

The Evora is here

Lotus Eco-Elise

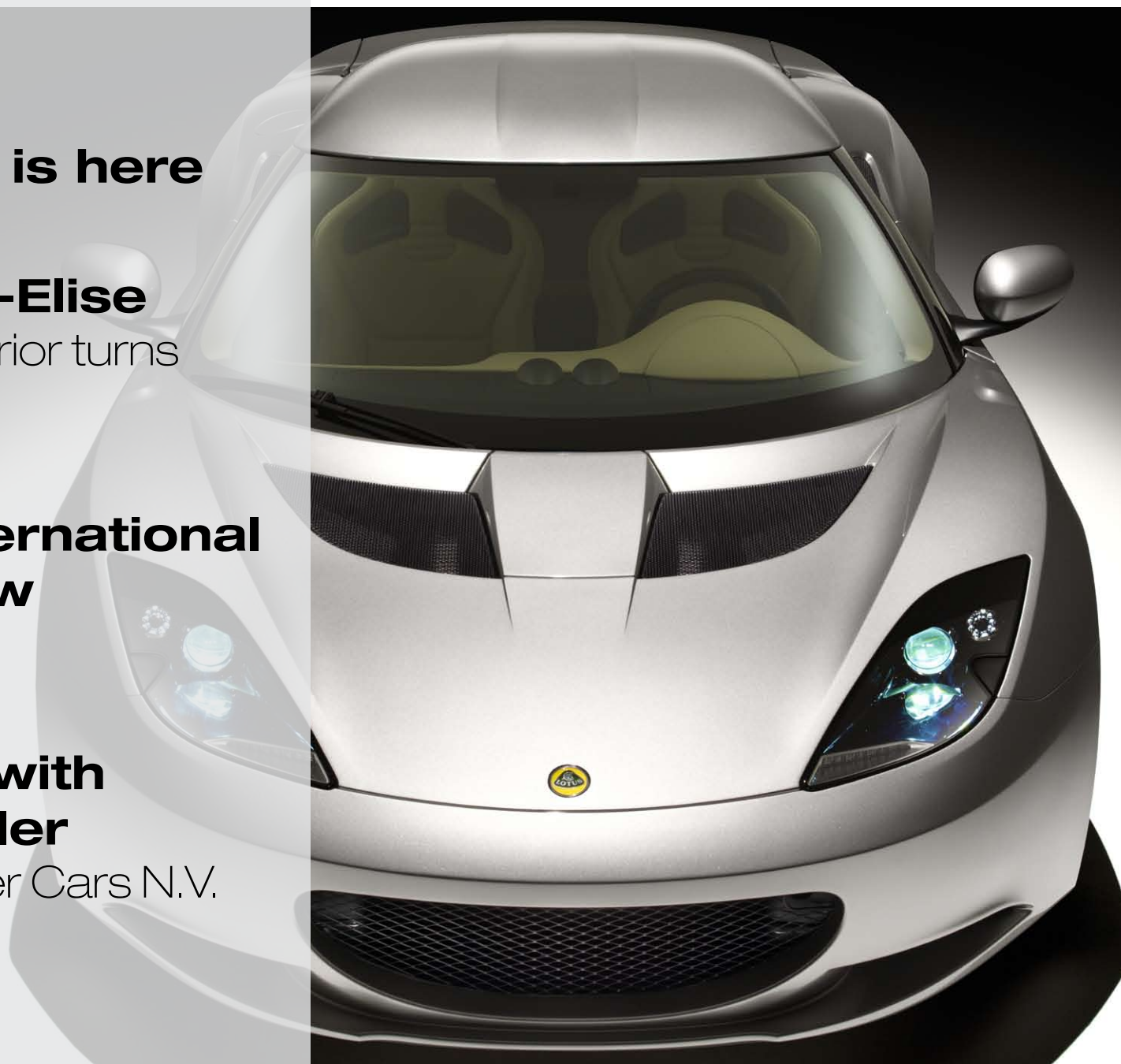
Trackday warrior turns
eco warrior

British International Motorshow

'08 review

Interview with Victor Muller

CEO of Spyker Cars N.V.



Welcome

The Lotus Evora is here, just in case you haven't heard! Though I'd be amazed if you've not already seen the extensive coverage of our all-new sports car. After nearly two years of hard work the covers came off at the British International Motorshow.

Everyone at Lotus Engineering is suitably proud of this achievement – the car is a fantastic demonstration of what our design and engineering teams can do. However, after the euphoria of the launch, everyone is already back to the hard work and looking forward to the coming months to ensure a smooth start to production at the end of the year.

The Evora being the star of the motor show was a surprise to no-one. However another Lotus, the Eco-Elise, also created a real stir, capturing public and media interest. Interesting from a technology standpoint – a hemp body, solar panels, eco fabrics and more – it is arguably an even greater example of the enthusiasm of the Lotus staff from across the business to drive forward new ideas.

The Eco-Elise was born from initiatives amongst the manufacturing staff to showcase some of the sustainable technologies, processes and approaches that they are pursuing. Quickly it became an opportunity to incorporate activities from other parts of Lotus as well. The car highlights many interesting avenues we are pursuing although many others didn't make it into the car, not being possible in time for the motor show. Behind the scenes there is so much going on to make our business and cars more sustainable, which Lee Preston, our Environmental Manager, discusses in this issue. It is not just words, it is real action, as the Eco-Elise proves, and that's what's important.

Peter Morgan
Marketing Manager – Lotus Engineering



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RUSSIA: Government forecasts Russia car output up to 5m by 2020

Russia's annual car output is projected to rise to 4.969m units by 2020 from about 1.3m units in 2007, the Economic Development Ministry has said.

Of the total, car production by joint ventures between Russian and foreign producers could reach 4.672m units, the ministry said.

The total share of imported cars on the domestic car market could rise to 42% by 2020 from 37.2% in 2007, the ministry said.

Under the forecast, the total number of cars in the country could rise to 94.2m units by 2020, up from 29.634m in 2007.

The ministry also predicts that truck output could increase to 745,000 units by 2020 from about 200,000 in 2007.

Source: just-auto.com editorial team



Russia's annual car output is projected to rise to 4.969m units by 2020 from about 1.3m units in 2007

UK: Falling consumer confidence hits new car sales

The UK new car market fell by 13.0% in July to 153,420 units - the steepest decline since December 2006, according to the Society of Motor Manufacturers and Traders (SMMT).

