

Big Science Business Forum 2022



BSBF 2022

***ESRF-EBS: fostering innovation
Creating value for all***

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on behalf of **Francesco SETTE**
Director General,
European Synchrotron Radiation Facility





21 PARTNER COUNTRIES

13 Member states:

France	27.5 %
Germany	24.0 %
Italy	13.2 %
United Kingdom	10.5 %
Russia	6.0 %
Benesync (Belgium, The Netherlands)	5.8 %
Nordsync (Denmark, Finland, Norway, Sweden)	5.0 %
Spain	4.0 %
Switzerland	4.0 %

8 Associate countries:

Austria	1.75 %
Israel	1.75 %
Poland	1.00 %
Portugal	1.00 %
India	0.66 %
Czech Republic	0.60 %
South Africa	0.30 %
Hungary	0.25 %

ESRF MISSIONS AND VALUES

- Bringing nations together through science and contributing to the construction of the ERA
- Pioneering X-ray synchrotron science and providing value to all partner countries: new science, new technology, new opportunities for breakthrough innovation and for industry
- State-of-the-art X-ray facilities to unveil and link atomic structure complexity to functioning of materials and living matter: health, energy, environment, new and sustainable materials for industry, etc.
- Training and inspiring the young generation and society

10 000
scientific
visitors
each year


4
Nobel prizes

2 000
scientific
publications
each year


30%
of research
carried out
with industrial
partners

MODERN SYNCHROTRON X-RAY SCIENCE


**TIME FOR THE NEXT STEP
X-RAY IMAGING AND MICROSCOPY
TO UNDERSTAND COMPLEXITY
FROM NANOMETRIC/ATOMIC LEVEL
TO THE FULL FUNCTIONING
MACROSCOPIC OBJECT**



