

## Power struggle

The shadow of Fukushima, the world's worst nuclear disaster after Chernobyl, hangs over Japan's energy future



He'll be seeing more of those

THIS week Japan's last working nuclear reactor was switched off. At Oi, on the west coast of the country's main island, the closure was supposedly for routine maintenance and safety checks. Yet no firm date is in sight for reopening Oi or any other of Japan's 50 reactors, shut in the wake of the triple meltdown at the Fukushima Dai-ichi plant. Before the earthquake and tsunami of March 2011 turned so much of Japan's world upside down, the country counted on nuclear power for 30% of its electricity—one of the highest proportions in the world. Now it is entirely without nuclear power for only the second time since 1970.

In government since December, the Liberal Democratic Party (LDP) warns of the economic costs of mothballed plants. The industry ministry says that the need to import extra oil, gas and coal to fire conventional power stations will have cost Japan an extra ¥9.2 trillion (about \$93 billion) by the end of 2013. A sharply weaker yen and higher oil prices have not helped, and Japan is now running trade deficits for the first time in three decades. Businesses and consumers face much higher electricity costs in Japan than in many countries.

The cosy community of electricity utilities, bureaucrats, academics and heavy industry, known in Japan as the "nuclear village", is urging the LDP to restart the reactors. The prime minister, Shinzo Abe, would love to oblige. Earlier this year his government purged an energy-policy board of anti-nuclear types. The street demonstrations in Tokyo against nuclear power that took place in the wake of the Fukushima disaster were dwindling. The way had seemed open to fire up the reactors again.

It will not prove so simple. For one, a new, strengthened nuclear agency, the Nuclear Regulation Authority (NRA), must declare any plant safe before it starts—and several sit on or near active faults (Japan accounts for a fifth of the world's big earthquakes). In addition, the law gives towns and villages a say over nearby plants, and most Japanese want to ditch nuclear power for good. To cap it all, news of the mess at the stricken Fukushima plant gets no better. Recently, it transpired that hundreds of tonnes of radioactive water were leaking each day into the Pacific.

So Mr Abe has to tread carefully. If the NRA rules that Japan's oldest and riskiest plants may not reopen, the LDP can do nothing about it. Although the understaffed agency has come under political pressure, including to speed up the publication of new safety rules, it is making a stand over reactors on active faults.

Nor can the prime minister easily overcome public opposition. Local towns that play host to nuclear plants are not the problem: in the past, the government and the power utilities conspired to site power stations in isolated, economically deprived places that could be bought off with largesse. Several of these towns are clamouring for the reactors to restart. But in places a little farther afield, opposition mounts. Hiro

hiko Izumida, governor of Niigata prefecture on the main island's north-west coast, says that around 70% of the prefecture's population are against starting the reactors at Kashiwazaki-Kariwa, the world's biggest nuclear plant. Mr Izumida says that governors do not have the power to block restarts once the NRA has given the go-ahead. Yet overriding popular local politicians would take bravado from the government and the utilities.

Besides, the LDP itself contains many more critics of nuclear power than it did before March 2011, countering the influence of nuclear backers such as the economy minister, Akira Amari. They think that starting the reactors could become a liability before the next general election, due in 2016. The LDP's anti-nuclear coalition partner, New Komeito, also constrains the government somewhat. Meanwhile, rising business optimism appears to undermine the case that economic recovery depends on nuclear power. Probably no more than 12-15 reactors will be switched back on, says Kazuhiro Ueta, a renewable-energy specialist who sits on the government's energy-advisory board. For the nuclear village, which once expected to supply at least half of Japan's power, that would be a grave disappointment.

Instead, Japan is preparing for other long-term energy supplies. Since 2011 the number of independent power producers tapping renewable sources, such as solar power, has tripled, thanks in part to a new "feed-in" tariff system for renewables. Including hydro-electricity, renewables now represent 10% of the energy mix, leading to hopes that they might one day replace the share that nuclear power once claimed.

Yet scepticism is warranted. The power grids are still owned by the big utilities, which can find excuses to deny access. And where in a crowded, mountainous country to put all the needed solar panels and wind turbines? Paul Scalise of Tokyo University says that a square metre (10.8 square feet) of land devoted to wind power generates just two watts of power. For solar power, the equivalent area generates 20W. Nuclear power generates about 1,000W a square metre.

For a long time to come, therefore, Japan will turn to oil, gas and coal to make up most of the nuclear shortfall. In May the government won American approval for imports of cheap shale gas from the United States. That could handily slash the cost of energy imports and alleviate concerns about energy security.

The cranking-up of fossil-fuel power stations, many working at well under capacity before March 2011, is one reason why the predictions of widespread black-outs never came about after the Fukushima scare. But another reason was the room for conserving energy. Tokyo alone has slashed electricity consumption by a tenth since 2011, according to the Japan Renewable Energy Foundation. The demand for power-saving devices has leapt. Sales of light-emitting diodes (LEDs) have shot up from 3% of all Japanese bulbs sold in 2009 to over 30% today. By 2015, says the head of Philips Electronics Japan, Danny Risberg, incandescent and fluorescent lights will be nearly a thing of the past.

Long-overdue proposals to liberalise the electricity market may do much to diversify energy sources and lower electricity bills. The government's plan, easier to push through now that TEPCO, the biggest utility, has been brought low by its handling of the Fukushima fiasco, is

to split generation and transmission, with the residential electricity market open to new competition. If the reform succeeds, says Hiroshi Takahashi of the Fujitsu Research Institute in Tokyo, the share of nuclear power in the energy mix would fall as new, non-nuclear providers won customers. It would, at long last, give the public some say over Japan's energy choices.

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