an alloy made of abundantly available metals, with cobalt borate catalysts. Steven Reece of Sun Catalytix, a firm in Cambridge, Massachusetts, USA, and his co-workers report that this system could be developed into a means of generating cheap fuel from sunlight, because, unlike similar devices that have been created in the past, this one operates in benign conditions, without wires and expensive noble metal catalysts. *AP*

MITIGATION

Car pool

Proc. Natl Acad. Sci. USA **108,** 16554–16558 (2011)

What type of vehicles most benefit society over their lifetime per dollar spent on building, maintaining and fuelling them? Perhaps surprisingly, it turns out to be hybrid and plug-in hybrid electric vehicles, according to group of researchers led by Jeremy Michalek of Carnegie Mellon University in Pittsburgh, Pennsylvania, USA.

These vehicle classes outdid conventional cars and battery-powered electric vehicles in their analysis. The work takes into account, for example, the power plant emissions associated with charging a plug-in car, the direct costs of oil as well as the military expense associated with defending against disruption in its supply, the impact of greenhouse-gas emissions from exhaust pipes, and vehicle recycling and land filling. The results are subject to certain variables, such as oil price and battery life.

The authors argue that some of the US subsidies for encouraging emission reductions in transportation should be targeted at potential buyers of hybrids, which offer the most social benefit per dollar despite their small battery packs. *AP*

MICROBIOLOGY

Fungi for fuel

Nature Biotechnol. **29,** 922–927 (2011)

Industrial biofuel production using fungal agents is limited by the rate at which the fungi's enzymes break down plant cellulose and other polysaccharides into fermentable sugars. This reaction would occur more rapidly at higher temperatures, but that requires temperature-tolerant — thermophilic — fungi, so that the agent isn't killed in the process.

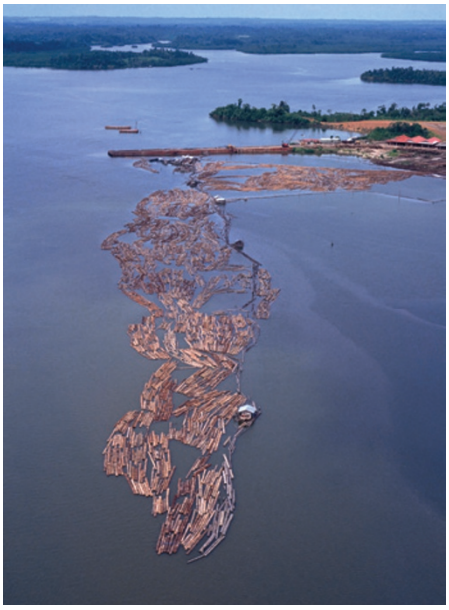
A team led by Adrian Tsang from Concordia University in Montreal, Canada, and Randy Berka of Novozymes in Davis, California, USA, have now sequenced the genomes of two thermophilic species of fungi, *Myceliophthora thermophila* and *Thielavia terrestris*. Both fungi have relatively small genomes and large amounts of heat-stable cytosine and guanine base pairs in the protein-coding regions of their DNA. Both fungi could be enhanced through breeding, as they reproduce sexually.

The authors measured the fungi's responses to a feedstock of barley (mainly cellulose) and alfalfa (which contains more pectin). Both species increased their production of metabolic enzymes, although they responded less strongly to the alfalfa. They would both make excellent industrial decomposers, the researchers say. *AP*

ECONOMICS

Cost of deforestation

Ecol. Econ. **70,** 2503–2510 (2011)



Ghana lost 1.9 million hectares of forest between 1990 and 2005, placing it among the most rapidly deforesting regions in West Africa. Recognizing the economic value of forests could help motivate conservation efforts by local communities and agencies.

Lawrence Damnyag, of the University of Eastern Finland, and his colleagues estimated the monetary value of four ecosystem services — timber, edible fruits, soil nutrients and carbon storage — in both natural and degraded forests located in the Dormaa and Begoro districts in Ghana, during 2008.

They found that the annual timber revenues per hectare in degraded forests were around US$160 lower than in natural forests. The loss of edible fruits in Ghana's degraded forests was estimated to be worth US$777 per hectare per year. Although the researchers didn't find significant differences in the value of soil nutrients between degraded and natural forests, they estimated that in the case of carbon storage, the gross revenue loss per hectare from degraded forests was on average US$492. Added together these estimates equate to a loss of about 2.6% of the 2008 agricultural gross domestic product in Ghana. *MC*

DEFORESTATION

Deforestation changes rainfall

Geophys. Res. Lett. **38,** L19802 (2011)

Replacing forest with pasture or cropland often produces sharp gradients in the landscape, which tend to generate local temperature-induced circulation patterns called 'vegetation breezes' — analogous to sea breezes. These breezes enhance rainfall-generating convection currents.

Luis Garcia-Carreras and Douglas Parker from the Institute for Climate and Atmospheric Science at the University of Leeds, UK, used an ensemble of atmospheric cloud-resolving model simulations to investigate the potential impact of deforestation-generated vegetation breezes on local rainfall.

The results indicate that variation in vegetation cover increases the total locally generated rainfall on average by 13% and produces a particularly pronounced four- to sixfold increase in rainfall over cropland boundaries compared with uniform land cover. However, rainfall was not enhanced everywhere, and was actually reduced by 50% or more over the forest. The authors note that these local- to medium-scale processes can interact with large-scale atmospheric circulation in complex ways, so predicting the change in total precipitation due to deforestation is an ongoing research aim. *AB*

Written by Alastair Brown, Monica Contestabile and Anna Petherick.