

At a College in Maine, Class Projects Tackle Climate Change

From First Business Page

the bucket," he said.

"The way to scale it up is to get our students to really think differently about it and for them to make advances on renewable energies off campus and once they graduate," he said.

Other academic institutions use project-based learning, and students at technical powerhouses like Stanford, M.I.T. and the California Institute of Technology are busy inventing new energy products and approaches. But few colleges have taken on climate change — and alternative energy as a solution — with as much fervor as the College of the Atlantic, weaving it into the school's curriculum and operations.

A team of students in a class called the Physics and Mathematics of Sustainable Energy, for example, met last term with companies in Portland to determine if it would make economic sense to bring a large-scale anaerobic digester, an apparatus used to break down organic waste, to a dairy farm on Mount Desert Island.

And projects continue to move ahead from a program started last year that sent about a dozen students to Samsø, a Danish island that produces more energy from renewable sources than it uses. That program, organized with the Island Institute in Rockland, Me., has already resulted in bulk purchases of energy-efficient lighting, heating products and energy upgrades for homes. There is also the potential installation of solar arrays on several Maine islands.

Some of the students who participated are continuing to pursue energy projects after they graduate, including Nick Urban, who is now working for a renewable-energy developer, and Saren Peetz, who is hoping to raise enough money to extend her efforts to help Mount Desert Island better meet its energy needs and potentially grow into a self-sufficient, renewable-energy community like Samsø.

There, Ms. Peetz saw "this whole idea of community leadership but also bringing everybody to the table," she said. "I just really realized that that's what I want to do with my life."

For small islands like Mount Desert, the need is acute. Fuel is imported at great expense, leaving year-round residents in a vicious cycle of sorts: The more money they spend on conventional energy, the less there is to find alternative sources.

A small, experimental school founded in 1969, with 35 students, by a priest and an entrepreneur, the College of the Atlantic takes an interdisciplinary approach to human ecology, the study of the interaction between people and their social and physical environments. There are no departments, and the approximately 350 enrolled students learn by doing.

Consider the description on the school's website: "College of the Atlantic is for idealists with elbow grease."

"The mission of the school is to create the people who can create the change," said Jay Friedlander, chairman of the sustainable business program, which in-



Zach Soares, above, with his daughter outside his home in Bar Harbor, Me., was the recipient of a home energy upgrade through a student project. Below left, Saren Peetz, a recent graduate of the College of the Atlantic, plans to spend the summer helping a community better meet its energy needs. Below right, solar panels sit on top of a sustainably built dormitory at the college.



cludes the Hatchery, an on-campus incubator. "And then the school itself is a big social entrepreneurship experiment."

It is an approach that is catching on, said Debra Humphreys,

A curriculum focused on finding solutions through student-led projects.

vice president for policy and public engagement at the Association of American Colleges and Universities, at institutions as disparate as Cornell, Mount Holyoke and the College of Wooster in Ohio.

Part of the impetus is that educators see it as a way to better en-

gage students with some of the interests they already have, as well as to prepare them for workplaces that increasingly seek employees with the collaborative skills that applied projects can foster.

"Organizing teaching around problems and cross-disciplinary work is much more aligned with what the world needs and what the economy demands," Ms. Humphreys said.

Still, she said, the commitment to green energy at the College of the Atlantic is unusual.

In 2007, the school announced that it had become carbon neutral, largely through the purchase of credits to offset its emissions. Six years later, its trustees voted to divest from fossil fuel interests, and the school embarked on an ambitious plan to become free of fossil fuels by 2050 by reducing consumption while increasing its production and purchase of energy from renewable sources.



In keeping with the school's overall approach, the effort is being designed, carried out and monitored through student projects.

That endeavor, and the school's growing reach among Maine residents, has accelerated since the Danish trip, which Mr. Friedlander helped oversee with Anna Demeo, a professor of physics and engineering who directs the energy program.

"We've really gotten our stride where this community knows us more and knows what we're doing," Ms. Demeo said. "Samsø really raised the profile and gave this whole effort teeth in a way that it has real staying power."

Of course, because it is a school, not all projects have panned out. The wind turbine that a class installed on one of the college's farms has proved inefficient and not cost-effective, Ms. Demeo said, because a town ordinance kept it from its optimum

height. Students trying to analyze energy use of the refrigerators at a local store reported in one of her classes in May that they may have blown two fuses.

But the student efforts have generally been met with approval.

"What we were doing wasn't quite cutting it, and just having some good suggestions really helped," said John Barnes, who is in charge of carpentry in the buildings-and-grounds department at the college and received a free energy audit and air sealing last year as a result of a project. It was the "little kickstart" he said he needed to make changes around the house.

"People sometimes say if lights made the same noise as dripping water, more people would shut their lights off," he said. Just to be able to see where his house was losing heat, he said, "lights that fire and gets you motivated about fixing things."

