Solving climate and development challenges in the developing world

through cleantech clusters

A White Paper developed by

GreenCape

Clean
The Danish Water & Environmental Cluster

INTERNATIONAL CLEANTECH NETWORK

Contents

Developing countries urgently need to accelerate the adoption of solutions that can mitigate against and adapt to our changing climate. One of the proven and viable mechanisms to realise this ambition is to harness the sustainable development opportunities in cleantech clusters.

The concept of clusters is hardly new; it has been explored for decades in the European industrial development landscape, but building cleantech clusters in the developing world requires an adapted approach that takes into account the competing local priorities and institutional capacities. The establishment of a cleantech cluster agency is a vital ingredient to catalysing action as this independent intermediary organisation is able to help coordinate the local ecosystem and the firms' collective efficiency. The cluster agency should prioritise its activities on creating jobs and attracting investment as this helps reduce some of the political tension in the system. Furthermore, the cluster agency can support the development of a project pipeline for grant makers and funders, and improve the overall coherence of the funding environment. GreenCape and Clean, are members of the International Cleantech Network and are reputable cleantech cluster agencies that have replicated in other regions in the developing world with success. They are looking to scale their efforts in order to tackle the dual challenge of climate and development in the developing world.

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Introduction

> There is an urgent need to accelerate the adoption of cleantech solutions to help in the mitigation and adaption efforts against anthropogenic climate change. However, for the developing world, this process has been slow with climate finance flows substantially below what is required[1].

There are a number of reasons for this, but vitally, within developing countries, there are competing interests and priorities. Developing world economies, particularly those endowed with natural resources, have a tendency to "under-co-operate" at the firm level and usually demonstrate a low level of institutional maturity. Typically, the focus is on control and extraction of the available natural resources rather than building a collaborative ecosystem to boost overall economic competitiveness. This "zero-sum" thinking holds back development across many spheres and is often deeply entrenched.

However, the nature of cleantech provides a compelling opportunity to build business ecosystems and collaborative institutions around these new and decentralised solutions. Economically viable cleantech is able to fulfil the dual objective of sustainable development whilst providing climate and environmental benefits. But for these benefits to be realised, some institutional and ecosystem elements need to be in place, even if imperfect, to build progress towards cleantech clusters.

Cleantech clusters are able to catalyse the transition by creating opportunities for green businesses to thrive and for local economic development and growth to occur as a result. By promoting the economic development benefits that the green transition can bring rather than simply touting the climate and environmental benefits, clusters help in mobilising public sector support so that the required regulatory and policy changes can take place.

This document outlines the proven examples of how cleantech cluster agencies can accelerate the uptake of cleantech technologies and solutions, why it works, and the opportunities to further scale this impact.

1 https://www.mckinsey.com/capabilities/sustainability/our-insights/solving-the-climate-finance-equation-for-developing-countries

Problem statement

The lack of sufficient climate finance flows to developing countries has resulted in inadequate resources to combat climate change, impacting their ability to implement effective adaptation and mitigation strategies.

Despite being among the most vulnerable to climate impacts, these nations receive only a fraction of the necessary funding, creating disparities in global climate action. This financial shortfall leads to increased poverty, food insecurity, and damage to ecosystems, further exacerbating the challenges these communities face. Furthermore, developing countries are looking for means to grow their economies and "catch-up" to the West. The G7[2] gross domestic product (GDP) per capita is over 20x that of Africa's average GDP per capita. Climate change is only likely to exacerbate current global inequality, so it remains urgent to develop mechanisms to empower developing countries to access and successfully implement cleantech solutions whilst also finding a means to grow and develop more sustainably.

Background

Climate finance commitments often fall short of the necessary levels to meet the needs of developing countries, which are disproportionately affected by climate change despite contributing the least to global emissions. Furthermore, financial resources are frequently concentrated in a few countries, leaving many vulnerable nations without adequate support. This inequity hampers global climate action.

When funding is available, the bureaucratic processes required to access climate funds can be overwhelming, particularly for smaller nations with limited capacity. This complexity can deter countries from applying for, or effectively utilizing, available funds. Moreover, the dependence on unpredictable external funding, such as from international donors or multilateral organizations, creates uncertainty for long-term planning and climate initiatives. Climate finance projects are often not tailored to the specific contexts or priorities of local communities, leading to ineffective or counterproductive outcomes. Grant makers and funders of cleantech deployment are equally frustrated at the lack of a project pipeline and coherence at the local level. Many developing countries face challenges such as weak institutional frameworks and insufficient technical expertise, making it difficult to effectively implement climate projects.

