UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION
Progress by innovation

Supported by
global environment facility
INVESTING IN OUR PLANET

CLEANTECH INNOVATION

Actor Engagement Framework

GCIP
Global Cleantech innovation programme

Cleantech Group

DISCLAIMER
© 2026 – United Nations Industrial Development Organization (UNIDO). All rights reserved.

This publication has been produced without formal United Nations editing. The designations employed and the presentation of the material do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. The designations "developed", "industrialized" and "developing" are intended for statistical convenience and do not necessarily express a judgement about the stage reached by a particular country or area in the development process. The mention of specific companies, products or services does not imply endorsement or recommendation by UNIDO.

Graphic sources
Unless otherwise indicated, photographs, illustrations and graphic elements are © UNIDO or have been obtained under appropriate licences from third-party platforms and services, including Pexels, Envato Elements, Freepik, Pixabay, Unsplash, iStock and Canva. Certain visual elements may have been created or enhanced using artificial intelligence (AI)-assisted creative tools. All external assets are used in accordance with their respective licence terms.

Contents

Acknowledgments & Glossary 3
Introduction 5
Executive Summary 6

I. Actors in a Cleantech Innovation and Entrepreneurship Ecosystem (CIEE) 10
Startups/MSMEs 12
Government and Public Institutions 12
Universities and Research Organizations 13
Risk Capital Providers 13
Corporations 14
Incubators & Accelerators 14
Other ecosystem actors 15
Ecosystem roles and their relationship with GCIP stakeholders 16

II. Designing and Implementing a Process to Engage Ecosystem Actors 17
The purpose of stakeholder engagement 17
A four-step process for engaging ecosystem actors 17
Stakeholder mapping and prioritization 19
Creating buy-in and a shared vision 20
Implementing and maintaining engagement 21
Evaluation and defining success 25

III. How Other Actors Can Contribute to Ecosystem Connectedness 29
Networking events 29
Competitions, Hackathons & Challenges 30
Broadcast communications 31
Targeted Programmes 31

Appendix 1. UNIDO stakeholder groups and how they can be aligned 33
Appendix 2. Resources for designing and conducting stakeholder engagement activities 34
Appendix 3. Insights from expert interviews 35
Appendix 4. Types of engagement activities to increase ecosystem connectedness 59

References 62

Acknowledgments

This document was produced as part of the UNIDO's Global Cleantech Innovation Programme (GCIP), supported by the Global Environment Facility (GEF). UNIDO would like to express its gratitude to the Cleantech Group for its key role in developing the present document in alignment with the objectives of GCIP.

UNIDO and the Cleantech Group extend their heartfelt appreciation to all individuals and institutions, organizations, private sector representatives and agencies that participated in interviews and took the time to provide inputs to and/or peer review this report, as well as the GCIP national project executing entities, partners and the GCIP-supported entrepreneurs and alumni.

Glossary

Accelerator
It is a structured cpacity building programme desgined to accelerate the growth of innovative cleantech startups and SMEs by strengthening their bsuiness models, enhancing theit market and invetsment readiness, connecting them with mentors, invetsors and ecosystem partners to enable the commercialization and sclaing of technologies.

Cleantech
A broad range of solutions (technologies, processes, services, business models, and their combinations) that lead to an increase in positive impact or a decrease in negative impact on climate change mitigation, transition to a low-emission economy, sustainable energy systems, and other dimensions of environmental sustainability. Climate technology, clean energy technology etc. are subsets of cleantech.

Cleantech Entrepreneurship Ecosystem
The network of entreprenuers, startups, support organizations, investors, policymakers, reserach instituions, corporations and other stakeholders that work together to enable the creation, growth, and scaling of cleantech enterprises.

Cleantech Innovation and Entrepreneurship Ecosystem (CIEE)
The network and interactions among innovation and entrepreneurship stakeholders and the social, economic and policy environment, and their combined influence on the development and commercialization of cleantech solutions.

Cleantech Innovation Ecosystem
The network of stakeholders, institutions, polciies, financing mechanisms, and support services that enable the creation, development, commercialization and scaling of innovative clean technologies as solutions.

Country/National Child Project
In the context of GEF, country-specific GCIP implementation project designed in line with the GCIP Global Programme, to address the maturity, priorities, and needs of the national cleantech innovation ecosystem.

Ecosystem
The wide range of stakeholders, factors and influences as well as the interactions between these. Can range from a low-level, small context such as city or community, to the high-level macro-view of whole countries or regions.

Entrepreneurship
Willingness and ability to turn an innovation into a profitable business model through identifying or creating a market opportunity.

Finalists
Selected group of semi-finalists advancing to the final stage of the accelerator and judging process.

GCIP Alums/Alumni
Entrepreneurs and companies that have successfully completed a GCIP accelerator cycle and remain engaged through the programme's alumni network.

GCIP Coordination Child Project

Global coordination project responsible for maintaining the GCIP methodology, ensuring consistency, and supporting collaboration across all national child projects.

Gender Mainstreaming / GEEW (Gender Equality and Empowerment of Women)

Cross-cutting activities ensuring equitable recruitment, participation, opportunities, and benefits for women and men throughout the programme.

Generalist Mentor

Experienced entrepreneur, investor, or cleantech professional providing overall business coaching and strategic guidance to participating startup and MSME teams. Generalist mentors may not invest in a mentee company during the competition cycle.

Global Accelerator

Global competition for innovators from developing, emerging, and transition economies without a national GCIP project, held after the national accelerators conclude.

Implementing Agency

In the context of GEF donor, the organization responsible for providing overall programme oversight, technical guidance and quality assurance throughout the implementation of the GCIP project. The Implementing Agency supports the NPEE, ensures compliance with project objectives and standards, and facilitates knowledge sharing and coordination across participating countries.

Innovation

The development of new, adapted, or alternative solutions and/or improvements to existing processes or addressing challenges.

Innovation Challenges

Mechanism for identifying demand-driven solutions to industrial climate and sustainability challenges by matching innovators with private-sector-defined market needs.

Investment Readiness

The degree to which a startup, product or solution is prepared to attract and secure external investment. It reflects the maturity of the venture, including a validated business model, scalable solution, capable team, financial planning and a compelling value proposition for investors.

Manufacturing Readiness Level (MRL)

A standardized scale used to assess the maturity of manufacturing processes, technologies, and production capabilities for a specific technology, component, or system. The MRL framework evaluates the readiness of manufacturing from initial concept and process development through stable, full-rate production, supporting the transition from innovation to commercial-scale manufacturing.

National Academy

Core component of the GCIP Accelerator, designed to equip participating entrepreneurs with the knowledge, skills and tools needed to strengthen their business models, validate their technologies and prepare for market growth and investment through expert-led workshops, mentoring and networking opportunities.

National Accelerator

Country-level platform and competition process that brings together national cleantech stakeholders and delivers the annual GCIP accelerator.

National Project Executing Entity (NPEE)

The institution/organization within the participating country that is responsible for the day-to-day implementation and execution of the national GCIP project. The PMU sits within the NPEE that manages the project implementation at the national level.

Post-Acceleration Support

Continued support for GCIP alumni focused on business growth, internationalization, partnership development, investment readiness, and access to finance.

Project Management Unit (PMU)

The operational unit responsible for the day-to-day management and implementation of the GCIP project. It coordinates project operations, stakeholder engagement, procurement, communications, training, mentoring and event delivery, ensuring the effective execution of national GCIP activities.

Proof of Concept (PoC)

An early demonstration that verifies the technical feasibility and potential effectiveness of an innovation, providing evidence that the proposed solution can successfully address the intended challenge.

Semi-finalists

Applicants selected from the pool of entrants to participate in the GCIP accelerator programme and receive structured support. Typically 15-25 nationally and 10-15 globally.

South-South and Triangular Industrial Cooperation (SSTIC)

A UNIDO-led cooperation approach that promotes the exchange of knowledge, technologies, expertise and resources among developing countries to advance inclusive and sustainable industrial development. Through triangular cooperation, these partnerships are further supported by developed countries or multilateral organizations to enhance their impact and scale.

Specialist Mentor

Subject-matter expert providing technical advice in a specific area, such as finance, marketing, engineering, legal affairs, or intellectual property.

Technology Readiness Level (TRL)

A standardized scale used to assess the maturity of a technology, from early-stage research to full commercial deployment. The TRL framework ranges from TRL 1 (basic principles observed) to TRL 9 (actual system proven in an operational environment) and is widely used to evaluate technological progress and readiness for commercialization.

Winners / Runners-up

Top-ranked finalists selected by the judging panel based on the programme's evaluation criteria.

Introduction

Purpose of this framework

The United Nations Industrial Development Organization (UNIDO) is a specialized agency of the United Nations with a unique mandate to promote, dynamize and accelerate industrial development. The guiding principle of UNIDO's activities is low-emission, climate-resilient development. This means promoting policies, technologies and practices so that countries can take climate action and create millions of new, decent jobs. UNIDO sees innovation as key to mitigating and adapting to climate change.

Micro, small and medium-sized enterprises (MSMEs) form the backbone of the economy and generate a large share of economic value. Given the scale of climate mitigation and adaptation action needed, it is critical that MSMEs are supported to be part of the solutions, be it as entrepreneurs, in the context of small-scale industries and clusters or through their participation in regional and global value chains.

The **Global Cleantech Innovation Programme (GCIP)** of UNIDO, supported by the Global Environment Facility (GEF), aims to address the growing global demand for environmental sustainability and climate action by harnessing the potential of cleantech innovation and entrepreneurship. Through GCIP's theory of change, the programme seeks to empower innovative cleantech startups and MSMEs to make substantial contributions to climate mitigation. The goal is to achieve low-carbon development and stimulate job creation in priority sectors and systems.

Cleantech Group provides research, consulting, and events to catalyse opportunities for sustainable growth powered by innovation. Cleantech Group's Cleantech Ecosystem Building practice works with cities, regional administrations, national governments, NGOs and multilateral organizations to create the macro conditions for cleantech innovation to thrive. Cleantech startups face specific challenges as they scale, from long times to market, needs for testing equipment and demonstration opportunities, access to finance, talent, and the need to compete with lower-priced, higher polluting incumbent technologies. Effective cleantech ecosystems support startups to overcome these challenges, creating the conditions to bring more cleantech innovation to market and to scale it faster. The result is economic growth as well as climate impact.

This framework is an integral component of GCIP activities focused which address **Cleantech Innovation and Entrepreneurship Ecosystem (CIEE)** strengthening and connectivity, implemented in partnership with the Cleantech Group. Through the GCIP, UNIDO helps strengthen the capacity of national cleantech innovation and entrepreneurship ecosystems

in the GCIP partner countries, identifies synergies across these national ecosystems and facilitates knowledge exchange and partnership building among different CIEEs.

The purpose of this report is to provide guidance to project executing entities (PEEs) in GCIP partner countries in designing and implementing coordinated activities aimed at increasing internal connectedness in national and local CIEEs. It does not focus on ways to increase international connections between different countries ecosystems: this aspect is covered in the 'Cleantech Innovation Cluster Development Framework'.

This report provides a flexible framework that can be adapted to different national contexts. It provides guidance to practitioners in designing and implementing effective engagement interventions, and makes suggestions how other ecosystem actors can proactively contribute to building and strengthening connections within CIEEs.

It supports GCIP partner countries to:

- Understand the key roles within a CIEE and how they interact with one another to maximize the framework's utility;
- Design an effective process for engaging the different roles within the ecosystem, thereby increasing the CIEE's internal connectedness;
- Provide guidance to actors within the ecosystem on measures they can take to facilitate and strengthen connections with other ecosystem actors.

Executive Summary

The GCIP's primary objective is to provide partner countries with the necessary frameworks, processes and tools to help transform their ecosystems into self-supporting networks. The goal is to develop ecosystems that can produce and scale multiple cleantech solutions, attracting entrepreneurs, investors and demand owners to collectively contribute to climate impact mitigation, create high quality jobs and foster sustainable economic growth.

Connectedness plays a pivotal role in determining the overall effectiveness of cleantech innovation production and scalability. Connectedness entails two aspects: external connectedness measures the connections with other ecosystems within the same country or internationally. Internal connectedness measures the web of connections within a local ecosystem or cluster. Startups located in ecosystems with a high degree of internal connectedness tend to experience faster revenue growth compared to those in more weakly connected ecosystems[1].

This report examines the roles and relationships between actors in a Cleantech Innovation and Entrepreneurship Ecosystem (CIEE) and provides a framework to guide the strengthening of such relationships to increase internal ecosystem connectedness.

CIEEs contain the same key roles as generic innovation ecosystems, but the nature of these roles and the relationships between them are different. The principal actors in an innovation ecosystem are entrepreneurs, government, universities and research organizations, risk capital providers, corporates and accelerators. Government provides funding support for early-stage ventures, establishes a supportive regulatory framework, creates lead markets for new cleantech solutions, and ensures the development of essential infrastructure. Universities provide the research, which is the foundation of many cleantech ventures, as well as the talent needed to develop and sell complex, innovative solutions. Risk capital providers supply early-stage funding to ventures that may not yet be ready for conventional financing options. Corporates generate demand for innovative cleantech solutions, and offer opportunities to test solutions in the real world through pilot projects. Accelerators play a particularly important role in the cleantech context, providing essential support for business model development and commercialization to founders who may not come from a business background.

