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Backing visionary entrepreneurs

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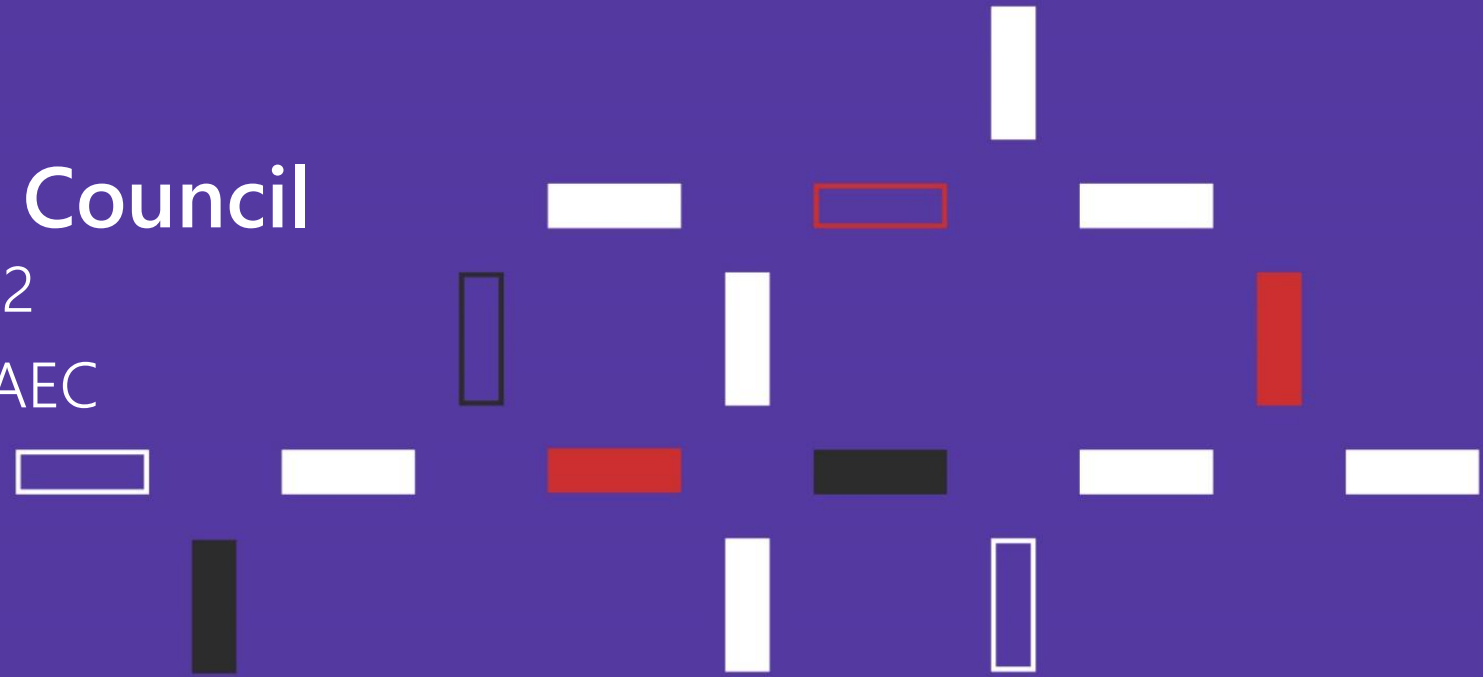
Anne-Marie Sassen, Head of Unit D2