As a powerful reminder of how cleantech can play a role in fundamentally shifting the economic landscape in developing countries, the provision of electricity access in Africa provides a clear opportunity. Access to electricity provides signicant development dividends. According to the International Energy Agency (IEA), as of 2022, approximately 600 million people in Africa lacked access to electricity[3]. However, Africa has vast renewable energy resources, including solar, wind, and hydroelectric power. For example, the continent receives more than 2 500 hours of sunshine annually, making solar energy a particularly promising avenue for increasing access.

Urban areas typically have much higher access to electricity compared to rural areas. For instance, while many urban centres might have access rates above 80%, rural areas often struggle with rates below 30%[4]. Into this mix strides economically viable, decentralised, off-grid and grid-tied small-scale solar photovoltaic (PV) solutions. This cleantech can provide immediate access to electricity without the need for extensive infrastructure investments and within this value-chain, there opportunities for local jobs within the construction and maintenance phases, even ignoring the upstream opportunities in manufacturing and assembly.

Similar cleantech opportunities exist in other core service delivery areas, such as waste collection and beneficiation, and sanitation. Vital for Africa is the need for improving agricultural productivity and adapting food production to climate changes. Again, cleantech could play an important role here, from solar-powered irrigation pumps, to precision agriculture where sensors, drones, and GPS technology monitor crop health, optimize inputs (water, fertilizers,

2 The Group of Seven (G7) is an intergovernmental political and economic forum consisting of Canada, France, Germany, Italy, Japan, the United Kingdom and the United States.

3 https://www.iea.org/reports/africa-energy-outlook-2022/key-findings

4 https://www.iea.org/reports/africa-energy-outlook-2022/key-findings

pesticides), and improve yield while minimizing waste, to climate smart crop varieties that can better withstand the increasingly variable climatic conditions. There are significant economic and environmental dividends to be achieved through the adoption of cleantech in the agricultural sector, but there are additionally economic benefits to be realised within the value chain that supports these green solutions.

The adoption of cleantech that assists in the mitigation and adaptation to climate change is urgent as the climate projections up to 2050 indicate that in highly vulnerable regions like Africa, average temperatures are expected to rise, with projections ranging from 1.5 to 3.0 degrees Celsius above pre-industrial levels. This rise will exacerbate heatwaves, particularly in southern and eastern Africa. Changing rainfall patterns will impact different parts of the region differently with the Sahel and parts of southern Africa predicted to become drier, leading to increased aridity and desertification, whilst in East Africa and some parts of West Africa increased rainfall is expected, raising the risk of flooding. Furthermore, an increase in the frequency and intensity of extreme weather events, including cyclones and floods, is expected, impacting infrastructure and communities. The combined effects of climate change are expected to hinder economic growth, especially in agriculture-dependent economies, and exacerbate poverty and inequality.

There are a number of challenges with the availability and accessibility of climate finance that should be solved by the international financing community, but there are a number of opportunities for developing countries to attract climate finance and implement cleantech projects. However, this often requires strong coordination mechanisms and institutional maturity. As the 2024 Nobel prize winning researchers[5] have established, there is a strong correlation between a country's prosperity and the maturity and coherence of its societal institutions, and the development of these institutions is largely reliant on their colonisation experience. Building these institutions from the ground-up can be very difficult to achieve, as the status quo leans towards authoritarian and extractive institutions. But there remains hope in the development of "islands of effectiveness"[6] that combine high-quality institutional arrangements at the micro-level, plus supportive, narrowly-targeted policy reforms. It is within this realm that evidence is emerging for the potential of independent, intermediary organisations to mobilise the green transition to promote the dual benefits of climate action and economic development. Developing intermediary organisations that fulfil networking functions can support the "thickening" of the local institutional landscape[7] that, over time, supports economic success and growth. Cleantech ecosystems that can focus on growth by accelerating the pace and scale of the deployment of economically viable cleantech solutions can help to reconcile the need for significant growth and achieving this in a way that is lower carbon, more resource efficient, climate adaptive and more socially inclusive.

