

# The Spanish Science Industry

## Document on industrial interests on ILC in Spain

**Erik Fernández (INEUSTAR)**

ILCX 2021

2019/10/26

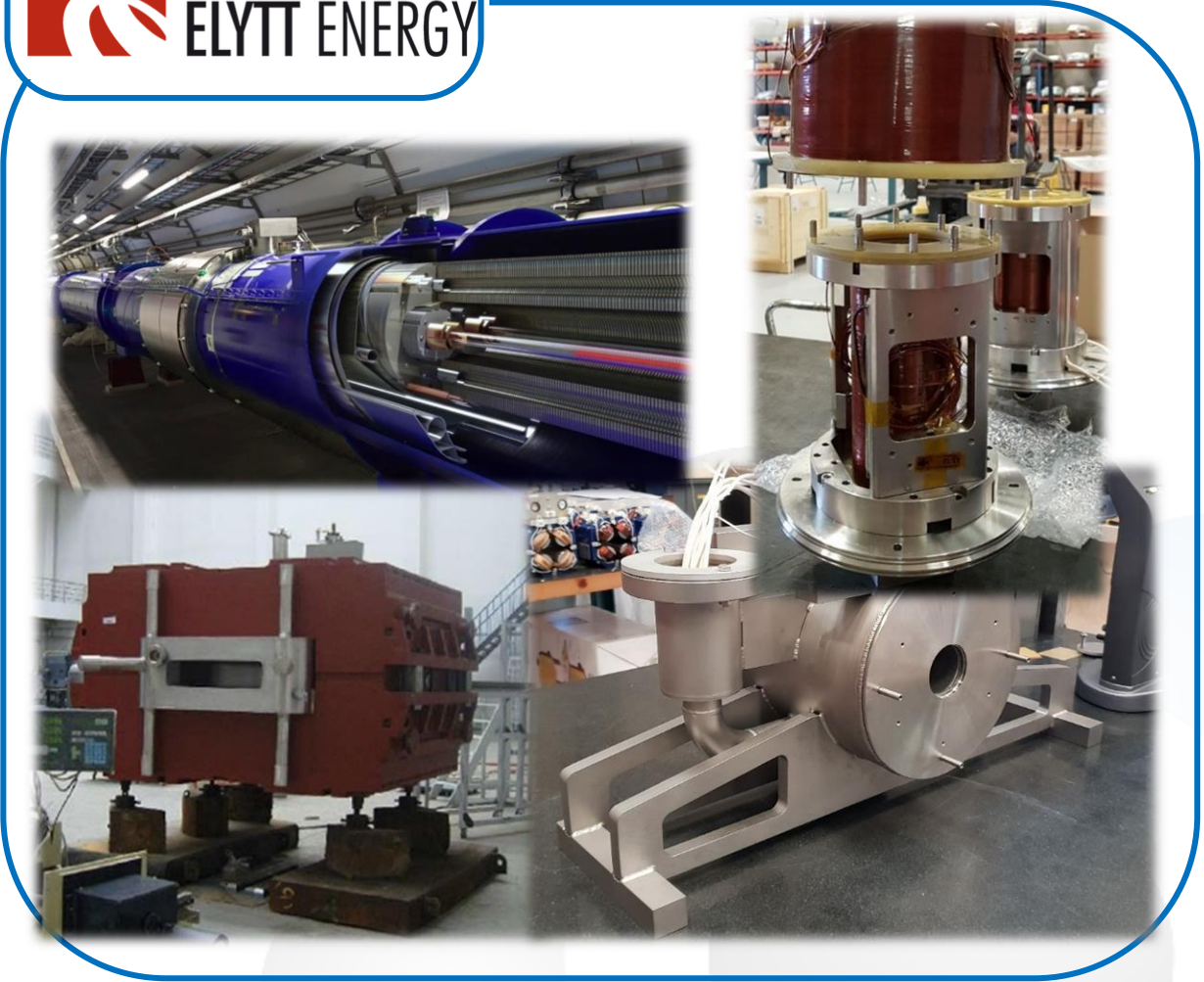
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Asociación Española de la Industria de la Ciencia

