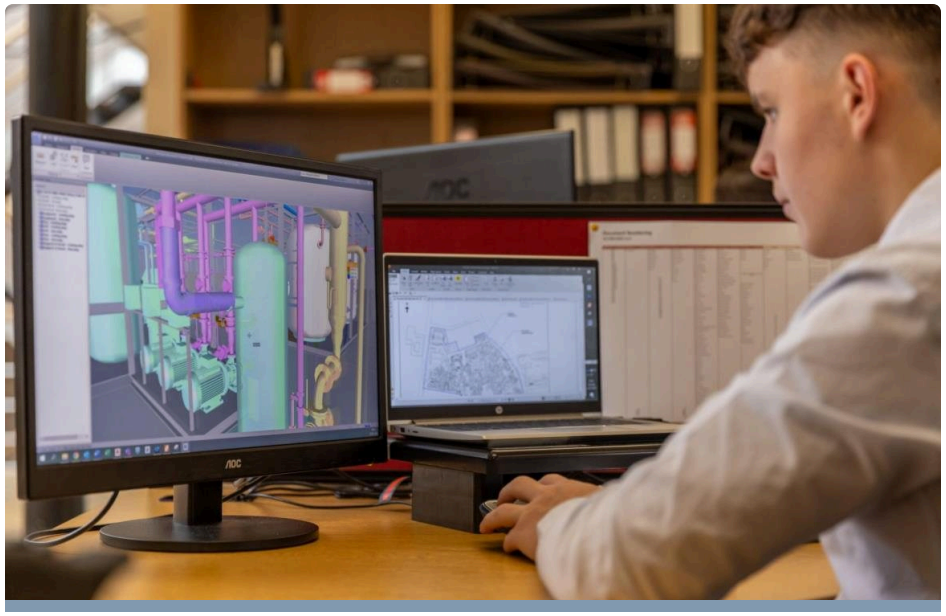
Civil interface

Reactions, anchor loads and foundations coordinated with structures.

DELIVERABLES 3D model · load assumptions · calculation report · fabrication/erection drawings

BIM and coordinated 3D models

Electrical models for verifiable spatial coordination.



Model content

Switchgear, transformers, rooms, cable routes and supports at the agreed level of detail.

Clash detection

Clashes with civil and MEP; equipment access and maintenance spaces.

Data and coordination

Coordinates, attributes, revisions, views and sections according to the BIM execution plan.

Tool environment

primtech 3D, Inventor, Revit and Navisworks as required; IFC/model delivery as agreed.

DELIVERABLES Electrical model · clash register · coordinated views and sections

Photovoltaics and BESS storage

Integration of generation and batteries in line with grid requirements.



Grid connection

Architecture, load flow, short-circuit, reactive power and operator requirements.

Plant distribution

HV/MV switchgear, transformers, inverters, BESS and auxiliary systems.

Protection and control

Protection philosophy, operating modes, metering and SCADA/EMS interfaces.

Cables and layout

Sizing, routing, layout and technical specifications.

DELIVERABLES Connection single-line · studies · layout · cable/equipment lists

Technical procurement and Owner's Engineering

Verifiable documentation for equipment procurement.



Specifications

Data sheets for transformers, switchgear, batteries, UPS, generators and cables.

RFQ packages

Technical scope, interfaces and testing and documentation requirements.

Bid evaluation

Comparison matrices, deviations and clarifications with manufacturers.

Vendor documents

Review of drawings/calculations and FAT/SAT technical support within scope.

DELIVERABLES Specifications · RFQ package · technical evaluation · review log

Engineering quality that counts

Our processes ensure that every deliverable complies with standards, is verifiable and can be audited.

Four-eyes principle

A second specialist engineer checks and approves every calculation and document.

Version control

Documentation of all design stages, traceable and audit-ready.

Standards-compliant deliverables

All documents comply with the applicable VDE, IEC, EN, BS, IEEE and DIN standards and are ready for review by network operators and authorities.

