

Boston stakes its claim as centre for clean energy innovation

With its established technology scene, thriving private equity scene and a supportive state government, Boston and the state of Massachusetts could yet stake its claim as North America's hub for clean energy development and investment.

Massachusetts-based energy storage company A123 System's \$380m IPO in the midst of a challenging 2009 has been heralded by some as a marker for the clean energy sector's growing maturity. The company's valuation was pushed up to \$1.9bn on its first day of trading and, although this has settled since, it represented a strong investor appetite in a weak market and a strong vote of confidence for the still-emerging electric vehicle market. Its innovative lithium-ion battery technology was born out of the laboratories of the Massachusetts Institute of Technology, developed in part through investment from the university and Boston's bustling venture capital scene. It is a story that many companies in the state could tell.

'I think Boston is ground zero for the clean energy space,' says John Harper, a managing director at Boston firm Global Energy Investors. Formed in 2009, the firm invests in operating renewable energy projects. 'It is located in the middle of a number of states that are focused on bringing more renewable energy projects to market. It's the centre of an academic hub where a lot of innovation in technology, as well as business and finance is happening,' he adds.

Technology hub

Boston has the most educated labour pool in the US, with engineers, scientists, entrepreneurs and financiers flowing out of the region's universities, and often settling nearby. 'If you look at a five to ten mile radius around MIT, there's been a phenomenal amount of economic development driven out of there,' says Rob Pratt, CEO of energy efficiency company EnergyClimate Solutions. The presence of so many high class, technology-focused universities with hothouse programmes such as the University of Massachusetts Renewable Energy Research Laboratory and the MIT Clean Energy Prize means that the level of clean technology innovation is also extremely high. Coupled with one of the biggest private equity hubs outside of New York – including heavyweight firms such as Bain Capital, TA Associates and

Thomas H Lee Partners – and one of the most concentrated pools of venture capital dollars outside of Silicon Valley, Boston functions as an incubator where technologies born in university labs can gain access to seed and growth stage capital, before courting private equity cash or going public.

Fundraising focus

The convenience and advantage of such a high concentration of investors cannot be understated, according to Mitch Tyson, CEO and director of Wilmington, Massachusetts-based company Advanced Electron Beams. Tyson's company uses a

miniaturised version of electron beam technology to replace thermal and chemical processes in manufacturing, vastly reducing the amount of energy used. Investors in a \$14.2m Series C round in August 2009 included local investors Flagship Ventures, Atlas Venture, General Catalyst Partners and Rockport Capital Partners.

Tyson says, 'This is a wonderful place to start when raising money. I did go and visit California, but I love having my VCs local. There are

so many companies in this area that one can start with and they're very accessible.'

Numerous state and university initiatives also exist to identify the most promising technology innovations and provide start-up funding. Since 2005, the MIT Enterprise Forum of Cambridge has run the Ignite Clean Energy Competition, inviting early-stage technology companies and engineers to submit business plans, with the most promising receiving \$250,000 seed money and runners up receiving \$30,000. The winner in 2008 was wind technology company FloDesign Wind Turbine. Since then, the company has raised \$34.5m in a Series B round and Lars Andersen, former head of wind turbine manufacturer Vestas, joined as CEO.

FloDesign was also one of six recipients in Massachusetts of grant funding from the US Department of Energy's Advanced Research Projects Administration – Energy. The state took \$33.3m of the \$151m funding, more than any other state, with other winners including solar photovoltaic company 1366 Technologies, biofuel technology developer Agrivida,

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electric vehicle and energy storage company FastCAP Systems, fuel cell company Sun Catalytix Corp, and waste heat company MC10. MIT also received the largest award given out to a research institution, capturing \$6.9m for research on an all-liquid metal grid-scale battery.

A number of other Massachusetts companies are maturing to a point where going public is an option, with likely listers including wind farm operator First Wind, green car-sharing service Zipcar and energy management company Ameresco.

Intellectual resources

While the region has scarce natural resources, it is overwhelmingly dependent on foreign oil and coal-fired plants, which make up 25 per cent of its energy mix. Without the options available to more spacious or sparsely populated states, such as the large desert-based solar installations in California, Massachusetts has excelled at doing more with less, and will soon be spending more per capita on energy efficiency than any other state. Five years ago, it was widely predicted that Massachusetts would start to experience power shortages, but regional transmission organisation ISO New England launched a series of initiatives to meet power needs through energy efficiency and demand response.

‘It has worked fabulously well. We have not had to go out and build new power plants,’ says EnergyClimate Solutions’ Pratt. ‘Suddenly we’ve gone from being a power short region to a region that no one is saying has any difficulty. We’ve come up with something like 700-800MW of demand response availability.’

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help customers to use less energy without losing revenue.

