Protoscar
CLEANCAR SHAPERS

Communication plan

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PRESS RELEASE

From LAMPO to LAMPO^3: The evolution to a purpose designed premium EV.

Executive Summary

LAMPO^3 is a battery powered electric demonstration sports car developed on the base of 30.000 km lessons learned with its predecessors LAMPO and LAMPO^2. It features a purpose designed light weight chassis, a 2+2 coupé design and a fast charge option. The BRUSA powertrain (3 motors with a total output of 420 kW) guarantee extreme performances without compromises in terms of efficiency. LAMPO^3 has been developed by Protoscar (www.protoscar.com), a Swiss company working for OEMs, power utilities and governments, and since 24 years specialized in the development of CleanCar projects. LAMPO^3 has been unveiled the 11 May in the M-Way Shop in Zürich.

LAMPO evolution

LAMPO^3 is the 3rd sports EV prototype realized by Protoscar, the first company worldwide having developed three generations of 4WD sporty EVs within three years. After more than 30.000 kilometers "lessons learned" with its predecessors LAMPO and LAMPO^2, tested by more than 500 different drivers (mostly OEM's engineers) on European roads and test tracks, Protoscar's highly specialized staff made its dream become truth: the purpose designed 2+2 coupé LAMPO^3.

LAMPO (presented in 2009) and LAMPO^2 (presented in 2010) have permitted to collect all the necessary experience for Lampo^3: the first purpose-designed EV supercar.

Purpose designed chassis

LAMPO^3 is an electric sports car with purpose designed lightweight chassis that impressively shows un-compromised CleanCar design and engineering competences:

1) For the first time a pure electric 2+2 coupé features a chassis specifically built around the electric components, unlike most OEMs' EV-chassis, which are adapted from internal combustion versions. LAMPO^3 is the worldwide first pure electric sports car being a 2+2 seater and providing enough luggage space and optimized ergonomics.
2) The light weight chassis carries actively cooled batteries, optimally positioned in the central tunnel to improve drive dynamics, safety and pay load.
3) Three motors - of which two on the rear axle and one on the front axle - allow an improved dynamic behaviour of the car and an optimized torque vectoring, not only between front and rear axles, but also between the two rear wheels (the motors actively drive on different adapted RPMs for instance in curves, where the inner wheel turns slower than the outer wheel).

Technical description and top performances

LAMPO^3 has three electric motors (in fact becoming a four-wheel drive with variable torque between front and rear axle for optimal handling, safety and efficiency) with a total output of 420 kW (equivalent to 550 HP), 900 Nm and 32 kWh of Lithium-Ion battery capacity. LAMPO^3 features real sports-car performances: 4.5 seconds for accelerating from 0 to 100 km/h, 220 km/h of max. speed, and 200 km of range. More than enough energy for driving throughout the whole year is produced by a remote solar plant, allowing a real zero-emission drive..

As the first two LAMPO prototypes, LAMPO^3 impressively demonstrates that from a pure performance point of view (acceleration, torque, overtaking, speed, efficiency) pure E-drive is THE solution not only for city cars, but for all other types of vehicles including premium-segment cars (the only segment, through which new technologies have been introduced into the market successfully so far). The real performance of LAMPO^3 will be demonstrated on different test-tracks during the year 2011 by the winner of the 2010 GT1 24 hours of LeMans, Mr Gabriele Gardel. Catch him … if you can!

For the first time a LAMPO concept could be produced in a micro-series for public customers such as companies involved in the EV development, entities dealing with the promotion of EVs and private enthusiasts.

Charging Modes

LAMPO^3 is equipped with the new BRUSA on-board charger NLG6 allowing up to a 22kW of charging power. Therefore LAMPO^3 can be charged with every kind of power actually on the market: from a standard single-phase 10 A plug, up to a three-phase 32A for charging at industrial plugs (fleet users).
Moreover LAMPO^3 has an interface for DC fast charging based on CHAdeMO standard (www.chademo.com). With LAMPO^3 different infrastructure solutions will be tested and evaluated.

<u>Home Charge Device</u>
The Home Charge Device offers maximum safety to charge any compatible electric vehicle, because its hardware and software is personalized to a specific car brand, model, plug (Type 1 / 2 / 3 or CEEPlus Plug) and to a specific national grid.
Electric plugs are available everywhere, but not all of them can withstand the full power required by an electric vehicle charger. The HCD allows the automatic adapting according to the limitations of the available infrastructure.
The HCD is to be considered as “snow chains”: because it is personalized, it follows the specific car once the car changes to a second user. This is why the HCD is conceived as a mobile device, and can easily be hanged up on the wall (in the garage or outside, since the HCD is conceived both, for indoor and outdoor use). The marketing concept is to offer the possibility of ordering the HCD equipment device and its proper installation at the same time, including a relevant check of the existing electric domestic installation.

Fast Charge (in association with ABB)
The ABB DC fast charge station is conceived to dramatically decrease the charging time of electric vehicles. According to the battery type and its status, an additional range of up to 100 km can be achieved within 10 minutes of charging. This charging solution is mainly intended as a range extension, not as a recharge system for full charges, although this would be possible as well (at least between 20% and 80% DOD - according to the battery type and status).
The ABB DC fast charge follows the CHAdeMO standard. Two characteristics define this standard: protocol and connector compatibility - both will be made available by CHAdeMO, and no IP will limit the diffusion of such systems. Nissan, Mitsubishi, Subaru, Peugeot, Citroen, Think and Protoscar already support this standard from an OEM point of view.

Philosophy

Well to Wheel approach
Protoscar not just realises zero emission vehicles, but also cares about the energy needed to let them move. This takes into account the entire energy chain, focused on CO_2 emissions - the so called "Well-to-Wheel" (www.optiresource.com). LAMPO^3 is powered by solar energy, produced by a remote 16 kWh photovoltaic plant located in Seggiano (Tuscany), Vitabella Palazzetto. The energy produced is put into the global grid and charges the LAMPOs around Europe when needed. The goal is to self-produce all the energy that we need for the car getting to counterbalance the entire consumption. See:
www.sunnyportal.com/Templates/PublicPageOverview.aspx?page=c07b1bc9-afdd-4ae9-a489-8ffb4fbcea9d&plant=496a607f-3e95-44fe-bef5-4013639397a3&splang=it-IT

Innovative top-down approach
With LAMPO^3 we clearly apply a top-down approach, instead of a bottom-up strategy. Traditionally the automobile sector initially shows trendy characteristics in exclusive, premium, vehicles. Unavoidably, at first the price of such products is very high but with growing production the prices decrease, allowing a large number of people to have access to the new technology (in other words the first buyers allow the technology to circulate). However, in the electric vehicles market the strategy is often contrary based on a bottom-up approach. This is the reason why electric vehicles are not always successful. In today's market the majority of the EV promoters try to sell electric cars as a "rational vehicle" and forget the emotional aspects. But as a matter of fact, for most buyers a car is essentially an emotional object and not only a means of transport. The LAMPO^3 as well as its predecessors LAMPO and LAMPO^2 shall demonstrate that electric drivetrains can be perceived positively and totally accepted if placed and launched in a different way.

Vehicle's name and logo
LAMPO^3 - "^{3}" because it is not just the third car within the LAMPO project developed by Protoscar, but it is even more efficient than its predecessors and the purpose design chassis represents a huge step forward in terms of design and engineering of sporty Evs.
In the Italian language LAMPO means „lightning". A lightning stands for power, especially for electric energy like the one propelling LAMPO^3. Moreover a lightning is fast, intense, impressive and, last but not least, LAMPO^3 is a product of nature. The edgy logo of LAMPO^3 with its straight lines reminds the lightening and emphasizes the electric spirit of the car.

Vehicle's design

The Design of LAMPO^3 has been inspired from an oblique approach to car design, combined with an essential rule for an extremely advanced, performing and efficient vehicle: form follows function.
We took inspiration from the American Le Mans and FIA GT1 series cars, where all the functional aspects of these high performance cars are presented in a stylish way.
The general layout of the vehicle, consisting in a shortened bonnet, front wheels close to the cabin, long wheelbase and short rear overhang, helps to give a very dynamic feel to the silhouette of the car. This combined with some "LAMPO DNA" design clues creates the mix that lead to the final design that wears LAMPO^3 body.

Protoscar

Protoscar SA (www.protoscar.com) is a design company founded in 1987 specialized in CleanCars and based in Rovio (Ticino, Switzerland). It presently employs 14 specialists.
We act like a "Minergie-architect", but apply the efficiency-concepts to cars, mainly by introducing electrification. Our unique experiences and holistic approach allow us not only to develop forward looking strategies and outstanding vehicle concepts, but also to support the market introduction of CleanCars and the communication activity of these technologies. We are proud to include worldwide companies like Alpiq, Fraunhofer IAO, ABB, Daimler AG, General Motors, Rinspeed-Esoro and Nissan among our faithful clients.

Sponsors & Partners

Protoscar would like to thank all partners and sponsors who have allowed such an ambitious project as LAMPO to become reality: In addition to BRUSA, which supplies the components of the whole drive train, the main partners and sponsors of LAMPO^3 are ALPIQ (leading Swiss company in power generation and distribution), ABB (DC fast-charging technology), Credit Suisse (one of the world's leading financial services providers), m-way (future distribution) and the Swiss Federal Office of Energy as well as the technical partners Metaltool, Q11, EVTEC, BASF, Nationale Suisse and Leoni.