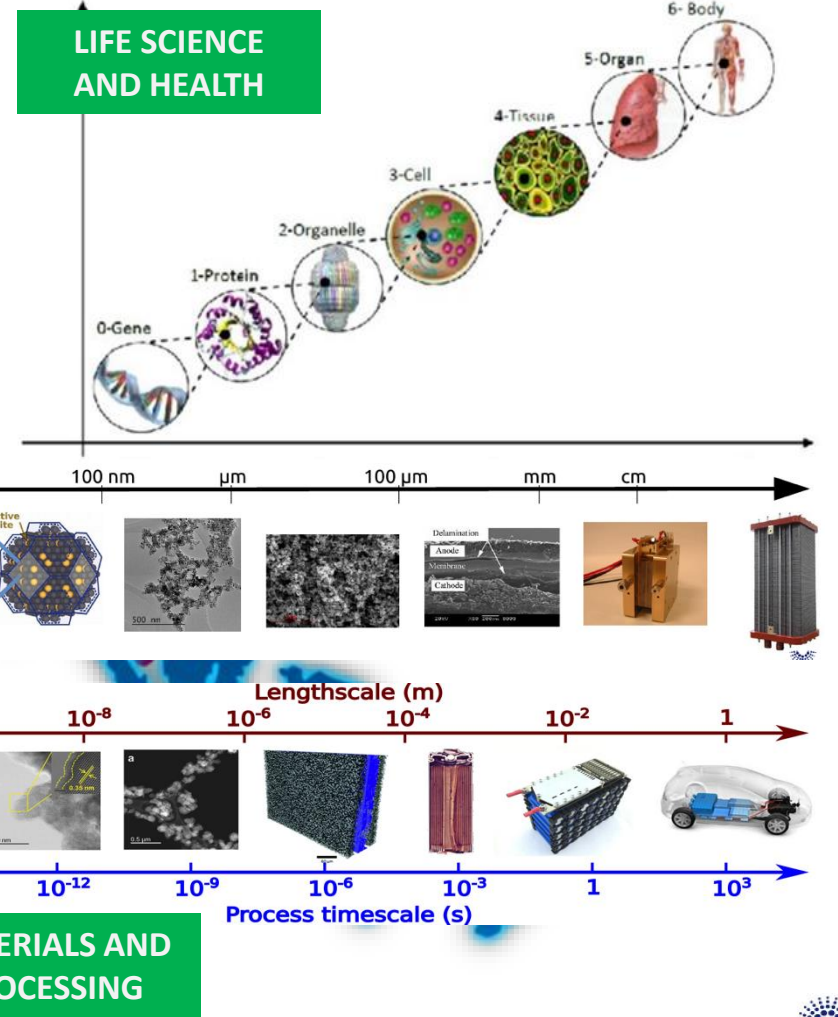
New and innovative materials



Health and life science



Energy and environment





ESRF UPGRADE PROGRAMME 2009-2022 A « landmark » in the ESFRI roadmap

- Investments: 330 M€
- Staff cost: 220 M€
- **TOTAL :** 550 M€

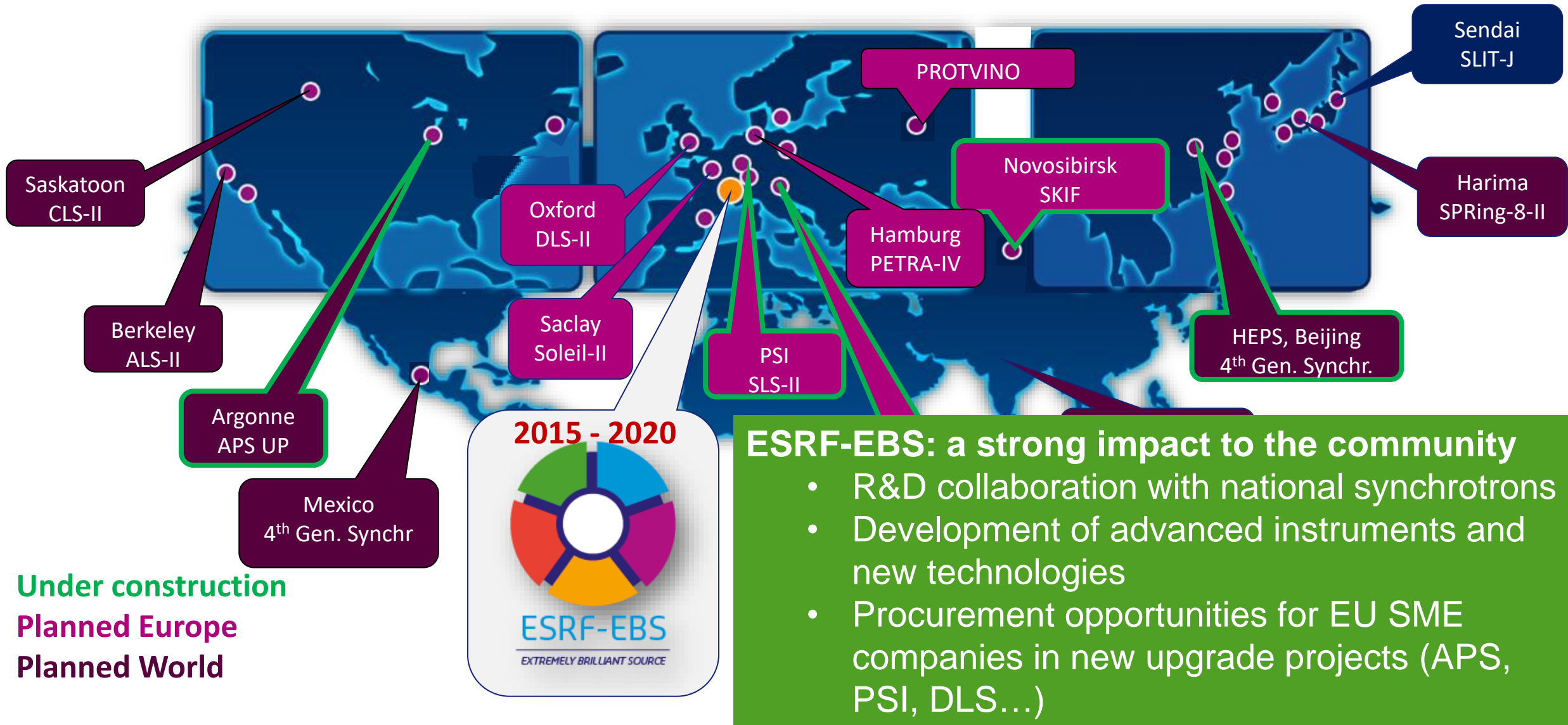
- NEW BEAMLINES (27) AND CRYO-EM FOR HEALTH, MATERIALS, ENERGY, ENVIRONMENT AND CULTURAL HERITAGE SCIENCES
- NEW – FIRST OF A KIND – LOW-EMTTANCE HIGH-BRILLIANCE X-RAY SOURCE
- NEW BIG DATA AND IT INTERNAL (100 PB) AND EXTERNAL INFRASTRUCTURE AND PROGRAMMES (EOSC ASS. MEMBER, HPCS , ...)
- NEW EXPERIMENTAL FACILITIES
- 20% OF ENERGY SAVINGS (20 GWH/year)

