Joint Call High-Performance Computing 2023

Information Session
19.09.2023 | 11:00 – 12:00

Agenda

- **Introduction: Joint Call High-Performance Computing 2023** – 10 min
  Speakers: Christian Pauly (Ministry of Economy)
  Sakthivel Sundharam (FNR)

- **National HPC Competence Centre** – 5 min
  Speaker: Ralf Hustadt (Luxinnovation)

- **Presentation of the Joint Call High-Performance Computing** – 25 min
  Speakers: Christian Pauly (Ministry of Economy)
  Sakthivel Sundharam (FNR)

- **Luxinnovation Support** – 5min
  Speaker: Maximilian Przybyl (Luxinnovation)

- **Q&A** - 15min

Who is Who in the Joint Call HPC

LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Économie

Granting authority for **Companies** (R&D aid schemes)

Luxembourg
National
Research Fund

Granting authority for **Research Organisations** (R&D grants)

LUXINNOVATION
#MakingInnovationHappen

Research Industry Collaboration Platform Manager

EURO
LUXEMBOURG
NATIONAL HPC
COMPETENCE
CENTRE

HPC Community Manager in Luxembourg

National Research Priorities

Luxembourg's National Research & Innovation Strategy

www.researchluxembourg.org

Innovation Challenges TRL 4 to TRL7

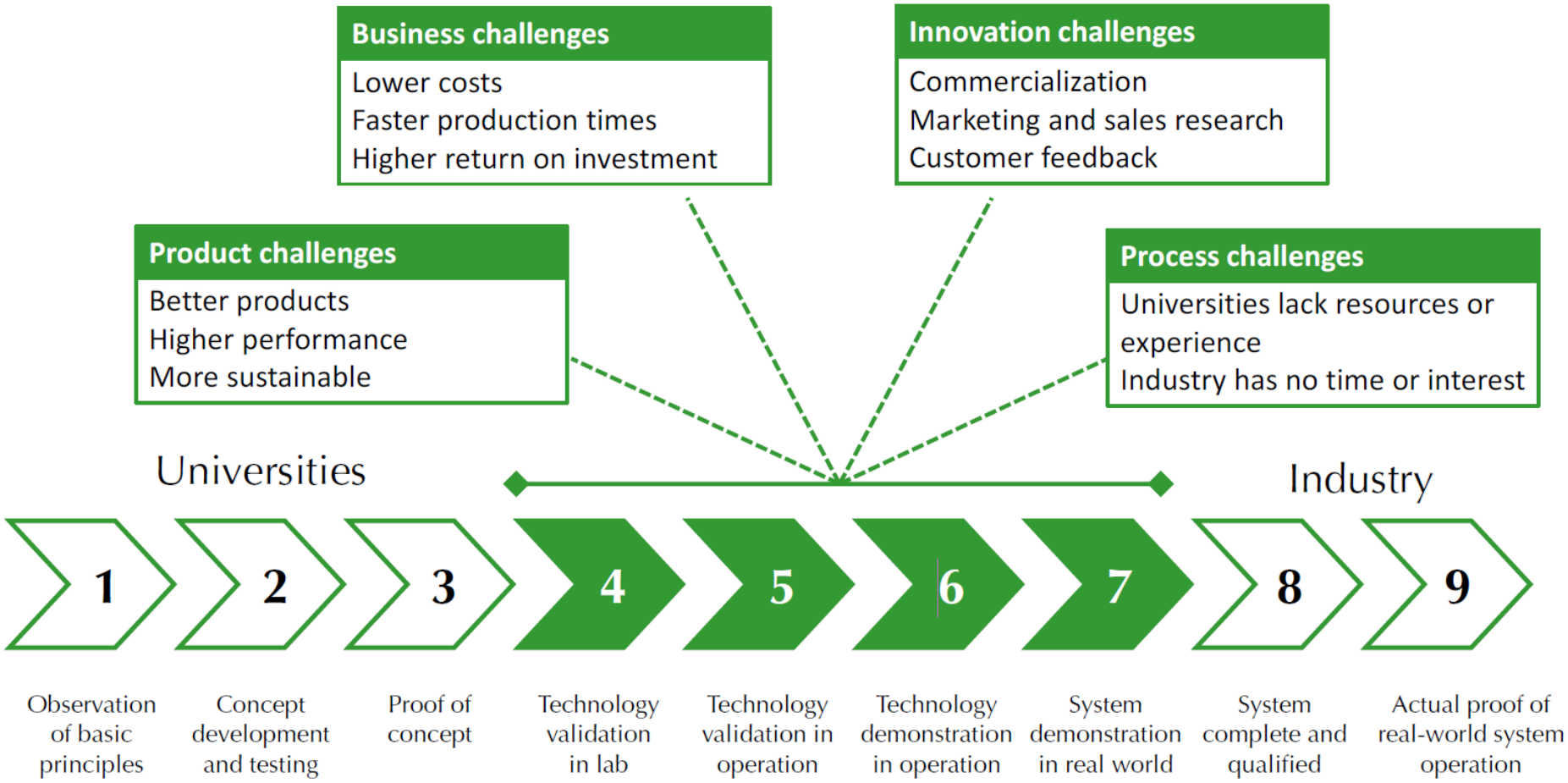
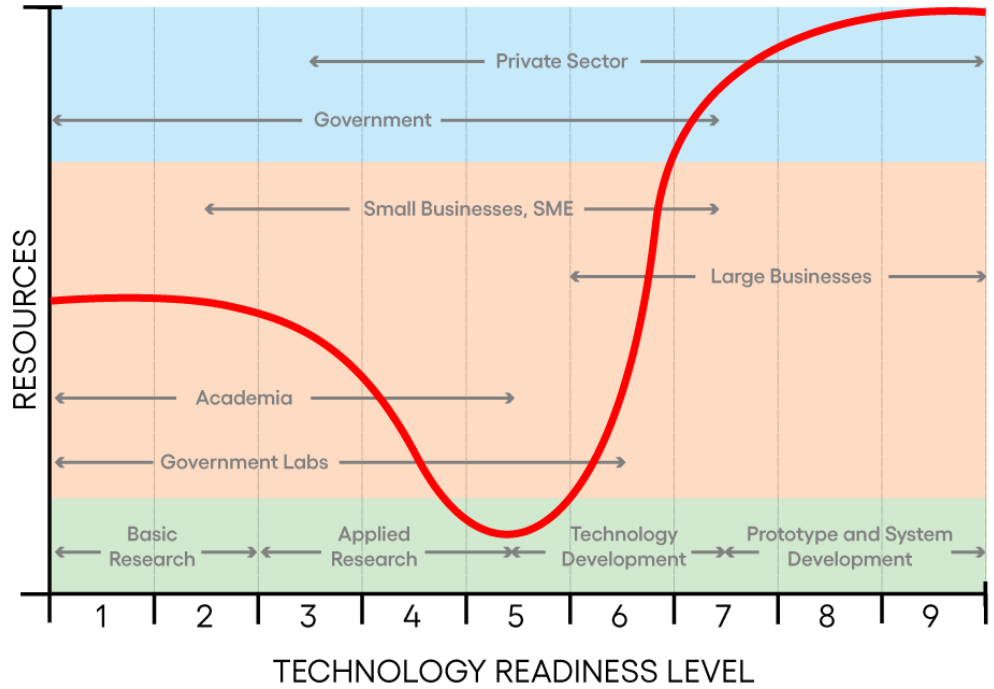


