

EXALOS

Public Funding Opportunities Swiss Photonics

Brugg-Windisch, 4th of December 2019

Dr. Christian Velez, CEO EXALOS AG

Company Overview

- **Founded in 2003** as a management buy-out from OptoSpeed (originally ETH Zurich, spin-out)
- **Private profitable company** with five key shareholders/investors
- 32 employees with headquarter (10,000 sq ft) in Schlieren, Switzerland, including 2,000 sq ft of clean room space
- Closely coupled with tier 1 research institutes
- **ISO-9001 certified** since 2004
- Worldwide sales in over 20 countries through direct and distributor channels
- **Over 500 thousand devices in the field**
- #1 market leader in superluminescent diodes (SLEDs) for Optical Coherent Tomography (OCT) and optical sensor market
- Unique position in visible SLED devices



Current Markets for Infrared Sources

Fiber Optics Sensors (FOS)

Strain, pressure, current

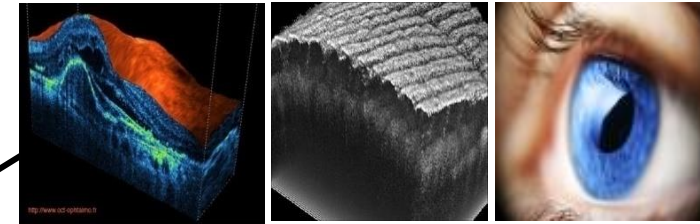


Other Applications

Optical sensing,
Metrology, Machine
Vision, Spectroscopy

Optical Coherence Tomography (OCT)

Corneal and retinal
diagnostics



Fiber Optics Gyroscopes (FOG)

Navigation systems
(air, space, sea, land)

Fiber Optic Test Equipment

Chromatic & Polarization Dispersion



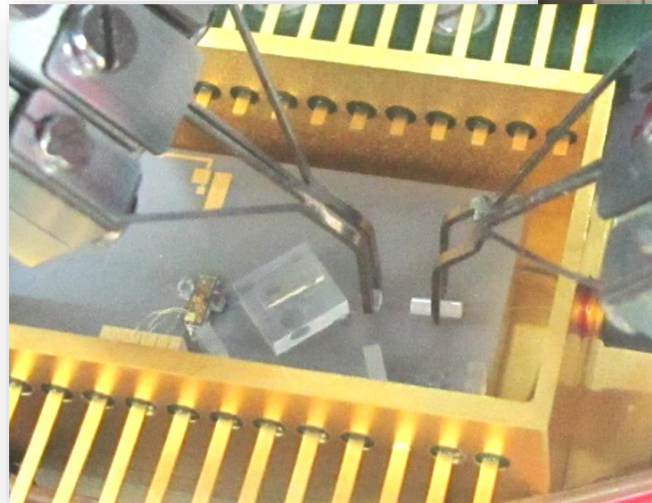
Micro-Optical Assembly Machine

Automated assembly

- Micro-component UV epoxy attachment (MEMS scanner, lenses, filters, etc)
- Alignment accuracy: ± 50 nm
- Placement accuracy (with curing): ~ 300 nm

Active alignment based on

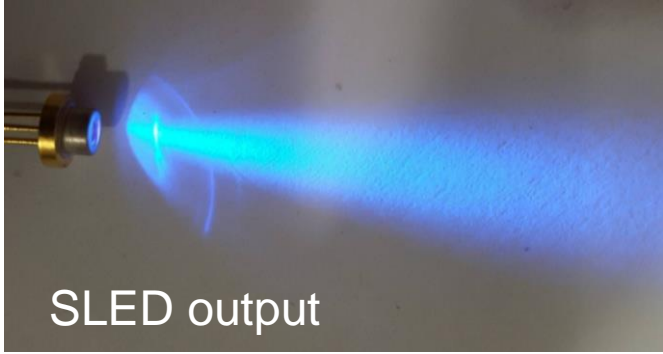
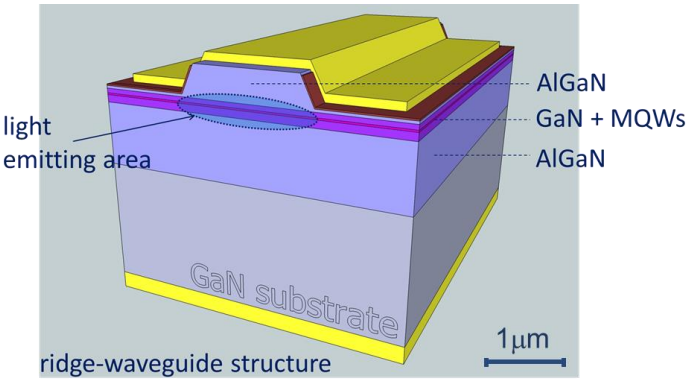
- Optical power *
- Beam profile*
- Wavelength*
- Coherence*
- Noise
- SNR
- ...