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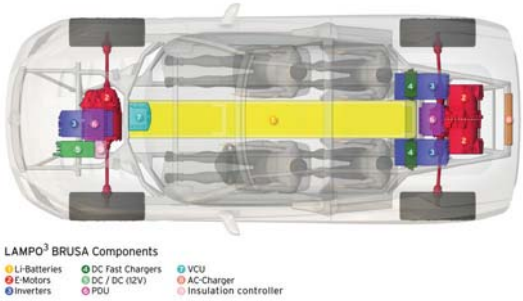
Protoscar LAMPO^3

pure battery EV – specifications



Unique features

Purpose design chassis:
1) For the first time a pure electric 2+2 coupé features a chassis specifically built around the electric components, unlike most OEMs' EV-chassis, which are adapted from internal combustion versions. LAMPO3 is the worldwide first pure electric sports car being a 2+2 seater and providing enough luggage space.
2) The light weight chassis carries actively cooled batteries, optimally positioned in the central tunnel to improve drive dynamics, safety and pay load.
3) Three motors - of which two on the rear axle and one on the front axle - allow an improved dynamic behaviour of the car and an optimized torque vectoring, not only between front and rear axles, but also between the two rear wheels (the motors actively drive on different adapted RPMs for instance in curves, where the inner wheel turns slower than the outer wheel).

Four wheel drive with active torque vectoring: thanks to the 3 electric motors it is possible to control the torque of each rear wheel separately.

Charging: LAMPO3 is equipped with the new BRUSA on-board charger NLG6 allowing up to a 22kW of charging power. This means that LAMPO3 can be charged with every kind of power actually on the market: from a standard single-phase 10 A plug, up to a three-phase 32A for charging at industrial plugs (fleet users). Moreover LAMPO3 has an interface for DC fast charging based on CHAdeMO standard (www.chademo.com).

External charging status LED, integrated charging cable

Motorization

Electric vehicle (3 electric motors and Li-ion batteries), fixed transmission ratio (1/6.4)

Electric motors

Type: BRUSA HSM1-10.17.12 hybrid synchronous with transaxle gearbox, powered by a BRUSA DMC534 inverter

Quantity:	3, one on front axle, two on rear axle
Max Power (kW): 420	420
Max shaft torque (Nm):	900 (from 0 to 4'500 rpm)
Cooling:	water

Batteries

Type: BRUSA EVB2 Li battery packs based on prismatic Kokam SLPB cells (Li-ion with polymeric electrolyte)

Quantity	**4**
Total rated energy (kWh)	32
Full charge (EU domestic plug) (h)	12
Total capacity 0.5C (Ah)	80
Nominal voltage (V)	400
Max. continuos discharge current (A)	200
Max. peak discharge current (A)	400
Max. charging current (A)	80
Total number of cells	216
Total weight (kg)	360
Cooling	water
Estimated life time @ 80% DOD (cycles/km):	>800 / >160'000

Battery chargers (on board)

Type: BRUSA NLG6; quantity	1
Power (kW)	22
Cooling	water

DC/DC converter for the on board devices

Type: BRUSA BSC624-12V

Performances and consumption

Max. speed (km/h):	approx. 220
Acceleration (sec., 0-100 km/h):	approx. 4.5
WtW emissions (g CO2):	0
Max torque on the wheels (Nm):	5'760
Range (km):	200
Energy consumption (Wh/km - ton):	99
Cost of energy (CHF/100km):	approx 2.40

Developed and manufactured by

Protoscar

CLEANCAR SHAPERS

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Protoscar LAMPO^3

pure battery EV – specifications

Vehicle Structure

Tubular steel chassis, composite material body

Dimensions and weight

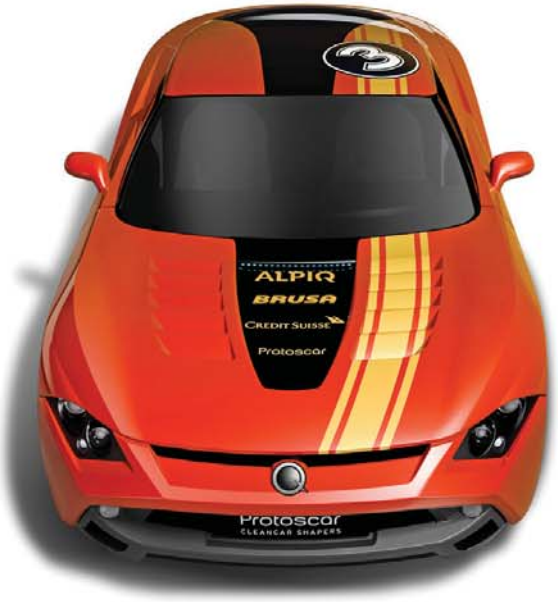
Length (mm)	4'687
Width (mm)	1'998
Height (mm)	1'307
Wheelbase (mm)	3'000
Number of seats	2 + 2
Weight (empty, kg)	1'700
Tires	245/40 R18 front, 295/35 R18 rear

Interior equipment

Driving style settings
Sport steering wheel
Electric heating
Central locking system
Electric brake button on steering wheel
Boost button on steering wheels

Exterior equipment

Aerodynamic flat floor
Targa roof
Aerodynamic shaped back wheels cover
LED tail lights



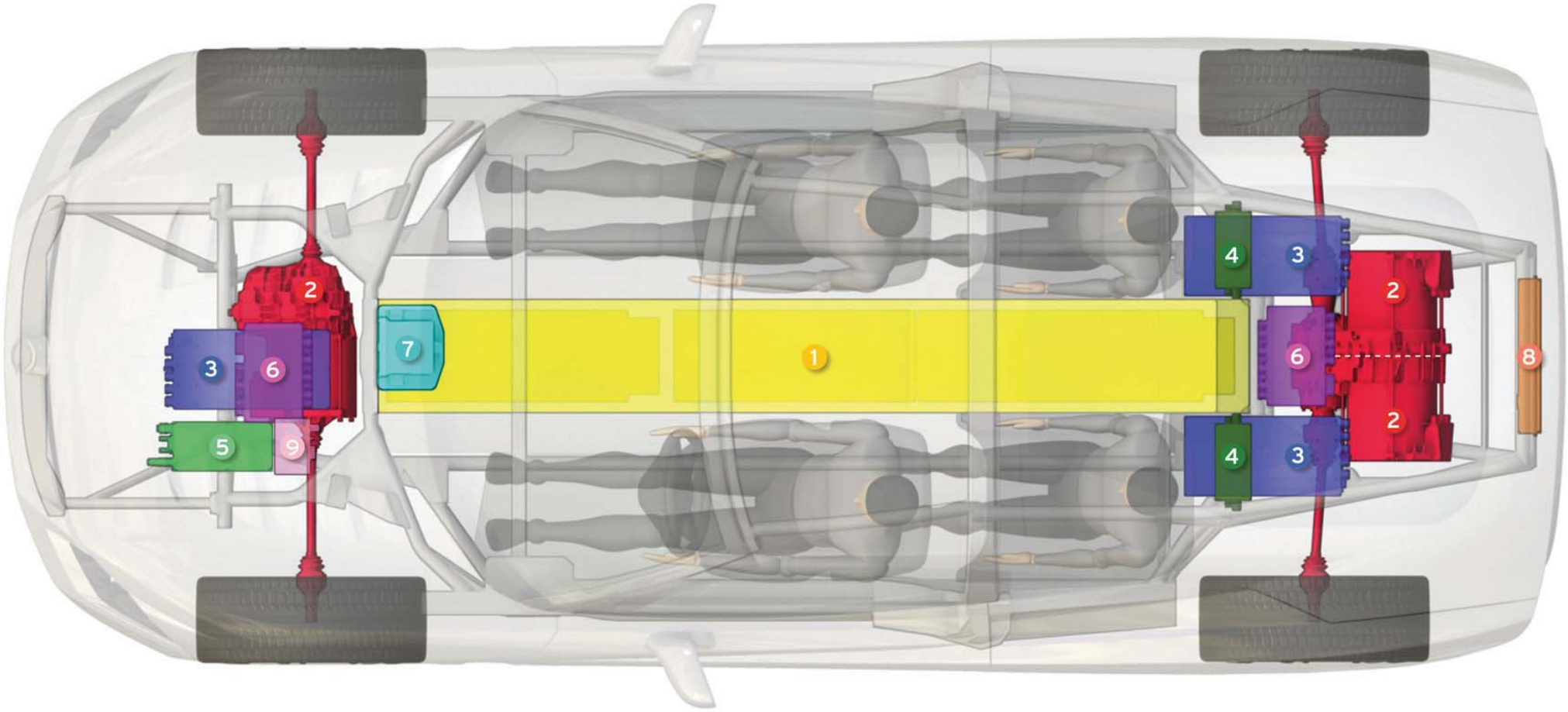
Remote photovoltaic plant

Type: photovoltaic laminate by United Solar Ovonic with amorphous silicon cells

Surface (m^2)	260
Rated power (kW)	16
Energy production per year (kWh/year)	16'800

