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Stimulating and Connecting the FINEST Experimentation Practices and Spaces

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Authors Dissemination Level

Surname	First name	Beneficiary
Bigorra	David	Cleantech Group
Ross	Noah	Cleantech Group

Reviewers

Surname	First name	Beneficiary
Chatburn	Lucy	Cleantech Group
Bitšikov	Carina	TalTech
Phakoukaki	Yiota Victoria	KIOS CoE
Veskioja	Kaija	TalTech

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Executive Summary

The transition from laboratory innovation to real-world impact in cleantech – particularly in deeptech areas like sustainable energy, mobility, and the built environment – requires more than strong technology. It demands a comprehensive ecosystem of support that includes robust, purpose-built experimentation spaces, such as testbeds, regulatory sandboxes, and living labs, which play a vital role in validating solutions, reducing market entry barriers, and accelerating deployment. However, these spaces are only one part of a broader set of capabilities needed to drive cleantech innovation forward. A well-rounded experimentation space or innovation ecosystem acts almost like an “innovation concierge,” guiding startups to the right opportunities, testing spaces, resources, and partnership at each stage of development. This report identifies a wide range of best practices across physical experimentation infrastructure, regulatory frameworks, program & support services, ecosystem governance & connectivity, and funding & talent models used by leading hubs to build high-performing innovation environments. Together, these tools, resources, and services form a flexible blueprint for the FINEX network to adopt and adapt, supporting the deployment of experimentation spaces and the development of globally competitive innovation ecosystems. This is in line with the main vision of the FINEX project, to support the quick deployment and uptake of Cleantech solutions and the development of supporting regulatory frameworks through building on world class experimentation practices, networks and experience of its partners.

This deliverable is the direct output of task T4.2 that identifies and formulates experimentation and support tools and services best practices. Furthermore, it is a relevant resource for: 1) WP5 Attracting and Accelerating Cleantech Innovators under which a joint interregional Helpdesk for use cases and innovators is set up, and 2) WP6 Experimentation spaces and pilots: Action Plan & Deployment under which support for the piloting of 6 Cleantech use-cases is provided through collaborating and utilising the mapped experimentation resources and best practices from WP4.

This report draws on primary research interviews, internal Cleantech Group expertise, and publicly available insights from 9 leading innovation ecosystems and hubs across Europe and North America, including Greentown Labs, Newlab, Scale Space, the National Robotarium, BlueChem, Norrsken, WaterCampus, TU/e Innovation Space, and key Estonian initiatives. To guide this work, the report organizes findings into six key categories:

1. Physical Spaces & Infrastructure

Leading cleantech hubs provide affordable, adaptable lab and demonstration facilities with specialized utilities and shared equipment to meet the unique needs of hardware-intensive innovation. Facilities such as Scale Space in London and Greentown Labs in the US illustrate how modular lab design, shared equipment libraries, and access to advanced tools can reduce costs and development time. Strategic location near universities, industry, and transit networks, combined with amenities like housing, childcare, and transport incentives, helps attract and retain top talent.

For early-stage ventures, testbeds offer essential tools for prototyping and technical validation. For late-stage companies, living labs, demonstration plants, and urban test zones – such as Test in Tallinn and BlueChem’s corporate partnerships in Antwerp – provide real-world testing environments and often serve as gateways to pilot procurement. These physical spaces underpin cleantech ventures' ability to build, validate, and scale solutions with technical rigor and market relevance.

2. Regulatory & Policy Environment

Innovators often face delays and roadblocks due to outdated or rigid regulatory frameworks. Successful ecosystems implement regulatory sandboxes and policy experimentation tools that enable real-world testing under relaxed conditions, closely monitored by regulators. Estonia’s Accelerate Estonia program and the FinEst Centre for Smart Cities exemplify how public institutions can support experimentation while generating evidence for future regulatory updates.

Just as important are mechanisms to ensure scaling beyond the pilot phase. This includes policy flexibilities such as temporary permits or MOUs that allow for live deployment, as well as structured pathways for transitioning from pilots to procurement or regulatory integration, which address the common “pilot trap” faced by cleantech ventures.

3. Programs & Services

Beyond physical infrastructure, startups require targeted programs and support services tailored to their stage and needs. Best practices include:

- **Technical expertise access** via mentoring networks, in-house technicians, or on-demand labs (e.g., Scale Space, BlueChem).
- **Venture support and acceleration**, with tailored learning, investor connections, and structured curricula, as seen in Greentown Labs’ Go Program and Antwerp’s BlueChem.
- **Market access facilitation** through corporate challenge programs, procurement support, and matchmaking. WaterCampus and Greentown’s corporate partnerships are strong examples.

Startups benefit most from programs that are personalized, flexible, and focused on outcomes, whether that be a validated prototype, a paid pilot, or investment readiness.

4. Stakeholder Engagement, Governance & Ecosystem Connectivity

High-performing experimentation spaces act as collaborative platforms that align startups, corporates, governments, academia, and investors around shared climate and innovation goals. Governance structures such as steering committees (e.g., National Robotarium) ensure coordinated decision-making and trust. Transparent startup selection processes and rigorous evaluation criteria maintain credibility and mission alignment.

Crucially, successful hubs foster ecosystem connectivity through regular events, digital tools, and community managers who create curated connections. Norrsken’s community-driven model, combining member-led programming, digital tools, and cross-location events like Impact Week, exemplifies this.

Robust data collection on performance, impact, and community engagement, such as Greentown Labs’ detailed KPIs, builds transparency and supports fundraising.

5. Funding Models & Financial Sustainability

Experimentation spaces require long-term financial health to remain impactful. The most resilient models leverage diversified revenue streams, including:

- Membership fees tiered by startup stage
- Public and philanthropic grants
- Corporate partnerships and sponsorships
- Rental income from labs, equipment, and event space
- Success-based returns or equity stakes (e.g., Newlab)

6. Talent Attraction & Development

Talent is the lifeblood of any innovation ecosystem. Leading hubs build pipelines through academic partnerships, hands-on training programs, and challenge-based learning models. Examples include TU/e Innovation Space in Eindhoven, Greentown’s partnerships with universities, and national programs like Estonia’s e-Residency.

Retention and inclusion are addressed through fellowships, upskilling programs, and diversity initiatives. Notably, Greentown’s ACCEL program supports BIPOC-led startups with funding, mentorship, and network access, reflecting an integrated strategy for inclusive innovation.

Conclusion

The findings from this study underscore the importance of designing experimentation environments that go far beyond physical infrastructure. The most successful cleantech hubs integrate regulatory flexibility, tailored services, multi-stakeholder governance, diversified funding, and robust talent strategies into a coherent ecosystem that supports the entire cleantech innovation lifecycle.

As a FINEX Deliverable (Task 4.2), this report provides a comprehensive repository of global best practices, equipping European stakeholders with actionable insights to create world-class experimentation spaces. By learning from and adapting these strategies to local contexts, FINEX regions can better support cleantech entrepreneurs, accelerate decarbonization, and drive inclusive economic growth.

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List of Terms and Definitions

Table 1 Definitions

Abbreviation	Definition
CAD	Computer-aided design
CE	Conformité Européenne
Deep tech	"Deep tech is technology that is based on cutting-edge scientific advances and discoveries and is characterised by the need to stay at the technological forefront by constant interaction with new ideas and results from the lab. Deep tech is distinct from 'high tech' which tends to refer only to Research & Development intensity." - European Innovation Council standard definition
DEI	Diversity, Equity and Inclusion
EC	European Commission
ESO	Entrepreneurial Support Organization
EU	European Union
GA	Grant Agreement
HVAC	Heating, ventilation, and air conditioning
IE	Innovation Ecosystem[1]
IP	Intellectual Property
KPI	Key Performance Indicator
MSMEs	Micro, Small and Medium Enterprises
RCC	Resources, Competences and Capabilities
R&D	Research and Development
TRL	Technology Readiness Level
UL	Underwriters Laboratories
WP	Work Package

[1]European Commission (2023). Retrieved from:https://eismea.ec.europa.eu/programmes/european-innovation-ecosystems_en#european-innovation-ecosystems

1. Introduction

As part of the FINEX project's mission to accelerate the deployment and uptake of cleantech solutions, Deliverable 4.2 provides the final output of Task 4.2 within Work Package 4 (WP4). It serves to identify and consolidate best practices, tools, and support services that enable the creation and optimization of high-performing experimentation environments for cleantech innovation. In alignment with the overarching FINEX vision – to accelerate the deployment and uptake of cleantech solutions and enable supportive regulatory frameworks – this report draws on leading practices from across Europe and North America to equip stakeholders with actionable insights for experimentation infrastructure design and ecosystem development. The findings in this deliverable also directly support the implementation of other key FINEX work streams: namely, WP5 (Attracting and Accelerating Cleantech Innovators), which uses the mapped best practices to establish a joint interregional Helpdesk for innovators; and WP6 (Experimentation Spaces and Pilots: Action Plan & Deployment), which leverages this work to pilot six cleantech use cases by applying the identified resources and services. In this way, D4.2 not only fulfills the objectives of Task 4.2 but also contributes a foundational resource that enhances collaboration, knowledge transfer, and deployment effectiveness across the FINEX consortium.

Cleantech innovation in fields like energy, mobility, and the built environment requires specialized support to overcome barriers from lab to market. Cleantech start-ups, especially deeptech ventures with a hardware component, require thorough testing and validation, face skills gaps, experience funding shortages, and must compete with incumbent technologies. To address these challenges, innovation ecosystems must offer a coordinated set of support mechanisms that reflect the complexity and capital intensity of cleantech development. Experimentation spaces represent one of several key activities within effective innovation ecosystems. By offering real-world environments, resources, and networks, they enable innovators to test and scale solutions. Together with other ecosystem functions, these practices help bring climate solutions to market, supporting decarbonization and economic growth.