Rapid
Prototyping

Wide Color Gamut and Highly Directional/Low Etendue Output Beams

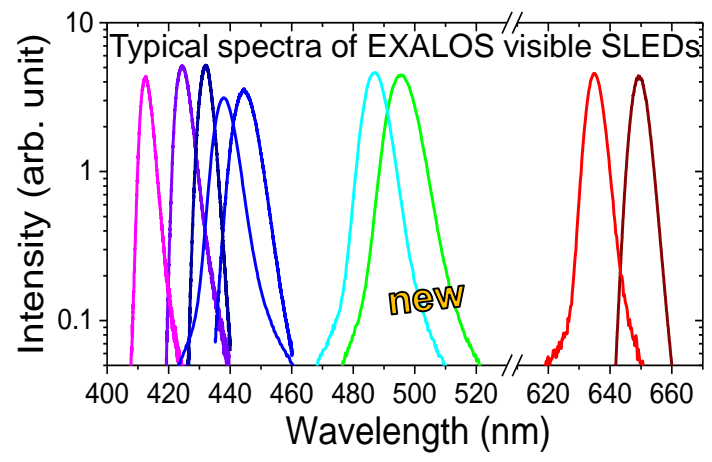
SLED



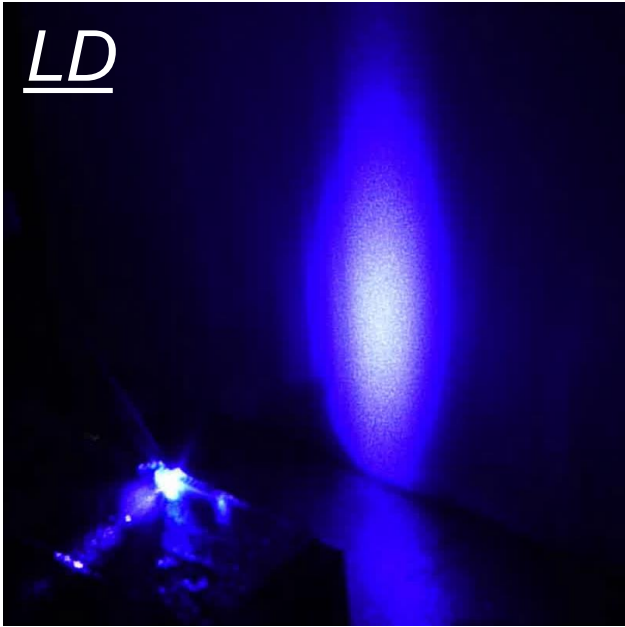
SLEDs have very small etendue: the light emitting area is orders of magnitude smaller than that of LEDs



can be easily collimated into parallel beams and coupled into fibers



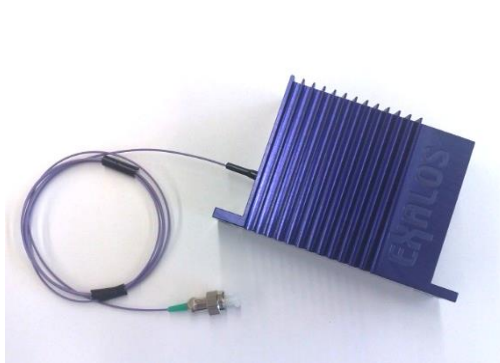
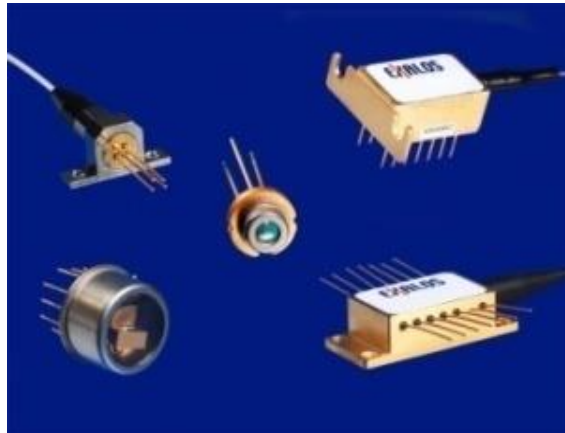
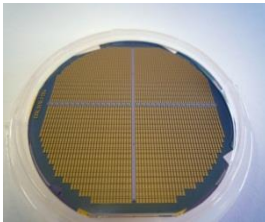
Speckle comparison SLED/LD



