Vol 02 | Issue 03| April 2008
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CLIMOS AIMS TO BEAT THE SCEPTICS AND PROVE THAT THE WORLD'S OCEANS CAN HOST PROJECTS TO REDUCE GREENHOUSE GAS EMISSIONS AND GENERATE CARBON CREDITS. **ROBIN LANCASTER** REPORTS

UPON A PAINTED OCEAN

The global carbon markets have so far had little cause to consider emissions reduction projects in the world's oceans. But that could change if Climos, a San Francisco-based company, has its way and starts creating carbon credits from a process known as ocean iron fertilisation (OIF).

OIF works by improving the efficiency of natural phytoplankton production in the ocean. Phytoplankton – a single-celled microscopic organism – continually bloom, mature and die in a 60-day lifecycle, with a portion of their biomass sinking and locking away carbon for long periods of time. Like all plants, Phytoplankton require various nutrients to grow and, in the central ocean basins, the scarcest of those nutrients is iron. OIF applies trace amounts of iron to the deep ocean surface, which enhances phytoplankton growth and ultimately sequesters atmospheric carbon dioxide into the ocean depths.

On 5 March, Climos secured a first round of financing, with a $3.5-million investment from venture capital fund Braemar Energy Ventures and Elon Musk, an entrepreneur and technology investor. The funds will be used to expand the scope of Climos's work, with the aim of establishing a demonstration project in 2009 that generates verifiable emission reductions for sale in the voluntary carbon market.

"The goal is to do this under a voluntary framework at the moment," said Dan Whaley, the company's founder and chief executive officer. "We aim to work with the Voluntary Carbon Standard (VCS) ... to demonstrate that the technique can work and show that you can do it in the regulated market," he said. The VCS was set up by the International Emissions Trading Association, The Climate Group, the World Business Council for Sustainable Development and the World Resources Institute to provide the voluntary market with a quality benchmark for carbon offsets.

Climos was established in 2006, when Whaley linked up with the company's chief science officer Margaret Leinen, a former assistant director of geosciences at the National Science Foundation (NSF) – a US government agency.

"The aim was to see if we could connect the science with the market mechanisms that exist," said Whaley. "We weren't sure, but thought it was probably worth a try."

Whaley has a good track record with giving things a go. In 1994, he founded Getthere, the first company to conduct travel reservations via the internet, and in 2000, a year after an initial public offering, he sold it for $750 million.

During a road trip from California to Buenos Aires in Argentina following the sale of Getthere, he started hearing about issues relating to climate change. "I was reading and digesting information and considering what might be done from an entrepreneurial point of view for energy and the environment," he said.

With Leinen on board she set about putting together the company's scientific advisory team, which includes Rita Colwell, director of the NSF, Tim Killeen, director of the National Center for Atmospheric Research and Tom Lovejoy, president of the Heinz Center, a non-profit institution dedicated to improving the scientific and economic foundation for environmental policy.

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Dan Whaley, Climos

On the carbon market side, the goal was to find the most credible players and put a methodology in place on which to base a project, said Whaley. The plan was to develop the project as if it was for the clean development mechanism (CDM) – UN-approved emission reduction projects that create carbon credits in developing countries. Although, he pointed out that the project cannot be an official CDM project for several reasons, such as the fact that it will be located in the middle of the ocean.

At the start of 2007, Climos approached London-listed

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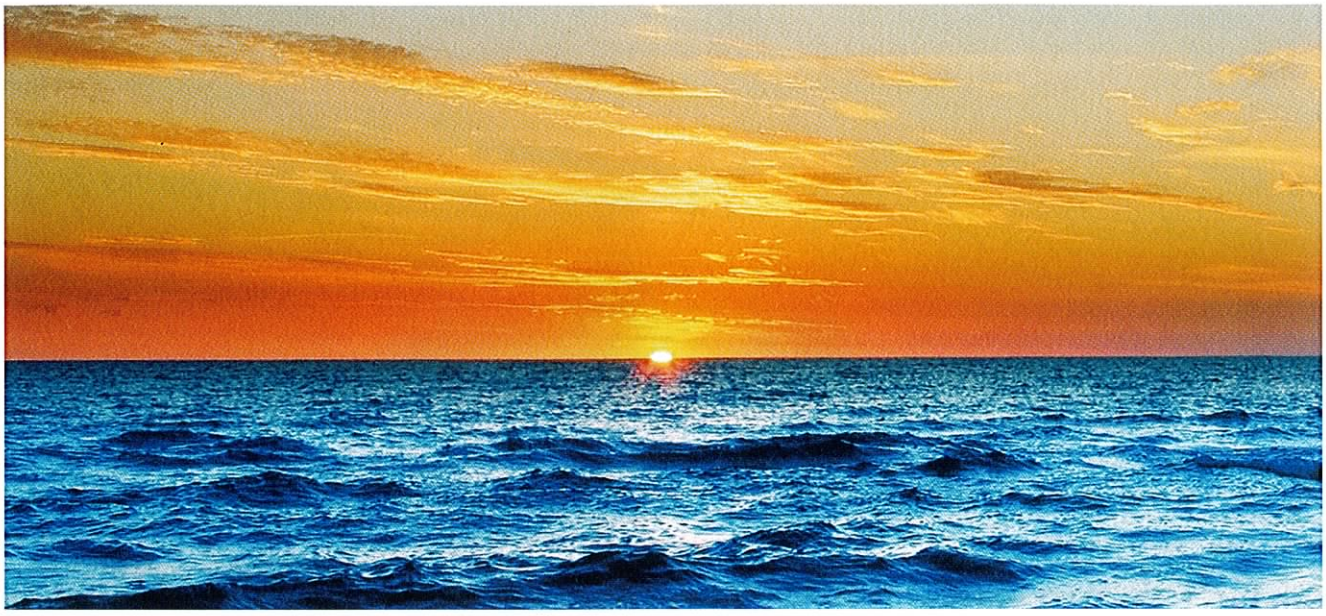