Price

Prototype, not for sale



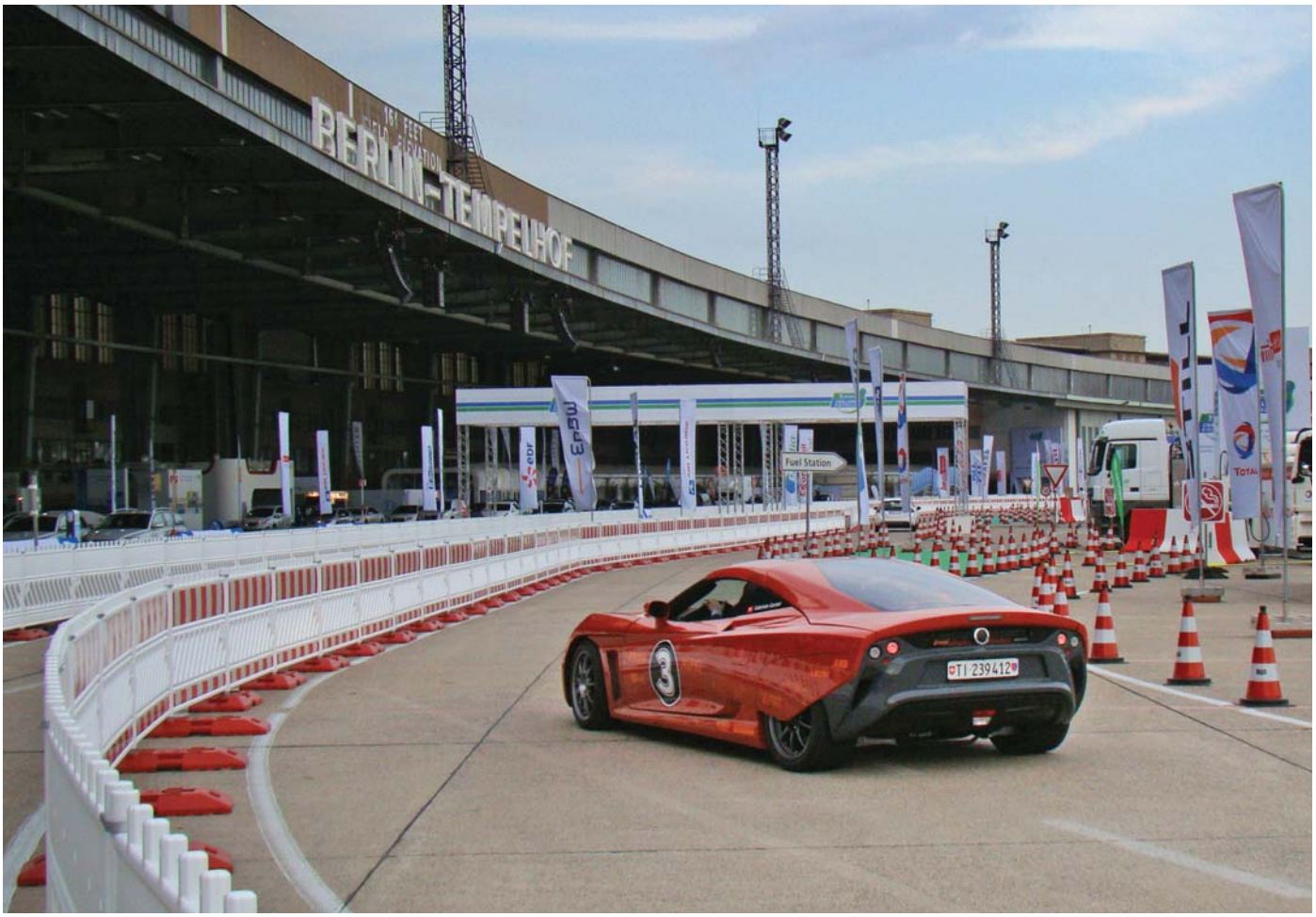
LAMPO^3 BRUSA Components

1. Li-Batteries
2. E-Motors
3. Inverters
4. DC Fast Chargers
5. DC / DC (12V)
6. PDU
7. VCU
8. AC-Charger
9. Insulation controller

LAMPO^3 events

11 May	World Premiere m-way Shop Zürich
18-22 May	Challenge Bibendum Berlin
8-12 June	Le Mans parade
7-9 July	Silvretta rally Montafon
16-18 August	Prolog raid Zürich
12-25 September	IAA Frankfurt (TBC)
10-13 November	VELexpo Lugano

World Premiere m-way Shop Zürich



Challenge Bibendum Berlin

PARTNERS, SPONSORS & MAIN SUPPLIERS

With the realization of LAMPO^3 Protoscar has reached a new top level of CleanCar Design and Engineering. Thanks to the experience with its predecessors LAMPO and LAMPO^2 - which have covered a distance of more than 30'000 km through Europe - Protoscar made its dream become reality: for the first time a pure electric 2+2 coupé features a purpose designed light weight chassis built around its electric components. Actively cooled batteries are positioned in the central tunnel. 3 motors - 2 rear, 1 front - improve drive dynamics and optimize the torque vectoring between front and rear axles, as well as between the 2 rear wheels. As the first two LAMPO prototypes, LAMPO^3 impressively demonstrates that from a pure performance point of view (acceleration, torque, overtaking, speed, efficiency) pure E-drive is THE solution not only for city cars, but for all other types of vehicles including premium-segment cars

I would like to thank all of our faithful and new partners, sponsors and suppliers for their support and interest in joining such an ambitious project. The collaboration between Protoscar and these companies has surely been enriching for all participants in many ways.

Now that all our enthusiastic work becomes reality, I'm proud to show you LAMPO^3 that will be unveiled at the M-Way shop in Zürich on May 11th 2011.

Marco Piffaretti

<u>Very special thanks to:</u>

Josef, Fredy, Dr. Philipp, Axel, Alex, Pietro, Roland, Vasco, Arno, Andrea, Thomas, Urs, Markus, Luca, Giorgio, Franca, Stefano, Paula, Giovanni, Miriam, Giacomo, Olympia, Dario, Luca, Sandro P., Sandro M., Mauro, Martin, Peter, Tania G., Tania B, Nick, Simona, Enzo,…

…from Switzerland, Germany, New Zealand, Oesterreich, Canada, Spain, Italy and France.

ABB (Asea Brown Boveri Ltd)

ABB (www.abb.com) is a leader in power and automation technologies that enable utility and industry customers to improve their performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs about 124,000 people.

ABB applies its competence to develop the infrastructure technologies needed to make widespread electric vehicle use a reality. ABB's involvement in the LAMPO project focuses on the electrical grid and charging system. For example for the Geneva International Motor Show 2011 ABB provided the advanced off-board DC fast charge station. Able to deliver as much as 100 kW charging power to the vehicle, this solution also simultaneously manages the grid voltage and ensures power quality in the grid is actively improved. The unit demonstrated in Geneva is a part of ABB's product range of charging solutions that include fast, ultra fast and regular charge stations. ABB is working with Protoscar to demonstrate DC fast charging technology in the LAMPO^3, offering 10 minutes refueling for 100 km.

ABB's contribution to the electric vehicle infrastructure is more than a century of experience in grid architecture, and several decades in power electronics. Through the application of the smart grid technologies, ABB develops the infrastructure needed to connect electric vehicles to the grid and helps make sustainable mobility a reality.

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Alpiq. Think Energy. Think Service

Alpiq Holding Ltd. is Switzerland's leading energy trading company and largest service provider with a pan-European reach. The Group was formed at the beginning of 2009 through the merger of two energy pioneers, Atel Holding Ltd and Energie Ouest Suisse SA (EOS). Operating in 33 countries with subsidiaries present in 28 countries, it employs more than 11,000 people and generated consolidated revenue of over CHF 14 billion for 2010. Alpiq is engaged in power generation and transmission, energy sales and trading, and energy services. The company is responsible for supplying about one third of Switzerland's electricity needs.

Alpiq has been committed to electric mobility for a number of years. We see electric and electric pluggable vehicles as a promising solution to reduce CO2 emissions and to improve energy efficiency in the transport sector.
As a major player in the Swiss electricity sector, Alpiq aims to find solutions for an optimal integration of the electric vehicles charging infrastructure into the grid. We contribute to the concept and the development of an efficient and adapted country-wide network of standardized charging stations.
Our partnership with Protoscar and the sponsorship of LAMPO, LAMPO^2 and LAMPO^3 are in line with the Alpiq long term strategy of facilitating the introduction of electric vehicles in Switzerland. With this collaboration, we could recently put on the market an innovative and smart solution for a home charging station.

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High-efficient power electronics for electrically driven vehicles

Company
Since BRUSA Elektronik AG was founded in 1985, we focus on the development of highly efficient power electronics for electric mobility. The company belongs to its staff and has grown steadily due to careful business development. Today it is an acclaimed technology leader in its field.

System
Due to its long-standing know-how and top-notch technology, BRUSA Elektronik AG develops high quality electrical systems, precisely matched to the application. Devices to control and convert electric energy according to the individual needs of the customer are challenge and motivation for our staff.

Drive
BRUSA drive systems are exactly tailored to the needs of hybrid and electric vehicles. Liquid cooled motors and controllers along with matched gearsets are suitable for different types of vehicles, while their compact size accounts for the needs of individual packaging constraints.