“The shortfall was more pronounced than expected and reflects growing concerns of weaker consumer confidence,” it said in its monthly report.

July marked the third successive month of falling new car demand, with volumes down 7.4% in the past three months.

The July 2008 total was 13.4% or 23,810 units off the 1999-2007 average for the month of 177,230 units.

The SMMT's revised forecast for 2008 suggests a 6.6% decline in volumes in the second half of the year. Year-to-date volume was off 3% to 1,400,899 units. The forecast for 2009 was also cut due to concerns that the economic situation will remain subdued for a more prolonged period.

The 12-month rolling total fell to 2.361m units in July - the lowest level since February last year, but would still mean that full year 2008 figures would be in the top ten annual totals.

The SMMT noted that July is a relatively small volume month, at 7.3% of annual sales, but the total was 7% below expectations. August is also a very low-volume month and so September (when the registration plate changes half-yearly, spurring sales) should provide a much clearer indication of underlying trends.

Private sector volumes have fallen in every month of 2008, but the July drop of 16.8% to 58,414 units was the steepest recorded since February 2005. Year-to-date private sale volume was 595,761, down 6.2%.

BMW, Kia, Nissan and Volvo have made the best volume gains for the year-to-date.

“The 13% decline in July new car registrations reflects the continued deterioration in consumer confidence being experienced across the economy. Rising fuel and household bills, alongside falling house prices are making consumers reluctant to commit to new expenditure,” said Paul Everitt, SMMT chief executive.



The Ford Focus just beat the Fiesta to be the number one best-seller in July

“Vehicle manufacturers are doing their bit to support consumers. New cars are now 22% more affordable than they were ten years ago and new technology is delivering more fuel efficient motoring. Industry needs the support of government in order to encourage the uptake of lower-emitting vehicles and ultimately lower the cost of motoring for consumers.”

The Ford Focus just beat the Fiesta to be the number one best-seller in July. VW's Golf was the best selling diesel in both July and over the year-to-date.

Only the mini and executive segments posted growth in July.

The diesel market fell in July (6.4% to 67,963 units) for the first time since February 2007. However, its market share continued to improve at 44.3% compared with 41.2% a year ago. Year-to-date volumes remained positive at +7.3% to 604,331 units, but are likely to drop as the overall market slips.

Market shares should edge higher as the consumer looks for more fuel efficient options, the SMMT said, adding that demand for alternatively fuelled vehicles bucked market trends and rose by 19.4% in July to 1,479 units.

Source: just-auto.com editorial team

The parallel-powertrain hybrid system eliminates the need for conventional torque converters, contributing to higher responsiveness and linear acceleration for improved driving feel

JAPAN: Nissan shows off new EV and hybrid technology

Nissan Motor has unveiled new all-electric and original hybrid electric prototype vehicles, both powered by lithium-ion batteries.

Under its Nissan GT 2012 business plan, the company has committed to zero-emission vehicle leadership, and has announced plans to introduce an all-electric vehicle in 2010 and mass market globally in 2012.

Powered by advanced lithium-ion batteries, the EV prototype is part of the automaker's research and development programme on zero-emission vehicles. This latest-generation vehicle features a front-wheel drive layout and uses a newly-developed 80kW motor and inverter. The advanced laminated compact lithium-ion batteries are installed under the floor, without sacrificing either cabin or cargo space.

The production vehicle to be introduced in 2010 will have a unique body style (the prototype is based on the current Cube production model) and is not based on any existing model.

The original HEV delivers two claimed breakthrough technologies - a high-performance rear-wheel drive hybrid system and parallel powertrain hybrid system. The hybrid employs Nissan's own originally-developed hybrid technology (the current Altima hybrid sold in the US uses a bought-in Toyota system) and its first rear-wheel drive hybrid powertrain.

The parallel-powertrain system comprises an energy-optimising system with two clutches, where one motor is directly connected to an engine and transmission via two separate clutches. Under changing driving conditions, the motor switches between the two clutches to optimise and conserve energy utilisation as well as improve fuel efficiency.

The parallel-powertrain hybrid system eliminates the need for conventional torque converters, contributing to higher responsiveness and linear acceleration for improved driving feel.

The dynamic characteristics of the clutches are: idle-stop where the battery is used to power the motor to save on fuel; regular driving



Infiniti sedan body cloaks prototype hybrid drivetrain developed in-house

where the engine is used to power the motor as well as regenerate the battery; acceleration where both the engine and battery (power assist) is used to power the motor to achieve smooth acceleration; and deceleration where energy from braking is conserved and re-routed back to regenerate the battery.

The lithium-ion batteries used in both prototypes are sourced from the Nissan-NEC joint venture, AESC (Automotive Energy Supply Corporation) and are said to offer superior performance, reliability, safety, versatility and cost competitiveness, compared to conventional nickel metal-hydrate batteries.

Its compact laminated configuration delivers twice the electric power compared to nickel-metal with a cylindrical configuration. The compact batteries also allow for improved vehicle packaging and a wide range of applications.

Source: just-auto.com editorial team



The Evora is here

With its stunning visual impact, exhilarating all-round dynamic performance, innovative chassis technology and high levels of luxury, packaging and convenience, the Evora heralds an exciting new era for Lotus.

The first all-new Lotus since the iconic Elise made its debut in 1995, The Evora enters the sports car market as currently the world's only mid-engined 2+2. Powered by a Lotus-tuned 3.5-litre V6 engine producing 280PS, and weighing just 1350kg (prototype specification), the Evora promises breathtaking performance. During preliminary testing around the famous Nürburgring, the Lotus chassis engineers report that it is extremely agile and great fun to drive - even when clad with the full development disguise that hid the beautiful lines from the prying motor-industry paparazzi.

In addition to its excellent performance and exemplary handling, the Evora offers a more refined ownership experience than Lotus's existing smaller four-cylinder models. Its elegantly-styled cabin is elegantly trimmed and its equipment list includes contemporary features such as an advanced touch-screen multimedia system and electric power-fold door mirrors.

