

Correspondence

Take direct action on climate inaction

We are scientists recently arrested in Canada for blockading a 125-car train carrying coal destined to release 26,000 tonnes of carbon dioxide into the atmosphere. We joined 11 other Canadians in this act, despite the personal risks and potential negative impact on our careers.

Time is running short and our dialogues on climate change with Canada's conservative government have been futile, which is why we undertook this extreme action. We were following the example of NASA climatologist James Hansen, who has been arrested three times in the past three years for civil disobedience in protesting against the mining of coal or development of the Canadian oil sands.

If the rate of carbon emissions does not decrease soon, the 2°C threshold for serious consequences of climate change could be broken this century (M. New *et al. Phil. Trans. R. Soc. A* **369**, 6–19; 2011). Yet many nations, including Canada and the United States, remain more concerned with building infrastructure to extract and transport fossil fuels than with seeking alternative energy solutions.

Civil disobedience has a long-standing tradition of inducing social change when those in power fail to act. Governments are neglecting their responsibility to future generations. Because science is built on professionalism and objective evidence, media coverage of our arrests will ensure that they, and the voting public, receive a forceful message.

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Doubt in Australia's emissions scheme

Policy uncertainty is dogging emissions-trading schemes. On 1 July, Australia introduced the largest carbon-pricing scheme outside the European Union, with a higher price for carbon permits than in the EU carbon market (F. Jotzo *Nature Clim. Change* **2**, 475–476; 2012).

When we surveyed a sample of Australian large emitters, carbon financiers and carbon-market experts (see go.nature.com/jlehiy), we found that 79% think there will still be a carbon price in 2020. But 38% expect that the current scheme will be repealed by the end of 2015, in line with the opposition's pledge. Of those who expect repeal, half think that a carbon price will be reinstated in Australia by 2020.

According to our survey, the average expected carbon price for the first three years of Australia's scheme is predicted to start near the 'fixed' (legislated) price of Aus\$23 per tonne of carbon dioxide equivalent. It then falls to an expected Aus\$11 per tonne for 2016 before rising to Aus\$22 per tonne in 2025.

Assessments of future prices vary greatly between experts, indicating pervasive uncertainty. Low-carbon investments depend on expectations about future prices, and can be hampered by

too much uncertainty. Managing prices in emissions-trading schemes could help. One way would be to use a fixed price, as in Australia, or a price band. Another would be to vary the supply of permits, as proposed for the EU carbon market, in which prices have dropped following economic troubles.

Setting carbon prices in line with domestic policy ambitions may be an attractive option for other countries, including for China's planned emissions-trading schemes. It will not alleviate policy uncertainty, but it can reassure businesses that low-carbon investments will pay off financially and make revenues more predictable.

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Spanish cuts: careers come to abrupt end

Carmen Vela suggests that the 22.5% cut to the already limited Spanish science budget is an opportunity for improvement (*Nature* **486**, 7; 2012). But her optimism is unrealistic.

Spain already has substantially fewer researchers per capita than other members of the European Union such as France or Germany. Entire grant programmes have disappeared

and important research institutes have laid off many highly qualified scientists. Even the Ramón y Cajal programme for young researchers has failed to fulfil its contractual obligations, forcing an end to the careers of bright young scientists.

This all comes at a time when research and development offers Spain the only certain route of recovery from economic collapse.

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Spanish cuts: more economic damage

The Spanish government's secretary for research, development and innovation has attempted to put a positive spin on the country's severe shortfall in research funding (C. Vela *Nature* **486**, 7; 2012). But the latest drop in funds is unlikely to make the little science that remains more competitive.

Returns from investment in science are unpredictable. But limited funding will mean that high-risk projects get left out and that scientists will be driven abroad or choose alternative careers. Investment during the bonanza years will have served no purpose.

These deep cuts for science will deprive the Spanish economy as a whole. Creating an environment that is conducive to research and innovation calls for a long and sustained input from government, irrespective of economic cycles.

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Spanish cuts: reform bureaucratic culture

The Spanish government's draconian cuts to its science budget do indeed present us with an opportunity (C. Vela