Image from : Hensen, Jan & Loonen, Roel & Archontiki, Maria & Kanellis, Michalis. (2015). Using building simulation for moving innovations across the “Valley of Death”. REHVA Journal. 52. 58-62.

FNR Innovation Programmes



Source: Hensen, Jan & Loonen, Roel & Archontiki, Maria & Kanellis, Michalis. (2015). Using building simulation for moving innovations across the "Valley of Death." REHVA Journal. 52. 58-62.

Universities along with public funding sources focus on TRLs 1-4

Private sector focuses on TRLs 7-9

'Valley of Death' represents often neglected addressing of TRLs 4 to 7, where **neither academia nor the private sector** prioritizes investment

Consequently, many technologies, albeit promising, finish their maturity journey prior to deployment

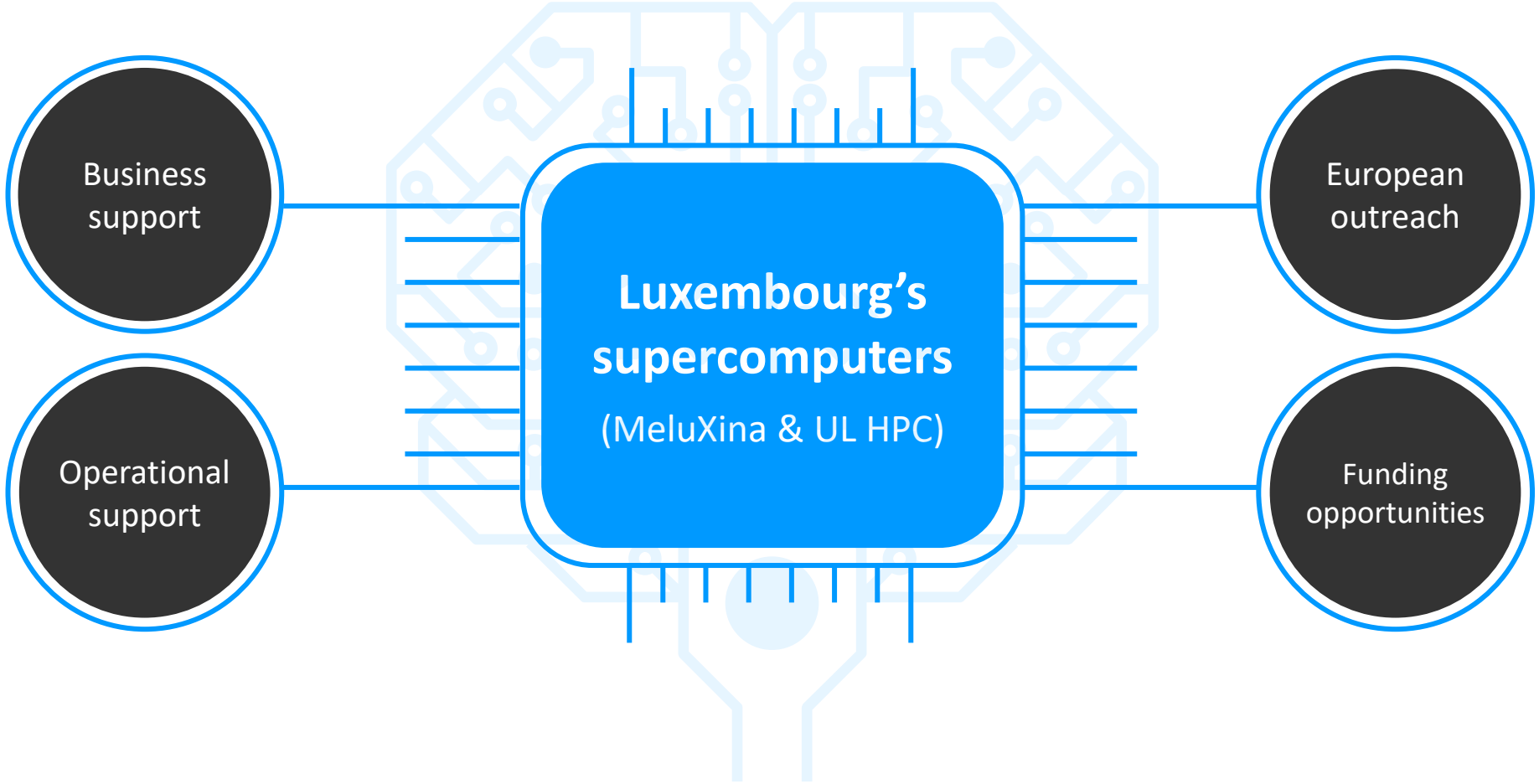
To **bridge (jump)** the valley of death, collaborative efforts are often required

National HPC competence centre

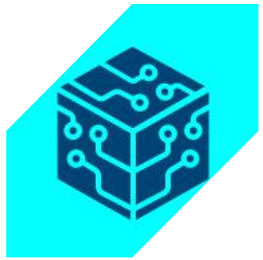
Luxembourg's contact point for **high performance computing** and **data analytics**

Set up a **network of national competence centres in HPC** across **Europe**

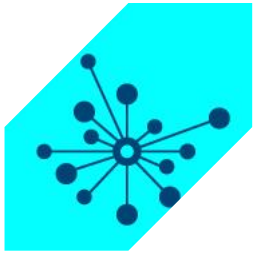
Foster HPC ecosystem in Luxembourg



What to do with HPC?