speckle-free laser

Product Portfolio

- Superluminescent Diodes (SLEDs) 390nm to 2500 nm
- Broadband Light Sources
- Fast Wavelength-Tunable Lasers (Swept Lasers)
- GaN-based SLEDs, microLEDs and Laser Diodes



Success Story with CTI/Innosuisse Project

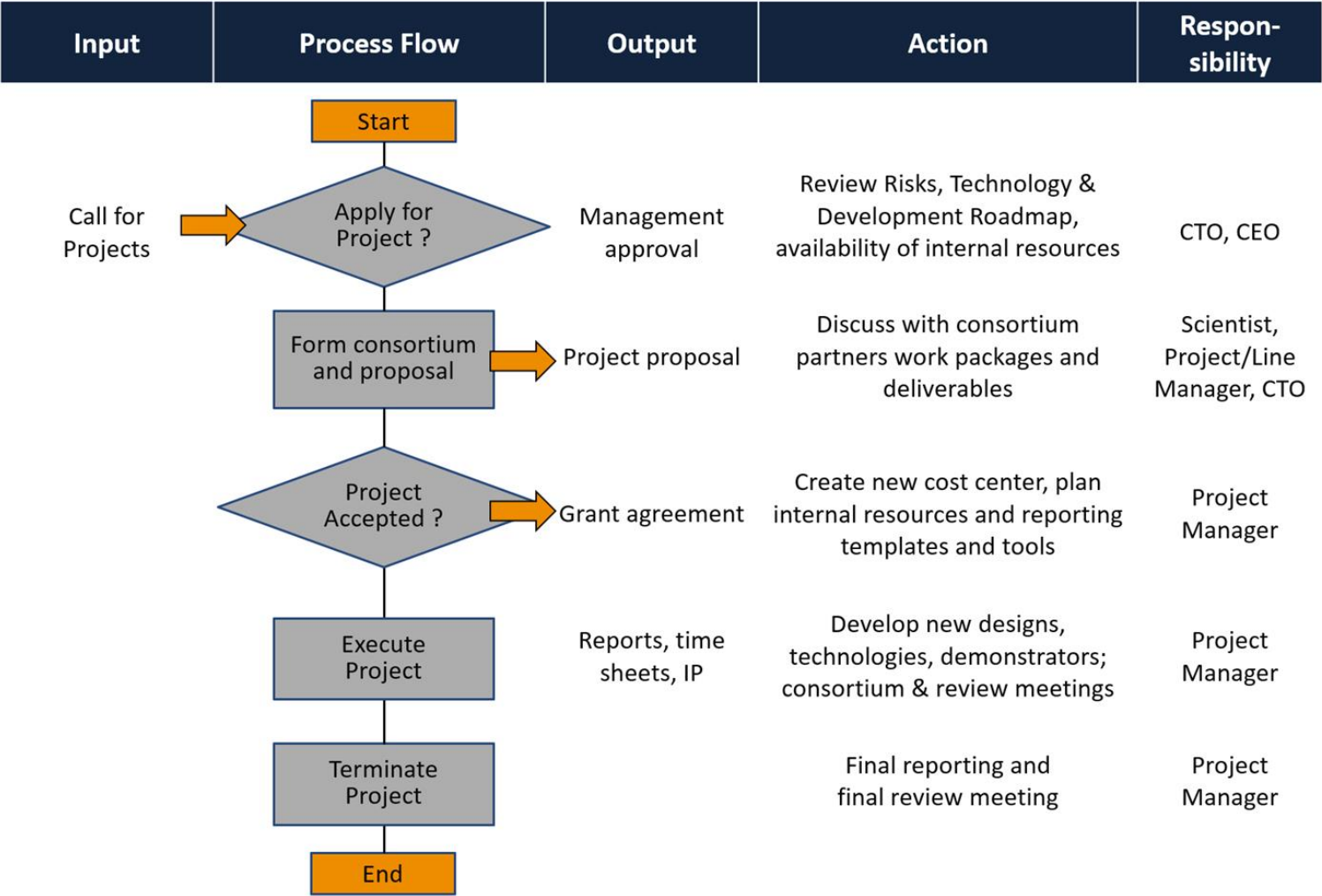
- Successfully develop a new technology platform for GaN semiconductor SLEDs via multiple project
- Total of 4 project over 10 years in collaboration with group of Prof. N. Grandjean at EPFL
- Out of the project developed first violet and blue SLED in the world
- Several PhD students and PosDocs at the group of Prof. Grandjean are now part of the EXALOS Nitrides team in Eculens-VD
- Thanks to CTI/Innosuisse, we have today a unique technology, opening up new and big markets like Augmented Reality.