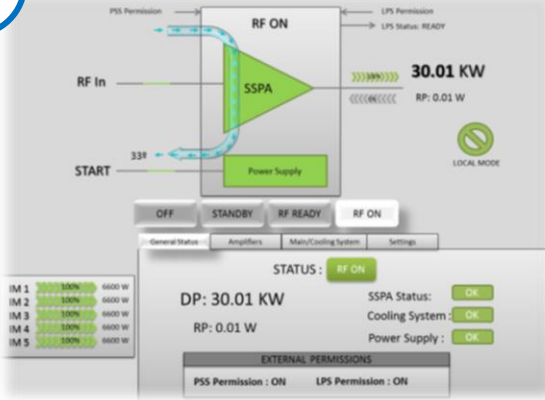


# Few examples of highly technological systems developed by Spanish companies



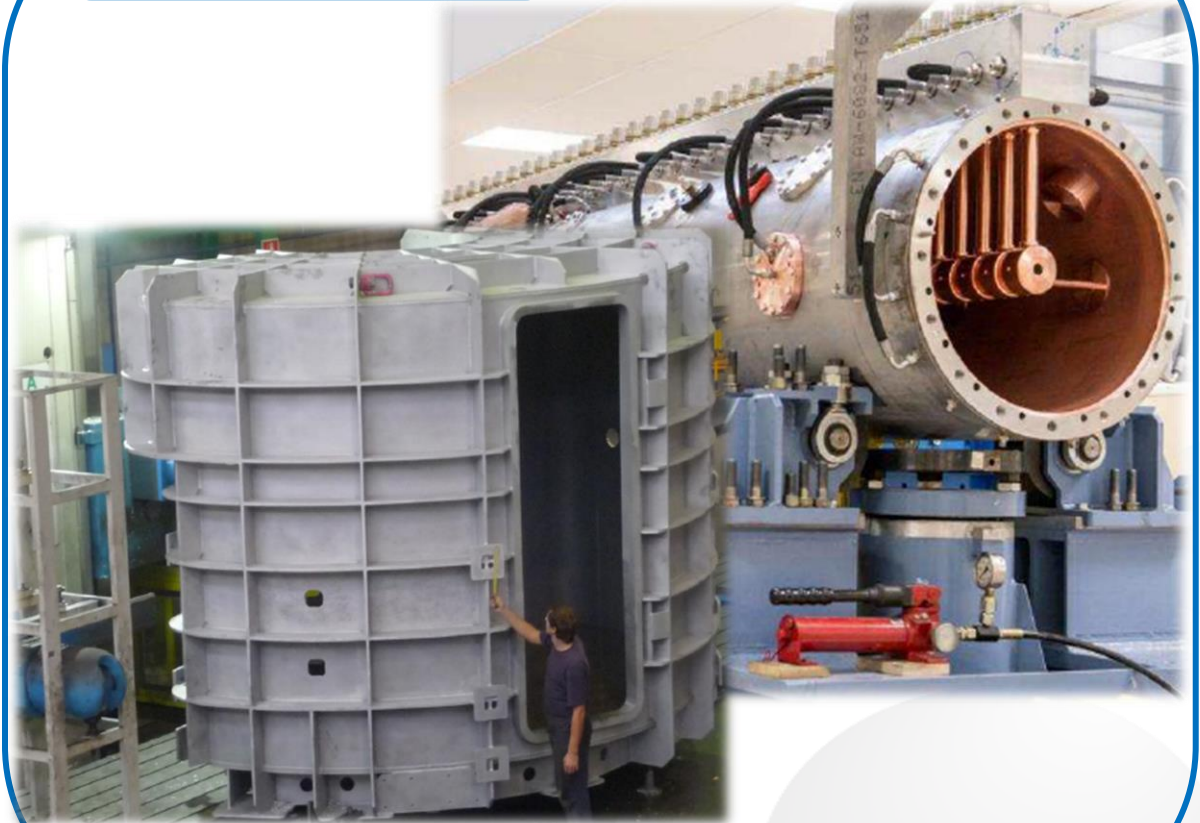


