



2ND INTRODUCTORY ELI ERIC IBERIAN INFORMATION DAY

“INDUSTRY PT”

Presentation from 1st Information day (Nov. 2021)



AGÊNCIA NACIONAL
DE INOVAÇÃO

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01/06/2022



Why should we invest in Big Science projects?

Countries investing in Big Science projects want to reap benefits *beyond* Science

- Settlement of qualified labor force
- Local industrial demands
- Technology spill-overs

Impact in the Host Countries (ELI Technical and Scientific Description):

- Direct impact from investment;
- Increased opportunities for national/local researchers;
- Increased innovation opportunities for local industry





PERIN - doubling the Portuguese Presence in European P



Why should *any country* want to be a member of ELI ERIC?

- User Access is purely excellence-based – **no membership premium**
- **Procurement not limited** to member country industry;
- Facilities are **remote** (from Portuguese point of view);
- Membership fee covers **operations only** – what happens if/when **other facilities join** and/or **upgrades** are decided?;
- User community exists, but **not extensive**.

- Preferential participation in **Technology roadmap** initiatives?
- Preferential **access to IP**?
- Possibility to contribute **in kind**?
 - Future **upgrades**
 - Personnel **secondments**
 - **Training** and other services



Possible industrial contributions to technology roadmap

The technological development driven by the ELI ERIC's requirements will continue during the operational stage. A few examples are:

- **Key optical components for the high power/high repetition rate lasers.** The transport and focusing optics, as well as the diffraction gratings and the active materials need to be developed further to withstand for a long period of time high energy and high peak power pulses, and over large beam diameters, and this must be done for a high number of shots.
- **Short pulses, large beams metrology.** Disruptive solutions to measure the performances of the systems on short pulses and large beams are necessary, to support the understanding of the unique scientific results that will be achievable with the ELI facilities.
- **Complete control for complex systems.** The experimental systems must guarantee the performances and the smooth operation. Intelligent and completely interfaced control systems are needed.





Portuguese industrial contribution to ELI (case study)

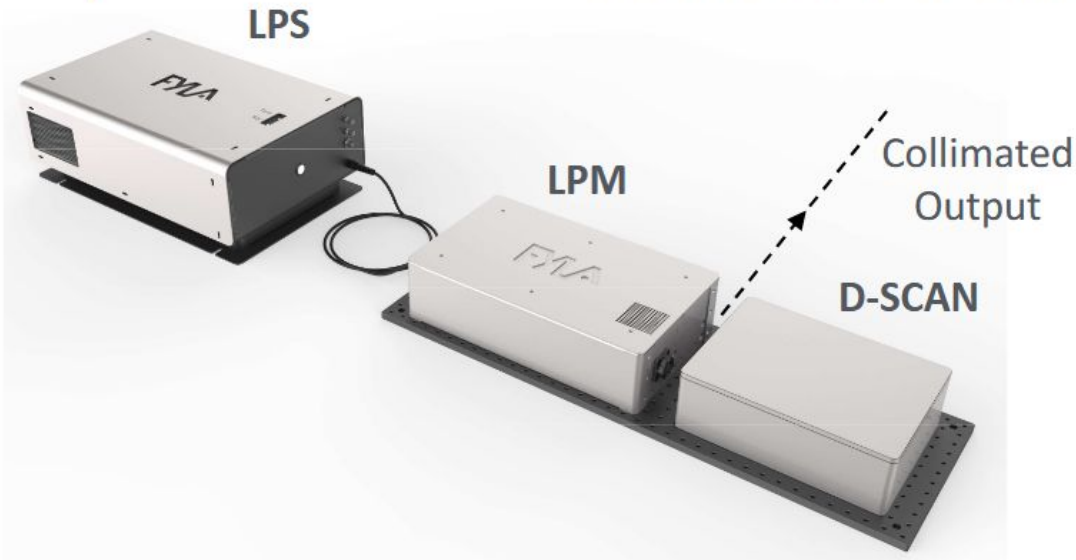




...also at CERN (iberian collaboration)



