Horizon Europe: “Minority Report”

A first Horizon Europe ⇔ New Zealand project

Cluster 5: Climate, Energy and Mobility – **process & collaborations**

Peter.Thompson@canterbury.ac.nz

This project has received funding from the European Union’s Horizon 2020 Programme under Grant Agreement no 101147385

What we will cover

- "Minority Report" project overview
- Applying:
  - Finding the right call and partners
  - Planning, and applying
  - From reserve to awarded funding
- Delivering
  - Kick off meeting
  - Delivery schedule
  - Completion
- The Future
  - Collaborations?
  - Lessons and tips

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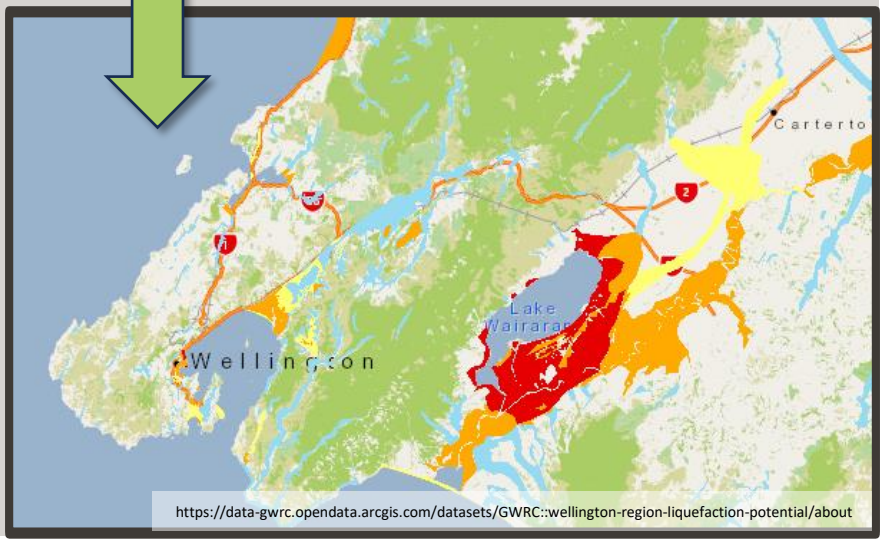
Minority Report

“Minority Report” project overview

Evaluate future climate-related ‘disaster’ events

- **Use future weather predictions**
- **Simulate impact:**
  - Storms, flooding, wildfires
  - Population evacuations
  - Visualise through fragility curves & risk maps
- **Plan adaptation strategies** to mitigate effects
  - Adaptation to future climates
  - Build up risk-maps to inform decision-makers
- **Work with local councils** in 3 test sites
  - Dublin, Ireland
  - Patras, Greece
  - Wellington, New Zealand
- **Share outcomes**
  - Workshops, publications, planning

WUI-NITY simulations: https://www.youtube.com/watch?app=desktop&v=e8cFsCNxZO0



https://data-gwrc.opendata.arcgis.com/datasets/GWRC::wellington-region-liquefaction-potential/about

*Animation of WUI-NITY wildfire modelling and evacuation (NFPA-funded consortium)
https://www.nfpa.org/education-and-research/research/fire-protection-research-foundation/projects-and-reports/wuinity-a-platform-for-the-simulation-of-wildlandurban-interface-fire-evacuation

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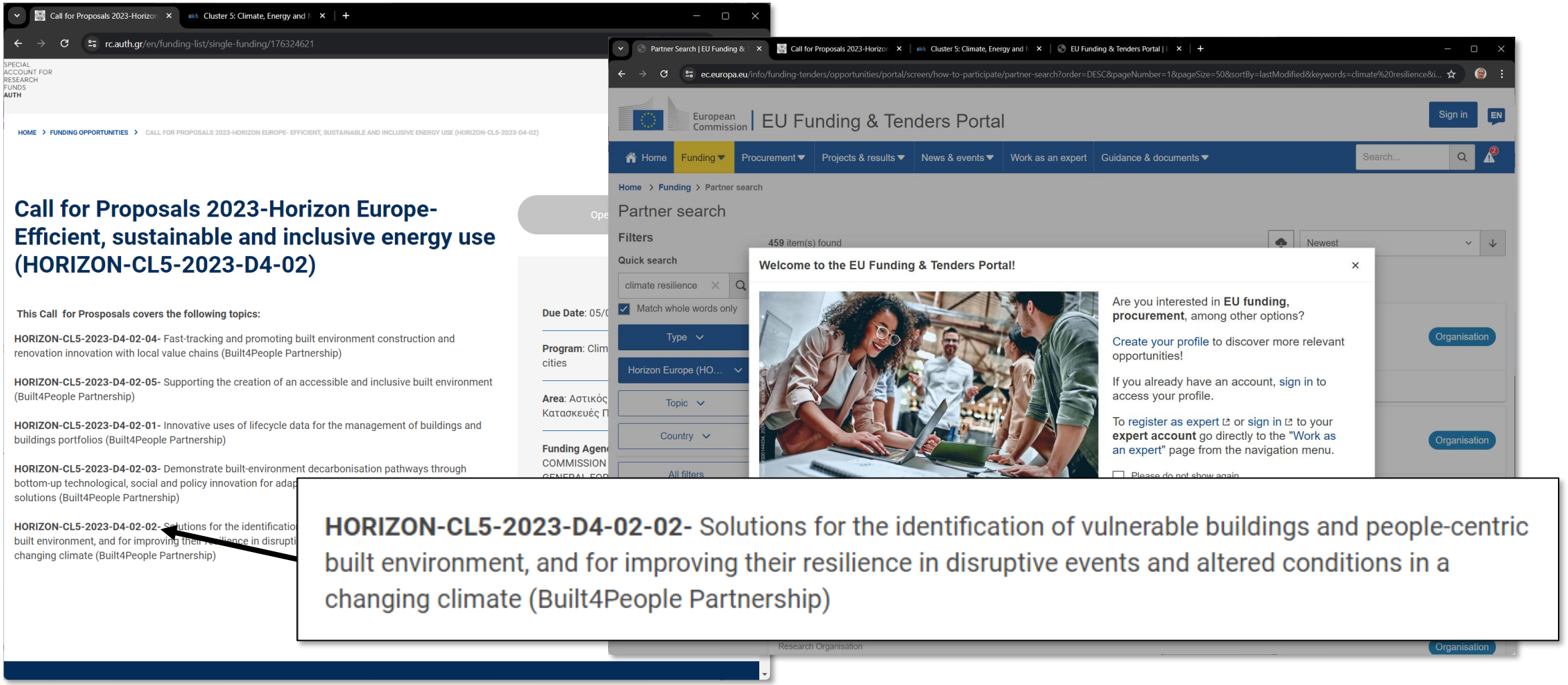
Finding the right call… and partners



