European Innovation Council

Backing visionary entrepreneurs

The European Innovation Council

Info Day Transition challenge: Chip-scale Optical Frequency Comb

February 9th 2023

European Innovation Council

WELCOME!

- Be aware that **this meeting is recorded**
- **Recording and slides** of the event will be available very soon **on the event page**
- Please submit **your question as Anonymous** in Sli.do if you do not want your name to appear in the recording.

Join at **Sli.do**

With the event code
#Challenges

Backing visionary entrepreneurs

The European Innovation Council

InfoDay Transition Challenge

Chip-scale Optical Frequency Comb

Agenda

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9 Feb 2023, 11:35 AM - 11:40 AM CET	**Welcome & Introduction** Anne-Marie Sassen (EIC/EISMEA)
11:40 AM - 11:50 AM CET	**Presentation EIC Transition Project Specificities** Isabel Obieta (EIC/EISMEA)
11:50 AM - 12:10 PM CET	**EIC Transition Challenge – "Chip-scale Optical Frequency Comb"** Challenge considerations and criteria Examples of EIC projects in the "Photonic devices" Thematic area Isabel Obieta (EIC/EISMEA)
12:10 PM - 12:55 PM CET	**Q&A**
12:55 PM - 01:00 PM CET	**Closing remarks** Anne-Marie Sassen & Isabel Obieta (EIC/EISMEA)

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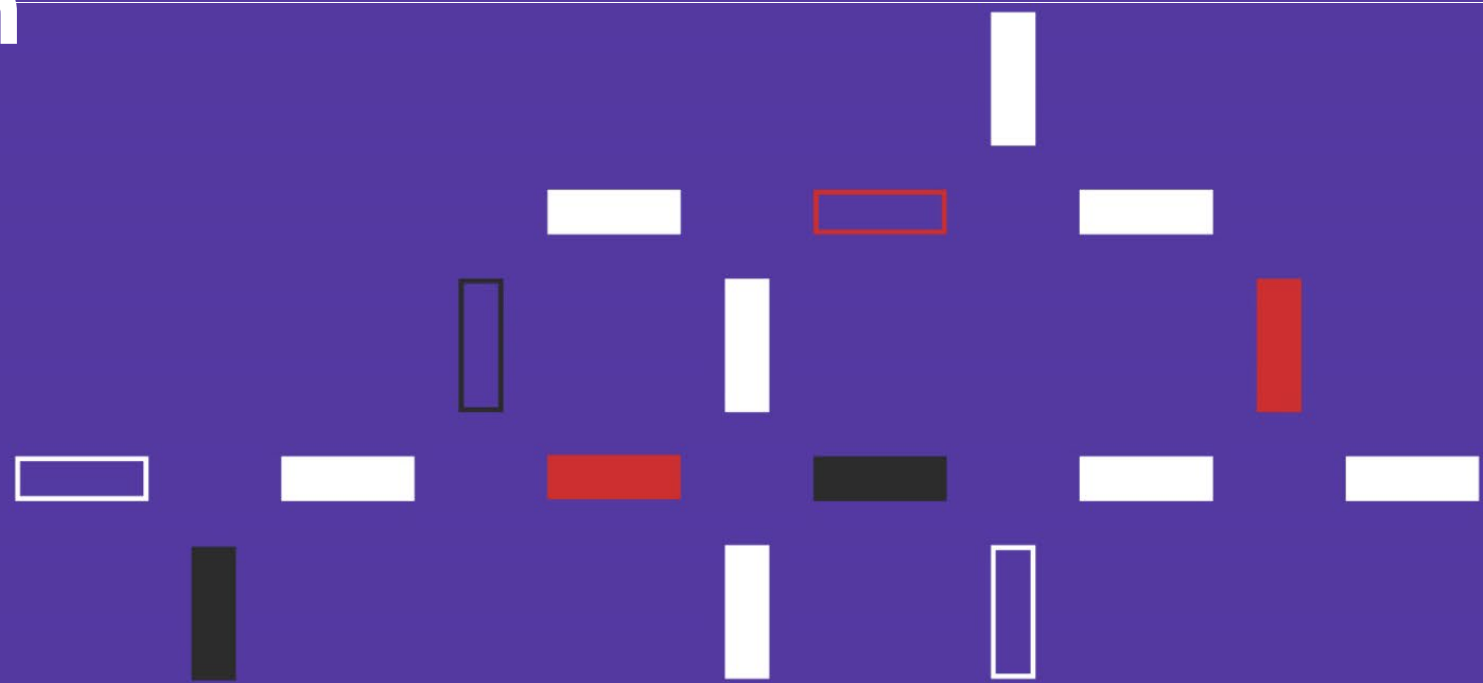
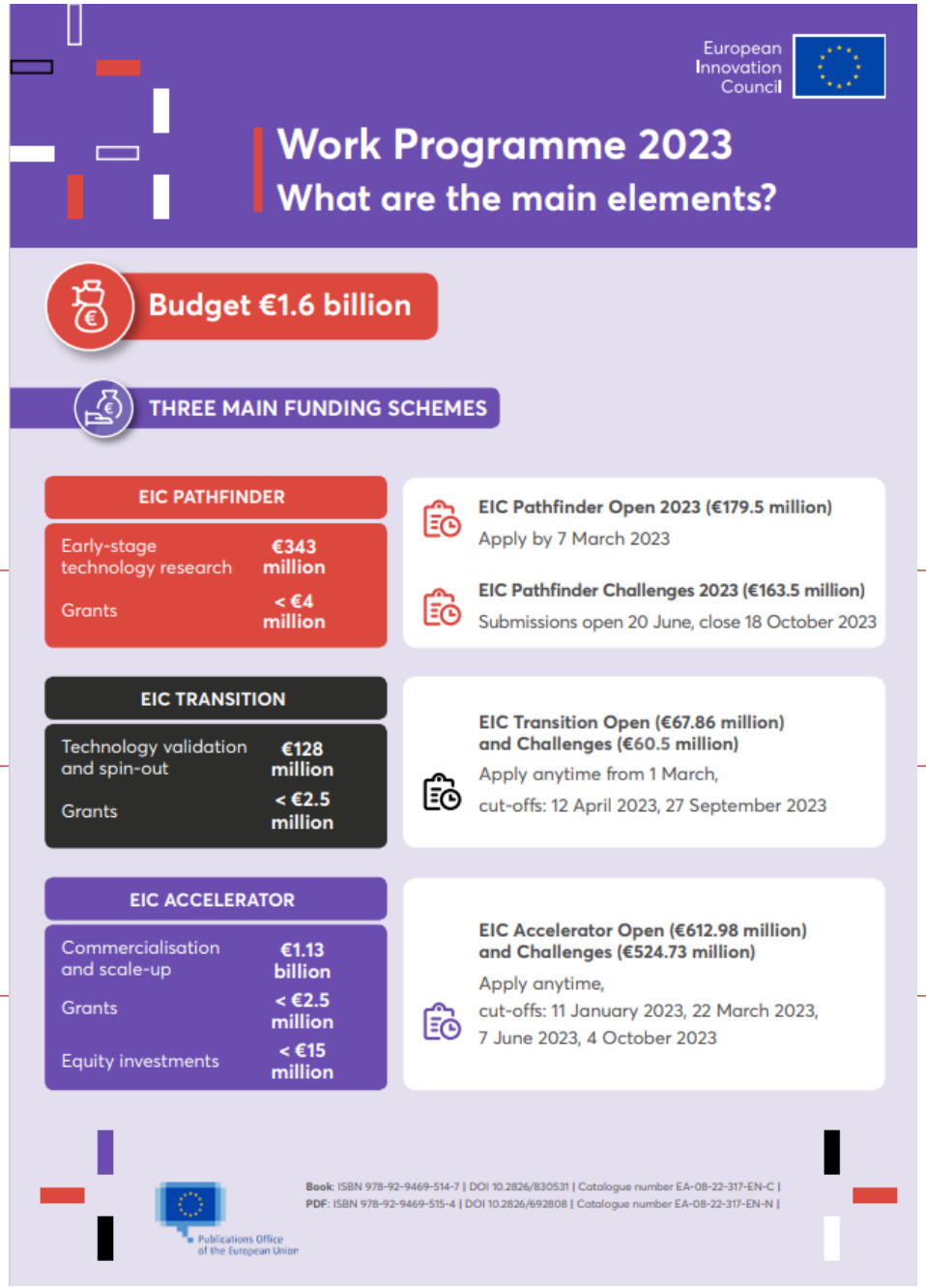
Introduction