Energy
BRUSA Lithium-Polymer batteries are optimally suited for electric vehicles due to their well-balanced ratio of energy content, power and weight. Due to our specifically developed battery management system we ensure a safe energy supply at maximum user value.

LAMPO^3
BRUSA Elektroinik AG contributes to the LAMPO project by supplying its latest drivetrain components for this full size four-seat sport-vehicle: The electric motors 3 x HSM1-10.18.13/150kW hybrid-synchronous with gearbox, the motor controllers 3 x DMC534/150kW, the Li-Ion battery 4 x EVB2 Li-battery packs 400V/8kWh based on prismatic Kokam cells, the battery charger NLG6/20kW and the DC/DC converter BSC624-12V/3.5kW.
The Highlight is the high power on-board charger: Charging time 1.5 hours for 4 batteries! The average range with four batteries is 200km.

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CHAdeMO

CHAdeMO is a trade name of a quick charging method that this Association is proposing globally as an industry standard. "CHAdeMO" is an abbreviation of "CHArge de MOve", equivalent to "charge for moving", and is a pun for "O cha demo ikaga desuka" in Japanese, meaning "Let's have a tea while charging" in English.
This standard, adopted on 15th March 2010, was developed jointly by the members of the CHAdeMO Association, hosted by TEPCO, electricity provider to the Tokyo region; the Association boasts more than 300 member companies, including car manufacturers and charger makers.

The evolution of efficient charging infrastructures across society should greatly benefit from recommending and standardizing the CHAdeMO Protocol as a global standard and seeking a speedy solution to common challenges by coordinating technologies of practical value.
Close inter-disciplinary fair alliances and collaboration between interested businesses and associations should also drive the efficient deployment of such activities.
This is how the Association has come into being as a core of the work of developing quick charging infrastructures.

The DC quick charge system CHAdeMO is an off-board charging system, with cars acting as a master and the charger as a slave, that is functional, safe and a promising solution to overcome the range and the charging time problems. The intellectual property of CHAdeMO standards (the communication protocol and the plug/inlet geometry) is open and freely accessible to all CHAdeMO members.

With a typical capacity of 50 kilowatts, the CHAdeMO stations can charge 80% of the autonomy of a medium size EV within 30 minutes.

This year several manufacturers have already started the production of DC mixed quick-charge stations with CHAdeMO's specifications for their DC system. Up to now, more than 600 CHAdeMo charging stations have been installed in the world.

Protoscar believes in the future of the CHAdeMO standard. This is the reason why big efforts have been invested into the support of the Association. In more, LAMPO and LAMPO^2 have been the first European electric vehicles compatible with the CHAdeMO standard.

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Credit Suisse AG

Credit Suisse AG is one of the world's leading financial services providers and is part of the Credit Suisse group of companies (referred to here as 'Credit Suisse'). As an integrated bank, Credit Suisse offers clients its combined expertise in the areas of private banking, investment banking and asset management. Credit Suisse provides advisory services, comprehensive solutions and innovative products to companies, institutional clients and high-net-worth private clients globally, as well as to retail clients in Switzerland. Credit Suisse is headquartered in Zurich and operates in over 50 countries worldwide. The group employs approximately 50,100 people.

The social and economic impacts of global climate change are becoming increasingly evident. It is therefore essential for the international community to take prompt action to prevent the most severe consequences. Credit Suisse can contribute to these efforts by implementing internal measures, by using its expertise to create excellent products and services and by supporting innovative projects such as Protoscar's LAMPO^3.

Further information about Credit Suisse can be found at www.credit-suisse.com

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EVTEC AG (engineering and programming)

EVTEC AG (Electric Vehicle Technologies) is a specialist for electro-mobility.
The experienced and highly motivated team of engineers offers profound knowledge in conception, development and maintenance of prototype- and series products.

Due to the network of manufacturing partners and suppliers in the field of electric and mechatronic components the best quality and efficiency can be guaranteed.

As an ETH Spin-off (federal institute of technologies Zurich) the affinity to advanced research is ensured. EVTEC supports current student projects such as Formula Student Electric and SunCar at various technical universities.

Beside car engineering EVTEC is working on infrastructure issues, such as Home and Public Charging. Therefore various solutions for AC and DC Fast charging were evaluated, developed and tested. To survey the load ability and lifespan of battery cells and systems suitable testbenches are available.

LAMPO^3 Project
EVTEC is the system architect for the entire electric system.
As such EVTEC was responsible the following works:

- Component evaluation
- Wiring harness design
  A fully customised wiring harness consisting of signal (low voltage) and power connections (high voltage) was manufactured. All wires are labelled according a detailing schematic drawing.
- Vehicle control unit programming
  To suit all requirements and get the maximal flexibility a LAMPO^3 specific vehicle control software was implemented. Thus the huge number of sensors and actuators can be controlled. In total LAMPO^3 consists of 148 electric components such as battery modules, motors, inverters, pumps and so on.
- Commissioning and testing
  Based on the tight time schedule a Testbench for the Vehicle control unit was developed to begin programming work while the car is not finished.

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LEONI - Thinking in green technologies

LEONI is a global supplier of wires, optical fibres, cables and wiring systems as well as related services for the automotive sector and further industries. The LEONI Group, which is market-listed in the German MDAX index, employs about 56,000 people in 34 countries and, with 87 subsidiaries, generated consolidated sales of € 2.96 billion in 2010.

As a developer and system supplier of cables and harnesses, LEONI offers a big range of products which is particularly tailored to customers' needs and requirements for use in electrical and hybrid vehicles since 1992. The product portfolio covers components for power distribution and protection in the high voltage harness, complex wiring of lithium battery systems as well as high voltage systems connecting the battery, power electronics, electric motor and further high voltage components. Electrical safety and electromagnetic shielding are the biggest challenges in the context of systems development.

LEONI has designed/equipped the high voltage wiring of LAMPO^3 with special shielded 600 V cables and optimized EMC cable glands.



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LoSon (body developing and manufacturing)

LoSon is an aerospace composite manufacturer, with focus on designing and producing carbon fiber (CFRP) and glass fiber (GFRP) composite structures. LoSon offers the integrated competences from design to prototype and production:

- 3D Designing CFRP / GFRP components
- Structure simulation
- Molds development
- Project management
- Prototyping
- Production and assembling

LoSon has been created in 2005 by a group of young engineers, coming from sailing experience, who have had always in mind the need of continuous innovation. At the beginning the company production has been focused on sport components, as for example America's cup components.
Since then we have developed skills in aeronautic prototyping, as our target is to move the experience and the technology developed for aeronautic to automotive and design.
LoSon disposes of 200 square meter ISO 7 clean room, two autoclaves and 500 square meter devoted to the development of new products. The company, following its mission, is characterized by a strong team of engineering and designing, simulating and developing; the structure operates in strict connection with a strong network of suppliers coordinated by LoSon engineering, which let LoSon offer its costumer the chance of developing complex structure in a very short timing.
LoSon has contributed to the LAMPO^3 project by developing the molds and components of the car body, mainly with high tech glass fiber prepreg with autoclave process. Molds and body have been developed in a very short timing, thanks to a very strict synergy with the LAMPO^3 project team.

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Metaltool (mechanical workshop)

Metaltool is a mechanical workshop – founded in 2001 by Dario Piffaretti – which offers various services and currently employs 11 specialists.
The workshop is characterized by widely using Electric Discharge Machining (EDM). This is a machining process that uses a series of electric discharges (sparks) to erode material from a workpiece. There are two types of EDM: wire-cutting and die-sinking. EDM is a key technology in the manufacture of high-performance molds as well as press tools for the series production of plastic, glass and metal parts and for the direct machining of complex precision components.

Metaltool realizes primarily:

1. Tools for industries
- mechanical matrix for printing and overhauling
- tooling up
- general mechanical pieces
- assembling fitting
- fixing
- grinding
- plate tools
- milling

2. Moulds
- pressure die casting
- shearing machine

The main application fields of Metaltool are:
- medical
- luxury zipper
- mechanical tools
- special and unique car components
-

Metaltool has contributed to the LAMPO^2 project by realizing and installing several different mechanical special parts. In particular it has provided:
- structural modification of the chassis in order to adapt it to the electric drivetrain
- realization of new mechanical parts needed for the new layout of the powertrain (e.g. a new front suspension ring in order to locate the front wheels drive axle)

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m-way

m-way is the Migros competence center for electric mobility. Its purpose is to set new directions in the area of individual mobility. m-way stands out by its innovative and thoroughly chosen product range, incorporating electric bicycles, electric scooters, electric motorcycles, as well as electric cars. All vehicles correspond to high standards in terms of form and functionality, delivering its drivers the pure enjoyment of electric mobility and acceleration. That is why Protoscar's developments, such as the LAMPO^3 fit in perfectly with the m-way product philosophy. Starting from this launch event, its cutting-edge electric vehicles will be distributed by m-way.

m-way places great emphasis on sustainability and green issues. Eco energy certificates allow m-way customers to assure that the energy needed for their individual mobility comes from green energy sources.

Besides providing a superior range of electric vehicles, m-way is also actively developing innovative service solutions that ultimately enable new forms of mobility and interactivity between drivers and their vehicles.

m-way works on concepts of situational mobility to move away from car ownership. It develops solutions away from status-oriented to networked mobility solutions. m-way pursues a global approach regarding network services and value-added solutions.