Figure A illustrates the interactions between startups and MSMEs and the other key ecosystem actors.

---

1 Startup Genome. 2019. "Can Culture Be Counted? Why Local Connectedness Matters for your Startup". Accessed November 1, 2022. https://startupgenome.com/articles/can-culture-be-counted-why-local-connectedness-matters-for-your-startup

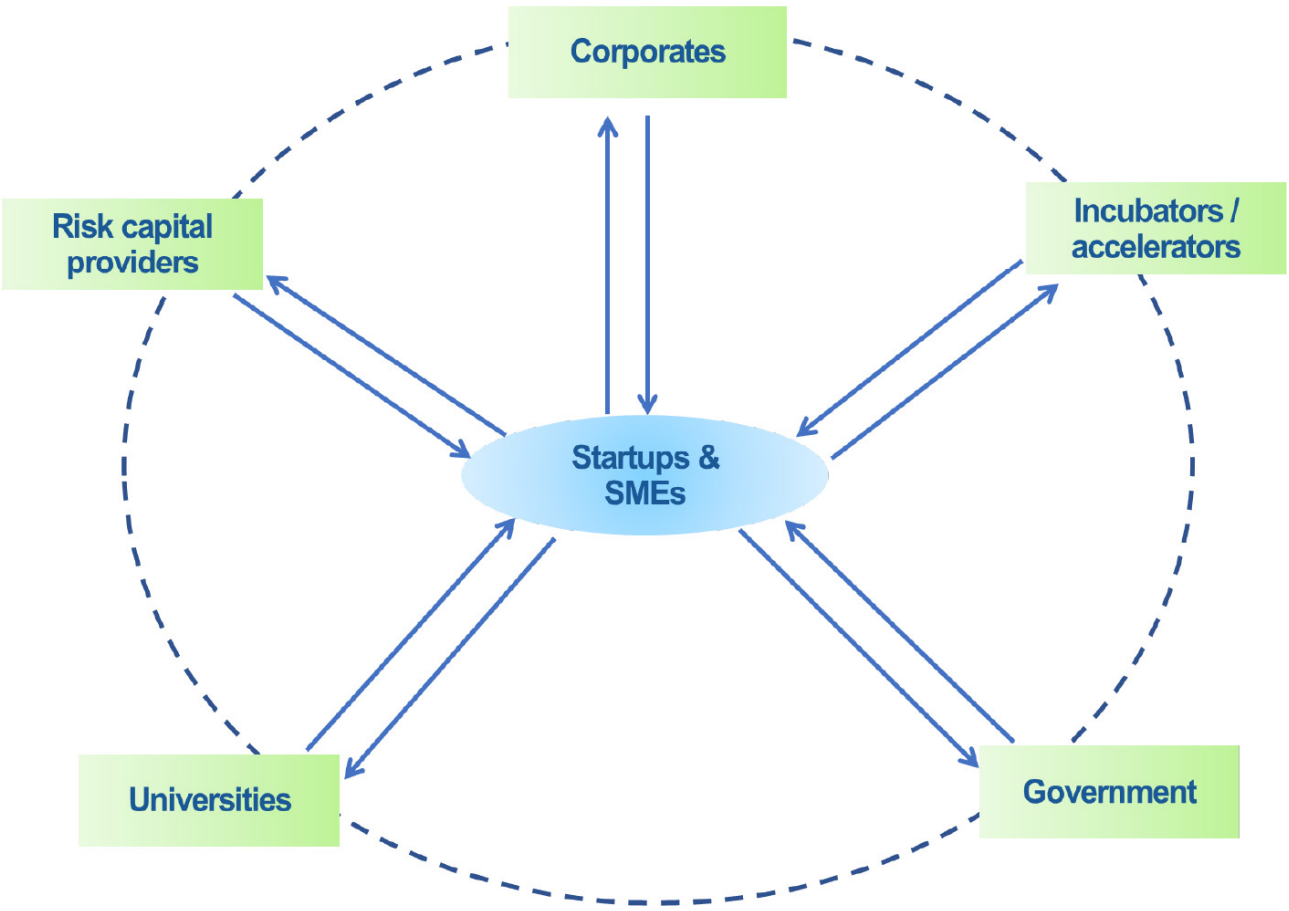

Figure A. Interactions between startups, MSMEs and key CIEE actors

Denser ecosystems with a strong internal connectedness are more effective in producing and scaling cleantech innovation for systemic impact. Actors within these ecosystems are individual entities (organizations) that perform specific roles within the ecosystem. Actors who wish to participate in a local CIEE assume responsibility to perform their specific role to increase the potential for synergies with other actors and create increased value across the ecosystem.

Stakeholder engagement initiatives and activities work to increase internal connectedness within CIEEs. Enhanced and higher quality interactions between ecosystem actors facilitate stronger internal connectedness. Well-connected ecosystems are characterized by a high level of trust among different organizations (actors). This is demonstrated by their willingness to share information and resources and coordinate actions with different actors.

Engagement initiatives are more effective when they are targeted at the unique strengths and challenges of each ecosystem. Engagement is not a one-size-fits-all process: successful engagement initiatives begin by defining their objectives, selecting suitable participants and involving them in designing the overall engagement initiative as well as individual events. Many tools and methodologies are available; the key lies in selecting

the most appropriate ones based on the specific circumstances. This framework therefore primarily aims to provide guidance for implementing a successful process, rather than recommending specific tools and methodologies. Inclusivity is an integral part of this process: including women, youth and other underrepresented groups during the design stage ensures that the process benefits all segments of society.

Government and civic society are best positioned to spearhead engagement initiatives in emerging ecosystems. Governments with their abundant resources and influence must play a leading role in the development of young ecosystems, to bring other ecosystem actors together and promote the desired goals. Civic society organizations are often experienced stakeholder engagement practitioners and can conduct first-time initiatives in ecosystems that have not previously implemented systematic engagement activities. These organizations can facilitate the transfer of knowledge and skills to public officials who will conduct such initiatives in subsequent iterations.

As the ecosystem matures, other actors can and should take on a more proactive role in engagement activities. Accelerators, hubs and other entrepreneurial support organizations (ESOs) tend to be particularly active in establishing connections and opportunities for networking and collaboration opportunities. Likewise, corporates, investors and even entrepreneurs themselves can all contribute to enhancing ecosystem connectedness. Methods for achieving this include organizing founder events, hackathons and startup competitions, demo days and conferences. Activities designed to increase connections between different ecosystems, such as international study or networking tours and international trade initiatives, can open access to new markets, attract foreign entrepreneurs and further improve the ecosystem's overall value. Techniques for building external connections are addressed more extensively in subsequent frameworks.

I. Actors in a Cleantech Innovation and Entrepreneurship Ecosystem (CIEE)

CIEEs vs general innovation ecosystems

The same set of roles are found in every innovation and entrepreneurship ecosystem, regardless where it is located. Massachusetts Institute of Technology (MIT) identifies five key roles in an innovation ecosystem, complemented by supporting roles that contribute to catalysing growth[2]. The five key roles are entrepreneur, government, research organizations, risk capital providers and corporations.

Other ecosystem actors include entrepreneurial support organizations (ESOs) including accelerators; mentors; business associations; financial institutions; non-government organizations (NGOs) and citizens. Most of these actors play an active role in the ecosystem, with the exception of citizens, who are either affected by the ecosystem's actions or are potential future participants.

While CIEEs share the same actors as generic innovation ecosystems, certain actors and activities take on greater significance. Moreover, the responsibilities among actors may vary. These differences are driven by key aspects which set CIEEs apart from innovation ecosystems in other sectors.

- Cleantech entrepreneurs are often driven by a strong environmental or social mission.
- Cleantech entrepreneurs are more likely to have applied science and research backgrounds, and may need coaching in business skills.
- Cleantech solutions typically have a hardware component and must undergo an initial phase of technical validation before moving to the commercialization stage. This means that lead times to market are longer compared to purely software-based solutions, and that early-stage investors must assess both technology as well as commercial risks.
- Innovative cleantech solutions often compete with higher-polluting incumbent solutions that may not face penalties for polluting and in some cases are even subsidized.

2 Murray, Fiona E. 2019. "MIT's Stakeholder Framework for Building & Accelerating Innovation Ecosystems". https://innovation.mit.edu/assets/MIT-Stakeholder-Framework_Innovation-Ecosystems.pdf

- Cleantech solutions may hinge on infrastructure, such as gas or electricity transport networks, or may be impeded by existing industry structure such as waste collection systems, which prevent innovators from connecting directly with waste producers.

For example, due to the technical challenges and longer lead times to market cleantech startups face, government can assume a greater role in de-risking cleantech ventures, or in providing or facilitating 'patient capital' for investments that do not align with traditional venture capital cycles. Government actors in a cleantech innovation ecosystem may therefore be more likely to partner with risk capital providers, using mechanisms such as blended finance to ensure sufficient financing is available for startups with innovative cleantech solutions.

Categories and roles in a cleantech innovation and entrepreneurship ecosystem

This section describes the key actors in CIEEs and their responsibilities towards the ecosystem. The main purpose of the ecosystem is to scale businesses that offer new solutions, ultimately leading to a systemic climate impact. This is why we place startups and MSMEs at the centre of the ecosystem. However, devising strategies to attract a wide range of actors creates value across the ecosystem, multiplying its effectiveness.

Figure 2 presents the interactions between startups and MSMEs and other key ecosystem actors.

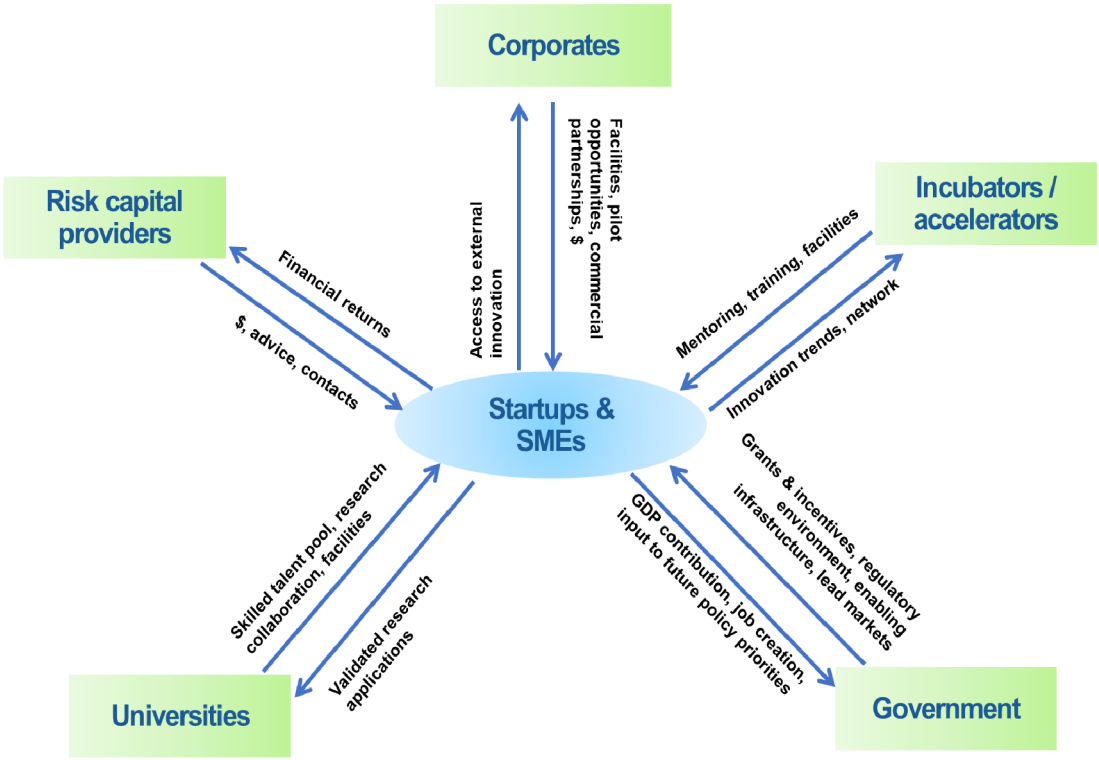

Figure 2. Interactions between startups, MSMEs and key CIEE actors

a. Startups/MSMEs

Startups are young companies characterized by innovation, speed, growth and scalability. Micro, small and medium-sized enterprises (MSMEs) are defined here as independent firms (i.e. not a subsidiary or franchise) with less than 250 employees and a turnover equal to or less than EUR 50 million[3]. Cleantech startups and MSMEs develop novel or innovative solutions that reduce greenhouse gas (GHG) emissions or result in more efficient use of resources.

Startups on a high-growth trajectory are able to quickly scale their operations to achieve climate impact. On the other hand, MSMEs due to their significant number, are a key contributor to building a resilient economy and generating jobs for a large share of the population. Therefore, both startups and MSMEs are integral members of a CIEE.

Startup/MSME responsibilities in the CIEE

- Develop innovative solutions to climate problems.
- Accelerate the research, development and commercialization of a new technology or product.
- Create local jobs and demand.
- Mentor or invest in other startups.
- Contribute to sustainable gross domestic product (GDP) growth.

b. Government and Public Institutions

Government includes ministries or entities established or controlled by the government, such as innovation agencies and economic development agencies.

