The Spanish Science Industry

Technological Interest in the ILC

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Asociación Española de la Industria de la Ciencia

Spanish science industry companies

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*Non exhaustive presentation

Other Spanish science industry stakeholders (science and technology)

*Non exhaustive presentation

Spain Government contributes to many Scientific Facilities

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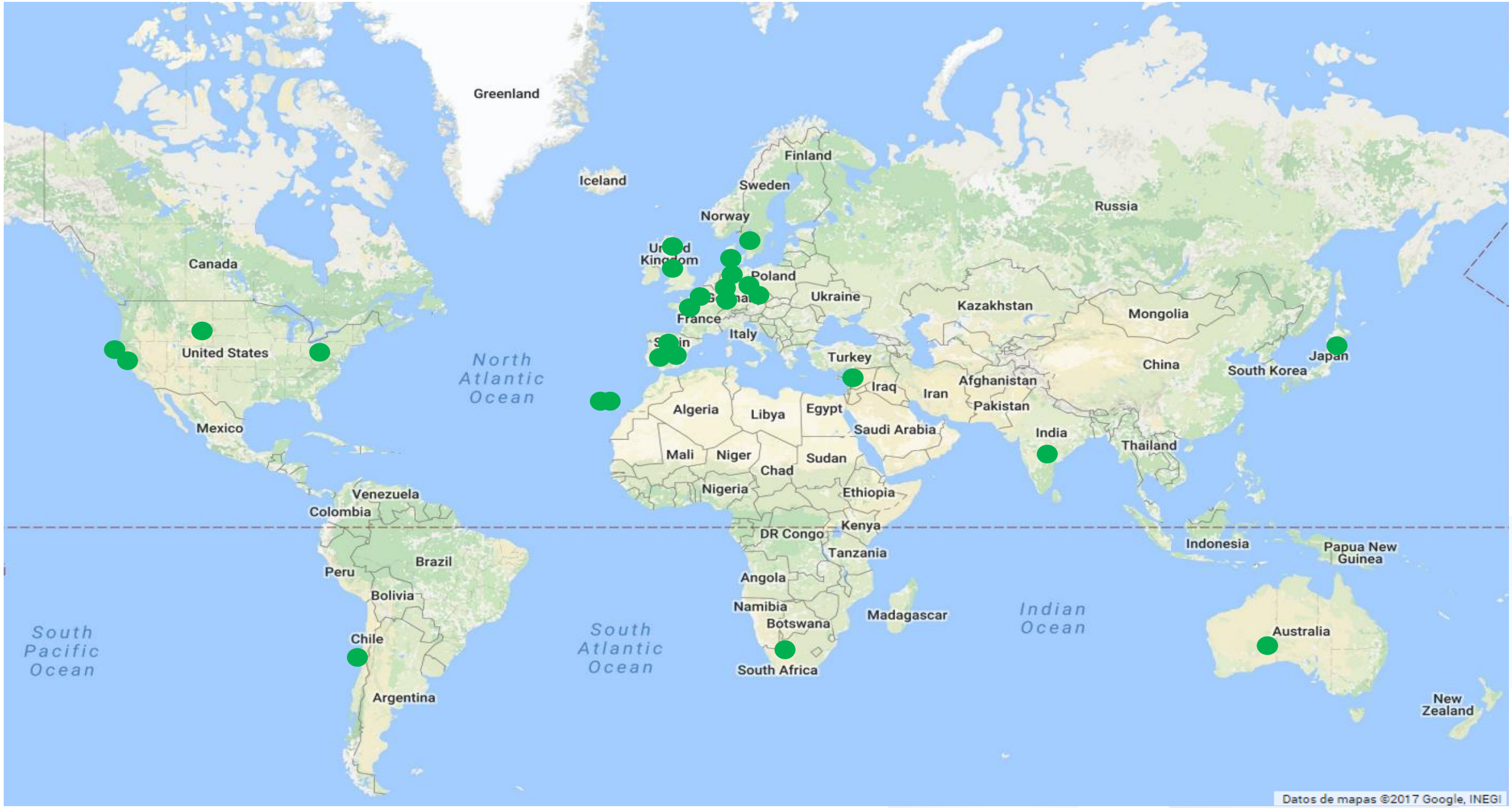
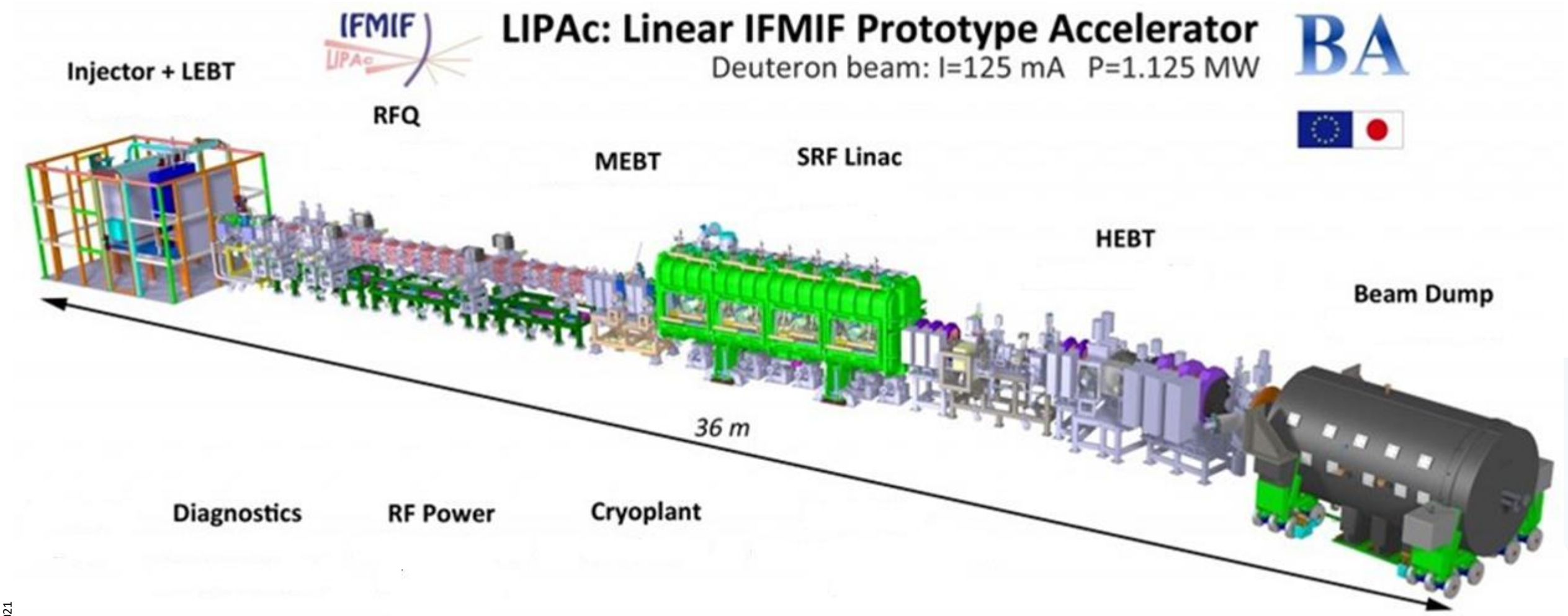
But Spanish companies work for many other scientific facilities along the world