Since its opening of the world's first electric mobility concept store in Zurich in October 2010, m-way has opened a second store in St. Gallen, fully dedicated to two-wheel electric vehicles, such as electric bicycles, electric scooters, and electric motorcycles. For the next three years, the goal is to cover all of Switzerland with a network of m-way stores, focusing on larger agglomerations. Besides that, a network of shop in the shop systems operated by partner companies, will contribute to a thorough coverage of the Swiss territory.

Recently, the m-way alliance was launched in order to complement m-way's product and service offering. A network of successful national and international companies, such as SBB, Zurich, GE Money Bank, Leaseplan, Alpiq, Bosch, and Siemens add their proficiency and know-how to the m-way concept to deliver a superior electric mobility experience to m-way customers.

m-way is owned by Migros. Therefore it follows the pioneering spirit and the vision of the founder Gottlieb Duttweiler, as well as Migros core values (social responsibility + economy + ecology = sustainability).

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Nationale Suisse

Nationale Suisse is an innovative, international and independent Swiss insurance group. In addition to providing attractive risk and pension solutions in the non-life and life fields for a discerning clientele, we strengthen and foster special competencies in our specialty lines. Here, Nationale Suisse is a niche provider characterized by outstanding expertise and an international network.

The art of insurance: this is the quintessence of our services. This core message stands for more than just knowledge and ability. For Nationale Suisse it also implies exceptional passion and the desire to pursue and implement our goals in an individual, successful and attractive manner. By "individual" we mean assuring satisfaction and fulfilling clients' wishes sustainably and unbureaucratically. By "successful" we mean creating added value in an innovative, efficient way. And by "attractive" we mean taking responsibility and putting quality-conscious, future-oriented Swiss reliability into practice.

Just like Nationale Suisse, Protoscar practices the art of building future-oriented vehicles with a passion. Lampo3 is a milestone in the construction of an innovative, efficient high-performance car that boasts sustainability through the use of state-of-the-art technology. It also comes with typical Swiss precision, aesthetics and elegance that inspires emotions.

Further information about Nationale Suisse can be found at www.nationalesuisse.ch

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Q11 AG (spare parts, online distributor)

Q11 AG is one of the most successful spare parts retailer on the German E-Commerce market. The company was founded in 2000 and distributes spare parts out of the stockhouse in Zurich throughout Germany via parcel service.
According to the specific part identification in Germany, Q11 AG uses an in-house developed software which guarantees the customers a comfortable and correct product choice. High availibilities and a great level of service standards allowed Q11 AG to grow up to one of the most popular providers in the automotive after market.



To fulfill the requirements of its end consumers, Q11 AG is specialized on spare parts for all kind of passenger cars and motorcycles, tyres, cleaning and lubricant products. Q11 AG offers a wide range of brake parts, exhaust systems, filters, shock absorbers, clutches as well as steering and cooling products.
A central topic of Q11 AG`s business implies that each offered item has to come up to the high technological demand of original equipment which is assured by exclusive and certified suppliers.

Q11 AG itself has been a pioneer in German E-Commerce 10 years ago and accomplished proving the potential of online part trading. The company is now proud to be placed one of the most innovative visionary clean cars, which will hopefully affirm the rightness of energy efficiency in automotive business.

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Rudolf Steiner Schools

Total pedagogy from pre-school up to the end of high school level.
36 schools in Switzerland, more than 70 kindergarten.
The Rudolf Steiner Schools create the prerequisites for personal active, inventive learning, they foster the individual **creativity** and develop the interest in one's fellow-beings and surroundings.
The three pillars of this pedagogy:
Head: to discover and understand the world and oneself
Heart: to meaningfully experience what one has recognised
Hand: to experience the manageability and alterability of life
This develops a feeling of consistency and a constructive relation to oneself and the environment.

Concept of education of the Rudolf Steiner Schools
The anthroposophical pedagogy's most important concern is to guide each child to achieve independent acting and judging as well as developing self-education. The trust in the innate will of each child to learn is based on the understanding that each human being indeed has a biological, social, religious or ethnic origin which considerably contributes to his life. However, beyond it, each human being has a spiritual origin which enables him to develop his innate impulses for an individually-biographic approach to life. The individuality and originality of each human being is based on his spiritual origin. This forms his human dignity.
The anthroposophy views the development of the human being as a process which is extremely open to the environment while simultaneously encouraging the physical development and maturity. The support and promotion of linking individual worldly experience and physical development is one of the major pedagogic tasks. Anything undertaken with the children on a methodical-educational level during the two first decades of their lives is based on their being accompanied appropriately, depending on their age, in the development of their individuality. The basis for the pedagogic work is given by the knowledge of the anthroposophy of humankind as well as that of the current pedagogic, medical and further research.
The highest aims pursued in a Rudolf Steiner School during the complete school curriculum are: a healthy relation to one's own body, assurance and purity in feeling, initiative, imagination and moral responsibility in acting, and independence in judging and thinking. These aims are linked to the belief that such qualified human beings dispose of all the essential requirements in order to actively contribute to the further development of social and cultural life.

The Rudolf Steiner Schools are politically neutral, they are generally humanly organised and are open to anyone.

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SFOE (project support)

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Bundesamt für Energie BFE
Office fédéral de l'énergie OFEN
Ufficio federale dell'energia UFE
Uffizi federal d'energia UFE

The **Swiss Federal Office of Energy (SFOE)** is the office responsible for all questions relating to energy supply and energy use within the Federal Department of the Environment, Transport, Energy and Communication (DETEC).

The SFOE pursues the following objectives:

- It creates the necessary conditions for ensuring a sufficient, well diversified and secure energy supply that is both economical and ecologically sustainable.
- It imposes high safety standards in the areas of production, transportation and distribution of energy.
- It sets out to promote efficient energy use, increase the proportion of renewable energy in the overall energy mix and reduce the level of CO_2 emissions.
- It promotes and co-ordinates energy research and supports the development of new markets for the sustainable supply and use of energy.

The SFOE is proud to be one of the sponsors of LAMPO^3!

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Vitabella-Palazzetto (remote photovoltaic power plant)

Vitabella-Palazzetto is a farmhouse situated in Tuscany (Italy) where the sun is (nearly) always shining!

This is the reason why it has been decided to develop a remote photovoltaic power plant in that place. This photovoltaic plant has three goals:

1. to produce (more than) enough totally clean energy for driving our electric cars LAMPO and LAMPO^2;
2. to become a sample to be copied, particularly as part of the electric-mobility solution;
3. to serve as a didactic tool for the guests of the farmhouse.

The manufacturer of the photovoltaic laminate, United Solar Ovonic, is the world leader in thin film solar technologies and the manufacture of thin film solar electric laminates. Distributed globally under the UNI-SOLAR® brand, the company's products are ideally suited for cost-effective solar roofing solutions because they are lightweight, durable, flexible, can be integrated directly with building materials, and generate more energy in real-world conditions. The solar plant of Vitabella-Palazzetto is installed by the Grosseto-based company TECNA.

Of course, all the guests of the farmhouse Vitabella-Palazzetto are very welcome to check the production of solar energy themselves, spending some absolutely relaxing holidays in the direct neighbourhood of Siena, Montalcino and the fabulous “terme di Saturnia”.

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Website

http://www.protoscar.com/LAMPO3.html

Links

http://www.alvolante.it/news/protoscar_lampo3-471061044

http://www.aftermarketleads.com/2011/05/protoscar-lampo3-best-electric-sports-car-you-cant-buy-yet.html

http://www.buyelectrictruck.com/protoscar-lampo3-best-electric-sports-car-you-cant-buy-yet.html

http://www.okusato.com/blog/index.php/2011/05/24/lampo3-supercar-elettrica-e-concept-originale/

http://www.plugincars.com/meet-swiss-electric-supercar-420-kw-protoscar-lampo3-107170.html

http://www.technologicvehicles.com/fr/actualite-mobilite-verte/828/video-troisieme-evolution-de-la-sportive-elec

http://www.quattroruote.it/notizie/auto-novita/protoscar-lampo-trimotore-elettrica

http://www.autoblog.it/tag/protoscar+lampo3

http://www.blick.ch/auto/neuheiten/heisser-elektroflitzer-aus-der-schweiz-172407

http://www.plugincars.com/meet-swiss-electric-supercar-420-kw-protoscar-lampo3-107170.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed:+PluginCars+%28PluginCars.com+RSS+Feed%29&utm_content=Google+Reader

http://www.auto-wirtschaft.ch/news.php?id=2036

http://www.topspeed.com/cars/2011-protoscar-lampo-3-ar110058.html

http://www.tio.ch/aa_pagine_comuni/articolo_interna.asp?idarticolo=635089&idsezione=20&idsito=157&idtipo=410

http://auto.bloglive.it/protoscar-lampo3-3079.html

http://automobile.challenges.fr/concept-cars/20110525.LQA0734/protoscar-lampo3-2011.html

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AUTOMOBIL REVUE

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AR-TEST

Viel Innenraum

Mit dem Verso-S ist Toyota wieder im Kompaktvan-Segment unterwegs. Er schlägt sich gut.

ab Seite 10

Der Stromknaller

PROTOSCAR LAMPO³ Elektro-Sportwagen aus dem Tessin. Seite 4.

