

TO WIN THE £6m X PRIZE, JUST SAVE THE PLANET

Competitors from around the world are battling to build the first production car capable of 120mpg. Mark Harris examines some of the contenders

It's one of the richest science prizes ever: a \$10m (£6.2m) pot contested by teams on a mission to create the most environmentally friendly vehicle on the planet. Not only must the car be capable of 120mpg or, if it is an electric vehicle, be capable of travelling 200 miles between recharges, but it must be ready to go into mass production. It is a tall order and just 41 teams from around the world are still in the hunt. No wonder the competition is called the X Prize.

Among those that have made it through the first stages are two British teams. Delta Motorsport from Silverstone and the UK arm of Tata Motors. The competition, launched in 2007, is now entering its final phase; a winner will be declared in September 2010.

The challenges include tests on braking distances, lane-changing capabilities and usability. The biggest hurdle, though, is fuel economy. The goal of 120mpg (equivalent to 100 miles per US gallon) is formidable, given that the cars must be production ready rather than expensively equipped one-off prototypes. To put that into perspective, the Toyota Prius Hybrid, currently the green motoring mascot of choice, returns less than 75mpg.

For electric vehicles, a minimum range of 200 miles is equally challenging, given that most existing electric cars, such as the Reva G-Wiz, struggle to travel 50 miles between charges; even new models such as the Smart ForTwo EV and the elec-

tric Mini now being trialled will struggle to reach 100 miles.

The field is nothing if not eclectic: Delta's vehicle is the sleek, plug-in E-4 coupé clad in ultralight composites and powered by four electric motors, one on each wheel. It can reach 140mph and looks more like a supercar than an endurance vehicle. By contrast Tata's all-electric Indica Vista EV-X looks more like a Mini Metro. It has been designed by engineers from Land Rover and Jaguar, takes 10sec to reach 40mph and tops out at 65mph.

Their rivals include a pedal-assisted battery-powered trike, a carbon monocoque sports car running on biometane and a full-size electric delivery van.

The prize's organisers are relaxed about fuel, allowing anything from petrol and biodiesel to ethanol and electricity. "The X Prize targets breakthrough innovations, but innovations that are achievable within the next three to eight years — so you won't see any hydrogen fuel cells," says Eric Cahill, senior director of the Automotive X Prize.

Despite the emphasis on commercial production, none of the world's biggest car makers are taking part. None of their next wave of energy-efficient production cars — such as the Nissan Leaf, Renault ZE or Ford Escape — would meet the criteria for mileage and range.

"There are some advantages in being part of a big company but there are also substantial disadvantages," says Nick Carpenter, technical director of Delta Motorsport. "They just

