HELPING MEXICO DESIGN AN EFFECTIVE CLIMATE POLICY

MIT researchers are working with the Mexican government on carbon pricing options to meet the country's climate goals under the Paris Agreement.

幫助墨西哥制定有效的氣候政策

麻省理工學院的研究人員正與墨西哥政府就碳定價方案進行合作，以符合"巴黎協定"下的國家氣候目標。

MIT CEEPR
MIT Center for Energy and Environmental Policy Research

As nations gathered in Bonn, Germany, for this year's UN climate summit, one item on their agenda was determining whether pledged climate efforts are sufficient to achieve the targets of the 2015 Paris Agreement.

Researchers at MIT have been working with the Mexican government to explore policy options that can help the country meet its international commitment of reducing greenhouse gas emissions 22 percent by 2030, compared with business as usual. According to their analysis, this could be achieved by putting a modest additional price on carbon.

本期摘要(KEY INFORMATION)

◎麻省理工學院的研究人員一直在與墨西哥政府合作，以符合「巴黎協定」下的國家氣候目標，實現 2030 年前減少溫室氣體排放 22％的國際承諾。根據他們的分析，這可以透過適度增加碳價格來實現。碳定價已經成為各國在減少溫室氣體排放方面的重要政策工具，在制定碳定價政策時，決策者面臨的選擇是：他們可以直接對碳排放徵稅，或實行總量控制與交易制度(cap-and-trade)，由政府發布有限的污染許可證並允許公司進行交易，或者使用這兩者的組合。分析的結論顯示，在墨西哥現有的氣候政策（包括已經實行的碳稅）中增加相對較低的碳價格（每 20 美元每噸 3 美元）將足以幫助該國實現減排 22％的承諾。

◎根據世界資源研究所等機構的評估，停止森林砍伐，恢復森林和改善林業相關作為，每年可節約 70 億公噸的二氧化碳排放量，相當於消除 15 億輛汽車，勝過擺脫現今世界上的所有車輛！且避免森林砍伐可以減少 40％以上的低成本解決方案所提供的減排量。（在此研究中，其定義的低成本是指每年減少一噸二氧化碳排放量的花費將低於 100 美元）。研究並指出保護和恢復泥炭地，是避免森林和土地轉化為排放的最有效的領域之一。我們還可以透過改變飲食習慣，減少糧食損失和浪費來減少對牧場的需求，將肉類和乳製品的消費減少一半，可以使我們的膳食碳足跡減半。

Carbon pricing has emerged as an important policy tool for countries (and subnational governments) as they work to reduce greenhouse gas emissions, the predominant cause of climate change. Policymakers confront a choice when developing carbon pricing policies: They can tax carbon emissions directly; implement a system known as cap-and-trade, wherein governments issue a limited number of pollution permits and allow companies to trade them; or they can use a combination of the two.

The MIT analysis, led by researchers Michael Mehling, deputy director of the Center for Energy and Environmental Policy Research, and Emil Dimantchev, a graduate student in the MIT Technology and Policy Program, focused on this third, hybrid approach, exploring how Mexico can implement a cap-and-trade program alongside its existing carbon tax. They identify and discuss a number of different combinations, for instance using the tax as a floor price to keep carbon prices from falling too low.

The authors concluded that adding a relatively low carbon price — $3 per ton of emissions in 2030 — to Mexico's existing climate policies, including a carbon tax already in place, would be enough to help the country meet its commitment of reducing emissions by 22 percent compared with a baseline in which no new policies are adopted to slow Mexico's emissions growth. This 22 percent reduction would cut Mexico's emissions growth roughly in half, to less than 1 percent per year.

The analysis found that a number of factors, including low natural gas prices and a requirement that 35 percent of Mexico's electricity sales must come from clean energy sources by 2024, would contribute to slowing emissions growth. A hybrid tax and cap-and-trade system would complete the picture, helping to drive emissions growth even lower.

Mehling highlighted Mexico's experience in accelerating its rate of economic growth while decelerating its rate of emissions growth. "Mexico is proving to the rest of the world that a developing country can rein in emissions while continuing to grow its economy," he says.

In 2012, Mexico's Congress unanimously passed the General Law on Climate Change, making Mexico the first developing country with a comprehensive climate change law. In October 2016, Mehling and Dimantchev began advising the Mexican federal government on the design of its national climate policy.

Dimantchev, who is also a research assistant with the research group of MIT Associate Professor Noelle Selin and with the Joint Program on the Science and Policy of Global Change, says this kind of analysis can help policymakers manage uncertainty when developing long-term policies. "Our ability to forecast the future is very limited, which is why it's important that policymakers not design policies based on a single projection of the future," he says.