Because one of the roles of the Evora is to attract new customers to the Lotus brand, much attention has been paid to its ease of use. Wider, taller door apertures and narrower sills make getting in and out of the cabin a less athletic undertaking than it is in Lotus's smaller sports cars (the Elise, Exige, Europa and 2-Eleven), while the design of the cabin itself will accommodate two 99th percentile (6ft 5in tall) American males in the front seats.

The 'convenience factor' of the Evora extends to less obvious areas of the car. For instance, beneath the skin the entire front-end structure is a high-tech aluminium sacrificial modular unit, attached to the main extruded aluminium tub. This modular unit is designed to deform for maximum safety, and to reduce repair costs in the event of a frontal impact.

The Evora has been designed with global automotive regulations in mind, and future derivatives are planned: these including amongst others, a convertible.

The Evora will be hand-crafted and built on a dedicated new assembly line within Lotus's advanced manufacturing facility at Hethel in the east of England; production will be limited to approximately 2000 cars a year, ensuring the dynamic new sports car's rarity and exclusivity.

Mike Kimberley, CEO of Group Lotus plc, has this to say about the exciting new model: "The Evora is the biggest milestone Lotus has achieved since the Elise was born 13 years ago and is part of our bold five-year strategic plan, which includes the introduction of new cars and technologies to many more markets around the world. The Evora also represents Lotus' core values of performance through light weight and efficiency and proves that you can have phenomenal performance, fuel efficiency, elegant design and practicality all in a class-leading mid-engine 2+2 sports car, which will meet global safety and homologation standards." He continued: "Looking to the future, we will continue to research, develop and produce lighter,



Lotus News

more efficient vehicles which are linked to our extensive and well-regarded work on all aspects of future fuels, alternative engines and electric and hybrid vehicle solutions for the future. We all have an environmental responsibility to future generations and the Evora is another example where Lotus is seen to make significant steps towards improving the efficiency and sustainability of the motor car, keeping Britain at the forefront of the high-technology motor industry."

By the time the Evora reaches the Lotus showrooms from Spring 2009 onwards, it will be the most thoroughly-tested Lotus car in the history of Lotus. It will also be one of the company's great milestones. The order book is now open in the UK and across continental Europe, with markets around the world to start taking orders in due course. Final specifications, options and prices of the production Lotus Evora will be published closer to the sale date in the many Lotus markets around the world.

Kimberley sums up: "This year Lotus celebrates its 60th anniversary and it is fitting that 2008 is also the birth of the Lotus Evora, a fantastic addition to the Lotus range. The Lotus Evora represents Group Lotus, a company that is at the forefront of the automotive industry, in a changing world where priorities of efficiency, economy and environmental impact go hand in hand with performance, design and individuality. I think Colin Chapman would have approved."

Source: Lotus Engineering



Innovative chassis technology used on the Evora

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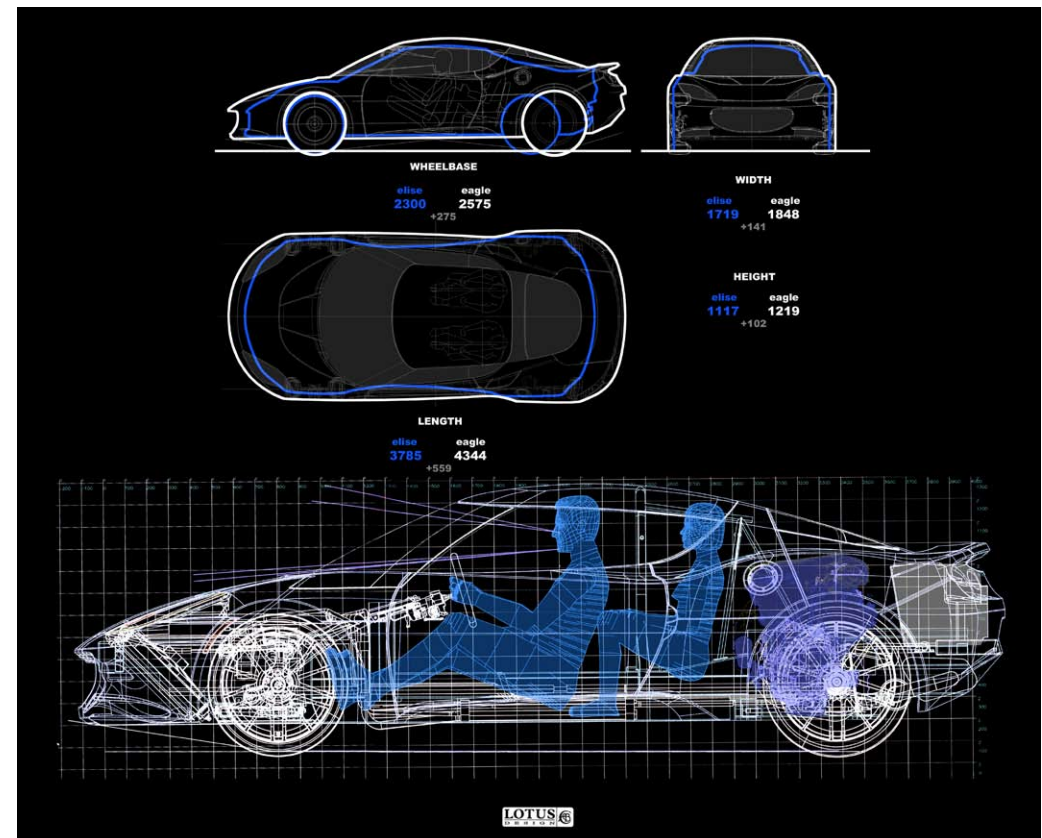
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The Evora and Elise's dimensions compared



Lotus to develop OMNIVORE research engine

Lotus Engineering has announced a collaboration with Queen's University Belfast and Jaguar Cars Ltd to develop an engine which maximises fuel efficiency when running on renewable fuels. The OMNIVORE concept will employ novel engine architecture to achieve a high thermal efficiency when fuelled on any alcohols or gasoline.

The project is sponsored by Defra (Department for the Environment, Food and Rural Affairs) and the DOE NI (Department of the Environment Northern Ireland) through the Renewable Materials LINK Programme. Lotus Engineering is currently undertaking a design study and the build of a single cylinder research engine for completion in December 2008. Vehicle modelling will validate the reduction in vehicle CO₂ emissions. Queen's University Belfast's School of Mechanical and Aerospace Engineering will be adding its world-leading expertise in engine simulation, with Jaguar Cars Ltd a consultative partner at all stages of development.