Governments can typically considerably enhance the growth of emerging CIEEs by providing support to cleantech startups and MSMEs and in developing and implementing targeted initiatives to increase ecosystem connectedness. As the ecosystem matures and other actors start engaging more proactively, the government's role may start to gradually diminish. However, governments must strike a balance between different objectives, such as preserving jobs in other sectors of the economy. Therefore, the government's influence on CIEEs may sometimes be the result of a compromise between conflicting priorities.

Government responsibilities in the CIEE

- Define national research and innovation priorities according to a forecasting of future innovation needed to meet climate targets.
- Provide targeted grants, subsidies and other incentives to support research and innovation in priority and/or underserved areas.
- Provide mechanisms to de-risk innovative cleantech solutions and 'crowd in' private financing.

3 European Commission. "SME Definition". Accessed November 3, 2022. https://single- market-economy.ec.europa.eu/smes/sme-definition_en

- Coordinate value chains to ensure availability of critical inputs, either by developing domestic industries or importing innovation to fill gaps.
- Define and enforce the policy framework, standards and regulations.
- Ensure sufficient infrastructure development.
- Create a level playing field, lead markets and stimulate demand for innovative solutions.

c. Universities and Research Organizations

These include publicly or privately funded universities or research institutes. While both types of organizations have a research and development mandate, universities also produce students trained in new techniques and technological developments. Universities and research organizations may also be involved in the early commercialization of research breakthroughs.

Universities and research organizations play a particularly important role in CIEEs, as many cleantech innovations result from the commercialization of scientific research.

University/research organization responsibilities in the CIEE

- Research frontier technologies.
- Produce a talent pool trained in relevant technologies or with the skills to market and sell complex technological products.
- Support commercialization through incubators, spin-off labs and accelerator engagement initiatives.
- Project-based research and development (R&D) collaboration with startups, MSMEs and corporates.
- Provide venues to host networking or other ecosystem engagement events.

d. Risk Capital Providers

Providers of risk capital within cleantech ecosystems may be business angels, philanthropic investors, venture capital investors (VCs), growth investors or other types of investment firms. VCs and follow-on growth investors typically invest in high-growth companies, but alternative investment firms may specialize in different risk-return profiles, allowing them to invest in companies with slower growth expectations. In the cleantech sector, governments and multilateral banks can help 'crowd in' risk capital investments by providing first-loss capital.

The growing importance of ESG reporting and impact investing is attracting more risk capital providers to focus on cleantech investing; however, investments are still expected to clear minimum financial hurdles, as well as meet sustainability criteria.

Risk capital provider responsibilities in the CIEE

- Provide capital to emerging, early-stage and scaling ventures.
- Provide high-value connections with other ecosystem actors.
- Offer business expertise in corporate development and go-to-market strategies, or hands-on support in legal, HR and other functions.

e. Corporations

Larger companies, both national and multinational, either provide cleantech solutions themselves or are potential adopters of cleantech solutions. They may buy products and services from, partner with, invest in, or acquire cleantech startups or MSMEs.

Corporation responsibilities in the CIEE

- Provide real-world test cases for innovative solutions by sharing access to data, labs and testing infrastructure, or production lines with startups or MSMEs.
- Facilitate commercialization by piloting new technologies to demonstrate commercial feasibility.
- Supply funding and exit possibilities for investors by taking equity stakes or acquiring startups.
- Provide innovative startups with access to markets and potential customers.
- Create demand for cleantech solutions.

f. Incubators & Accelerators

Incubators are ongoing support structures for young startups, providing office space, infrastructure, advisory services and training to help entrepreneurs turn ideas into viable businesses. This may be fee-based.

Accelerators offer cohort-based programmes with a predetermined duration that support early-stage startups by providing mentoring and skills development, access to networks, facilities and in some cases financing. Entry into a programme is usually competitive. An accelerator may be managed by any of the key ecosystem actors (most often universities or early-stage funders), or be an independent stand-alone entity.

Accelerators (and sometimes incubators) can provide sector-specific commercialization or innovation expertise, which is relevant to other ecosystem actors, not just startups and MSMEs. They play an especially important role in the cleantech sector, helping innovators who often have scientific and research backgrounds to identify markets for their technologies and acquire the necessary skills to scale their businesses.

Incubator/accelerator responsibilities in the CIEE

- Provide or coordinate training, mentoring and skills development for startup founding teams.

- Provide access to facilities (i.e. office space, lab equipment, technology).
- Offer grants or seed funding for startups.
- Facilitate connections to other ecosystem actors and potential follow-on funders.
- Signal that a startup has achieved a certain quality.
- Coordinate with policymakers to raise awareness of market needs and impact of policy changes.

g. Other ecosystem actors

In addition to the key actors, cleantech innovation ecosystems include other types of organizations that contribute to catalysing growth.

Entrepreneurial support organizations (ESOs) include ecosystem builders, economic development agencies and other organizations that facilitate ecosystem activity without playing a direct role. This may include knowledge transfer, raising awareness of market opportunities created by policy change and new technological developments, facilitating and/or funding connections between actors within and between ecosystems and promoting cleantech startups and MSMEs in the broader ecosystem.

Industry associations usually operate on a membership basis and group actors within an industry. They often conduct market research to raise awareness of industry developments and technology needs and may lobby for members' interests. Associations are well-equipped to offer sector-specific recommendations and guidance on key cleantech issues, by developing tools and promoting best practices. They often engage with policymakers and other key stakeholders to advance public policy issues[4].

Financial institutions provide financing as an alternative to or follow on from risk capital in the form of loans or project financing. Financial institutions may also act as Limited Partners (LPs), providing capital to VC funds. Capital from financial institutions is essential to scale cleantech solutions, i.e. involving these actors becomes increasingly important as the ecosystem matures.

Non-governmental organizations (NGOs) fill gaps that are not covered by the activities of government or for-profit businesses. They are particularly important in the climate space, where commercial interests may not put a correct price on climate externalities, leading to insufficient emphasis on climate action. NGOs may also assist governments in developing and deploying climate responses, including by raising awareness among policymakers of cleantech innovation's potential to solve climate issues. As civil society's awareness of environmental issues rises, NGOs often lead research, communication and grassroots initiatives involving and promoting climate action, including the adoption of cleantech solutions.

---

4 UN Global Compact. "Business and Industry Associations." Accessed November 1, 2022. https://www.unglobalcompact.org/what-is-gc/our-work/industry-associations

Gender and youth associations are youth- or gender minority-led NGOs dedicated to improving the services that foster and promote the positive growth of youth and gender minority activities, for example, in establishing new cleantech ventures. They may also contribute to youth and gender representation in policy formulation and consultation.

Think tanks carry out public-policy research analysis, scrutinize policies and advocate for specific issues. They can inform and influence public policy through data-driven findings and creative solutions. Think tanks may offer independent alternatives to prevailing policy paradigms which may be overlooking the needs of most vulnerable and underrepresented communities, especially around climate issues.

Service providers include lawyers, accountants, consultants, co-working space and other business infrastructure providers. These may offer discounted or subscription-based services to startups, enabling them to keep costs low and flexible.

Ecosystems' roles and their relationship with GCIP stakeholders

GCIP has also identified stakeholders who are relevant for the programme.
Appendix 1 discusses the alignment between GCIP stakeholders and CIEE roles.

II. Designing and Implementing a Process to Engage Ecosystem Actors

This section outlines ways government, civic society and research organizations can take the lead in stakeholder engagement activities. These activities may be an integral part of GCIP, or may encompass additional activities outside of the programme.

The purpose of stakeholder engagement

The purpose of conducting activities to engage ecosystem actors is to increase the ecosystem's internal connectedness. This increases the combined value of ecosystem actors in producing and scaling innovative cleantech solutions.

One common problem observed in many innovation ecosystems — not only cleantech ecosystems — is the lack of regular interactions among the different groups, or of a good understanding of who else is part of the ecosystem, what they do and what their goals are. The primary objective of stakeholder engagement is to give different ecosystem actors the opportunity to get to know each other and understand how their respective roles contribute to the ecosystem's value. Secondly, it aims to increase the level of awareness and trust among the ecosystem actors to facilitate interactions and collaboration which will increase the ecosystem's overall effectiveness.

The process described below provides guidance in the design, implementation and evaluation of targeted interventions to meet these objectives. Interventions may be one-off events or longer term processes consisting of a series of different events, meetings and other activities. The type of intervention should be determined during the design phase in alignment with the ecosystem's objectives, stage and other characteristics.

A four-step process for engaging ecosystem actors

A 'good' participatory approach builds on three components: 1) inclusive, engaging methods and tools; 2) a flexible process; and 3) a set of guiding principles[5]. While many approaches focus on methods and tools, all three are important.
The recommendations in this section are structured around a simple process for a

5 SEI. 2009. Stakeholder Engagement and the work of SEI: an empirical study. Accessed November 1, 2022. https://www.sei.org/publications/stakeholder-engagement-work-sei-empirical-study/

stakeholder engagement initiative, considering that flexibility is key, so that each GCIP partner country can customize its approach according to national objectives and the specific characteristics of its own CIEE.

We provide key recommendations, best practices and success factors for each step in the process. We also identify potential challenges and provide suggestions to address them. We also provide example tools and methods, although these are not exhaustive: a key success factor highlighted by experts is that tools and methods must be aligned to the given situation and circumstances. It is therefore useful to collaborate with someone who has experience in stakeholder engagement and expertise and who recommends the most suitable tools. Appendix 2 contains more resources, tools and methodologies.

Figure 2 presents a four-step process for engaging ecosystem actors.

Figure 3. A four-step process for engaging ecosystem actors

1. Stakeholder mapping and prioritization

The first step in the process is to map the key actors in the ecosystem and determine which role they each fulfil. Once we understand who is part of the ecosystem, we can identify their roles, and within that role, determine who the most relevant actors are to include in an engagement initiative.

2. Creating buy-in and a shared vision

After determining which specific ecosystem actors to engage, the next step is getting them on board, aligning objectives and ensuring that each actor agrees with the process and intended outcomes.

3. Implementation and maintaining engagement

The implementation phase entails the design of the engagement initiative, defining the types of intervention, and planning and implementing them. As initiatives may last for several years, keeping actors engaged over the full duration is also important.

4. Evaluation and defining success

To evaluate whether an intervention has succeeded, the first step is to define what a successful outcome looks like. The next step is determining how to measure the actual outcome against the desired one. This step also includes evaluating any remaining gaps, which can be used to help define objectives for the next round of interventions.

Appendix 3 includes in-depth findings from interviews conducted with international experts and thought leaders with a focus on the areas of cleantech, general startup innovation and development.

Stakeholder mapping and prioritization

Mapping the ecosystem

An engagement process begins with mapping and categorizing the various actors involved in the ecosystem. However, it may also be useful to periodically repeat the mapping and prioritization procedure as the programme progresses, especially if objectives evolve.

The main groups involved in a cleantech innovation and entrepreneurship ecosystem were described in the previous section. The mapping process aims to systematically catalogue all organizations or groups linked to cleantech innovation, mapping each organization to the role it plays within the ecosystem.

Case Study #1

Climate Investment Fund's approach to stakeholder mapping

The World Bank suggests taking a holistic approach to stakeholder mapping, including the following steps:

- Mapping and involving stakeholders in the design of investment plans
- Mapping funding support requirements
- Mapping complimentary investment programmes
- Recommending a mapping tool to enable development partners to map categories of stakeholders to work with

A mature ecosystem is likely to contain multiple actors in each stakeholder group; emerging or developing ecosystems may be less consistent. For example, a younger ecosystem may have many startups but lack a diverse set of investors. Or it may have one or more universities with a strong research output, but few startups because the research has not yet been commercialized. A mapping exercise can also identify gaps in the stakeholder landscape. The GCIP Cluster Development Framework, developed as part of the GCIP Pillar 2 activities, provides recommendations for fostering a diverse set of ecosystem participants.

Prioritizing ecosystem actors

To maximize its effectiveness, each engagement initiative should identify the most relevant ecosystem actors for engagement. This depends on the initiative's objectives. The following table summarizes stakeholder mapping and prioritization, as well as best practice recommendations gleaned from interviews carried out with leading global stakeholder engagement practitioners.

Best practices and success factors: Stakeholder mapping and prioritization

Work arising from national objectives	Sweden identified an upcoming skills gap in cleantech-related professions. This led them to involve education institutions in workshops on decarbonizing industry.
Involve a wide group of actor in process design	Local and indigenous communities can provide expert inputs to process design as they are knowledgeable about the conditions on the ground or possess important expertise about natural ecosystems. Community-based actors can also influence design or an initiative to ensure relevance for underserved communities.
Start small, expand later	It may be useful to start by recruiting a core steering committee of actors who can commit to driving the process for the duration of the engagement initiative. This core group can be expanded as the initiative progresses, building on initial successes to gain buy-in from additional prospective participants.
Thematic working groups	If a larger stakeholder group becomes difficult to manage, it might be more effective to divide it into smaller working groups, for example around thematic interests.
Topic-based participation	Participants for individual events such as workshops should be selected in line with the relevant topic. For example, a discussion on solar energy could involve technical experts and installers.

