

Japan goes for the sun

Tens of thousands of Japanese homes and businesses are preparing to put new solar panels on their roofs, spurred by a subsidy plan going into effect this month. It is a step towards regaining Japan's once-dominant position in solar energy, something that has become a matter of pride for the country's policy-makers.

But the government knows it cannot count on citizens to continue backing solar energy out of civic pride and eco-mindedness alone, so it is now spending ¥30 billion (US\$300 million) of state money annually on subsidies and research and development on the technology.

In 1999 Japan led the world in solar-cell production, a position it maintained for several years. In 2005, solar cells produced by Japan accounted for 45% of the world's capacity, according to figures from the country's industry ministry. By 2007, however, the figure was only 24.6%, barely ahead of China's 22.0%.

Each year from the late 1990s on, Japan also installed more capacity for producing energy from solar cells than any other country, but was surpassed by Germany in 2005 and Spain in 2008. It more than doubled its total capacity between 2003 and 2007, but could not keep pace with Germany's ninefold increase over the same period. The German boom was fuelled by



RECESSION WATCH

"Germans do it because it is profitable, but there's no profit for the Japanese."

a 'feed-in' tariff which guarantees that solar-cell power plants and rooftop installations receive a high price for electricity that they feed back into the grid. By 2007, Germany had twice Japan's 1.92 gigawatts of installed capacity.

Japan now wants to get back on top. Last July, the cabinet announced a low-carbon-economy action plan that called for the country to "regain its global leadership position in solar generation". It set out ambitious targets to increase its 1.4 gigawatts of solar power capacity in 2005 20-fold by 2020. The 2009 budget earmarks ¥10 billion for solar-photovoltaic energy research and development. Another ¥60 billion has been set aside for renewable energy subsidies, a third of which will go

on solar cells.

The country's recently announced economic stimulus package also targets solar research and development as a major investment area, although specific numbers have not yet been determined (*Nature* 458, 819; 2009).

The subsidy programme starting this month gives ¥70,000 per kilowatt to homes and businesses that install solar panels. So far it is proving popular, with 22,000 applications in its first two-and-a-half months.

Takashi Kawabata of the industry ministry's



new and renewable energy division notes that Japan is unusual in having so much of its capacity — 1.55 million kilowatt-hours, or 80% — in homes and businesses. In Germany, only 40% of the country's capacity is found in these places; instead, power companies have found it profitable to invest because of the feed-in tariffs. "Germans do it because it is profitable," Kawabata says, "but there's no profit for the Japanese." To explain his fellow-citizens' motivation for installing the technology, he cites

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Basic researchers protest UK budget

Britain's government has unveiled an economic stimulus package designed to harness what it calls a "world-class science base" — at the same time as it cuts funds for undirected basic research.

In a speech to parliament on 22 April, Alistair Darling, the Chancellor of the Exchequer, unveiled the 2009 budget. It includes £1.4 billion (US\$2.1 billion) in new cash for low-carbon business and technology.

Some scientists were underwhelmed by the plan, which redirects £106 million from the nation's seven research councils,

which fund most of Britain's basic research, towards "key areas of economic potential". These areas make up roughly 15% of the councils' £3-billion annual budget and are defined by five cross-cutting programmes with titles such as "living with environmental change" and "digital economy" (see *Nature* 453, 1150–1151; 2008).

Chloë Somers, a spokeswoman for the councils, says that most of the £106 million will come from reprioritizing the 'blue-skies'

funding that allows researchers to pursue any topic they choose. Despite the change in focus, Somers argues, the councils will still fund fundamental science: "This has

"The value of our universities lies in their transformative discoveries."

nothing to do with cutting basic-research funding."

But others see it as an erosion of the councils'

independence. The decision is part of a worrying trend to force basic research to prove its economic worth, says Nick Dusic, director of the Campaign for Science and Engineering in the UK, a London-

based group that advocates for science funding. If it continues, it could undermine the real worth of basic science in Britain, adds Martin Rees, president of the Royal Society. "The value of our universities lies in the transformative discoveries that emerge unpredictably and unplanned," he says. "The research councils should not stifle this potential."