This engine design is expected to significantly increase fuel efficiency for sustainable bio-alcohol fuels. The architecture features an innovative variable compression ratio system and uses a two-stroke operating cycle with direct fuel injection. The OMNIVORE engine will be ideally suited to flex-fuel operation with a higher degree of optimisation than is possible with existing architectures.

Mike Kimberley, Chief Executive Officer of Group Lotus Plc, said: "The automotive industry is now focusing on its environmental obligations to reduce CO₂ emissions and improve efficiencies and we are seeing the high-technology capabilities of Lotus Engineering being in strong demand. Not only does our brand value of 'performance through light weight' fit perfectly with the necessary direction of the industry to produce lighter, more efficient vehicles, but we are also working on all aspects of future fuels, investigating alternative powertrains to accommodate alcohol fuels as they enter the market."

Kimberley continues: "Alcohols possess superior combustion characteristics to gasoline which allow greater optimisation. Taking full advantage of the benefits of sustainable bio alcohols will ensure a greater percentage of vehicle miles will be travelled using renewable fuels. We are delighted with the investment from Defra which will assist this partnership in taking forward research development and the demonstration of this environmentally-conscious transport solution."

Source: Lotus Engineering

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Lotus Eco-Elise

Trackday warrior turns eco warrior

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The Eco-Elise technology demonstrator vehicle created quite a stir on the Greener Driving Pavilion at the British International Motor Show. It provides a different perspective on 'green' that does not revolve solely around tailpipe CO₂ and complements the work Lotus Engineering is doing in hybrids and EV's, alternative fuels and lightweight vehicle structures. The focus of the Eco-Elise is to integrate affordable and green body, trim and vehicle technologies into the Elise design, showcasing more of the innovative work within the engineering and manufacturing groups at Lotus.

Lotus staff innovation and creativity led to many of the exciting features on this cutting edge Elise concept, illustrating the positive, green culture ingrained within Lotus. In keeping with the philosophy of the Eco-Elise, the energy expended to manufacture the car has been targeted, working to the 3R's, Reduce, Re-use and Recycle. Dramatic improvements to the culture at Lotus has rewarded the company with staggering reductions in energy (electricity 14%, gas 30%) and water (11%) consumed across the Hethel site in 2007 compared to 2006. These advances have coincided with improvements in recycling, with 57% of waste products now being recycled.

The new green materials sourced for the Eco-Elise have had their green credentials carefully assessed to ensure that each technology reduces the environmental impact of the vehicle. The whole lifecycle of the components has been analysed; the production stage, in-use and at the end of the vehicles life. It was important to ensure the technologies selected would offer lower emissions of harmful solvents and CO₂ over the lifecycle of the vehicle and reduce energy and water consumed during manufacture.

The Eco-Elise project focuses on developments in sustainable materials, cleaner manufacturing processes, renewable energy generation, reducing carbon miles, efficient driving techniques and weight reduction. Renewable materials have been incorporated into the project, with hemp, untreated wool and sisal providing natural, biodegradable engineering materials. Cleaner manufacturing processes have been sought; one example is the utilisation of the latest water based paint technology. In using this paint system, Lotus is able to save energy and reduces emissions of solvents from the paint shop. Solar panels have been seamlessly set into the hemp hard top to help power the electrical systems and give a means of renewable energy generation.



With the use of locally-farmed hemp the carbon miles to produce the Eco-Elise are reduced, in keeping with the holistic approach to this vehicle. The Eco-Elise puts an emphasis on efficient driving techniques by using a green gear change display to improve fuel efficiency and promote greener driving. Unsurprisingly for Lotus, the car has been on a crash diet to shed a few extra kilo's which assists fuel economy.

Sustainable materials

Sustainable hemp technical fabrics have been used as the primary constituent material in the composite body panels, spoiler and the structure of the lightweight sports seats. Historically hemp has been used in the manufacture of rope, illustrating the great strength of the material. The renewable hemp fibres have exceptional material properties that make for a very strong fibre.

Areas of the body and spoiler on the Eco-Elise have been left unpainted and the seats not fully trimmed to show the construction

of the panel on the car. But what is particularly noteworthy is the A-class surface quality achieved, something that Lotus is not aware of being achieved before.

As well as using a natural, sustainable material that absorbs CO₂ through photosynthesis when it is farmed, the manufacture of hemp panels is a low-energy process. Although the hemp material in the Eco-Elise uses a standard polyester resin to form a hybrid composite, further research is underway at Lotus into a different resin to enable a fully-recyclable composite, viable in the short-term future.

And to add to its appeal, the hemp used in the Eco-Elise fibres has been farmed in East Anglia, reducing the carbon miles incurred.

The hemp sport seats in the Eco-Elise are upholstered in a biodegradable woollen fabric. This new material is ethically produced and does not use any dyes or harmful processing. The colour is created from the selection of breeds used in the yarn, which increases the natural feel of the wool and reduces the processing of the cloth.

Lotus Eco-Elise

Trackday warrior turns eco warrior

“ The hemp hard top on the Eco-Elise has two flexible solar panels neatly and seamlessly embedded in the roof, contributing power to the electrical systems ”



Sisal is a renewable crop that, like hemp, is used for its strong material properties. It has been used for the carpets in the Eco-Elise, as it is a tough, abrasion resistant material. The use of these materials illustrates the capability at Lotus of utilising new, advanced materials and the flexibility of the manufacturing facilities.

Cleaner manufacturing processes

Whilst improving the green credentials of the production facilities, the Lotus paint shop, in partnership with Du Pont have developed a totally water-based paint system. This paint solution includes primer, colour coat and lacquer, and it is the first time that it has been possible to hand spray a water based production paint system.

In using this progressive water based technology, Lotus is able to achieve impressive savings in energy consumption due to the low bake curing temperatures this paint requires. An additional benefit of this paint system is the reduction in emissions of solvents, all of which contributes to substantial cost savings. This is a result of the unique collaboration with Du Pont in pushing forward low-volume paint spraying technology. This technology is anticipated to be available in production cars in the near future.