Creating buy-in and a shared vision

After determining which ecosystem actors are relevant, the next step is to convince them to join the engagement initiative. This might be easier in the cleantech sector, where many actors already have a strong common goal of striving for climate impact or solving an environmental problem. Actors within the ecosystem are driven by different motivations which are shaped by their respective roles. Securing buy-in often entails explaining the benefits in terms of progress towards achieving the different actors' particular goals. Maintaining ongoing dialogue with key ecosystem actors about their goals, needs and motivation helps them understand why they should join an initiative.

Case Study #2 · GEN's approach to creating buy-in

The **Global Entrepreneurs Network (GEN)** aims to strengthen local innovation ecosystems at the global level by providing resources to ESOs and organizing events that enhance connections between different ecosystems at the local, national and international level. GEN has produced a series of handbooks called audience guides, which explain the benefits of participation to different potential partner organizations. Audience groups include colleges and universities, policymakers, investors, rural entrepreneurs, and women entrepreneurs. GEN has developed dedicated handbooks for each of these groups.

The following table summarizes the best practices for creating buy-in and a shared vision based on interviews with leading global stakeholder engagement practitioners.

Best practices and success factors: Creating buy-in and a shared vision

Articulate benefits with a focus on motivating all groups of stakeholders	Maintaining ongoing dialogue with ecosystem actors helps them gain a deeper understanding of their areas of interest and about the challenges they face. This, in turn, helps to articulate the engagement initiative's benefits relevant to them.
Set objectives that resonate with all stakeholders	All actors are likely to agree on the need to reduce emissions, even if they disagree on how to achieve this objective.
Craft a strong proposal outlining the initiative's aims	Participants need to be persuaded that the time and resources they invest will be used effectively.
Create a mission statement or manifesto	Consolidating the initiative's objectives helps articulate its overall mission and unites the core group. It can serve as a reference point for communicating about the initiative.
Conduct flagship research to create a shared vision of change	Accessible research findings can create an imperative for change and identify priority cleantech sectors in a country or region.

Implementing and maintaining engagement

Implementation

The implementation phase consists of implementing the interventions that were identified during the design phase. These can include public or mass communication initiatives such as broadcasts, public consultations or citizen assemblies and hackathons, or closed-door

roundtables or workshops, one-on-one meetings or dialogues, and informal social events or activities. The objective is to convene different stakeholders in the same space so they can engage in conversations to better understand each other's perspectives and work towards finding a common ground.

Case Study #3 · Cleantech for Europe's approach to maintaining engagement

Cleantech for Europe is an initiative powered by the Cleantech Group and supported by Breakthrough Energy, which aims to strengthen the voice of cleantech innovation in the EU public debate. The initiative brings together 20 EU cleantech VC firms, united behind a common vision of bringing the cleantech community and policymakers closer together to scale EU cleantech. The VC group meets every 6-8 weeks to discuss policy topics and obstacles to scaling cleantech within the EU. In return for their time, VC firms gain a more in-depth understanding of upcoming policy issues, and the opportunity to address the challenges their portfolio companies – cleantech startups – are facing, and to draw attention to these issues among EU policymakers.

Maintaining engagement

Many engagement initiatives begin on a positive note but often face diminishing interest and engagement over time. The continued participation in the engagement initiative relies on their perception of the initiative as a valuable investment of their time and resources. This section focuses on how to maintain and communicate the value of an intervention as it progresses.

It is useful to periodically reassess the engagement initiative's value for the different actors. Are the objectives being achieved? Do the stakeholders continue to derive value from their involvement? If stakeholders begin to disengage, prompt action must be taken to understand the underlying reasons and to recover the value. This could be a sign that the engagement initiative as a whole is not achieving its objectives (this process is linked to the evaluation stage).

Follow-ups after an event are a good way to keep participants engaged. This can include surveying participants and circulating notes summarizing the discussions and next steps. Surveying participants serves a dual purpose: it helps to keep them interested while providing inputs to the evaluation stage of the process.

Participants also appreciate being informed of results arising from the process, such as policy discussions or follow-up meetings. Celebrating successes, however small, creates enthusiasm for further progress and can help attract more stakeholders to the initiative.

Case Study #4 · SEI's approach to maintaining engagement

The **Stockholm Environment Institute (SEI)** conducts multi-stakeholder programmes focused on industrial decarbonization. It engages local media as a strategy to generate interest: participants are more likely to attend subsequent workshops if the first event got media attention. A recent workshop in India was mentioned by over 20 local news outlets, which increased interest among participants.

The following table summarizes best practice recommendations for implementation and maintaining engagement based on interviews carried out with leading global stakeholder engagement practitioners.

Best practices and success factors: Implementation and maintaining engagement

IMPLEMENTATION PHASE	
Policymakers and civil society organizations are well-positioned to take the lead in engagement initiatives	It may be beneficial for the first round to be led by an external organization so policymakers can learn about best practices.
Assess signals from stakeholders during the implementation phase	If stakeholders start to disengage, act promptly to identify the reasons and adapt the process to increase the initiative's value for them.
Recruit champions to drive engagement	Identify influential actors in different sectors who have a high personal interest to drive engagement. In smaller ecosystems, identify key players who are well-connected and keep in touch with them.
Local organization team	Workshops are most effective when they are organized by locals for locals, bringing in international expertise where needed.
Leverage data to advocate for change	Relevant, well-researched data and solutions, presented in an accessible way, can give policymakers the tools they need to propose different solutions.
Use success stories to inspire change	Showcasing startups that have the potential of solving the problem under discussion illustrates what is possible and serves as inspiration for others.

Follow-up communication after events	Following up after an event by circulating a summary of the discussion, or surveying participants, helps keep them engaged in the process. Communicating successes and other follow-up activities is also useful.
Present results publicly	Sharing the workshop's results publicly and disseminating them to as wide an audience as possible helps hold participants accountable if they have committed to achieving change.
Cultivate media relationships	If events are covered by local and national press outlets, expectation around the initiative is raised and participants are more likely to join subsequent events.

PLANNING GROUP DISCUSSION EVENTS (SUCH AS WORKSHOPS)	
Conduct individual meetings during the preparation phase	Individual meetings can help in preparing updates for key stakeholders on the issues and to better understand their perspectives.
Arrange the seating in such a way that encourages different types of stakeholders to interact with one another	During the workshop, strategically arrange seating to promote interaction between different types of stakeholders: this will compel them to work together and exchange perspectives to imagine an alternative reality.
Choose the right moderator	Selecting the right moderator is crucial: this person should be neutral, respected locally, on good terms with all participants and prepared to step in if the discussion gets heated.
Conduct workshops in the local language	Workshops must take place in the local language so that participants feel comfortable making contributions: if there is an international moderator, this person should use an interpreter.
Include informal events	Including unstructured events/activities for socializing helps participants build rapport with each other and share their opinions more openly.

Make funding available for proposed initiatives	Proposed projects need to be financially sustainable, and potential funding strengthens engagement. This is especially relevant in lower income countries or emerging ecosystems where funds are not abundant.

Troubleshooting group discussions

Conflicting viewpoints exist within the group:

Start with less controversial topics. For example, a workshop aimed at addressing the issue of phasing out free allocation could start with a discussion around net zero emissions targets. This gives participants the opportunity to engage in the process by contributing their perspectives and openly engaging in debates with other participants. This process can continue during lunch or other social activities. More contentious topics can then be broached. Through joint discussions and the exchange of different perspectives, stakeholders can cultivate a shared understanding of the necessary subsequent steps.

The discussion reaches an impasse:

The facilitator must be prepared to mitigate potential conflicts and if necessary, pause the conversation and redirect it in case of insurmountable conflict. It is often more effective to discontinue a dialogue that is unproductive.

Evaluation and defining success

The final step in the process is evaluating the initiative's outcomes, acknowledging the achievements made and determining what actions still need to be done. Ideally, progress checks should take place during the engagement initiative to realign efforts if necessary. The final results can feed into the next intervention. It can be helpful to engage an independent moderator to evaluate success, especially if the initiative is required to report results to external donors. Success metrics should be identified during the design phase and will differ for each initiative. Some definitions of success include:

- Ensuring the attendance of key decision-makers or influential individuals in the workshop.
- Translating workshop recommendations into policy.
- Developing a credible source of information that policymakers can refer to.
- Securing commitments from workshop participants to align with the identified objectives.
- Attracting investment commitments from investors or corporates.
- Achieving a shift in mindset.
- Removing barriers between ecosystem actors to facilitate future collaboration.

The next step is collecting feedback. This can be achieved using a survey, organizing a group 'lessons learnt' workshop, or individual follow-up calls or meetings. Such follow-up activities serve the dual purpose of keeping participants engaged, while incorporating their experience to improve the engagement initiative.

Case Study #5 · SEI's approach to evaluation

External evaluations: SEI invites external critical observers to make recommendations on how SEI can strengthen its delivery and impact over the longer term.

The SEI Science Advisory Council: The Council regularly reviews achievements and progress made in key research areas.

Partner feedback: SEI incorporates the findings from annual surveys of key partners, inviting them to assess their institutional engagement with SEI.

Feedback during projects: SEI encourage stakeholders to provide continuous feedback during project implementation.

End-of-project evaluation: All programmes, initiatives and large projects must undergo an evaluation upon its completion.

The following table summarizes evaluation and defining success best practice recommendations derived from interviews carried out with leading global stakeholder engagement practitioners.

Best practices and success factors: Evaluation and defining success

Maintain flexibility around outcomes	An intervention might determine that the current structure is effective, and that no policy change is needed.
Feed into the next process	Lessons learnt provide useful input to subsequent interventions by identifying what worked as well as what actions still need to be taken.
Include evaluation and feedback loops in every step of the process	Keeping communication channels open throughout the process is a key method of creating and maintaining engagement. This is also an opportunity to collect feedback and implement continuous improvements as the engagement initiative proceeds – no need to wait until the end of the process.

Potential challenges and suggestions to address them

Reaching non-elite groups

In many ecosystems, the majority of startup founders have a college education, though there is a need to promote entrepreneurship among underrepresented groups. These are best reached through local organizations that already have established networks within the community. It is essential to involve representatives from these groups in the process design stage, both to gain buy-in and to raise awareness, while ensuring that the engagement initiative is tailored to their specific needs and reality.

Resistance to participatory engagement methods

Initiatives that may alter the existing power structure may encounter resistance from stakeholder groups that stand to lose some of their authority. For example, citizen engagement and participatory decision-making processes can reduce the decision-making authority of other ecosystem roles. The most effective approach to address this challenge is for high-level leaders to drive and champion change.

Digital literacy and connectivity

Throughout the COVID pandemic, many activities could no longer take place in person. This meant that more ecosystem engagement events shifted to virtual alternatives. Small entrepreneurs could not sell their products in physical locations. The transition to online sales and communication channels presented a unique challenge for those who lacked a reliable Internet connection and lacked experience using online tools. Training can help MSMEs move their business online – for example, GEN offered a course entitled "Build your website in 100 days". Connectivity issues can only be resolved by building the necessary infrastructure.

Coherence between different workstreams, events and initiatives

Fostering alignment around a shared set of objectives or a mission statement helps maintain coherence as initiatives grow and more ecosystem actors become involved. It can be helpful to periodically reassess the objectives or mission statement to ensure that it is still relevant for all stakeholders involved.

Evaluation phase may be constrained by donors

Donor-funded projects may have a limited scope that prevents a comprehensive evaluation phase. One way to address this is to embed evaluation and feedback loops into every step of the process, for example by combining data collection with other activities and emphasizing continuous, incremental improvements. By adopting this approach, evaluation can be seamlessly integrated with minimal additional cost to the project.

Considerations for building an inclusive process

Stakeholder mapping & prioritization	Choose partners who can help establish access to underrepresented groups and communities. Ensure complementarity among the different partners. Consider social inclusion from the beginning of the engagement initiative.
Creating buy-in & a shared vision	Embed inclusivity goals in the initiative's key objectives. Consider the benefits of establishing a dedicated team to focus on inclusivity considerations. Include underrepresented groups from the start of the process; their inputs to process design are crucial. Highlight success stories from communities outside the main innovation centres; include these in the story.
Implementation & maintaining engagement	Consider both the format and timing of events. Some participants may face challenges attending events outside regular working hours, or lack connectivity for online meetings. Where cultural issues or power imbalances exist, organize separate events to increase participation from underrepresented groups. Incorporate graphic recording tools into meetings to benefit those with different information processing preferences. These tools can be particularly valuable in multilingual settings. Ensure that gender analysis shapes project design. Women, youth and other underrepresented groups should be treated separately as they each have different needs and require different solutions.
Evaluation & defining success	To gain a fresh perspective, conduct independent evaluations with the involvement of expert groups (e.g. youth committees) to gain unique insights and alternative viewpoints.

III. How Other Actors Can Contribute to Ecosystem Connectedness

While governments typically assume the lead in developing young innovation ecosystems, as the ecosystem matures, different actors can and should start playing a more active role, organizing events and cultivating relationships with other ecosystem actors.

Section 2 focused on ways the government, civic society and research organizations can take the lead in stakeholder engagement activities. In this section, we provide some examples of how other cleantech innovation ecosystem actors have taken the lead, proactively engaging other participants in the ecosystem.

Appendix 4 lists different types of interactions that can contribute to ecosystem connectedness.