FIRMENHOCHZEIT

SAAB LÄSST SICH VON DEN CHINESEN RETTEN

BETEILIGUNG Der chinesische Autohersteller Hawtai kauft 29,9 % von Saab und spült so 120 Mio. Euro in die Firmenkasse. Das könnte für den schwer gebeutelten schwedischen Hersteller die Rettung sein. Hawtai produziert in der Inneren Mongolei – 700 km westlich von Peking – Hyundai-Geländewagen in Lizenz und eigene Modelle. Ab 2014 soll nun der neue Saab 9-3 in China gebaut und verkauft werden – ein grosser Sprung nach vorn für Hawtai. **RAK** WEITER SEITE 18 ›

BLECH- ODER TOTALSCHADEN?

Wie weiter nach einem Unfall?

NICHT ÜBERROLLEN LASSEN Nach einem Unfall besteht für Geschädigte die Gefahr, dass sie die Zügel aus der Hand geben und zum Spielball im nachfolgenden Schadenmanagement der leistungspflichtigen Versicherung werden. Denn: Auch wenn anstandslos bezahlt wird, muss das nicht immer voll und ganz im Sinne des Geschädigten sein. Wir zeigen, was passieren kann, und geben Tipps, wie Sie die Hoheit über die Schadenabwicklung behalten. **CS** WEITER SEITE 25›

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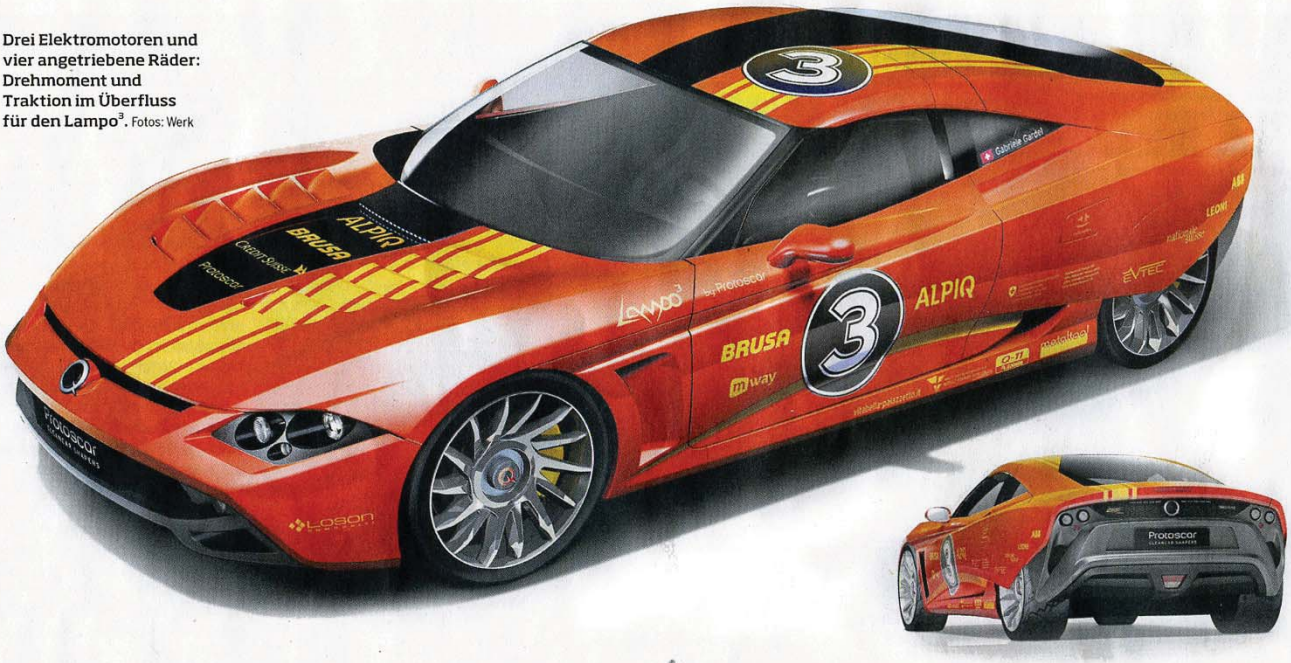


Drei Elektromotoren und vier angetriebene Räder: Drehmoment und Traktion im Überfluss für den Lampo³. Fotos: Werk

Jetzt blitzt es schon wieder

WELTPREMIERE Der Tessiner Elektroautospezialist Protoscar lanciert die dritte Entwicklungsstufe des Lampo.

VORSTELLUNG

Protoscar Lampo³

STEPHAN HAURI

Nicht jedermann weiss auf Anhieb, was er mit der Modellbezeichnung Lampo anfangen soll. Für Italienisch Sprechende jedoch ist es klar: Lampo bedeutet Blitz, wird also mit viel Licht, viel Energie und hoher Geschwindigkeit in Verbindung gebracht. Eingeweihte wissen ausserdem, dass alle diese Eigenschaften zur Modellbezeichnung für ein extrem leistungsfähiges Elektrofahrzeug passt, mit dem die Schweizer Autodesign-Firma Protoscar neue Ideen für die nachhaltige Automobilität der Zukunft aufzeigt.

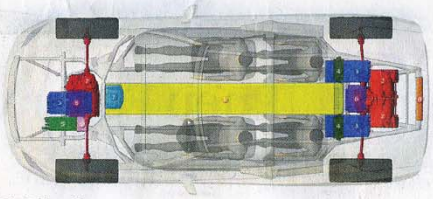
DRITTE AUFLAGE Nun blitzt es bereits zum dritten Mal: In Zürich wird als Weltpremiere die jüngste Entwicklungsstufe präsentiert, der Lampo³. Nach den beiden Vorläufern Lampo und Lampo² ist der Lampo³ das erste Modell der kreativen Tessiner, das als 2+2-sitziges Coupé ausgelegt ist.

Mit drei Elektromotoren, die zusammen 420 kW Maximalleistung und einen Drehmomenthöchstwert von 900 Nm verfügbar machen, soll der Neue aufzeigen, dass Elektroautos nicht nur umweltfreundlich, sondern auch extrem leistungsfähig sein können. Protoscar nennt für das dynamisch geformte Coupé eine Höchstgeschwindigkeit von 220 km/h, einen Beschleunigungswert von 4,5 s für den Spurt aus dem Stand auf Tempo 100 km/h und eine Reichweite von 200 km.

Für die Realisierung seines dritten Lampo-Projektes hat Protoscar-CEO Marco Piffaretti wieder eine ganze Reihe spezialisierter Zulieferer als Partner gewinnen können. So kommen zahlreiche Komponenten der auf einem Rohrrahmen aufbauenden Karosserie von der italienischen Firma Loson Compositi, die kohle- und glasfaserverstärktes Material auch an die Luftfahrtindustrie liefert.

ELEKTRO-KOMPETENZ Seit Beginn der Lampo-Aktivitäten spielt die Firma Brusa Elektronik AG aus dem sankt-gallischen Sennwald eine wesentlich Rolle bei der Entwicklung des Elektroantriebsstranges. Im neuen Modell kommen gleich drei Hybrid-Synchron-Elektromaschinen der Ostschweizer zum Einsatz; zwei treiben die Hinterräder an, eine die Vorderräder. Mit entsprechender Leistungsregelung, ebenfalls von Brusa, gelingt es dem überaus potenten Elektroauto, die Antriebsmomente an den einzelnen Rädern exakt den Traktionsmöglichkeiten anzupassen – Torque Vectoring ohne komplizierte Verteilergetriebe und Differenziale.

Die vier Lithium-Polymer-Batteriepakete, die im Mitteltunnel des Sportwagens untergebracht sind und eine Gesamtkapazität von 32 kWh aufweisen, wiegen 360 kg und sind ebenfalls Brusa-Produkte. Zu den Highlights der Lampo-Technik gehört laut Piffaretti ausserdem das Onboard-Ladegerät, das das Aufladen zweier Batterien in nur anderthalb Stunden ermöglicht. Für die Systemarchitektur der gesamten, aus 148 Komponenten bestehenden Fahrzeugelektronik ist ein weiteres Schweizer Unternehmen verantwortlich: das ETH-Spin-off Evtec mit Sitz in Emmenbrücke. Gemeinsam mit ABB und Alpiq hat Protoscar Schnell- und Heimladestationen entwickelt.



Die Rohrrahmenkonstruktion ist für den Elektroantrieb massgeschneidert. ❶ Batterie, ❷ Antriebsmotoren, ❸ Umrichter, ❹ DC-Schnellladegerät, ❺ DC-DC-Umrichter, ❻ Leistungselektronik, ❼ Fahrzeugsteuergerät, ❽ AC-Ladegerät, ❾ Isolationsüberwachung. Fotos: Werk

BALD EINE KLEINSERIE? M-Way, das Kompetenzzentrum für Elektromobilität der Migros, könnte zur Stützpunktkette für den Lampo³ werden, falls – wie vorgesehen – demnächst eine kleine Serie des attraktiven Elektrosportwagens gebaut wird.

Technische Daten

KAROSSERIE, GEWICHTE
Coupé, 2 Türen, 2+2 Sitze; Leergewicht 1700 kg.