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5 https://www.nobelprize.org/uploads/2024/10/popular-economicsciencesprize2024.pdf
6 https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1942801
7 https://doi.org/10.1016/j.tmp.2020.100770

Figure 1: The UNIDO Approach to Cluster Development (2020)

02

Proposed approach

> Part of the solution set that has proven viable is the support to and catalysation of clusters to support economic and industrial development. Clusters are defined as a *critical mass of enterprises located in geographical proximity to each other that produce similar or related goods or services*[8].

Clusters have received increased prominence in economic development debates in recent years as governments worldwide regard clusters as potential drivers of enterprise development and innovation.

According to the European Union (EU) - clusters are a major part of the European industrial landscape. They play a crucial role:

- boosting collaboration and connecting enterprises, especially small- and medium-sized enterprises (SMEs), and building bridges across Europe's ecosystems
- supporting innovation take-up, internationalisation and scaling-up of SMEs
- setting up transnational partnerships to better help SMEs access global value chains
- as change agents in the digital and carbon-neutral 'green' transition

There are around 3 000 specialised clusters in Europe, accounting for 54 million jobs. Clusters are represented in all parts of Europe and have shown resilience during economic crises. They nurture growth and jobs, e.g. 3% higher wages and the 67 700 fast-growing enterprises in clusters employ more staff than other enterprises (35 compared to 24).[9]

Collaboration, innovation, scale-up, internationalisation and green transformation are all embedded in this cluster theory. Clusters, as theorized by Michael Porter[10] – are a group of co-located firms that interact with one another and increase both individual firm competitiveness as well as the competitiveness of the industry through collaboration. In the green economy and green transformation this is typically through solving collective problems, innovation in design and unusual partnerships to access global opportunities.

According to the United Nations Industrial Development Organization (UNIDO), SMEs can benefit from economies of scale when combining their procurement and marketing activities. They can also benefit from information exchange, joint learning and the development and adaptation of innovations. Vibrant clusters are home to innovative firms that reap the benefits of an integrated support system and dynamic business networks. Clusters look to create a "collective efficiency" where spatial proximity and shared strategic interests allow enterprises and their support institutions to realize shared gains through the organization of joint actions between cluster enterprises (e.g. joint bulk inputs purchase or joint advertising, collaborative R&D or innovation projects, or shared use of equipment), and between enterprises and their support institutions (e.g. provision of technical assistance by business associations or investments in infrastructure by the public sector).

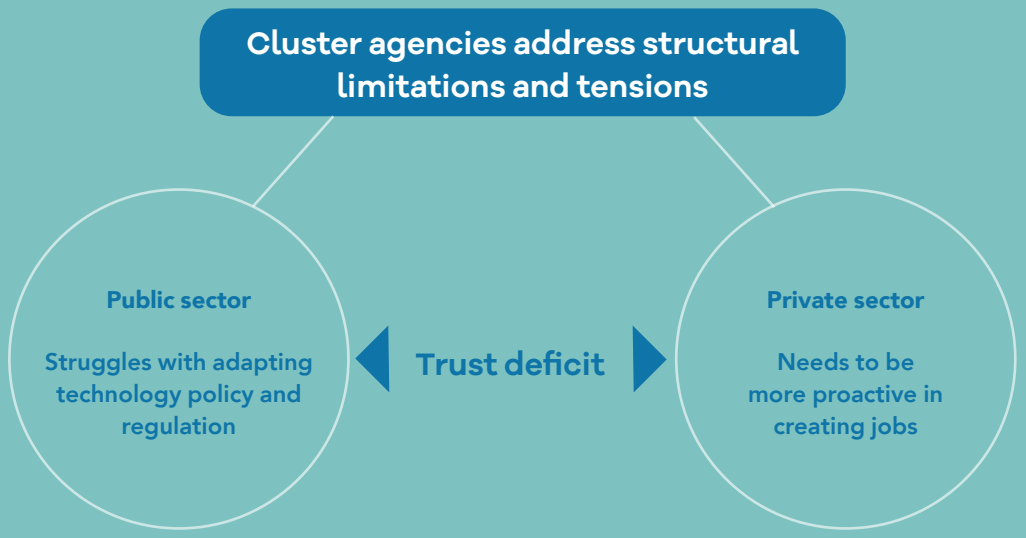
8 https://www.unido.org/sites/default/files/2014-01/UNIDOs_CLUSTER_APPROACH_0.PDF
9 https://ec.europa.eu/growth/industry/policy/cluster_en
10 Porter, M. E. (1998b). Clusters and the new economics of competition. Harvard Business Review, 76(6), 77-90

Cluster initiatives are also considered to be efficient policy instruments in that they allow for a concentration of resources and funding in targeted areas with a high growth and development potential that can spread beyond the target locations (spill-over and multiplier effects).