BUSINESS BRIEFING

European Officials Set Rules To Nurture Digital Commerce

European officials approved on Tuesday a series of sweeping changes to how mobile and wired Internet service works in the region, pushing through rules that outlaw mobile roaming charges and forbid providers from giving preference to some types of online traffic. As part of the new rules, which are expected to be officially approved by European governments over the next few months, officials banned cellphone roaming charges, beginning in 2017, when people travel across the 28-member European Union. The changes also outline how Internet service providers must treat data over their networks, forbidding broadband providers from slowing down any particular service. Lawmakers say they want the new rules to foster greater economic activity in the European Union, which in many ways is still divided by national boundaries. European policy makers' attention has already turned toward new legislation — called the Digital Single Market — that was announced in May. MARK SCOTT

Facebook Sweetens Terms For Buyers of Video Ads

Facebook is giving advertisers the option to pay for video ads only if users view them for at least 10 seconds, a move that comes as the social media company faces pressure over how it charges for ads. Facebook began offering the new ad-buying feature on Tuesday to bigger advertisers. Previously, Facebook immediately charged advertisers when their video ads appeared in news feeds. But advertisers and media buyers expressed frustration, arguing that users were quickly passing by the ads in their feeds. Elisabeth Diana, a Facebook spokeswoman, said that the company was aware of these complaints, and that it had been thinking about a new ad-buying option. "We want to give marketers more flexibility," she said. "We heard the frustration, but we've been working on this for a while." SYDNEY EMBER

Output Cuts in Brazil and Iraq Augur Risks of Oil Shortage

Immense downward revisions to oil output in Brazil and Iraq have increased the risks for oil markets of going from the current feast to famine within just a few years, according to the long-term forecast of the International Energy Agency. Brazil and Iraq had been expected to add over two million barrels a day to global supply by 2020, but Brazil's Petrobras cut this week its five-year production outlook by 1.4 million barrels a day, and Iraq is renegotiating deals with oil majors to reflect "more realistic" output targets. "All these project cancellations and deferral and cutbacks are setting the world up for tighter oil markets in the medium term (2017-19) unless the record Middle East oil rig count successfully translates into significantly higher production," said Seth Kleinman of Citigroup. (REUTERS)



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Apple Music Makes Debut With D.J. Carrying the Flag

By BEN SISARIO

"Into the unknown we go," the D.J. Zane Lowe said just after noon on Tuesday, as he began his first show on Beats 1, the Internet radio station that is a big feature of Apple's new music service.

Many in the music industry may have been thinking the same thing. The new service, Apple Music, is the most thorough change to the company's audio offerings since it introduced the iTunes store in 2003, a move that legitimized a nascent digital market and led to a computer manufacturer becoming the world's largest retailer of music.

As Apple Music opened on Tuesday — most listeners found it as part of an update of Apple's mobile operating system — much of the attention turned to Beats 1, a live radio feed that in some ways functions as marketing for the entire service. Led by Mr. Lowe, who was born in New Zealand and became a top announcer on the BBC station Radio 1, Beats 1 is in some ways an old-fashioned radio station, with D.J.s, promotional recordings — "carts," as they are called in industry parlance, after the tape cartridges they used to fit on — and teases about new songs.

After warming up with atmospheric tracks by Brian Eno, Mr. Lowe opened his first show with the song "City" by Spring King, a little-known alternative band from Manchester, England. Then came Beck, the English producer Jamie XX, the English rapper Skepta and AC/DC, a playlist that in some ways telegraphed Mr. Lowe's musical approach. He is



The D.J. Zane Lowe began his first show on Beats 1, the Internet radio station of Apple Music, on Tuesday.

dedicated to brand-new rock and hip-hop music and isn't afraid to take chances on the kinds of obscure records that most commercial American radio stations would normally consider too risky to play.

Even Spring King seemed surprised by Mr. Lowe's choice. "Yo @zanelowe are you kidding?!?!? you just spun our tune! you're an absolute legend!!!" the band tweeted shortly after he played its song.

But as part of Apple's new service, the station played plenty of songs that were exclusive to it, or that highlight its catalog. AC/DC, long a holdout to streaming services, joined Apple Music — along with Spotify, Rhapsody and others — only on Tuesday. And Mr. Lowe played Pharrell Williams's new song, "Freedom," a

track that, for now at least, can be heard only through Apple.

Mr. Lowe has a kinetic style that is derived partly from hip-hop producers, and for American listeners it can come across as a slick and hyperactive version of a college-radio announcer who is eager to play all the coolest new tracks. (Although few college D.J.s have Mr. Lowe's clout in music: On Tuesday, he teased listeners to tune in the next day for his interview with Eminem.

"If you have ever had an inkling that you would enjoy Prince's very eclectic WPRB, but don't have the time to tune in, or enough patience once you get there, it's a more managed version of that experience," said Sean Ross, a radio analyst with Edison Research who pays close attention to station playlists.

Apple Music is competing directly with a range of online streaming music outlets. Like Spotify, it is offering \$10 monthly subscriptions that let people stream any song they choose out of a catalog of tens of millions. Like SoundCloud, it lets artists upload brand new or unofficial tracks, and like Pandora, it offers Internet radio feeds that cater to a user's tastes.

The new service carries the hopes as well as the worries of the music business. If Apple Music is successful — some analysts say they believe it can attract as many as 100 million subscribers — it could deliver billions of dollars in revenue to the music industry and establish streaming music as a stable business. But at that same time, its embrace of streaming may hasten the demise of downloads, which are a vital source of income for the music business but over the last couple of years have begun to fall.

Apple did not release information on Tuesday about how many people had downloaded the new operating system or were tuning in to Beats 1. But Mr. Lowe's Twitter feed was full of messages from listeners from around the world — South Africa, Germany, France, the United States, England, Australia — which added to the excitement of the show's debut and also demonstrated Apple's enormous reach.

"My name is Zane Lowe," he announced near the beginning of his show. "I come from Auckland, New Zealand, and I'm proud to be here to play music for the entire world."