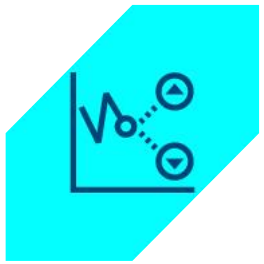


SIMULATIONS & MODELLING



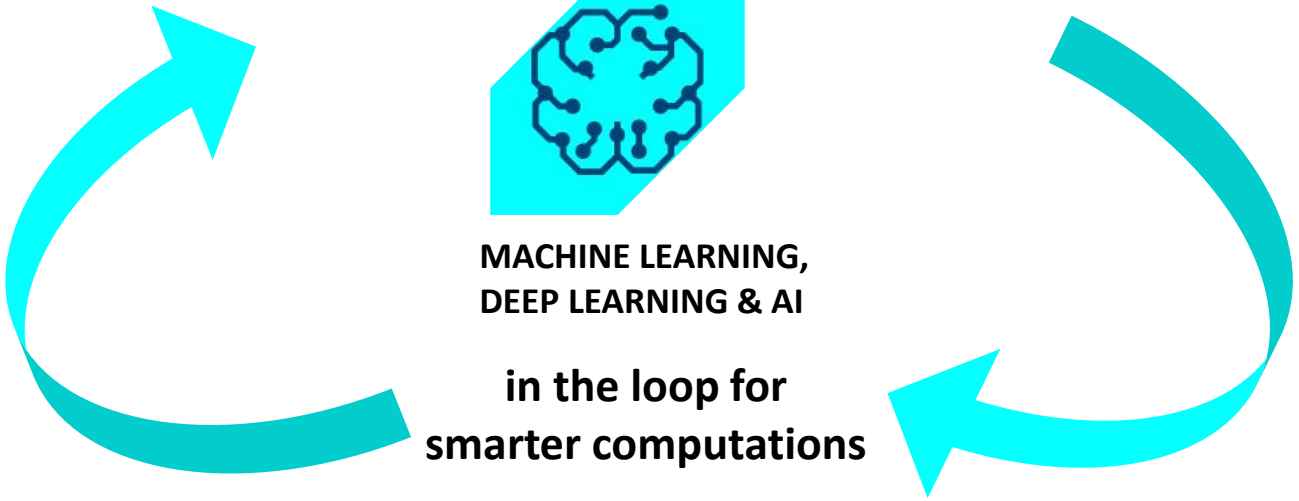
BIG DATA ANALYTICS & VISUALISATION

MACHINE LEARNING, DEEP LEARNING & AI



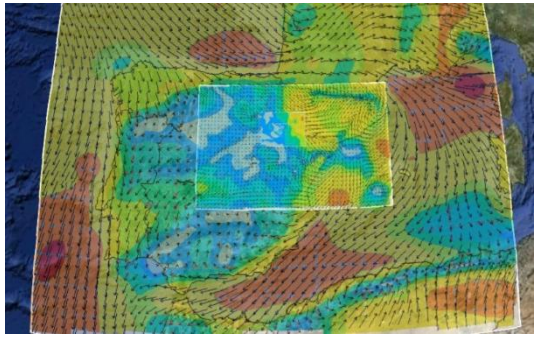
PREDICTIONS & FORECASTING

VIRTUAL TESTING & OPTIMISATION

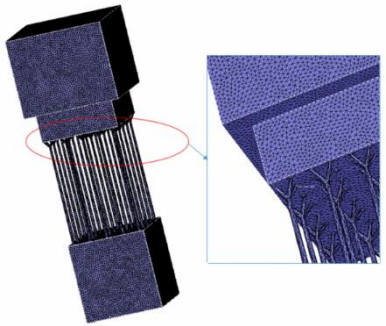


in the loop for smarter computations

HPC use cases examples

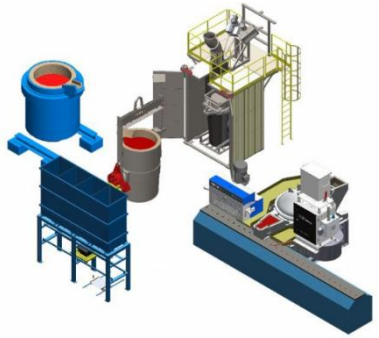


Best position for small wind turbines or solar panels

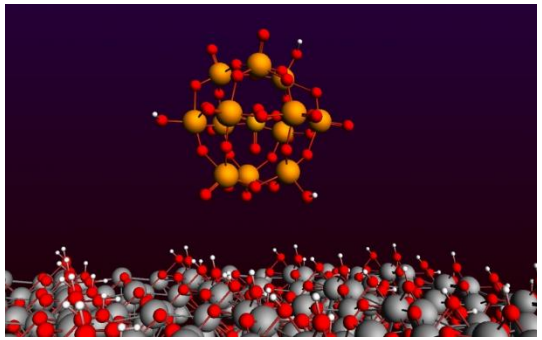


Simulation of additive manufacturing process

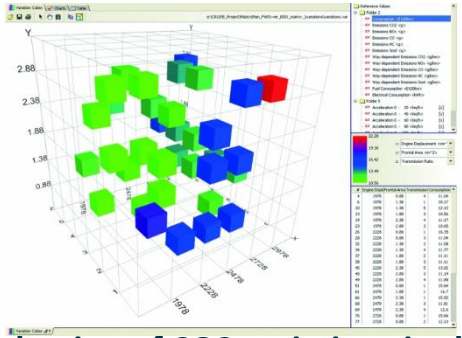
Optimise logistic choices



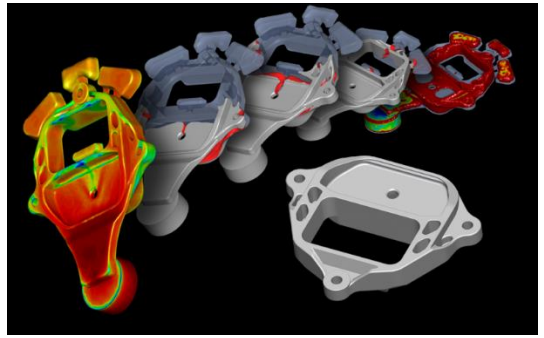
Reduce waste rate in production processes



