

A bid to cut emissions looks away from coal

WASHINGTON (The NYT) — As Congress debates legislation to slow global warming by limiting emissions, engineers are tinkering with ways to capture and store carbon dioxide, the leading heat-trapping gas.

But coal-fired power plants, commonly identified as the nation's biggest emissions villain, may not be the best focus.

Rather, engineers and policymakers say, it may be easier and less costly to capture the carbon dioxide at oil refineries, chemical plants, cement factories and ethanol plants, which emit a far purer stream of it than a coal smokestack does.

Carbon dioxide typically makes up only 10 percent to 12 percent of a coal plant's emissions, they note, and the gas is so mixed with pollutants that it is difficult to separate.

Cheaper strategies for sequestering carbon dioxide could prove especially important if Congress passes a law setting up a so-called cap-and-trade system. That would set a national ceiling for overall emissions and allot pollution allowances to utilities, manufacturers and other emitters, which could then trade them among themselves.

Companies that exceed their carbon dioxide emission allowances could buy credits from those that pollute less. Under such a system, a coal plant that had exceeded its allotment might pay a chemical plant that could separate a ton of carbon dioxide more cheaply.

"If we have a cap-and-trade scheme, it will happen wherever it is the most cost-effective," said Jeffrey R. Holmstead, a lawyer and former assistant administrator for air and radiation at the Environmental Protection Agency.

Lending momentum to this thinking, a Texas company, Denbury Resources, is building a 320-mile pipeline for carbon dioxide that will run from Louisiana to Houston.

Initially the pipeline will take natural underground deposits of carbon dioxide in Mississippi to the aging oil fields of east Texas, where it can be used to force more oil to the surface.

But as the pipeline threads its way through more and more refineries and plants — the chemical heartland of the United States — manmade carbon dioxide captured at those sites could also be added and stored.



Sequestering a ton of carbon dioxide from a chemical plant would have the same effect on the Earth's atmosphere as storing a ton from a coal plant, scientists and industry executives emphasize.

"Sequestration is not a coal technology — it is a greenhouse gas abatement strategy," said S. Julio Friedmann, leader of the carbon management program at Lawrence Livermore National Laboratory.

Last month, the Energy Department announced \$44 million in grants to develop the technology, known generally as carbon capture.

Among them was \$1.72 million for Praxair, a chemical company based in Connecticut that operates two plants near Houston that make hydrogen for use in oil refineries.

The money will go toward developing engineering studies on how to capture carbon dioxide from the hydrogen production and deliver it to Denbury.

Carbon dioxide makes up 20 percent of the gas resulting from hydrogen pro-

duction, twice the concentration found in a gas stream from a typical coal plant. Recovering it from this stream rather than a coal plant smokestack would therefore be cheaper and simpler.

In the oil industry, drillers have for years tapped underground reservoirs of carbon dioxide, brought it to the surface and moved it by pipeline to oil fields. Then they inject it into the fields to help force oil to the surface in a process called "enhanced oil recovery."

If the oil industry left the natural carbon dioxide where it was, and drew on carbon dioxide from industrial plants instead, far less manmade carbon dioxide would enter the atmosphere, experts say.

What oil drillers pay for carbon dioxide depends on the value of the oil it will help produce. When oil is at \$70 a barrel, carbon dioxide goes for \$10 or \$11 a ton, said Tracy Evans, the chief executive of Denbury, the Texas company building the carbon dioxide pipeline. Should the Congressional legislation

mandate a cap-and-trade system, that modest price could be very important. "Wherever you can go to store a ton of carbon the most cheaply, you will go," said Mr. Holmstead, the former E.P.A. administrator for air.

Another likely source of pure streams of carbon dioxide are plants that refine natural gas. The natural gas usually comes out of the ground mixed with carbon dioxide, which natural gas sellers routinely remove so the natural gas can be considered "pipeline quality." That carbon dioxide is sometimes reinjected into the ground, but sometimes vented.

Then there are cement kilns, which produce a nearly pure stream of carbon dioxide.

For now, no one is sure what it will cost to capture and sequester carbon dioxide from coal plants because the first such project in the nation, at American Electric Power's coal-fired plant in New Haven, W.Va., got under way only last month. At the moment, the process

consumes 30 percent of the coal plant's energy, but engineers are working to cut that in half.

Even so, experts expect the price to run to \$60 a ton or more. But pure streams could be captured for the cost of drilling a natural gas well and compressing the gas into liquid form — perhaps \$10 to \$15 a ton, Dr. Friedmann of the Livermore laboratory said.