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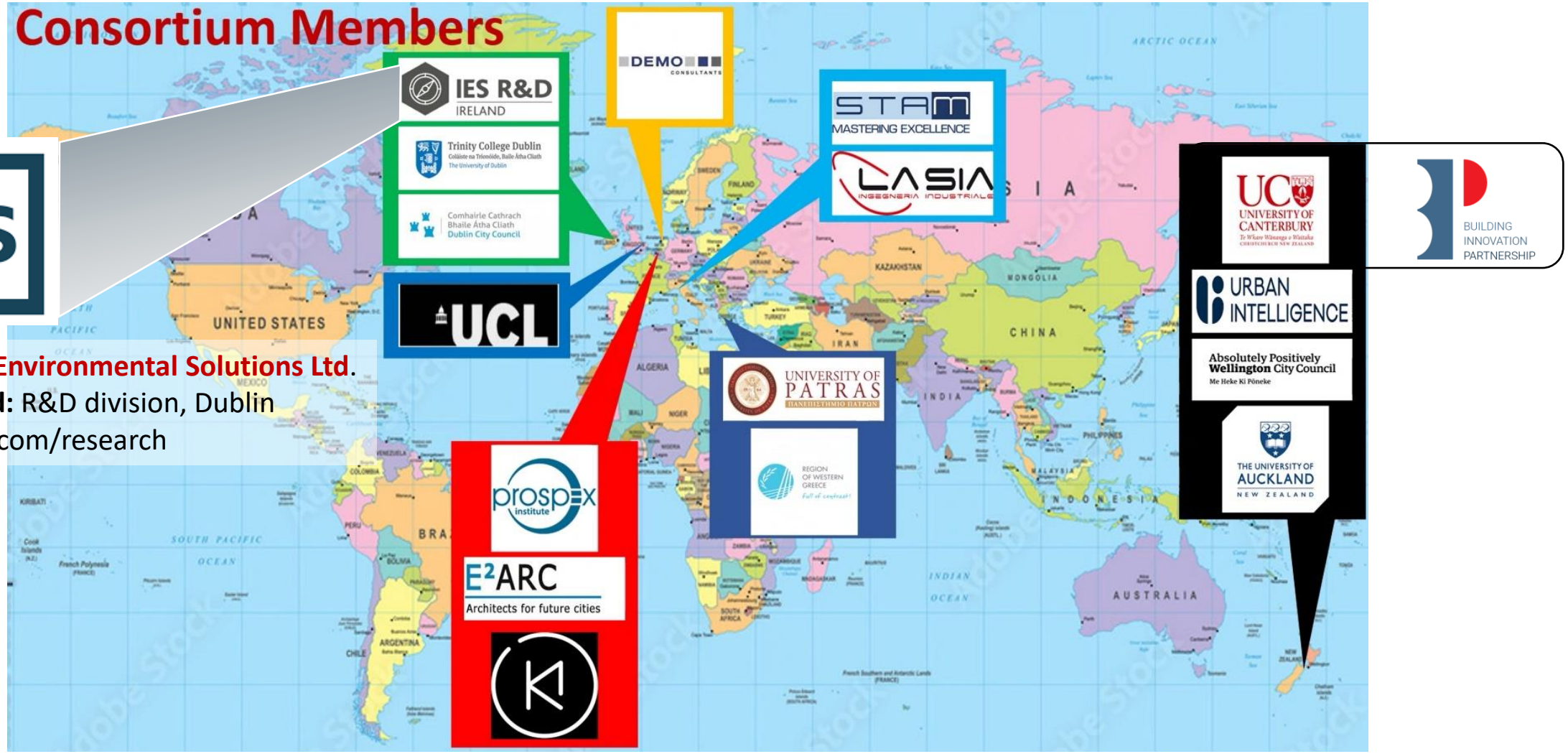
Finding the right call…& partners



Integrated Environmental Solutions Ltd.
Project lead: R&D division, Dublin
www.iesve.com/research

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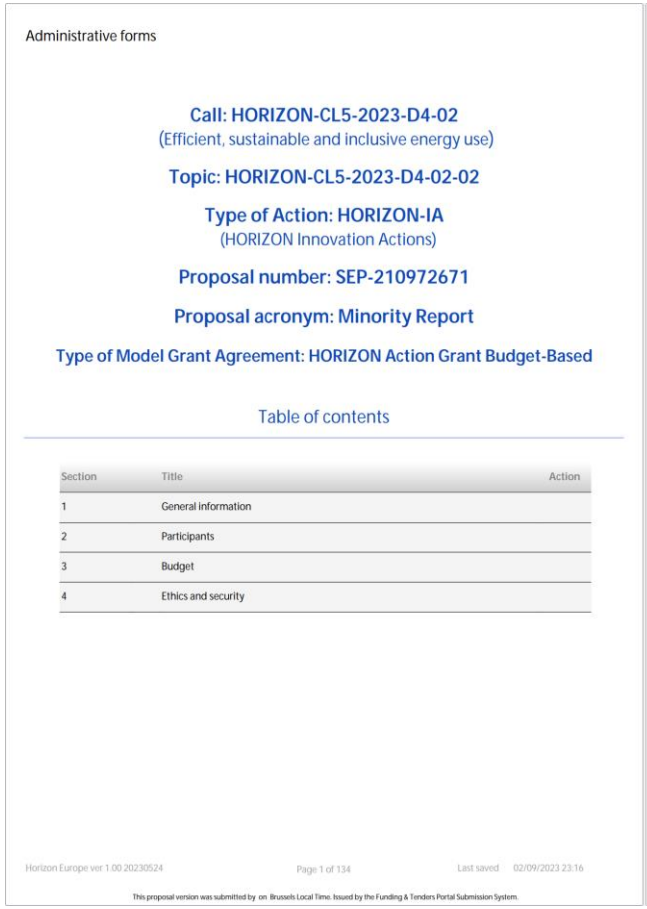
Planning, and applying