Testbeds, sandboxes and living labs are the main types of experimentation spaces, each playing a distinct role in supporting cleantech ventures across different stages of technological development. The diagram below illustrates how these experimentation spaces are typically positioned along the technology readiness level (TRL) curve, from early laboratory testing through to early adoption:

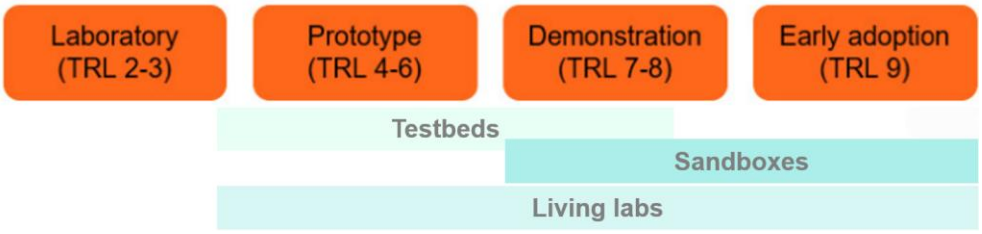

Figure 1: Experimentation spaces across development stages.[2]

To guide a shared understanding, we adopt the European Commission's definitions, as outlined in the Commission Staff Working Document: Regulatory Learning in the EU – Guidance on Regulatory Sandboxes, Testbeds and Living Labs. The exact definitions are provided below for reference:

- **Testbeds** are "experiments to develop, test and upscale a product or service in a dedicated environment. The focus of the experiment is mostly technical. The type of evidence generated by testbeds concerns technology requirements and performance, including user needs and consumer protection features."
- **Regulatory sandboxes** are "schemes that enable the testing of innovations in a controlled real-world environment, under a specific plan developed and monitored by a competent authority."
- A **living labs** is an "experimentation tool to co-create, prototype, test and upscale innovative solutions to (local) needs in real-life settings. One of their distinguishing features is the involvement of citizens as well as several other stakeholders and the end-users as co-creators during the entire experimentation process. The type of evidence generated by living labs is socio-technical and makes it possible to explore the effect of an innovation on users and society, thus leading to better calibration of requirements."

This report compiles best practices from leading cleantech hubs across Europe and North America, drawing on primary research, in-house Cleantech Group knowledge, and publicly available insights. Featured hubs include Greentown labs and Newlab in the US, Scale Space and the National Robotarium in the UK, Bluechem in Belgium, Norrsken across Europe, WaterCampus and TU/e Innovation Space in the Netherlands, and other relevant actors in Estonia, such as FinEst Centre for Smart Cities, and Accelerate Estonia. The best practices have been structured into six key categories which cover all Resources, Capabilities, and Competences (RCC) needed for cleantech innovation:

1. **Physical Spaces & Infrastructure**: Provide affordable, well-equipped lab, maker, and demonstration facilities in strategic locations, with flexible layouts and services tailored to cleantech startups' evolving needs.

[2]European Commission (2023). Retrieved from: https://research-and-innovation.ec.europa.eu/document/download/fc6f35cd-a8d6-4770-aefe-c09ca85cff8c_en?filename=swd_2023_277_f1.pdf

2. **Regulatory & Policy Environment**: Implement regulatory sandboxes and supportive policies that grant startups the flexibility to pilot innovations and establish clear pathways to regulatory approval and market entry for successful pilots.
3. **Programs & Services**: Offer comprehensive support programs, from market access (corporate partnerships, pilot facilitation) and expert mentorship to structured accelerators and venture support to address cleantech startups' business development and commercialization challenges.
4. **Stakeholder Engagement, Governance & Ecosystem Connectivity**: Foster multi-stakeholder ecosystem governance (public-private-academic-civil) with platforms for ongoing collaboration, ensuring alignment of interests, co-investment, and shared strategic vision.
5. **Funding Models & Financial Sustainability**: Diversify funding for experimentation spaces through memberships, corporate partnerships, public grants, and innovative funds, enabling financial sustainability while subsidizing early-stage ventures (e.g. grants for lab fit-out).
6. **Talent Attraction & Development**: Develop programs to train and retain specialized talent (technical and entrepreneurial), link startups with universities and vocational institutes, and implement inclusion initiatives to tap diverse talent pools.

By understanding and acknowledging these best practices, the FINEX innovation ecosystems are better equipped to develop world-class experimentation spaces tailored to their context. This will help cleantech startups more quickly validate solutions, attract investment, scale up, and ultimately drive economic development and climate impact.

The following document is structured as follows. Section 1 explains the underlying methodology for data collection and analysis, and sections 3 to 8 give a detailed overview of the best practices that cover all RCCs needed for cleantech innovation. Section 9 concludes.

2. Methodology

This report employs a qualitative, multi-source research approach combining primary interviews, secondary literature analysis, and proprietary Cleantech Group expertise. The goal was to systematically identify, validate, and analyze global best practices in experimentation spaces and innovation ecosystems, in alignment with the strategic aims of the FINEX project.

Primary Research

The core of the analysis draws on nine expert interviews conducted between January and July 2025 with leaders and representatives from prominent cleantech hubs across Europe and North America. Institutions were selected based on their global leadership, operational maturity, and demonstrable success in fostering deeptech innovation. Each hub also represented practices and capabilities directly relevant to the priorities and contexts of the FINEX partner ecosystems. The interviews followed a semi-structured format to enable consistent cross-comparison while allowing space for context-specific insights and case studies.

Interview Summary:

- **Greentown Labs** (Feb 3 & Jul 11, 2025 – Julia Travaglini, Sam White): Funding structure, membership models, ecosystem metrics, corporate services
- **Newlab** (Mar 17, 2025 – Sahil Jain): Location strategy, public-private partnerships, financial and business models
- **Scale Space / Undaunted** (Feb 3, 2025 – Alyssa R. Gilbert): Physical infrastructure, design, shared services
- **National Robotarium** (Jan 23, 2025 – Steve Maclaren): Governance and culture, stakeholder alignment, talent models
- **BlueChem** (Feb 13, 2025 – Maarten Van Ostaeyen, Liesbet Boogaerts): Financial sustainability, public-private collaboration
- **WaterCampus** (Jan 22, 2025 – Pieter de Jong): Technology transfer, infrastructure, industry integration
- **FinEst Smart City Centre** (Jul 8, 2025 – Külle Tärvo): Regulatory enablers, city-led pilots, programmatic support
- **Creative Destruction Lab – Paris** (Jul 8, 2025 – Livia Kalossaka): Reputation as a tool for talent and corporate engagement

Each interview focused on strategic topics such as infrastructure, governance, services, funding, stakeholder engagement, and market access. These inputs were used to identify original insights, validate emerging themes from other research streams, and refine the overall analytical structure.

Secondary Research

To complement the interviews, we undertook a detailed desk-based review of secondary sources between January and July 2025. This included publicly available reports, institutional case studies, ecosystem evaluations, and strategy documents from over 15 innovation hubs, as well as guidance documents and working papers published by the European Commission and other innovation policy bodies. Furthermore, peer-reviewed and grey literature on ecosystem development, deeptech innovation, and regulatory sandboxes informed the development of our criteria for evaluating best practices. This enabled a structured comparative analysis and ensured that the hubs profiled aligned with key dimensions such as infrastructure readiness, governance maturity, ecosystem connectivity, and commercialization outcomes.

Cleantech Group Expertise

The analysis also leveraged Cleantech Group's internal knowledge base, drawing on over two decades of experience advising, researching, and convening actors across the global cleantech landscape. Our in-house frameworks for ecosystem analysis place startups at the center of innovation environments, supported by enabling actors such as corporates, investors, governments, and academic institutions. These frameworks emphasize the role of public policy, testing infrastructure, venture support, and talent systems as foundational pillars for cleantech innovation. This institutional knowledge enabled us to interpret findings in light of systemic patterns across regions and to tailor recommendations to the specific needs and aspirations of the FINEX network.

3. Physical Spaces & Infrastructure

Cleantech startups developing hardware solutions typically need accessible, affordable, and well-equipped physical spaces from early development stages (post-lab concept validation) through pilot production and demonstration. This includes laboratories, workshops, test sites, and offices tailored to the evolving needs of innovators – ranging from solution discovery to pre-commercial deployment. Because infrastructure needs vary by sector, innovation hubs must either specialize in specific domains or offer a comprehensive suite of services, both of which demand significant investment. Key best practices include designing flexible lab facilities, providing shared equipment on demand, and locating spaces strategically near talent pools and industry clusters.

3.1 Early-Stage Experimentation Spaces – Testbeds

3.1.1 Overview and Importance

Early-stage cleantech ventures may require access to maker spaces, wet/dry labs, and testbeds to build and validate prototypes. Unlike generic coworking spaces, these facilities must accommodate hardware experimentation and consider the following elements:

- Lab and Workshop Spaces
- Equipment, Tools, and Supplies
- Utilities, Retrofits & Software

Lab and Workshop Spaces: The goal is to provide startups with affordable, well-equipped laboratory and workshop space that can be customized to different fields (e.g., energy, mobility, built environment, etc.) and evolving needs, and scales of prototype. By offering shared testbed facilities, an ecosystem lowers the barrier for a startup to develop a physical proof-of-concept.