Anne-Marie Sassen





TRL1-4

Open: for consortia
Challenge: single, consortia
Science and research

TRL4-6

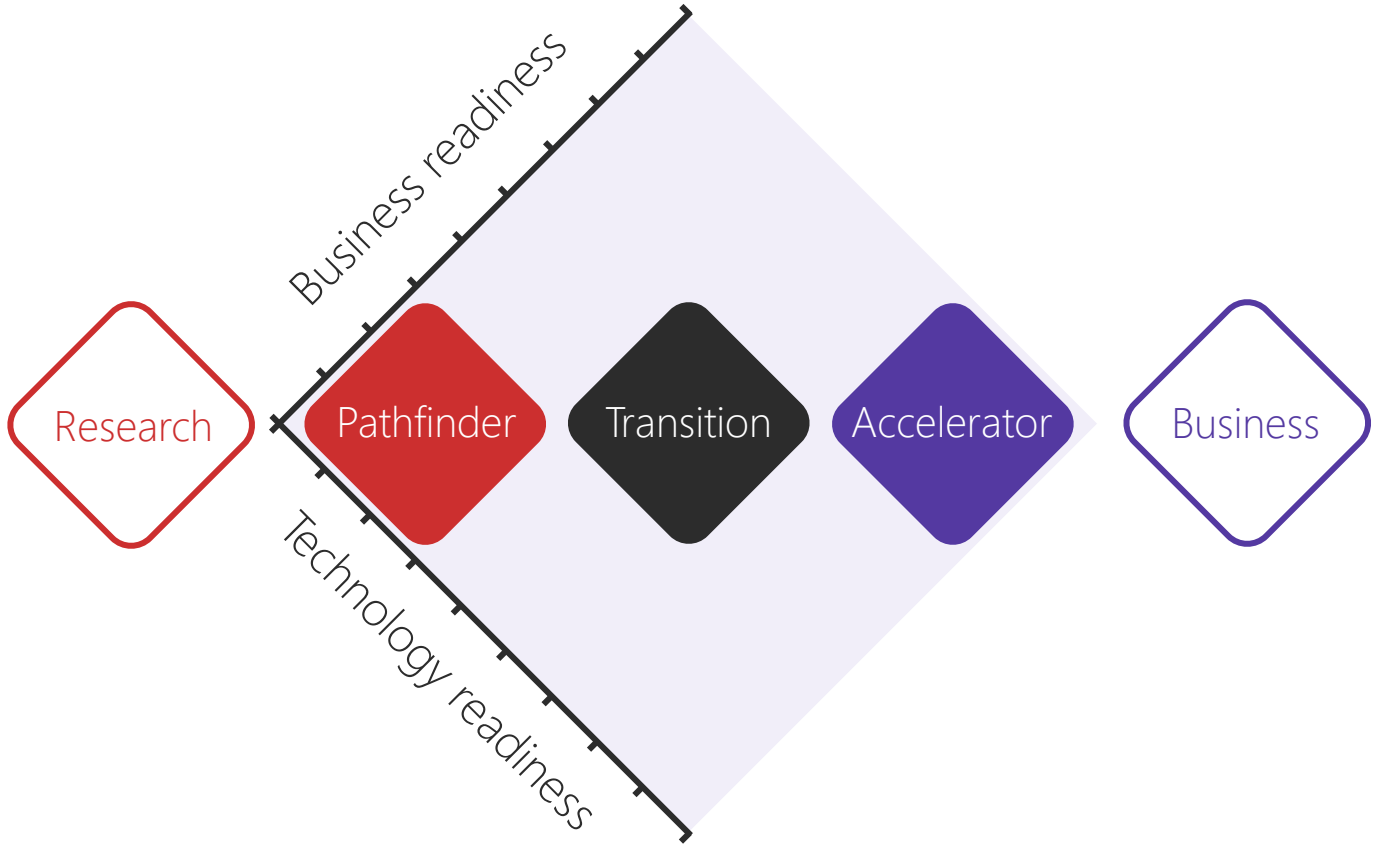
For consortia
For single entities
EIC Pathfinder, ERC PoC
Business readiness

TRL6-9

For individual SME / start-ups
Innovation scale-up
Blended finance

EIC stages the entrepreneurial journey as pathfinder, transition, accelerator with increasing readiness levels

WHAT?



