WELCOME TO IIT

Institute for Research in Technology
Instituto de Investigación Tecnológica (IIT)
1. IIT Mission & Vision Open to the world
2. Five key points about IIT
3. IIT in numbers 2020/2021
4. Structure and Organization
5. Research groups
6. Energy Economics & Regulation
   - Smart and Sustainable Grids
   - Energy Systems Models
   - Electric Power Systems
   - Intelligent Systems
   - Fire Safety, Thermal and Fluids Engineering
   - Railway Systems
   - Bioengineering
   - Smart Management for Sustainability
7. Products and Services
8. Relevant European Projects
9. Relevant partners
1. IIT Mission & Vision
Open to the world

**International activity** is at the core of IIT life. We are a committed member of the international research community.

IIT participates in a variety of **European Commission Research Projects** in the fields of **smart grids, renewable energy integration, electric vehicles, energy system models, cybersecurity, and others.**

In blue countries where IIT has developed projects
2. Five key points about IIT

was founded in 1984 ago and is a university-based research center which belongs to the ICAI School of Engineering of Universidad Pontificia Comillas.

places academic excellence at the core of its activities, participating fully in the international research community. Strong cooperation with the Massachusetts Institute of Technology in research & teaching activities. IIT also participates in international networks: Electric Energy Systems-University Enterprise Training Partnership (EES-UETP), Climate Friendly Materials Platform (CFMP), international professional associations such as IEEE, CIGRE, CIRED, ISGAN, among others.

is dedicated to applied research, doctoral and postgraduate education and the transfer of technology and knowledge to society. IIT researchers have had relevant positions at regulatory authorities and expert groups in Spain, Ireland and at the European Association of Energy Regulators

is self-financed and most of its work is carried out in collaboration with industry.

has more than 120 researchers and academic staff from 4 continents. Among them, recognized researchers included in the 2% of the most influential researchers worldwide according to Stanford University: Tomás Gómez, Luis Rouco and Pedro Linares,
### 3. IIT in numbers 2020/2021

<table>
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<th>Staff</th>
<th>Projects Turnover</th>
<th>Projects funded by industry and institutions</th>
<th>Papers published in JCR journal</th>
<th>Thesis</th>
<th>Courses</th>
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<tr>
<td>126</td>
<td>7.25</td>
<td>190</td>
<td>84</td>
<td>5</td>
<td>15</td>
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- **Staff**
  - 59 research assistants
  - 80 senior researchers
  - 6 admin

- **Projects Turnover**

- **Projects funded by industry and institutions**
  - 10 in other publications

- **Papers published in JCR journal**

- **Thesis**
  - submitted, 63 ongoing

- **Courses**
  - training and specialized
  - offered to external entities

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**Graphs:**

- **Turnover M€**
- **Projects**

- **Researchers**
- **Associated Researchers**
- **Student Researchers**
4. Structure and Organization
5. Research groups

- Energy Economics & Regulation
- Smart and Sustainable Grids
- Smart Management for Sustainability
- Energy System Models
- Electric Power Systems
- Intelligent Systems
- Fire Safety, Thermal and Fluids Engineering
- Railway Systems
- Bioengineering
- Smart Management for Sustainability
6. Energy Economics & Regulation

- Regulatory design of energy markets
- Economic instruments for environmental and climate change policy
- Regulation of transmission and distribution networks
6. Smart and Sustainable Grids

- Smart Grids
- Planning and operation of Distributed Energy Resources
- Green energy integration
- Universal energy access & rural electrification
- Information and Communication Technologies & data exchange protocols
- Smart Grid Data modelling
6. Energy Systems Models

- Short-term operation and market bids
- Medium-term planning studies
- Long-term strategic analysis
6. Electric Power Systems

- Steady-state
- Dynamic analysis & stability
- Automatic Generation Control
- Power electronics
- High Voltage Direct Current
- Power Quality / Electromagnetic transients
6. Intelligent Systems

- Smart buildings
- Forecasting and data mining
- Smart cities
- Reliability, maintenance and diagnosis
- Mobile robotics and artificial vision
- Helping accessibility using Information and Communication Technologies
- Smart Industry
- Artificial intelligence applied to industrial robotics

Big data analytics in energy systems.
6. Fire Safety, Thermal & Fluids Engineering

- Numerical modelling
- Structural analysis
- Experimental analysis
- Adhesives
6. Railway Systems

- Optimal design of signaling and railway capacity
- Railway power supply systems
- Safety analysis, specification and demonstration of RAMS (Reliability, Availability, Maintainability and Safety), quality control and assurance
- Communication and control in railway power systems
- Mechanical design of overhead contact lines

Centralized Regulation System for Madrid-Barcelona High Speed Train.
6. Bioengineering

- Electronic Instrumentation
- Digital communications
- Embedded digital systems
- Biomaterials
- Biomechanics
- Biomedical metrology
6. Smart Management for Sustainability

- Managerial transitions to sustainability (SDG) and disruptive business models
- Social inclusion, vulnerability, longevity and wellbeing
- Management and measurement of stakeholder satisfaction
- Adoption of green technologies and consumer engagement
- Socioeconomic indicators and Environmental, social and corporate governance
- Circular economy
- Deep reality analysis
7. Products and Services

Smart and sustainable grids

- **RNM** Reference Network Model

- **REM** The Reference Electrification Model
7. Products and Services

Computational mechanics and advanced materials
- **CANDY** Catenary Non-linear Dynamics

Intelligent systems
- **SPLODER**: Smart Planning Operation DER

Power electronics and telecom
- **SIMPRIME**
7. Products and Services

**Energy Systems Modeling**
- **OWL** Offshore Windfarm Layout
- **CEVES** Dynamic Generation Expansion

- **openTEPES**: Open Generation, Storage, and Transmission Operation and Expansion Planning Model with RES and ESS
- **TEPES** Long-Term Transm. Expansion
- **ROM** RES Reliability Operation
- **StarNet** Bulk Generation Cost
- **FLOP** Generation System Reliability
7. Products and Services

Electrical Systems

• ISLA Island System Load-shedding
8. Relevant European Projects

Horizon 2020
8. Relevant European Projects

Seventh framework programme
9. Relevant partners

Our main customer list includes Spanish and international companies and institutions in sectors like Energy, Transportation or Communications.

iit.comillas.edu
THANK YOU

Contact details:
info@iit.comillas.edu