Energy generation and efficient driving

The hemp hard top on the Eco-Elise has two flexible solar panels neatly and seamlessly embedded in the roof, contributing power to the electrical systems, saving energy that would've been drained from the engine and providing energy to the battery when the vehicle is stationary. Installing the system within the curvature of the roof shows the potential to use the surface of a vehicle to collect solar energy, something which could be of even greater benefit for larger vehicles with greater body surface areas.

Lotus cars have red shift lights to help drivers extract the maximum performance from the engine. However for the Eco-Elise, Lotus software has been developed to assist drivers in maximising the fuel efficiency of the engine. A green gear shift display has been integrated into the instrument panel to ensure that gears are changed at the optimum point, to save emissions and fuel. In real-world driving conditions significant improvements have been made in fuel efficiency, illustrating the benefit of this system and the effectiveness of adopting a more energy-conscious driving style.



Weight reduction

'Performance through light weight', so synonymous with Lotus, has been embraced, as not only does the reduction in weight improve the handling and braking performance, but it also reduces the force required to accelerate a car. The weight reduction philosophy has even extended to the audio system with an exceptionally lightweight stereo and speaker system from Alpine saving 1.5kg. The system uses MP3/ iPod technology in a sleek modern design

The Eco-Elise uses special lightweight wheels that reduce the unsprung mass and contribute a weight saving of approximately 15.8kg over the already super-light Elise wheels. The hemp body panels and seats are lighter than the standard parts they replace, and in all the weight saving program for the Eco-Elise has resulted in a total saving of around 32kg from the car, which in turn will reduce the fuel required to drive it.

Source: Lotus Engineering

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British International Motorshow

'08 review

The British International Motorshow (BIM) is now in its second year at London's Excel and the 2008 show provided a showcase for a multitude of technological innovations. The challenges currently facing our industry have been well discussed and it is pleasing to see the way in which manufacturers are responding. I spent a day at the 2008 British International Motorshow to see how the industry and the technologies are evolving.

In addition to the normal exhibition halls, this year the show dedicated areas for the avant-garde of environmentally-friendly driving – the Greener Driving Pavilion and Electric Vehicle Village. Here I found electrical vehicles, hybrid electric vehicles and new sustainable materials. The NICE Ze-O, a small family MPV, is just one example of how small vehicle manufacturers are creating a niche within the industry. As this niche becomes more popular the technologies are often applied to higher-volume models by the larger manufacturers. Another car from NICE, the Super Light Electric Sports Car Concept, uses drive-by-wire technology to control the steering and brakes, combined with lightweight carbon fibre materials.

The BIM also saw the launch of a truly electrifying car. The Lightning GT uses hub motors on each wheel, combined with nano battery technology to deliver an estimated 0-60mph time of 4.0 seconds and a top speed of more than 130mph. Due to go into production later this year, the Lightning will join the Tesla Roadster, also on show and already in production at Lotus' manufacturing facility in Norfolk, in providing true supercar performance from an electric battery. This is achieved in both cases by using powerful electric motors combined with carbon fibre in order to keep the weight low.

This brings us nicely on to materials and the role they may play in reducing the carbon footprint of a vehicle. High-technology, innovative materials have always been at the heart of the automotive industry. Recently we have seen the popularity of carbon fibre and aluminium increase, both materials engineered to reduce weight and thus reduce fuel consumption. The BIM also saw the first showing of the Eco-Elise from Lotus. This concept further lightens the already featherweight statistics of the Elise by reducing weight from the alloy wheels and entertainment system but the real point of interest is the body panels – made from industrial hemp, they are sustainable and sourced locally and of lighter-weight.

The use of natural materials in the automotive industry is not a recent occurrence; manufacturers have been using hemp as sound-



“ The use of natural materials in the automotive industry is not a recent occurrence, manufacturers have been using hemp as sound-proofing for many years ”

proofing for many years. However, the Eco-Elise shows that there is perhaps a wider application for these types of materials. As the demand for steel increases due to the growth from countries like China, it may prove prudent for automotive companies to investigate alternatives, not only to reduce their carbon footprint but to also help their financial bottom line.

The advancement of green technologies is not confined to the lower volume and start-up manufacturers. Large established companies also used the BIM to demonstrate their ecological prowess.

Ford successfully launched its ECONetic range with the Focus ECONetic back in 2007, which was shortly followed by a Mondeo version. The new Fiesta was launched at the show along with an ECONetic derivative. Powered by a 1.4 TDCi diesel engine the Fiesta ECONetic emits a remarkable 98g/km and achieves 76.3mpg on a combined cycle. This has been achieved through aerodynamic revisions, lowered suspension, low rolling resistance tyres and a remapped ECU. Sales of Fords ECONetic range have grown by 38% in the first six months of the year. Despite the fantastic advances made by ECONetic it wasn't this Ford model which won the *What Car?* Green Car of the Year Award. This accolade instead went to the 119g/km Ford Focus 1.6 TDCi. *What Car?* Group editor Steve Fowler, said: "It's proof that outstanding efficiency and lower emissions can be achieved without using prohibitively expensive technologies." The Ford Focus ECONetic lowers emissions to 115g/km for an additional £250.

MINI used the show to launch the new Cooper S Works derivative – a 211bhp hot hatch boasting a 148mph top speed. However, there was something else on the stand which is much more impressive. Something which in its own unique way, MINI has termed 'MINIalism'.

MINIalism uses the same technology that Mini's parent company, BMW, employs in its model range. It encompasses an auto stop-start function, brake energy regeneration and a gear shift indicator. These technologies combined result in CO₂ emissions of just 104g/km for the MINI Cooper D - a great example of how by integrating affordable technologies car manufacturers can provide large improvements for consumers.

Citroën has long been known for their its engine technology and thus it comes as no surprise that it has adopted this approach to its environmental strategy. The Grand C4 Picasso and C5 both

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“ There is one thing upon which I can be certain though: the industry has never been more exciting and inspirational a place, both for the consumer and for those of us lucky enough to work in it ”

won awards from *What Car?* Green Awards, achieving emissions of 149g/km.

This figure is impressive and Citroën's common rail diesel technology is without doubt at the leading edge of development. However, when a comparison is made with the afore mentioned MINI, 149g/km starts to sound slightly on the high side. This is primarily due to the extra size and weight of the Citroën but this begs the question, is all that extra really necessary? Is a MINI large enough to function as a family car? This raises the second question of whether the industry should be placing a greater emphasis on developing lightweight affordable materials.

