

BioPREVAIL Built Environment Design Challenge

Call for Applications

Introduction

The **BioPREVAIL Built Environment Design Challenge** is a new initiative under the broader BioPREVAIL program, focused on advancing biosafety, biosecurity, and sustainability within laboratory and health-related infrastructures for work on and storage of especially dangerous pathogens (EDP). This Call for Applications invites innovative project ideas that address the problem statement of at least one of the three thematic areas prioritized by the BioPREVAIL Built Environment Advisory Committee (BE-AC). We are looking for creative, scalable, and interdisciplinary solutions that can help reshape how built environments support global biosecurity and biosafety. Submissions are welcome from individuals, institutions, and organizations across sectors.

Eligibility Criteria

The BioPREVAIL Built Environment Design Challenge is open to applicants globally, including academic researchers, nonprofits, startups, engineers, architects, and interdisciplinary teams. We welcome solutions at all stages of development, from idea to market ready. Priority consideration will be given to solutions that are sufficiently conceptually developed and ready to enter a design sprint and pilot phase within a 6-month period. A design sprint refers to an intensive, short-term period of focused development to rapidly prototype and test core features of a solution. The pilot phase involves small-scale implementation or field testing to evaluate performance, feasibility, and potential for broader adoption.

Applications may include advanced concepts, prototypes, or applied research with clear plans for practical validation. Early-stage ideas without a credible pathway to implementation are less likely to be prioritized but may be considered. Applications will be reviewed by a panel composed of BioPREVAIL team members and BE-AC experts. Selected submissions may be invited to receive technical mentorship, partnership discussions, and/or exploratory support—though submission does not guarantee funding or collaboration.

While applicants from all countries are eligible to apply, we especially welcome proposals that reflect deep understanding of local needs, and that are led by, or meaningfully engage with, institutions embedded in settings where laboratory innovation must be tailored to specific environmental, infrastructural, or resource-related constraints. Projects rooted in such contexts are central to the goals of this challenge and may be prioritized during the review process when local relevance, sustainability, and contextual adaptation are clearly demonstrated.

Thematic Areas and Problem Statement

The BioPREVAIL Built Environment Advisory Committee (BE-AC) has identified three key thematic areas related to biocontainment, biosafety and biosecurity within the built environment. These themes serve as strategic focus areas for this design challenge. Applicants should respond to the problem statement by proposing solutions that demonstrate impact, feasibility, and alignment with BioPREVAIL’s mission — **addressing a minimum of one thematic area per submission. Proposals that address more than one thematic area must demonstrate clear connectivity and complementarity between the proposed solutions.**

“How might we come up with novel solutions that are context specific, locally sourced or manufactured, cost effective and revolutionize the way that laboratories function and are operated safely and securely?”

By “context-specific,” we refer to solutions tailored to the environmental, economic, regulatory, and operational conditions of the setting in which a laboratory functions—such as climate, resource availability, infrastructure, and workforce capacity. By “locally sourced or manufactured,” we mean solutions that use materials, tools, or expertise available within the region or country of implementation, helping reduce reliance on global supply chains and improving long-term sustainability and maintenance.

Respondents will be asked to designate the thematic area(s) that their solution addresses, and solutions must address challenges posed by at least one of the following thematic areas:

- A. Laboratory facility design and construction
- B. Equipment maintenance
- C. Laboratory waste management

Background information and rationale

- A. Challenges in laboratory facility design and construction
 - **Basic Infrastructure Needs:** Clean water, air, power, protection from the elements, and effective pathogen containment—essentials are often compromised in current designs.
 - **Design and Maintenance Challenges:** Many lab facilities are over-engineered with unnecessary features and rely on complex HVAC systems, which can consume up to 50% of maintenance budgets in some settings.
 - **Poor Adaptation to Local Conditions:** Standard lab designs often are not sufficiently adapted to local climates and proven vernacular architecture, leading to issues like humidity damage, dust incompatibility, and lack of sustainable, performance-based design standards.

What success looks like: Facilities that are resilient and adaptable to local conditions, cost-effective to operate and maintain, ensure robust and uninterrupted biosecurity and are capable of scaling up during surges. Successful designs could use locally available or easily-sourced materials, reduce unnecessary complexity, and anticipate long-term maintenance through local expertise. Possible solutions might include improved air handling systems, reliable power solutions, local procurement of parts or recertification of materials, and reduced dependence on external supply chains. Applicants are also encouraged to think beyond individual components and consider whole-system approaches.