Equipment, Tools, and Supplies: Cleantech innovators need access to a broad array of equipment (machines, instruments), tools, and consumable supplies. These can range from basic hardware (3D printers, welding kits, oscilloscopes) to specialized apparatus (environmental test chambers, biotech assay instruments). Such resources are often too expensive for a single startup to purchase or needed only sporadically. The challenge is to make expensive equipment and basic supplies available on-demand and at reasonable cost, so startups can prototype and test without huge capital outlays or delays. These considerations are crucial because a lack of equipment can stall development (e.g. waiting months for a single test or specific supply) and buying tools that sit idle wastes precious funds.

Utilities, Retrofits & Software: Cleantech labs have intensive and specialized utility needs (e.g. high electrical loads, three-phase power, ventilation for chemical work, access to distilled water or specialty gases). Additionally, as startups grow or pivot, facilities may require retrofits or upgrades. Access to certain software tools (CAD programs, simulation suites, big-data storage, etc.) is also crucial for design and testing, but licenses can be expensive. Supporting flexible utilities and affordable digital infrastructure is critical for accommodating evolving technical requirements.

3.1.2 Examples and Implementation Guidelines

The leading innovation hubs interviewed for this study design testbed facilities prioritizing flexibility, affordability, and efficient resource allocation:

- **Flexible Lab and Workshop Spaces:**
  - Create shared, versatile workspaces optimized for utilization and collaboration. Facilities are pre-configured for sector-specific needs (e.g., biotech labs with biosafety cabinets), focusing on similar development stages.
  - Modular designs enable easy reconfiguration through movable benches, adjustable fume hoods, and partitionable spaces. “Plug-and-play” laboratory units reduce startup setup time significantly, and flexible lease terms allow companies to easily expand or shrink their space as needs evolve.
  - Commitment to sustainability should be embedded in workspace design through green-certified buildings and energy-efficient infrastructure, among others. This is especially impactful when in-house innovators contribute solutions, turning the building into a living lab for cleantech deployment and validation.
- **Shared Equipment, Tools, and Supplies:**
  - Establish a shared equipment library or maker lab providing pay-per-use access to specialized tools (3D printers, CNC machines, high-end microscopes), significantly reducing upfront costs for startups and accelerating development times.
  - Negotiate bulk purchasing agreements for commonly needed consumables (chemicals, electronic components), reducing per-unit costs. Implement automated inventory management (e.g., solvent vending machines automatically restocking essential reagents and available 24/7).
  - Employ onsite technical staff dedicated to equipment maintenance, user training, and prototyping assistance, optimizing equipment use, safety and reducing downtime and speeding up the product development process.
- **Utilities, Retrofits & Software**:
  - Leading hubs implement continuous feedback loops with tenants to adjust utilities and infrastructure. For example, facility managers might use regular surveys or a reporting app for startups to request upgrades such as additional fume hoods, higher electrical capacity, or safety retrofits, ensuring the space can accommodate changing project needs (e.g. a sudden need for increased purified air capacity). Some hubs design utility systems to be modular (e.g. extra HVAC capacity or flexible piping that can be activated for specific labs if needed) minimizing downtime for retrofitting.
  - On the software side, providing “academic-style” licensing arrangements for startups via dedicated workstations pre-loaded with expensive engineering software, or hub-wide licenses that allow startups to use high-level tools like SolidWorks or MATLAB. Additionally, cloud computing and digital tools credits along with access to online databases helps startups adopt best-in-class products early on.

3.1.3 Real-world Application

Scale Space, an innovation campus in White City (London), offers state-of-the-art life sciences labs and maker spaces on an affordable, shared model. The labs are designed to provide facilities that multiple startups can use without each bearing the full cost. Scale Space specifically targets startups around TRL 4–6 and configures its laboratories accordingly, ensuring most common needs are met (e.g., fast prototyping, basic operations such as welding and building basic electronic components). To keep costs low, Scale Space fosters high occupancy by focusing on tenants in active R&D phases and employs a pay-per-use model for expensive consumables such as protective garments, cutting tools that wear down, feedstock materials and specialized equipment, ensuring startups pay only for what they use. Portions of the space can be subsidized by external partners. For instance, Undaunted, a hub for the UK's climate innovation community established by Imperial College London and the Royal Institution, provides startups joining its program with access to its workspace within Scale Space for the first 12 months until they secure funding, with the option to extend for an additional 6 months. This blended funding approach allows early-stage ventures to access labs at a price per sq. ft significantly below market rates appropriate to their stage and technical requirements. In terms of customization, Scale Space provides a mix of private and shared lab options and uses movable lab furniture and walls to let teams reconfigure their space. This is particularly valuable when startups face cross-contamination risks, confidentiality requirements, or the need for controlled access—for instance, biotech companies cultivating sensitive biological colonies that could be compromised by minor environmental fluctuations.

The building itself was constructed with a modular design planning for a 10-year horizon, after which it can be reassembled or expanded as needs change, ensuring the infrastructure keeps pace with the sector's evolution. Despite this, the building has been BREEAM certified [3](a renowned environmental assessment system for buildings in the UK evaluating categories such as energy, water, health, pollution, and more) with a score of "Very Good". Scale Space's model illustrates how a hub can deliver affordable, flexible testbed facilities that grow with cleantech startups.

Greentown labs, the world's largest climate tech and energy incubator with physical hubs in Boston and Houston in the US, is a good example of a third-party access provider. This means that it relies on partnerships with other organizations to allow its startups to access a wide range of facilities. Some of these partnerships and facilities include cutting-edge university R&D, like the Harvard's nanoscale research lab and the Texas Entrepreneurship Exchange for Energy (TEX-E)[4]. It also gives its members access to open databases (e.g., energy market data sets) and facilitates pilot projects on the Massachusetts grid through partnerships with the Massachusetts Clean Energy Center (MassCEC).

[3]Western Build (2025). Retrieved from: https://westernbuild.com/build/case-studies/scale-space

[4]Greentown labs (2022). Retrieved from: https://greentownlabs.com/greentown-labs-mit-texas-universities-reveal-new-student-entrepreneurship-program/

3.2 Late-Stage Experimentation Spaces – Living Labs and Demonstration Facilities

3.2.1 Overview and Importance

As cleantech solutions mature to late-stage, they must be tested in real-world conditions. These experimentation spaces include living labs and demonstration facilities where innovations can be trialed at or near operational scale. Late-stage facilities are essential to bridge the gap between prototype and market deployment, and to ensure practical application by real-world users (e.g., a smart grid controller in a live electrical network, or a new building material in an actual building).

3.2.2 Examples and Implementation Guidelines

The best practice is for ecosystems to establish dedicated testing facilities that support demonstration through to commercial-scale deployment, enabling startups to validate solutions under real-world conditions. These might be industrial testing facilities (e.g., wind tunnels, water tanks, or expensive testing elements such as fire/acoustic for building materials), urban test zones (e.g. a city district where new mobility or energy solutions can run), campus demonstration facilities (like a model smart home or microgrid), or industrial pilot spaces (e.g. a section of a chemical plant for testing carbon capture). Ideally, this is achieved through partnerships: a city government, university, or corporate partner provides a controlled environment and partial funding for trials. For most startups, setting up these spaces in-house is out of reach due to cost and complexity. Equally important is securing feedback from real customers to clarify what to test, how useful the solution is, and whether it needs adjustment. Others looking for external partners with the right capabilities often lack the network, visibility, or contacts to identify them, so the hub steps in to coordinate access. In practice, hubs may pool resources to build a demonstration site (such as a test wind farm or solar field) that startups share, or negotiate with facility owners (like a port, a landowner or a corporate owning a production site) to host pilot projects for startups.

3.2.3 Real-world Application

A standout example is **Test in Tallinn** in Estonia, where the city itself serves as an urban living lab for smart and green technologies. Launched as part of Tallinn's innovation strategy, this program invites startups and scale-ups to use the city as their testbed, transforming the traditional model where cities only adopt mature solutions. Through Test in Tallinn, companies from around the world have tested over 40 innovative projects, from drone detection systems to smart textile recycling, on the city's streets and infrastructure. The program provides a one-stop shop for regulatory and logistical support: it streamlines permits, allocates city-owned spaces (like rooftops or street corners for sensors or devices), and directly connects startups with municipal departments who help run the pilots. For example, when TrackDeep, a startup developing an AI-based drone detection system, needed to install sensors in various buildings, the city's Test in Tallinn team granted 1 m² of space in each of 21 city-owned buildings, and coordinated and executed all lease agreements simultaneously across all required departments, saving TrackDeep from navigating bureaucracy at each step. Companies can test

solutions for up to one year under this initiative[5]. Crucially, if a pilot succeeds, Tallinn has mechanisms to move into procurement discussions, meaning the city may become a first customer, providing a clear pathway to scale. This addresses the common “valley of death” after demonstration by helping startups transition to commercial contracts.

BlueChem, Belgium’s first incubator for sustainable chemistry based in Antwerp, facilitates access to testing and demonstration facilities in industrial biotech, circular chemistry, and advanced materials via established industrial partners such as BASF, INEOS, and ExxonMobil and the adjacent port of Antwerp-Bruges[6]. These collaborations provide startups with access to industrial facilities for testing under real-world conditions and corporates with early access to innovation. Terms of such partnerships are typically defined through case-by-case bilateral agreements, focusing on aspects like intellectual property rights, safety protocols, and operational responsibilities.