emissions reduction project developer Ecosecurities to develop the methodology. At first, Ecosecurities were unsure of the project's carbon market worth, but, said Whaley, Climos convinced them that it was feasible.

"This is an extremely controversial technique," he said. "Not all scientists agree that it works, is safe or should be done. (Ecosecurities) came into the meeting sceptical and left turned around about whether it could be done."

Since 1993, there have been 12 publicly funded experiments aimed at showing that the OIF process triggers increased blooming of phytoplankton. The most recent of the these experiments in 2004 measured 50 per cent of the biomass sinking below 1,000 metres – a depth where the carbon would be sequestered away from the atmosphere for hundreds of years, the company said. "(It showed) that there can be high efficiency and that the sequestration can be measured fairly and rigorously," said Whaley.

However, in the 2007 Intergovernmental Panel on Climate Change fourth assessment report on mitigation of climate change, OIF was described as "largely speculative and unproven and with the risk of unknown side effects."

The scepticism has already resulted in one company, with similar plans to Climos, to "indefinitely postpone" its work on OIF within the carbon market. On 13 February, California-based Planktos blamed a "highly effective disinformation campaign" for the company's failure to raise the capital needed to fund its own OIF research trials.

"One of the reasons we went into this was because we saw Planktos and thought we can do something there," said Whaley. "Competition is fine, but in an astounding way they created a very negative backlash."

Planktos was the subject of some high profile media coverage, including features in the *New York Times* and the London *Times* newspapers and on the BBC television channel in the UK. But, it seems, the high profile helped to attract the critics that have brought its efforts to a halt.

Climos is perhaps more wary and Whaley said it prides itself on having a questioning mind and coming up with the answers later. "Can it be effective, can it be safe? We need funding to focus on the unresolved issues," he said. "If sequestration can be proven to work it will be at the end of a long process, when we can say 'this is what it looks like and this is the amount of tonnes that can be stored,'" he added.

Clearly Braemar Energy Ventures believe in the company's efforts. "(Climos) have created a strong business plan for advancing this technology, while addressing the questions surrounding it," said Dennis Costello, managing director of Braemar, which has investments ranging from $1 million to $20 million in around 40 companies.

Climos's methodology is currently being assessed by Det Norske Veritas (DNV), an Oslo-based company that has a large presence in the carbon market as a verifier, validator and CDM methodology assessor.

"(DNV) have returned their first comments (on the methodology) and, of course, they have a lot of questions," said Whaley.

Key issues surround permanence of the reductions, as well as measurement and verification. Climos is planning to hold several science workshops this year addressing such issues. The workshops, backed by the recent investment, will help to summarise current scientific knowledge about OIF, identify areas where more research is needed and provide direction on design elements for further demonstration projects in the future.

The company also plans to use the funding to conduct an environmental impact assessment in 2008 and to apply for international permits to support the initial demonstration project. Under the UN International Maritime Organisation London Convention, the company requires a permit from a signatory country before it can engage in an OIF project.

Whaley expects the company's methodology to be completed by the third quarter of this year and is confident that carbon credits will be ready for sale by the end of next year. "Permits pending ... we will be selling credits with a 2009 vintage," he said.

Following that, the company aims to provide climate change regulators with regular updates on their progress. "We'll show them where we are, where we think it fits in with their work and hope that it will help to inform them with their cap setting," said Whaley.