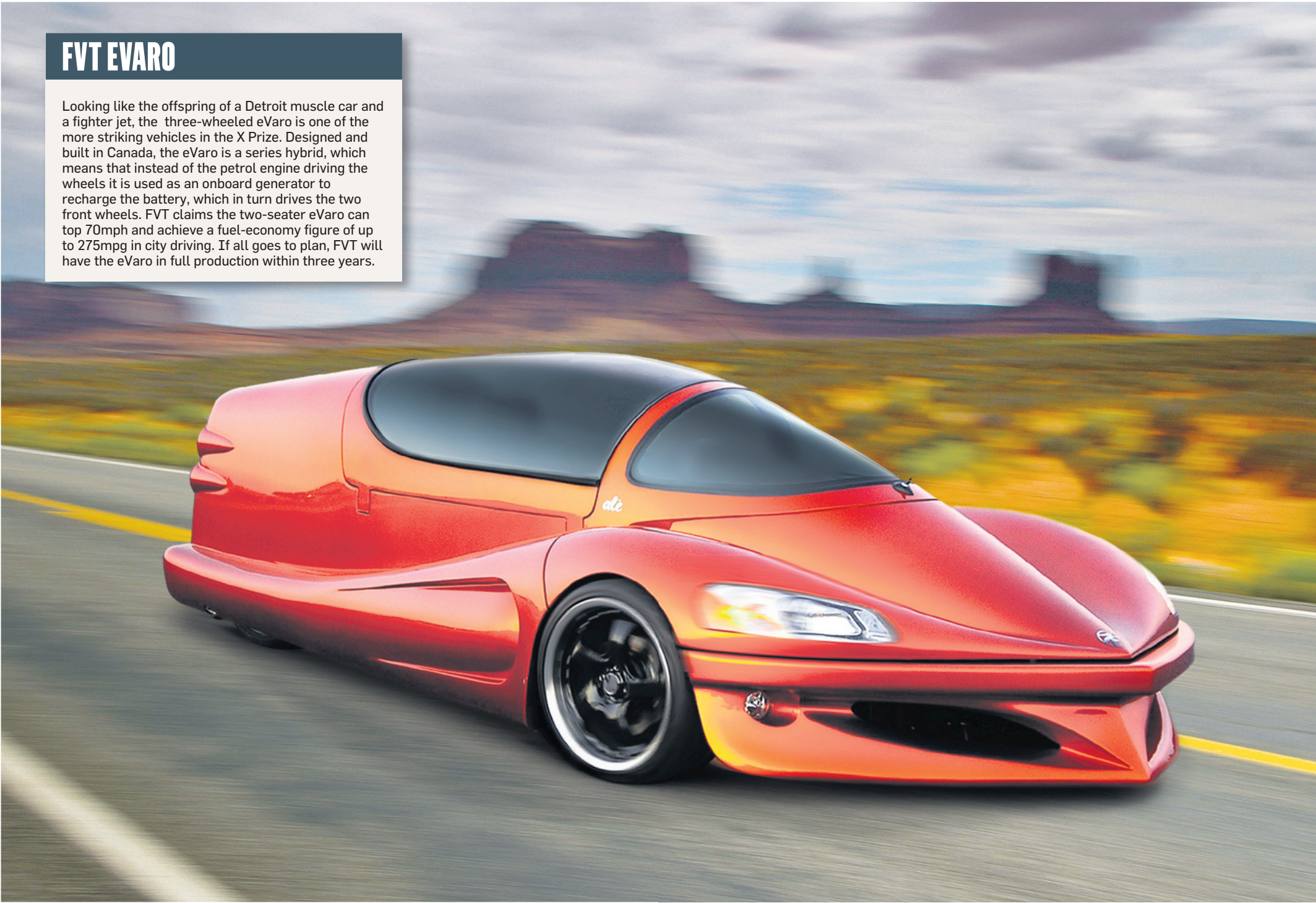
don't have the same level of flexibility as us to get the hell on with the project."

Big firms may also fear a PR disaster should they lose to amateurs such as EVX, a team of teenagers from Philadelphia running a sporty biodiesel hybrid.

Nearly 100 vehicles have dropped out of the competition, and no one expects all 41 remaining contenders to reach the final Le Mans-style endurance races. Between now and then the vehicles will be tested on everything from brakes, headlights, safety systems, windscreen wipers, mirrors — even the heater.

Such development does not come cheap. Delta has scraped together £750,000 from grants and investors, while Tata has the backing of the British government. Last September, Lord Mandelson announced a £10m loan to help Tata set up a UK assembly line for the Vista EV. The first Tata Motors-badged vehicles are expected to hit British roads in 2011.

The Automotive X Prize's \$10m purse is being provided by Progressive Insurance, an American car insurance company, but none of the teams is doing it for the cash. "Even if we win the X Prize, it's not enough," says Todd Pratt of FVT, a small Canadian car maker entering a high-speed trike. "Getting our car on the road is going to cost us somewhere between \$20m and \$50m. The real benefit of the X Prize is marketing. For a small company like us to have the entire world watching us is pretty spectacular."



FVT EVARO

Looking like the offspring of a Detroit muscle car and a fighter jet, the three-wheeled eVaro is one of the more striking vehicles in the X Prize. Designed and built in Canada, the eVaro is a series hybrid, which means that instead of the petrol engine driving the wheels it is used as an onboard generator to recharge the battery, which in turn drives the two front wheels. FVT claims the two-seater eVaro can top 70mph and achieve a fuel-economy figure of up to 275mpg in city driving. If all goes to plan, FVT will have the eVaro in full production within three years.