Franc Mouwen, Program Manager AEC



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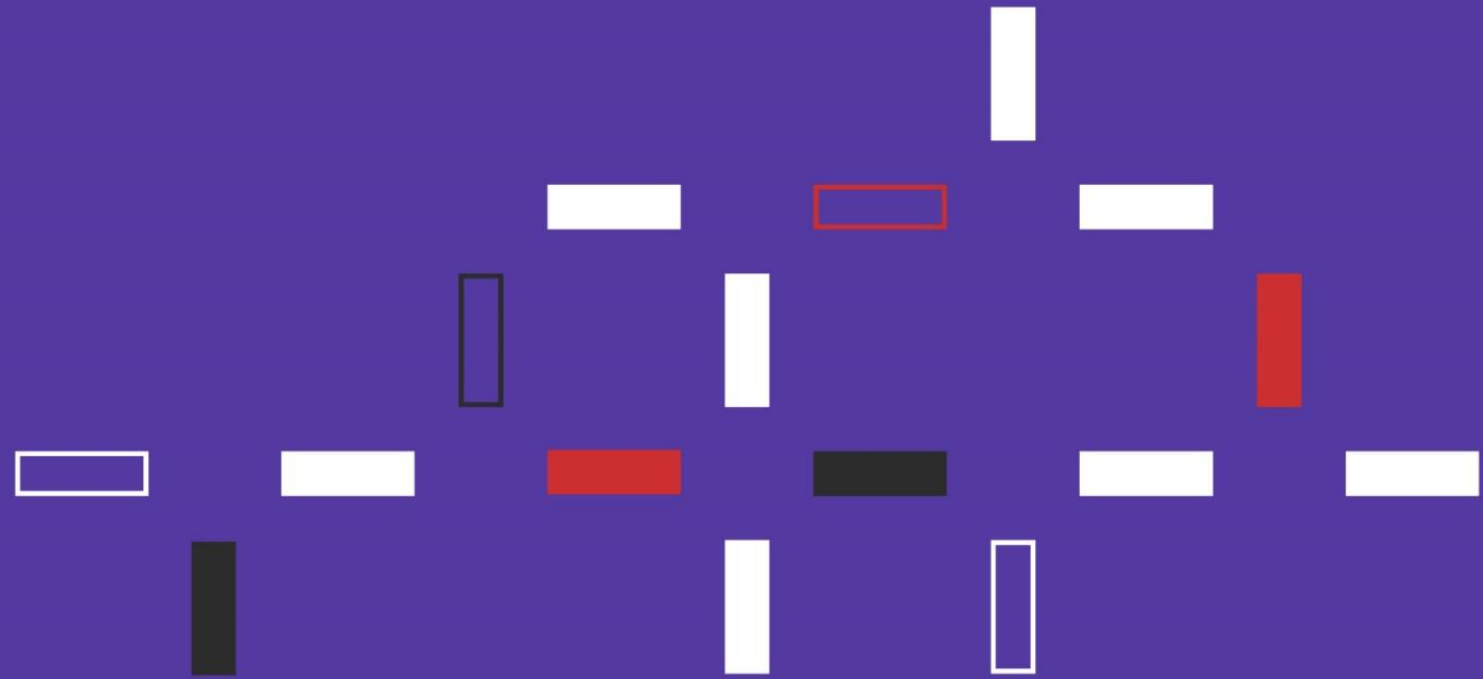
AEC Pathfinder Challenge

Franc Mouwen



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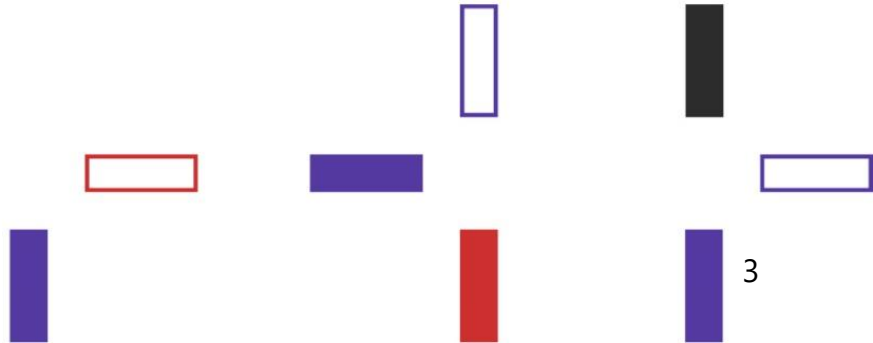
The goal of this Info-day session:

- 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:

The EU faces a monumental task to decarbonize and modernize the construction sector within 30 years

- The EU committed to net-zero by 2050
- GHG emissions of the construction sector are estimated at 5-12% of EU's total
- Good progress is already being made with Operational GHG emissions 👍
- Embodied GHG emissions increase both relatively and absolutely 👎

Global context: the world will add the equivalent of 1 New York City, per month, for the next 40 years:

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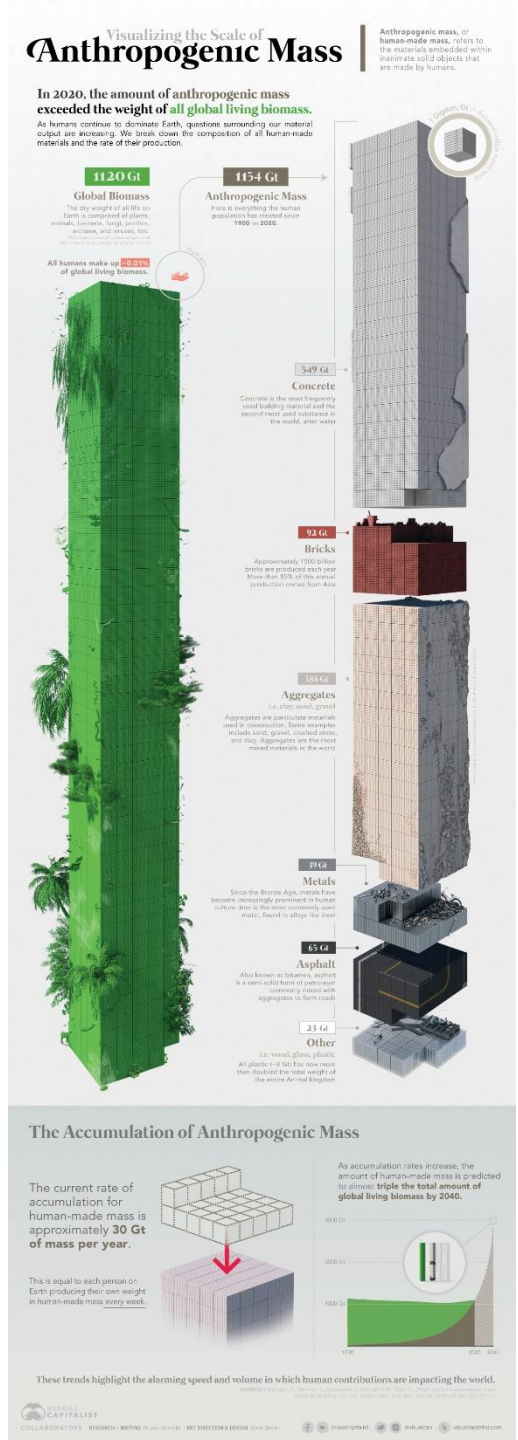
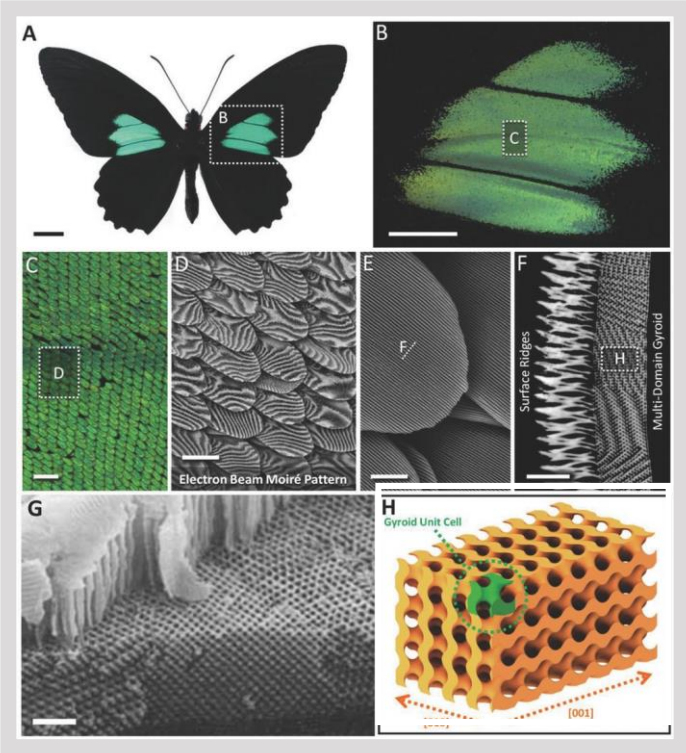


Source: visualcapitalist.com

Nature uses few materials in endless complex ways; humans many materials in simplistic, wasteful ways