Simulation of the thermodynamic properties of chemicals



Reduction of CO2 emissions in the design of vehicles



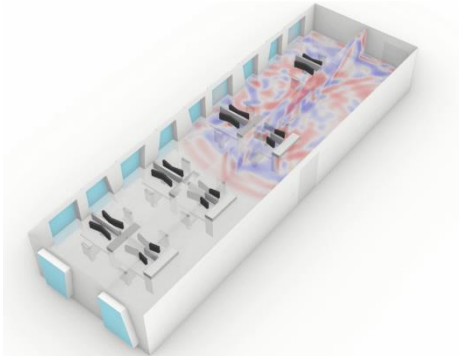
Simulation of metal casting for moulds design

Smart Retail Recommendation Engine (AI algorithm)

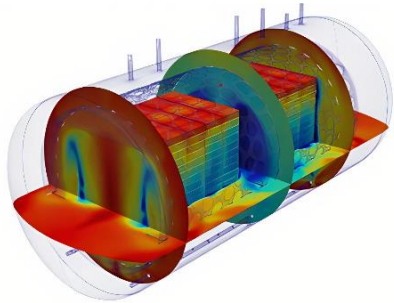
HPC use cases examples

Predictive maintenance of machines and tools

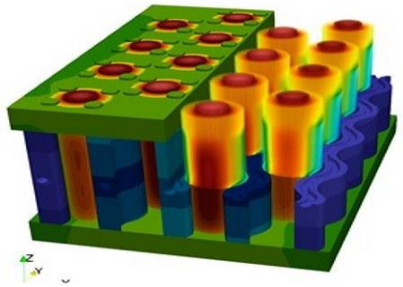
Geospatial intelligence based on AI algorithms



Architectural acoustic simulation

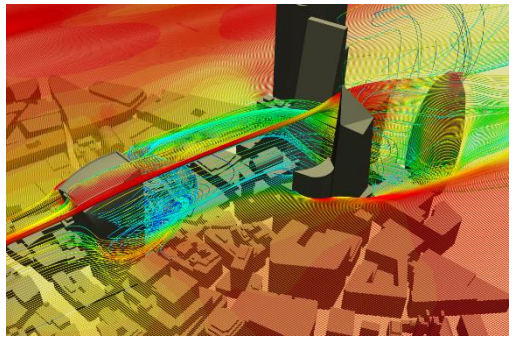


Simulate canned food dynamics

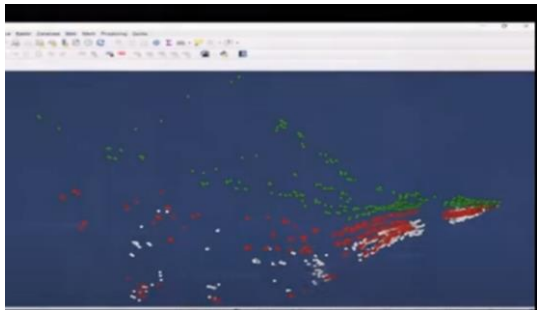


Improved battery materials using molecular modelling

Reservoir monitoring through satellite data (AI algorithm)



Simulation of Pedestrian Urban Microclimate & comfort



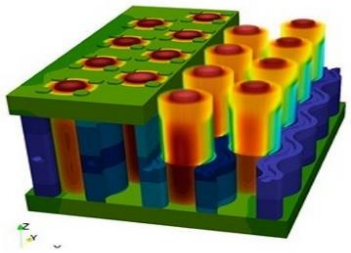
Navigation system for maritime litter hunting

Joint Call High Performance Computing

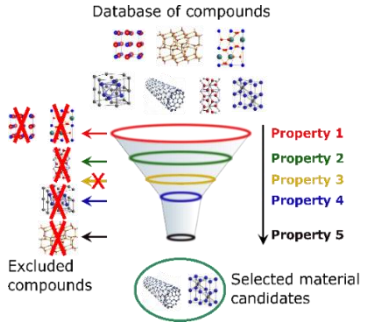
Scope:

Supporting consortia to take advantage of high-performance computing (HPC) capacities in their research or business fields.

- **Integrating computer-aided engineering, design and analytics** as well as HPC into company's **internal innovation process**
- Implementation of **high quality** and **innovative** applied R&D projects based on HPC



Improved **battery materials** using **molecular modelling**



Workflow for **high-throughput computation**

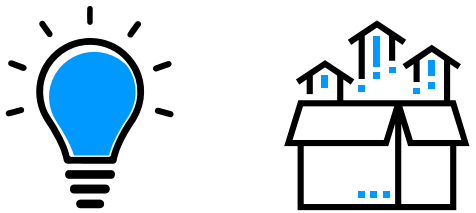
Context:

HPC is an **innovation accelerator** offering enormous potential

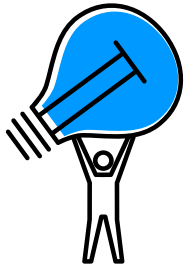
- Simulation and virtual prototyping
- Large and complex problems with many parameters
- Big data analytics and training of AI algorithms
- …

Call Objectives – in a nutshell

Facilitating **collaborative projects** between public research institutions and companies that are **based on HPC** and that are **valuable for both parties**



Increase the **company's expertise** in HPC applications (e.g. modelling and simulation, data analysis, virtual testing, machine learning, AI..)



Support **innovation** and **sustainable value creation** through **strong partnerships**

Encourage the implementation of innovative projects that contribute to the **development of Luxembourg's industrial and economic landscape** and are in line with **national strategic priorities**

Increase the **attractiveness** of Luxembourg as an **innovation hub** based on **advanced technology research on HPC**

Call Topics

R&D projects must address innovative problems that **require large allocations of computing and data storage resources**.

HPC application fields

- Complex simulations with multiple parameters
- Virtual testing and optimization
- Big Data analytics and visualization
- AI and Machine Learning algorithms
- Predictions and forecasting of complex models

Thematic areas

- Manufacturing
- Advanced engineering
- Materials
- Energy and environmental technologies
- Telecommunications

Target companies

- Substantial expertise in computer-aided R&D, big data analytics, training of AI algorithms
- little or no expertise in HPC

➢ Industrial research and/or experimental development projects

Eligibility Criteria

Companies

Only private enterprises registered in Luxembourg are eligible for direct funding by the Ministry of the Economy.