ANTRIEB
3 Brusa-Hybrid-Synchronmotoren, Gesamtleistung 420 kW, max. Drehmoment 900 Nm bei 0 bis 4500/min, Leistungselektronik Brusa DMC534, Allradantrieb.

BATTERIEN
4 Lithium-Polymer-Pakete (total 216 Zellen) Brusa EVB2, mit Aktivkühlung, Gesamtkapazität 32 kWh, Nennspannung 400 V, max. Ladestrom 80 A, Gesamtgewicht 360 kg.

FAHRGESTELL
Stahl-Rohrrahmen-Chassis, Karosserie aus Verbundmaterial.

FAHRWERK
Reifen v. 245/40 R 18, h. 295/35 R 18.

ABMESSUNGEN
Länge 469 cm, Breite 200 cm, Höhe 131 cm; Radstand 300 cm.

FAHRLEISTUNGEN
Höchstgeschwindigkeit 220 km/h, 0 bis 100 km/h 4,5 s; Reichweite 200 km.

PIONIER DER ELEKTROMOBILITÄT

PROTOSCAR Autodesigner Marco Piffaretti, der Gründer und CEO des Tessiner Unternehmens Protoscar, ist seit mehr als zwanzig Jahren an vorderster Front der schweizerischen Elektromobilität. Er war Organisator des gross angelegten schweizerischen Elektrofahrzeugprogramms Mendrisio, das zwischen 1995 und 2001 Teil des Aktionsprogramms Energie 2000 war. Seit vielen Jahren entwickelt der heute 46-jährige Piffaretti zusammen mit grossen Fahrzeugherstellern Karosserie- und Antriebskonzepte für Autos mit einem besonderen Flair für das Unkonventionelle.
Mit dem Lampo³ bringt Protoscar nun die dritte Entwicklungsstufe eines Hochleistungssportwagens mit Elektroantrieb. Waren der Lampo (2009) und der Lampo² (2010) noch reine Studienfahrzeuge, also Ideenträger für neue Antriebsformen, handelt es sich beim Lampo³ nun um ein Fahrzeug, das bereits so weit gereift ist, dass es für die Kleinserie bereit wäre. **SHA**

2009: der erste Lampo, 200 kW.

2010: Lampo², 300 kW

2011: Lampo³, 420 kW.

MELDUNGEN

Seat-Sondermodelle für die Schweiz

SCHINZNACH AG Ab sofort sind zwei Seat-Sondermodelle exklusiv in der Schweiz erhältlich. Der Ibiza Cupra R210 Seat Swiss Racing leistet dank Chiptuning 210 statt 180 PS, bietet eine erweiterte Ausstattung und kostet in Weiss ab 33 900 Franken. Beim Leon Cupra R310 Seat Swiss Racing beträgt die Leistung 310 gegenüber sonst 265 PS; die Preise beginnen bei 44 900 Franken. Für jedes verkaufte Fahrzeug zahlt Seat im ersten Jahr über die Stiftung Myclimate die CO_2-Kompensation für 20 000 km.

Jaguar-Studie geht in Kleinserie

SAFENWIL AG Das Showcar C-X75, das Jaguar 2010 an der Motorshow in Paris zeigte, soll in einer Serie von 250 Exemplaren gebaut werden. Im Gegensatz zum Ausstellungsstück verfügt es aber nicht über einen Elektroantrieb mit Gasturbinen als Reichweiten-Verlängerer, sondern soll mit konventionellem Hybridantrieb ausgeliefert werden. Der Preis dürfte bei mindestens einer Million Franken liegen.

Biografie zum Chevrolet-Jubiläum

FRAUENFELD TG Pünktlich zum 100. Geburtstag der Marke Chevrolet in diesem Jahr, legt Journalist und Fachautor Martin Sinzig eine **Biografie** des Firmengründers vor. «Louis Chevrolet – Der Mann, der dem Chevi seinen Namen gab» schildert auf 187 Seiten das Leben des 1878 in La Chaux-de-Fonds NE geborenen Auswanderers, Rennfahrers und Konstrukteurs, der in den USA sein Glück machte. Erschienen im Verlag Huber, erhältlich für 39.90 Franken.

Toyota trotzte 2010 der Krise

TOKIO Der japanische Autobauer Toyota hat im abgelaufenen Geschäftsjahr seinen Umsatz um 0,2 Prozent auf rund 208 Mrd. Franken steigern können; der operative Gewinn verdreifachte sich auf rund 5,1 Mrd. Franken. Angesichts der Produktionsausfälle infolge der Erdbebenkatastrophe in Japan enthielt sich das Unternehmen einer Prognose für das laufende Geschäftsjahr.

Testfamilie senkt ihren CO_2-Ausstoss

STOCKHOLM Im sechsmonatigen Projekt One Tonne Life der schwedischen Unternehmen Ahus, Vattenfall und Volvo versucht eine Testfamilie, ihren CO_2-Ausstoss auf unter eine Tonne pro Jahr und Kopf zu drücken. Zur Projekthalbzeit liegt ihre Kohlendioxidemission bei umgerechnet 2,6 Tonnen – deutlich weniger als die anfänglichen 7,3 Tonnen. Statt eines konventionellen Autos nutzt die Familie einen Volvo C30 mit Elektroantrieb.

Keine Millionen aus China für Saab

TROLLHÄTTAN S Der Einstieg des chinesischen Autokonzerns Hawtai beim schwedischen Autobauer Saab ist doch gescheitert. Hawtai sollte Saab gegen einen rund 30-prozentigen Unternehmensanteil mittelfristig knapp 190 Mio. Franken zur Begleichung offener Rechnungen und Aufrechterhaltung der Produktion zur Verfügung stellen.

Neuer Hyundai i40 im Coupé-Stil

DIETLIKON ZH Nach der am Genfer Automobilsalon präsentierten und im Laufe des Sommers verfügbaren Kombiversion folgt im Spätherbst die **Hyundai i40 Limousine**. Die Silhouette des Fünfplätzers wirkt wie die eines Coupés; das Kofferraumvolumen beträgt 503 l. Zum Marktstart werden zwei Benziner (135 und 177 PS) und zwei Diesel (116 und 136 PS) lieferbar sein. Die Preise sind noch nicht bekannt.

2011 PROTOSCAR LAMPO³
Drei Synchron-Elektromotoren, 570 PS/420 kW, feste Übersetzung, Allradantrieb mit variabler Kraftverteilung, vier Lithium-Ionen-Batteriemodule, Gesamtkapazität 32 kWh, Spitze ca. 220 km/h, 0–100 km/h ca. 4,5 s, Reichweite ca. 200 km, Verbrauch Ø ca. 16 kWh/100 km (entspricht dem Energiegehalt von 1,8 l Benzin), Länge/Breite/Höhe 4,69/2,00/1,31 m, Gewicht 1700 kg

Energisch und emissionsfrei durchs Ziel

Der Schweizer Elektro-Sportwagen Protoscar Lampo³ könnte in Serie gehen

VON ANDREAS FAUST

Offenbar wurde die Zeit knapp. Im Doppelschichtbetrieb habe man an Entwicklung und Bau des Lampo³ gearbeitet, erklärt Marco Piffaretti, Gründer der Protoscar in Rovio TI und einer der Elektroauto-Pioniere hierzulande, bei der Präsentation seines neuen Prototyps. «Aber immer mit denselben Leuten.»

Mit der viersitzigen Flunder aus Stahlrohr und Kunststoff, die am vergangenen Mittwoch im Zürcher M-Way-Shop, dem Elektromobilitätszentrum der Migros, enthüllt wurde, soll nach zwei reinen Prototypen *(siehe Text unten)* der Elektrosportwagen aus schweizerischer Fertigung jetzt zur Serienreife gebracht werden. «Das Ziel ist die Produktion einer Kleinserie», betont Piffaretti.

Selbst der Lampo-Testfahrer kommt aus der Schweiz

Statt in eine von einem anderen Auto übernommene Basis mühsam einen Elektroantrieb einzupassen, wurde der Lampo³ geradezu um die als Rückgrat fungierenden Batterien in der Fahrzeugmitte herum konstruiert. Wie bei den Vorgängern zeichnet die Brusa AG im sankt-gallischen Sennwald verantwortlich für den gesamten Antriebsstrang. Firmengründer Josef Brusa gilt als einer der europaweit wichtigsten Ansprechpartner für Elektroantriebe. Mercedes, Volvo, VW – viele Hersteller greifen für ihre Elektro-Prototypen auf Brusa-Komponenten zurück.

Der Gitterrohrrahmen, die Fahrzeugelektronik und die zugehörige Software des Lampo³ wurden ebenfalls von Schweizer Unternehmen entwickelt. Selbst Testfahrer Gabriele Gardel, seit 1995 als Profi-Rennfahrer in mehreren Sportwagenserien aktiv, stammt aus dem Tessin. Er soll in einem umfangreichen Testfahrprogramm mögliche Schwachstellen der Konstruktion aufdecken.

Hohe Fahrleistungen und grosse Reichweite sind derzeit noch unvereinbar bei Elektroautos. Piffaretti entschied sich für Ersteres: «Wir wollen Antrieb und Fahrwerk auch im Grenzbereich erproben. Beweist beides unter Extrembedingungen Funktionsfähigkeit und Standfestigkeit, dann wird die Technik im Alltagsbetrieb keine Probleme machen.» Später wären dann Varianten mit weniger Leistung und grösserer Reichweite problemlos möglich.