However, entrepreneurs do not necessarily naturally cooperate with each other, especially when they are potential competitors in a sector. Nevertheless, for the SMEs to unleash their growth potential, joint actions can prove a critical success factor. Therefore, it may become relevant to consider a coordinating activities to provide assistance to improve the competitiveness of the cluster, as per **figure 1** from UNIDO.[11]

The path towards clustering becomes more complex when the sector is still emerging and nascent. In this context, there need to be more deliberate efforts to build the cluster from the ground up, and in a fashion that allows for the coordination with the academic or R&D sector (from which many of the new solutions may emerge but they need to find commercialisation partners while developing solutions that actually meet industry's needs) and with the public sector (whose support will be needed but may be overwhelmed by the demands of the businesses to adapt). It is into this context that a cleantech cluster agency may be worthwhile pursuing as a mechanism to bridge the gap between the public and private sector:

Figure 2: Cluster agencies as a mechanism for bridging the gap between the public and private sectors (GreenCape, 2020).



When considering the status of the climate agenda and the need for countries to achieve increasingly ambitious goals, climate technologies[12] or cleantech solutions need to be deployed at greater scales. According to IEA analysis[13], 35% of the energy sector emissions savings that are needed to achieve net zero CO2 emissions globally by mid-century must come from technologies that are not yet commercially available on the market. Therefore, significant urgency is required to scale up efforts to attract investment into new solutions and to increase the adoption of more mature technologies. This requires a well-coordinated effort between the various actors in our societies.

However, in GreenCape's experience, the status quo is broken down by a lack of trust between the key actors in the emerging cleantech sector, despite the ultimate goals of the green transition being in alignment, as long as this is viewed within the paradigm of the green transition also addressing socio-economic challenges.

11 https://www.unido.org/sites/default/files/files/2020-09/Clusters_Brochure.pdf

12 Climate technologies either reduce greenhouse gas emissions (through the removal of carbon from the atmosphere or through the displacement of fossil-fuel based technologies, such as renewable energy), improve resilience and adaptation to a changing climate, or improve our understanding of the climate.

13 https://www.iea.org/reports/clean-energy-innovation-policies-in-emerging-and-developing-economies/executive-summary-and-insights-for-policy-makers

Benefits and implications

Our thesis, as per the illustration in figure 3 is that by creating a neutral, independent intermediary organisation that is able to bring all the stakeholders together, whilst also providing support to those stakeholders through sector expertise, investment facilitation and the identification of industry-wide barriers, significant economic and climate benefits can be realised.

The activities undertaken by cluster agencies vary across the globe and are indicative of the demands from the local ecosystem, as there is no "one-size-fits-all" strategy for clusters. However, the following governance and strategic elements and would be considered as common components of a cluster agency:

- **The cluster agency is an independent non-profit organisation** (NPO) with no political affiliations.
- **The NPO has a triple helix structure** with partners and members from within research institutes, business (largely focused on SMEs) and government.
- **The NPO has a regional or geographic focus** where local networks are a key ingredient to the value that the NPO brings.
- **The NPO ultimately works to the benefit of the green sectors they represent** and not for individual members.

The kinds of activities that cluster agencies undertake include the following:

- **Industry events**. These are typically opportunities for organisations to network and to share information on the latest industry updates.
- **Supporting businesses with funding, market and regulatory insights** as they look to invest, scale or develop. Free one-on-one services are provided as they look to overcome hurdles to their expansion.
- **Promoting the sector to external stakeholders**. The publication and promotion of key opportunities in the sector is done through a variety of channels.
- **Workshop solutions to industry challenges with cross-sectoral stakeholders**. The barriers experienced and the potential solutions to these can also be articulated to external stakeholders (notably government) to provide assistance in overcoming them.
- **Support to technology transfer activities and adaptation processes**. Technology from elsewhere in the world is attracted to the local environment but support given to international investors in understanding the local business, regulatory and environment conditions so that they can adapt their technology for improved uptake.

