

The case for clustering

There has been an explosion of clean-tech clusters around the world, promising to help accelerate financing, growth, job creation and the mainstream of the next generation of sustainable technologies. Peter Adriaens, Shawn Lesser and Ben Taube explain

Four years after public stimulus funds aimed at greening the economy were committed, a new pattern of economic development, green job creation, green procurement and high growth ventures is emerging. During the past decade, the development of the clean technology sector was driven by private or strategic corporate investments in venture-grade companies, or by investment in projects underpinned by renewable energy targets and carbon markets.

We argue that the low-carbon economy has now gone mainstream. Local, regional and countrywide economic development groups, business organisations, corporate partners, investors and centres of R&D are coalescing in clusters aimed at accelerating the path to market for clean-tech innovations. From Europe to the Asia Pacific, via North America, dozens of clusters have been launched, often in conjunction with major clean-tech investment events.

Whether as incubators of clean-tech growth companies, or business services and partnerships for later stage innovators, these clusters represent and attract a portfolio of companies characteristic of their mandate (whether job promotion, green procurement, economic development or achieving high-value exits for investors) and local business culture (see table). Clean-tech clusters are fast becoming the driving force behind the acceleration of innovations in energy, water, waste, clean fuels, green materials and green buildings.

In 2010, the Global Clean-tech Cluster Association (GCCA) was formed to facilitate global connections, develop a platform of exchange for best practices and align emerging startups with corporate partners. By joining the GCCA, clean-tech clusters and their member companies increase their exposure for their region and companies worldwide, while also harnessing the knowledge, experience, and other benefits a worldwide association of clusters have to offer.

Until the advent of the GCCA, international collaboration was limited by a scarcity of resources and a lack of strategic alliances between clusters and cluster member companies. The GCCA is addressing this challenge by making

communication and collaboration for local clusters and their companies, faster, more efficient, affordable and, most importantly, global.

Why do these clusters matter?

Clusters help clean-tech investors. Like mutual funds, the portfolio of companies within each cluster represents a spectrum of deals that are currently investable, or that may be investable in future, whether seed and venture, debt, strategic, project or public finance. Growing interest in clean technology has drawn aggregate cluster company investments upwards of \$200 million, with individual investments in the sub-\$50 million range.

Indeed, the seven clusters that track investment in member companies estimate that close to \$800 million was invested in 2010/11 as the result of cluster efforts, a figure which, if replicated across the GCCA cluster universe, would suggest an aggregate exceeding \$3 billion.

During the past few years, the Clean-tech Group has reported on the increasing trend of corporate strategic and venture investments in clean-tech companies. Clusters are capitalising on this trend, engaging companies such as Veolia Environnement, Siemens, IBM and Bosch and many others to accelerate the integration of clean-tech innovators in new business practices. Particularly ac-

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tive in this space are Swiss Cleantech, CleanTECH San Diego, the Finnish CleanTech Cluster, EcoTech Quebec, the Singapore Sustainability Alliance and An tSli Ghlas – The Green Way (Ireland).

Clusters help portfolio companies. No two clusters are the same, but all aim to help accelerate access to markets and provide networking, business services, and links to the R&D pipeline, corporate partnerships or investors. Aside from visibility and access to the investment community, it is the strength of global supply chain collaboration that sets the clusters apart.

For example, in 2011, the Finnish CleanTech Cluster connected later-stage and corporate members with CleanTECH San Diego smart grid companies and investors, and is planning to repeat this with nascent clusters in China in 2012. The Swisscleantech cluster was instrumental in setting up Cleantech Nord-Rhein WestPhalen in Leverkusen, Germany, a public-private partnership. Similar cross-border connections are being promoted by other clusters, either within Europe or North America, or with Pacific Rim clusters, exposing member companies to corporate partners, entrepreneurial start-ups and potential investors.

The GCCA further amplifies this exposure and global collaboration and scalability. For example, EcoTech Quebec, focused on green procurement for ecocities, brought together 17 clusters and their member companies in Montreal in conjunction with the EcoCities World Summit, with meetings hosted by the Quebec pension fund. An tSli Ghlas in Dublin, a collaborative cluster established by industry, academic institutions and public authorities, GCCA Later Stage Awards event in 2011 brought together cluster managers and member companies with the top clean-tech and government players in Ireland.

Clusters spur economic development. While most clean-tech clusters are primarily business-, investor- or research-driven, around one-third are funded by economic development organisations. Clearly, the objectives here are green jobs and strategic investment. An analysis by the Brookings Institution suggested that the clean economy employs some 2.7 million workers in the US.