3.3 Location & Amenities

3.3.1 Overview and Importance

The location of an experimentation space and the amenities it provides can significantly affect a startup’s ability to innovate. Cleantech hubs benefit from proximity to sources of talent (universities, research institutes), industry partners and business parks (companies and potential customers), and transportation networks. Co-location with related industries or clusters (e.g. a clean energy hub near an energy company cluster or a port for marine energy startups) can speed up collaboration and access to specialized facilities. Additionally, because founders and their teams often spend long hours on-site, providing quality of life amenities (e.g., affordable housing, transport access, childcare, food options, etc.) helps attract and retain the best talent. These support systems are often overlooked but are vital: a brilliant engineer might decline to join a startup if the laboratory is too far away or if living costs are untenable. For deeptech innovation, which can require years of development, sustaining the people behind the technology is as important as the tech itself.

3.3.2 Examples and Implementation Guidelines

Key considerations when selecting the experimentation space location include:

- Situating hubs in or **near talent pools**, innovation districts or campuses. For example, locating an incubator adjacent to a major university or within a science park allows daily interaction with researchers and students.

[5]TrackDeep (2024). Retrieved from: https://live.s3.teliahybridcloud.com/s3fs-public/inline-files/20241104_TrackDeep_Tallinnovation%20raport.pdf

[6]BlueChem (2025). Retrieved from: https://www.bluechem.be/our-community/partners

- **Proximity to industry**: some hubs deliberately position themselves in industrial zones or near corporate R&D centers to facilitate partnerships, especially in later stages as seen in the previous section.

In terms of amenities, some best practices observed are:

- **Affordable housing**: Hubs and local governments collaborating to provide accommodation for startup employees. This can mean reserving units in nearby residential developments at subsidized rents for researchers, or leveraging university dormitories for startup teams.
- **Transport incentives**: Discounted public transport passes, shuttle services, ample bike lanes and racks, and even parking allowances help ensure that a commute is not a deterrent.
- On-site or **nearby facilities** such as canteens, cafés, gyms, and event spaces contribute to a supportive environment for entrepreneurs, employees and visiting stakeholders. For entrepreneurs and employees, the aim is to create a mini-ecosystem where they can focus on innovation without neglecting basic life needs. Notably, amenities like childcare centers and pet-friendly spaces are increasingly prevalent, recognizing that many entrepreneurs embark on their ventures while navigating parenthood or owning a pet. For visiting stakeholders, strong connectivity by air, road, and water, along with accommodation, conference halls, restaurants, and catering services is essential to host events, and business meetings. Without these assets, the area's capacity to attract partners, investors, and delegations is diminished, limiting its ability to function as a credible innovation destination.

3.3.3 Real-world Application

Scale Space in White City integrates a number of amenities into its design. It provides on-site dining (canteen, cafes) and fitness facilities (gym, showers) that are subsidized for tenants. This not only improves quality of life but also encourages the spontaneous interactions ("watercooler moments") that spark collaboration. In partnership with the adjacent Imperial College campus, the hub can also tap into student housing for interns or low-cost accommodation for researchers, addressing the challenge of London's high rent for those early-career innovators. The location is highly accessible and within an hour's commute via public transport for much of Greater London and directly connected to a major research university.

In Antwerp, BlueChem is located within the Blue Gate sustainable business park, strategically positioned near the Port of Antwerp and the city's extensive chemical industry. This location provides startups with access to industry expertise and nearby chemical facilities operated by major companies. To support the workforce and attract talent, the City of Antwerp has integrated the area into its broader urban development programs, ensuring an appealing environment that combines green spaces with strong land transport connectivity to main nearby urban areas and Antwerp's international airport.

4. Regulatory & Policy Environment – Sandboxes

Cleantech innovation often pushes against the boundaries of existing regulations whether it is connecting a novel energy device to the grid, testing autonomous vehicles on public roads, or introducing new sustainable building materials not yet covered by code. Thus, a supportive regulatory and policy environment is a critical component of an experimentation ecosystem. Best practices in this category involve **creating mechanisms that allow regulatory flexibility and learning**, such as sandboxes and pilot-friendly policies, and ensuring there are **clear pathways to scale** once a technology is proven. Importantly, these practices usually require action by government or regulatory bodies in partnership with innovation hubs.

In many regions, regulatory hurdles are cited as a top barrier by cleantech startups that struggle with long approval processes or standards not ready for new tech, among others. Leading ecosystems tackle this by collaborating closely with regulators to carve out safe spaces for experimentation and aligning policy roadmaps with innovation timelines.

4.1 Regulatory Sandboxes

4.1.1 Overview and Importance

A regulatory sandbox is a testing environment that allows innovators to conduct live experiments under a regulator's supervision, with temporary relaxations of certain rules. In energy, mobility, or other cleantech sectors, sandboxes let startups demonstrate new concepts without first having to fit every existing regulation which might have been written before such innovations existed. It enables learning for both the innovator and the regulator while limiting risk; the startup can test viability, and regulators can observe and decide if rules need updating. This is crucial in areas like energy, where market rules can otherwise block new entrants. Without sandboxes, promising solutions might never see the light of day due to legal technicalities.

4.1.2 Examples and Implementation Guidelines

Typically, a regulatory agency establishes a sandbox program with an application process. Startups (or consortiums) apply, explaining their innovation and which regulations they seek exemption from, and for how long. Approved sandbox trials are then allowed to operate within set parameters (e.g. limited scale or geography, for a fixed period). Regulators monitor outcomes closely.

Involving regulators early in defining innovation projects (especially when a regulatory exception may be needed) helps secure direct support and anticipate regulatory requirements. For innovators, it reduces the risk of pursuing a model that ultimately hits regulatory dead ends, saving time and resources. For regulators, it allows them to shape safe testing conditions, build internal understanding of emerging technologies, and prepare the ground for potential future policies. This can save time and resources by avoiding efforts on initiatives that may ultimately prove unfeasible.

Key success factors in creating regulatory sandboxes include clear eligibility criteria (to ensure only genuine innovations get exemptions) and defined scope (what laws can be adapted, how safety is maintained). Many sandbox programs also involve stakeholders (utilities, cities, consumers) so that experiments have real context. For example, a sandbox in energy might allow a new peer-to-peer energy trading model to run in a neighborhood by exempting it from certain grid tariffs or licensing rules, with the regulator observing results. The sandbox ends with an evaluation and, if successful, possibly integration of the model into mainstream regulation.

4.1.3 Real-world Application

Accelerate Estonia, a governmental innovation lab, has developed an experimentation framework to enable regulatory sandboxes in Estonia. To do so, Accelerate Estonia coordinates the process across application assessment, validation, consultation with relevant authorities, approval of the temporary testing permit, and post-testing data collection and reporting to determine whether the business model should be permanently regulated. Some relevant examples of policies shaped by Accelerate Estonia include the legalization of autonomous vehicles, beyond-visual-line-of-sight (BVLOS) unmanned aviation, and self-service pharmacies, which eliminate the requirement for a pharmacist to be physically present[7]. Thanks to its specialization in this niche and streamlined access to decision-makers, Accelerate Estonia enables a fast, efficient process, accelerating innovation for entrepreneurs while saving time and resources for policymakers.

The FinEst Centre for Smart Cities, an international research and development centre under Tallinn University of Technology (TalTech) that funds pilot projects, is highly aware of the challenges that policy and regulation can pose to innovative solutions. To address the associated risks, each program includes a supervisory board with two representatives from relevant ministries to identify and resolve potential regulatory barriers, and to ensure that regulators understand the purpose and urgency of the pilot. In cases where a regulatory gap is insurmountable or would take too long to resolve, the project team flags the issue early and decides not to pursue that direction, thereby avoiding wasted time and effort.

Another illustrative case is BlueChem's ecosystem in Antwerp. It provides soft landing services (support services for startups or companies expanding into a new country or market) and benefits from Antwerp's progressive regulatory framework, which facilitates remote operation of drones, ships, and industrial automation, positioning the region as a prime location for high-tech innovation. Notably, the Port of Antwerp-Bruges has become the first non-aviation authority in the world to act as a geozone manager, granting it the ability to authorize drone flights within its jurisdiction. This autonomy enables streamlined approval processes for drone operations, including BVLOS flights, enhancing operational efficiency for various industrial applications. The port's implementation of the D-Hive drone network, comprising six

[7]Accelerate Estonia (2025). Retrieved from: https://accelerate.ee/projects/

autonomous drones conducting daily flights for various purposes, including infrastructure inspections, environmental monitoring, and security surveillance[8].

4.2 Policy Flexibility & Pathways to Scaling

4.2.1 Overview and Importance

A broader best practice is policy flexibility at local or regional levels to accommodate pilot projects, in order to be able to test and scale cleantech solutions. This can include temporary permits, experimental clauses in legislation, or special designations like innovation zones. For example, a city might waive certain zoning rules to allow a pop-up electric vehicle charging park, or a country might have an experimental use permit for drones in a limited airspace. Such flexibility is often needed because cleantech solutions can cut across traditional regulatory domains (energy, buildings, transport) in novel ways that weren't anticipated by existing laws.

Once the solution has been demonstrated, a common problem is the "pilot trap", where startups then struggle to convert their solution into commercial deployment or broader adoption due to regulatory inertia and lack of follow-on investment or procurement. Best practices in this segment ensure mechanisms to fast-track solution deployment, creating markets and incentivising private sector customers. Some examples involve updating codes and standards based on pilot results, public procurement commitments providing innovators with market certainty and demand signals, or scaling programs helping navigate permits for multi-site deployment.