In the developing world context there are several additional critical factors for clusters (and tactics where the critical mass is nascent):

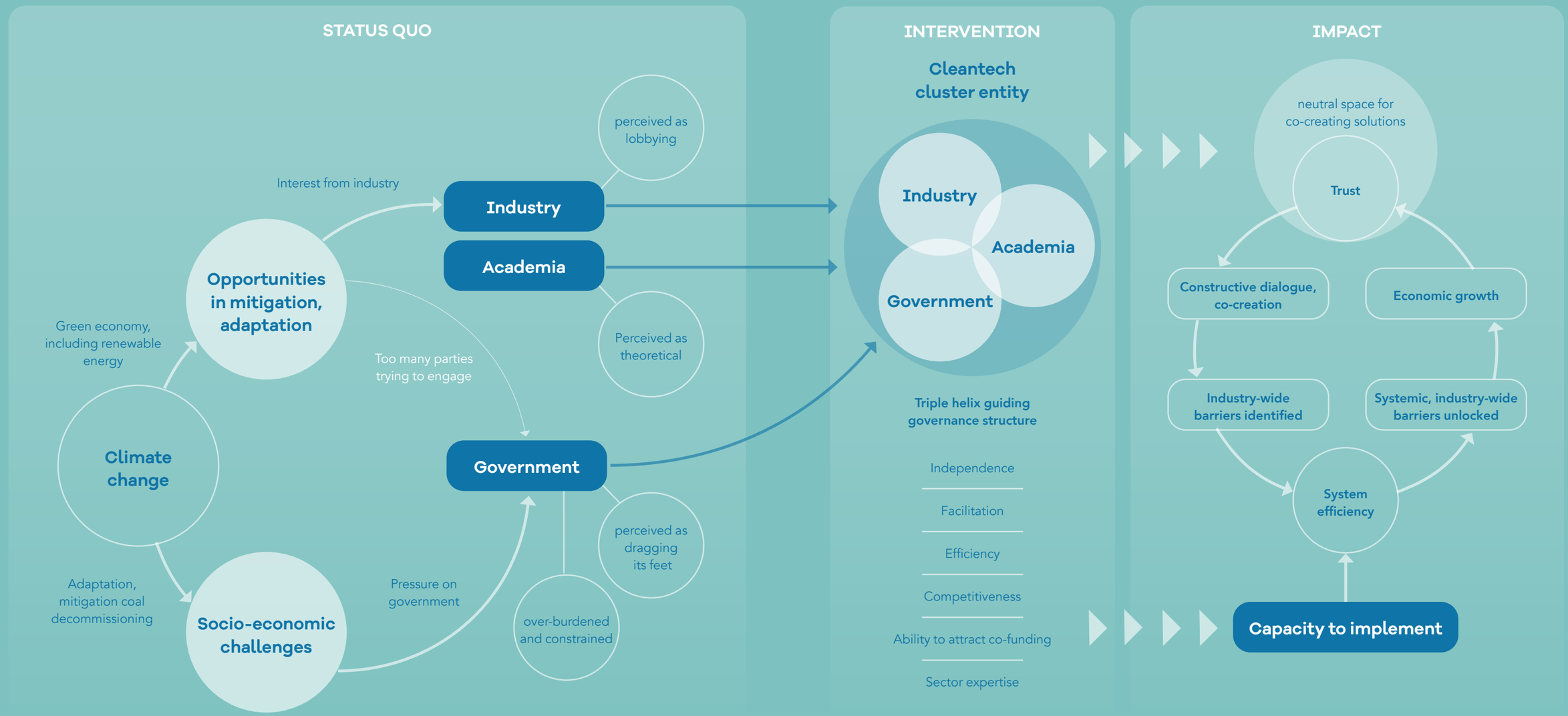
- **Focus**: The prioritisation of creating jobs and investment via competitiveness allows a reconciliation with the political need for local economic development.
- **Investment readiness**: The cluster will be more oriented towards inward investment attraction, which is a slight differentiator from export competitiveness and internationalisation efforts that is common in the European clusters
- **Collective efficiency**: Driving towards collective efficiency in a developing world context includes ecosystem building as the volume of uncertainty is higher, and so clusters can support actions improving overall "ease of doing business" through non-combative support to regulators and policy makers. (e.g. ports/visas/regulations). They can also support the development of policies and regulations where the cleantech is particularly new, for e.g. feed-in-tariffs, standards for Black Soldier Fly farmers, electric mobility standards, voluntary recycling targets for plastics users.
- **Institutional thickening**: Institutional thickness[14] is associated with four factors: a strong local institutional presence, high levels of interaction between local organizations, a structure of domination and/or patterns of coalition, and a mutual awareness of being involved in a common enterprise, and can have significant economic outcomes. Cluster agencies will need to carefully navigate the local institutional landscape, but over time they may be able to strengthen the local institutional presence by attracting different types of organisations to the sector, and by increasing the frequency and nature of firm-level interactions, and building consensus on what the common goal is for the sector, improve the "thickness" of the cleantech institutional environment.