Networking events

A meeting point for the cleantech innovation ecosystem – Cleantech Forum

The **Cleantech Forum** is an annual regional event that takes place in Asia, Europe and North America, featuring startups, scale-ups, investors, public entities and multinationals from across the world. Each Cleantech Forum is organized around a theme, e.g. how to transform commitments into actions for the global sprint to net zero. Through a combination of panel discussions, innovator showcases and networking opportunities, each Forum connects the latest generation of startups with investors and corporates looking for new partners.

Cleantech Forum Asia, held in October 2022, featured Asia's sustainable innovation ecosystem of leading companies at the forefront of innovation sharing insights and investment trends in the region. Participants stated that the true value of this event lays in the presence of the Cleantech Group in Singapore and its ability to bring together an international community committed to sustainability. Bringing this community together is what will ultimately achieve the highest impact.

Investor ecosystem days – Rockstart Venture Capital Investor

Rockstart's investor days bring together investors, corporates and partners for in-person meetings. These events have garnered a reputation for their exceptional quality, interesting content and enjoyable dinners, making them highly anticipated by relevant participants. Beyond showcasing startups, these events provide an opportunity for ecosystem actors to discover shared interests, create synergies and opportunities for collaboration. Later stage investors have the opportunity to select promising startups for seed funding. This piques interest, and they are likely to closely monitor the company as it grows and potentially provide follow-on funding. For investors, this presents a chance to gain early insight into emerging technologies and innovations.

Events as a catalyst for establishing new connections - GEN Global Entrepreneurship Week

GEN operates programmes in 200 countries. Its events aim to create welcoming local ecosystems for entrepreneurs from diverse backgrounds and connect ecosystems regionally and internationally. **Global Entrepreneurship Week** is a global event held once a year. Throughout this week, GEN's partner organizations host entrepreneurship-related events around themes related to ecosystems, policy, education and inclusion. Many different collaborations emerge from connections made during the week.

Competitions, Hackathons & Challenges

Smart Cities Hackathon – Plug and Play Morocco

A successful hackathon includes the identification of a problem, the exploration of potential solutions, a prize and a call to action. In partnership with the Moroccan corporate OCP Group, Plug and Play Tech Centre organizes **Smart Cities Hackathons**, inviting students and entrepreneurs with multiple backgrounds to join a two/three-day intensive idea generation competition. At the end of the event, teams present the solution they developed during the hackathon.

Broadcast communications

Highlighting innovative cleantech solutions in a podcast – Cleantech Estonia startup accelerator

Cleantech Estonia hosts an Estonian-language podcast on national radio. The hour-long podcast is broadcast once a month and is divided into two parts. The first part covers a current policy topic focused on the cleantech sector, featuring public sector officials and sometimes Members of the European Parliament (MEPs). The second part of the podcast showcases a specific solution developed by a cleantech startup operating within a sector affected by the policy issue discussed in the first part. The podcast is aired on a business station and reaches a corporate audience such as chief executive officers (CEOs) and board members, who are one of the primary target groups for the adoption of cleantech solutions.

Engaging young people through pop culture – SustyVibes Community Organization

SustyVibes uses pop culture to raise awareness of climate issues among young people, who make up 60 per cent of Nigeria's population. Events such as movie screenings and sustainability-themed parties bring young people together to discuss sustainability issues and solutions in a relaxed environment. SustyVibes' activities are organized by youth, empowering young people to come up with ideas for new businesses and environmental activities that they can implement themselves.

Targeted Programmes

Producing a diverse talent pipeline – Leeds Business School, University of Colorado Boulder

The "End the Gap" initiative was set up to inspire and educate underrepresented students to prepare for top leadership positions in startups and corporations. This starts with recruitment for MBA programmes, by conducting outreach activities to reach young and early career women to show them the opportunities that business education can offer. Throughout the MBA programme, women have access to extra-curricular development opportunities such as workshops on countering unconscious bias. There are similar programmes in place for other underrepresented groups. Local startup participants contribute to the programmes by mentoring a variety of students, providing real-life case studies for classroom discussions and hiring students as interns.

Increasing the adoption of innovative solutions in the energy sector – Cleantech San Diego

Utilities play an essential role in the energy transition but may be wary of deploying innovative solutions or lack the internal capacity to develop them. Cleantech San Diego uses its industry connections and in-depth knowledge of the energy sector to forge connections between corporates (utilities) and innovative energy startups to trial innovative solutions.

Appendix 1. UNIDO stakeholder groups and how they can be aligned

UNIDO's GCIP has identified key stakeholder groups for engagement and communication. The table below maps the correspondence between identified GCIP stakeholder groups and the CIEE roles discussed in this framework.

Cleantech ecosystem roles	UNIDO GCIP stakeholder groups
Key CIEE roles	GCIP accelerator stakeholders, potential investors and customers for GCIP alumni/private sector partners, project implementation and execution partners, academia
Other ecosystem roles	Current and future partners active in the CIEE space, including UN agencies, general public gender focal points at UNIDO and national project teams, gender experts and associations promoting gender equality and the empowerment of women (GEEW), youth entrepreneurship programmes and associations, UNIDO staff
Stakeholders specific to GCIP	Donors, partner countries, Global Advisory Board

Appendix 2. Resources for designing and conducting stakeholder engagement activities

Organization	Resource	Used for
CIF/World Bank	How to Implement Stakeholder Mapping into the Programmatic Approach of the Climate Investment Funds	Stakeholder mapping
Global Entrepreneurs Network	Audience Guides	Creating buy-in
Global Entrepreneurs Network	Activity Ideas Bank	Implementation: ecosystem events
SEI	Stakeholder engagement and the work of SEI: An empirical study	Implementation: participatory approach
UNIDO	UNIDO Guide to Gender Analysis and Gender Mainstreaming the Project Cycle	Integrating gender considerations into the process
UN Women	Handbook: How to Manage Gender-responsive Evaluation	Evaluation
Danish Board of Technology	TAMI – Technology Assessment – Methods and Impact	TAMI – Technology Assessment – Methods and Impact

Appendix 3. Insights from expert interviews

When compiling this framework, we interviewed international experts and thought leaders in stakeholder engagement practices with a focus on cleantech, general startup innovations and development. **The insights gleaned from the interviews are classified into two groups.**

The first group are **practitioners**. These organizations lead stakeholder engagement initiatives and have practical knowledge of how to conduct a stakeholder engagement process from start to finish.

The second group are **ecosystem actors**. These organizations provide general observations about cleantech and innovation ecosystems, and ideas for how ecosystem actors can contribute to greater ecosystem connectedness.

a. Practitioners

Ecosystem Role: Research Organization

Name and title of interviewee: Gökçe Mete, Head of secretariat, leadership group for industry transition

Organization: Stockholm Environment Institute

Location: Stockholm, Sweden

Key insights from interview

INSIGHT 1: Working backwards from national-level objectives can help identify new stakeholder groups to engage (e.g. identifying skills gaps -> involve education institutions).

INSIGHT 2: Where stakeholders have divergent views, start with a less controversial topic to strengthen confidence, then touch on more contentious topics once participants become more comfortable sharing their views. Social or physical activities are important for breaking the ice.

INSIGHT 3: Maintaining follow-up communication and local media engagement help maintain engagement throughout the course of a project.

About the organization

Stockholm Environment Institute is an international non-profit research and policy

organization that addresses environmental and development challenges. Stakeholder involvement is an integral part of SEI's efforts to build capacity, strengthen institutions and equip partners for a long-term change. The leadership group for industry transition (Leadit) secretariat gathers countries and companies committed to reaching net zero carbon emissions from industry by 2050.

This interview provided insights from stakeholder engagement activities in Sweden, Norway, the UK and India. SEI's initiatives primarily target policymakers, corporates, civil society and increasingly education institutions.

Best practices for stakeholder engagement

Stakeholder mapping and prioritization:

In Sweden, this was done using industry roadmaps, working backwards from 2050 and 2030 targets, and focusing on what needs to happen when and who needs to do what. For example, calculations show that Sweden does not have the appropriate projected skills mix to meet its 2030 plans. Therefore, SEI is increasingly seeking to involve education institutions in stakeholder engagement initiatives. It is important to include policymakers from different segments, who may have little day-to-day contact with each other. Social science stakeholders were included in these exercises because the just transition concept is new to engineers.

Creating buy-in and a shared vision:

Identify champions (influential actors in different sectors) and meet informally ahead of events, workshops, etc.; they can take ownership of the issues. Build trust before the workshop.

Implementation and maintaining engagement:

Workshops work best when organized by locals for locals, involving international expertise where needed. Partners chosen according to independence, local reputation, industry connections. Partners who have already worked with SEI are preferred. If one partner does not cover all bases, multiple local partners may be selected. New partners may be recommended through the UN, embassies, ministries.

Local media engagement is helpful to maintain engagement. One workshop run by SEI was covered in 20-30 local news outlets which boosted return rates for the next event. Follow-up is also important, which can be achieved using questionnaires or regular updates. Creating shared ownership by keeping stakeholders in the loop is important.

Evaluation and defining success:

When workshop recommendations are translated into policy, it is a success. Or if the ministry representative who is running the process is in the room (second in command who is more important than the head of the department). Or if the outcome is a credible

source of information that politicians can refer to.

SEI's evaluation is structured around five main activities:

- **External evaluations**: SEI invites external critical observers to make recommendations on how SEI can strengthen its delivery and impact over the longer term.
- **SEI Science Advisory Council**: the Council regularly examines achievements and progress in key research areas.
- **Partner feedback**: SEI conducts annual surveys of key partners, inviting them to evaluate their institutional engagement with SEI.
- **Feedback during projects**: SEI invites stakeholders to provide continuous feedback during project implementation.
- **End-of-project evaluation**: All programmes, initiatives and large projects are required to carry out evaluations at completion.

Success factors

- **Moderated sessions**: the choice of moderator is important – SEI aims to use locally known moderators who are neutral and amiable.
- **Local language**: important for sessions to be held in the local language so all participants feel comfortable participating. This means that international partners are less directly involved and have to rely on interpretation by local partners.
- **Graphic recording**: this is helpful as it gives workshop participants something to focus on, helps those with different information processing preferences, and can facilitate workshops in countries where there is more than one local language.
- **Inviting external experts**: real-life innovation examples and success stories, for example inviting innovative startups to engage in dialogue with policymakers and industry representatives can help break resistance to change. They can demonstrate what is possible and can address objections.

Challenges

- Oil and gas: including the social science perspective helped shed light on the just transition narrative.
- How to deal with different opinions / perspectives:
    - Start with a less controversial issue. For example, net zero emissions vs phasing out of free allocations. Participants will talk about what they know, start to engage with the process, get more comfortable debating with other participants. Continue talking over lunch.
    - Approach more difficult topics once the ice has been broken. Thereby stakeholders may arrive at a joint understanding of what needs to be done.
- Socializing activities help break down barriers – this can be a lunch, yoga session, other physical activities.
- Seating is important: mixing participants rather than separating them according to stakeholder type.

Ecosystem Role: Research Organization

Name and title of interviewee: Lars Kluver, Director

Organization: Danish Board of Technology

Location: Denmark

Key insights from interview

INSIGHT 1: Policymakers and citizen organizations are best placed to lead stakeholder engagement activities. It may be beneficial for the first round to be led by an external organization so that policymakers can gain insights into best practices. Providing training for public officials in regions and municipalities is also beneficial.

INSIGHT 2: Initiatives that alter the existing power structure will often encounter resistance from those groups that stand to lose some of their authority. This aspect must be addressed to ensure success.

INSIGHT 3: Many tools and methodologies are available, choosing the appropriate one for the given situation and objectives is important, which requires a practitioner with experience using different tools in different situations. Beware of modern methodologies that are simply adaptations of already existing ones.

About the organization

The Danish Board of Technology is a not-for-profit corporate foundation and an international expert in technology assessment and foresight methodology, with special emphasis on developing collaborations between citizens, experts, stakeholders and decision-makers, and developing citizen engagement in the context of policy development. Thematic areas covered include democracy, technology and climate.

The DBT has pioneered a cross-disciplinary approach to stakeholder engagement, treating stakeholders as experts and not just interested parties. The DBT developed the World Wide Views (WWViews) methodology for global citizen engagement and has coordinated three implementation sessions to facilitate citizens' participation in UN decision-making on global warming, biodiversity and climate and energy.

Best practices for stakeholder engagement

Mapping and prioritization:

Participatory approach which treats stakeholders as experts, not just interested parties, develop ways to co-create.

Creating buy-in and a shared vision:

Ecosystem actors should be considered in the design process. Trust that people want to

contribute, give them responsibility and they will usually heed it.

Implementation and maintaining engagement:

- Informal interactions are also useful.
- Online tools show varied success – only Zoom and Webex offer the necessary functions to successfully organize break-out rooms, which is important.
- Privacy-compliant conference systems are difficult to work with, especially if participants are located outside the country. In Scandinavia, small groups of stakeholders can collaborate online without facilitation, but this varies by region.
- Follow-up processes are influenced by power structures – it might be useful to decide on follow-up activities before planning the initial activity.

Evaluation:

Success can also be determining that we are on the right course – we cannot measure success purely in terms of implementing new legislation; building strong networks between actors and breaking down barriers is also a success.