4.2.2 Examples and Implementation Guidelines

Policy flexibility demands close collaboration between innovators and policymakers. Cities and regions often set up dedicated teams or innovation offices to handle pilot requests, expedite processes, and coordinate multiple departments to give a unified response. Common methods include:

- **Regulatory frameworks** with experimentation provisions
- **Memoranda of Understanding** (MOUs) between an innovator and authorities, outlining the pilot conditions (safety, data sharing, etc.).

The MOU can also include public procurement deals to support rolling out the solution once the pilot has been successful. Additionally, innovators may receive support from follow-on accelerators or partnerships with corporates to integrate their solutions into existing infrastructure.

The key is agility: rather than requiring legislative change for each pilot, empower agencies to grant case-by-case leeway while still protecting public interest.

[8]Port of Antwerp-Burges (2023). Retrieved from: https://newsroom.portofantwerpbruges.com/en/press-releases/world-first-in-antwerp-port-area-drone-network-officially-launched

4.2.3 Real-world Application

As part of the FinEst Centre for Smart Cities, the UrbanSplash[9] project exemplifies the challenges of scaling innovative solutions within existing regulatory frameworks. Piloted in Tartu (Estonia), Fingal, and Dún Laoghaire-Rathdown (Ireland), UrbanSplash employs real-time sensors and AI to monitor bathing water quality, significantly reducing detection times from days to near real-time results. However, the project encounters regulatory hurdles, as current European Directive 2006/7/EC[10] concerning the management of bathing water quality mandates water quality testing only four times during the summer season. Consequently, the wealth of data gathered by this innovative solution cannot be utilized for official assessments. This discrepancy between technological capability and regulatory provisions underscores the need for policy flexibility to accommodate and integrate innovative solutions.

[9]FinEst Centre, Külle Tärnov (2024). Retrieved from: https://finestcentre.eu/media-and-events/news/smart-city-challenge-round-3-winner-brings-innovative-bathing-water-quality-assessment-solution/

[10]European Union law (2014). Retrieved from: https://eur-lex.europa.eu/eli/dir/2006/7/oj/eng

5. Programs & Services Offered Across the Ecosystem

Cleantech startups need a rich array of programs and services to navigate the complex journey from idea to market. A well-rounded experimentation space or ecosystem acts almost like an “innovation concierge”, guiding startups to the right opportunities and resources at each stage. The best practice is to offer (or facilitate access to) programs that cover the critical aspects in a personalized way. We group these into three broad subcategories: (1) Technical knowledge & expertise services, (2) Acceleration and Venture Support, and (3) Market Access & Commercialization.

5.1 Technical Knowledge & Expertise Services

5.1.1 Overview and Importance

Cleantech startups need access to a broad base of knowledge, ranging from technical expertise beyond their founding team’s core skills to business know-how. This expertise is often needed urgently, with little lead time, and for short, intensive bursts. As such, it is essential that startups can quickly tap into personalized, on-demand support tailored to the specific challenges and pace of their operating environment.

5.1.2 Examples and Implementation Guidelines

Key examples of services to support cleantech experimentation spaces include:

- **Mentoring networks**: roster of experienced entrepreneurs, industry veterans, and subject-matter experts who volunteer or modestly compensated, to advise startups. Startups might be paired with a lead mentor but also have access to a pool for specific questions whether in the form of experts, knowledge platforms or collaborative databases.
- **Technical expertise**:
    - In-house: Product development support from experts ensures using the equipment safely, understanding its capabilities and limitations, and speeding up the processes to shorten the already lengthy development cycles in cleantech innovation.
    - Jointly negotiate access to specialized services, with unpredictable demand and long lead times (e.g., welding, laser cutting, or environmental testing) with external providers. This ensures faster turnaround and avoids idle time caused by service bottlenecks.
- **Business know-how**: in areas like legal, IP, financial modelling, etc., either through in-house advisors holding office hours where subject-matter experts (lawyers, accountants, prototype designers, etc.) are available for consultations or referrals to consultants with partners, labs and universities.

5.1.3 Real-world Application

Greentown Labs, formalized a “Startup Resources & Mentor Network” that includes experienced entrepreneurs, legal experts, and corporate executives who commit to mentoring Greentown startups

for 2h to 8h a month depending on the program. The broad theme is that these hubs act as a one-stop shop for expertise: if a founder has a question or a challenge, the hub either has someone on staff or on speed dial in their network who can help address it. This dramatically accelerates problem-solving and prevents mistakes. Access to professional services from partnerships include legal experts, tax advisors, HR professionals, among other relevant areas.

Scale Space, in turn, has a strong team of technicians in the shared lab and hackspaces who support innovators building early-stage prototypes. The team includes electricians, physicists, mechanical technicians, and general technicians with backgrounds in product development, contributing from design through to the actual build.

BlueChem has also cultivated a network of partners formed by corporations that offer technical expertise and business know-how to its resident startups. For instance, partners like VITO, Flemish Research Institute for Rech, and Catalisti, a local innovation cluster for chemistry, provide access to scientists or labs that startups can use for advanced testing. Partners include corporate service firms that give pro bono or reduced-cost advice on topics like financing (BNP Paribas), legal advice (Deloitte), strategy and operations, upscaling and growth (Port of Antwerp-Bruges), recruitment (A-maze), safety solutions (Dekra), IP (NLO), storytelling (Media Mixer), and more, functioning as an extended support arm of the incubator.

5.2 Acceleration and Venture Support

5.2.1 Overview and Importance

Many cleantech founders are scientists or engineers who may be first-time entrepreneurs. While incubation provides space and general support, many startups benefit from more structured acceleration programs to sharpen their business and investment readiness. Developing strong product-market fit, business model, and pitch, are essential skills required in to navigate the entrepreneurial journey. The goal is to increase the rate of startup success by systematically imparting lean startup methodologies and connecting founders with investors.

5.2.2 Examples and Implementation Guidelines

Many cleantech hubs run their own accelerators or partner with external ones. Successful cleantech accelerators carefully balance structured support with personalized attention, ensuring relevance and tangible value to startups. Key guidelines include:

- **Personalized and practical support**: Programs must recognize each startup's unique stage and immediate needs. Instead of having a box-ticking rigid curricula, it is preferable to offer short learning bites, practical templates (e.g., term sheets, financial models), and personalized mentorship for founders to have flexibility to address their most pressing challenges without diverting excessive time from product development.
- **Funding opportunities**:

- **Risk capital**: Not only creating dedicated events engineered to connect startups to investors (demo day, lunch with investors, investor speed-dating sessions, etc.) but also encouraging VCs, angels and family offices to have a permanent presence in hubs to foster casual encounters and closer relationships.
- **Loans, grants & research funding:** present the relevant open opportunities to the startups and support in the application process (e.g., grant writing).

- **Experience sharing & emotional support:** connecting startups at a similar stage or within the same industry to exchange experiences and challenges fosters a sense of connection and community that plays a pivotal role during difficult periods.
- **Clear pathway**: Offering seamless progression pathways to guide startups from early-stage validation to growth and eventual commercialization. Integrating accelerators into a broader innovation ecosystem encompassing early-stage incubators, scale-up platforms, and industrial demonstration hubs, ensures startups receive consistent support across each growth stage.

5.2.3 Real-world Application

Greentown Labs offers holistic venture and acceleration support tailored to early-stage climatetech startups. Its Investor Program connects startups with capital through curated introductions, visibility in the Deal Flow Digest, and participation in industry-specific pitch days. In parallel, startups gain access to a flexible suite of advisory services delivered through structured office hours and on-demand one-on-one sessions. Areas of support include fundraising strategy, pitch deck development, product–market fit, and business development. These services are offered at no cost through the Advisor Program, which brings together a network of seasoned experts who volunteer their time to help startups navigate key growth challenges[11].

BlueChem and the Antwerp Ecosystem offer a clear structure that connects key actors to create a seamless pathway to commercialisation. This journey typically begins with proof-of-concept at the University of Antwerp, followed by feasibility and development at BlueApp, an early-stage sustainable chemistry incubator. Startups then receive early market support at BlueChem, scaling through NextGen Demo innovation hub for growth stage, and finally market maturity and IPO-readiness at the NextGen District, a business district bustling with new ideas and creative entrepreneurship. Both, NextGen Demo and NextGen District are part of the Port of Antwerp-Burges and based at the BlueGate business park.

5.3 Market Access & Commercialization

5.3.1 Overview and Importance

For many cleantech startups, the first customers are often large organizations (utilities, cities, corporates) or heavily regulated markets which can be tough to break into. Facilitating corporate partnerships, pilot projects, and procurement opportunities helping startups connect with customers and

[11]Greentown labs (2025). Retrieved from: https://greentownlabs.com/membership-benefits/

enter markets effectively. Commercialization support also covers administrative support, such as navigating certifications or standards needed to sell a product.

5.3.2 Examples and Implementation Guidelines

When it comes to supporting market access and commercialization, relevant services include:

- **Procurement support:** writing proposals, meeting procurement officers or creating first-buyer programs where local governments or big companies commit to buying from startups.
- **Market-driven corporate partnership**: through a corporate accelerator or challenge program where corporates with specific innovation needs are matched with startup solutions. Key to its success is developing a joint roadmap (defining milestones and responsibilities for both startup and corporate) and appointing a third-party representative responsible for the execution and compliance along the way. This ensures both sides remain accountable, aligning expectations and clearly defining outcomes (e.g., paid pilots, offtake agreements, capital, etc.) from the beginning.
- **Thematic workshops** delivered by seasoned industry experts and targeting specific industry challenges (e.g., regulatory compliance guidance in CE marking, UL certification, grid interconnection standards, etc., so they can meet market entry requirements).