14 Amin, A., and Thrift, N. 1994. Living in the global. In Globalization, institutions, and regional development in Europe, ed. A. Amin and N. Thrift, 1–19. Oxford: Oxford University Press.

Ultimately the success of a cluster agency is reflected in the growth and dynamism of the cleantech sectors it helps to support. The impact of the support provided should be reflected in statistics from the region in terms of how much the sector provides in GDP contribution, employment, number of new businesses, business turnover etc. If this kind of data is not easily available, alternative impact metrics may be gathered through investment declarations[15] or surveys of the sector. Additionally, the demonstration of increased project pipeline and funding of locally developed projects and initiatives is a clear indication that the coordination function held by the cluster agency is improving ecosystem coherence for grant makers and development financiers.

15 An investment declaration states that support was provided to the businesses by the cluster agency, and as a result investments were made and jobs created

Figure 3: Cleantech cluster agency theory of change



Examples of cleantech cluster agencies

The International Cleantech Network

The International Cleantech Network[16] (ICN) is an independent NPO for the world's leading cleantech cluster organisations, consisting of 23 regional clusters from four different continents. The ICN connects more than 7 000 SMEs, 100 public authorities, and 90 research institutions. Each cluster represents businesses and knowledge institutions that are leading within their field of cleantech, providing the ICN network with valuable expertise.

The ICN helps connect global stakeholders through an ICN Solutions Platform[17] where businesses are provided opportunities to match with each other and find international challenges[18] that they can apply to. The ICN members and their member businesses have opportunities to connect with each other at events and conferences, they are supported in match-making activities and develop international projects and R&D partnerships together. For SMEs this implies that if your cluster agency is part of the ICN, your firm is able to access global markets through a number of support mechanisms.

The ICN is going from strength to strength, and each year attracts new members and grows the portfolio of activities. Most notably, the ICN Solutions Platform has provided their members with over 300 challenges which has supported cross-border innovation partnerships.

GreenCape

GreenCape was established in 2010 in South Africa, initially focused on the Western Cape province. It is an NPO and has become recognised as a trusted centre of expertise for the green economy and an expert facilitator of regional green economic development, removing barriers to investment, enabling market growth and creating employment opportunities.

GreenCape's[19] vision is a thriving prosperous Africa mobilised by the green economy and in the next 5 years, GreenCape aims to be globally relevant in driving the uptake of green economy infrastructure solutions in the developing world context. GreenCape works at the interface between business, government and academia in order to identify and remove barriers to economically viable green economy infrastructure solutions in developing countries, thereby catalysing their replicable and large-scale uptake to enable each country and its citizens to prosper.

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16 https://internationalcleantechnetwork.com/

17 https://icn.solved.fi/login

18 An innovation challenge is where a problem owner (typically a business or public utility) is unable to source adequate solutions to their cleantech challenge and therefore develops a project where emerging and innovative solutions can be proposed for piloting or testing

19 https://green-cape.co.za/

GreenCape does three broad categories of work:

- **Advisory services:** GreenCape provides strategic advice and technical support to industry and other stakeholders on economically viable green economy solutions focusing on renewable energy, water and waste, and their application across all sectors (including specialised support for agriculture).
- **Sector development services:** GreenCape uses a cluster-based approach providing policy and regulatory advocacy and support, assisting investors to establish operations, removing barriers to the growth of existing businesses and establishing skills development partnerships. GreenCape works on both the 'demand side' (the users of green products and services) and the 'supply side' (the providers of technologies and services).
- **Thought leadership:** GreenCape conducts niche industry-relevant research for the green economy. This includes the flagship market intelligence reports as well as the development of guidelines and frameworks to support decision making in business and influence local, provincial and national government towards better supporting the growth of the green economy

Impact:

Since 2010, GreenCape has helped to facilitate and support over $2.4 billion worth of investment into the green economy in Southern Africa. From these investments, over 19 000 local jobs have been created.