B. Challenges in equipment maintenance

- **Inappropriate Equipment Choices:** Labs often rely on equipment not suited to local needs, with limited servicing capacity and high maintenance demands. e.g., Class II biosafety cabinets, diagnostic tools, autoclaves.
- **Lack of Support for Alternatives:** There is insufficient validation and guidance for accessible, lower-cost alternatives to complex, imported equipment.
- **Maintenance Gaps:** Poor awareness of maintenance needs, underfunded budgets, and underutilized local expertise lead to equipment failure and inefficient operation.

What success looks like: Equipment systems that can be maintained, certified, calibrated and repaired with in-country resources, technician training and local support. Performance is equal or superior to current systems while reducing dependency on global supply chains. Possible solutions might include energy-efficient equipment with a wide voltage operating range and the use of affordable portable power generators to ensure reliable electricity supply in areas with unstable power or frequent outages.

C. Challenges in laboratory waste management

- **Poor Waste Management Practices:** Many labs lack proper segregation, transport, and disposal systems for biological, chemical, and clinical waste.
- **Inadequate Tools and Infrastructure:** The absence of affordable, durable, colour-coded bins and safe holding or incineration facilities limits effective and safe waste handling.
- **Complex and Costly Processes:** Waste management procedures are often overly complicated and expensive, making consistent implementation challenging in settings facing resource-related constraints.

What success looks like: Alternatives to existing waste systems that meet biosafety requirements and can be sustained using local infrastructure and budgets, including utilizing available local resources and maintenance staff to reduce costs. Approaches should be energy-efficient, reduce risk, and include safe options for temporary storage, treatment, and transport. Possible solutions might address decontamination, incineration, and the safe recycling or upcycling of laboratory waste, all designed to minimize environmental impact while maintaining secure and practical waste handling.

Context specific considerations

Innovation Scope and Framing

We seek novel, context-specific solutions that address real-world challenges while offering insights applicable to global laboratory practice. These innovations must not compromise effectiveness, safety and security by oversimplifying or reducing quality to fit resource constraints. Submissions should not include standard operating procedures, training programs, or protocols for existing tools—local risk assessments and robust biosafety and biosecurity programs are expected as foundational prerequisites.

Biosafety and Biosecurity Performance

Proposed solutions must demonstrate the ability to control biological risks efficiently, sustainably, and in ways that are locally appropriate (i.e., tailored to the practical realities and constraints of the target setting). While adherence to specific international standards or national regulations is not required, solutions must show performance equal to or better than existing standards in effectiveness, sustainability, flexibility, and cost-efficiency. Proposed solutions should fully meet biosafety requirements while also demonstrating energy and cost efficiency.

Operational Planning and Maintenance

Solutions should define the basic skills and qualifications required for safe operation and maintenance (e.g., HVAC systems). Infrastructure must align with realistic, long-term operational budgets covering energy, staffing, decontamination, and ongoing maintenance. Designs should rely on accessible parts, local supply chains, and manageable system complexity. A clear maintenance plan will be required for consideration at the pilot stage.

Local Relevance and Context Adaptation

Solutions must be tailored to specific settings, with clear justification for design choices (e.g., air recirculation). Facilities should be resilient, allowing for future adaptation, surge capacity, and safe scaling during emergencies. Design responses must account for local environmental and operational challenges such as unreliable power, high humidity, and risk of flooding.

System Thinking and User-Centered Design

Many implementation gaps arise from poor alignment between user needs and technical designs. Solutions should address this by integrating and enhancing local capacities—including human resources, supply systems, and institutional support—to ensure long-term sustainability. Building infrastructure must go hand-in-hand with developing the ability to maintain and operate it effectively within the local context.

Examples of possible solutions

- A. A design for an innovative laboratory that can be entirely locally manufactured and assembled and be cost-competitive with particular attention being paid to the quality of surface finishes, capital costs, energy use and maintenance.
- B. A low-cost, low-pollution disposal system that is powered by a renewable energy source.
- C. A successful technology in another industry (aviation, maritime, oil & gas) that is applied in a novel way to one of the three problem areas.
- D. A water sanitation system tailored for laboratory settings that uses locally available materials and decentralized treatment methods to ensure clean water access and safe wastewater disposal in areas with unreliable infrastructure.