5.3.3 Real-world Application

Greentown Labs' Greentown Go is a structured accelerator platform that connects climatetech startups with corporates such as Saint-Gobain, BASF, Schneider Electric, Shell, and Mitsubishi Corporation to address specific industrial challenges. The program is organized into five sector-focused tracks: Go Move (transportation), Go Energize (energy), Go Make (manufacturing), Go Build (buildings), and Go Grow (food and agriculture. Targeting later-stage startups, each Go program runs over six months and offers technical mentorship from corporate engineers, tailored use-case exploration, and a pathway toward pilot agreements or commercial partnerships. Corporates benefit from early visibility into emerging solutions, while startups retain full IP control and the freedom to engage with multiple industry players.

A compelling example is the Go Make 2022 cohort, run in collaboration with Mitsubishi Corporation (Americas), with a focus on supply chain decarbonization. From nearly 150 applicants, five startups were selected: Energiency, Moment Energy, Nfinite Nanotech, RenewCO_2, and Sensai Analytics. Energiency piloted energy-management software at Yazaki's plant in Mexico. Moment Energy secured investments from Asahi Kasei and ENEOS, launching EV battery testing with Mitsubishi. Nfinite Nanotech conducted a packaging coatings pilot with Mitsubishi Packaging and ENEOS. RenewCO_2 co-developed a PET market strategy with Mitsubishi and ENEOS, while Sensai Analytics demonstrated EV analytics solutions to M-Lab stakeholders[12].

[12]Greentown labs (2023). Retrieved from: https://greentownlabs.com/greentown-go-make-2022-startups-and-corporate-partners-announce-investments-pilot-projects-and-more/

WaterCampus in the Netherlands is an example of a market-driven ecosystem, where innovation depends on the availability and fit within a clearly defined innovation project led by a corporate partner. The core of its model is a long-term commitment from corporates to co-fund PhD research aligned with their strategic interests, potentially leading to spin out ventures especially when corporate partners choose not to pursue patent ownership. Key to the success of this model is the high ratio of corporates sponsoring projects (approximately one corporate for every three startups) and enforcing rigid terms for corporate engagement and commitment. These include a minimum number of hours committed by the corporate representative, clear milestones, and tangible outcomes such as paid pilots or first-buyer agreements, ensuring that startups receive meaningful attention and are properly compensated.

6. Stakeholder Engagement, Governance and Ecosystem Connectivity & Communication

6.1 Stakeholder Engagement and Governance

6.1.1 Overview and Importance

As outlined in the previous sections, supporting cleantech capacity building requires a dense and well-connected ecosystem that brings together a diverse range of actors who are actively engaged and understand the value of their participation. These actors can be categorized as 1) startups and MSMEs, 2) universities, 3) incubators and accelerators, 4) risk capital providers, 5) government, and 6) corporates.

This section focuses on how experimentation spaces and programs can orchestrate these diverse actors, establish governance structures that sustain collaboration and strategic direction, and foster connectivity. Key considerations include setting up steering committees, measuring impact collectively, and cultivating a culture of openness and "systems thinking" among participants. Essentially, it's about treating the cleantech ecosystem as a community with a shared mission, rather than isolated silos of activity.

6.1.2 Examples and Implementation Guidelines

- **Stakeholder buy-in:** Experimentation spaces and programs engage key stakeholders through structured collaboration and mutual value exchange. The examples below highlight how different groups benefit from and contribute to these programs:
    - Startups and MSMEs: These entities benefit from access to state-of-the-art prototyping labs, testing equipment, and office spaces. They receive mentorship, funding opportunities, and integration into a community of like-minded entrepreneurs, facilitating growth and innovation.
    - Universities: Engagement provides students with access to experimental facilities and entrepreneurial support. Academia contributes a talent pipeline through internships and graduate placements, fostering innovation and practical experience.
    - Incubators and Accelerators: Collaborating within the ecosystem allows these entities to tap into a vast pool of startups, access specialized expertise, and integrate into knowledge networks. Such collaboration enhances their credibility and provides avenues for funding and resource sharing.
    - Risk Capital: Investors gain access to a rich pool of innovations, strengthening their investment pipelines. In exchange for capital, they receive support from the ecosystem, aiding in selecting promising innovations and mitigating risks through market intelligence and collaborative support.

  - Government: Participation acts as a catalyst for attracting private investment, fostering job creation, and enabling procurement opportunities at national levels. It also facilitates the adaptation of policies and regulations to evolving needs and aligns with strategic objectives like addressing social inequalities.
  - Corporates: Engaging with early-stage innovations offers corporates reputational benefits and a preferential position in accessing cutting-edge technologies. This engagement can manifest through proactive technology scouting, sharing internal data (e.g., for selection assessments, IP considerations, roadmaps), and participation in thematic events aligned with corporate innovation challenges.
- **Governance platforms:** refers to formal or informal structures where representatives of key ecosystem actors come together to guide the innovation hub or initiative. This could be a steering committee, advisory board, or platform that includes members from government, industry, academia, risk capital, ESOs and the startup community ("penta helix" approach).
- **Selection process for innovators for venture programs and innovation hubs**: Transparency and rigor are essential to safeguard the neutrality and reputation of the ecosystem. Key evaluation criteria include alignment with the hub's mission, team composition, technical innovation, business model, and financial situation. Leading innovation hubs typically prioritize mission fit and team strength first, followed by technological innovation, with business and financial factors considered last. Assessments are led by in-house experts with strong technical and industry backgrounds, including PhD's and serial entrepreneurs in the field. To reduce bias, it is common practice to involve external advisors or mentors at later stages of the evaluation process. Best in class hubs have an acceptance rate around ~10%.
- **Metrics and Results**: Ensure transparency and accountability, enables course-correction through regular data reviews that spotlight underperforming areas and new opportunities, and strengthens credibility and fundraising by showcasing quantifiable financial and impact successes. While operational and financial indicators are straightforward to track, deeper impact measures often are difficult to track; the best approach is to start with reliable, easily measured metrics and gradually layer in more complex impact KPIs as your data-collection capabilities mature.
  - Operational and financial: Track record common metrics include ROI, startup survival rates, capital raised, foreign startups attracted, and awards, number of members and newcomers, square ft size of the space, total value of equipment and tools, etc.
  - Impact: Track environmental and social impact metrics such as CO_2 abatement, biodiversity preservation, and improvements in social equity to demonstrate broader ecosystem value.
  - Community: Project metrics include KPIs for hub startup collaborative projects, connections made, number of events, participants, etc.

6.1.3 Real-world Application

The National Robotarium (TNR) serves a dual mandate as a research and learning centre and an incubator for robotics startups. At any moment, its premises host scientific experts, robotics engineers, technicians, business and project managers, multiple resident startups, established firms, local councils, and various visitors. To enable agility, TNR operates with a flat hierarchy, streamlined procedures, and minimal bureaucracy. This operational model depends strongly on a culture that mitigates competitive friction, fostering trust-based collaboration among diverse stakeholders. Central to maintaining harmony and effective coexistence is cultivating an atmosphere of respect and cooperation, underpinned by a clear mission and transparent guidelines for rapid conflict resolution. To support this culture, TNR has a dedicated in-house management team that acts as both neutral mediator and facilitator. The team helps impartially resolve conflicts and connects startups to opportunities that, in most cases, emerge to the community which would be inaccessible to individual ecosystem actors.

Greentown Labs operates as both a climate tech incubator and a collaborative hub, advancing early-stage startups through a structured selection process and fostering a dynamic ecosystem. Startups are admitted on a rolling basis, with the application process typically completed within a month. The membership committee, composed of Greentown team members from various departments, evaluates applicants based on four primary criteria: climate tech fit, team composition, fit with the community (e.g., open workspace, collaborative environment, community engagement), and commitment (personal financial investment of the funding team, full time dedication, etc.). Startups are generally in the prototype development phase, corresponding to TRL 3-4 and the selection process very competitive with some examples like the Carbon to Value Program having an acceptance rate of just 7%[13].

To measure its impact, Greentown Labs monitors several KPIs, many of which are publicly available in their annual impact report. The 2024 report includes operational performance metrics such as all-time startup survival rate (89%), total funding raised for climate solutions ($8.2B) or direct job creation (13,500 since inception). It also presents a detailed picture of the financials, with revenue streams by source, and the total expenses. And finally also gathers information on the community engagement with 300+ annual events, 10,000 unique attendees, 80 new members only in the past year or more than 700 curated connections that lead to corporate partnerships or pilot digest[14].

Greentown Labs also exemplifies a collaborative model that integrates diverse stakeholders to accelerate climate tech innovation. Its long-standing partnership with Saint-Gobain led to a joint development agreement with alumni company Building Envelope Materials, focusing on advanced

[13]Greentown labs (2024): Retrieved from: https://greentownlabs.com/the-carbon-to-value-initiative-announces-year-4-startup-cohort-for-its-carbontech-accelerator-program/

[14]Greentown labs (2025), Impact report. Retrieved from: https://greentownlabs.com/wp-content/uploads/2025/02/Greentown-Labs-2024-Impact-Report.pdf

insulation technologies[15]. For investors, Greentown's Investor Program offers curated startup introductions, deal flow digests, and exclusive events like the Investor Activation Series, facilitating connections with early-stage climate tech ventures. Academically, Greentown partners with institutions such as Olin College of Engineering, providing startups access to engineering talent and fostering real-world experience for students. Government collaboration is evident through a $400,000 grant from the U.S. Economic Development Administration supporting capital access for underrepresented founders[16].