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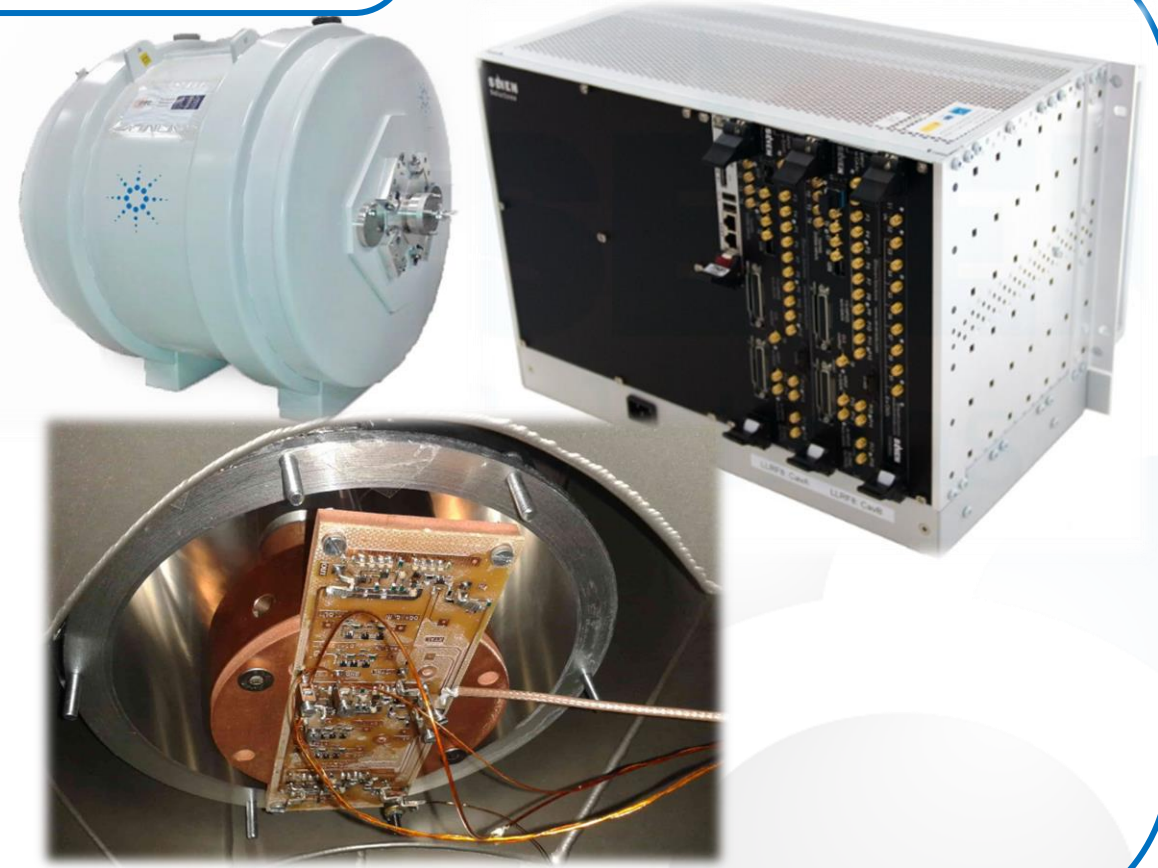
Document on industrial interests on ILC