Bruce Nilles, director of the National Coal Campaign at the Sierra Club, also cites natural gas plants as a promising avenue for carbon capture. Natural gas has only half as much carbon dioxide in it as coal does. So the equipment needed to separate and sequester the carbon dioxide at a gas plant would be half as big as the machinery at a coal plant of the same size, and would cost less to build and operate.

Mr. Nilles and others say that biomass fuels, derived from wood, waste and alcohol, could offer an even better opportunity for carbon capture. If an electric plant burns wood chips or other plant material in place of coal, it produces a stream of smoke from which carbon dioxide can be taken and then injected deep into the earth.

The advantage is that if a tree is cut down and burned in a boiler, a new tree can grow in its place, and absorb carbon dioxide from the atmosphere. That makes the process "carbon negative;" for each ton burned, the amount of carbon dioxide in the atmosphere will decline.

Eventually, Mr. Evans of Denbury said, most of the carbon sequestration will come from the power sector, because it is a far larger emitter than the chemical or refining sectors.

But for the moment, he said, for companies like his, which use carbon dioxide to drill for oil, there is something of a shortage. His company is still drilling for natural deposits of carbon dioxide, he said, and "we don't have any to sell to others."

YouTube cashes in on one billion weekly views

YouTube is now making money from one billion video views per week. The Google-owned video sharing site has more than tripled the amount of views it is now able to monetize, since the same period last year. Google would not reveal how many individual clips make up the one billion views, nor would it disclose how much revenue those views are generating.

The increase in the amount of views it is now able to monetize has grown due a rise in the number of content owners, such as ITV, opting to use YouTube's 'content ID' system.

Content ID is YouTube's copyright fingerprinting system which allows rights holders to block or make money from unauthorized use of their material. It is free of charge and being used by 1,000 content partners globally, including major brands such as Electronic Arts, Sony BMG and most recently Tiger Aspect, the creators of Mr. Bean programming.

It has played a major role in content holders regaining control of the unauthorized use of their material on the major video site and reducing the amount of legal actions are brought against YouTube for copyright infringement.

Rights holders, once unauthorized use of their material has been located, can then either choose to have it removed from YouTube, or for YouTube to serve an ad around the video and split the money in a revenue sharing deal which Google says favors the content owner.

One third of the content being monetized has come from unlawful user uploads, the content owner has chosen to keep up on the site in exchange for an advert being served.

And two thirds of the videos making money are uploaded by the content partner themselves. YouTube is selling the majority of the adverts around the content — unless a special arrangement has been negotiated, as with the recent Channel 4 deal — which will see the broadcaster sell the adverts around its own content.

The increase in views YouTube is able to make money from is being seen by analysts as a positive step towards potential profitability — as the video site has famously yet to turn a profit, since it was created and subsequently acquired by Google for \$1.65b (£883m) in 2006.

However, there is a lack of knowledge about how much it costs to operate, as streaming video online en masse, is extremely costly. Enders Analysis's head of Internet Ian Maude, predicts that the site will generate \$400m (£243m) by the end of this year, which is double his estimates of 2008 turnover. This figure includes revenues generated by both video and display advertising, as well as Google AdSense.

"It is difficult to model out YouTube's costs accurately, so knowing how close it is to profit is near impossible. However, I think its revenues are growing ahead of expectations and pretty rapidly in a tough advertising market.

"It is also good news for them the site that it is starting to attract full length quality content — as is the case with its Channel 4 deal. This is crucial in a bid to make it a more attractive proposition for advertisers." YouTube streams a billion videos a day.

(Source: Telegraph)

3,000 images combine for stunning Milky Way portrait

A new panoramic image of the full night sky — with the Milky Way as its centerpiece — has been made by piecing together 3,000 individual photographs.

The panorama's creator, Axel Mellinger of Central Michigan University, spent 22 months and traveled over 26,000 miles to take digital photographs at dark sky locations in South Africa, Texas and Michigan.

"This panorama image shows stars 1,000 times fainter than the human eye can see, as well as hundreds of galaxies, star clusters and nebulae," Mellinger said. To combine these images, a simple cutting and pasting job would not suffice.

Each photograph is a two-dimensional projection of the celestial sphere. As such, each one contains distortions, in much the same way that flat maps of the round Earth are distorted.

In order for the images to fit together seamlessly, those distortions had to be accounted for. To do that, Mellinger used a mathematical model — and hundreds of hours in front of a computer.

Another problem he had to deal with was the differing background



light in each photograph.