6.2 Connectivity and Communication

6.2.1 Overview and Importance

Beyond formal governance, a vibrant cleantech ecosystem relies on constant communication and connectivity among its members. This includes both structured networking (events, forums, online platforms) and an open culture that encourages collaboration over competition on shared goals like climate impact. Ecosystem connectivity ensures that knowledge flows – for instance, that a researcher who developed a new battery can find the entrepreneur who knows how to commercialize it, or a startup facing a technical challenge can be directed to a local expert or supplier. It also helps in creating a sense of community and trust supporting innovation (people are more likely to share advice, refer investors, or form partnerships if they feel part of a cohesive community).

6.2.2 Examples and Implementation Guidelines

Leading hubs and regions implement various tools for this:

- **Physical events**: Monthly meetups, pitching sessions, hackathons, mentorship days, and industry breakfasts which bring diverse actors into the same room.
- **Digital platforms & tools:** Open channels using tools such as Slack or Teams can facilitate day-to-day knowledge exchange for more generic needs such as job postings, Q&A, or sharing opportunities, and for a broader and geographically spread community.
- **Orchestration:** Hubs identified as leading employ community managers whose role is to ensure that both physical events and digital platforms align with members' needs. By staying close to the community, they identify opportunities for targeted connections (e.g. connecting a startup with a university lab that has a needed test rig).

6.2.3 Real-world Application

Norrsken, a Swedish non-profit foundation supporting impact founders and startups, excels at steering its community through a set of initiatives, events, and tools. It has developed strong ecosystems around

[15]Greentown labs (2019). Retrieved from: https://greentownlabs.com/partners/partner/saint-gobain/

[16]US Economic Development Administration (2023). Retrieved from: https://www.eda.gov/funding/programs/build-to-scale/past-grantees/2023-capital-challenge/Greentown-Labs

the locations where they operate Norrsken Houses (Stockholm, Barcelona, Kigali, and Brussels), bringing together innovators, ESOs, investors, and corporates. Each house hosts a variety of physical events ranging from social gatherings to professional workshops. Relevant programming includes everything from supper clubs and thematic meetups (e.g. climate tech) to investment-readiness workshops and corporate-led challenges like the Santander X Global Challenge on Circular Economy. Importantly, many events are created and led by members, who use their expertise and the space provided by Norrsken to support the ecosystem. While professional events and those with limited capacity are typically members-only, social events are open to the public, creating a natural entry point into the broader community.

Connectivity also extends across locations with initiatives such as Impact Week, a flagship annual event bringing together global thought leaders for sessions, workshops, and side-events on grand challenges like climate change, systemic fragility, and geopolitical conflict. Another example is the impact/100, which publishes the list of the 100 most promising startups, selected from 1,200 nominations submitted by 40 leading global VCs[17].

To coordinate all these initiatives, Norrsken relies on a team of community managers who keep communication flowing and create curated connections by personally understanding members' interests, capabilities, and needs. They are particularly active in Norrsken's digital ecosystem, which includes a Slack community with channels organized by function, user group, and interest, along with a mobile and web app that features all events, resources, and a searchable member database.

[17]Norrsken (2024). Retrieved from: https://www.norrsken.org/impact100

7. Funding Models & Financial Sustainability

7.1.1 Overview and Importance

Building and operating experimentation spaces and programs requires significant funding, particularly when supporting startups with high capital needs such as those developing hardware-intensive cleantech solutions. A financially sustainable experimentation space can continue supporting startups without constant uncertainty and without depending on a single funding source that might run dry. Diversifying income and developing innovative revenue streams are widely recognized best practices in successful models.

7.1.2 Examples and Implementation Guidelines

Diversified revenue streams can include membership fees, rent, equity stakes, corporate sponsorships, service fees, events, and more. Maintaining a mix helps ensure that if one source declines, others can compensate. This approach often reflects a variety of stakeholders having “skin in the game” – for example, revenue from startups through rent or fees, from corporates via sponsorships or paid projects, and from public grants or philanthropy. Diversification supports financial independence and stability, enabling the hub to remain neutral and mission-driven, rather than influenced by third-party agendas.

- **Membership or program fees**: Charging startups according to their size/stage (e.g., early-stage pay minimal fees while later-stage pay closer to market rate). Many incubators charge monthly fees or rent per desk/lab, which can be an important steady income.
- **Equity and success-based returns**: Taking a small equity stake in startups can serve as a means of revenue diversification. While this approach is relatively uncommon among publicly funded cleantech incubators, it is more frequently used by privately operated hubs. In some cases, hubs may also manage dedicated investment funds or accept warrants, signaling a deeper commitment and alignment with the startups they support.
- **Corporate and partner contributions**: Corporate members might pay recurring dues to be part of the ecosystem (for innovation scouting access), or sponsor equipment (with naming rights) or specific programs (e.g., a corporate might fund a “Clean Mobility Challenge” program).
- **Rental of space and services**: Besides startups, renting out facilities to others (universities, corporate R&D teams, events) can generate income. For example, leasing an entire floor to a research partner or renting the event hall for conferences.
- **Specialized services**: Prototyping, testing, or consulting for startups, and open innovation projects and programs for corporates on a fee basis.
- **Public grants and philanthropy**: Apply for public innovation grants or attract donations from foundations interested in cleantech innovation. This is especially relevant for capital expenses (building new labs) or programs with public good elements (e.g., training underserved talent).
- **Investment fund management fees**: If the hub also manages an investment fund (e.g., seed fund for its startups), it may earn management fees or carry.

7.1.3 Real-world Application

Greentown Labs operates as a nonprofit but with a diversified funding model. It earns revenue from member companies' monthly fees (which are roughly market-rate for space but include a rich suite of services), and also from corporate partnerships in exchange for access to the startup community. Greentown has also historically been supported by state grants (MassCEC funding helped its expansion), by philanthropy, and corporate and partner sponsor of equipment in order to get naming rights and build their corporate brand. Finally, Greentown labs also provided specialized scouting services through its "Launch" program, where corporates seeking innovative solutions paid the hub to identify the top five startups in a specific area. The selected startups were granted six months of complimentary membership to further develop their solutions at Greentown Labs. As the hub's reputation and influence grew, corporates began trusting Greentown to define the scouting focus itself. Today, corporates fund these programs to gain early access to the results and connect with the selected startups. This diversified approach has allowed Greentown to grow to two locations and 100+ startups without a single controlling funder.

Newlab is a space-based innovation platform headquartered in Brooklyn, New York, with additional hubs in Detroit, Montevideo, and Saudi Arabia and established through public-private partnerships tailored to local industrial strengths. They provide startups with access to prototyping facilities, physical infrastructure, and sector-specific programs, with a strategic focus on areas like critical minerals, energy, transportation, and advanced manufacturing. While their primary revenue comes from government and industry partnerships, Newlab also invests in startups part of their innovation centers, enabling partial returns to flow back into the platform and deepen alignment with the companies they support.

Scale Space in London is an interesting case as it's a joint venture between Imperial College and a venture builder (Blenheim Chalcot). Its revenue comes from leasing office and lab space to startups and scale-ups (property-based model), but also from renting office space and lab facilities to Undaunted for its accelerator programs and to corporates that want to co-locate in the innovation district.

In Antwerp, **BlueChem** finances its operations through a mix of rental income and public–private support. A key tool is the BlueChem Kickstart Fund, launched by the City of Antwerp in 2019 with a budget of approximately €3.4 million. The Fund subsidizes up to 80% of the total cost of furnishing laboratory space covering a wide range of setup needs, including benches, safety equipment, and specialized instrumentation[18]. Thanks to this subsidy, BlueChem can significantly reduce the price point for startups renting the space, ensuring labs remain occupied and rental revenue remains steady.

[18]Business in Antwerp (2021). Retrieved from: https://press.businessinantwerp.be/bluechem

8. Talent

Cleantech innovation spaces are only as good as the people driving the startups and projects. Thus, a vital category of best practices revolves around attracting, developing, and retaining talent from scientists and engineers to entrepreneurs and skilled technicians. Cleantech often demands interdisciplinary knowledge (combining engineering with policy or biology with software, for example) and benefits from diverse perspectives to spur creativity. Moreover, deep tech startups typically need longer-term and specialized talent commitments (PhDs, lab technicians, etc.), which can be hard to come by in competitive job markets. Best practices in talent focus on building the pipeline (through education and training), making the ecosystem attractive for experts (through opportunities and incentives), and fostering inclusivity (ensuring underrepresented groups are engaged, given the importance of broad climate solutions).

8.1 Attraction & Development

8.1.1 Overview and Importance

To supply startups with the skills they need, many ecosystems implement training programs in technical and entrepreneurial skills. This can include upskilling programs for existing workforce (e.g., helping oil and gas engineers transition to renewable energy jobs) or founder education (teaching scientists how to run a business). Since cleantech is constantly evolving, continuous learning is crucial even for current startup employees who may need training in new tools (like AI for energy management) or in regulatory compliance, etc. It also signals that joining the ecosystem leads to opportunities for professional growth.