The contributions to job creation vary widely, as do some of the underlying assumptions to quantify them. Re-



Clean-tech clusters create clean-tech jobs

Clean-tech clusters

Country	Clusters	Cluster type	No of firms	Investment (general)	Company investment (if known)							Clean-tech focus
					G	A	VC	PE	D	SI	PF	
US	Washington Clean Technology Alliance (Seattle, WA)	B	90									General
	Environmental Business Cluster (San Jose, CA)	B, Inc, ED	28									General
	Watershed Capital Group (Atlanta, GA)	I	30									General
	CleanTech San Diego (CA)	B, R, I	800									Solar, fuels, efficiency, transport, grid, storage
	Portland Development Commission (OR)	ED	na									Solar, wind, efficiency, transport, green buildings
	Cleantech Alliance Mid-Atlantic (Philadelphia, PA)	ED	450	Pub/priv								Energy, transport, advanced materials
	Akron Global Business Accelerator (OH)	B, Inc	52									Waste-to-energy
	Clean Technology & Sustainable Industries (Austin, TX)	B, Inc, R, I	200									General
	New England Clean Energy Council (Boston, MA)	ED	400									Renewable energy, storage
	NYC Acre (New York, NY)	B, Inc, R	na	Pub/priv								Clean-tech, renewables
	CleanTech Los Angeles (CA)	B, Inc, R, I	na									Vehicles, renewables, water, infrastructure
	Colorado Cleantech Industry Association (Denver, CO)	B, R, I	200									Energy efficiency, renewables
	Chicago Clean Energy Alliance (IL)	B	na	Pub/priv								General
	CleanTech Center Syracuse (NY)	B, Inc, R	na									Energy, fuels, grid, building, transport
Canada	Ecotech Quebec (Montreal, QC)	B, R, I	320									General
	GreenTech Exchange (Vancouver, BC)	B	na									General
	MaRS Discovery District (Toronto, ON)	Inc	na									General
France	CD2E (Loos-en-Gohelle)	B, Inc, R, I	550	FDI, state								General
	French CleanTech (Lyon)	B, I	360									General
Italy	Progetto Manifattura (Trento)	Inc	20									Green buildings
Netherlands	Amsterdam Ecocluster	ED	na	Pub/priv								General
	CleanTech Business Club (Rotterdam)	B, I	46									General
Denmark	Copenhagen Cleantech Cluster	ED	27									Smart cities
UK	Ecoconnect CIC (London)	B, I	12									General
	UK CEED (Peterborough)	ED	380	Pub/priv								Energy, water, green buildings
Germany	CleanTech NRW (Leverkusen)	ED	94	Pub/priv								General
Ireland	The Green Way (Dublin)	ED	200									Energy
Austria	EcoWorld Styria (Graz)	B, Inc, R, I	175									General
Belgium	Flanders CleanTech (Oostende)	B	500	Pub/priv								General
Switzerland	Swiss CleanTech (Zurich)	ED	280	Pub/priv								General
Finland	Finnish CleanTech Cluster (Lahti)	B, Inc, R	400									Green materials, waste-to-energy, water
Australia	Australian CleanTech (Adelaide)	B	9									Solar
N Zealand	Grow Wellington	ED	15									General
Singapore	Singapore Sustainability Alliance	ED	na	Pub/priv								Sustainability, green IT, management
S Korea	CleanTech Korea (Seoul)	B	na									Solar, green chemistry
As of 1 January 2012. For details see www.globalcleantech.org Types: B = business, Inc = incubator, ED = economic development (publicly financed entity, I = investor, R = research na = not available or not disclosed				Pub/priv = no specific funding type indicated G = grants; A = angel funding; VC = venture capital; PE = private equity; D = debt financing; SI = (corporate) strategic investing; PF = project finance General = no specific focus indicated or all clean-tech domains supported. <i>Source: GCCA</i>								

ardless, credible sources indicate the economic impact of clusters. For example, the Washington Clean Technology Alliance is estimated to have spawned 83,000 jobs according to the Brookings report. The Colorado cluster generated about 3,000 jobs from 200 companies. Similar stories abound in Europe. For example, the EcoWorld Styria cluster Austria has facilitated the growth of 150 clean-technology companies, providing 5,500 jobs in renewable energy and environmental technology sectors. The Finnish CleanTech Cluster attributed new 500 jobs to its member companies, and Progetto Manifattura generated 100 jobs in its first year.

One of the key issues that the GCCA seeks to tease out is, what makes clusters successful? What are the practices that make clusters grow or founder?

What are the lessons for the design of public policy instruments that drive success of clusters?

The role of the cluster is to bring together the research enterprise, corporate partners and investment capital, engage with public authorities to help develop legal frameworks (green procurement, subsidies and market incentives) and organise trade missions to 'make local global'.

Since composition of clusters reflects the local business environment, and since different clusters may have different mandates, best practices are difficult to identify. The emergence of a variety of networking, incubation, business development and investment-dominated clusters, all of which are helping their members attract investment and create jobs, is indicative of a wide range

of potentially successful but perhaps not widely replicable models. Think of the largely unsuccessful replication elsewhere of Silicon Valley's approach to innovation enterprise – the whole is greater than the sum of the parts.

However, the public policy lessons to date include the need to promote richness in diversity, allowing local strengths to be leveraged, and to enable 'coopetition' instead of competition between clusters. To take clean-tech to the scale that continues to be attractive to investors and governments alike, global collaboration and sharing among clusters needs to be encouraged.

By setting up policies that enable public-private partnerships, mobilise financing through loans and private (including risk) capital, incentivise green procurement targets through market-

based strategies, and are conducive to promoting foreign investment and technology sharing, clean-tech clusters will continue to develop and grow, allowing their member companies to capture value in the market. **EF**

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