Gyroids at nanoscale in butterfly wing



Paradigm

Computational design
Digitalized fabrication
Less or alternative materials

In-situ concrete pouring and formwork

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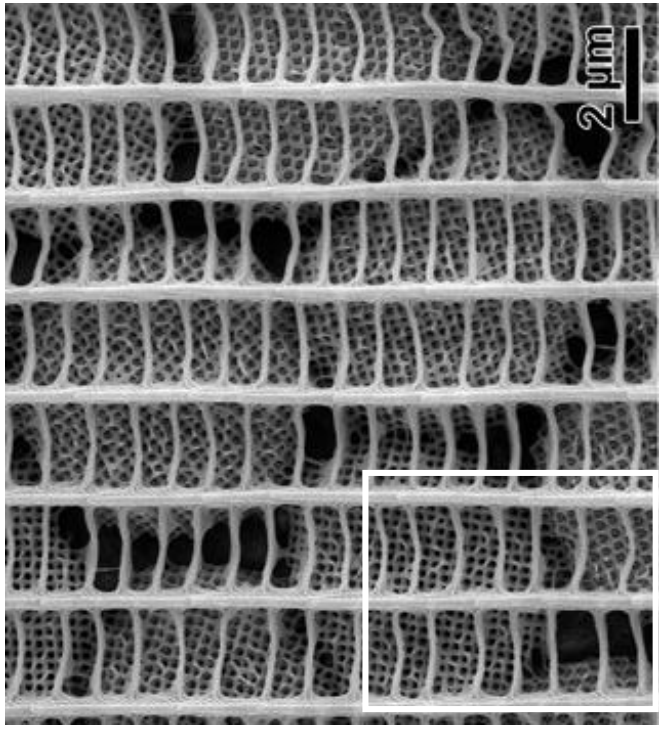
Nature uses few materials in endless complex ways; humans many materials in simplistic, wasteful ways

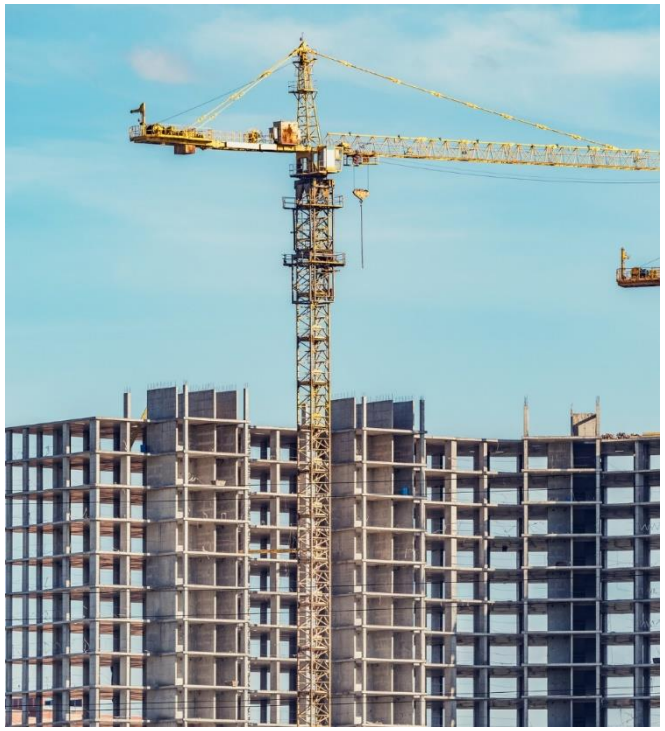
Nano-structure



Paradigm

Computational design
Digitalized fabrication
Less or alternative materials

Slab column



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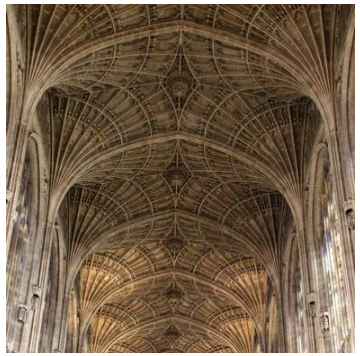
Rooted in EU legacy, computational digital AEC offers pathways to use less ánd alternative materials

Once …

Unreinforced
concrete
3D

Then …



Stone
stereotomy
3D

Then …

In-situ reinforced
concrete
2D+

… our logical digital future?