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Dr. Erik Fernández

# Few examples of highly technological systems developed by Spanish companies



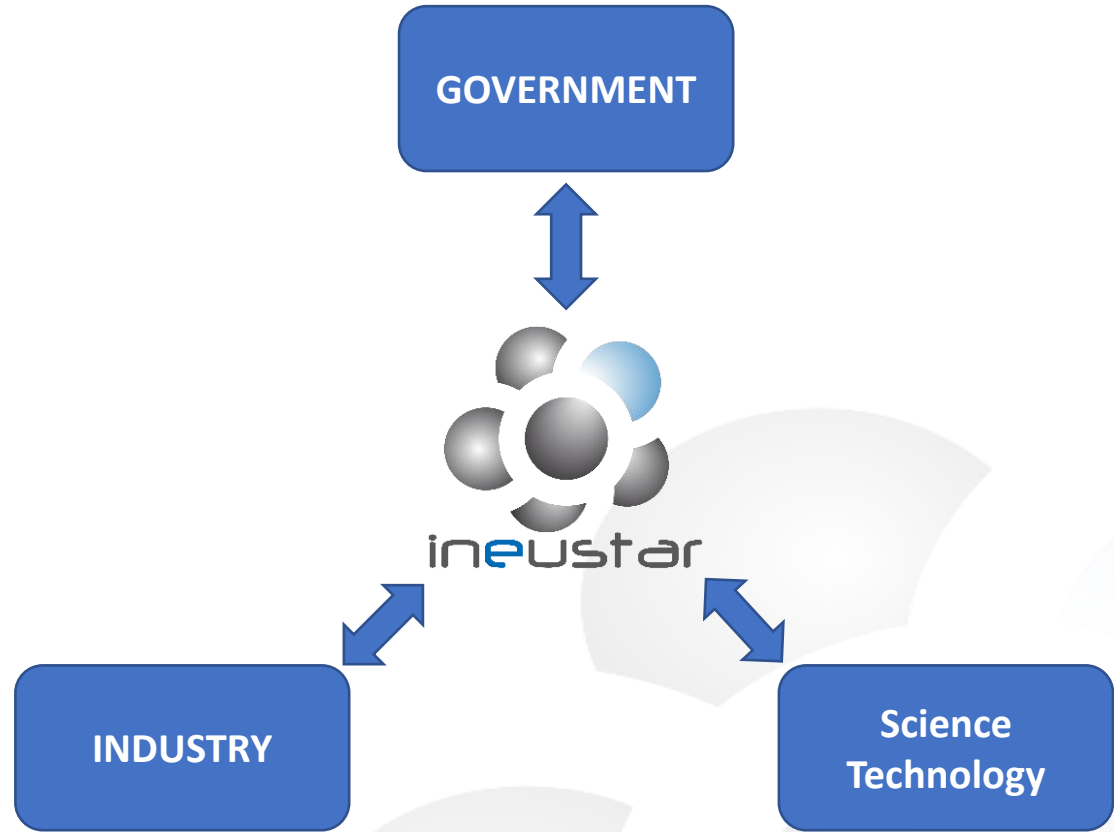


# Technology centers – Public and privates-

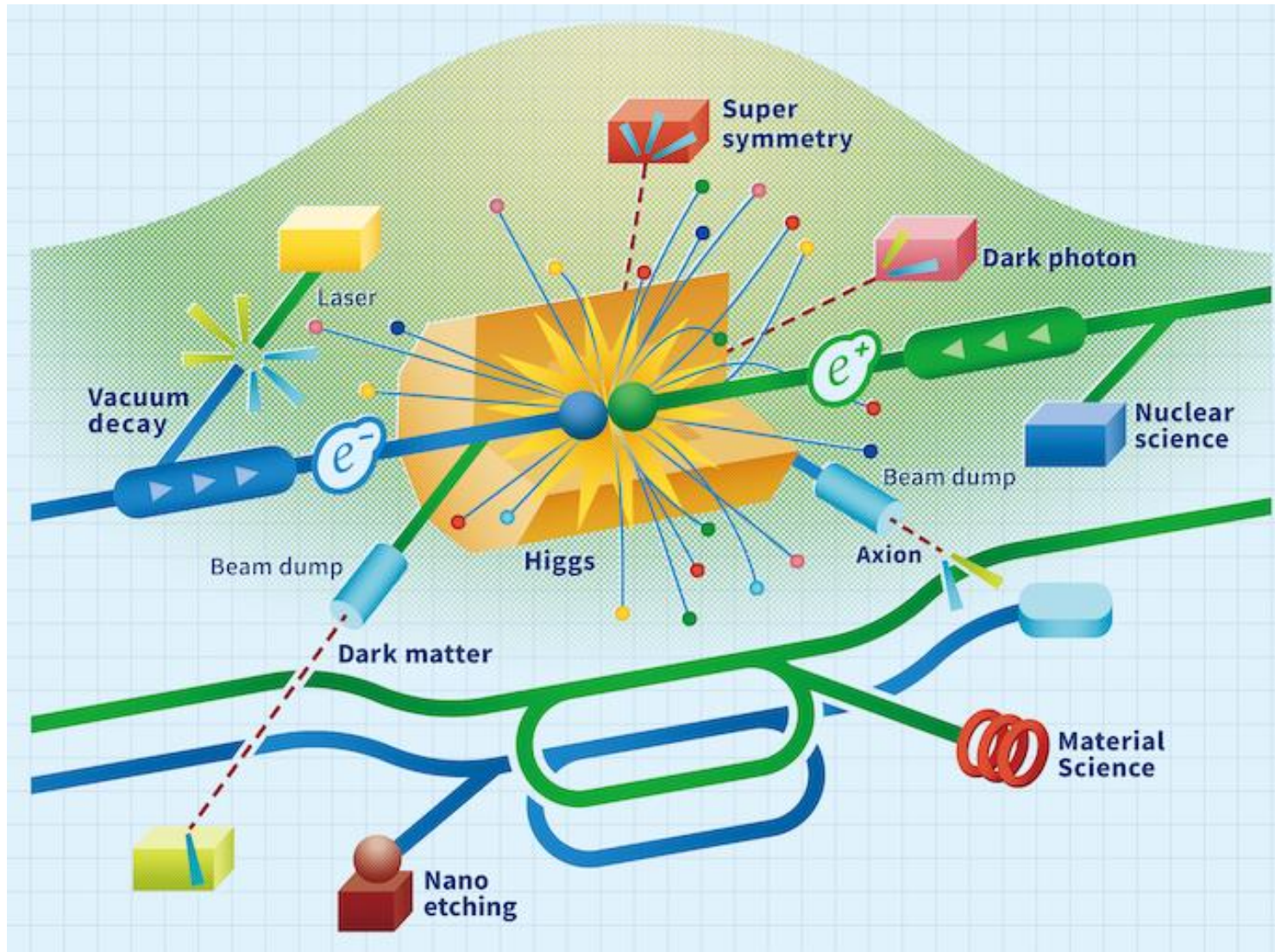


# Medium-long term vision and COLLABORATION

- Consultancy to government
- Relation between industry and academia
- Relation between companies
- Definition of common (industry-academia) interests
- In kind contributions
- R&D Programs



# Technological Interests in ILC: Spanish Network for future Colliders



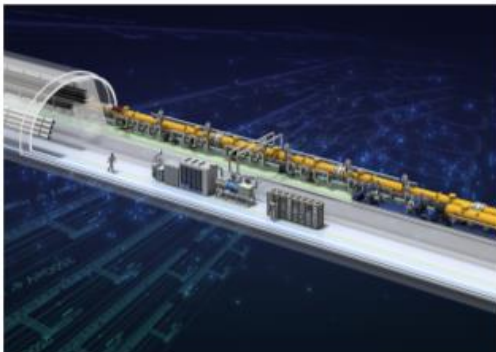


# Technological Interests in ILC: A Spanish Contribution to the ILC

Version 2.3, March 1<sup>st</sup>, 2021

## A Spanish contribution to the International Linear Collider

Prepared by the Spanish network for future colliders



**Author list:** the following Spanish scientists express their support for a Spanish participation in the ILC project, in the understanding that this proposal is aligned with the European strategy for particle physics. The **European Strategy updated in 2020** recognizes a Higgs factory as the highest priority new facility and deems a timely realization of the ILC compatible with the European strategy, and with RD activities and feasibility studies for a future collider facility at CERN.