ESRF UPGRADE: ON THE ESFRI
ROADMAP SINCE ITS INCEPTION

ESFRI



ESRF's R&D SPILLOVER EFFECT TOWARDS THE WORLD COMMUNITY



ESRF-EBS: A driver of innovation for EU

A PROJECT BASED ON A STRONG COLLABORATION AMONG ESRF'S MEMBER COUNTRIES LABS AND INDUSTRY

More than 100 companies, mostly from ESRF's partner countries, supplied parts and services



Vacuum valves



Vacuum Chamber support



Com
Magnets



High-gradient quadrupole & sextupole magnets



Octupole magnets



SS vacuum chambers

EBS industry story: AVS

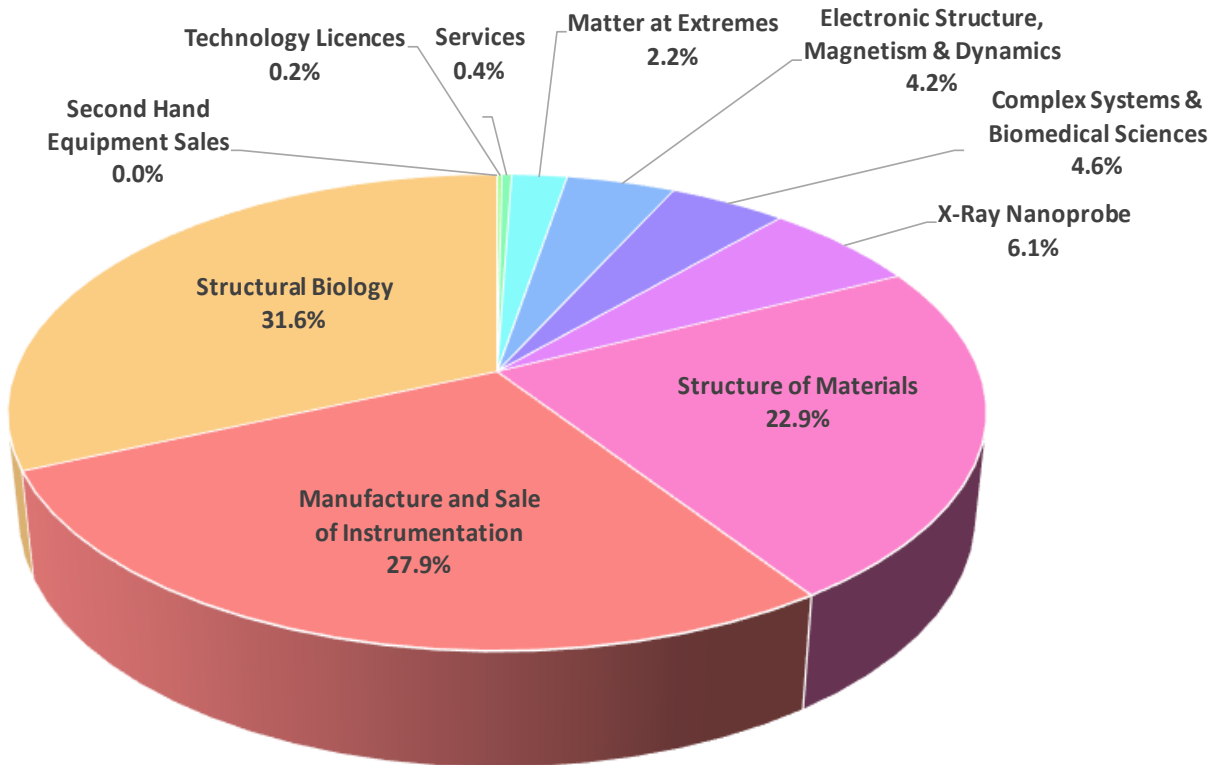
A Spanish SME company founded in 2006.
First contract with the ESRF in 2012 for the construction of a high-precision detector tube for ID02SAXS/WAXS beamline
2016-2018 delivery of half of the 129 steel girders for ESRF-EBS