➔Long forms, takes months to collaborate and develop plan



Administrative forms

Call: HORIZON-CL5-2023-D4-02
(Efficient, sustainable and inclusive energy use)

Topic: HORIZON-CL5-2023-D4-02-02

Type of Action: HORIZON-IA
(HORIZON Innovation Actions)

Proposal number: SEP-210972671

Proposal acronym: Minority Report

Type of Model Grant Agreement: HORIZON Action Grant Budget-Based

Table of contents

Section	Title	Action
1	General information	
2	Participants	
3	Budget	
4	Ethics and security	

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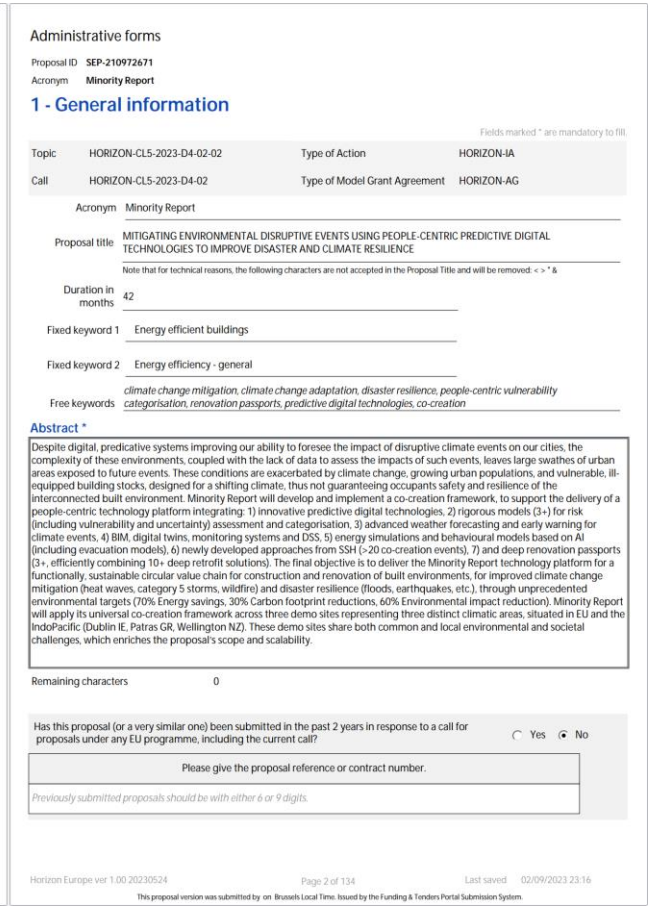
This proposal version was submitted by on Brussels Local Time. Issued by the Funding & Tenders Portal Submission System.



Administrative forms

Proposal ID SEP-210972671
Acronym Minority Report

1 - General information

Fields marked * are mandatory to fill.

Topic	HORIZON-CL5-2023-D4-02-02	Type of Action	HORIZON-IA
Call	HORIZON-CL5-2023-D4-02	Type of Model Grant Agreement	HORIZON-AG

Acronym: Minority Report

Proposal title: MITIGATING ENVIRONMENTAL DISRUPTIVE EVENTS USING PEOPLE-CENTRIC PREDICTIVE DIGITAL TECHNOLOGIES TO IMPROVE DISASTER AND CLIMATE RESILIENCE

Note that for technical reasons, the following characters are not accepted in the Proposal Title and will be removed: < > " &

Duration in months: 42

Fixed keyword 1: Energy efficient buildings

Fixed keyword 2: Energy efficiency - general

Free keywords: *climate change mitigation, climate change adaptation, disaster resilience, people-centric vulnerability categorisation, renovation passports, predictive digital technologies, co-creation*

Abstract *

Despite digital, predicative systems improving our ability to foresee the impact of disruptive climate events on our cities, the complexity of these environments, coupled with the lack of data to assess the impacts of such events, leaves large swathes of urban areas exposed to future events. These conditions are exacerbated by climate change, growing urban populations, and vulnerable, ill-equipped building stocks, designed for a shifting climate, thus not guaranteeing occupants safety and resilience of the interconnected built environment. Minority Report will develop and implement a co-creation framework, to support the delivery of a people-centric technology platform integrating: 1) innovative predictive digital technologies, 2) rigorous models (3+) for risk (including vulnerability and uncertainty) assessment and categorisation, 3) advanced weather forecasting and early warning for climate events, 4) BIM, digital twins, monitoring systems and DSS, 5) energy simulations and behavioural models based on AI (including evacuation models), 6) newly developed approaches from SSH (>20 co-creation events), 7) and deep renovation passports (3+, efficiently combining 10+ deep retrofit solutions). The final objective is to deliver the Minority Report technology platform for a functionally, sustainable circular value chain for construction and renovation of built environments, for improved climate change mitigation (heat waves, category 5 storms, wildfire) and disaster resilience (floods, earthquakes, etc.), through unprecedented environmental targets (70% Energy savings, 30% Carbon footprint reductions, 60% Environmental impact reduction). Minority Report will apply its universal co-creation framework across three demo sites representing three distinct climatic areas, situated in EU and the IndoPacific (Dublin IE, Patras GR, Wellington NZ). These demo sites share both common and local environmental and societal challenges, which enriches the proposal's scope and scalability.

Remaining characters 0

Has this proposal (or a very similar one) been submitted in the past 2 years in response to a call for proposals under any EU programme, including the current call? ○ Yes ◉ No

Please give the proposal reference or contract number.

Previously submitted proposals should be with either 6 or 9 digits.