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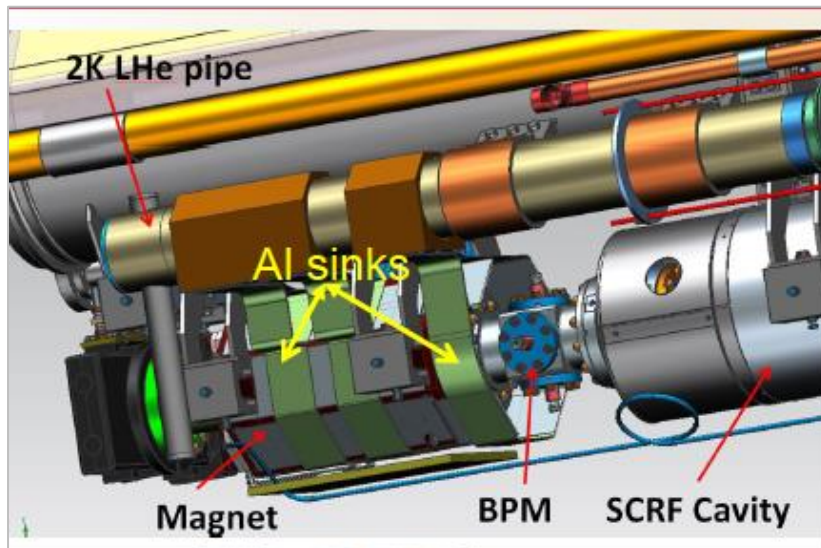
<sup>13</sup>Universidad Autónoma Madrid

<sup>14</sup>IFT (UAM/CSIC), Madrid

<sup>15</sup>ALBA Synchrotron - CELLS, Barcelona

## Linear Accelerator

“The Spanish contribution to the linear accelerator, by CIEMAT and IFIC, focuses on the quadrupole magnet and on the beam position monitor that are installed in every third cryomodule”



The splittable, conduction cooled superconducting magnets allocated in the Main Linac Cryomodules to focus and steer the beam.

The contribution includes the Magnet Power Supply and the Beam Position Monitor.

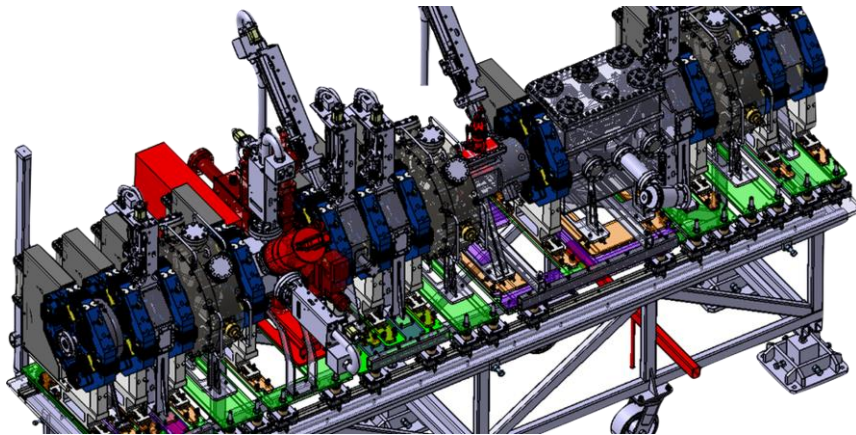
“The proposed contribution builds on the experience in the magnet design and fabrication for the European XFEL, and has a clear projection beyond the ILC project”



