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'Formula Zero' kart race could drive fuel cell technology

22:08 25 August 2008
NewScientist.com news service
Vicki Cleave, Rotterdam

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The world's first international fuel-cell-powered go-kart race took place in Rotterdam, the Netherlands, on Saturday. Six teams participated in the "Formula Zero" event, which is aiming to be a zero-emissions alternative to today's high-performance "Formula 1" car races.

The six teams used go-karts powered by fuel cells, which electrochemically combine hydrogen with atmospheric oxygen to produce electrical power and an exhaust of pure water, producing zero carbon-dioxide emissions.

But instead of the fuel cells charging a battery, as called for in designs for fuel-cell-powered road cars, the cells charged supercapacitors. These devices, which store energy in the electric field between two conducting plates, discharge more quickly than batteries, giving the karts more kick.

The race had two components: an endurance event and a sprint. For the endurance event, karts had to complete six laps of a 533-metre-long track in the fastest time possible. For the sprint, karts were timed as they completed one lap after a flying start, where they started accelerating before the beginning of the lap.

A team called EuplatecH2 from Zaragoza, Spain, won the sprint, finishing one lap in just over 36 seconds, sustaining an average speed of 53 kilometres per hour.

Wind power

The endurance event proved trickier. Two teams were unable to compete because they couldn't get their karts working in time for the race, and the remaining teams made unscheduled stops on the track.

It is not entirely clear why the karts stopped, but race cars are harsh environments for fuel cells. Getting so much power out of the cells in a short amount of time takes complex control systems to prevent problems such as overheating.

In the end, a team called Greenchoice Forze from the Netherlands' Delft University of Technology took first place in the endurance event.

The founders of Formula Zero, Godert van Hardenbroek and Eelco Rietveld, love fast cars and want to race them in an environmentally friendly way.

"In the sustainable future that we want to live in, you can still drive around in circles just because you want to," says van Hardenbroek. Indeed, wind power was used to electrolyse water and produce the hydrogen that powered the carts, making the races 100% if not the whole event 100% sustainable.

Public awareness

By 2015, Formula Zero plans to race full-size cars from professional teams. While this first race used a single fuel cell design 100% purchased from the Canadian firm Hydrogenics, competing teams will ultimately be able to choose their own fuel cells.

"Formula Zero will be a competition between fuel cell technologies," says van Hardenbroek.

Jerry Hardcastle, vice president of Nissan Technology Centre Europe, says this sort of event is "complementary" to the company's own efforts in promoting new technologies, such as fuel cell cars.

"One of the issues in introducing new technologies is customer awareness and acceptance, and anything which demonstrates or supports that is welcomed," he told **New Scientist**.

He also feels that such competitions, which often involve university teams, help train future engineers. "The students that are doing these events now are potentially the managers of our technology centres in 10 or 15 years' time."

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The EuplatecH2 team (front) and Greenchoice Forze (behind) - which each won a race event - lined up in the pits before heading out onto the track. The fuel cell is clearly visible next to the driver in the EuplatecH2 kart (Image copyright: Chris Nobbs 2008)

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A team called Imperial Racing Green raced in the six-lap endurance event (Image copyright: Chris Nobbs 2008)

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Wicked.

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By Dagz Meridian

Mon Aug 25 23:04:43 BST 2008

Keep it up. I hate the fact that we are still combusting the rotten carcass of a million year old dead shellfish.

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By Amos

Tue Aug 26 06:20:08 BST 2008

Why not race these suckers instead? <http://www.youtube.com/watch?v=kRd7ER7u-KU>

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Alternative Platform

By Emmet Fox

Tue Aug 26 11:20:38 BST 2008

I totally agree, why bother with the clearly problematic hydrogen technology when the electric car's technology is already way more advanced and effective. Yes people say you still have to burn fossil fuel at the power station - of course you do but at least with the fossil fuel burning in centralised locations they'll be better situated for controlled transformation to alternatives

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Fraud

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By Scunnerous

Tue Aug 26 06:30:23 BST 2008

This is a sales & promotion event for an infeasible technology. Did they also use wind power for the cryogenics and compressors to uhh, liquefy the hydrogen? No word on the efficiency of the entire err, "process"? I wonder why? Any word on the leakage of hydrogen?... Which you don't get back BTW - its gone forever - the next environmental crisis if this "technology" is not nipped in the bud.

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Fraud

By Mark

Tue Aug 26 07:15:02 BST 2008

Its a dead end technology nothing more than a gimic

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Fraud

By Steve

Tue Aug 26 10:30:54 BST 2008

Couldn't agree more. When are we going to wake up and realise hydrogen power is not zero emission. Hydrogen does not exist in its pure state anywhere in our world. We have to use masses of energy to unbind it so we can get that energy back when it re combines. At best it is a way to store energy such as solar or wind.

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