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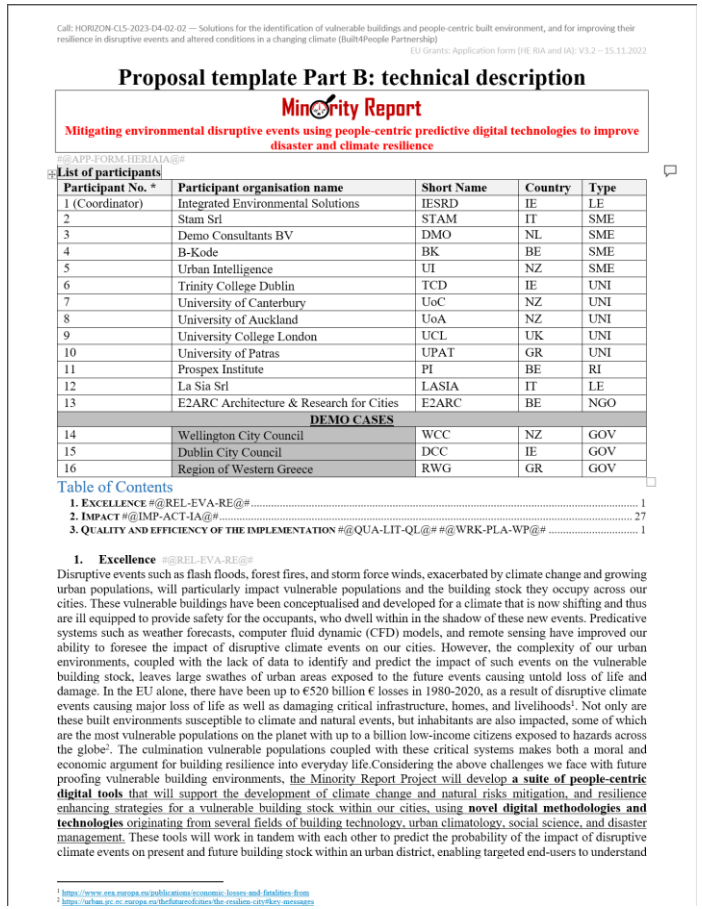

Call: HORIZON-CL5-2023-D4-02-02 — Solutions for the identification of vulnerable buildings and people-centric built environment, and for improving their resilience in disruptive events and altered conditions in a changing climate (Built4People Partnership)

EU Grants: Application form (HE RIA and IA): V3.2 – 15.11.2022

Proposal template Part B: technical description

Minority Report

Mitigating environmental disruptive events using people-centric predictive digital technologies to improve disaster and climate resilience

#@APP-FORM-HERIAIA@#

List of participants

Participant No. *	Participant organisation name	Short Name	Country	Type
1 (Coordinator)	Integrated Environmental Solutions	IESRD	IE	LE
2	Stam Srl	STAM	IT	SME
3	Demo Consultants BV	DMO	NL	SME
4	B-Kode	BK	BE	SME
5	Urban Intelligence	UI	NZ	SME
6	Trinity College Dublin	TCD	IE	UNI
7	University of Canterbury	UoC	NZ	UNI
8	University of Auckland	UoA	NZ	UNI
9	University College London	UCL	UK	UNI
10	University of Patras	UPAT	GR	UNI
11	Prospex Institute	PI	BE	RI
12	La Sia Srl	LASIA	IT	LE
13	E2ARC Architecture & Research for Cities	E2ARC	BE	NGO
	DEMO CASES			
14	Wellington City Council	WCC	NZ	GOV
15	Dublin City Council	DCC	IE	GOV
16	Region of Western Greece	RWG	GR	GOV

Table of Contents

1. **Excellence** #@REL-EVA-RE@#

Disruptive events such as flash floods, forest fires, and storm force winds, exacerbated by climate change and growing urban populations, will particularly impact vulnerable populations and the building stock they occupy across our cities. These vulnerable buildings have been conceptualised and developed for a climate that is now shifting and thus are ill equipped to provide safety for the occupants, who dwell within in the shadow of these new events. Predicative systems such as weather forecasts, computer fluid dynamic (CFD) models, and remote sensing have improved our ability to foresee the impact of disruptive climate events on our cities. However, the complexity of our urban environments, coupled with the lack of data to identify and predict the impact of such events on the vulnerable building stock, leaves large swathes of urban areas exposed to the future events causing untold loss of life and damage. In the EU alone, there have been up to €520 billion € losses in 1980-2020, as a result of disruptive climate events causing major loss of life as well as damaging critical infrastructure, homes, and livelihoods[1]. Not only are these built environments susceptible to climate and natural events, but inhabitants are also impacted, some of which are the most vulnerable populations on the planet with up to a billion low-income citizens exposed to hazards across the globe[2]. The culmination vulnerable populations coupled with these critical systems makes both a moral and economic argument for building resilience into everyday life.Considering the above challenges we face with future proofing vulnerable building environments, the Minority Report Project will develop **a suite of people-centric digital tools** that will support the development of climate change and natural risks mitigation, and resilience enhancing strategies for a vulnerable building stock within our cities, using **novel digital methodologies and technologies** originating from several fields of building technology, urban climatology, social science, and disaster management. These tools will work in tandem with each other to predict the probability of the impact of disruptive climate events on present and future building stock within an urban district, enabling targeted end-users to understand

[1] https://www.eea.europa.eu/publications/economic-losses-and-fatalities-from
[2] https://urban.jrc.ec.europa.eu/thefutureofcities/the-resilien-city#key-messages

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Highly ranked, but…

At first declined, and “on the reserve list” …then later **Awarded**

Proposal Evaluation Form

EUROPEAN COMMISSION

Evaluation Summary Report - Innovation actions

Evaluation Summary Report

Evaluation Result

Total score: 14.00 (Threshold: 10)

Criterion 1 - Excellence

Score: **5.00** (Threshold: 3 / 5.00 , Weight: -)

The following aspects will be taken into account, to the extent that the proposed work corresponds to the description in the work programme:
- Clarity and pertinence of the project's objectives, and the extent to which the proposed work is ambitious and goes beyond the state of the art.
- Soundness of the proposed methodology, including the underlying concepts, models, assumptions, inter-disciplinary approaches, appropriate consideration of the gender dimension in research and innovation content, and the quality of open science practices, including sharing and management of research outputs and engagement of citizens, civil society and end users where appropriate.

Overall, the proposal successfully addresses all relevant aspects of the criterion. In particular:
• The objectives are clear and pertinent to the call topic. The proposal aims at tackling the major challenges hindering the take-up of digital technologies within the EU construction and renovation industry, through delivering an innovative people-centric technology platform and a Decision Support System (DSS) that acts as a driver for renovation activities.