Linac under installation in Rokkasho: LIPAC for IFMIF EVEDA



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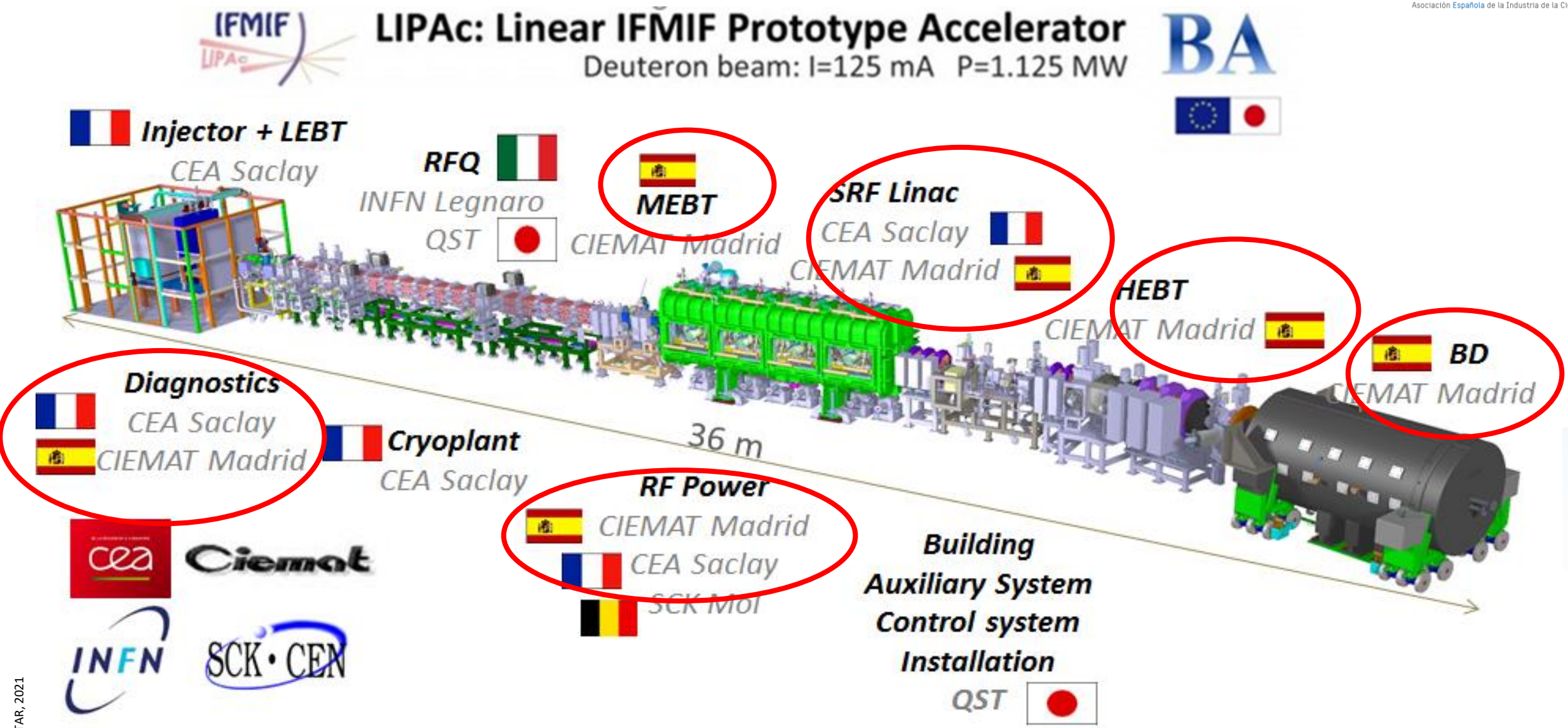