The company:

- Must demonstrate its viability and financial soundness regarding its contribution to the project
- Shall demonstrate the positive impact of the expected project outcome on its growth and future assets

Ineligible companies

Undertakings in difficulty
For all companies (excluding SME < 3 year of existence), if more than half of subscribed share capital (share premium included) has disappeared as a result of accumulated losses.

Example of an undertaking in difficulty:

Own funds of €50k
Share capital of €200k

Eligibility Criteria

Public Research Organisations

Research organisations must be eligible under article 3-(2) of the FNR statute (Loi modifiée du 31 mai 1999 portant création d'un fonds national de la recherche dans le secteur public) and be registered at the FNR.

- Public institutions performing research in Luxembourg
- Non-profit associations, societal impact companies (SIS), and foundations engaged in research in Luxembourg and accredited by the Ministry of Higher Education and Research

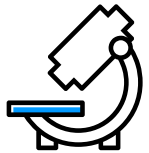
The PI must be employed by one of the public research institutions in Luxembourg with a work contract covering the full duration of the project

If an established co-ownership agreement between the public institution and the industrial partner exists, there should be a commercialization agreement put in place

In general, FNR BRIDGES General guidelines to be followed – Link (section 2)

Other public research inst. ….

Funding Conditions



R&D grants **for public research organisations**

Max 400k EUR per project (collaboration with companies)

Aid rates up to 100%

Project eligible costs – FNR financial regulations

24 months to 36 months

Funding Conditions

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24 months to 36 months

R&D aid schemes **for companies**

LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Économie

35% upfront payment (call specific)

Max 700k EUR per project (collaboration with research institute)

Aid rates up to 80% of eligible costs

Aid intensities

Experimental development
- *Development of a solution*

Industrial research
- *Acquisition of new knowledge*
- *No direct commercial application*

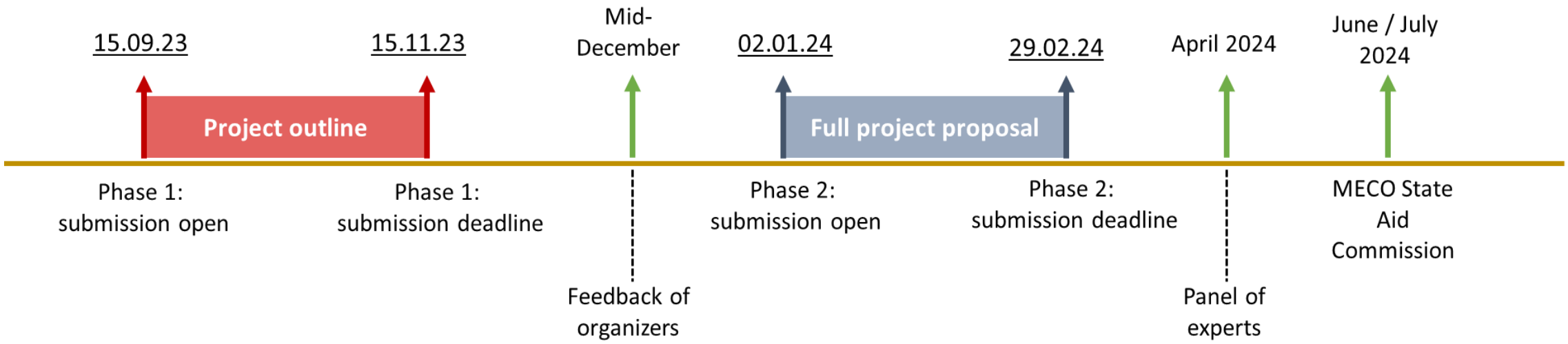
Maximum aid intensities	Large company	Medium company	Small company
Experimental development	40%	50%	60%
Industrial research	65%	75%	80%

Submission and Evaluation Process – Call Timeline

15.09.23 15.11.23 02.01.24 29.02.24

PHASE-1 Project Outline (PO)		PHASE-2 Full Project Proposal (FPP)	
Submission	Evaluation	Submission	Evaluation
(1) PO submission on the research-industry collaboration platform	(1) PO review by granting authorities (2) Eligibility and financial viability check by LXI (3) GO/NO GO decision, including potential recommendations, towards PHASE-2	(1) Coaching by LXI for companies (2) FPP submission on - MyGuichet (companies) - FNR grant system platform (research organisations)	(1) Review by Independent expert panel (IEP) (2) Recommendation on projects for award decision (3) State aid Commission for company projects (4) FNR/MECO Joint Funding decision

Submission and Evaluation Process – Call Timeline



Submission and Evaluation Process:

Qualification for PHASE-1

Pre-selection criteria

All

- If the project is in line with the call objectives and call topic
- Completeness of compulsory information

Companies

- State aid eligibility
- Co-funding capacity

Ensure that the project costs are adapted to your co-funding capacity

Compulsory documents (annexes on platform)

All

- Project description, HPC related information and cost estimation (on platform)
- CVs of principal investigators (ORCID ID or LinkedIn Public Profile)

Companies

- Organigram - full visibility on the shareholder structure (up to the ultimate beneficial owner)
- 2021/2022 accounts of the applicant(s) and the linked entities
- Cash-flow forecast

(check the full list in the call text)

Submission and Evaluation Process:

Evaluation in PHASE-2

Full project proposal (FPP) submitted to MECO and FNR

Review of all FPP by an independent expert panel (IEP)

Recommendation on projects to be awarded

State aid commission consultation

Funding decision / project start

Evaluation criteria of the joint call for projects (next slide)

Evaluation & Submission process:

IEP Evaluation in PHASE-2

Complete list of evaluation criteria can be found in the call text

Relevance

- Project idea clarity and pertinence of the objectives
- Level of innovation and soundness of research approach
- Scientific and technical maturity