Project types

We welcome a wide range of project types, including conceptual designs, applied research, prototypes, digital tools, and operational interventions. Projects may focus on physical infrastructure, engineering solutions, or systems that improve how laboratory built environments are designed, maintained, or scaled. Both early-stage ideas and more developed concepts are encouraged, as long as they demonstrate relevance to the problem statement in at least one of the identified thematic areas and have potential for real-world impact. Interdisciplinary and cross-sector approaches are especially valued.

Information Session: Learn More Before Applying

An information session for the BioPREVAIL Built Environment Design Challenge will be held on **August 5, at 2:00 PM CEST**. The session will cover the challenge goals, problem statements, application process, and evaluation criteria. While **attendance is not mandatory**, it is strongly encouraged for those seeking guidance before applying.

The session recording and a summary of key questions and answers will be shared with all registered participants via email, posted on BioPREVAIL's social media channels, and made available in the public [Applicants Package folder](#). Don't miss the chance to strengthen your proposal— [register here](#) now and get your questions answered live!

Application Process and Selection Criteria

The Call for Applications opens on July 28 and includes **two submission deadlines**: a priority deadline on August 15 at 11:59 PM Central European Time (CEST), and a late submission deadline on August 31 at 11:59 PM CEST. All applications must be submitted exclusively through the [BioPREVAIL StartupTree platform](#). Applicants may consult the application form in the [Applicants Package](#) folder for reference only, but all official submissions must be completed through the StartupTree platform.

Applications will be reviewed on a rolling basis. We strongly encourage applicants to submit by the August 15 priority deadline to allow for timely review and early engagement. Submissions received during the late window (August 16–30) are welcome but may be reviewed and processed later in the selection timeline.

To support a fair and effective evaluation process, applicants should consider the following criteria outlined below. Strong applications will clearly connect their idea to the problem statement in at least one thematic area, demonstrate a sound implementation plan, and articulate the potential for scalability and real-world impact.

Submissions will be assessed using the following criteria: Clarity and relevance to the selected problem statement, innovation and originality, feasibility and scalability, impact on biosafety, biosecurity, sustainability, strength and qualifications of the project team, and timeline realism.

All materials will remain confidential and accessible only to the BioPREVAIL team and judges unless otherwise agreed.

Awards and Recognition

Up to three project applications will be selected per thematic area. All selected teams will participate in a development phase, during which they will receive up to 10,000 CAD in financial support to develop a prototype, along with personalized mentorship, access to virtual training sessions, and recognition through BioPREVAIL's communication channels. Participants may also be invited to present their work at future convenings or partner events.

Following the development phase, selected projects may receive additionally up to 10,000 CAD to support prototype testing. Please note that financial support is not provided as unrestricted funding; all disbursements will be based on approved budgets for each stage of the project. This tiered support model is designed to help refine ideas and identify the most promising solutions for further investment and implementation. All selected teams will be expected to participate in mentorship and training sessions as part of the program.

Key Dates and Timeline

The timeline below outlines the key dates for the BioPREVAIL Built Environment Design Challenge. Applicants are encouraged to submit their applications as early as possible. All submissions will be reviewed on a rolling basis, but final selections will be made after the August 31 deadline, and applicants will be notified shortly thereafter.

Milestone	Date
Call for Applications opens	July 28, 2025
Information session	August 5, 2025 (2:00 PM CEST)
Priority deadline	August 15, 2025 (11:59 PM CEST)
Late submission deadline	August 31, 2025
Selected teams announcement	Early September, 2025
Prototype development phase	September–November 2025
Prototype testing phase	Begins early 2026

Intellectual Property

By submitting an application applicants acknowledge that they retain ownership of any intellectual property (IP) included in their submission. However, BioPREVAIL and its partners may review applications content internally and with select external advisors for the sole purpose of evaluating alignment and feasibility. Submission does not grant BioPREVAIL any rights to the applicant's IP beyond what is necessary for the review process. Applicants are advised not to include proprietary or confidential information unless essential to understanding the application. Selected teams must be willing to share non-confidential summaries during the innovation showcase event in December 2025. **Applicants are solely responsible for ensuring that their submissions do not infringe on any existing intellectual property rights, including patents, trademarks, or copyrights held by others.**

Disclaimer and Contact Information

Participation in the BioPREVAIL Built Environment Design Challenge does not guarantee funding, partnership, or future engagement. This initiative serves as a platform to identify and explore promising ideas for alignment with BioPREVAIL's mission. **For questions after the Information Session, and before submitting, please contact us at admin@bioprevail.org**