« AVS had limited interactions with synchrotrons before it started the SAXS tube project. The EBS girders project was even more ambitious, and again we acquired new confidence and expertise. Since our ESRF work, our growth in activity for synchrotrons has been exponential. »

Pedro Noguera Crespo, AVS



ESRF impact – facts and figures – industry use and procurement



cumulative commercial income over the past 15 years



have used the ESRF for their R&D since 1994

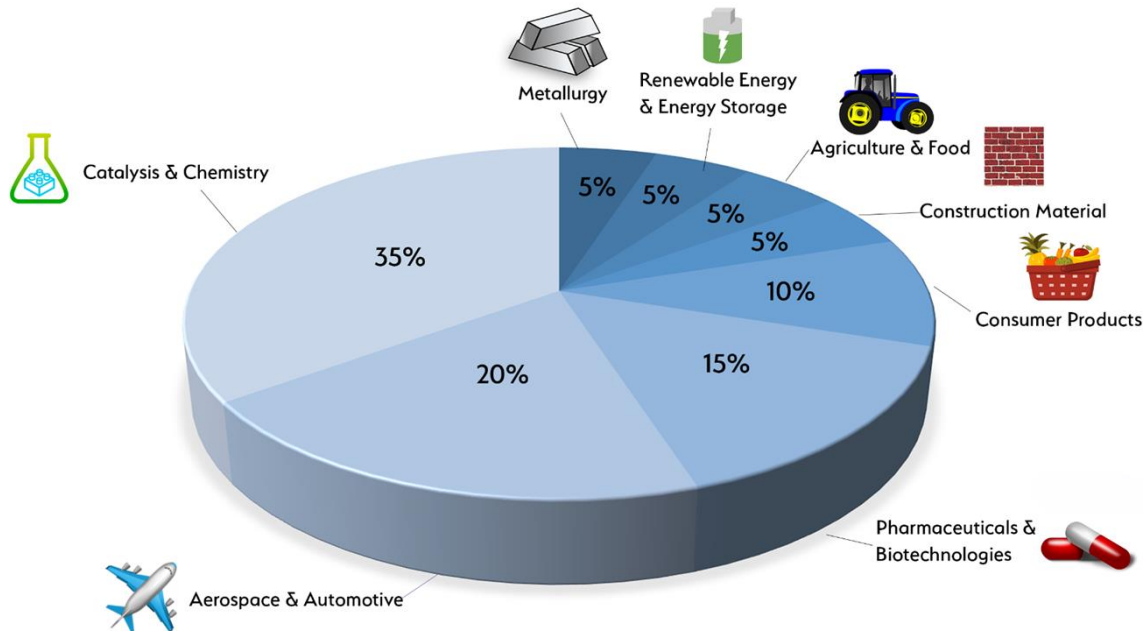


technology licences with companies

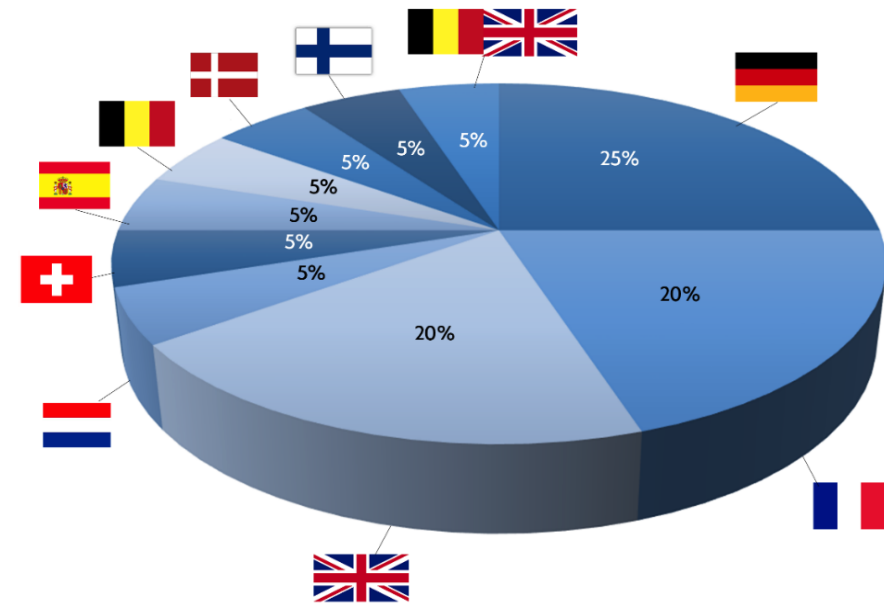


InnovaXN Marie Skłodowska Curie COFUND Programme based on EBS

Co-funding of 40 PhD student projects on research driven by precompetitive industrial R&D topics using X-rays and neutrons