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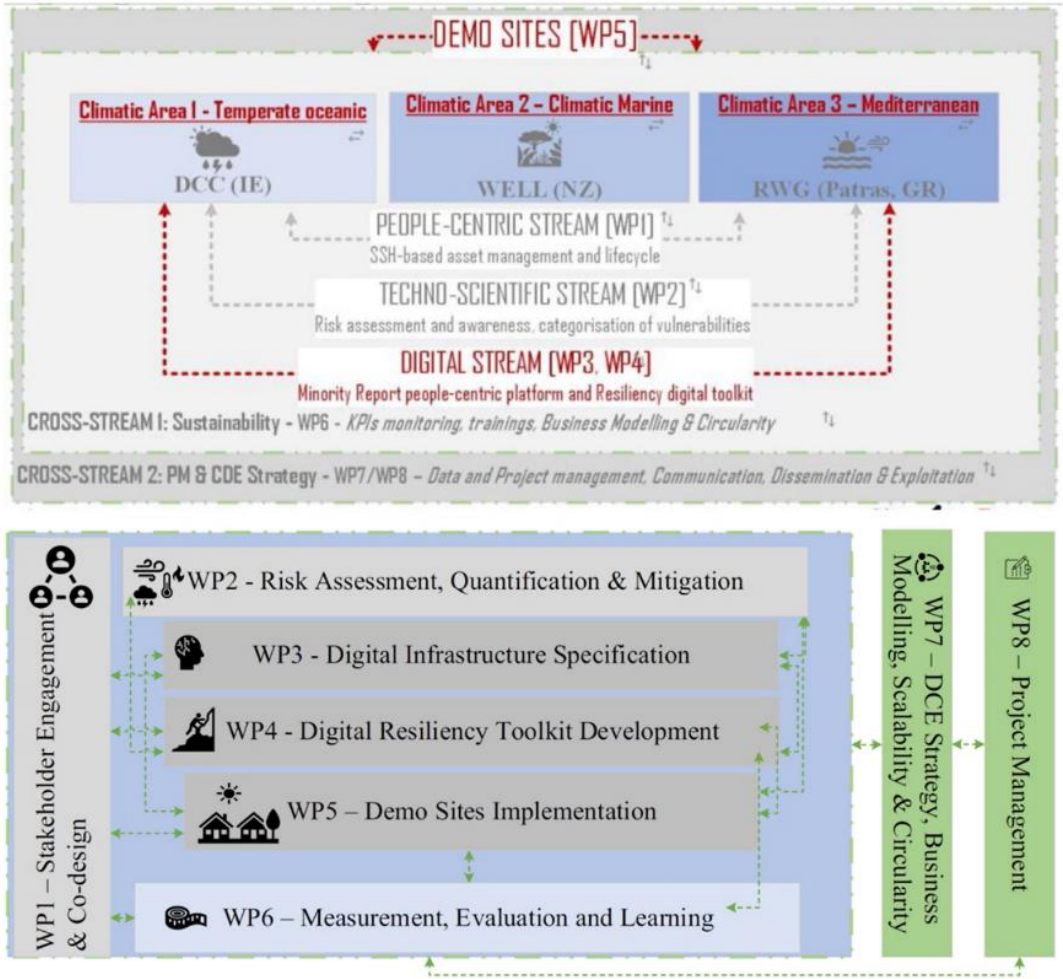
Delivering

Work Package Outline

- People Centric Stream
- Techno-Scientific Stream
- Digital Stream
- DCE Stream
- Management Stream



Resilience analysis

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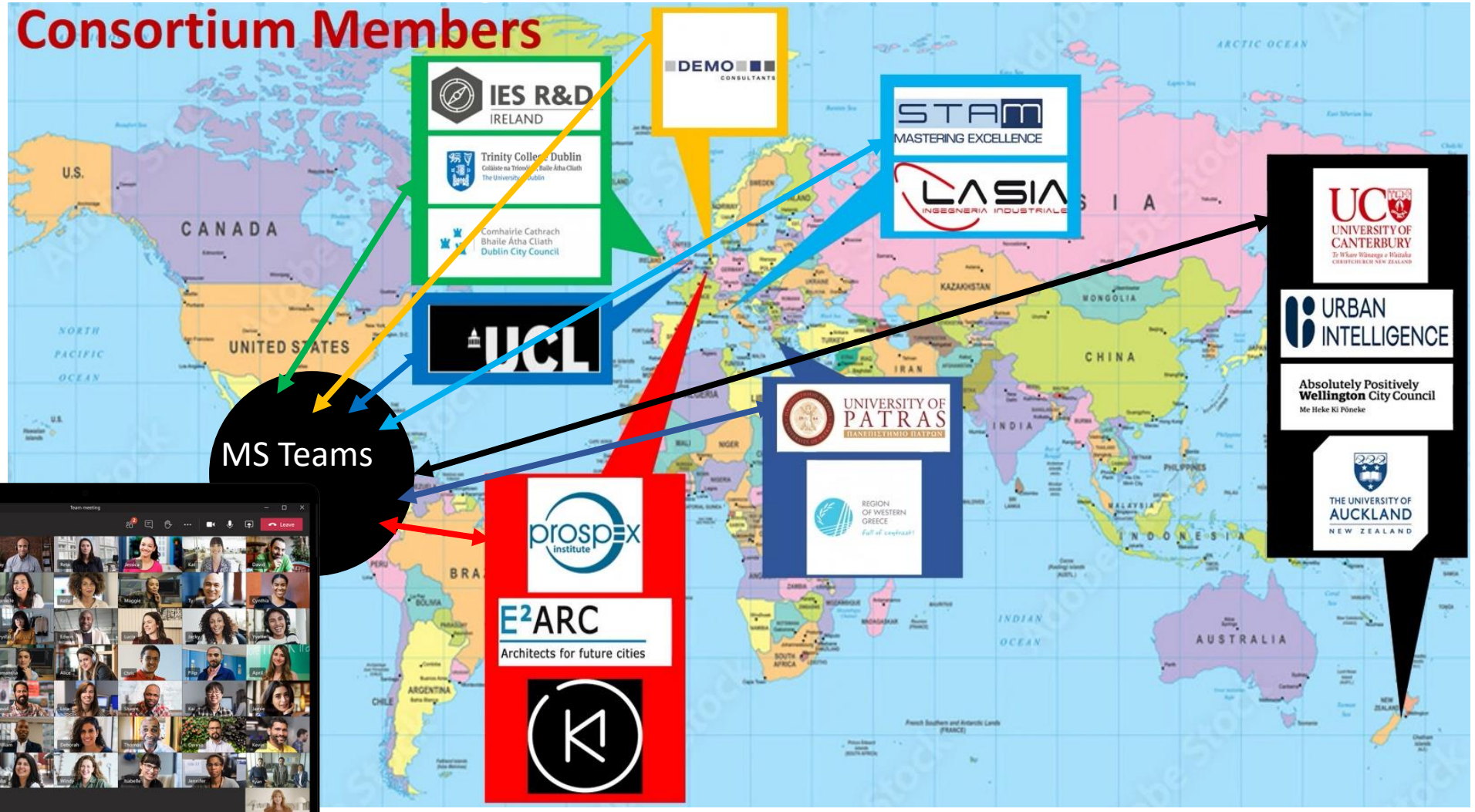
Kick-off meeting: 3 days, 3 hour sessions