Computational design
Digital fabrication
GHG neutral materials

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Background and scope

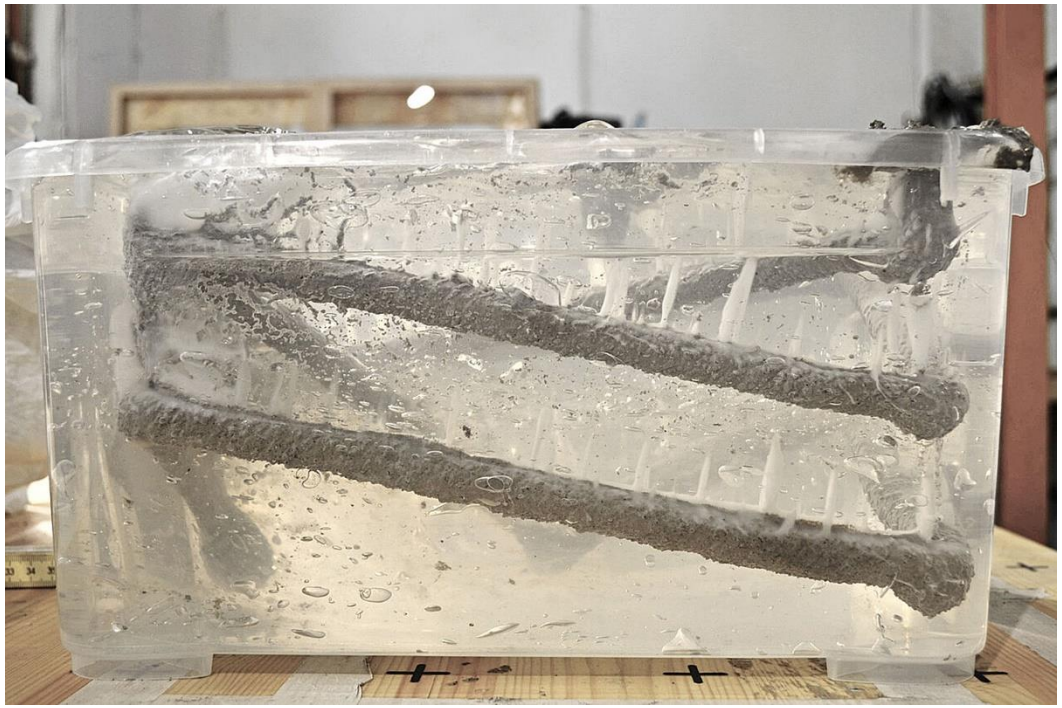
- This Challenge seeks to develop research and early innovations with a breakthrough potential related to design, fabrication and materials for the AEC value chain enabled by novel algorithms and advanced digitalization. In such a digitalized AEC value chain design, fabrication and materials are symbiotic and mutually dependent and enabling.
- This combination can enable designers, architects, engineers, and fabricators to imagine, design, optimize and create complex and efficient structures within a digitalization pathway, in response to ever more ambitious requirements for climate neutral, sustainable, inclusive, aesthetic, and inspiring buildings.

Specific objectives

- The potential of the digitalized, mutually interdependent, mutually reinforcing, intertwined triad of design, fabrication and materials can potentially exceed our wildest imaginations. This Challenge seeks the realization of disruptive solutions for AEC in one or more of the following areas:
  - Computational design
  - Digitalized fabrication
  - Alternative materials
- Projects are expected to target organizations and collaborative endeavors that develop ways to incorporate the digitalized triad of design, fabrication and materials in the reduction of embodied CO2 emissions

Expected outcomes and impacts

- Proof of principle and validation of the scientific basis of the breakthrough technology.
- The development and expression of techno-economic views on geometric and economic scalability of the technology itself, coupled with an entrepreneurial path towards commercialization and future adoption by the AEC value chain are strongly encouraged.
- Proposals are expected to demonstrate interdisciplinary and collaborative processes to create critical interactions between disciplines, economic sectors, and other partners.



Source: I3DCP, TU Braunschweig

Source: BRG, ZHCODE

How does the EIC decide if your proposal will be funded?