WHY?

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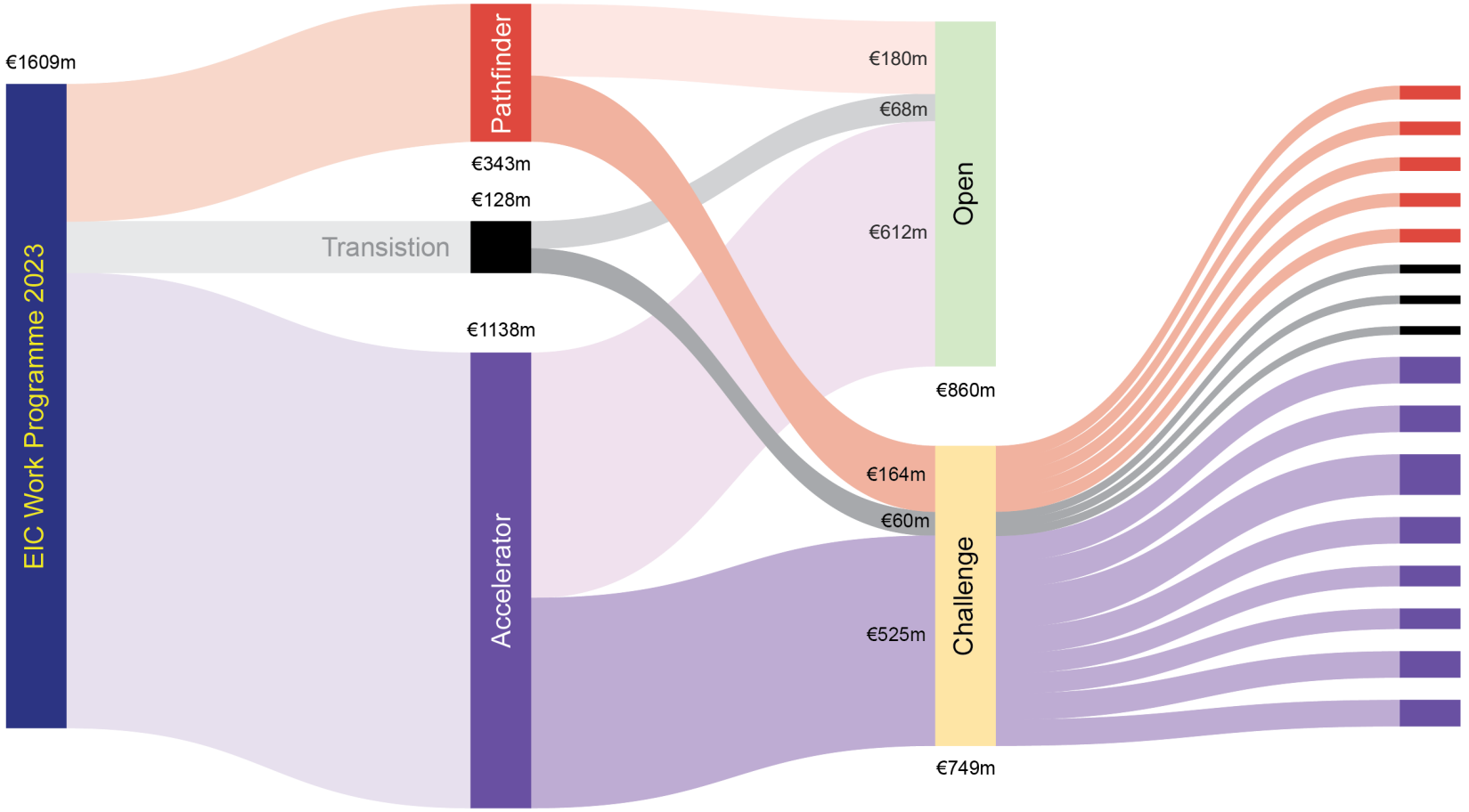
In 2023 EIC allocates ~€1.6bn to Open and Challenge calls by its Pathfinder, Transition, Accelerator programs



€32.7m	P1	Clean efficient cooling
€32.7m	P2	Digitalized construction
€32.7m	P3	Precision nutrition
€32.7m	P4	Responsible electronics
€32.7m	P5	In-space solar energy harvesting
€20m	T1	Medical micro-nano-bio devices
€20m	T2	Environmental intelligence
€20m	T3	Chip-scale optical frequency combs
€65m	A1	Biomarker-guided cancer treatment
€65m	A2	Aerosol and surface decontamination
€100m	A3	Energy storage technologies
€65m	A4	Digitalized construction
€50m	A5	Fault-tolerant quantum computers
€50m	A6	Semiconductor chip design
€65m	A7	Technologies for resilient agriculture
€65m	A8	Space technologies and services

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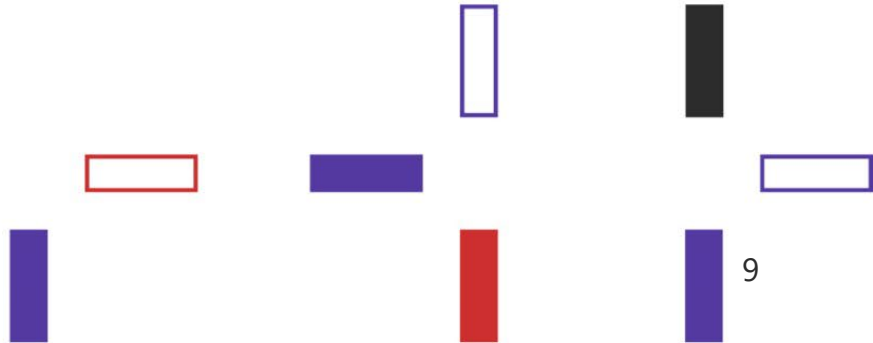
The goal of this Info-day session:

- Provide some background to the Challenge
- Explain the Challenge as presented in the Work Programme
- Answer your questions regarding the Challenge Call
- Is not to provide you with feedback of appropriateness of your individual proposal to this Challenge call



The Legal Basis: EIC Work Programme 2023:

EIC Transition
Open and Challenges

EIC Transition supports different pathways…

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A 'Transition to Technology' for collaborative project **to further develop strategic and high impact technology** up to TRL 5/6. This may require a multi beneficiary approach (e.g. SMEs, RTOs and potential users / customers).