*Not actual attendees image

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Delivery schedule: 3½ years

- Work packages
- Listed by partner

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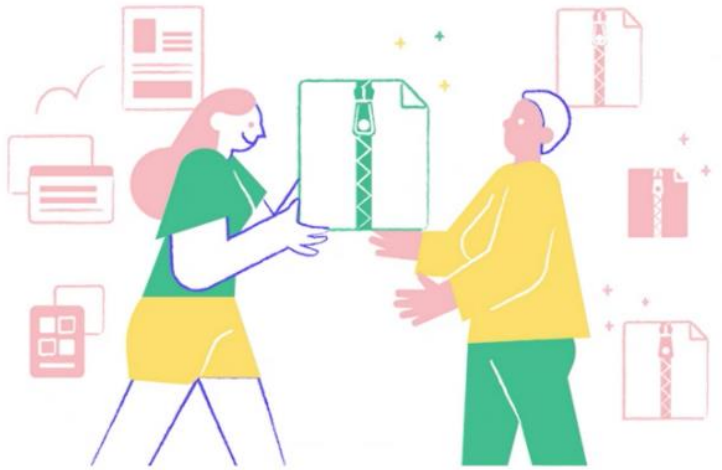
Completion

KEY DELIVERABLES

- D8.1: Progress Reports (Financial & Technical) (Every 6 months from M6)
- D8.2: Risk Mitigation Strategy (Annually from M6)
- D8.3: Data Management Plan (Annually from M6)
- D8.4: Knowledge & IPR Management (Annually from M6)
- D8.5: Project Management Plan (M2)



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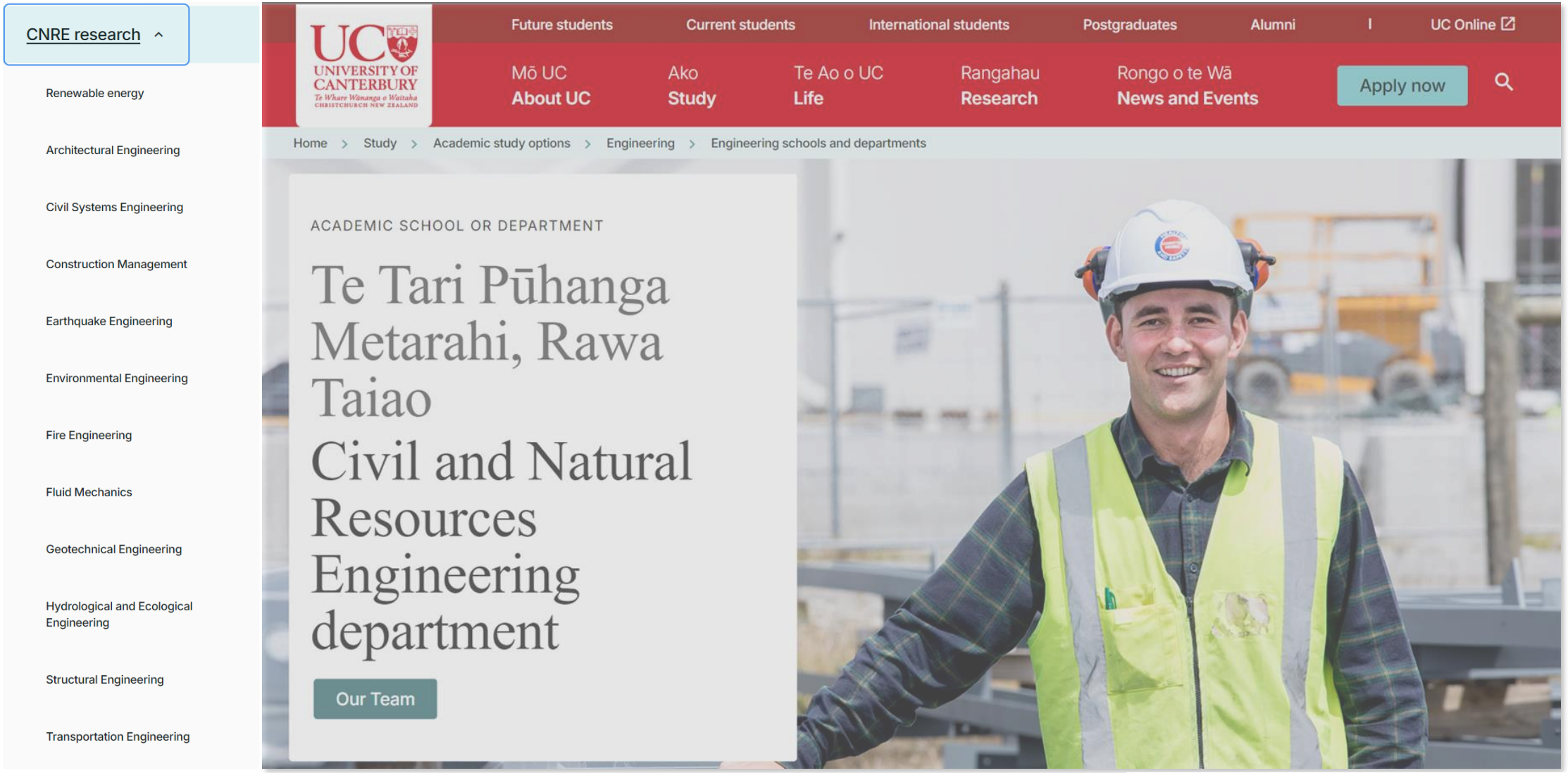
The future: collaborations?