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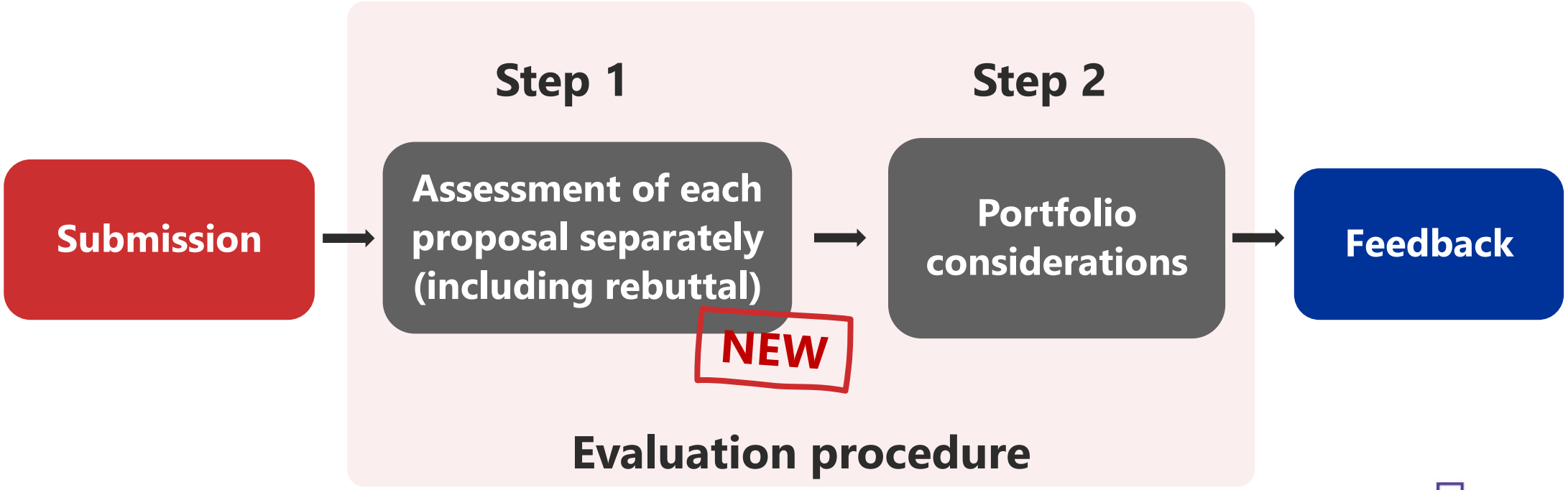

Step 1: ranking

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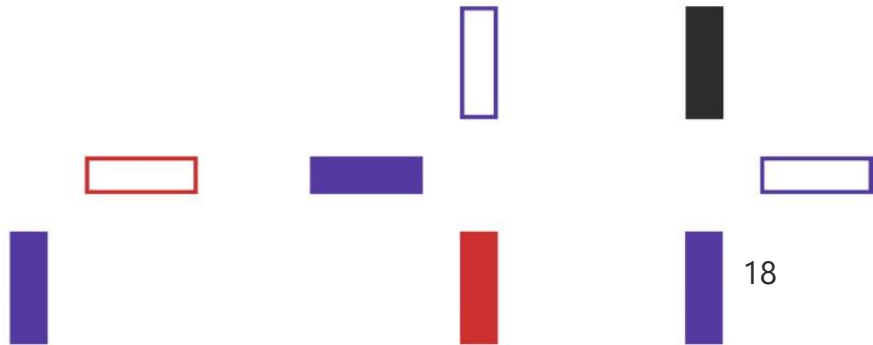
Award criteria Pathfinder Challenge (and Open)

- Excellence (threshold 4/5, weight 60%)
- Impact (threshold 3.5/5, weight 20%)
- Quality implementation (threshold 3/5, weight 20%)



Step 2: portfolio considerations

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The Challenge Guide for AEC Pathfinder Challenge describes the Portfolio Considerations:

Step 2: Portfolio considerations

NEW

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- All proposals that meet the thresholds defined in the award criteria will be considered in step 2
- **Mapping of proposals in categories** stemming from overall goal and specific objectives of the Challenge (e.g., building blocks or subsystems, technical areas and/or competing technologies, platforms, applications areas, risk level and stage of technology readiness level, size)
- A **suitable portfolio of proposals** to be selected by evaluation committee by applying **portfolio considerations** in order to propose for funding a coherent set of projects to achieve expected outcomes and impacts of Challenge (in all cases the overall balance and composition of the portfolio will be taken into consideration)