"Due to artificial light pollution, natural air glow, as well as sunlight scattered by dust in our solar system, it is virtually impossible to take a wide-field astronomical photograph that has a perfectly uniform background," Mellinger said.

To fix this, Mellinger used data from the Pioneer 10 and 11 space probes. The data allowed him to distinguish star light from unwanted background light.

He could then edit out the varying background light in each photograph and fit them together so that they wouldn't look patchy.

Mellinger describes the image-making process in the November issue of the journal *Publications of the Astronomical Society of the Pacific*.

The result is an image of our home galaxy that no star-gazer could ever see from a single spot on earth.

Mellinger plans to make the giant 648 megapixel image available to planetariums around the world.

(Source: Space.com)

Approval of non-Latin website addresses is 'biggest technical change to internet'

The approval of website addresses using non-Latin characters has been described as the "biggest technical change to the internet" since its creation 40 years ago.

Internet addresses using scripts such as Hebrew, Hindi and Korean will be available by mid-2010 after their use was approved on Friday by the Internet Corporation for Assigned Names and Numbers (ICANN) board at a meeting in Seoul, South Korea.

Nations and territories will be able to apply for internet address endings reflecting their name and using their national language from November 16, when ICANN's Internationalized Domain Name (IDN) fast track process begins.

If the applications meet certain criteria, including government and community support and a stability evaluation, the applicants will be approved to start accepting registrations for domain names.

More than half the world's internet users do not use English or a Latin-based language as their first language and this move will see around 100,000 new characters available for use in IDNs.

Peter Dengate Thrush, chairman of ICANN, a not-for-profit corporation which oversees internet addresses, said: "The coming introduction of non-Latin characters represents the biggest technical change to the internet since it was created four decades ago.

"Right now, internet address endings are limited to Latin characters - A to Z.

But the fast track process is the first step in bringing the 100,000 characters of the languages of the world online for domain names."

Rod Beckstrom, ICANN's president and chief executive, added: "This is only the first step but it is an incredibly big one and a historic move toward the internationalization of the internet.

"The first countries that participate will not only be providing valuable information of the operation of IDNs in the domain name system, they are also going to help to bring the first of billions more people online - people who never use Roman characters in their daily lives." Mr. Beckstrom said engineers around the world had been working on the technical issues surrounding the introduction of IDNs for more than nine years and the systems had been tested over the last 18 months.

Tina Dam, ICANN's senior director for IDNs, said: "Our work on IDNs has gone through numerous drafts, dozens of tests and an incredible amount of development by volunteers since we started this project.

"Today is the first step in moving from planning and implementation to the real launch.

"The launch of the fast track process will be an amazing change to make the internet an even more valuable tool and for even more people around the globe."

(Source: Telegraph)

PCs shed pounds and CD drives, gain touch screens

SEATTLE (AP) — Personal computers are changing — and not just because of the recent launch of Windows 7. Visit an electronics store and you might also find laptops are missing a familiar component. You could experiment with new ways of controlling some computers. And you'll see portable PCs slimming down.

Even with all the attention lavished on Apple's iPhone and Amazon.com Inc.'s Kindle this year, your PC likely is still the center of your digital universe. Here's a look at what the season's computer trends mean for you.

Computers have come with "optical drives," slots for CDs or DVDs, for years. They've been useful for installing new software, watching movies or transferring music libraries into digital form. But one of the biggest lessons from the craze for "netbooks" — inexpensive little laptops designed mainly for browsing the Web — is that people were so excited about the small, easy-to-carry size that they didn't miss having a CD or DVD drive.

Apple Inc. got rid of an optical drive two years ago when it introduced the first sliver-thin MacBook Air. That wasn't seen as a trendsetting step at the time because the computer, which cost \$1,800 then, wasn't meant for mainstream consumption. But netbooks, which start at \$250 on BestBuy.com, surely are made for everyone. The wee laptops' popularity is proof that people are finding it easy enough to download software, movies and music to portable computers, especially with the widespread availability of Wi-Fi and cellular Internet service. And plenty of services let you store files over the Internet, eliminating the need to burn backups to discs.

Taking out the optical drive doesn't significantly lower prices. Doing so does let PC makers design much thinner laptops. Companies including Dell Inc. and Hewlett-Packard Co. have pulled DVD drives out of mid-range to more expensive computers, such as HP's Pavilion dm3z, which starts at \$550, all the way up to the \$1,700-and-up HP Envy and Dell's \$1,500-and-up Adamo.

You just might want to think twice if you're hooked on transferring CDs into MP3s — or if you spend a lot of time watching DVDs on airplanes and don't want to squint at your iPod screen or get a separate portable video player.