The future: collaborations?

CNRE research

- Renewable energy
- Architectural Engineering
- Civil Systems Engineering
- Construction Management
- Earthquake Engineering
- Environmental Engineering
- Fire Engineering
- Fluid Mechanics
- Geotechnical Engineering
- Hydrological and Ecological Engineering
- Structural Engineering
- Transportation Engineering

- Fire Engineering group

Fire Engineering is the art and science of designing buildings and facilities for life safety and property protection in the event of an unwanted fire. Learn more.

Cluster 5 areas of interest:

- Wildfire simulations
  - Impact to infrastructure and people
  - Adaptation to climate change
- Evacuations
  - Pedestrians
  - Traffic
  - Safety

Contact: **daniel.nilsson**@canterbury.ac.nz, **andres.valencia**@canterbury.ac.nz

The future: collaborations?

CNRE research

- Renewable energy
- Architectural Engineering
- Civil Systems Engineering
- Construction Management
- Earthquake Engineering
- Environmental Engineering
- Fire Engineering
- Fluid Mechanics
- Geotechnical Engineering
- **Hydrological and Ecological Engineering**
- Structural Engineering
- Transportation Engineering

- Hydrological engineering

Cluster 5 areas of interest:

- Hydrological analyses, management (across rural and urban spectrum)
  - Floods
  - Droughts
  - Water quality
- Developing modelling tools
  - Develop and test mitigation and adaptation strategies
  - Co-benefits (ecosystem services)

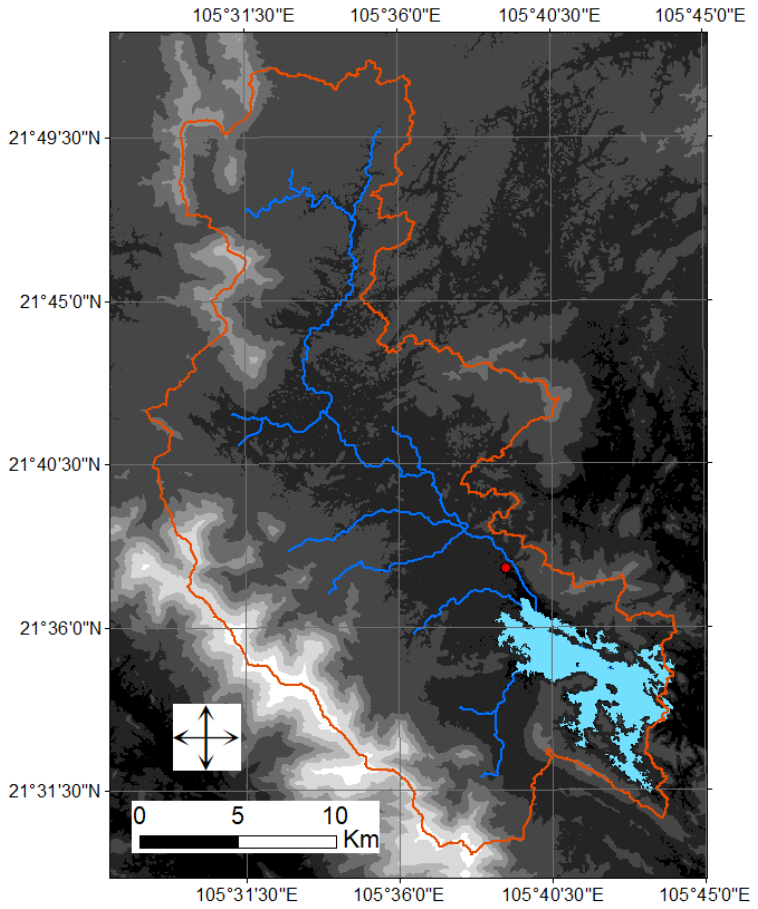


*Image: "A Framework to Assess the Reliability of a Multipurpose Reservoir under Uncertainty in Land Use" DOI: 10.3390/w13030287

Contact: **tom.cochrane**@canterbury.ac.nz,
markus.pahlow@canterbury.ac.nz

Minority Report

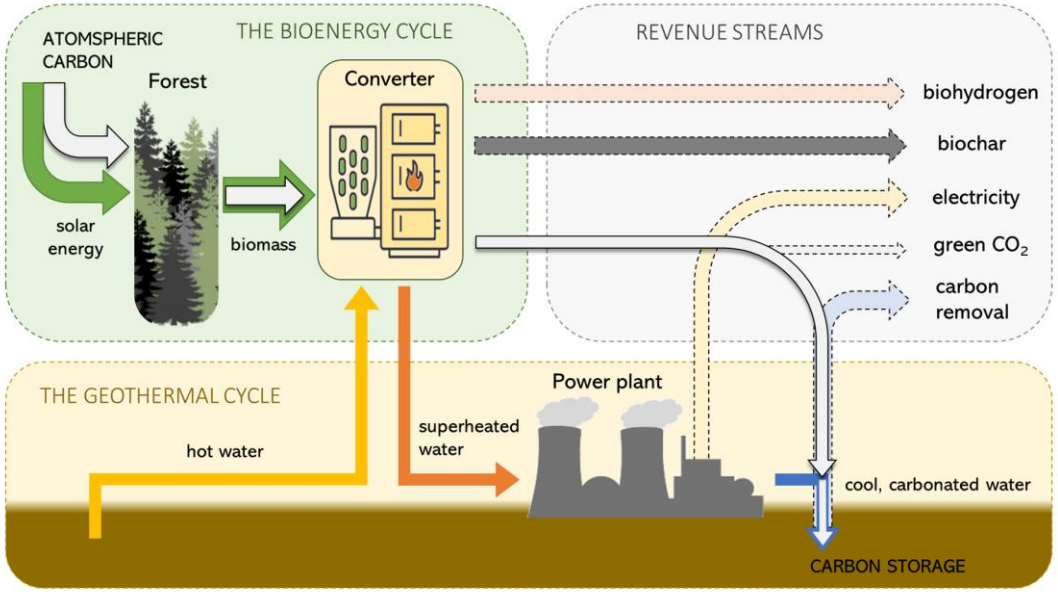
The future: collaborations?