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Portfolio Considerations: Categories / Subcategories

COMPUTATIONAL DESIGN	DIGITALIZED FABRICATION	MATERIALS
Algorithmic design, AI	AM[1]: extrusion 3D printing	Concrete/cement[2]
Topology optimization	AM[1]: other technologies	Timber derivatives[3]
Agent-based modelling	Subtractive manufacturing	Bio-based materials
Parametric design	Weaving, braiding, knitting	Natural materials
Physical simulation engines	Macro-, meso-, microscale	EM[4]: fibre composites
Biomimicry	Industrialized automation	EM[4]: fabric composites
Macro-, meso-, microscale	Robotics	EM[4]: metamaterials
Digital Twin	QA/QC scanning at scale	Discrete blocks, archimats[5]
Other	Other	Other

Starting from the highest ranked proposal, a portfolio of proposals will be selected based on shared components/complementarities, while ensuring diversity among the selected proposals and coverage of the three categories.

Challenge guide – Activities within a portfolio

In your proposal add a dedicated WP for portfolio activities with at least ***10 person months***

- Barriers to strategic autonomy/technology non-dependence
- Communicate key outcomes of research work
- Market analysis – initial stakeholders mapping
- Innovative space applications for in-space solar energy use (e.g. ISAM, ADR, EoL, etc.)
- Early commercialisation
- Access to research labs/ test facilities
- Access to non-EU markets and customers
- IOD/IOV activities in case of TRL5/6

Q&A, Discussion

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Join at **Sli.do**

With the event code
#Challenges

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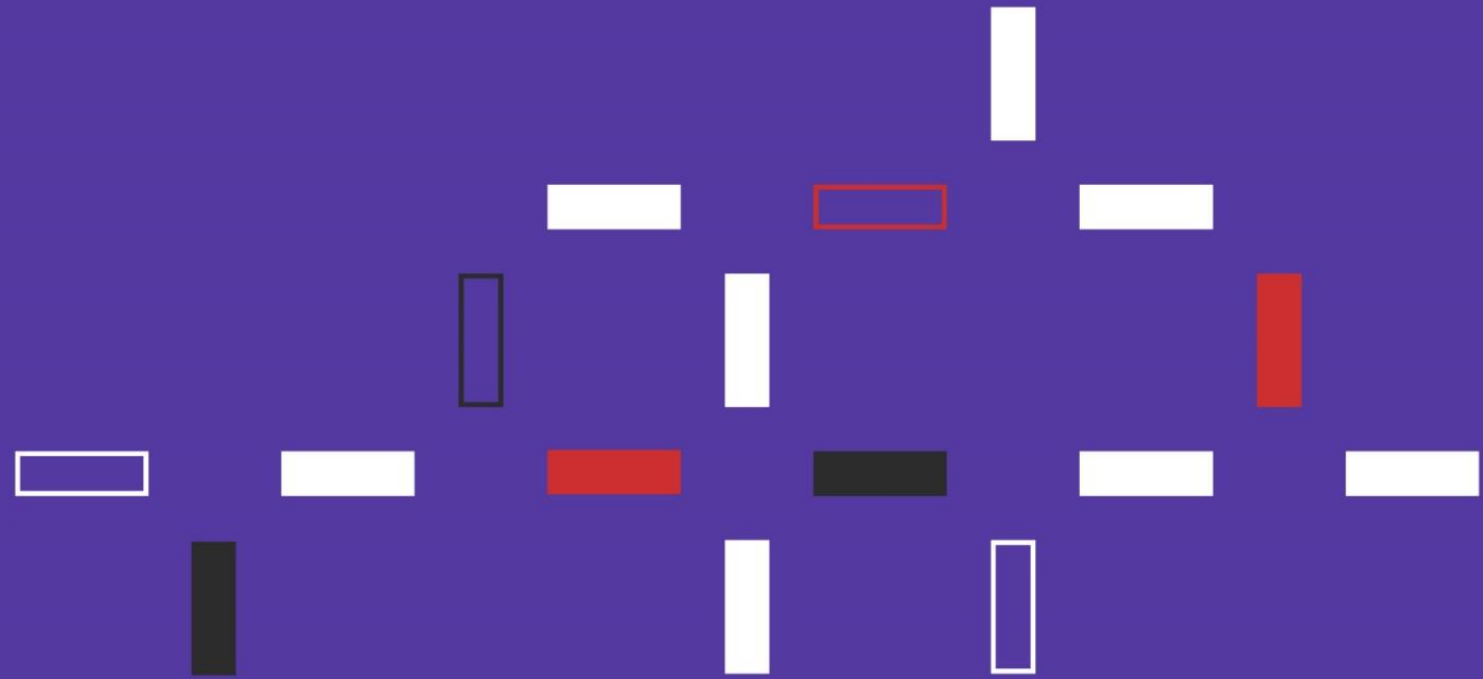
Q&A

Franc Mouwen
Remus Iacobescu



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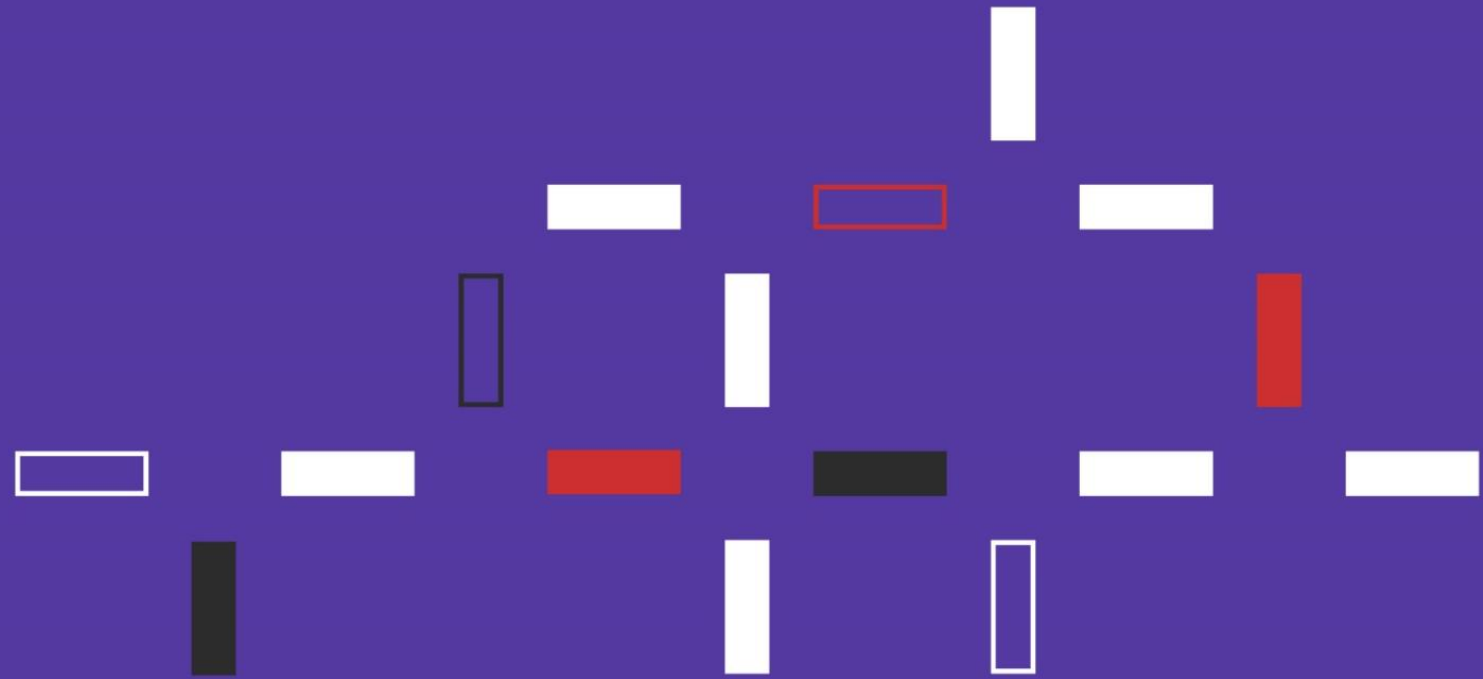
Short pitches

Participants



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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Questions: contact your National Contact Point

National Contact Points for Horizon Europe:
(NCP Portal)

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Thank you!

https://eic.ec.europa.eu

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