## Extraction lines and beam dump system



“ESS Bilbao has designed the ESS target and beam dump and complex beam transport lines and coordinated the fabrication in Spanish industry of many of its components and sub-systems”



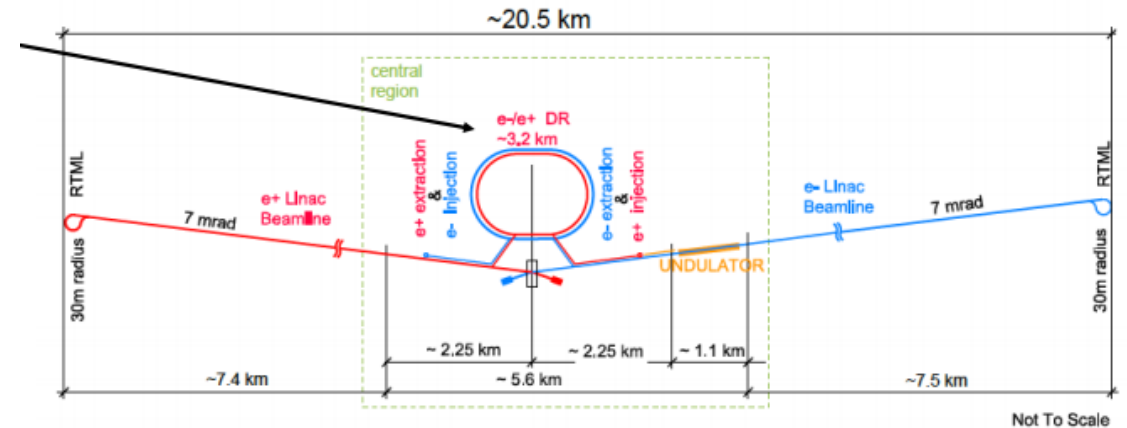
- 400 kW Tuning Beam Dump
- 17 MW Main Beam Dump
- Accelerator Components
  - Klystron Marx Modulators
  - ...

“Beyond the technical contribution to the extraction lines and beam dumps, ESS-Bilbao is envisaged as the central node in the network of institutes and industry that takes responsibility for the Spanish contribution to the ILC”

## Damping Rings

“The team at ALBA-CELLS proposes to use its experience in the design, construction, testing, installation and operation of the ALBA accelerators for taking on key responsibilities in the ILC damping ring system”

- **Beam Dynamics**
- **Combined permanent/coils dipole magnet**
  - Design, production and magnetic measurement

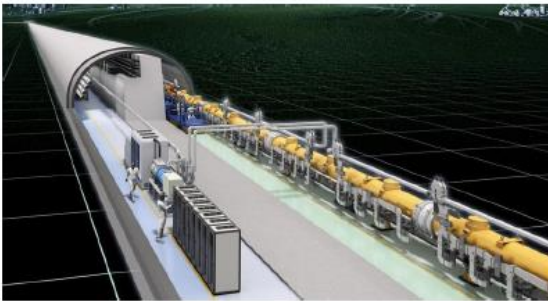


“In particular, several components have been already identified as of interest by the Spanish industry: the magnets with its power supplies, the modulators and the low level control electronics of the RF systems, the wiggler insertion devices, the instrumentation for timing and for diagnostics, and other ancillary systems”



# Recipe of success: Medium-long term vision and COLLABORATION

OPORTUNIDADES E INTERESES  
ESPAÑÓLES EN EL INTERNATIONAL  
LINEAR COLLIDER (ILC)



- Target: Spanish Science and Innovation Ministry  
Public Authorities in general
- Objective: To Show common INDUSTRY-ACADEMIA interests in ILC contributions and derived opportunities (scientific, technological, industrial, social...)