Toyota has been at the leading edge of Hybrid Electric Vehicles since the first-generation Prius made its debut in 1997. The Prius continues to sell extremely well in markets around the world: however the 2008 BIM saw the debut of the iQ in the UK. The iQ is a premium compact vehicle which uses innovative packaging to achieve space for three adults and one child in a vehicle which measures less than 3-meters in length. Further specifications of the vehicle have yet to be announced but Toyota claims the car will offer class leading fuel consumption and emissions.

The iQ perhaps shows the potential limitations of the conventional full hybrid system. Packaging limitations mean it would be difficult to engineer such a system for the iQ, yet stop-start technology will ensure the iQ offers competitive emissions, similar to the approach adopted by MINI. It is also interesting to note that Toyota's luxury brand, Lexus has positioned its hybrid derivatives primarily as performance vehicles. 'The world's first hybrid performance saloon' proclaims the marketing material for the Lexus GS 450h, utilising the hybrid powertrain as a performance enhancement rather than for its lower emissions. Will a full hybrid vehicle ever be able to compete on emissions with a smaller, lighter vehicle using innovative packaging and materials such as the iQ? It could be argued that rather than reducing carbon dioxide emissions, the industry is in fact adding unnecessary complexity and weight.

Nissan has adopted a slightly different approach to its environmental strategy. "We would like to be mass producing electric cars – not just one or two hundred – by 2012" said Pierre Loing, Nissan vice-president of product planning. Nissan showcased an electric vehicle at the Green Driving Pavilion which uses hydrogen fuel cells as its power source. The X-Trail FCV has a top speed of 90mph and a



range of 300 miles. The car has also recently completed a lap of the infamous Nürburgring, making it the first fuel cell vehicle to do so. Lithium Ion battery technology could also make electric vehicles a much more compelling proposition for the consumer – recharge times and range will improve dramatically and Nissan certainly seems to be concentrating its efforts in this area.

After spending half a day walking around the 2008 British International Motorshow, it becomes obvious to even the most apathetic consumer that the automotive industry is going through surely the most turbulent time in its history. Manufacturers are pursuing a wide range of new technologies and materials, each applied and



integrated into its model range in a manner which sets it apart from the competition and builds on the brand image which it has spent many years investing in.

Ultimately, no person can yet say with certainty where the future of the automotive industry lies. There is one thing upon which I can be certain though: the industry has never been more exciting and inspirational a place, both for the consumer and for those of us lucky enough to work in it. The 2008 British International Motorshow is testament to that.

Source: Kieran Harper, Lotus Engineering

Interview with Victor Muller

CEO of Spyker Cars N.V.

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We were almost in the black in 2006 and 2007 should have been an improvement, but Formula 1 changed all that

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Netherlands-based Spyker Cars is a maker of high-end sports cars that is rebuilding its business after an expensive involvement with Formula 1 that saw its losses balloon. As well as getting itself back on an even financial keel, the firm is also eyeing new products and higher volume. just-auto editor Dave Leggett interviewed the CEO, Victor Muller on behalf of proActive.

DL: How is business this year?

VM: We have seen a steady improvement and return to normal trading circumstances in the first quarter and we expect that to continue to improve through this year.

DL: What's behind the large loss (EUR72m) the company made last year?

VM: Clearly that's our involvement with Formula 1 – we ran into massive liquidity problems as a result of Formula 1. It dragged the rest of the business down and in the end we didn't have money to buy parts for our cars and production dropped like a stone as a result.

We were almost in the black in 2006 and 2007 should have been an improvement, but Formula 1 changed all that.

DL: What went wrong with your Formula 1 involvement?

VM: We did not manage it properly. It wasn't like we had the wrong ingredients...we just did not manage it properly.

You can see with the performance of Force India – the buyer of our team – that even with the addition of US\$50m budget, they still perform no better than we did. That shows how difficult it is.

DL: Who owns Spyker?

VM: We are a public company (listed on Amsterdam Exchanges) and there are four major shareholders. One is Vladimir Antonov, a new shareholder who came in at the end of last year. He's a Russian banker who is very committed to the company and a keen car collector and financial investor. He has 30% of the stock.

Some 25% of the stock is in the hands of government owned Abu Dhabi investment company Mubadala (which also has 5% of Ferrari). Another investment company, Gemini, has 10% and I also have 10%. So collectively, the major shareholders account for 75% of the company's ownership. The rest is in free float.

DL: What's the ideal production volume for a company like yours making exotic high-end sports cars?

VM: The ideal volume is what the market demands minus one. In 2006 we produced around 100 cars and we intended to produce around 150 last year. Of course last year we did not get anywhere near that number because of the trouble that we ran into.

But we are seeing a tremendous increase this year over last year. We could easily go to 250 cars a year within the existing production infrastructure so there is no reason that we wouldn't aim to make that many if we can sell them.

DL: You have plenty of capacity then?

VM: Yes, plenty.

DL: Given the financial problems you have had and the disruption to production, are you confident that you can maintain loyalty from your customer base?

VM: Amazingly, you could say, we still have a very loyal customer base. We have lost a handful of dealers but a lot of new dealers have joined us.

What really doesn't help is the worldwide financial crisis that we are in, which will find its way into consumer spending. But our customers are, relatively speaking, not hit so much by that crisis.

DL: I guess your customers are fairly high net-worth individuals?

VM: We estimate on average US\$50m.



Interview with Victor Muller

CEO of Spyker Cars N.V.



DL: Where are they from?

VM: 50% are in America, 50% outside America. When the SSUV four-door four-wheel drive car comes we expect that there will be a shift, let's say to the new economies – Russia, China and also the Middle East, because that's where that car will be going.

DL: Making exotic sports cars isn't an easy business to be in and you don't need me to tell you that. What attracted you to it?

VM: It is a phenomenal challenge and I have always tremendously enjoyed challenges and little did I know just how challenging it would be...but it was all self-inflicted because I decided with the board that we should go into Formula 1. Obviously we did not manage that properly and paid the price.

However, building exotic sports cars is still a tremendously nice and attractive business and when we get our new products on the road – the Aileron C-line and D-line SSUV – then we can demonstrate that this business is not only a challenging business but one that is also a nice business from a shareholder point of view.

DL: What is the basic company strategy for Spyker Cars?