8.1.2 Examples and Implementation Guidelines

Ecosystems and experimentation spaces often partner with universities, vocational institutes, or online course providers to create tailored educational programs and channel exit opportunities:

- **Attraction**: Academia and R&D attract talent by integrating academic excellence with entrepreneurial opportunities. Domain specialization, mobility programs, access to advanced infrastructure, and partnerships with leading innovation organizations not only enhance the institution's reputation but also position the region as a hub for innovation, making it more attractive to talent. Governments attract talent through policies and programs that lower barriers to entry and create conducive environments for innovation. Some examples include streamlined visa processes, tax incentives, centralized bureaucracy, and cleantech public procurement efforts that create market opportunities and de-risk emerging technologies.
- **Development:** creation of educational programs, targeted courses, certifications, and bootcamps are just some of the ways to support talent development. Increasingly, these are expected to offer hands-on learning experiences and lead to practical opportunities that can result in labor market entry, such as graduate summer programs or internships as in-house lab technicians. These need to cover training, upskilling and reskilling purposes both before and across the professional career of workforce in the cleantech sector. It is important to note that

the current speed of innovation is making reskilling more and more important compared to foundational education. Also note knowledge transfer requires collaboration to reduce the amount of time it takes for knowledge to flow from innovative companies to academia and then to students and workforce.

8.1.3 Real-world Application

Estonia's e-Residency program, launched in 2014, allows non-Estonians to establish and run EU-based companies entirely online. As of 2025, more than 120,000 e-residents from over 180 countries have founded over 33,000 companies. While most companies start with a digital footprint only, many of these businesses end up hiring local talent, creating employment opportunities within Estonia and signaling strong talent demand. In the first half of 2024 alone, e-resident-founded companies were responsible for more than 5,000 jobs across the country[19].

The **National Robotarium** in Edinburgh delivers concise, industry-focused training to bridge the robotics skills gap. Its "Robotics Readiness" workshops are half-day sessions that help businesses assess their current robotics adoption and develop tailored strategies for integration. These workshops are designed for business leaders and innovative professionals, providing practical insights and actionable steps to enhance operational efficiency in their organizations through robotics. Additionally, the Robotarium hosts the UK Robotics Summer School, a five-day immersive program held annually at Heriot-Watt University. This event brings together master's students and industry practitioners to explore cutting-edge topics such as generative AI, human-robot interaction, and bioinspired robotics. By centralizing these training initiatives, the National Robotarium ensures cost-effective delivery and maintains a critical mass of resources to stay at the forefront of robotics and AI advancements.

TU/e Innovation Space: Eindhoven University of Technology's prototyping hub within the Brainport innovation ecosystem is a prime example of developing talent and connecting it to real business needs through its Challenge-Based Learning (CBL) model. Each year, approximately 2,800 students take part in CBL courses, with around 550 working in 30 interdisciplinary student teams tackling challenges co-defined with more than 700 external partners, including industry, government, NGOs, designers, and artists[20]. This approach enhances interdisciplinary teamwork, cultivates entrepreneurial mindsets, and sharpens critical thinking – skills highly valued by employers and essential for real-world innovation. The CBL approach has resulted in successful student-led projects including the development of TEMNOS, an AI-powered system created to detect batteries in waste streams, aiming to improve recycling yields and prevent fires. Piloted in collaboration with industry partners like Huiskes Metaal and Wecycle, TEMNOS aligns with market needs (recovering rare metals and mitigating hazardous waste

[19]Invest in Estonia (2024). Retrieved from: https://investinestonia.com/estonian-e-residency-attracts-record-interest-and-revenue-in-2024/

[20]Eindhoven University of Technology (2025). Retrieved from: https://www.tue.nl/en/our-university/student-teams

incidents) while students gained hands-on prototyping experience and built meaningful stakeholder relationships[21].

Greentown Labs partners with nearby universities (like MIT and others) to host student-focused climate tech training. Students are engaged in hackathons and offered mentorship, often leading to them to joining or founding startups. In Texas, Greentown's Houston site has created an energy entrepreneurship ecosystem through building a consortium of universities which are connected to their incubator, giving students hands-on experience in climate tech startups. This approach supports the transition of talent from academia to real-world applications and professional opportunities through internships, and close collaboration with startups.

8.2 Retention & Inclusion Incentives

8.2.1 Overview and Importance

Attracting talent is only half the battle; retaining talent in the region is equally important. If experienced founders or skilled engineers constantly leave for larger tech hubs or corporate jobs, the local cleantech ecosystem cannot mature. Retention often hinges on quality of life and career prospects, hence some overlap with section "2.3 Location & Amenities". But beyond that, retention can be encouraged through incentives, career development opportunities or sense of belonging. Additionally, a truly robust talent strategy must be inclusive: engaging women, youth, and underrepresented communities in cleantech. Diversity isn't just about fairness; it expands the talent pool and brings in varied perspectives that can drive innovation, execution and public acceptance of solutions.

8.2.2 Examples and Implementation Guidelines

Some best practices observed to retain talent are:

- **Incentives**: Implement financial benefits such as grants, loan forgiveness for founders who stay local, tax breaks for hiring local graduates, and talent vouchers or hiring subsidies to support competitive salaries. Some hubs also create entrepreneurial fellowships where PhDs or postdocs spend a year at the incubator exploring venture ideas with funding from government or university.
- **Growth Opportunities**: Provide later-stage programs and access to local scale-up investors, enabling talent to advance their careers within the ecosystem without needing to relocate.
- **Quality of life and sense of belonging**: Foster community pride through celebrating local impact of the cleantech solutions with awards and media exposure, strengthening loyalty and network ties encourage talent to stay.

For inclusion, tactics include:

[21]Eindhoven University of Technology (2022). Retrieved from: https://www.tue.nl/en/news-and-events/news-overview/07-06-2022-tu-eindhoven-students-detect-batteries-in-waste-streams-with-ai

- **Accessibility & Support**: Provide gender-neutral facilities, flexible scheduling, and family-friendly policies to remove physical and logistical barriers. Offer financial incentives such as hiring subsidies and talent vouchers that enable startups to recruit diverse profiles and retain talent from varied backgrounds.
- **Accountability & Metrics**: Set clear diversity and inclusion goals, track key metrics, and appoint diversity officers or committees to guide and monitor progress.

8.2.3 Real-world Application

BlueChem, offers strong incentives to attract and retain talent, emphasizing quality of life through sustainable urban development. It is located within a 14.5-hectare ecological corridor that connects the Hobokense Polder nature reserve to Antwerp's green belt. This corridor serves as a vital habitat for local wildlife while also providing recreational space for residents. A pedestrian pathway links the business park to the surrounding urban landscape, integrating work, nature, and community in a single environment .

Greentown Labs is deeply committed to fostering an inclusive environment. A flagship initiative is the Advancing Climatetech and Clean Energy Leaders Program (ACCEL), developed in partnership with Browning the Green Space. Now in its third year, ACCEL supports Black, Indigenous, and People Of Color (BIPOC) climate tech startups by providing non-dilutive funding, tailored acceleration programs, mentorship, and access to Greentown's extensive network of corporate partners and resources. In 2024 alone, the program supported 7 BIPOC-led startups, selected from 79 applications, and provided a total of $175,000 in non-dilutive financial support. The participating founders benefited from 30 workshop sessions and guidance from 16 expert mentors, reflecting a structured and resource-intensive approach to inclusive support[22]. These efforts are part of Greentown's broader DEI strategy, which includes clear tracking of engagement metrics, ongoing evaluation, and partnerships aimed at dismantling barriers for historically underrepresented innovators in the climate tech space.

[22]Greentown labs (2023). Retrieved from: https://greentownlabs.com/bipoc-entrepreneurs-present-their-climatetech-solutions-at-accel-showcase/

9. Conclusion

This report supports Task 4.2 of the FINEX initiative by identifying global best practices that can guide the design and deployment of impactful experimentation spaces across innovation ecosystems focused on cleantech, deeptech, and smart city development. Drawing from a set of leading international hubs, it extracts actionable strategies that enable startups to accelerate technology deployment and operate in environments that mirror real market conditions. Findings are structured around six key areas, each highlighting essential features of successful experimentation environments.

Physical Spaces & Infrastructure: Leading hubs offer affordable, flexible, and well-equipped facilities that evolve with startup needs. These spaces go beyond real estate by providing access to shared equipment, prototyping zones, and lab support in strategic locations that encourage collaboration with researchers, corporates, and service providers.

Regulatory & Policy Environment: Successful experimentation spaces are supported by adaptive regulatory frameworks. Sandboxes and pilot-friendly policies, as seen in Tallinn, reduce barriers for emerging technologies by allowing controlled real-world testing while creating clear pathways to full regulatory approval.

Programs & Services: Tailored support services are critical to helping cleantech ventures manage early-stage risks. The most effective programs combine structured acceleration, expert mentorship, and market access facilitation. These offerings are designed to be flexible, time-efficient, and adapted to the evolving needs of founders, while complementing infrastructure and regulatory support.

Stakeholder Engagement, Governance & Ecosystem Connectivity: Thriving ecosystems depend on multi-stakeholder governance models that align the interests of public institutions, private actors, and academia. Regular coordination mechanisms and shared strategic leadership help build trust, streamline decision-making, and maintain focus on collective outcomes.

Funding Models & Financial Sustainability: A broad mix of income sources ensures long-term viability, autonomy and startup affordability. Strong models combine public funding with revenue from memberships and corporate partnerships. Targeted initiatives such as BlueChem's Kickstart Fund illustrate how financial support can reduce entry barriers for startups while supporting stable operations.

Talent: Effective hubs actively develop and retain talent through partnerships with universities, applied training, and founder-focused development. Programs that integrate education with real-world applications, such as challenge-based learning, are particularly effective in cultivating skilled professionals. These efforts are often coordinated with broader ecosystem strategies to ensure alignment with evolving industry needs.

As a deliverable for Task 4.2, this report directly supports the creation of a best practice repository for the FINEX network. It is intended to inform regional and national stakeholders, align strategies, and guide the joint implementation of tools, services, and governance models that can enhance Europe's position as a global leader in cleantech innovation.

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