For this reason, Dimantchev notes, the report uses Monte Carlo simulations to estimate a range of emissions pathways and their implications for Mexico's climate policy, allowing the authors to make recommendations for a hybrid carbon pricing policy that keeps prices from going as low as zero or as high as $100 or more per ton. "To induce action from the private sector, climate policies have to be more predictable, something with which hybrid carbon pricing can help," Mehling adds.

The MIT researchers worked closely with officials from the federal Ministry for the Environment and Natural Resources (SEMARNAT) and the Ministry of Finance (SHCP), including Juan Carlos Arredondo Brun SM '04, who now serves as director general for climate change policies at SEMARNAT, and Carlos Muñoz-Piña, director general for revenue policy at SHCP. Earlier this year, they traveled to Mexico City to discuss their initial findings with

officials from both agencies, including Rodolfo Lacy Tamayo SM '05, the undersecretary of planning and environmental policy at SEMARNAT.

"The MIT report has been helpful to my team as we explore how our existing carbon tax can operate alongside a future cap-and-trade system in Mexico," Lacy says.

The German Agency for International Cooperation, which operates the Mexican-German Climate Alliance, funded the analysis.

原始連結： http://news.mit.edu/2017/helping-mexico-design-effective-climate-policy-1117

CONSERVING FORESTS COULD CUT CARBON EMISSIONS AS MUCH AS GETTING RID OF EVERY CAR ON EARTH

保護森林可以減少碳排放，就像擺脫地球上的每輛車一樣
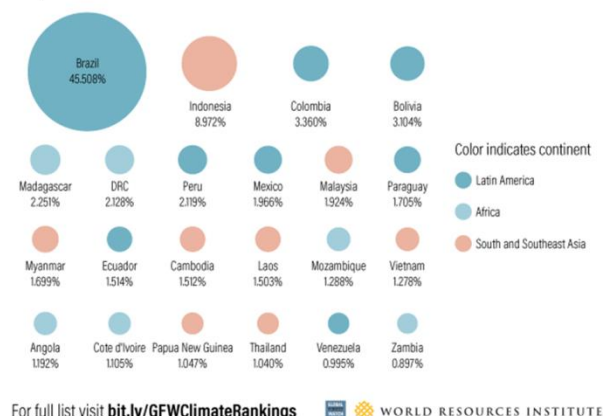

WORLD RESOURCES INSTITUTE

New analysis from The Nature Conservancy, WRI and others estimates that stopping deforestation, restoring forests and improving forestry practices could cost-effectively remove 7 billion metric tons of carbon dioxide annually, or as much as eliminating 1.5 billion cars—more than all of the cars in the world today!

In fact, forests are key to at least six of the study's 20 "natural climate solutions," which could collectively reduce 11.3 billion metric tons of greenhouse gas emissions per year. That's as much as halting global oil consumption, and would get us one-third of the way toward limiting global warming to 2 degrees C (3.6 degrees F) above pre-industrial levels — the threshold for avoiding catastrophic effects of climate change — by 2030.

Stopping Deforestation Offers the Biggest Benefit

Avoided deforestation could deliver more than 40 percent of total emissions reductions offered by low-cost solutions. (Low-cost as defined in the study means it would take less than $100 a year to reduce a ton of carbon dioxide emissions.) Protecting forests also offers the greatest potential to mitigate climate change based on land area. Brazil and Indonesia together contribute more than 50 percent of carbon emissions from tree cover loss across the tropics, and thus offer the greatest mitigation opportunity for avoided deforestation.

Percent of Total Carbon Emissions from Deforestation in Tropical Countries, 2001-2013

Brazil 45.508%
Indonesia 8.972%
Colombia 3.360%
Bolivia 3.104%

Color indicates continent
● Latin America
● Africa
● South and Southeast Asia

Madagascar 2.251%
DRC 2.128%
Peru 2.119%
Mexico 1.966%
Malaysia 1.924%
Paraguay 1.705%

Myanmar 1.699%
Ecuador 1.514%
Cambodia 1.512%
Laos 1.503%
Mozambique 1.288%
Vietnam 1.278%

Angola 1.192%
Cote d'Ivoire 1.105%
Papua New Guinea 1.047%
Thailand 1.040%
Venezuela 0.995%
Zambia 0.897%