Learnings with EU Projects

Applying for EU Project

- For typical (e.g., H2020) European projects, you cannot just apply for a project !
- You have to wait for a suitable “call for project”, issued by the programme (e.g., Information and Communication Technology, ICT) and initiated by the European Commission
- **You need to have a convincing consortium at hand**
 - From 3-4 different European countries
 - Good mix of academic (RTD) and industrial (ideally SME) partners
 - Ideally, managing partner has experience with EU projects
- **Preparing for Project Proposal**
 - Consider 3-6 months preparation time
 - 120-150 pages of documentation
 - Detailed work package & exploitation/business plan

EXALOS Process Flow for EU Projects



European vs Swiss Projects

	European Projects	Swiss Projects
Framework	H2020	InnoSuisse / CTI
Duration	Typ. 36-48 months (possible 12 months extension)	Typically 18-36 months
Funding (for EXALOS)	Typ. € 300-950k	No direct funding, but academic partner is funded
Project Lead	SME or RTD partner	SME or RTD partner
Number of Partners	Typ. 5-10	Typ. 2-3
Intellectual Property Owner	Inventing partner	SME
Internal Approval	EXALOS Management	CTO & CEO
External Approval	European Commission	InnoSuisse CTI
Efforts to Apply	Major (~150 pages)	Medium (~30 pages)
Efforts to Manage	Major	Medium

European projects are a major effort to manage and require corresponding resources !

Submitting a Project Proposal

- All submitted project proposals are reviewed by technical experts of the European Commission
- **Low acceptance rates & long timelines**
 - Example: ICT / photonics call in 2nd half of 2014, total budget € 30M
 - First meetings with potential consortium partners in late 2014
 - We submitted proposal in April 2015 (150 pages total)
 - 230 proposals submitted, 7 were accepted, our project was #1
→ 3% acceptance rate
 - Total budget for our project € 4.5M for 6 partners
→ our budget € 0.88M
 - Start of project = January 2016
 - Planned end of project = December 2019
 - 12-months project extension → end by December 2020

What makes a good proposal ?

- In order to receive a high ranking, the project idea must be innovative and generate jobs
 - Based on cutting-edge technology that academic partners provide to the SMEs within the consortium
 - A good amount of technology development within the project is very common
 - Therefore, the outcome (deliverable) of an EU project is, at best, a successful demonstrator or alpha-sample of a product
 - The required steps from an alpha-sample to a fully qualified and released product are not considered within EU projects
→ will have to be covered and managed by SMEs
 - Still, SMEs have to have a compelling commercialization plan (“exploitation”) or business plan, showing that jobs in the high-tech industry fields will be created

Showing that revenues & jobs have been created by EU-funded projects is more important than scientific achievements and publications (“dissemination”)

Burdens of EU Projects

- **Deliverable Reports**
 - Depending on the scope of the project and the tasks of the work packages, 5-10 deliverable reports (each 20-40 pages) have to be filed
- **Time Sheets**
 - H2020 introduced mandatory time sheets for all employees who are involved in EU projects
- **Financial Reporting**
 - Detailed reporting about external costs for sub-contractors, consumables, internal labor costs, travel costs, remaining and spent budget, etc.
- **Consortium Meetings**
 - Typically 2 meetings per year, in certain phases also every 1-2 months
 - Could also have weekly conference calls, in addition
- **Project Review Meetings**
 - Typically every 12-18 months, in Brussels
 - With external technical experts as reviewers → prepare well ...

