

TURNING CARBON INTO GOLD *

The X Prize foundation, based near Los Angeles, exists to encourage particular innovations that might be useful but from which conventional financial backers are likely to shy away. Previous X Prizes have been awarded for feats such as flying a reusable spacecraft to the edge of space and designing cheap sensors to measure oceanic acidity. Those still on offer would, among other things, reward the mapping of Earth's sea floor, and a way of extracting water from air using renewable energy for less than two cents a litre.

Another prize that is still up for grabs is for carbon capture and storage, a putative approach to stopping the rise of climate-changing greenhouse gases in the atmosphere. To claim a share of the \$15m on offer, winners will have to turn carbon dioxide extracted from power-plant flues into something useful—and do so profitably. On April 9th the ten-strong shortlist of those attempting this feat was announced.

At the moment, demand for carbon dioxide as a raw material is a trifling 80m tonnes a year. That compares with annual emissions of 52bn tonnes from power stations, vehicle exhausts, cement factories and so on. Moreover, the biggest use of the gas is to inject it into the ground to displace, and thus force to the surface, otherwise-inaccessible crude oil, so the net benefit in terms of global warming is close to zero. If new uses could be found—ideally ones that locked its carbon up in solid or liquid form for a long time—the market might be expanded into something big enough to make a dent in emissions.

The ten finalists hope to do this. They were selected from 27 teams (out of 47 original submissions) which managed to demonstrate, in a laboratory, that their ideas were feasible. Each was judged on how much carbon dioxide it extracted, net of any emitted in the production process or during subsequent use; by the value of the resulting product; and by the potential size of its market. Only those processes that needed less than 2,300 square metres of land and consumed less than four cubic metres of fresh water per tonne of carbon dioxide converted were deemed to qualify. As Marcius Extavour, who is in charge of the prize, explains, this stricture was intended to bar ideas like growing new forests—which are not exactly a novelty.

Four of the finalists plan to produce sturdy building materials such as cinder blocks made from the slag left over from steel production, cured with carbon dioxide. Another four will fashion the gas into plastics or carbon-fibre composites. The remaining two have invented ways to turn the stuff into carbon monoxide or methanol, which are industrial raw materials.

Each team in the final now gets \$500,000 to spend on proving that its lab-worthy ideas will work at a scale which might make them useful. Half of the shortlist will compete for a pot of \$7.5m at a coal-fired power station in Wyoming. The rest, seeking a similar prize, will set up shop at a gas-fired station in Alberta, Canada.

Some cynics have noted that a successful means of carbon capture and storage would be of great value to the prize's sponsors—NRG, an American energy company, and Canada's Oil Sands Innovation Alliance—since it would make it easier for them to keep their existing methods of business going. No doubt that is true. But in the fight against global warming many weapons will have to be deployed. If another can be added in this way, that is surely all to the good.