Success factors

- **Policymakers and citizen organizations are best positioned to lead stakeholder engagement activities**. It might be beneficial for the first round to be led by an external organization so policymakers can gain insights into best practices. Providing training for public officials in different regions and municipalities is also beneficial.

- **Example projects, showcasing success stories, courses and knowledge centres are important for capacity development, but require investment.** Capacity needs to be transferred; it does not simply develop on its own.

- **Many tools and methodologies are available; choosing the right one for the given situation and objectives is important and this requires a practitioner who has experience using different tools in different situation**s. Beware of modern methodologies that are simply adaptations of already existing ones.

Challenges

Initiatives that alter the existing power structure will often encounter resistance from stakeholder groups that stand to lose some of their authority. In the case of citizen engagement and participatory decision-making, this group are mid-level policymakers: giving citizens influence over policy development reduces some of their decision-making authority. The only way to resolve this is for high-level leaders to drive the change. Officials impacted by this change receive training, but those who refuse to participate in the game should be removed or they will continue to obstruct progress. Strong leadership is key.
If the executive level in an organization keeps too much hold over the process, the political level will not get what it needs.

Ecosystem Role: NGO/Foundation

Name and title of interviewee: Karin Jancykova, Programme Manager for Climate Policy, Energy and Global Environmental Governance
Organization: Konrad Adenauer Stiftung
Location: Brussels, previously working as ecosystem manager for Central and Eastern Europe, EIT Climate-KIC

Key insights from interview

INSIGHT 1: To foster collaboration, we need to persuade stakeholders that it is not about competing, but about complementing each other (by working together, everybody gains).

INSIGHT 2: Well-prepared data presented in an accessible way is necessary to counter the influence of big industry which already has a lobbying channel and to build trust among citizens. Results, solutions and financial returns can be persuasive when they are clearly articulated.

INSIGHT 3: Creating an open, honest and friendly environment is key to motivating participants. Sometimes, closed-door sessions are needed for a more honest and open dialogue.

About the organization

The Konrad Adenauer Foundation is a German political party foundation with offices in around 120 countries; in their host countries, they advocate for democracy, rule of law, freedom and a social market economy and promote exchanges between Germany and the host countries.

In the Czech Republic, aside from its main role to strengthen the Czech–German partnerships and collaboration, KAS acts as an ecosystem builder, focusing on how to connect top down with bottom up, grass roots approaches. Its ability to engage political actors is a key strength. In Central and Eastern Europe, only few political strategy consultations engage NGOs or citizens: KAS is one of the few organizations working to foster engagement between these stakeholder groups.

Best practices for stakeholder engagement

Stakeholder mapping and prioritization:

In-depth understanding of the local ecosystem is crucial – local partners play an important role. Ecosystem stakeholders who are willing to engage in dialogue and establish connections outside their bubble can have more impact. Choose stakeholders according to topic – for example, solar panels: stakeholders include landowners, politicians, developers, technicians, scientists.

Creating buy-in and a shared vision:

- Spend time with the people in the room to better understand their perspective.
- Show benefits of a collaborative approach.
- Listen and understand what is best for the country.

Implementation and maintaining engagement:

- **Event preparation is crucial**: choice of (neutral) meeting space, choice of guests, topic, agenda.
- **Identify the key player and stay in touch with that person**; motivated, strong stakeholders identified during workshops can be used to bring others to the process – they should be included in future touchpoints.
- **Events must be held in the local language** (this is especially important for deep dive discussions):
    - If external experts are invited to present best practices, they must use an interpreter;
    - Participants must feel safe and feel that the intervention has been planned for them and not for someone else's benefit.
- **A strong facilitator is crucial**.
- The **funding component is essential**, especially in lower income countries.
- Closed doors sessions might sometimes be necessary for a more honest and open dialogue.
- Creating an open, honest and friendly environment is key to motivating participants.

Evaluation and defining success:

Alignment, an understanding among stakeholders that the initiative is not about competition, but about complementing each other. Definition of success is achieving a change in mindsets.

Success factors

- For energy transition, ministry-level involvement is essential – the person responsible for implementing strategy (e.g. deputy minister) must be involved.
- For scaling solutions, it is useful to involve big industry or a private company interested undergoing the transition.
- Well-prepared data presented in an accessible way is necessary to counter the influence of big industry which already has a lobbying channel and to build trust among citizens.
- Results, solutions and financial returns can be persuasive when they are clearly articulated. Policymakers often do not have the bandwidth to dive into details, hence presenting relevant, well-researched data and solutions can give them the tools they need to propose different solutions.
- Innovation success stories motivate stakeholders to focus on the innovation and what is possible.

Challenges

At a recent hybrid English-language event in Brussels involving Czech stakeholders, 50 per cent of participants did not confirm their participation because of the language barrier – it is important to hold events in the local language, use interpreters which helps to make the event accessible to other local players, not to the "usual suspects" (English-speaking participants, the same 'bubble'). Facilitators must be prepared to mitigate potential conflicts and if necessary, pause the conversation and redirect it in case of an insurmountable conflict. It is usually better to discontinue a dialogue that is unproductive.

Ecosystem Role: Government and public institutions

Name and title of interviewee: Phil Anderson, Business Innovation Advisor and Cleantech lead

Organization: Callaghan Innovation
Location: Auckland, New Zealand

Key insights from interview

INSIGHT 1: The New Zealand climate tech report creates a shared vision and convinces stakeholders of the need to act.

INSIGHT 2: Managing a large stakeholder group became challenging, hence stakeholders were divided into smaller, thematic working groups.

INSIGHT 3: Māori inclusion is written into Callaghan Innovation's strategy, and a team is dedicated to the Māori economy.

About the organization

Callaghan Innovation is a government-funded innovation agency focused on the research to commercialization stage. Callaghan Innovation works to enhance New Zealand's innovation ecosystem by working with other government partners, trade organizations, universities, research organizations, funders and incubator/accelerators to increase private sector investment in R&D and innovation.

Callaghan Innovation's in-house scientists focus on underrepresented R&D topics, including advanced manufacturing, advanced materials, data, IoT and biotechnology. Callaghan Innovation also aims to identify early-stage ventures with potential, accelerate them to the growth stage and help them connect to global demand.

Best practices for stakeholder engagement

Stakeholder mapping and prioritization:

Stakeholders selected according to predefined objectives. Some are loosely involved; others are key coalition members. One-on-one calls with each partner to discuss how they fit and how best to participate. Some stakeholders may be aligned with the mission, but do not have the organizational mandate to participate.

Creating buy-in and a shared vision:

New Zealand Climate Tech for the World report creates a shared vision, galvanizes intention to act, helps to prioritize thematic areas. Ecosystem actors recruited to the coalition via one-to-one calls/conversations. Mission statement used to ensure all partners are signed up to achieve the same goal.

Implementation and maintaining engagement:

Zoom calls with all partner organizations felt jumbled, so CI created smaller working groups, or divided participants into 3-4 organizations aligned around key themes: larger groups of stakeholders were aligned around the mission, but became unwieldy to manage. Other stakeholders are more loosely involved, were kept informed but did not actively participate. Wider stakeholders involved through large events, for example startup pitches, tech conferences, commercialization-related workshops for students and startups.

Success factors

Include ecosystem actors who have played a role in previous startup/MSME innovation successes. Call out inclusivity goals in high-level strategic objectives and dedicate staff to promote objectives. Dedicated support for underrepresented groups: for example, Aotearoa energy innovation centre, Ara Ake supports Māori applicants to the Women in Climate and Energy Fellowship programme.

Challenges

- Creating coherence between the different workstreams, events and ongoing initiatives.
- Possible solutions include an overarching set of objectives and possibly a website for the initiative.

Ecosystem Role: Government and public institutions

Name and title of interviewee: Mikael Fjallstrom – Senior Business Developer

Organization: Swedish Energy Agency

Location: Eskilstuna, Sweden

Key insights from interview

INSIGHT 1: Sweden is a small country, and most small countries focus on international markets; Swedish Energy Agency first involves Swedish investors and is currently working on a focused programme for international investors.

INSIGHT 2: Participation is often about money. The trend of big companies downsizing R&D departments means they are keen to engage smaller startups. SEA supports these collaborations by financing the startups.

INSIGHT 3: International trips were useful for creating connections between stakeholders within the Swedish ecosystem – the information, conversations and interactions that took place during the trip led to collaborations such as co-investment.

About the organization

The Swedish Energy Agency (SEA) is a government agency subordinate to the Ministry of Infrastructure, responsible for issues related to the supply and use of energy in Sweden. Aside from coordinating the energy system, SEA supports and funds national research on new energy technologies, identifies and supports startups with the potential to scale for global sustainable development, and supports national business development to commercialize and export cleantech innovations.

Best practices for stakeholder engagement

Stakeholder mapping and prioritization:

Mainly engaging with investors; also influenced by activities organized for the Agency by the government.

Creating buy-in and a shared vision:

Help small early-stage startups grow and engage with universities on R&D activities; connect serial entrepreneurs with startups.
Provide grants to startups during the ideation stage and collaborate with entrepreneurial schools to finance the ideas.

Implementation and maintaining engagement:

SEA invited investors to visit fairs, meetings, study visits in California and Germany to understand the investor environment. International trips were useful for creating connections between stakeholders within the Swedish ecosystem – the information, conversations and interactions that took place during the trip led to collaborations such as co-investment. Participation often involves money. The trend of big companies downsizing R&D departments means they are keen to engage smaller startups. SEA supports these collaborations by financing the startups.

Evaluation and defining success:

Evaluation is based on whether or not involved investors ended up providing financial support to startups. Currently working on developing further KPIs to categorize companies into groups.

Success factors

SEA organized visits for investors to California and Japan to better understand international investor environments. An additional benefit of these trips was creating an opportunity for Swedish investors to interact with each other and find ways to co-invest.

Challenges

Today, it is very challenging to capture investors' time and attention. It is difficult to keep an overview of all startups due to the large portfolio of investments (300 companies). European legislation is tricky to manage due to its definition of startups (must have been established less than 5 years ago), and as a result, this affects how they can finance different projects.

Ecosystem Role: ESO

Name and title of interviewee: Jules Besnainou, Executive Director

Organization: Cleantech for Europe

Location: Brussels/EU

Key insights from interview

INSIGHT 1: Depending on the goals, the types of engagement will differ. For awareness purposes – media outreach and site visits; for growth – public private partnerships.

INSIGHT 2: A compelling proposition for why the intervention is being implemented, what the stakeholders can expect to get in return and that their time and resources will be invested effectively.

INSIGHT 3: Respond quickly and recover the value in case of disengagement by re-

evaluating the initiative's relevance and assessing signals from stakeholders.

About the organization

Cleantech for Europe is an initiative supported by Breakthrough Energy and 20 EU cleantech VCs, aiming to help the EU lead the race to net zero by building bridges between cleantech and policy leaders. Cleantech for Europe engages with VC and early growth investors and policymakers from the European Commission and European Parliament.

Traditionally, the EU cleantech innovation community and the EU policy community do not engage with each other. Cleantech for Europe fills this gap by creating touchpoints and opportunities for dialogue between the two communities.

Best practices for stakeholder engagement

Stakeholder mapping and prioritization:

Cleantech for Europe tracks EU policymakers and interest areas, the findings are used for targeted interventions depending on the topic and policy in question.
Initial engagement with 7-8 investors allowed Cleantech for Europe to reach a large audience (~200 companies) in a short time.

Creating buy-in and a shared vision:

Cleantech for Europe developed a manifesto with its founding members after initial conversations to identify challenges and areas of interest.

Implementation and maintaining engagement:

Personalized engagement aligned to context and objectives: for awareness purposes, media outreach and site visits are important; for growth – public private partnerships.

Success factors

A compelling proposition for why the initiative is being implemented, what the stakeholders can expect to gain from it and persuade them that their time and resources will be effectively invested. Be generous and thoughtful when designing interactions.
Respond quickly and recover the value in case of disengagement by re-evaluating the initiative's relevance and assessing signals from stakeholders. Drive participants towards an outcome that everyone feels positive about.

Investors like attention, they like being identified as pioneers, want visibility and exits for their companies. Local parameters are crucial. Choosing the right people: small conversations could lead to a big impact.

Ecosystem Role: Think Tank

Name and title of interviewee: Joel Boehme, Public Affairs Consultant, Head of Partnerships

Organization: Σigma Think Tank

Location: Brussels, Belgium

Key insights from interview

INSIGHT 1: If you have a concrete policy goal, the desk officer developing that policy must be involved.

INSIGHT 2: When dealing with established lobby groups or powerful interests, it is essential to form a coalition and present a unified front.

Activities

Political lobbying

Best practices

Stakeholder mapping needs to take place as an input to determining the objectives. Keep a clear goal in mind. If you are pursuing a concrete policy goal, the desk officer developing that policy must be involved. Timing: to raise awareness among the (political) voter base, publish articles on the day of key debates (strong relationships with the press are a prerequisite). When dealing with established lobby groups or powerful interests, it is essential to present a unified front.

What does success look like?

- Reach and productively work with the hands-on desk officer of a given legislative department.
- Building a united coalition with a specific set of coordinated demands.

Challenges

Different coalition members have competing demands: if no agreement is reached, that item must be deprioritized. Coalition members must also agree to not pursue a competing agenda unilaterally.