Recipe of success: Medium-long term vision and COLLABORATION

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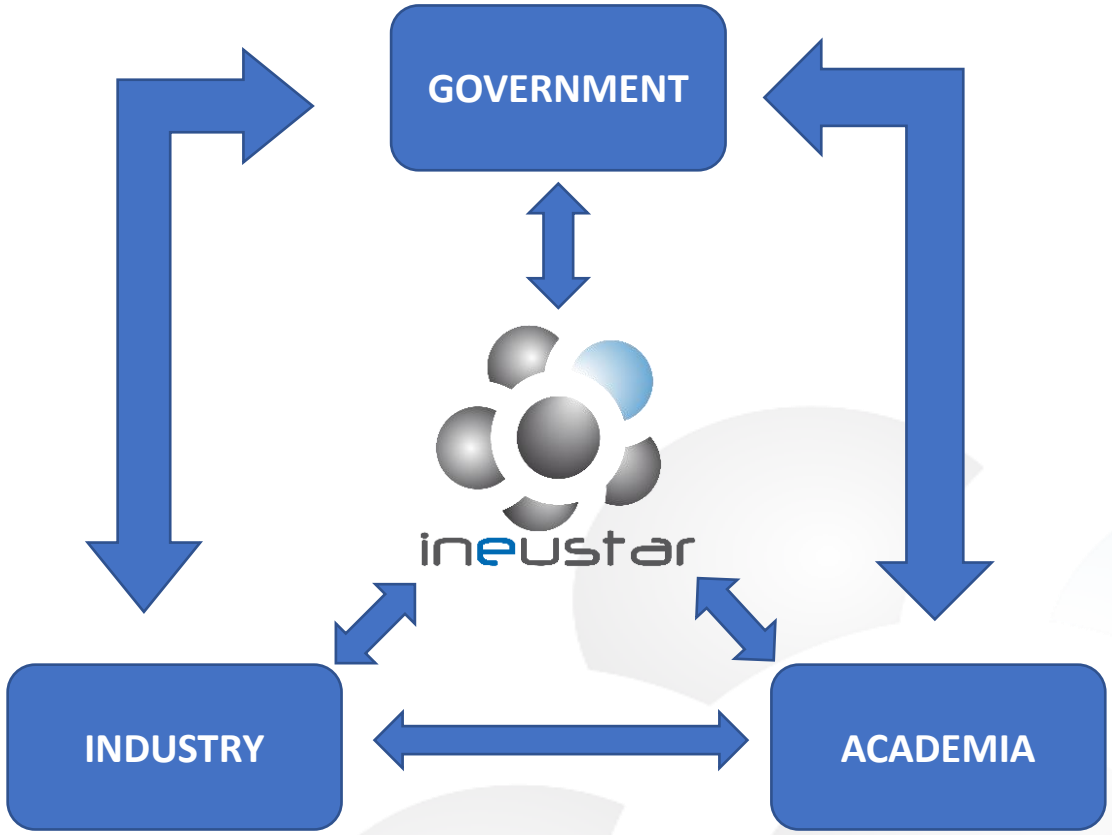
- Consultancy to government
- Relation between industry and academia
- Relation between companies
- Definition of common (ind.-academia) interests
- In kind contributions
- R&D Programs