A 'Transition to Market' for project **led by an SME/Start-up that identifies an opportunity** in the research results towards a specific market application. It may require, or lead to, a **license agreement** with the SME.

A 'Transition to Entrepreneurship' for project driven by **entrepreneurial researchers** to turn research results into a viable product **by looking for a suitable business model and creating spin off company**.

Who can apply?

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Who can apply?

- Pathfinder* & H2020 FET*
- **H2020* or HEU* if on topic**
- FET ERA NETs*
- EU Defence Fund (Preparatory Action on Defence Resarch)
- ERC PoC*

- Even if you were not part of the eligible project, you can apply. In this case, **you need to include in your proposal a commitment letter** from the relevant owner(s) of the result(s), which confirms the **commitment of the owner of the eligible project result to negotiate** with you fair, reasonable and non-discriminatory **access to such results**, including IPR, for the purpose of future commercial exploitation.

**Started 12 months before or ended less than 24 months after the call deadline*

You found an interesting innovation?! What's next?

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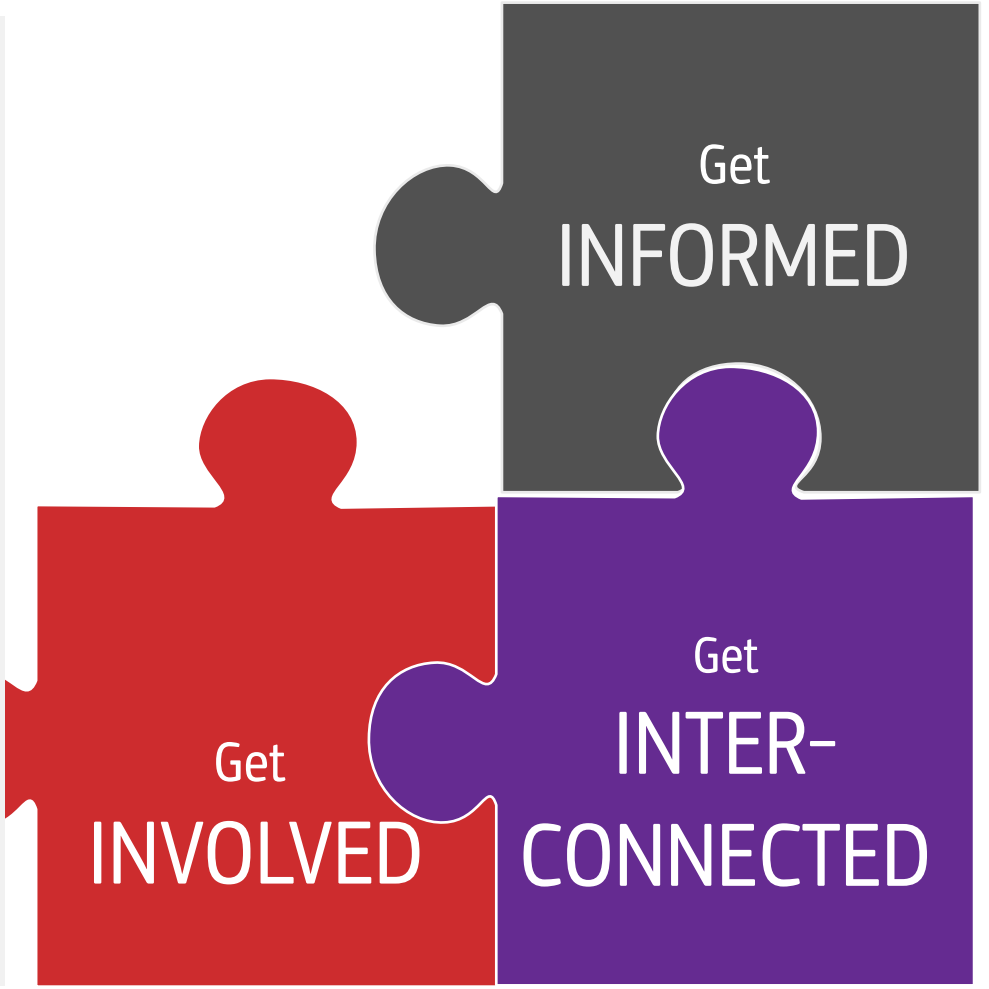
- **Get (inter) connected**
  - Talk to your NCP(s) (National Contact Point):
  - There are NCPs specialised on ERC or FET/Pathfinder, Accelerator…
  - Contact the owner(s) of the technology and/or members of the consortia.
  - Explore if there is an alignment of interest and potential for collaboration
- **Get involved**
  - Try to reach an agreement for a possible consortia
  - Start writing (together) your proposal.



EIC Transition 2023

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Budget €128.36 million

- Open: €67.86 million
- Challenges: €60.5 million
  - Full scale Micro-Nano-Bio devices for medical and medical research applications;
  - Environmental intelligences;
  - Chip-scale optical frequency combs

Grants up to €2.5 million

(or more if well justified)

Applications

- Apply anytime
- 2 cut-offs
  - 12 April 2023
  - 27 September 2023

Who can apply?
Monobeneficiary or small consortia

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2 beneficiaries	**2** different countries
3 beneficiaries	**3** different countries (min 1 Member State)
4 or 5 beneficiaries	**min 3** different countries (min 1 Member State)

Beneficiaries
independent legal entities

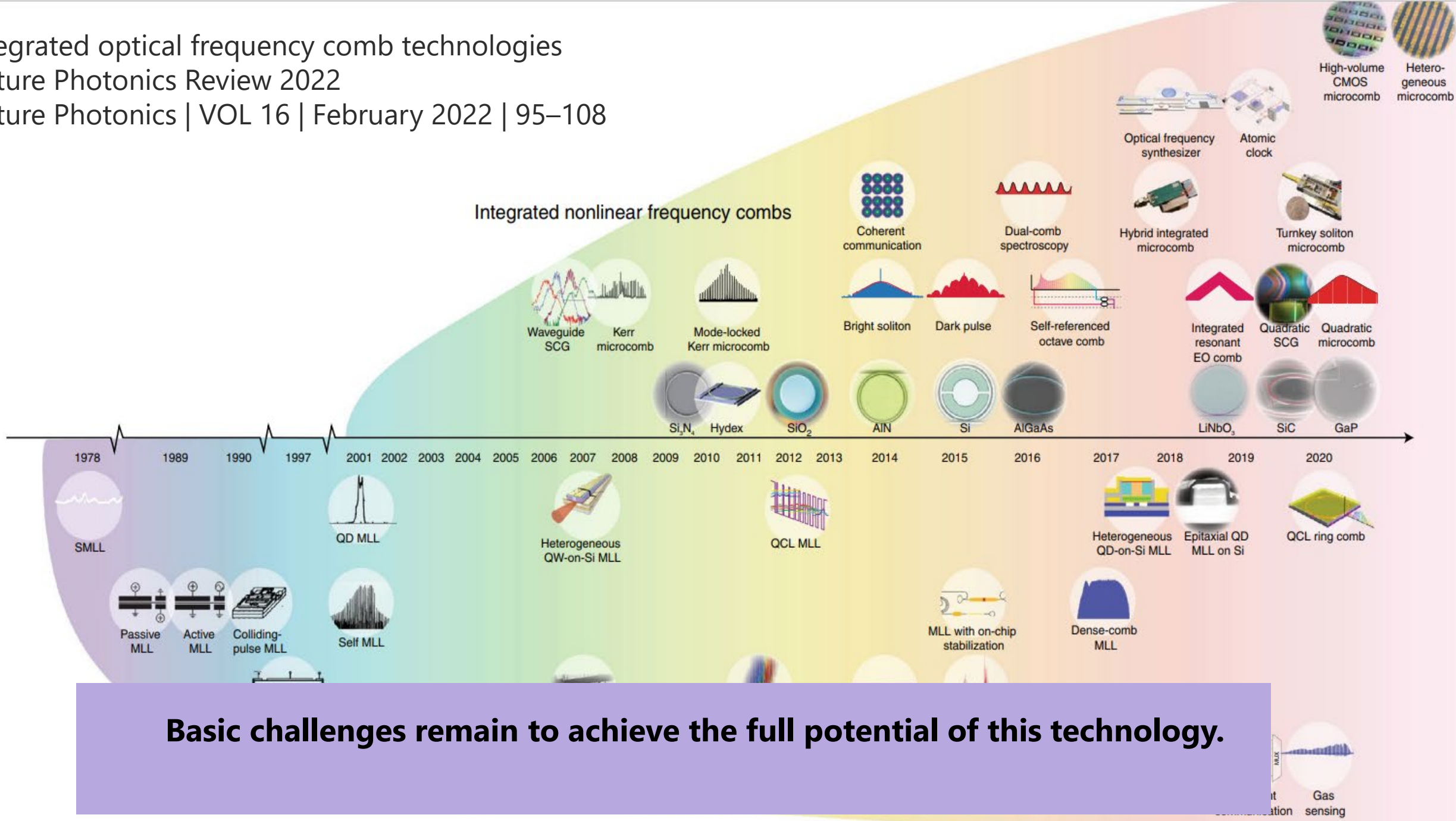
Countries
Member States or Associated countries

Consortia
may include universities (TTOs), RTOs, SMEs, corporates, customer organisations, end users
(e.g. hospitals, utilities, industry, regulatory bodies, public authorities)

EIC Transition

Chip-scale optical frequency comb

Integrated optical frequency comb technologies
Nature Photonics Review 2022
Nature Photonics | VOL 16 | February 2022 | 95–108



Basic challenges remain to achieve the full potential of this technology.

Chip-scale optical frequency combs
Overall goal and Specific objectives

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The overall goal of this Challenge is to **advance technological developments of the light states in driven nonlinear systems and to develop novel platforms for chip-scale frequency combs**

The s**pecific objectives of this Challenge** aim at supporting successful transition from experimental proof of concept or technology validated in lab to technology validated or demonstrated in relevant environment by:

- Advancing or maturing novel technologies for chip-scale frequency combs for applications that require multiple frequencies of coherent laser light, with higher than the currently mainstream conversion efficiencies and with extensions to wavelength ranges, across all spectral regions with integrated photonic technologies.
- Mature the frequency combs technologies to include integration options for other functional elements, compatible with wafer scale manufacturing. Use of new nonlinear materials such as Gallium Phosphide, Lithium Niobate and others may be considered as well.
- Exploit the precision of optical frequency combs by developing concepts for new industrial applications such as:

- **Integrated multi-channel light sources for optical communication in datacentres,**
- **Highly efficient sensors that measure mid-infrared molecular spectra,**
- **Optical atomic clocks on a chip.**

The applicants should identify what are the limits of the current paradigms they are trying to improve and propose relevant metrics or KPIs to track progress and demonstrate success or a superior paradigm compared with current state of the art.

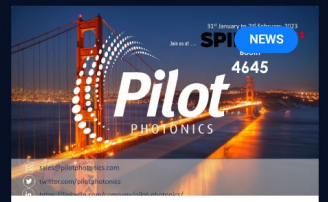
Chip-scale optical frequency combs
Expected Outcomes and Impacts

- to foster skills, talent, and innovation in semiconductor technologies, specifically for using advanced materials and the integration of photonics and microelectronics in cutting-edge chips.
- novel results deep-tech innovations for next-generation chip technologies that will enable new applications, providing strong competitive advantage for future innovative start-ups and SMEs that the EIC can further support towards scale up through its Accelerator scheme.
- An exploitation strategy (including the formal IP protection) and a credible business model, its initial validation and a business plan with the goal of attracting private investors and industrial partners.

Examples of EIC project

Pilot Photonics

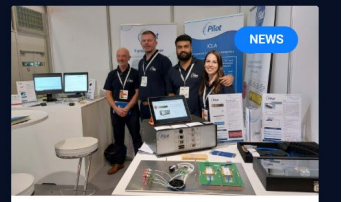
Enabling single-chip photonic integrated circuits with comb-enhanced capabilities at wafer scale, today.



PILOT PHOTONICS ANNOUNCES AVAILABILITY OF WORLD'S FASTEST SWITCHING LOW LINEWIDTH, WIDELY TUNABLE LASER

San Francisco, Jan 31, 2023— Pilot Photonics today announced the availability of a new widely

January 31, 2023



ECOC 2022: PILOT USES JEPPIX SERVER FOR PHOTONICS TECH

Pilot Photonics demonstrated three new products at ECOC2022 which emanated from the JePPIX platform. These

January 1, 2023

Accelerator project

Transition Project

STAND

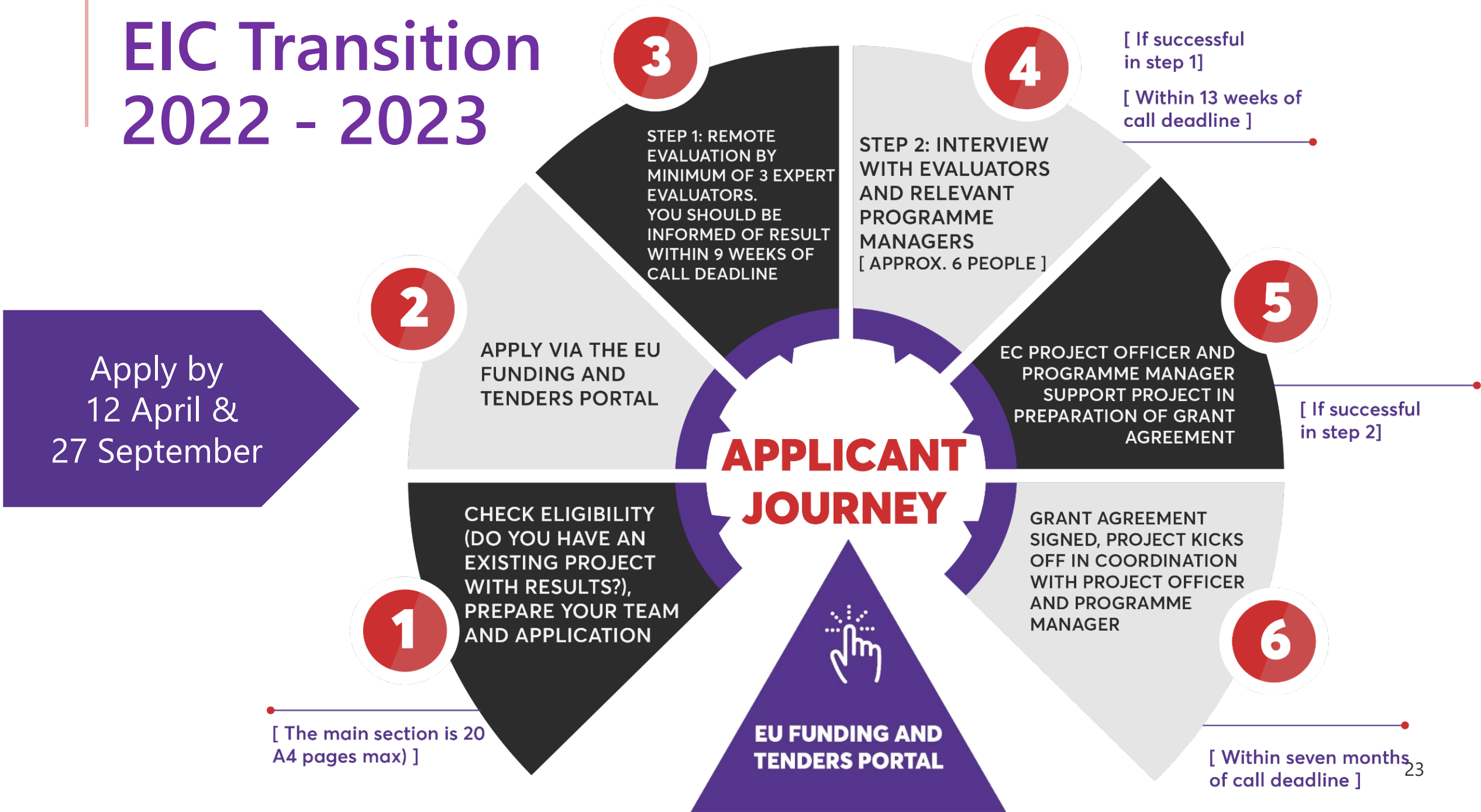
Home

STAND

STAND will focus on exploring market opportunities, commercial potential, and first industrial testing of standalone soliton microcomb modules. The project will be carried out by EPFL as Coordinator

EIC Transition Applicants Journey

EIC Transition 2022 - 2023



Step 1 and 2: Transition Challenge specificities

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At first evaluation stage

Under Excellence

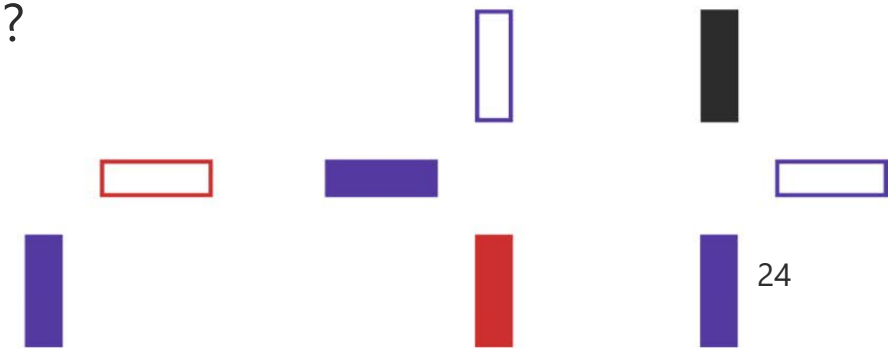
Additional Consideration for EIC Transition Challenges ONLY: How relevant are the proposal objectives in contributing to the specific objectives of the Challenge?

Under Impact

Additional Consideration for EIC Transition Challenges ONLY: To what extent the proposed application contributes to the expected outcomes and impacts, set out in the Challenge?

At second evaluation stage – Jury Interview

Additional Consideration for EIC Transition Challenges ONLY: How relevant are the proposal objectives in contributing to the specific objectives of the Challenge?



Step 2: Feedback from the Jury Members

Applicants must provide clarity on aspects related to

- current and expected **TRLs** at the end of the project,
- the **credibility of the business objectives**.
- **IPR** ownership,
- **technical** and **business** risks,
- the **future exploiting team**, and
- Technical **milestones**,
- **interdependence** of work packages and tasks,
- budget and allocation of resources,

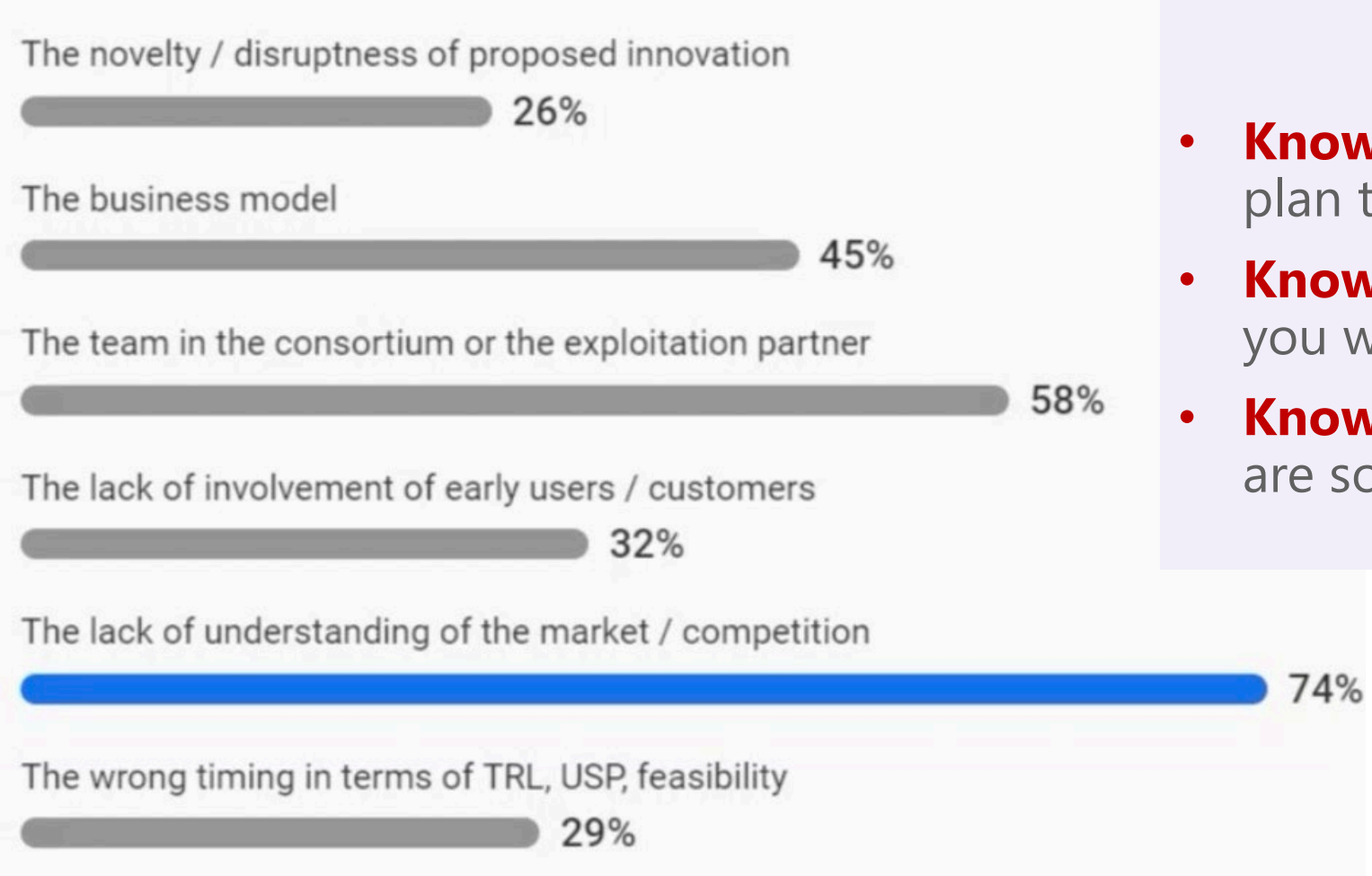
Lessons learned / proposal content

- **Need for focus on impact and business potential**
  - Some projects did not identify a promising market potential

- **Business Model and Market Analysis**
  - Preliminary Business and Market analysis part of proposal
  - Business Model validation and refinement of Market analysis alongside technology development

- **Technology Readiness Level**
  - Level 3 is the starting point in the proposal, cannot be less
  - Level 4 is preferred especially when high technological risks
  - Level 5 is too high. They can apply directly to Accelerator

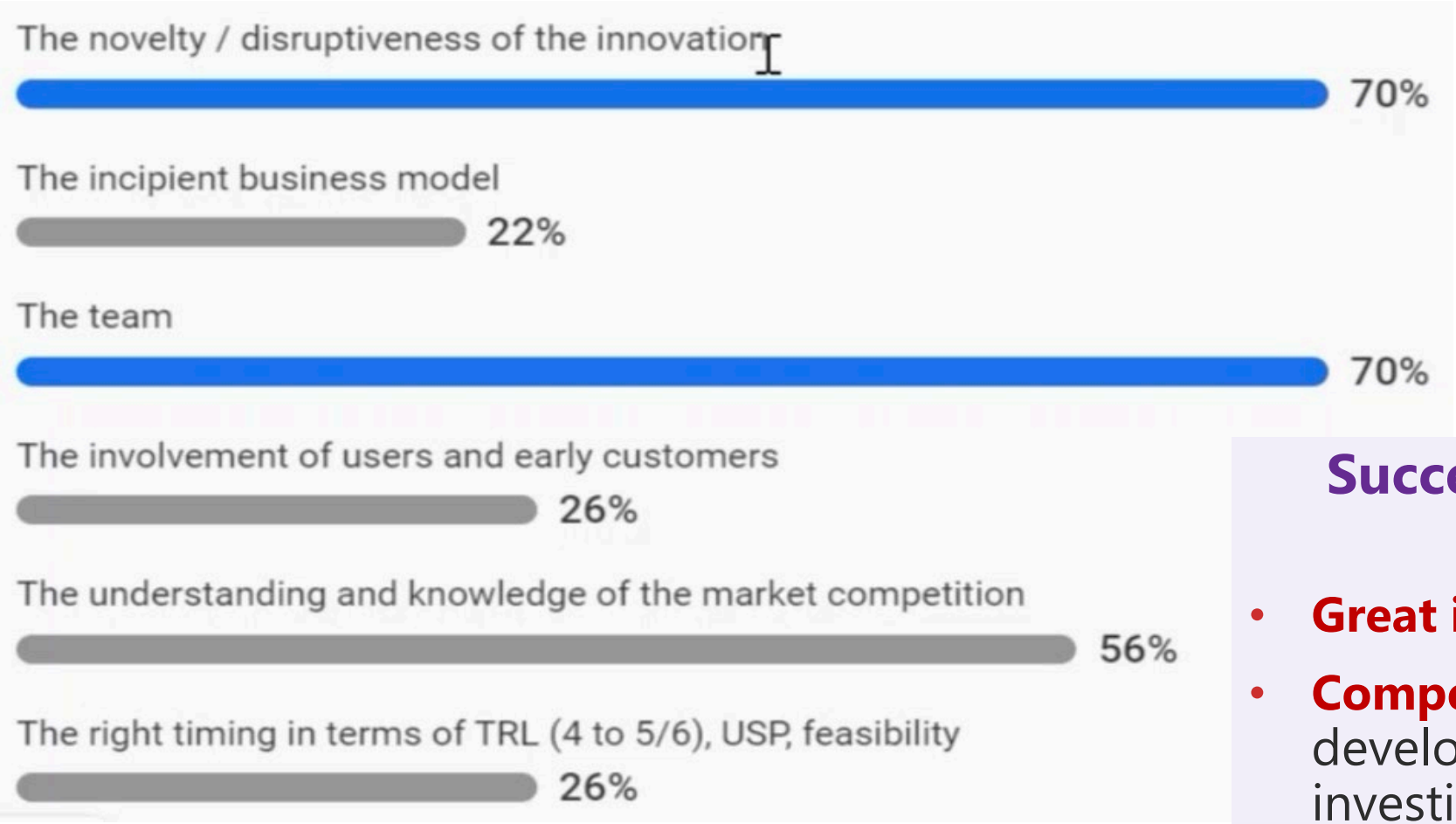
Major weaknesses of the NoGO proposals



Lessons

- **Know the market** you plan to enter
- **Know the competition** you will face
- **Know the problem** you are solving

Major strengths of the GO proposals



Succesful proposals have

- **Great innovation**
- **Competent team** to develop technology and investigate market and business

Useful links to the EIC Work Programme 2023:

EIC Work Programme 2023:
(the legal basis)

Recording of EIC Info-day 13 December:
(not repeated today)

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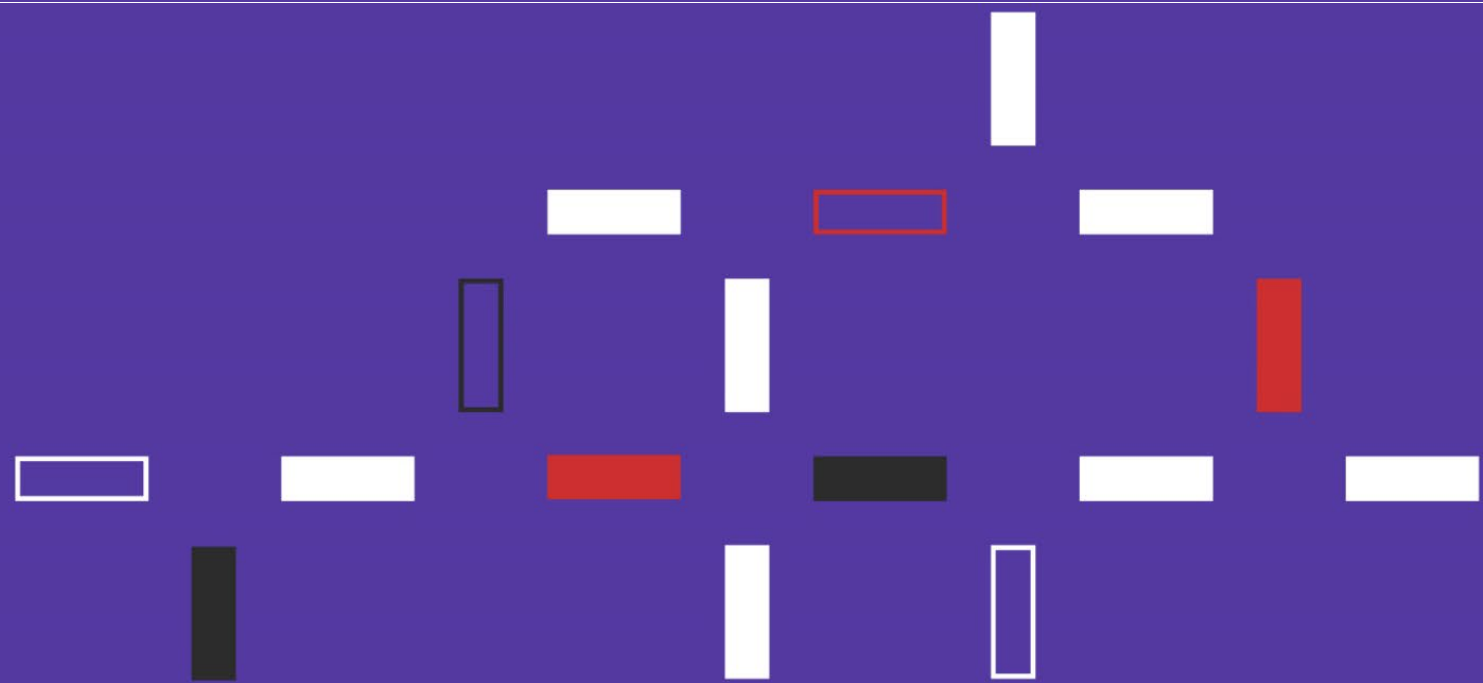
Q&A

Isabel Obieta
Ivica Cubic



Questions: contact your National Contact Point

National Contact Points for Horizon Europe:
(NCP Portal)

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Thank you!

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