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Replication example:

In 2020, GreenCape began the process of setting up the Mpumalanga Green Cluster Agency[20] (MGCA), and it was officially launched in May 2022. The MGCA was modelled on GreenCape's structure and approach to sector development and clustering. The MGCA is an independent NPO that is proving to be a critical component of the Just Energy Transition (JET) in the Mpumalanga Province in South Africa, as this coal-dominated region looks to diversify its economy away from fossil fuels and towards a more sustainable economy. It is still early days, but the concept of an independent intermediary organisation that can help build trust between the public and private sector in a region undergoing rapid and disruptive change has captured the imagination of many stakeholders in the space. It has helped promote investment opportunities in the region, built capacity, provided support to green businesses and supported regulatory updates needed to enable the green transition. The MGCA has already facilitated almost $35 million in investments and helped create over 250 jobs. It has also been placed at the centre of the JET Implementation Plan as the intermediary organisation to help facilitate the process towards a more sustainable and green economy.

20 https://mpumalangagreencluster.co.za/

Clean

Clean[21] is the Danish Water and Environment Cluster Agency, and has the vision for Danish companies to be world leaders in the water and environment sector. Clean has connected companies, utilities, knowledge institutions and the public sector for more than 15 years to market-driven green innovation in Denmark and abroad. Clean is a private-public company co-financed by the Danish Agency for Higher Education and Science, the Danish Business Promotion Agency and the European Union.

In the Danish water and environment cluster, SMEs meet with large companies, entrepreneurs, utilities, municipalities, regions and knowledge institutions. Together with strong partners, they open doors for innovation and business opportunities nationally and internationally, and accelerate business growth and the green transition. They support the growth and employment of water and environmental companies through knowledge dissemination and competence development, matchmaking and networking, collaborative projects and internationalization. Clean works within five focus areas: Water in the Technosphere; Air; Waste, Resources and Materials; Soil, Water and Nature; and Climate Adaptation.

Impact:

Within the first five years of Clean's registration, they measured the creation of 1 084 cleantech jobs. For this Clean received the EU RegioStars Award. Today Clean includes approximately 2 000 companies in its activities annually. They also directly finance over 50 active innovation projects where SMEs collaborate with other partners, such as academia, corporates, utilities, public bodies.

Replication examples:

In 2022 Clean, together with local partners, established a green cluster agency in Brazil, Greennova Hub[22] (GH). GH was modelled on Clean's structure and approach to sector development and clustering. GH is an independent NPO for which a critical component is bringing partners together for challenge formulation, funding identification and partnering in application writing and submissions. GH has successfully been admitted to the ICN as a member organisation and works closely with more experienced partners such as Clean and the ICN network when submitting/partnering in projects and applications. During its first two years the cluster agency has had a big impact locally by proving the validity of the cluster model and is already being integrated in events such as the G20[23] by the State of Rio de Janeiro who is also member of the cluster. The cluster agency is involved in three current projects and has submitted a further three proposals, for which they are awaiting approval. These projects have not only secured involvement by its members but also integration with several international partners and the cluster agency is already financially sustainable. The plan for GH is for the cluster to become the hub for ICN activities in order to secure a relevant regional presence.

In 2023 Clean supported the setup of a similar setup of a cluster agency in Colombia called Colombia Cleantech Cluster[24] (CTC). Using the experience from the establishment of the cluster in Brazil shortened the period required to set up the organisation and communicate its value to local stakeholders. CTC is already seen as an attractive partner in Colombia with Bogota, Medellin and ANDI (a national industry association) as members. There are two active projects in the cluster and three applications in process. CTC is also a member of the ICN and strongly linked to the Brazilian Hub.