Implementation: quality and efficiency of the project plan

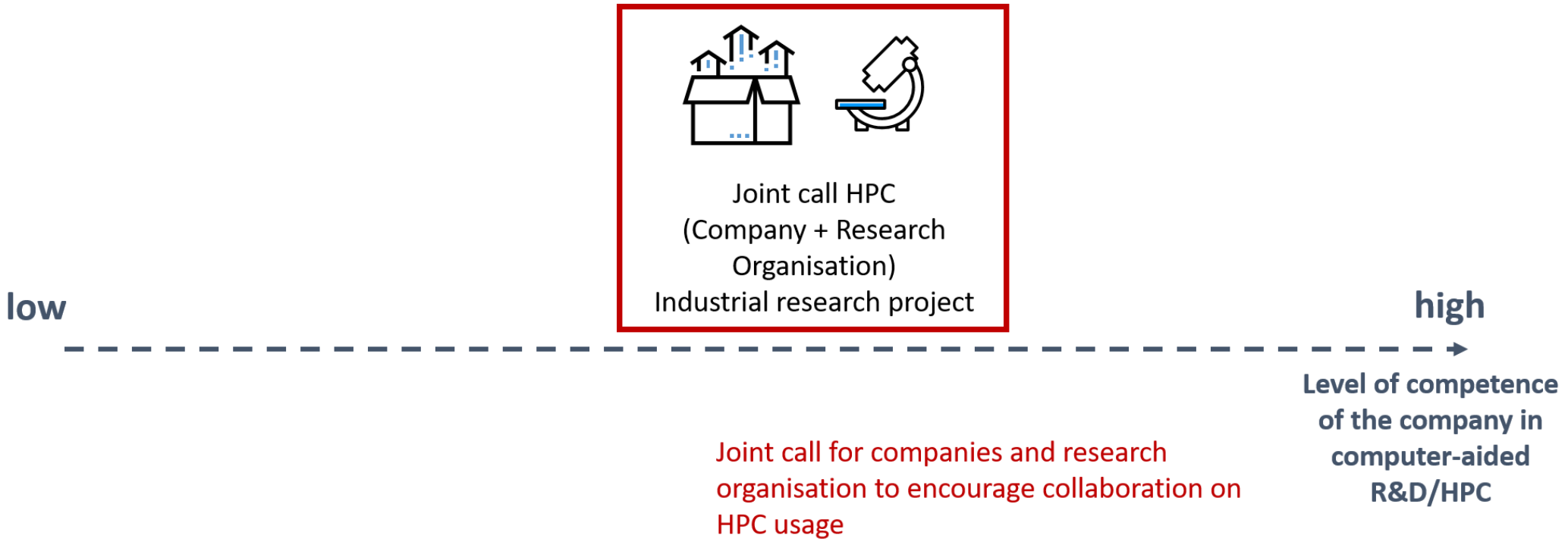
- Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources
- Competences, experience and complementarity
- Level of ambition of the collaboration and commitment of the participants

Impact

- Economic and societal added value of the proposed R&D project
- Strengthening of the competitiveness and growth of the company involved
- Contribution of the project to the advancement of knowledge in the field of HPC
- R&D projects involving new innovations and processes rather than improvements to existing technologies and core business activities

Joint Call HPC Initiative

Various aid schemes to foster computational R&D and HPC usage



Joint Call HPC Initiative

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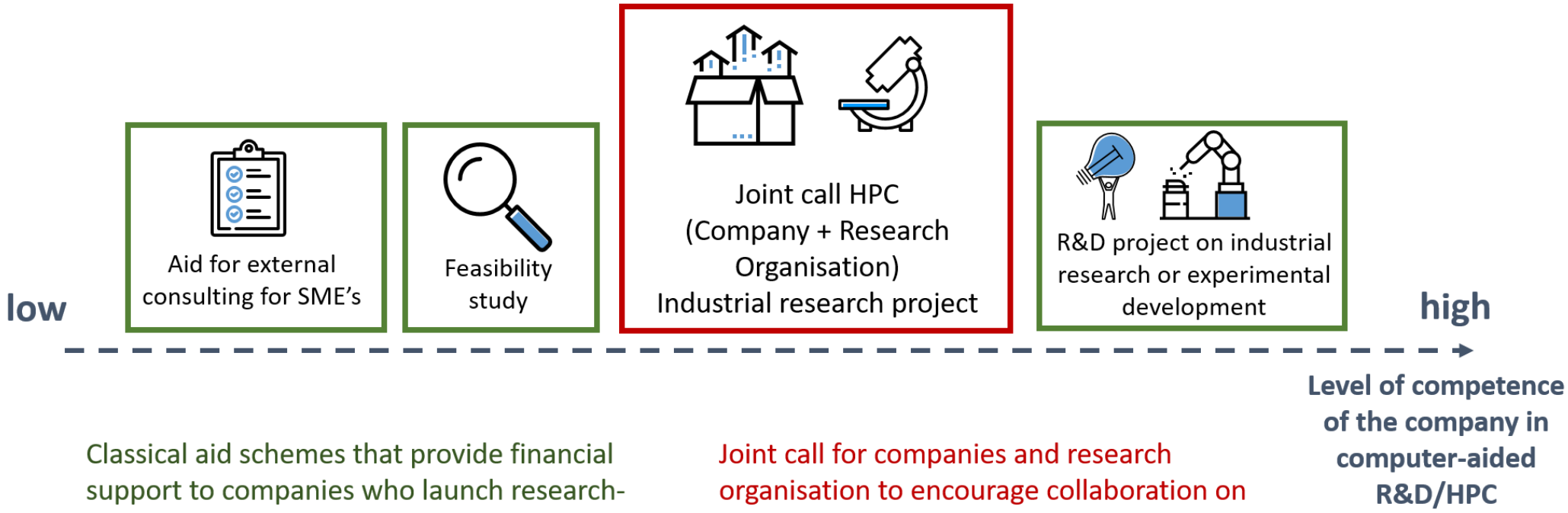


Classical aid schemes that provide financial support to companies who launch research-development-innovation activities in the field of computational R&D and HPC

- non-competitive
- no fixed timeline/deadline

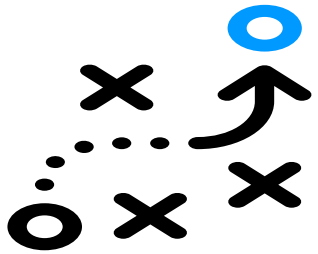
Joint call for companies and research organisation to encourage collaboration on HPC usage

- competitive
- recurring call
- Fixed submission deadline

Luxinnovation support

Phase-1

- Awareness raising on eligibility and financial viability checks
  - Q&A sessions
  - Completeness check



Phase-2

- Stress test (company / project)
  - innovative nature
  - business model / exploitation plan
  - financial capacity of the company
  - (eligibility criteria)

- Accompanying project measures
  - intellectual property
  - project scope and structure
  - competences and relationship building
  - project financing (subsidies, loans, etc.)

