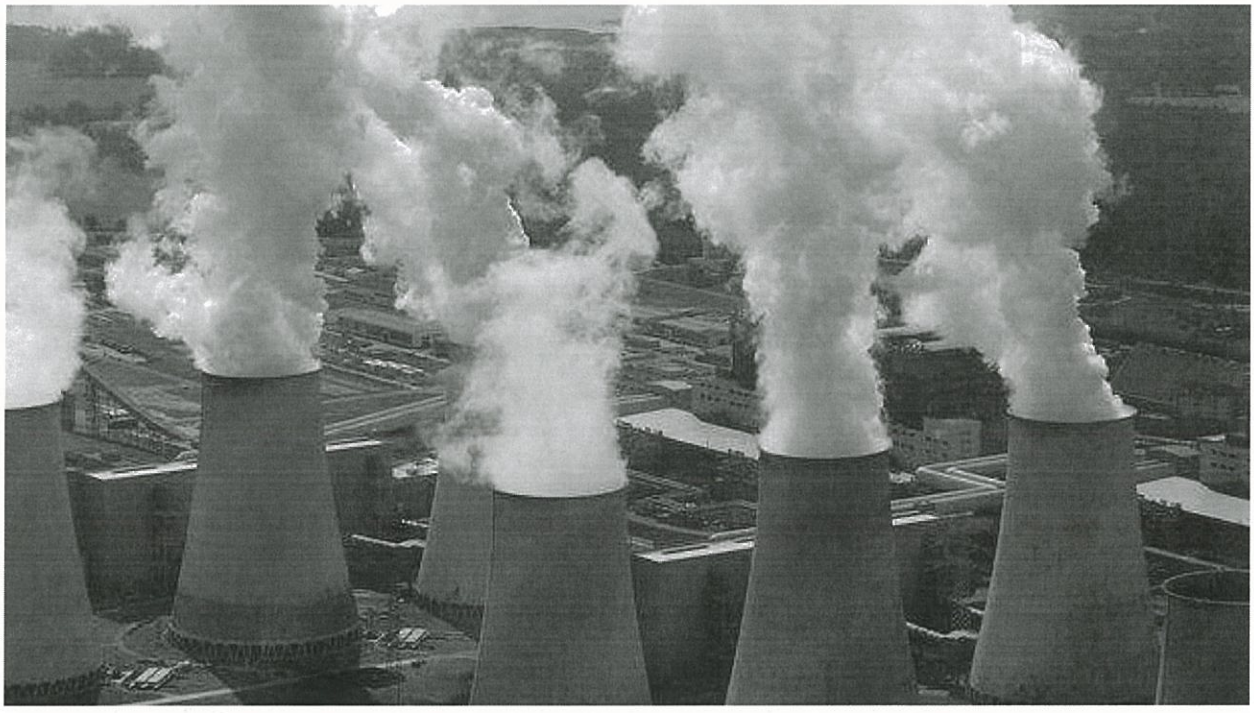
By **MICHAEL CASEY** / **CBS NEWS** / *September 29, 2015, 8:00 AM* /

$20M Carbon XPrize: Pulling money out of thick air



Steam rises from cooling towers at the Jaenschwalde coal-burning power plant near Cottbus, Germany, in this August 20, 2010 file photo. / **SEAN GALLUP**

When it comes to tackling climate change, the fossil fuel industry has focused mos of its efforts on finding ways to capture - so far with little success - the greenhouse emissions belching from power plants and factories so they don't reach the atmosphere.

But little research has gone into converting those heat-trapping emissions into another product - such as alternative fuels or even the next generation of cement.

With that in mind, the energy company NRG is teaming up with a coalition of Canadian oil sands producers known as COSIA to fund the $20 million Carbon XPrize.

The prize is being announced Tuesday as part of Fortune's Brainstorm E conference in Austin, Texas, with a call for entrants. The competition will run four and a half years and will culminate with two winners: one who can develop technology converting emissions from coal into a useful product, and a second for someone who can do the same thing with emissions from natural gas.

The winners will receive $8 million each, while four other finalists in each category will receive $500,000 apiece.

"There has been a lot of attention and investment paid to carbon capture and sequestration. But in the middle, there is the utilization piece and there has been a lack of investment," XPrize Chairman and CEO Peter Diamandis told CBS News. "Governments aren't investing significantly. Industry hasn't. There really has been a lack of money flowing into either research or the scaling of these approaches. Why that is, is beyond me. "

Diamandis told CBS News the goal of the project was to "turn on market forces" and offer an "opportunity for people to sell products made out of that carbon dioxide."

"Then, we are adding a pretty powerful tool into the mix that will help us drive down carbon dioxide emissions," he said.

Diamandis acknowledged that the market for alternatives to oil, gas and coal, such as wind and solar, is growing. But with energy demand expected to grow 37 percent by 2040 and many parts of the world continuing to depend on fossil fuels for energy, he and others involved in the prize said it makes sense to focus on salvaging those carbon emissions from fossil fuels, since they represent a majority of emissions.

"Carbon is a unique challenge in that as we move toward a low to zero-emission future, we'll need to continue using fossil fuels to meet current energy demands," Sicily Dickenson, NRG's chief marketing officer, said. "We're using the highly effective XPrize process to engage the world's brightest minds to find a solution that helps solve emissions problems, and simultaneously creates viable products that we use every day."