---

b. Ecosystem Actors

Ecosystem Role: Youth Association

Name and title of interviewee: Jennifer Uchendu, Founder, and Tunde Lukman, Projects and Partnership Director

Organization: SustyVibes

Location: Nigeria

Key insights from interview

INSIGHT 1: Youth-led initiatives result in significantly more engagement; letting youth lead projects (with the organization's supervision and support) gives them ownership and responsibility.

INSIGHT 2: Engage with youth in different ways – relating key messages to them through pop-culture allows them to talk about serious issues in a more approachable way.

INSIGHT 3: Youth need to be involved in policy discussions to better address their needs and challenges.

About the organization

SustyVibes is a community organization that supports young people who are passionate about climate and environmental protection. The organization supports the sustainable development agenda through a wide variety of advocacy and youth-led projects. Some activities include sustainability and climate change education, recycling awareness programmes, tree planting, masterclasses, and movie screenings. SustyVibe's goal is to increase awareness of sustainability issues within Nigeria and empower actors, especially youth, to take steps towards building a more sustainable future.

Partnerships

SustyVibes has strong partnerships with various public sector entities because projects must be approved by relevant government agencies. SustyVibes has worked with the Lagos State Waste Management Authority and Lagos State Health Management Agency, as well as the Ministry of Environment, amongst others. SustyVibes has also partnered with cleantech ecosystem actors, including Cleantech Hub in Abuja, Climate Launchpad and Nigeria Climate Innovation Centre. Finally, SustyVibes has worked with corporates on their CSR objectives, especially in relation to youth inclusion and environmental protection with support from embassies, including the British High Commission and the U.S. Embassy.

Activities

SustyVibes champions many youth-initiated environmental sustainability projects in Nigeria. Some activities include:

- **Street Dreams Project** – trainings using art and storytelling to empower young women in championing profitable environmental projects in their communities.
- **Susty on the Streets** – addresses the plastic pollution emergency through direct advocacy, including street clean-ups, recycling and upcycling advocacy.
- **Eco-anxiety in Africa Project (TEAP)** – seeks to understand and validate the experiences of eco-anxiety and environmental-related emotions in Africans.
- **Communitrees** – planting trees in Nigeria working with local communities.
- **Susty Parties** – actual parties where young people come together to have conversations around the SDGs in a more relaxed and fun environment.
- **Susty Movies** – uses movies for sustainability advocacy.

Best practices

SustyVibes has been able to capitalize on youth engagement by allowing youth to lead projects and initiatives (on SustyVibes terms). As a result, the organization is known for its work with pop-culture and sustainability, such as the use of art, music and dance to promote the engagement of young people in environmental stewardship.

What does success look like?

Success is measured in different ways, depending on the project. For some projects, success is measured on the number of participants engaged in a specific event as well as the level of awareness and knowledge acquired following participation. For other projects, there is a pre-established goal to reach (for example, with tree planting, a target can be the number of trees planted).

Challenges

Access to funding is always difficult for youth-led and youth-focused projects. Financial support is often provided by international organizations through grants. While internal organizations provide support through project approvals or technical assistance, they rarely provide financial backing.

Secondly, there are often **policy bottlenecks/misalignments between different government agencies**. This has happened in the tree planting initiative (one government agency plants trees but reports of trees being cut down by another agency) and in trying to formalize waste collectors (formalizing collectors is beneficial in reducing informal work and providing social/health services, but the government could not formalize collectors for other reasons).

Finally, roughly 60 per cent of Nigeria's population consists of youth, creating tremendous potential, but these **youth need to acquire the relevant knowledge and skills that will allow them to start sustainable businesses to empower them financially**.

Ecosystem Role: Accelerator

Name and title of interviewee: Erki Ani, CEO, Co-Founder

Organization: Cleantech Estonia & Beamline Accelerator

Location: Estonia

Key insights from interview

INSIGHT 1: Involving activists in the ecosystem can be challenging, but giving people the tools and opportunity to achieve change helps build buy-in among the community.

INSIGHT 2: A podcast on national radio is used to increase demand for cleantech solutions by showcasing what is possible, targeting CEOs and corporate board members (i.e. corporate demand owners)

INSIGHT 3: Collaboration between ecosystems provides opportunities for mutual understanding and to find new markets for local startups.

About the organization

Cleantech Estonia is a Tallinn-based business accelerator focused on the cleantech sector. It supports startups headquartered in Estonia, the wider Baltics and Central and Eastern Europe (CEE). In addition to delivering high-quality acceleration programs, Cleantech Estonia also contributes to policy development and aims to raise awareness of the impact of new technologies.

Partnerships

Cleantech Estonia has partnered with Climate-KIC since 2015 on various projects, including ClimateLaunchpad, a global community of impact startups. Other programmes include Pioneers into Practice: Empowering participants through system innovation thinking and Climate-KIC Journey Summer School.

Activities

Cleantech Breeze: monthly networking event with panel discussions involving academics, ministry representatives, sector experts and startups. Hackathon Climathon happens simultaneously in 130+ cities. Podcast: during COVID, Cleantech Estonia started a podcast which was aired on national Estonian radio. The podcast engages policymakers in discussions affecting cleantech and highlights innovative startup solutions. Founders club: annual meetup including startup founders and other ecosystem actors. Keynote speech

from Erki sharing key investment trends and policy updates, followed by an open mic so founders can share success and failure stories. Cleantech Estonia provides snacks and drinks; the event usually teams up with a larger event such as Latitude 69 (a high-profile Estonian tech & startup event - https://latitude59.ee/).

Study trips: Cleantech Estonia organizes trips abroad giving Estonian ecosystem builders the opportunity to meet VCs and local ecosystem developers to share knowledge and learn best practices. Trips are organized to coincide with a larger event such as London Tech Week. Participants are carefully selected; the trip is fully funded for successful applicants. Collaboration with other ecosystems: in partnership with EIT Climate-KIC, Cleantech Estonia participates in a regional innovation scheme, sharing experiences with 11 other EU countries for mutual learning. This is also a way to share portfolio companies with other markets that may have demand for the technology.

Best practices

- **Coordinated approach**: if a meeting takes place with a minister on a certain policy issue, try to introduce that topic to a broader audience (public or civil society) by including it in a podcast.
- **Building a long-term relationship with ministerial advisors is crucial**: whereas ministers change, the advisors stay in the field for a longer time and can promote certain issues.
- **Building relationships with the media**: they are hungry for innovation success stories.
- **Engaging local citizens**: identify individuals who are interested in sustainable development and collaborate with them.

What does success look like?

- Increased support for early-stage ideas and getting innovative solutions to market, including investment and business development. It can be measured by how many people are employed, revenues or investment attracted to the overall ecosystem.
- Securing government cleantech funding (for example Estonia's EUR 100 million Green Fund).
- Opportunities for the ecosystem to participate in high-level meetings and input to policy development or green innovation funding allocation decisions.

Challenges

- **Including activists**: Activists care deeply and can help provide solutions if engaged in the right way. Giving people the understanding that they have the tools and opportunity to bring change can help gaining their buy-in. If they feel that the local government is in their hands, they are more likely to engage.
- **Identifying funding**, especially for base-level innovation ecosystem development activities.
- **Finding the right people** and keeping them committed over time.

Ecosystem Role: Ecosystem Builder

Name and title of interviewee: Ellen Erickson, former Director for U.S. Ecosystems

Organization: Global Entrepreneurship Network (GEN)

Location: USA

Key insights from interview

INSIGHT 1: MSMEs need a different engagement approach from venture-funded startups for a number of reasons. One is that smaller startups face challenges with access to capital and a lot of resources are at the state level - sharing awareness about it and broadcasting it is important.

INSIGHT 2: Digital channels can exclude those who are not active online. Digital literacy can be strengthened with training, but lack of connectivity must be resolved via infrastructure upgrades.

INSIGHT 3: To reach more communities and foster inclusive entrepreneurship, choose partners according to whether they can help reach previously underserved groups.

About the organization

GEN is an ecosystem builder that believes that anyone anywhere should be able to start and scale a business. Working globally through entrepreneurial support organizations to make environments where entrepreneurship can thrive. Their focus is cross-sector, with global themes such as ecosystems, education, inclusion and policy.

Global reach: GEN runs programmes in 200 countries. Their events aim to make local ecosystems welcoming to entrepreneurs of diverse backgrounds, as well as connecting ecosystems regionally and internationally. In the U.S., GEN is extensively involved at the state level in smaller communities. There is a strong diversity focus. GEN also highlights entrepreneurial success stories, especially in smaller communities that do not get national coverage.

Partnerships

GEN primarily interacts with ESOs to create environments in which entrepreneurship can thrive. Other interactions include startups, policymakers, education players, including community colleges and universities, business associations, diversity players, including women's business centres. GEN emphasizes its role in engaging smaller stakeholders at the state and municipal level.

Activities

GEN has identified key pain points as: capital, policies and access to talent, and this informs their stakeholder outreach approach. Global Entrepreneurship Week (GEW) is a global GEN event that helps kick off collaborations during the rest of the year.

Global Entrepreneurship Congress is a major initiative that convenes representatives from 180+ countries to discuss topics in entrepreneurship and learn from experts and peers about best practices and challenges in entrepreneurship in their respective ecosystems. The 2022 GEC was held in Saudi Arabia and the 2023 GEC will be held in Melbourne. Community-led events include: workshops, pitch competitions, movie nights.

Best practices

- Establishing national chapters.
- Including smaller players at the state and municipal level.
- Providing a platform and slack channel to connect all community organizers in different networks.
- Sharing what has and what has not worked between different communities helps replicate successes.
- Highlight success stories from smaller communities and ecosystem, for example U.S. heartland – lots of entrepreneurship happens outside the main innovation centres, important to make this part of the national picture.
- GEN produces a series of targeted guidelines to explain to potential partner organizations in different segments why they should participate, and highlights the benefits.

What does success look like?

GEN's goal is to reach as many communities and partners as possible. Success is measured by how many activities during the week are being held in each community, whether they are getting other organizations in the ecosystem involved in GEW, and whether they are reaching entrepreneurs in their community.

Challenges

- **Silos between stakeholders**: GEN tries to connect and foster communication among them, encouraging them to share best practices and lessons learned from failures.
- **Fear of the unknown among stakeholders and as a result, hesitation to engage**: GEN's solution is using "Audience Guides" (see above) to help stakeholders better understand how to get involved and speaking directly with each stakeholder to explain the benefits of engaging.
- **Digital literacy**: the New Mexico community works with native American entrepreneurs, organizing a festival to sell their wares. During the pandemic, this could not take place, so the community helped them pivot to e-commerce with a "build your website in 100 days" programme.

Ecosystem Role: Industry Association

Name and title of interviewee: Jason Anderson, President and CEO

Organization: Cleantech San Diego

Location: California, USA

Key insights from interview

INSIGHT 1: Engaging utilities is essential to drive change in the energy sector, forging connections between corporates and startups provides opportunities to trial innovative solutions.

INSIGHT 2: Small players play an equal part in the ecosystem as do big players. Being inclusive, paying attention to MSMEs, speaking with entrepreneurs and including them is part of ecosystem development.

INSIGHT 3: COVID impacts such as virtual engagement did not slow development, on the contrary, it made it easier to engage stakeholders and interact, as well as include people from outside San Diego, i.e. made it more accessible.

About the organization

Cleantech San Diego is a non-profit, member-based business association focused on the energy sector. Its primary aim is to support startups drive the energy transition through leading advocacy efforts to promote cleantech priorities and encourages more equitable investment across the San Diego region. All members of the association are headquartered in or have an office in the San Diego area. Cleantech San Diego was founded 15 years ago, and its stakeholders include over 120 businesses (entrepreneurs and utilities), universities, governments, and non-profits. It also runs an accelerator for clean energy startups.

Activities

Cleantech San Diego carries out the following activities: Advocating for policies that help drive market growth, educating stakeholders, hosting networking events, running an accelerator programme. Main differentiator is its connections and comprehensive knowledge of the clean energy ecosystem in San Diego. It uses these connections to organize high-value networking events and to forge connections between corporates and startups to trial innovative solutions.

Best practices

- It is important to engage universities since many founders come from university programmes; utilities are essential to drive change in the energy sector.
- Most stakeholders in this space are already mission-driven by the idea of a cleaner environment and want to make a positive impact. This common overarching objective

helps to align around a common vision.
- Most utilities see the need for energy transition, California policy environment helps to incentivize change.

What does success look like?

- Having a common objective and collective mentality of a cleaner environment, and wanting to make a positive impact.
- Involvement of academia: engaging universities and actively collaborating with them is important because a lot of startups come from universities and university incubators, and they bring first-hand talent and ideas.

Challenges

Choosing the right partners to foster more inclusion in the field: most startup founders have a college education, while there is a need to foster entrepreneurship in underserved communities. These are best reached through local community organizations who already have networks within the community. It is essential to involve representatives during the programme design stage, both to gain buy-in and create awareness and to design a programme that works for their reality. Cleantech San Diego is still working on the best approach to identifying and selecting local community partners.

Ecosystem Role: Risk Capital Providers

Name and title of interviewee: Rune Thiell, CEO

Organization: Rockstart

Location: Netherlands

Key insights from interview

INSIGHT 1: Involving later-stage investors in early-stage startup selection helps raise interest, they may follow startups as they scale and even provide follow-on investment.