VM: The basic strategy is to design and develop timeless sports cars. We are not going to make any new-edge designs or do things that might be considered out-of-date in five years. We want to control our distribution very carefully and we believe that there are three things that are really important to building our brand: consistency, consistency and consistency. It is very, very important to have a consistent brand image.

We also focus on a limited number of markets in our strategy and we are also dedicated to racing and especially GT2. Of course F1 was a great way to promote the brand but that, unfortunately, was short-lived. GT2 and Le Mans are part of our strategy.

DL: What are the core values in the Spyker brand?

VM: We have five brand pillars: heritage, design, craftsmanship, performance and exclusivity. Those are the five core elements that constitute the Spyker brand.

DL: From a customer perspective, what should mark a Spyker out from an Aston Martin or Ferrari?

“ We have five brand pillars: heritage, design, craftsmanship, performance and exclusivity. Those are the five core elements that constitute the Spyker brand ”

VM: The exclusive element is important and the hand-built element is very important, too. The other cars are mass-produced by comparison. And the aviation heritage is something that is reflected in the exterior design and the interior design.

The customer is eager to buy Spyker because it is something else; he wants something different, more exquisite, more exclusive and more hand-built. We are not competing with Ferrari or Aston Martin. When you have made your first million pounds then you go and buy a Ferrari, not a Spyker – not yet. That will take quite some time. Typically a Spyker buyer already owns or has owned well-known brand supercars and wants something that is different from that experience. We are on average the seventh car in their collection.

DL: What models do you see as key to Spyker's future development?

VM: C8 Aileron which we showed in Geneva last March. And the Peking-to-Paris D8 SSUV – production of which starts in 2009.

DL: What engine will the SSUV get and can you say anything about likely pricing for that vehicle?

VM: The engine will be V8-cylinder and most likely of American origin. Pricing for that model will likely be around EUR235,000.

DL: And how many of those SSUVs do you think you will be building?

VM: It will be in the hundreds a year.



Interview with Victor Muller

CEO of Spyker Cars N.V.

“ Working with Lotus means that we can plug into a very well-oiled machine, very professional, with very helpful and passionate people who love cars ”

DL: Will the tie-up with Lotus Engineering help with product development?

VM: Clearly. Working with Lotus means that we can plug into a very well-oiled machine, very professional, with very helpful and passionate people who love cars. By teaming up with Lotus we have reduced product development time and cost.

Now that we have signed a letter of intent with Lotus for cooperation and platform sharing, I hope that the cooperation intensifies to the benefit of both parties – it's not just one-way traffic. Lotus can benefit, too: larger production runs mean lower cost, which should benefit both parties.

DL: Can more models follow?

VM: Of course, but let's not get carried away at this time. We have ideas for other models, but we are focused on making a success of the new models that are at an advanced stage of development – C8 Aileron and the 'Peking-to-Paris' SSUV.

DL: And Lotus can act as a contract manufacturer for some Spyker models?

VM: I would sincerely hope so.

DL: I guess many people are aware of the Spyker C8 Laviolette's role in the movie Basic Instinct 2 – how does that sort of product placement happen?

VM: We are consistently trying to get our products placed in movies and in advertising and that's working well for us. We don't use agencies to represent us in Hollywood or anything, we do it ourselves – they find us and we find them. We know a lot of people in Hollywood.

DL: Do you have many customers for Spykers in Hollywood?

VM: Oh yes, plenty – but I can't name them.

DL: Would you go into Formula 1 again after the last experience?

VM: I would have no hesitation in going back in but only if there is clarity with the Concorde agreement. And we would have to be in the position of being able to manage things properly. But for the time being it is certainly not on our agenda and we have other fish to fry.

Victor R. Muller

Victor Muller is one of the two founders of the company. As Chief Executive Officer he is responsible for implementing the overall strategy of Spyker. In the second half of 2007, Mr Muller temporarily stepped down as CEO because leadership of the company could no longer be combined with giving direction to the intensive media attention.



Victor Muller started his career in 1984 as a lawyer at Caron & Stevens/Baker & McKenzie, Amsterdam. In 1989, he became a member of the management team of the offshore company Heerema in Leiden and was involved in several acquisitions. He became partial owner of Wijsmuller Salvage and Towage, IJmuiden, as a member of a consortium through a management buy-out. From 1992, he has managed and restructured several companies including Emergo Fashions Group B.V. that went public under the name McGregor Fashion Group N.V. in April 1999. Victor Muller was appointed Management Board member for an indefinite period of time.

But you never know what may happen in the future...

DL: What gives you pleasure in this business?

VM: It's a fantastic business and I love it to death. Being at Le Mans and seeing your car pass by – that's really inspiring and a good feeling. Talking to existing customers who have lots of personal success with our cars is inspiring.

The design phase of new car development is exciting.

There are so many aspects to this business that inspire me and give me energy. And working with such dedicated professionals is very satisfying of course.

And the creation of a new product is very exciting. If it is well received that is extremely gratifying.

Source: just-auto editorial



Environmental mission

How Lotus stays green and clean

“ We have started to change light fittings to the latest-technology lighting systems using lamps that consume half the energy ”

Lotus cars are some of the most efficient sports cars in the marketplace and Lotus Engineering is at the forefront of green technologies for lightweight vehicles, hybrids and EVs, alternative fuels and cleaner engines.

However, behind the scenes we are also doing important work to make our production and engineering facilities efficient and increasingly more eco-friendly.

At the Hethel headquarters we employ over 1,000 people and use a significant amount of energy for heating, lighting and a wide range of activities from engine testing to paint curing. We have been busy for a number of years reducing these impacts and have made significant reductions in electricity consumption. The site used 14GWH in 2005/06 and in 2006/07 we reduced consumption by over 14% which was achieved across the whole site in a number of ways. Much of this has come from thinking about the small and simple things that cumulatively have a big effect.

We have started to change light fittings to the latest-technology lighting systems using lamps that consume half the energy and are rolling this out across the site. Even small changes, such as fitting switches that automatically switch lighting on and off in store rooms and kitchen areas, have been put in place to conserve energy. The production and engineering workshops use compressed air for hand-held tools and breathing apparatus. To generate dry compressed air suitable for use requires the consumption of a lot of electricity; we have introduced efficient dryers, compressors and have used software to automatically switch compressors on and off as required instead of the compressors running at full load continually.