Luxinnovation support – save the dates

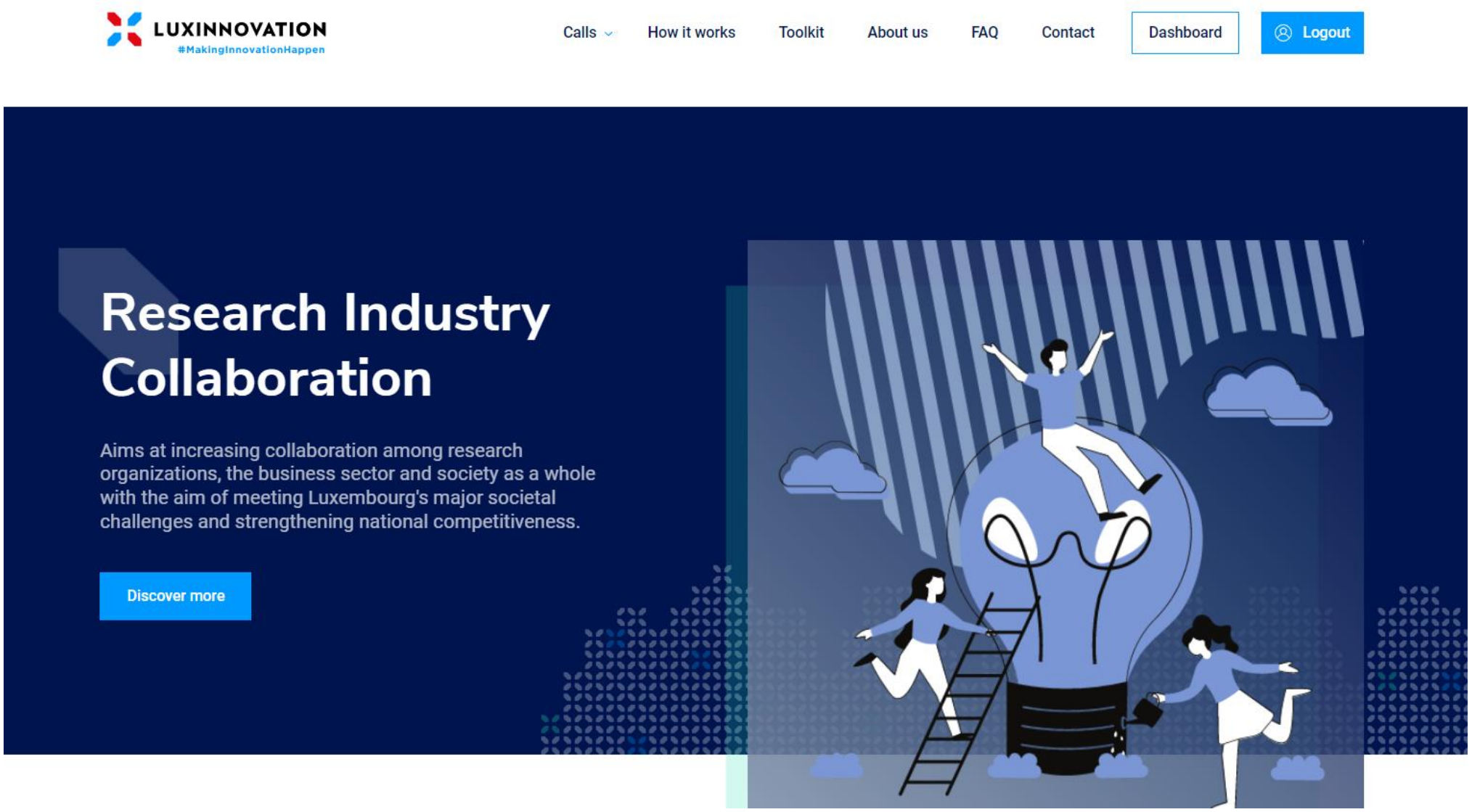
Q&A session 1: Main eligibility criteria and the eligible project costs for the Joint Call HPC

- Shareholder structure and accounts – what to prepare?
- Co-funding capacity – how to assess your own capacity with regards to the total project costs?
- Q&A

Q&A session 2: Completeness check of the application before the submission for the first phase of the Joint Call HPC

- Required attachments
- Q&A

Research-industry-collaboration.lu



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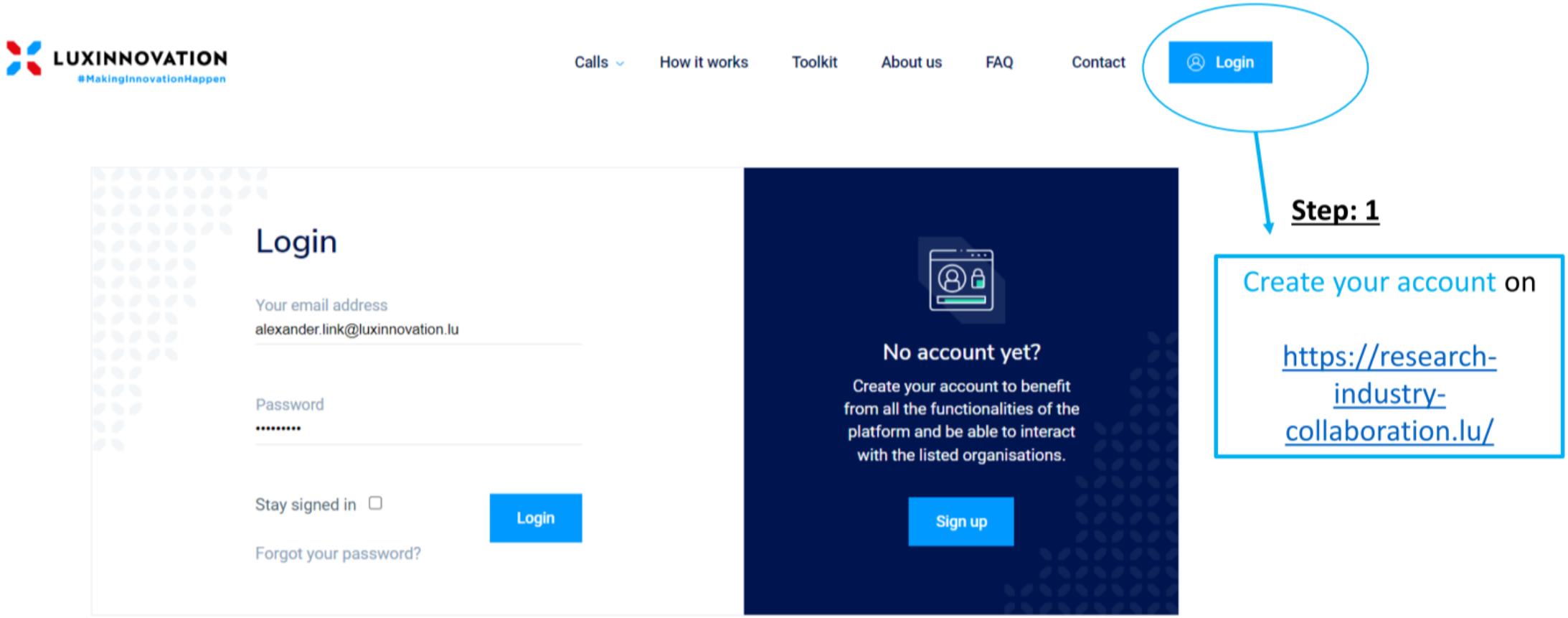