Interface coordination

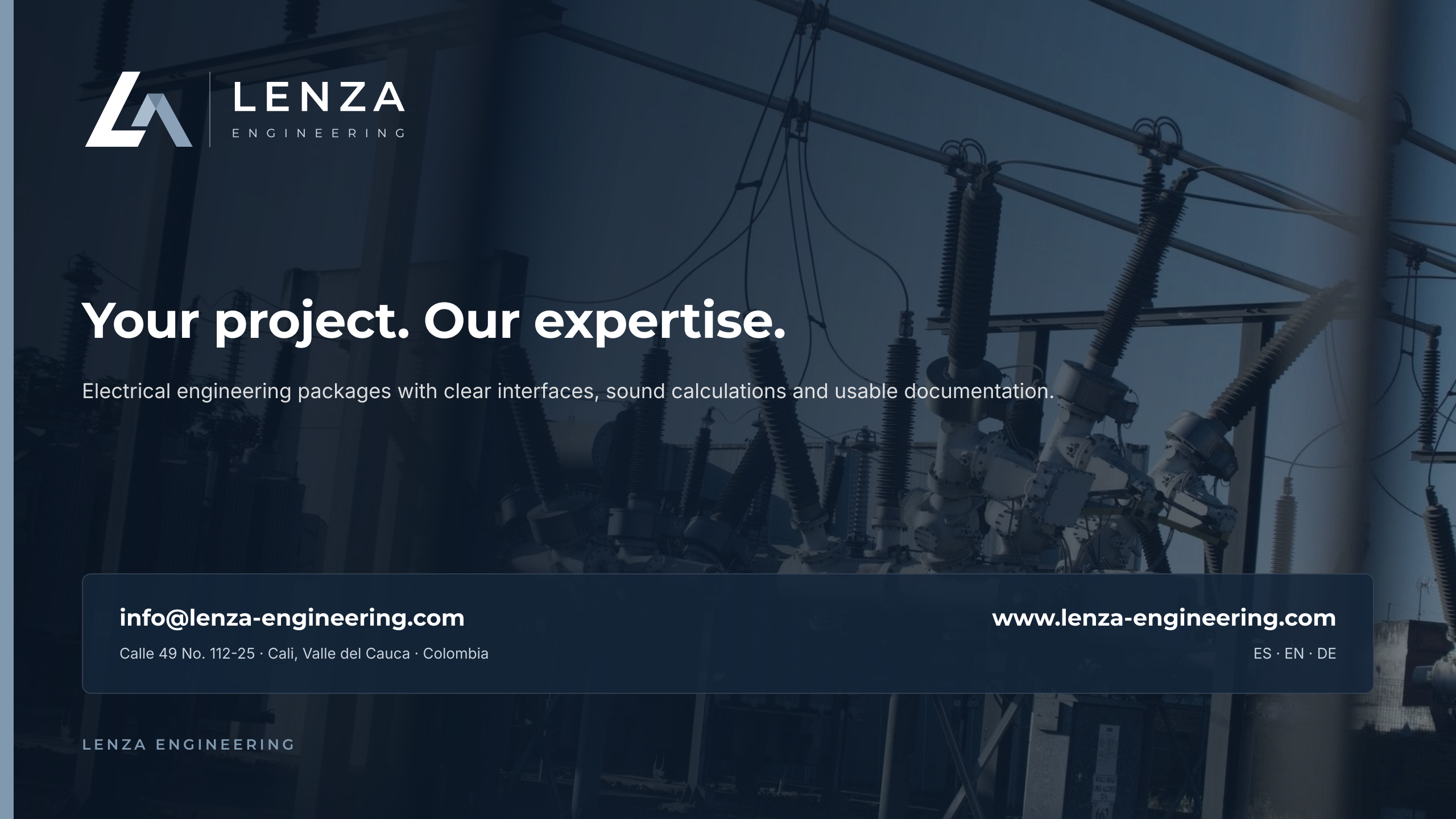
Clear coordination with network operators, suppliers and EPC contractors to avoid information loss at interfaces.

Change management

Structured record of all design changes, transparent and traceable for all parties.

Coordination with authorities and operators

Active coordination with distribution and transmission system operators and with authorities throughout the process.



LENZA
ENGINEERING

Your project. Our expertise.

Electrical engineering packages with clear interfaces, sound calculations and usable documentation.

info@lenza-engineering.com

Calle 49 No. 112-25 · Cali, Valle del Cauca · Colombia

www.lenza-engineering.com

ES · EN · DE