Participants will have nine months to develop their proposals. By September 2016, a panel of judges will pick 30 semifinalists who then must prove their ideas work in the lab. A year later, in October 2017, 10 finalists will be chosen who then must test them under real world conditions - by actually converting flue gas from a coal-fired or natural gas-fired power plant into their product.

Then in early 2020, the two, grand prize winners will be picked.

Diamandis said he expected to see a lot of ideas from areas where research has already started, including liquid fuels, injecting CO2 as a fertilizer to make algae-based fuels, building materials and advanced materials such as graphene. But he is hopeful the prize will attract "big thinkers" who until now have done little to develop their ideas.

"We anticipate, like any XPrize, a bunch of other ideas that we have just haven't even thought of," he said, referring to XPrizes that have included the $30 million Google Lunar XPrize, the $15 million Global Learning XPrize, the $10 million Qualcomm Tricorder XPrize, the $7 million Adult Literacy XPrize and the $2 million Wendy Schmidt Ocean Health XPrize.

"That is the exciting thing," he continued. "Part of the opportunity this provides is for innovators out there, people out there that have been thinking about something new but haven't been able to get the research grants or they haven't known where to go. They are slightly outside the industry."

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XPRIZE wants technologies to convert carbon emissions into valuable resources

Turning harmful byproducts of power plants into something we can use

H[Loren Grush
on September 29, 2015 08:00 am

(Sean Gallup/Getty Images)

The X-Prize Foundation will pay $7.5 million to two research teams who can come up with the best ways to convert carbon dioxide into something useful, like biofuels or cements, the group said today. The money is the top prize for winning the organization's newly created $20M NRG COSIA Carbon XPRIZE competition. The funds are meant as an incentive for people to invent technology that can turn concentrated carbon dioxide from power plants — a major source of greenhouse gas emissions — into something that won't harm the environment.

The competition is open to the public, will last four and a half years, and will have two tracks: one for converting CO2 from coal plants and one for converting CO2 from natural gas plants. Five finalist teams will be chosen for each track, who will then test their technologies at power plants in the United States and Canada. The winners for each track will receive $7.5 million each. All the finalist teams will receive $500,000 each for making it to the final round.

TURNING CO2 FROM POWER PLANTS INTO SOMETHING THAT WON'T HARM THE ENVIRONMENT

The XPRIZE Foundation is a non-profit founded in 1995 by Peter Diamandis; its goal is to sponsor competitions for technology meant to help address a major societal need. Among its other contests are technologies for cleaning up oil spills and — yes — a Star Trek tricorder that could help people diagnose their own health issues.

The foundation also aims to combat climate change — and rising carbon emissions. Carbon dioxide absorbs and traps heat, causing the Earth's temperatures to rise. Currently, the levels of carbon dioxide are at more than 400 parts per million in the world's atmosphere, nearly double the amount during the Industrial Revolution — and projections show the gas only becoming more widespread. The Environmental Protection Agency estimates that nearly a third of these greenhouse gasses come from power plants burning carbon-based fossil fuels, which is why the XPRIZE Foundation is aiming for the energy sector.

A natural gas power plant. (Mscalora / Wikimedia Commons)

This isn't the only effort to tackle CO2 coming from power plants. It comes on the heels of President Obama's Clean Power Plan, announced in August, which places new carbon emission standards on power plants in the US. And companies like Apple and Amazon are making the switch from carbon-based energy to renewable energy by using power generated by solar panels and wind turbines.

Those initiatives are a start, but around 82 percent of the global energy supply comes from burning fossil fuels like coal and natural gas. And as more people populate the planet, our global energy demands are projected to grow — models suggest a 37 percent increase by 2040. That's why XPRIZE wants to find a solution that will allow fossil fuel plants to continue operating at the same levels.

82 PERCENT OF THE GLOBAL ENERGY SUPPLY COMES FROM BURNING FOSSIL FUELS

The competition's goal is to keep further carbon from the atmosphere without changing the current energy infrastructure, says Paul Bunje, senior director of oceans at the XPRIZE Foundation. Ideally, teams should create products from CO2 that are valuable enough to outweigh the cost of maintaining the technology needed for the conversion. Bunje isn't picky about what the product of the conversion is; he suggested liquid biofuels or cements as possibilities. He also wondered if the carbon dioxide could be converted into more advanced, structural materials like graphene or carbon nanotubes. "We're going to see some crazy new ideas that work, and some that don't work so well," said Bunje.

Companies may be more motivated to convert CO2 if they can make a profit in the process, says Jon Christensen, an assistant professor at UCLA's Institute of the Environment and Sustainability, who isn't involved with XPRIZE. Technology exists to prevent carbon dioxide from reaching the atmosphere, but it is usually pricey. "There are a number of different proposals for carbon sequestration out in the world, but they are too expensive to make them viable at this point," said

Christensen. "People are motivated more by benefits and profits than they are by costs."

Christensen doesn't think the technology developed through competition will solve climate change alone. Rather, it will be used in combination with other technologies also aimed at lowering greenhouse gas emissions. "This kind of solution is one that we all eagerly hope for," said Christensen. "If we had that kind of solution it would be wonderful to add to the mix, because it's going to take everything we've got to address global warming."