Environmentalists, meanwhile, were cheered by the government's green stimulus package, which includes £1 billion to support renewable energy and jobs in green businesses. The development



Japan knows how to do solar power at home.

the well-known Japanese word *yasegaman*, which means ‘endure for the sake of pride’.

Nevertheless, Japan is debating a feed-in tariff of its own, which could come into effect in 2010 and would allow homes and businesses with solar panels to sell electricity back to the grid at twice the going rate. Many worry, however, that it would force electricity prices up overall. In Japan, the cost of producing a

kilowatt-hour of electricity using solar cells is twice that charged to consumers.

The government aims to cut that cost in half within five years. The New Energy and Industrial Technology Development Organization, which distributes research money for the industry ministry, has been leading an eight-year field test to prove the value of large-scale solar panel installations. It is spending roughly ¥6.3 billion per year from 2007 to 2014 on this project, and about another ¥3.7 billion for various others aimed at raising solar-cell efficiency, making manufacturing processes cheaper and finding ways to use cheaper materials.

In one of these projects, some 30 university groups and companies have banded together for solar-cell research. Mitsubishi Electric, for example, has made polycrystalline solar cells that convert 18.8% of solar energy to electricity, compared with the 15–16% achieved by most on the market now. Sanyo’s improved single-crystal cell has 22.3% efficiency — the world’s best, according to project leader Masafumi Yamaguchi, a semiconductor materials scientist at the Toyota Technological Institute in Nagoya.

Yamaguchi is also the research adviser for a new programme funded by the Japan Science and Technology Agency. With a hefty ¥8 billion over seven years, 12 teams of scientists will try to find new materials to make solar cells cheaper.

Yamaguchi says Japan needs to pursue this course because of the pressure from cheap producers, especially in China. “It’s the only way to compete,” he says. ■

David Cyranoski



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Obama says more money

President Barack Obama has bolstered his already-lofty promises to US scientists, saying he wants the country’s research and development budget to rise to 3% of gross domestic product (GDP).

That would be an increase of roughly US\$46 billion annually from today’s investment, which is nearly 2.7% of GDP. “This represents the largest commitment to scientific research and innovation in American history,” Obama said on 27 April at the National Academy of Sciences’ annual meeting in Washington DC.

John Marburger, who was science adviser to former president George W. Bush, called 3% of GDP a “healthy target” but said the trick will be getting industry on board. “The federal government can’t do all of that by itself,” he says. “Remember, two-thirds of that figure is coming from the private sector, and we’re in the middle of a recession.” The public sector contributes roughly one-third of US research and development investment.

“We have to deliver.”

It remains to be seen whether Obama can

deliver. In February, he and congressional leaders pushed through over \$21 billion in science funding in their economic stimulus package. In his proposed budget for the fiscal year that begins in October, the president has requested \$12.6 billion for the National Science Foundation, the energy department’s Office of Science and the National Institute of Standards and Technology.

Obama called clean energy the current generation’s “great project” and said that investment levels must be increased despite ongoing economic woes.

“We’re now in a no-excuse environment,” says J. Craig Venter, the genomics pioneer now working on sustainable energy issues. “We have to deliver.”

This week Obama also named all 20 members of the President’s Council of Advisers on Science and Technology, including Nobel-prizewinning chemist Ahmed Zewail, computational scientist David Shaw, plant geneticist Barbara Schaal and physicist S. James Gates. ■
Jeff Tollefson

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Alistair Darling announced the UK budget on 22 April.

of offshore wind farms is expected to receive £525 million over the next two years. The budget also

includes a new £750-million strategic investment fund for emerging technologies and high-tech industry and

sets aside £405 million to support low-carbon energy and advanced green manufacturing. Biotechnology will also receive some of the money.

Darling told parliament that together, the incentives will “harness commercially our world-class science base”.

That may be true, but the base is being ignored, Dusic argues. The United States is using stimulus money to make mammoth investments in basic science, he says, so “the United Kingdom cannot afford to fall behind”. ■

Geoff Brumfiel and Natasha Gilbert