Clean have also supported UNIDO and its pilot cluster establishment in Barbados, the Bloom Cluster[25]. UNIDO have a strong and positive opinion of the use and value of clusters in promoting sustainable development and they are promoting cluster replication in collaboration with Clean and ICN.

22 https://greennovahub.com.br/

23 The G20 or Group of 20 is an intergovernmental forum comprising 19 sovereign countries, the European Union, and the African Union.

24 https://cleantechcolombia.com/

25 https://bloomcluster.com/

03

Conclusion and Call to Action

> GreenCape and Clean are both members of the ICN, they are reputable cleantech cluster agencies, each with over a decade of experience. Both have set up new cluster agencies in different regions and have found success in accelerating the uptake of climate solutions in the developing world.

Together, they are looking to scale the roll-out of new cluster agencies based on the model adopted thus far and the lessons learnt:

Vital ingredients for success:

- **Local ownership**: The clustering model is premised on having and developing local networks. Therefore, the leaders driving the cluster must be from the region, familiar with the local environment, and well-known to relevant stakeholders.
- **Independence**: For an intermediary organisation to be trustworthy and neutral, it needs to be structurally independent, but ideally answerable to a board that comprises of the triple helix stakeholders
- **Financial sustainability**: Ideally, cluster agencies should receive core funding from public sector entities (at the city, regional or national level) that are keen on promoting green economic growth. However, in the developing world, this is a luxury that many NPOs do not have. Therefore, the financial strategy will need to consider how to build out a pipeline of projects to ensure sufficient financial sustainability for the core group of staff. It is unlikely for the cluster agency to attract member fees until they have proven their value to the ecosystem.
- **Differentiated funding opportunities**: NPOs are able to secure and attract funding for cluster activities that government and businesses are unable to. The NPO can utilise these funds to capacitate its members, provide technical assistance to government partners and re-grant to SMEs.
- **An open and collaborative culture**: The purpose of a cluster agency is to bring people together to form a collective. This implies that the cluster entity does not hold onto knowledge or information for its own benefit, it looks to widely consult on initiatives and then to share insights with relevant stakeholders

- **Clearly defined mission and vision to inform activities**: The cluster agency may become a lightning rod for a wide range of initiatives and ideas. It will need to be crystal clear to employees and external stakeholders what role the agency will play and what impact needs to be achieved.
- **In-depth research on the local conditions and stakeholders before launching the cluster agency**: As one of the initial steps of this process, a decent understanding of the local policy and regulatory environment, the key opportunities and barriers to be overcome, and the main stakeholders to be part of the collective is required

Variable elements:

- **The genesis of the agency**: A cluster agency may not need to be created from scratch and it may be useful to leverage off existing organisations or initiatives. The cluster agency may spin out of a government department or special purpose vehicle (SPV). It may also emerge from a research unit or university that is looking to improve the commercialisation opportunities for its innovations.
- **Thematic focus**: It will be advantageous for the cluster agency to develop according to where the most significant market opportunities lie. This will ensure that there is momentum behind the cluster, and it will vary depending on the local economic conditions

Concluding remarks

There is an opportunity to catalyse the adoption of cleantech in the developing world through the creation and capacitation of localised cleantech clusters that support cleantech solution providers and generate green economic returns. There are proven examples of how this has been achieved, with the theoretical foundation from the European experience but adapted to developing world circumstances and priorities. There is momentum building towards scaling up these efforts and the search is on for additional regional clustering opportunities.

The typical process for the setup and scale-up of a new regional cleantech cluster agency is outlined below in **figure 4**, but will be scoped out in more detail once the demand for these activities has been established:

Figure 4: A typical process for the setup and scale-up of a regional cleantech cluster agency.

Opportunity identification	• Research on the viable market opportunities for cleantech • Stakeholder mapping and assessment • Identification of potential partners, champions and collaborators
Breaking ground	• Initiation of cluster-like activities/projects within the region utilising experienced staff • Collaboration with local partners on project activities • Development of a member strategy and capturing of initial impact metrics
Building capacity	• Creation of a new, independent cluster entity • Fundraising for the new organisation, with on-going project delivery • Supporting with strategic guidance, and growing internal capacity
Scale-up and partnering	• Handover of day-to-day activities • Formalisation of partnership relationship and collaborative fundraising activities • Application to the ICN and associated cluster support mechansims

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