CNRE research

- Renewable energy
- Architectural Engineering
- Civil Systems Engineering
- Construction Management
- Earthquake Engineering
- Environmental Engineering
- Fire Engineering
- Fluid Mechanics
- Geotechnical Engineering
- Hydrological and Ecological Engineering
- Structural Engineering
- Transportation Engineering

- Sustainable energy research group

Carbon-negative geothermal with BECCS

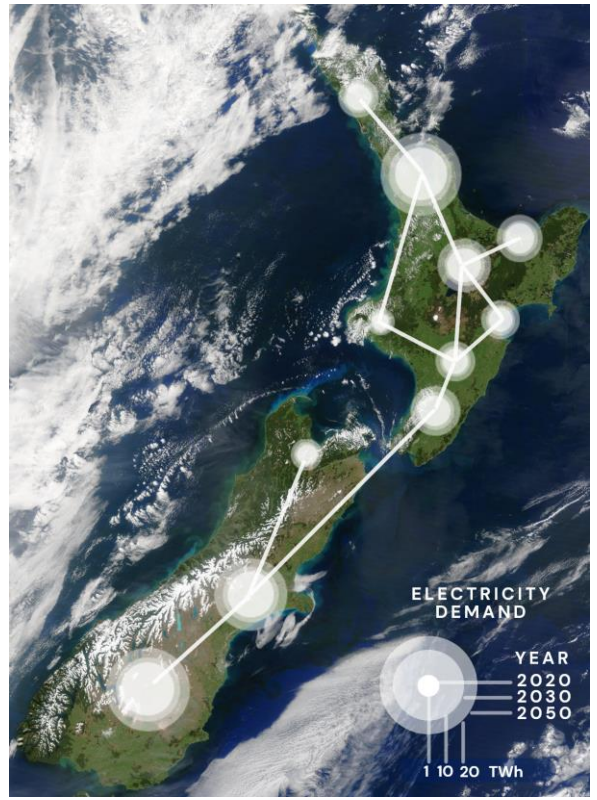


CURRENTLY INTERESTS

Investigating BECCS & geothermal

BECCS, DACCS, systems modelling of CCS

Energy Systems Modelling



Contacts: **rebecca.peer**@canterbury.ac.nz

jannik.haas@canterbury.ac.nz

david.dempsey@canterbury.ac.nz

The future: collaborations?

CNRE research

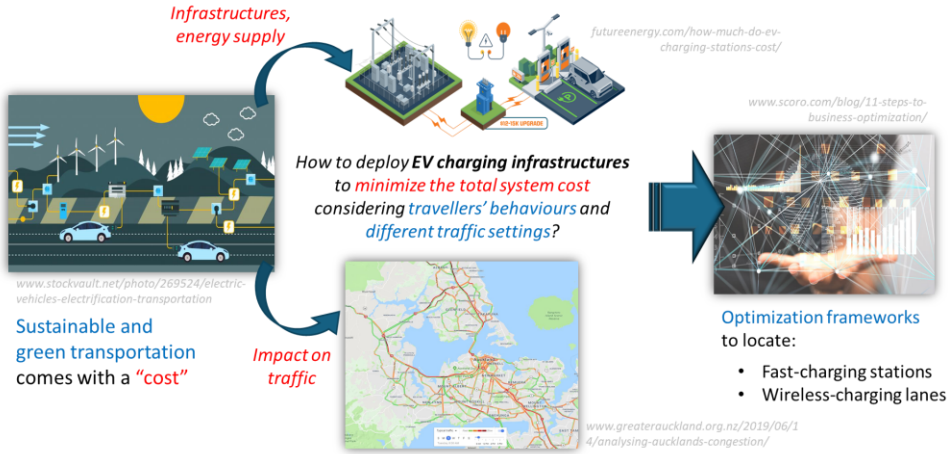
- Renewable energy
- Architectural Engineering
- Civil Systems Engineering
- Construction Management
- Earthquake Engineering
- Environmental Engineering
- Fire Engineering
- Fluid Mechanics
- Geotechnical Engineering
- Hydrological and Ecological Engineering
- Structural Engineering
- Transportation Engineering

CTSLAB

- Complex Transport Systems Laboratory (CTSLAB)

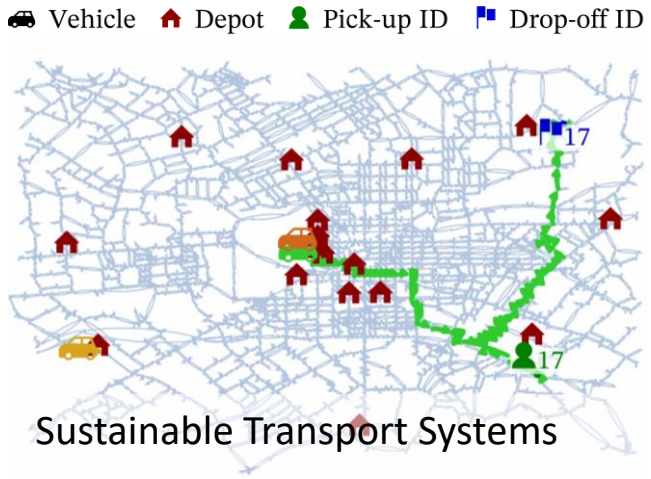
Large-scale traffic networks modelling

*Optimal deployment of **EV charging infrastructures** for urban networks*



Research interests:

- **Green On-demand Systems**
- **EVs and Charging Stations**
- **Traffic Modelling and Control**
- **Data-fusion and AI-based predictions**



Sustainable Transport Systems

Contact: A/prof. Mehdi Keyvan-Ekbatani **mehdi.ekbatani**@canterbury.ac.nz

The future: lessons and tips

1. **Find the right call** for you, carefully
   https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/cluster-5-climate-energy-and-mobility_en
2. Use the portal ⇨ “check the €s per call” & the **competitiveness**
3. Use existing **connections** and the partner-search
4. Find a very **experienced EU project lead**
5. Expand the team to **meet all the needs** (8 – 15 partners)
6. Budget carefully (and early)
7. Clarify **societal benefit** & highlight **high areas of research impact**
8. It’s very competitive ⇨ “**tick every box**”

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