‘That was a key thing,’ adds Advanced Electron Beams’ Tyson. ‘A utility makes money every time they sell more electricity, but the state changed the regulations so that the utilities could make money if they helped their customers save money, which had been one of the biggest market imperfections out there.’

State backing

The energy conservation drive has fuelled a strong proliferation of related companies in Massachusetts, such as energy efficiency company EnerNOC. Formed in 2001, the company achieved a \$100m IPO in 2007 and posted revenues of \$190m in 2009.

Clean energy technology in the state has also found a strong backer in Governor Deval Patrick, who assumed office in January 2007. He succeeded Mitt Romney, an advocate of increased offshore drilling, renowned for an indifferent approach to renewable energy projects. ‘Governor Romney paid no attention to renewable energy and Governor Patrick has made it a priority,’ says Tyson.

Governor Patrick has been a strong supporter of the state’s home-grown technology advantages. In a recent speech, he said, ‘We ought to drive toward a new industry in 

Massachusetts to become a global centre around alternative and renewable energy. The technologies and the products and services, I believe if we get that right, the whole world will be our customer. We have all the capability here in terms of the concentration of brain power and venture capital and that whole innovative tradition.'

Since then, he has introduced in a raft of renewable energy stimulus measures, including the Green Communities Act, which mandates utilities to increase the amount of renewable energy in their energy mixes, with a target of one percentage point increase in the amount of sustainable energy per year. Stimulus measures have also been put in place for solar power, next generation biofuels, green jobs and energy efficiency.

Barriers to growth

However, the image of Massachusetts as a progressive, energy-conscious state has been undermined by strong grassroots opposition to the development of any wind or solar projects of a substantial scale.

The opposition remains a source of frustration in the region's clean energy community. Pratt at General Climate Solutions served for over three years as director of the Massachusetts Renewable Energy Trust, a \$250m fund established in 1997 to stimulate the growth of clean energy. Despite achieving some success, Pratt resigned in frustration at the difficulties in getting larger, utility-scale wind and solar projects approved, due to what he decries as 'nimbyism'. To date, there are no wind or solar installations over 5MW in the state.

Pratt says, 'What I found in my three-and-a-half year stint there was that we had a lot of difficulty in terms of getting permitting approval for projects like large wind plants. We were having difficulties with 15-30MW wind projects around the state.'

'I reluctantly concluded that energy efficiency was probably going to be a more successful route for us,' he added, on the decision to leave the trust and found General Climate Solutions.

As it stands, there is currently 15MW of wind power and 21MW of solar power installed in Massachusetts. Although solar is forecast to increase to 60-70MW this year, larger scale projects can still find themselves hamstrung with red tape.

'All the major wind projects in Massachusetts are being litigated by anti-wind activists and others who have aesthetic problems with the projects,' says Ian Bowles, Massachusetts Secretary for Energy, on the opposition to larger plants.

With the state's protracted appeals process, projects such as renewable energy developer Iberdrola Renewables' 30MW Hoosac wind project has failed to advance in the five years since it received wetland permits, frustrating both investors and project developers.

New reforms, however, currently being pursued by state regulators would involve the consolidation of appeals, to move them through the courts more quickly.

Bowles says, 'The legislation would essentially say that in those cases where a town has approved that project, then any appeal of the town or state permits would go quickly or in an expedited fashion to the energy facility siting board of the state, and the board's decision would only be appealable to the state supreme court.'

'The legislative reform would consolidate all those appeals, so it would make a big difference,' he adds.

Cape Wind

No project has seen more attempts to block it by than the much-disputed Cape Wind project, which has been fighting red tape for over nine years. The project, being developed by local company Energy Management, could become the first large offshore wind farm in the US.

The proposed wind project would involve the installation of 130 turbines off the Nantucket Sound coastline, with the potential to expand Massachusetts's wind power capacity by up to 420MW.

Since his election, Governor Patrick has pushed for approval of the project and a final decision is expected imminently, with optimism about that the project may finally get the go-ahead.

'We are optimistic that it will be a positive decision. I expect construction would begin summer of 2011,' says Bowles.

If Cape Wind is approved, there is an expectation that it will be less difficult in future to

build large projects in the state.

'I think that the Cape Wind decision could end up being a little bit like the healthcare bill, where there's all this opposition until it gets passed, and then the people who were in opposition to it realise that it's not as bad as they think,' adds Global Energy Investors managing director and CEO David Richardson. 'What needs to happen is that it needs to be part of the cultural landscape.'

Whether the project is approved or not, more disruptive technologies are set to emerge from the state's labs, fuelled by a growing interest from its thriving private equity and venture capital scene.

Tyler says, 'I think we've got a broad range of clean technologies. What I think we benefit from is that all these strong technological bases come together in solving some of these new problems.'

He adds, 'If you look at the technologies that are here, it's using science and engineering, and applying them to these new applications. We have a rich source of engineering and science which we can tap to solve some of these new energy problems.' ■

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