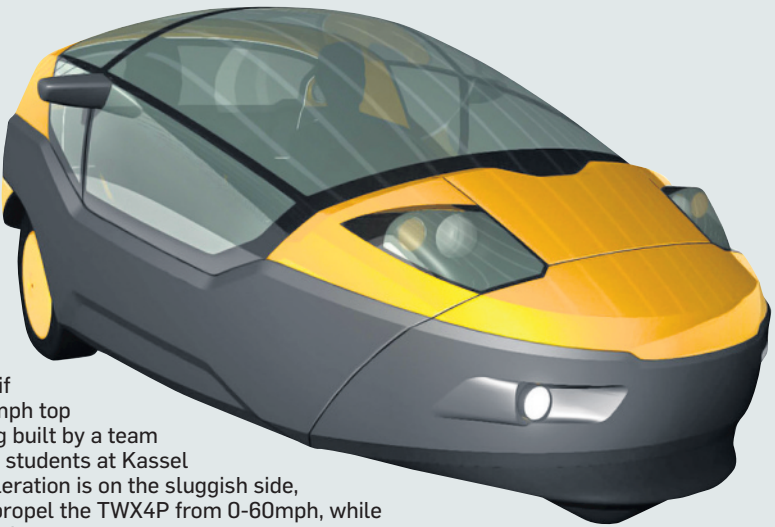
TATA INDICA VISTA EV-X

Based on the Indica Vista, Tata's hugely popular petrol-engined car in India, the Vista EV, pictured, uses polymer lithium-ion batteries, has a 125-mile range and a top speed of 65mph. The full specifications for the special X Prize version of the car — codenamed EV-X — are still unclear, but the power will have to be beefed up to meet the prize's requirement of 0-62mph acceleration in less than 15sec and a top speed of 80mph. It will compete in the alternative class, which has fewer restrictions than the mainstream class.



PROJECT TWX4P

Did Sir Clive Sinclair move to Germany? This two-seater electric trike looks very much like a 21st-century C5, complete with a pedalling option that lets the driver increase the vehicle's 100-mile range, if not boost its 80mph top speed. It is being built by a team of engineers and students at Kassel University. Acceleration is on the sluggish side, taking 12sec to propel the TWX4P from 0-60mph, while regenerative braking tops up the battery as you slow down.



EVX GT

Can a team of teenagers from Philadelphia outsmart boffins from Ivy League universities? This two-seater, rear-wheel-drive sports car uses an electric motor to deliver scorching acceleration (0-60mph in less than 5sec) before a Volkswagen 1.9-litre biodiesel powerplant kicks in to reach speeds of up to 150mph. It's built on a kit car frame and should sell for around \$60,000 (£36,000) — 40% less than the Lotus Elise-based Tesla Roadster.



SPIRA

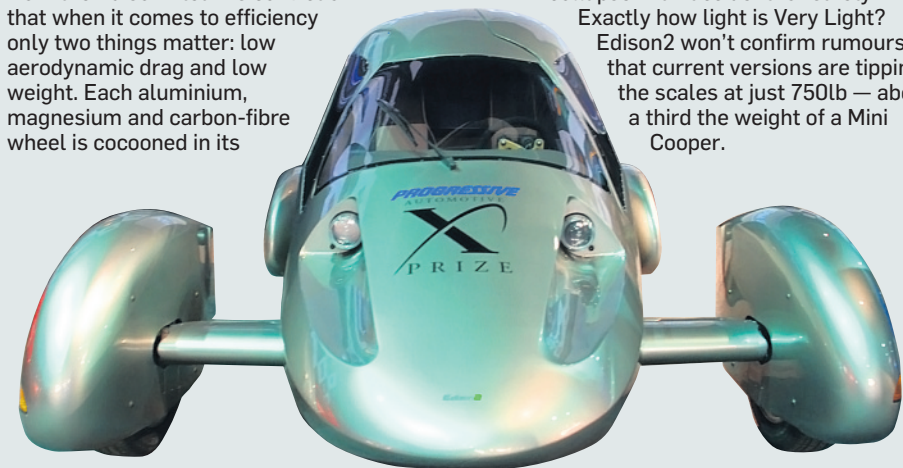
"Soft, safe and sexy" is the bizarre slogan for this two-seater foam vehicle from Thailand. The three-wheeled Spira should manage 100mpg and is light enough (300lb) to push home if its 250cc motorbike engine runs out of petrol. In terms of safety Spira's website proudly states that "a crash test at 27mph revealed no injuries to a pig carcass or a water-filled toy elephant". It also floats.



EDISON2 VERY LIGHT CAR

The Very Light Car's futuristic design came from the Edison2 team's conviction that when it comes to efficiency only two things matter: low aerodynamic drag and low weight. Each aluminium, magnesium and carbon-fibre wheel is cocooned in its

own fibreglass faring and is designed to collapse in an accident for safety. Exactly how light is Very Light? Edison2 won't confirm rumours that current versions are tipping the scales at just 750lb — about a third the weight of a Mini Cooper.



DELTA MOTORSPORT E-4

The E-4 coupé, the only mainstream X Prize entrant from the UK, is a four-seater plug-in EV with a range of 200 miles and a top speed of 140mph. Drawing on Delta's experience in producing grand prix and Formula 3 racing cars, the E-4 will use composite panels to save weight, pack low-slung lithium-ion batteries for a low centre of gravity, and enjoy brisk acceleration thanks to all-wheel drive from four wheel-mounted electric motors.