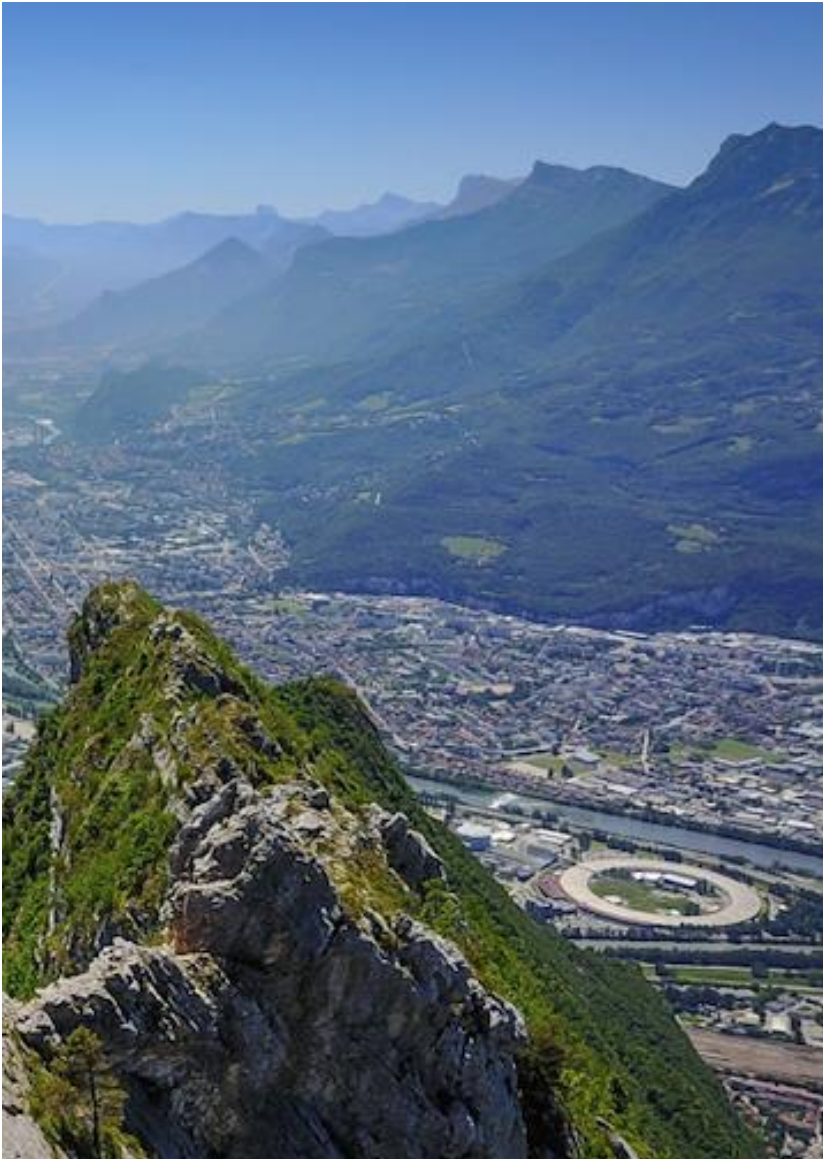
Industrial sectors of Round 1 (Sept. 2020)



Industrial partner countries in Round 1

This project has received funding from the EU Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 847439.





Contributing to mitigate climate change is a priority for large scale international infrastructure as the ESRF

- **20% decrease in energy consumption** with the new EBS storage ring technologies (20 GWH/year)
- **Full remote access possibilities to reduce travel** implemented with the support of the EU programme STREAMLINE
- **A step towards 'green purchasing'** in tenders/procurements
- **25% of the research carried out at the ESRF is linked to climate change, clean energy, environment, green engineering and sustainable materials:**
 - Battery research for electric transportation
 - Renewable energy technology
 - Geosciences and Environmental sciences
 - Bio-environmental engineering
 - Green metallurgy
 - Sustainable materials for industry

THANKS FOR YOUR ATTENTION
CREATING VALUE TOGETHER,
ACROSS SCIENCE,
FOR SOCIETY

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PIONEERING SYNCHROTRON SCIENCE