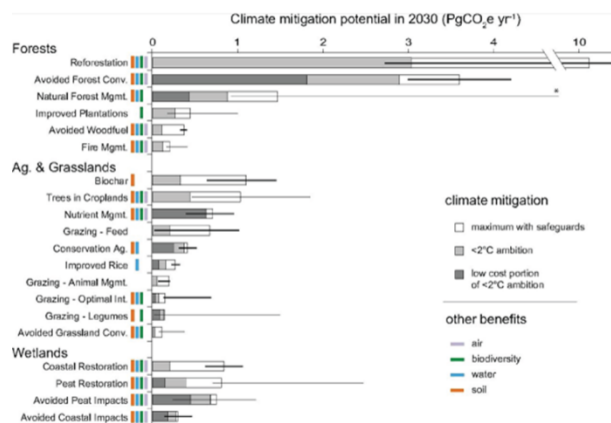For full list visit bit.ly/GFWClimateRankings
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Global tree cover loss reached a record high in 2016, with tropical countries especially struggling to curb emissions from deforestation. In the top-emitting tropical countries, beef production, agricultural crops such as soy, and large industrial oil palm plantations are the main drivers of tree cover loss.

Despite these setbacks, the international Paris Agreement's REDD+ (Reducing Emissions from Deforestation and Forest Degradation) policy and the inclusion of the land sector in 83 percent of tropical countries' emissions-reduction plans (known as "nationally determined contributions," or NDCs) mean these trends could be reversed. For example, strengthening and expanding Indonesia's Forest Moratorium could help the country avoid 427 million metric tons of deforestation-related emissions by 2030. If all countries achieve their NDCs for land use change by 2030, the world's forests could collectively store more greenhouse gases than Russia emits today.

Finding a Compromise

While forest-related climate solutions are critical, they must be balanced with the need for greater food production as populations and incomes rise. Like avoided deforestation, reforestation also offers large climate mitigation potential, particularly in the longer term.

Climate Mitigation Potential of 20 Natural Climate Solutions

Climate mitigation potential in 2030 (PgCO₂e yr⁻¹)

Source: Bronson W. Griscom et al. PNAS 2017; 114:11645-11650

According to the study, 42 percent of the total emissions reductions that could be achieved from reforestation depend on reducing pasture land, including by reforesting all grazing land in forested ecoregions. This scenario may be difficult to fully realize given the growing demand for food, including a projected 95 percent increase in beef demand between 2006 and 2050. Instead, we will need to find ways to increase productivity on pasture lands to concentrate food production on a smaller amount of land and free up land for restoration. Brazil, for example, aims to restore 22 million hectares (54 million acres) of land by 2030, including boosting productivity on 5 million hectares (12 million acres) of degraded pasture land by 2020. Restoration provides a good compromise. Forest-based products from restored forests—such as nuts, fruits and wild

game—promote food security, while the trees absorb carbon dioxide. And research supports the business case for investing in restoration.

We can also reduce demand for pasture land by shifting our diets and reducing food loss and waste. Cutting our meat and dairy consumption in half could nearly halve our dietary carbon footprint, and if whole populations shifted their diets away from beef, it could free up nearly 300 million hectares of grazing land—an area nearly the size of India—and reduce agricultural pressure on forests. Similarly, reducing food loss and waste could free up hundreds of millions of hectares of pasture land.

Costa Rica has proven that this approach works. In the 1980s, Costa Rica removed subsidies for the cattle industry, which, along with falling international beef prices, made it less profitable to ranch marginal lands. The nation's cattle herd dropped by one-third and pressure on grazing lands decreased. Meanwhile, Costa Rica's economy began to focus more on urban areas and tourism. Forest cover increased from 41 percent in the 1980s to 48 percent in 2005.

Peat and Wetlands Are a Good Starting Place

One of the most effective areas for avoiding emissions from forest and land conversion is protecting and restoring peatland. Wetlands are the most carbon-rich type of land and offer 14 percent of the low-cost natural climate solutions available — the biggest benefit over the smallest land area. WRI estimates that each hectare of tropical peat drained for plantation development emits an average of 55 metric tons (more than 60 U.S. tons) of carbon dioxide every year, roughly equivalent to burning more than 6,000 gallons of gasoline. Indonesia has some of the highest potential for mitigation benefits from peatland restoration and avoided conversion. Protecting wetlands also boosts climate resilience. Mangroves protect coastlines from storm surges and sea level rise, and wetlands provide flood prevention amidst the extreme rainfall expected to increase with a warming climate.

Embracing Natural Climate Solutions

More research organizations are campaigning to increase awareness and implementation of natural climate strategies. A broader movement including government, private sector and civil society stakeholders could deploy solutions faster and on a larger scale.

原始連結：
http://www.wri.org/blog/2017/11/conserving-forests-could-cut-carbon-emissions-much-getting-rid-every-car-earth