Only consider EU projects for technology developments that are synergetic and well-aligned with your own technology & product roadmap !

Thank You

European Research Projects

02-Dec-2019

MDU



European Framework Programs

7th Framework
Program
(FP7)
2007-2013

8th Framework
Program
(Horizon 2020)
2014-2020

9th Framework
Program
(Horizon Europe)
2021-2027

- Significant budget spent by the European Commission on Research & Innovation in Europe
 - FP7: € 55 billion
 - Horizon 2020: € 82 billion
 - Horizon Europe: € 100 billion
- Major focus is on small-medium enterprises (SMEs) and on creation of jobs in high-tech industries/SMEs !

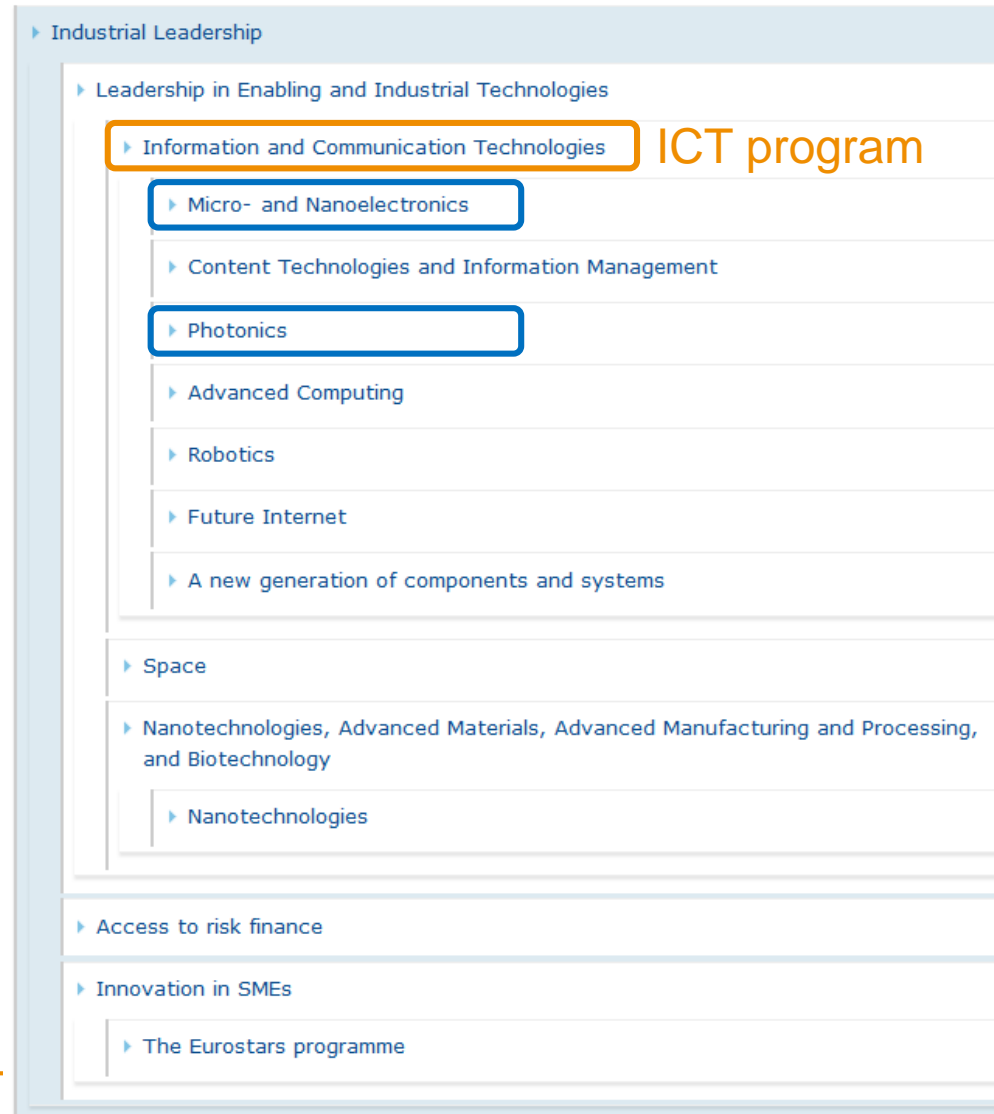
Sections of H2020

- The Horizon 2020 framework is organized in different sections:
 - Excellent Science
 - **Industrial Leadership**
 - **Societal Challenges**
 - Science with and for Society
 - ...