Technological Interests in ILC

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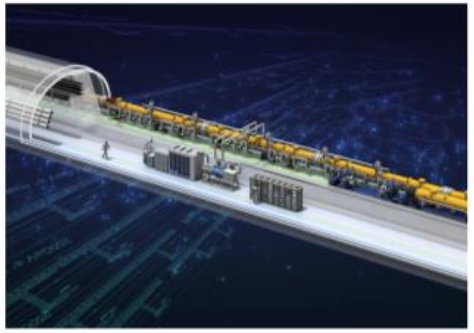
Spanish Network for future colliders

Version 2.3, March 1st, 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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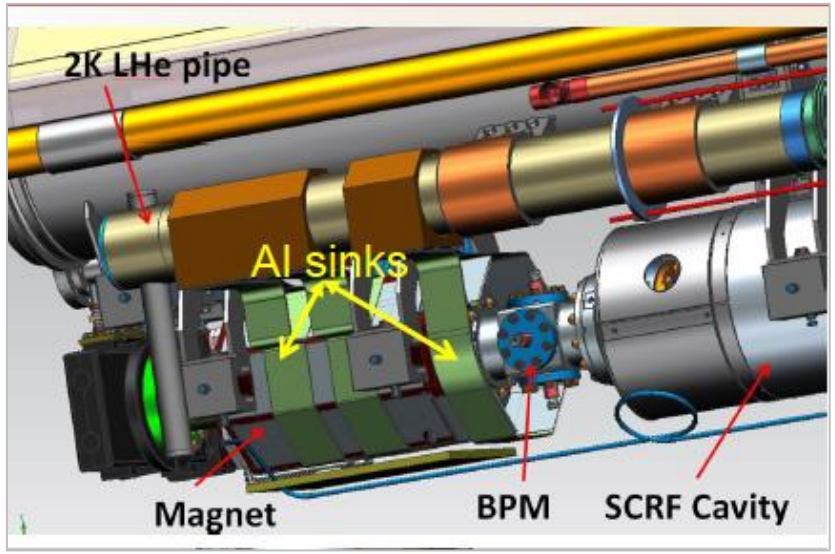
Linear Accelerator

"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"

Recipe of success: Medium-long term vision and COLLABORATION

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"

Parameter	Unit	Specification
Output voltage	kV	120
Output current	A	140
Pulse width	ms	1.65
Pulse repetition frequency	Hz	5 (10)
Max. average power	kW	139
Output pulse flat-top	%	±0.5
Pulse-to-pulse voltage fluctuation	%	±0.5
Energy deposited into klystron during a gun spark	J	< 20

- 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"

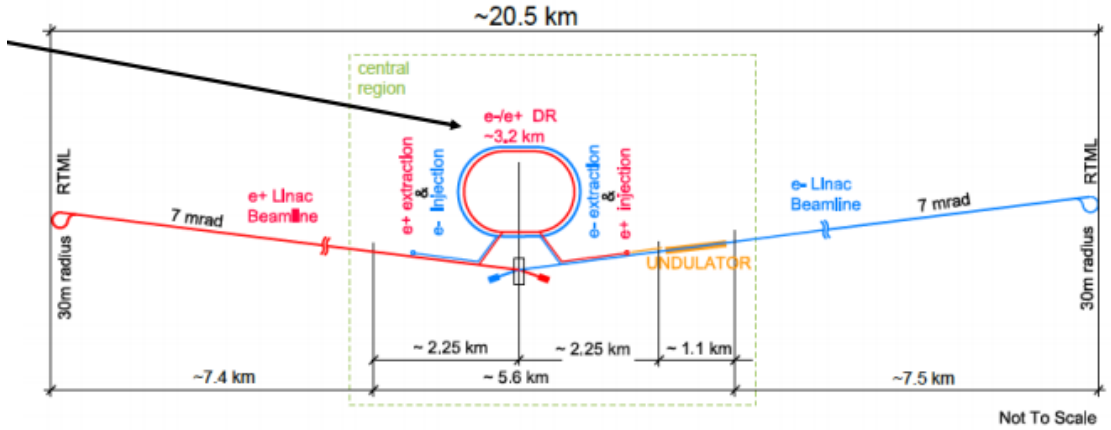
Recipe of success: Medium-long term vision and COLLABORATION

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"

CONCLUSIONS

- **The Spanish Science Industry has experience, background, and is prepared for the industrialization challenges**
- **The Spanish Science Industry is distinguished by a close collaboration between Industry and Research Institutes, generating synergies which maximize the results**
- **A specific exercise has been carried out looking for the most common interesting technologies in ILC**
- **The Spanish contribution to ILC will contribute to advance in the Japanese-Spanish research/industrial collaboration**

THANK YOU
FOR YOUR ATTENTION !

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