INSIGHT 2: Creating a high-quality event with interesting content and social aspects will gain better ecosystem participation.

About the organization

Rockstart is a VC fund investing in early-stage ventures in the energy, agrifood and emerging technology sectors. They also run a six-month compact accelerator programme. The fund engages startups, follow-on (growth) investors, startup mentors (sector or functional experts) in the EU and Latin America. Rockstart provides startups with access to capital, market expertise and community. It has executed 260 early-stage investments so far with the long-term goal of building a $1 billion portfolio.

Rockstart considers itself an ecosystem builder, helping startups find relevant market partners and investors.

Activities

Rockstart's investor days bring together relevant investors, corporates and partners from all over the EU and globally. The focus is on providing a high-quality event with interesting content and a dinner so people want to attend and spend more time engaging. Investors share excitement about the same companies, identify synergies and collaboration opportunities. Later-stage investors get involved in selecting promising startups: e.g. Series A and B investors sit in on seed rounds, this triggers their interest, and they are likely to follow the company as it grows.

Best practices

- Weekly check-ins with founders to check how financing is going, spot potential problems early and intervene before issues arise.
- Connect startups with expert mentors who provide targeted coaching on sector-specific or functional topics.
- Create external exposure through events and partnerships.

Ecosystem Role: Universities & Research organizations

Name and title of interviewee: Phil Budden, Senior Lecturer, Technological Innovation, Entrepreneurship, and Strategy (TIES) Group

Organization: MIT Sloan Management School

Location: Boston, USA

Key insights from interview

INSIGHT 1: MIT's model of the five core stakeholders in innovation-driven entrepreneurship ecosystems includes: entrepreneur, risk capital, corporate, government and university.

INSIGHT 2: Accelerators can be a tool for ecosystem-building, along with labs, incubators and workspaces. They may be funded by any one of the other stakeholders.

INSIGHT 3: Role of government is important, but not always what it (or others) expect: if that role is not fulfilled, entrepreneurship can be disincentivized.

About the organization

MIT Sloan's Technological Innovation, Entrepreneurship and Strategy (TIES) group conducts research (among other things) into the organization, development and commercialization of technology-based innovation in existing firms, and the formation, development and

growth of technology-based new enterprises, especially in ecosystems. The MIT Regional Entrepreneurship Acceleration Program (REAP) is MIT's global programme on accelerating innovation-driven entrepreneurship through ecosystem development.

Success factors

MIT's approach builds on Porterian cluster theory but asserts that clusters alone do not explain technology development: ecosystems are more organic and dynamic. Place-based approach: ecosystems need to consider what they have on hand to work with (systems analysis): which stakeholders can they bring? Which skills, knowledge, risk capital opportunities exist? This will determine what the growth possibilities are and what strategy to pursue. Getting stakeholders together is essential and helps them discover that they can play a role.

Challenges

Foundational institutions are important. Government must be a reliable partner, otherwise entrepreneurship might even be disincentivized. Where government is not fulfilling its role, in some cases other stakeholders can step in to fill the gap, e.g. in public service provision.

Ecosystem Role: Ecosystem Support Organization

Name and title of interviewee: Aziz El Hachem, North Africa Director

Organization: Plug and Play Tech Center

Location: Morocco/Egypt

Key insights from interview

INSIGHT 1: For international companies entering a new ecosystem, it is important to build relationships with local ecosystem actors to earn a place in the ecosystem.

INSIGHT 2: For cleantech to thrive, the country first needs to develop the 'first layer' of foundation technology companies such as fintech and logistics.

About the organization

Plug and Play Tech Center is a general innovation platform, aiming to connect early-stage investors, startups, and corporations through industry-focused accelerator programmes. The Center is focused on sustainability amongst other verticals, and supports some startups in cleantech sectors. Plug and Play Tech Center is active in over 45 locations globally.

Partnerships

Key partners in Morocco are the Moroccan state-owned phosphoric acid manufacturer

and fertilizer producer OCP Group and Mohammed VI Polytechnic University (UM6P).

Activities

Plug and Play Tech Center runs an equity-free programme for startups with investment, co- investment, mentorship and office space. Startups are also eligible for 'soft landing' support in any other country where Plug and Play is active.

Plug and Play Tech Center runs two acceleration programmes yearly and ends each acceleration programme with an EXPO or graduation ceremony where they invite different ecosystem players such as government representatives, investors, accelerators, startups and tech enthusiasts. These events showcase startups and include panel discussions on regulations and investment trends.

Plug and Play Tech Center also organizes Smart Cities Hackathons where they invite students and entrepreneurs from multiple backgrounds to join a two/three-day intensive idea generation competition.

Best practices

- Study the culture before entering the ecosystem.
- Build personal relationships to gain insights of the ecosystem and references to the right people.
- Invite big name to events, this boosts attendance among other participants.
- Mix and match mentoring between early-stage and more developed startups.
- Each African region has a few key players – invite them to events to show them what the different ecosystems have to offer.
- A successful hackathon consists of a problem, potential solutions, a prize and a call to action.

What does success look like?

Metrics to measure success include number of startups graduating from programmes, amount of money raised, successful introductions to corporates, government entities, investors and job creation.

Challenges

Traditionally, it has been difficult to be successful without personal connections. With merit-based selective programmes, Plug and Play is trying to make the ecosystem more inclusive. There is a need to rebuild confidence among corporates reluctant to invest in or engage with startups following previous negative experiences.

Appendix 4. Types of engagement activities to increase ecosystem connectedness

We can divide events into two groups according to their engagement type: open- and closed-door events. Events can address different objectives and involve different kinds of stakeholders. They can be formal or informal and thus have different levels of engagement and interaction. Events can serve different purposes depending on context and objectives: broadcast or site visits can be used to raise awareness; competitions and hackathons for growth. Other purposes include increasing visibility, engaging with stakeholders outside of the existing ecosystem or reaching and identifying new partners, investors or mentors.

Networking events

Networking events facilitate engagement with different stakeholders in a more informal way, identification of new partners, promotion of the product or company as well as meeting potential customers and building recognition. Networking events include:

- **Talks** – an event organized to discuss a specific topic
- **Meetups** – an event organized to engage stakeholders in an informal meetup
- **Conferences** – more formal type event organized to engage the ecosystem
- **Startup Weeks** – a series of events to showcase startups and connect them with risk capital
- **Webinars** – online events to discuss a particular topic
- **Community-led events** – informal gatherings organized by ecosystem players.

Competitions, Hackathons & Challenges

Competitions are effective tools for showcasing early-stage startups and to provide them with initial funding. Competitions also help build investor and advisor networks, raise visibility in the marketplace, and iterate business models and plans. Startup Challenges allow public and private organizations to communicate their innovation needs, to find innovative ideas and solutions outside the company. Hackathons provide an opportunity to engage talent and create operational products by the end of the event. It increases the knowledge and skill level of participants, and provides a solution for organizers to their

problem in a short turnaround with low costs. Competitions, Hackathons & Challenges all provide a room for networking, allow startups to connect with risk capital as well as to identify advisors and mentors.

Broadcast communications

Broadcast communications includes using radio, TV and Internet tools to transmit information. It involves engaging with media to share information about the product or other company news. It is a one-way communication – only receptors are not engaged in a conversation, they only receive it.

Workshops

A workshop can introduce a new concept and demonstrate its practical use. It is a way to teach hands-on skills to participants. Workshops aim to transmit new information and knowledge to participants and improve their competence.

One-on-one discussions

One-on-one discussions allow for private discussions on an individual level. Such types of interactions can be used to provide space for participants to share feedback, discuss progress and identify challenges. One-on-one discussions can be used to discuss a new venture or partnership or to provide feedback.

Citizen assemblies

Citizen assemblies allow for more in-depth discussions of issues, expert knowledge, debate and personal exchange. Citizen assemblies are beneficial for getting honest feedback from first-hand users, as well as ideas for improvement. Most citizen assemblies are top-down, initiated by governments to listen to people.

Site visits

Site visits are tours conducted to present the work process and physical location of a company. Site visits raise awareness and the visibility of the company and its activities. In some cases, it is also a way to engage relevant stakeholders in implementation activities.

References

ADB. 2013. **"Stakeholder Engagement in Preparing Investment Plans for the Climate Investment Fund. Case Studies from Asia"**. Accessed November 1, 2022. https://www.adb.org/sites/default/files/publication/30043/stakeholder-engagement-investment-plans-asia.pdf

Atlantic Council. 2021. **"Mapping Green Innovation Ecosystems: Evaluating the Success Factors for the World's Leading Greentech-Innovation Centers"**. Accessed November 1, 2022. https://www.jstor.org/stable/resrep31089

BCG. 2019. **"The Dawn of the Deep Tech Ecosystem"**. Accessed November 15, 2022. https://media-publications.bcg.com/BCG-The-Dawn-of-the-Deep-Tech-Ecosystem-Mar-2019.pdf

C40. 2019. **"Inclusive Community Engagement Playbook"**. Accessed November 1, 2022. https://www.c40knowledgehub.org/s/article/Inclusive-Community-Engagement-Playbook?language=en_US

C40. 2021. **"Implementation Guide: How to win support for local clean energy"**. Accessed November 1, 2022. https://www.c40knowledgehub.org/s/article/How-to-win-support-for-local-clean-energy?language=en_US

CIF. 2020. **"Enhancing climate action through stakeholder engagement at the country level"**. Accessed November 1, 2022. https://www.climateinvestmentfunds.org/sites/cif_enc/files/knowledge-documents/country_level_stakeholder_engagement_study.pdf

Delgosea. 2012. **"Handbook for the Implementation of Good Local Governance Projects in Southeast-Asia"**. Accessed November 1, 2022. https://uclg-aspac.org/wp-content/uploads/2022/04/UCLG-ASPAC-Brochure.pdf

Elizabeth Hoffecker, Molly Wenig Rubenstein. MITD-Lab. 2019. **"Understanding Innovation Ecosystems: A Framework for Joint Analysis and Action"**. Accessed November 15, 2022. https://d-lab.mit.edu/resources/publications/understanding-innovation-ecosystems-framework-joint-analysis-and-action

Erasmus Centre for Entrepreneurship. 2020. **"Study of the (cleantech) innovation ecosystem with a focus on GIST and SCALE-UP"**. Accessed November 1, 2022. https://ece.nl/app/uploads/Study-of-the-cleantech-innovation-ecosystem-with-a-focus-on-GIST-and-SCALE-UP.pdf

European Commission. **"SME Definition"**. Accessed November 3, 2022. https://single-

market- economy.ec.europa.eu/smes/sme-definition_en

IDB. 2020. **"Chile shows that multi-stakeholder participation is key to designing long-term decarbonization strategies"**. Accessed November 1, 2022. https://blogs.iadb.org/sostenibilidad/en/chile-shows-that-multi-stakeholder-participation-is-key-to-designing-long-term-decarbonization-strategies/

IFC. 2007. **"Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets"**. Accessed November 1, 2022. http://www.ifc.org/stakeholderengagement

Kauffman Foundation. 2015. **"Measuring an entrepreneurial ecosystem"**. Accessed November 15, 2022. https://www.kauffman.org/wp-content/uploads/2020/05/Measuring-an-Entrepreneurial-Ecosystem.pdf

Murray, Fiona E. 2019. **"MIT's Stakeholder Framework for Building & Accelerating Innovation Ecosystems"**. https://innovation.mit.edu/assets/MIT-Stakeholder-Framework_Innovation-Ecosystems.pdf

SEI. 2009. **"Stakeholder Engagement and the work of SEI: an empirical study"**. Accessed November 1, 2022. https://www.sei.org/publications/stakeholder-engagement-work-sei-empirical-study/

Startup Genome. 2019. **"Can Culture Be Counted? Why Local Connectedness Matters for your Startup"**. Accessed November 1, 2022. https://startupgenome.com/articles/can-culture-be-counted-why-local-connectedness-matters-for-your-startup

Startup Genome. 2022. **"The Global Startup Ecosystem Report GSER 2022"**. Accessed November 1, 2022. https://startupgenome.com/articles/the-state-of-global-startup-ecosystems-in-2022

Talmar, Madis, Bob Walrave, Ksenia S. Podoynitsyna, Jan Holmström, and A. Georges L. Romme. 2020. **"Mapping, Analyzing and Designing Innovation Ecosystems: The Ecosystem Pie Model"**. Long Range Planning 53, no. 4: 101850. https://doi.org/10.1016/j.lrp.2018.09.002

UN DESA. 2020. **"Stakeholder engagement and the 2030 agenda"**. Accessed November 1, 2022. https://sustainabledevelopment.un.org/content/documents/2703For_distribution_Stakeholder_Engagement_Practical_Guide_spreads_2.pdf

UN Global Compact. **"Business and Industry Associations"**. Accessed November 1, 2022. https://www.unglobalcompact.org/what-is-gc/our-work/industry-associations

WEF. 2021. **"Financing the Transition to a Net-Zero Future"**. Accessed November 1, 2022. https://www.weforum.org/projects/sustainable-banking

Vienna International Centre
Wagramerstr. 5, P.O. Box 300,
A-1400 Vienna, Austria

+43 1 26026-0

www.unido.org

unido@unido.org

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION