

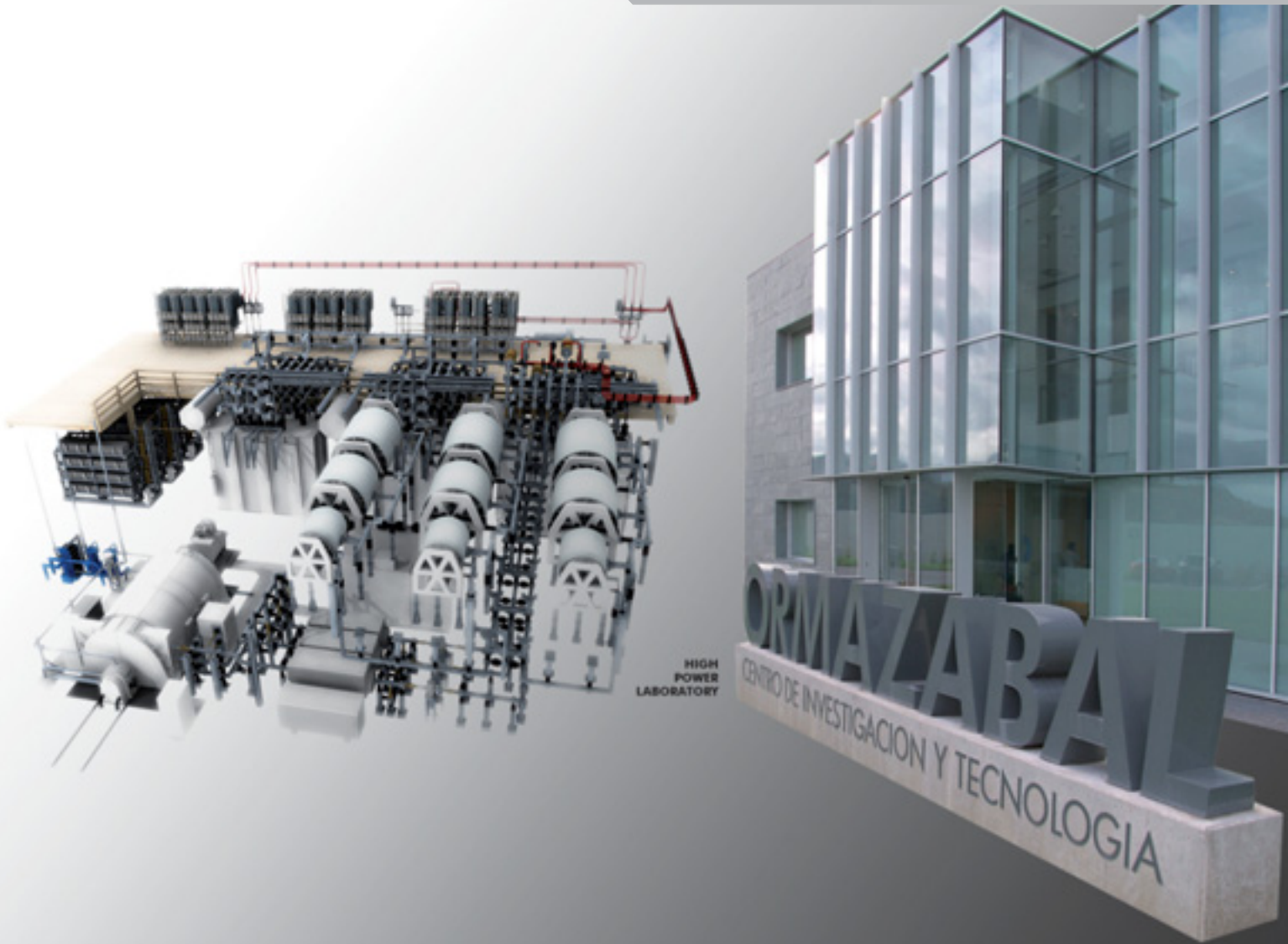


ORMAZABAL

Focus on Medium Voltage



Ormazabal: A life of Innovation



Research and Technology Center (CIT)

CIT: RESEARCH and TECHNOLOGY CENTER



CIT'S MISSION

The mission of the **Research and Technology Center (CIT)** is the identification, acquisition and dissemination within the **Ormazabal Group** of those product technologies or processes, which have been identified as strategic and must be incorporated in the development of new products and processes.



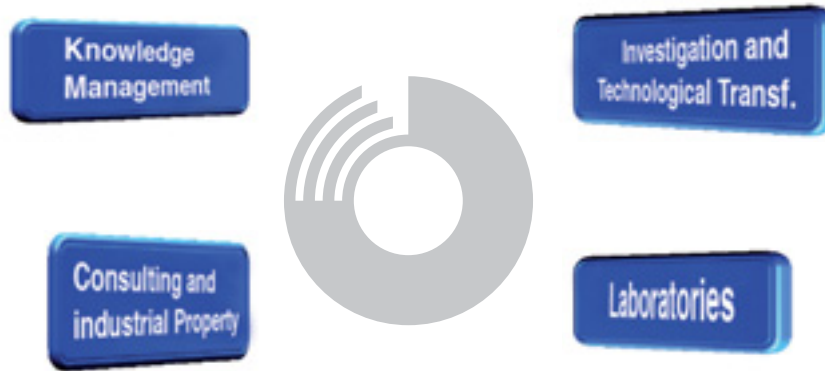
CIT'S VISION

CIT's vision is to become a reference organization at the international level for the application of new technologies in the electric sector; to be achieved through technological leadership within the **Ormazabal Group**.

ORGANIZATION



ORGANIZATIONAL STRUCTURE



Surveillance, Investigation and Technological Transferring: Defines, plans and performs Investigation projects for the development of non-existing technology, or Technological Transferring projects via agreements (partners, joint ventures, etc) or our own training for existing technologies.

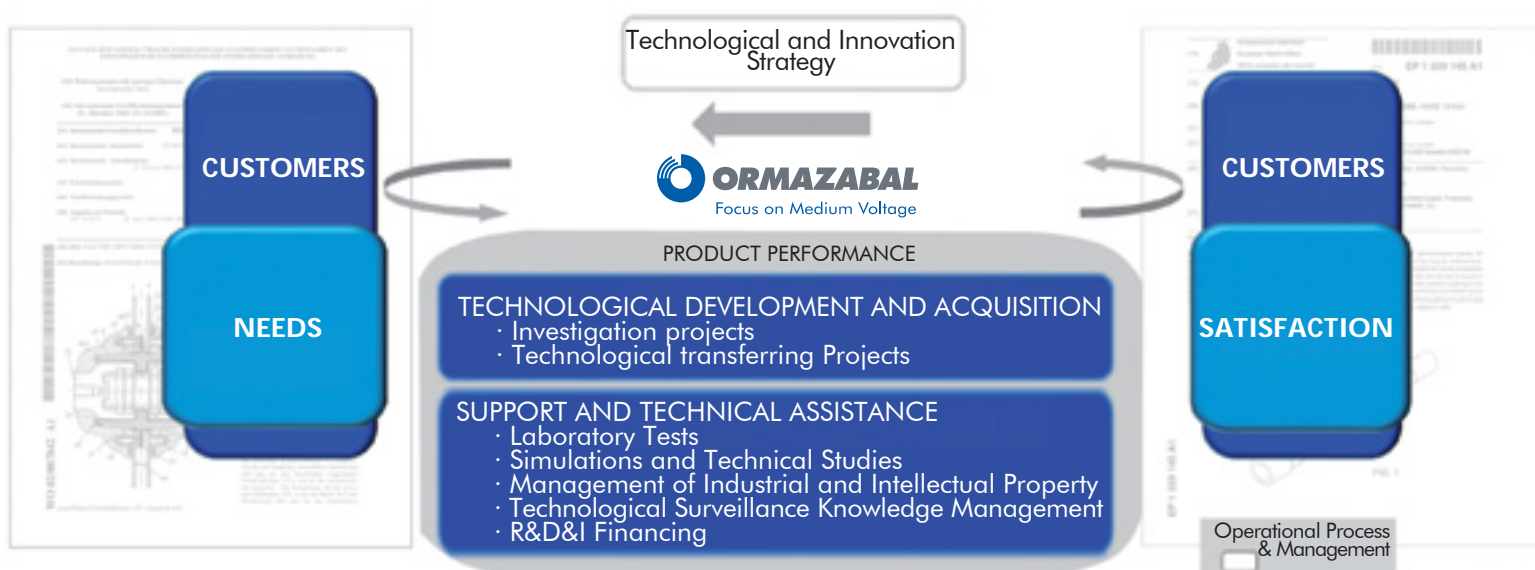
Consulting and industrial Property: It manages the organization's intellectual property.

Knowledge Management: Controls the documental management and the Portal where all the technical information is compiled.

Laboratories: Concentrates all of Ormazabal's testing and experimental investigation capabilities.



PROCESSES



TECHNOLOGICAL CAPABILITY



From the time **Ormazabal** was founded in 1967, it has been aware of the strategic importance of investigation applied to its own technological development, and in this way offering quality products and services to clients and reinforcing a worldwide privileged technological position. The Research and Technology Center represents an important leap in the company's evolution; a long desired project which aim is to be an international technical reference in the field of power distribution networks.

The Research and Technology Center represents an essential element in **Ormazabal's R&D**, with the purpose of capturing and improving existing technologies and investigating new ones.

The **CIT** offers its services to the **technological scientific sector for performing investigation testing and for developing and certifying products** for Ormazabal's own business units and for the rest of the electrical sector.



HIGH POWER LABORATORY

In the High Power Laboratory we can experiment and perform testing for the development of products that are safer for personnel and assets; which contribute to the improvement of the electrical supply and to a sustainable development.

The generation of the required power for testing is produced using a **short-circuit power generator (SCG)** rated at 2,500 MVA. The tests can be performed at 50 or 60 Hz.



CAPABILITIES

Laboratory short-circuit Power Tests

2,5 GVA

High Voltage Switches and Circuit breakers

Ability to withstand short-circuits	40 kA / 3 s
Connecting and breaking of Short-circuits	20 kA / 36 kV
	40 kA / 17.5 kV
Connecting and breaking of Active Loads	up to 2000 A / 36 kV
Connecting and breaking of Capacitive Loads	up to 100 A / 36 kV
Internal Arc	40 kA / 1 s

Transformers

Ability to withstand short-circuits	up to 20 MVA / 36 kV up to 25 MVA / 24 kV
Internal Arc	40 kA / 1 s

Low Voltage Switchgear

Ability to withstand short-circuits	80 kA / 1 s
-------------------------------------	-------------



OTHER LABORATORIES



HIGH VOLTAGE LABORATORY

The following tests can be performed at the High Voltage Laboratory:

- DIELECTRIC TESTS AT INDUSTRIAL FREQUENCY
- DIELECTRIC TESTS WITH VOLTAGE PULSES
- PARTIAL DISCHARGE TESTS

LABORATORY SHEET

- Lightning type pulse testing: up to 300kV
- Testing at industrial frequency: up to 100kV
- Partial discharge tests: up to 100 kV \geq 2 pC



TEMPERATURE RISE LABORATORY

- TEMPERATURE-RISE TESTS

LABORATORY SHEET

- Overheating tests: up to 4000 A
- Automatic current regulation
- Temperature Recording Channels: 180
- V measurement



ACCELERATED AGEING TEST

- In this laboratory we are able to perform synthetic tests, applying High Voltage and High Current cycles using independent sources

LABORATORY SHEET

- High Voltage at Industrial Frequency: Up to 100 kV
- High induced currents: up to 2000 A
- Automated control of cycles
- Automatic Fire Extinguishing System

MECHANICAL LABORATORY

LABORATORY SHEET

- Digital Oscilloscopes and Probes
- Data acquisition system
- Power Sources
- High Speed Filming: up to 10,000 images
- Saline Fog Chamber: 450 l
- Climate Chamber: -40°C to 180°C
- Dew point measuring in SF6



TESTS

The **CIT** laboratories are accredited by the National Accreditation Entity (ENAC) in accordance with standard UNE-EN ISO/IEC 17025.

ENAC accreditations are recognized in more than 50 countries since ENAC is signatory of the Mutual Recognition Agreements establis-

hed at the international level between accreditation organizations all around the world.

ENAC is a member of ILAC (International Laboratory Accreditation Cooperation), which integrates laboratory accreditation organisms around the world.



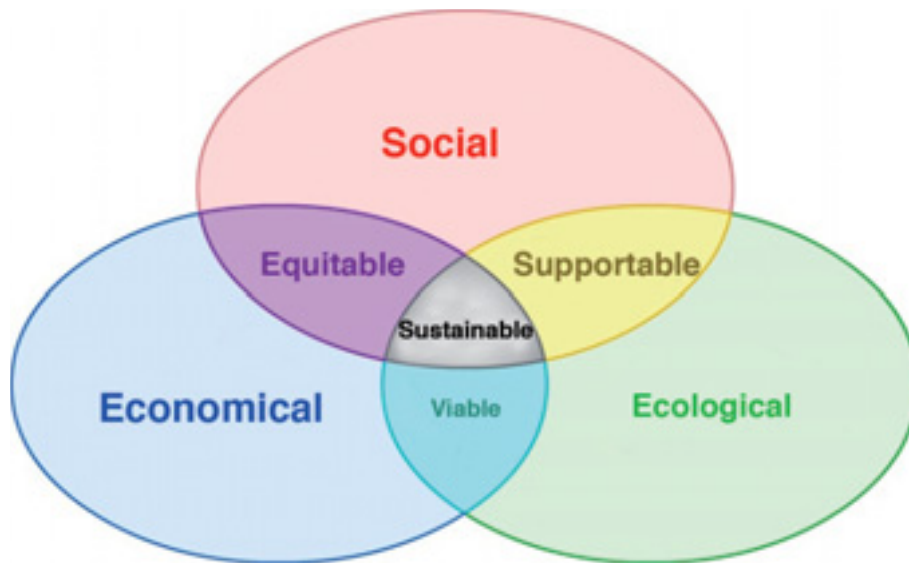
SUSTAINABILITY

Ormazabal has established the Sustainability or Sustainable Development as a strategic objective and is present in all of its activities.

Sustainability is defined as the best compromise between social needs and environmental and economic impact.

We understand that Social Needs come first, while of course taking the environmental and economic aspects into account.

Social aspects are the security of personnel and material goods; and the quality (continuity) of the electrical power supply.



Ormazabal's Research and Technology Center concentrates their efforts in Investigation and Technological Development as well as Innovation for achieving products and services that are more secure and more reliable, while taking into account the eco design and evolution of the networks and their needs.

We are working in the present to offer the products that will be required in the networks of the future.

The resources used at the Research and Technology Center, Human Resources and Laboratories demonstrates **Ormazabal's** commitment with its customers, which are offered a greater value in the short and long term, focused on sustainable solutions (products and services), adapted to present and future needs.



ORMAZABAL

Focus on Medium Voltage

ORMAZABAL CORPORATE TECHNOLOGY. Accredited Entity
RESEARCH AND TECHNOLOGY CENTER

Parque Empresarial Boroa · parcela 3A
48340 Amorebieta-Etxano · Vizcaya (Spain)
Tel.: +34 94 630 51 30 · Fax: +34 94 630 92 92

www.ormazabal.com

ACCREDITATIONS



The **High Power laboratory, with the collaboration of KEMA**, was certified by this same entity after its commissioning.

Through a collaboration agreement for the mutual assignment of the test installations, the Official Central Electrical technology Laboratory can use the **CIT** installations for performing their own tests.



ILAC: International Laboratory Accreditation Cooperation
ENAC: National Accreditation Entity (SPAIN)