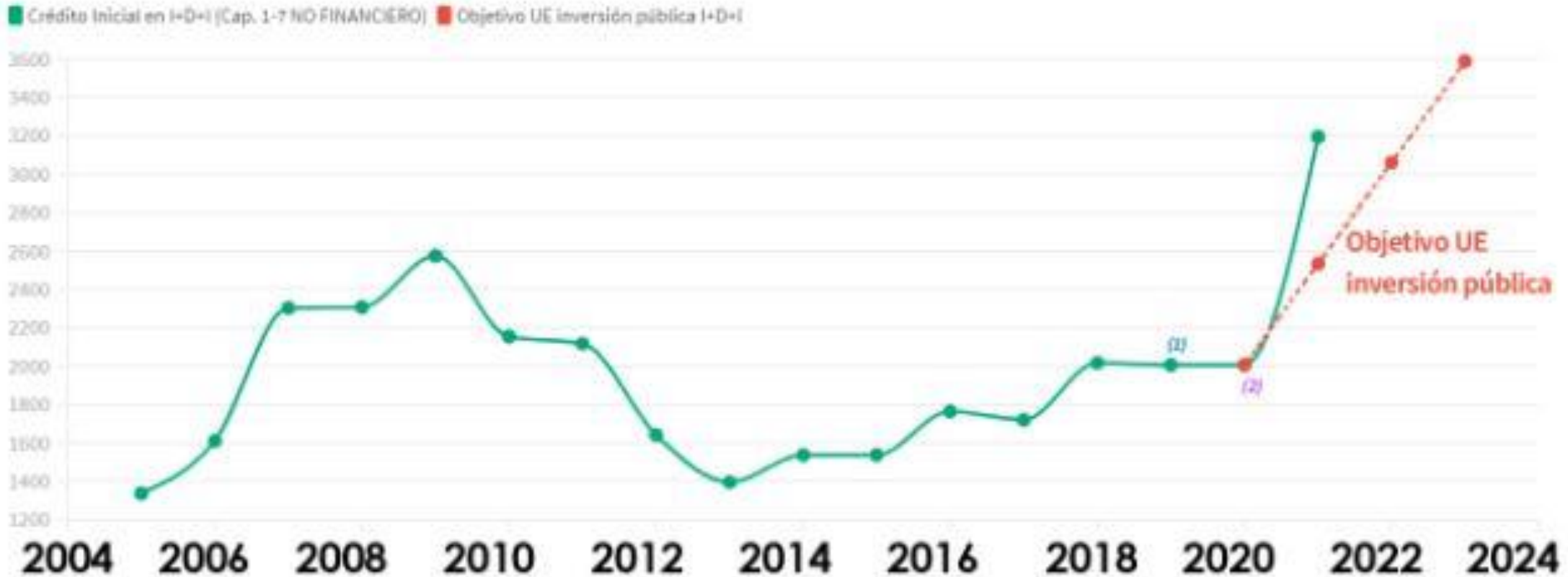


RED ESPAÑOLA DE FUTUROS COLISIONADORES



# Recipe of success: Medium-long term vision and COLLABORATION

## CRÉDITOS NO FINANCIEROS DE I+D+I CIVIL 2005-2021 en millones de euros



1) 109 M de € en aportaciones extraordinarias en 2019

2) 215 M de € en aportaciones extraordinarias en 2020 y otros compromisos del Plan de Choque

Nota: Créditos iniciales de las actuales competencias del Ministerio de Ciencia e Innovación sin sumar servicios comunes

Fuente: Ministerio de Ciencia e Innovación



- **ILC represents a common interest facility for Spanish Science and Technology institutes together with Industry**
- **The Spanish Science Industry has experience, background, and is prepared for the industrialization challenges**
- **Some minor R&D activities are starting funded by the Ministry**
- **We have done this exercise in collaboration with KEK and CERN**

**THANK YOU  
FOR YOUR ATTENTION !**

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**ineustar**  
Asociación Española de la Industria de la Ciencia

## 2. Bilateral Program JSIP