H2020 Section “Societal Challenges”

- ▶ Societal Challenges
 - ▶ Health, Demographic Change and Wellbeing
 - ▶ Scientific Panel for Health (SPH)
 - ▶ Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bioeconomy
 - ▶ Bioeconomy
 - ▶ Secure, Clean and Efficient Energy
 - ▶ Smart, Green and Integrated Transport
 - ▶ Climate Action, Environment, Resource Efficiency and Raw Materials
 - ▶ Water innovation
 - ▶ Fighting and adapting to climate change
 - ▶ Waste
 - ▶ Europe in a changing world - Inclusive, innovative and reflective societies
 - ▶ Secure societies - Protecting freedom and security of Europe and its citizens

H2020 Section “Industrial Leadership”



Switzerland & EU Projects

- Switzerland has been a fully associated countries for the **FP7** and for most part of the **H2020** framework

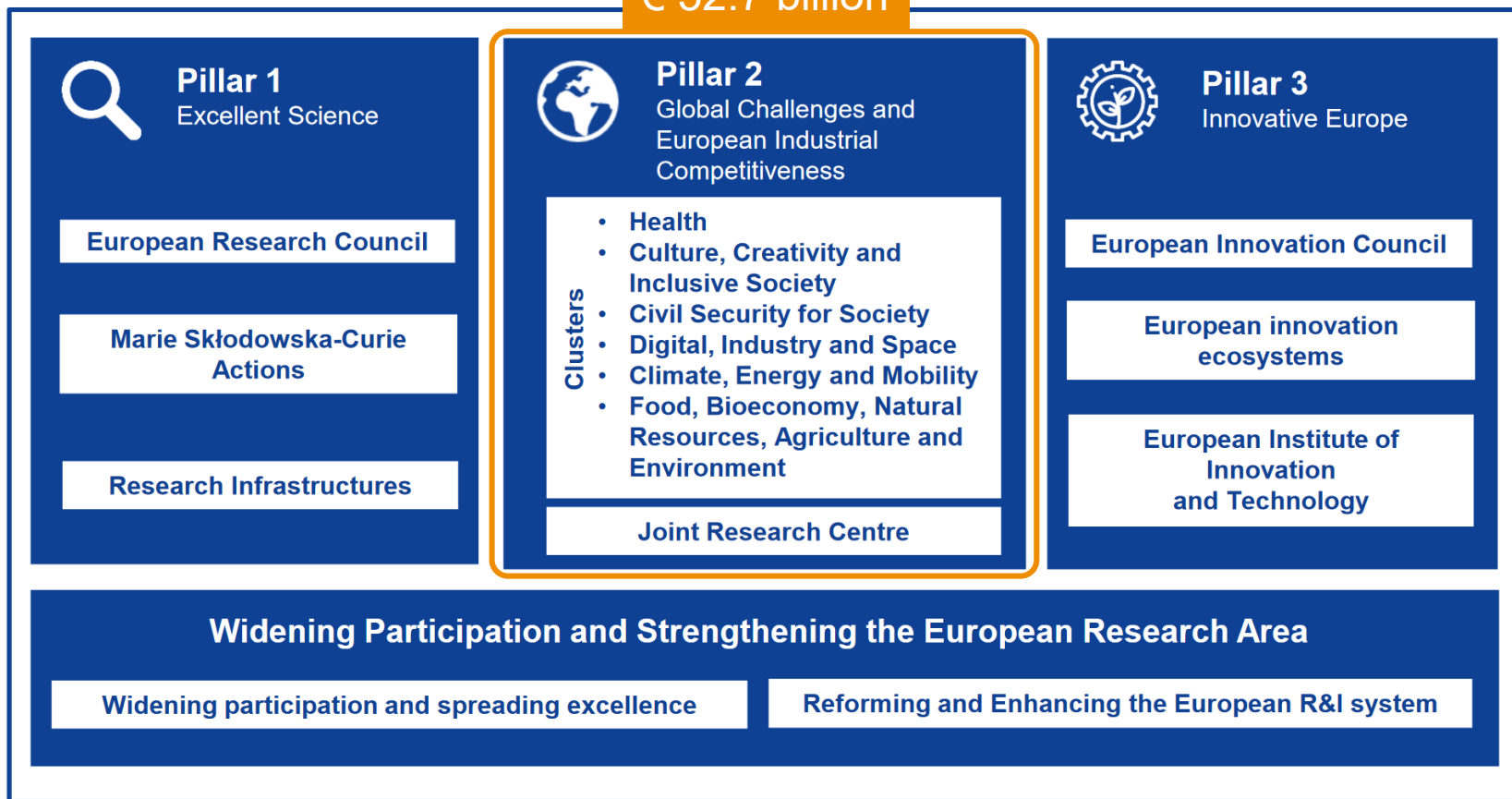
1987–2003, 1.– 6. FRP	Drittstaat
2004–2013, 6. und 7. FRP	Vollassoziierung
2014–2016, Horizon 2020 (8. FRP)	Teilassoziierung
2017–2020, Horizon 2020 (8.FRP)	Vollassoziierung

- The first H2020 projects have been directly funded by the Swiss ministry for research, education & innovation **SBFI**
 - Some “double bookkeeping” for Brussels & Berne
- Detailed information on SBFI websites

Upcoming “Horizon Europe”

Horizon Europe: Preliminary structure

€ 52.7 billion



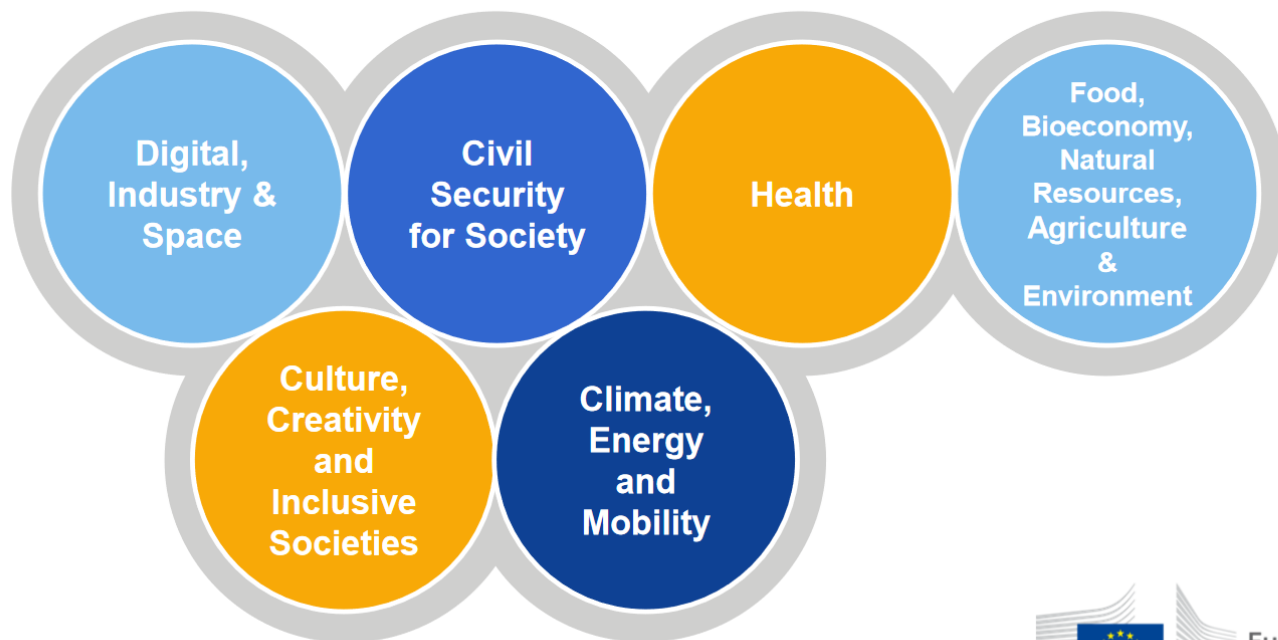
Pillar 2 of “Horizon Europe”

Pillar 2 - Clusters

Global Challenges & European Industrial

Competitiveness: boosting key technologies and solutions underpinning EU policies & Sustainable Development Goals

Commission proposal for budget: € 52.7 billion



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