Reducing the amount of electricity we use is important and we will continue to make further improvement. However of great significance is the recent approval we have been granted to install wind turbines at Hethel to produce our entire electricity consumption requirement for our headquarters. The wind turbines are a truly green perpetual source of electricity generation for Lotus needs and will also generate electricity for the national grid helping reduce CO₂ emissions from power generation nationally. The three turbines which will generate 6MWH should be operational in 18 months' time.

Alongside the electricity, we use gas at Hethel for heating, processes such as paint cure and ABS pattern forming for the car's interior. Gas consumption has also been reduced. The site used 16GWH



Lotus has dramatically reduced the volume of waste being sent to landfill by increased recycling

Environmental mission

How Lotus stays green and clean

“ All waste that is non-hazardous and cannot be feasibly recycled is compacted on site. This reduces volume therefore reducing the transport collections saving CO₂ ”



The hemp sport seats in the Eco-Elise are upholstered in a biodegradable woollen fabric.

in 2005/06 and in 2006/07 we reduced consumption by over 30% saving 942.6 tonnes of CO₂ being emitted to the atmosphere.

We have become smarter on how we use the gas by setting up systems to monitor external ambient temperatures and switching on the gas heating at variable times to ensure we get the right temperature for the staff start times. This means that if it is a particularly cold week, the heating will start earlier to get the workshop or production line at the right temperature for the start time and then when the weather warms, the system is intelligent enough to start the gas heaters later but ensures that the temperature is at the correct level, at the start time. To ensure we do not lose heat generated by gas, we are in the process of converting all of our traditional roller-shutter doors with rapid roll doors to keep heat in.

Lotus has dramatically reduced the volume of waste being sent to landfill by increased recycling and has reduced the total volume of waste produced through the production facility by improved resource efficiency. We have engineered waste out by reducing off-cuts of leather and fibreglass, etc. The waste produced across the site from

the offices through to the production line and engineering workshops is segregated at source by our staff. We have different colour-coded bins for different types of waste. The offices at Hethel have small green desk bins for paper related wastes such as office paper, card, magazines, paper-cups, etc. The workshops have larger green bins for card and blue bins for polythene. These recyclable waste streams are collected and baled on site then sold to recycling plants as opposed to being traditionally sent to landfill at a cost.

The engineering workshops produce a variation of scrap parts. The engineers now segregate the metals so that when they are sent to the recycling plant. All waste that is non-hazardous and cannot be feasibly recycled is compacted on site. This reduces volume therefore reducing the transport collections saving CO₂.

Packaging from parts used in production is recovered and is now used within the Lotus Aftersales department. This reduces the need to use new packaging and saves valuable resources. Due to the volume of packaging we handle in a year we are an obligated packaging company, and are required to comply with the Environment Agency Packaging Regulations. By re-using packaging we are reducing our obligation.

These changes reduce our impact on the environment but also benefit the bottom line and are helping make the business more sustainable. Our gas, electricity, waste and recycling performance is monitored closely; all the production facilities have an energy sub-meter so that we can see consumption on a half hourly basis. A management report is produced and circulated to senior management with summary data circulated to all staff via notice boards bi-annually with information to staff to switch things off and ask for feedback.

The involvement of the staff in the environmental performance of the site has produced some excellent initiatives. The most recent is the successful Eco-Elise, where we wanted to produce a demonstrator to showcase our latest ideas for greener production in one of our own products. The Eco-Elise uses hemp for the body panels and seats which is grown locally in Norfolk, absorbing and fixing CO₂ in its production materials.

The Hethel headquarters have to comply with stringent regulations set by the EU and government. Throughout the year we are audited by Environment Agency, DEFRA and South Norfolk Council to check our compliance against regulations such as the Packaging Regulations and our permit to operate. On all audits we are commended for our application of the regulations and commitment to them.

The company has had a positive impact within the area in which it operates and is part of Shaping Norfolk's Future Environmental Prosperity Group (SG4). Shaping Norfolk's Future is a business-led partnership that works to create wealth and jobs for the people of Norfolk. We have also been working with a range of schools to promote our eco-friendly ways and have been invited to talk about what we do on site and how it can be applied to a school environment.

“ To ensure we do not lose heat generated by gas, we are in the process of converting all of our traditional roller-shutter doors with rapid roll doors to keep heat in ”

Environmental mission

How Lotus stays green and clean



Mock-up of the proposed wind turbines set to supply electricity in a sustainable and green way

So what for the future? We recognise that there is always more that can be done and we are committed to continually reducing our impact on the environment at Hethel and are working on some exciting projects. With the proposed wind turbines set to supply our electricity in a sustainable and green way, we want to reduce our dependency on natural gas. To do this we are looking at harnessing the heat produced in the engineering test cells to heat the surrounding workshops and the heat generated from the paint trolley Pyrolysis oven stacks to heat the factory. We are evaluating the viability of using a bio-fuel heat source by converting all our clean waste wood into chips ready for the specialised burner to heat other parts of the site. This is a carbon neutral form of heating.

We are also looking to reduce gas consumption within the paint booths by converting to a fully waterbased low bake paint system. It is estimated that this system could produce a 10-20% gas saving within the paint facility.

Even though we will have the turbines we will increase the use of efficient lighting systems and are investigating the use of wind catchers. Wind catchers are designed to go onto flat roofs and use natural ambient air to cool offices and workshops. Once installed they use minimal electricity and can perform better than air conditioning as well as supplying fresh air to the workplace – thus improving the environment.

These are just some of the things we are looking at, but there are many more. We take our responsibility to reduce our environmental impact very seriously. The measures we take have to be practical and appropriate to our business but it is our experience that implementing greener initiatives also makes us more efficient and has a positive financial effect. That's a win-win-win and that's very Lotus.

Source: Lee Preston, Environmental Manager, Group Lotus

Contact Us

For more information, feedback or other enquiries to Lotus please contact:

Lotus Engineering

Headquarters

Hethel
Norwich
Norfolk
NR14 8EZ
United Kingdom
Editor: Peter Morgan
Email: proactive@lotuscars.co.uk

just-auto.com

c/o Aroq Ltd
Seneca House
Buntsford Park Road
Bromsgrove
B60 3DX
United Kingdom
Contact: Mike Gove
Email: mike.gove@aroq.com

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