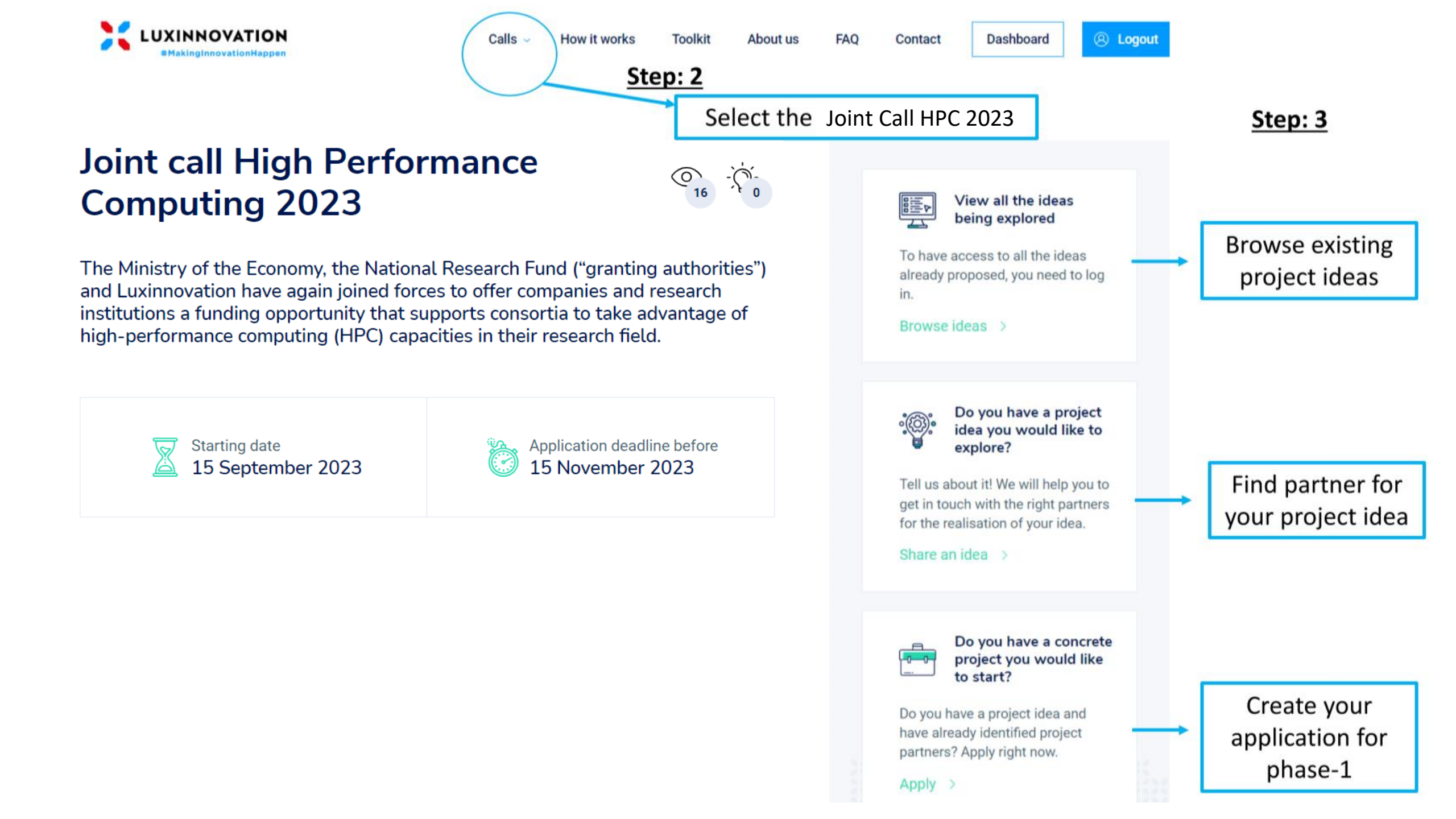
LUXINNOVATION
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Calls
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Step: 2
Select the Joint Call HPC 2023
Step: 3
Joint call High Performance Computing 2023
16
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The Ministry of the Economy, the National Research Fund (“granting authorities”) and Luxinnovation have again joined forces to offer companies and research institutions a funding opportunity that supports consortia to take advantage of high-performance computing (HPC) capacities in their research field.
Starting date
15 September 2023
Application deadline before
15 November 2023
View all the ideas being explored
To have access to all the ideas already proposed, you need to log in.
Browse ideas
Browse existing project ideas
Do you have a project idea you would like to explore?
Tell us about it! We will help you to get in touch with the right partners for the realisation of your idea.
Share an idea
Find partner for your project idea
Do you have a concrete project you would like to start?
Do you have a project idea and have already identified project partners? Apply right now.
Apply
Create your application for phase-1

Q&A

Thank you!

Create your projects on the research-industry collaboration platform

Questions on the joint call to be addressed at contact@research-industry-collaboration.lu

Questions related to the research organisations: https://www.fnr.lu/funding-instruments/high-performance-computing-call/

www.luxinnovation.lu

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