FIBER LASER SYSTEM DESIGNED FOR TPA-TCT

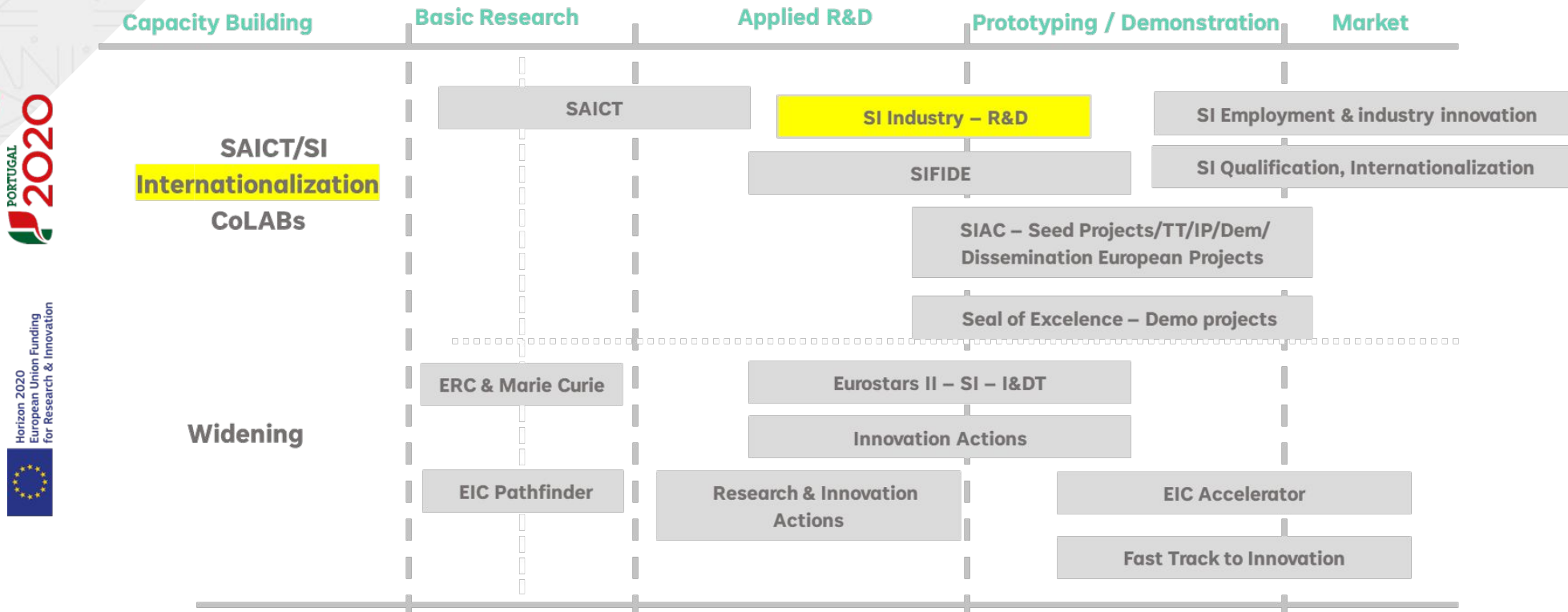


- **LPS:** Laser Pulse Source
 - All-fiber CPA femtosecond pulses generation
 - Pulse rep rate selection. **Single shot to 8 MHz**
- **LPM:** Laser Pulse Management module
 - Pulse energy modulation: **<10 pJ to > 10 nJ**
 - Synchronized shutter. **rise/fall time < 1 us**
- **D-SCAN:** Dispersion scanning
 - Pulse duration tuning: **200 fs to 500 fs** (approx)
 - Spectral and temporal pulse characterization





Portfolio of Support instruments – case study



- Pro-UPMS .: Pro-UPMS (Programmable Ultrashort Pulse Management system)
- ExtreMED .: Extreme Ultrashort Pulses for Advanced Medical Applications and Diagnostics
- Internacionalização - Sphere Ultrafast Photonics





Can ELI structure local laser ecosystems 3000Km away?



Portugal is fairly distant geographically from Szeged and from Dolní Břežany



Can ELI structure local laser ecosystems 3000Km away?

- In kind contributions (training, secondments, technology roadmap)
- Technology Infrastructure integration
- Medical (or other) applications
- Horizon Europe support to cluster (e.g. Excellence Hubs)



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Obrigado

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