Ob und wann man einen Lampo³ wird erwerben können, muss noch offen bleiben. Aber auch preislich dürfte er anderen Supersportwagen ebenbürtig sein.

Pioniere und Prototypen – wie Schweizer Autos unter Strom gesetzt wurden

1902 Die Tribelhorn AG in Feldbach ZH beginnt mit der **Produktion von Personen- und Lastwagen** mit Elektroantrieb. Letztere werden in weitaus grösserer Stückzahl gefertigt und bleiben oft bis in die 50er-Jahre im Einsatz. Weitere Fahrzeugbauer versuchen sich ebenfalls an Elektrofahrzeugen, kommen aber meist über das Prototypen-Stadium nicht hinaus.

1912 Den rund 130 Elektroautos in der Deutschschweiz stehen 29 Ladestationen zur Verfügung.

1939 Mit der Treibstoffknappheit während des Zweiten Weltkriegs besinnt man sich wieder auf den Elektroantrieb. Die Elektrische Fahrzeuge AG und die Schweizerische Industrie-Gesellschaft liefern mehrere Tausend Fahrzeuge insbesondere für den öffentlichen Dienst. In den 50er-Jahren werden sie von Fahrzeugen mit Verbrennungsmotoren verdrängt.

1985 Die Tour de Sol rollt als erstes Rennen für solarbetriebene Elektrofahrzeuge durch die Schweiz. Das Teilnehmerfeld mit dem Gründer der Brusa AG, Josef Brusa, gilt als Keimzelle der heutigen Elektroautoszene in der Schweiz. 1993 findet die Veranstaltung zum letzten Mal statt.

1988 Bei der Horlacher AG in Möhlin AG entsteht der eiförmige Prototyp GL-88. Er erreicht mit 11 PS/8 kW immerhin Tempo 80.

1989 Markus Eisenring aus Niederuzwil SG zeigt seinen ersten Elektro-Prototyp, den Stromboli I. Optisch erinnert der Zweisitzer an den Messerschmitt-Kabinenroller aus den 50er-Jahren und schafft mit einer Batterieladung etwa 115 km Reichweite.

1994 Swatch-Chef **Nicolas Hayek** gründet gemeinsam mit der damaligen Daimler-Benz AG die Micro Compact Car AG in Biel BE. Das Ziel ist die Entwicklung eines günstigen Stadtautos mit geringem Verbrauch – und vorzugsweise Elektroantrieb. Letzterer wird von Daimler-Benz bei der Entwicklung nicht verfolgt; Hayek steigt 1998 aus. Der Smart erscheint im gleichen Jahr mit konventionellem Motor.

1995 Im Rahmen des Aktionsprogramms Energie 2000 startet ein Grossversuch mit Elektromobilen in Mendrisio TI. Bis zum Ende des Projektes im Juni 2001 werden insgesamt 458 Elektrofahrzeuge an Bewohner Mendrisios und der umliegenden Gemeinden verkauft. Protoscar-Gründer Marco Piffaretti ist an der Auswertung der Ergebnisse beteiligt.

1996 Die Twike AG in Gelterkinden BL beginnt mit der Produktion des **Twike**, eines dreirädrigen Zweisitzers. Er ist entweder mit

Elektroantrieb mit 6,8 PS/5 kW oder mit zusätzlichem Tretantrieb lieferbar. Das ursprüngliche Konzept als vollverkleidetes Fahrrad mit Tretantrieb schufen Studenten der ETH Zürich. Bis heute wurden über 850 Stück gebaut.

2001 Bei der Cree AG in Biel entstehen 80 Exemplare des einsitzigen SAM. Das futuristisch gestaltete Elektromobil mit nur drei Rädern geht nie in Grossserie.

2007 Der Schweizer Finanzinvestor Lorenzo Schmid präsentiert seinen Elektro-**Prototyp Mindset** (rechts). Trotz mehrfacher Ankündigung einer Serienfertigung existiert bis heute nur dieses eine Exemplar.

2007 Der zigarrenförmige eTracer der Firma Paraves in Winterthur ZH geht in Serie.

2009 Am Genfer Salon präsentiert Marco Piffaretti den Lampo, einen offenen Zweisitzer mit 270 PS. Das Auto bleibt wie der Lampo² von 2009 ein Versuchsträger.

2009 Die Brusa AG, Elektroantriebsspezialist mit zahlreichen Kooperationen mit grossen Autoherstellern, entwickelt mit der Hochschule für Technik Buchs SG den **Brusa-Spyder**. Der Zweisitzer wird von zwei Motoren mit 272 PS/200 kW angetrieben.

2010 Die technisch und optisch identischen Kleinwagen Mitsubishi i-MiEV, Citroën C-Zero und Peugeot I-On erscheinen als erste Grossserien-Elektroautos.

2011 Im Herbst lanciert Nissan das Elektroauto Leaf. Es folgen die baugleichen Chevrolet Volt und Opel Ampera mit Elektroantrieb und kleinem Benziner zur Reichweitenverlängerung.

Blitzschlag Nummer 3

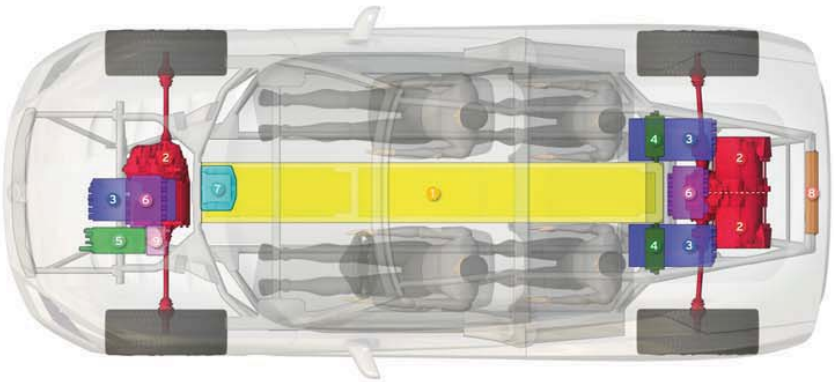
Schnittiges Design
Mit dem Lampo 3 schliesst Piffaretti seinen Zyklus aus drei Prototypen ab.

Mit der dritten Lampo-Studie hat Marco Piffaretti sein Elektrokonzept zur Serienreife gebracht. Damit hat der Tessiner bei kleinem Budget jetzt sogar etliche Autokonzerne überholt.

Text | Ulrich Safferling
Fotos | Protoscar, R. Meinert (2)

Marco Piffaretti ist glücklich. Der Mann aus dem Tessin mit der grossen Leidenschaft für Elektromobilität hat es geschafft und seinen dritten Prototypen auf die Räder gestellt. «Mehr als 10000 Arbeitsstunden und 2,3 Millionen Franken hat der Lampo 3 gekostet», sagt Piffaretti. Aber er ist stolz, mit seinem neusten Prototypen endlich Serienreife geschafft zu haben. Jetzt könnte man das Auto quasi klonen und eine richtige Kleinserie herstellen.

Mit den beiden vorangegangenen Modellen hat Piffarettis Firma Protoscar Erfahrungen gesammelt. Zum Beispiel mit dem Elektrokonzept, das bei Piffaretti auf 200 Kilometer Reichweite ausgelegt ist. «Mehr brauchen die meisten Menschen nicht am Tag.» Dabei



LAMPO^3 BRUSA Components

1 Li-Batteries
2 E-Motors
3 Inverters
4 DC Fast Chargers
5 DC / DC (12V)
6 PDU
7 VCU
8 AC-Charger
9 Insulation controller

Kompletter Neubau
Der Lampo 3 ist ausschliesslich für einen Elektroantrieb konstruiert worden und kein Chassisumbau.

Strahlender Konstrukteur
Grosser Andrang herrschte im Zürcher M-Way-Laden, als Marco Piffaretti den Lampo 3 erstmals vorstellte und Chefredaktor Ulrich Safferling zur sommerlichen Probefahrt einlud.

spielt vor allem die Steuerung der Elektromotoren und Speicherkapazität der Batterien eine Rolle. Dank drei Elektromotoren verfügt der Lampo 3 über Allradantrieb, braucht aber keine schwere Mechanik dafür. Alles wird elektronisch gesteuert.

Und wie. Die Lampo-Leistung ist beachtlich. Der 4,69 Meter lange 2+2-Sitzer soll dank 900 Nm Drehmoment in 4,5 Sekunden auf 100 beschleunigen, 220 km/h Spitze schaffen und 200 Kilometer weit mit einer Batterieladung fahren.

Serienreife als Ziel

Beim Lampo 3 ging es vor allem um die Serienreife. «Wir haben den Kabelbaum nicht mehr selbst ‹gestrickt›, sondern anfertigen lassen», erzählt Piffaretti. «Das war zwar teurer, dafür ist er jetzt reproduzierbar für eine Serie und muss nicht immer wieder neu von Hand hergestellt werden.»

Wie bei den Vorgängermodellen hat Protoscar wieder auf bewährte Schweizer Zulieferer zurückgegriffen. So lieferte Brusa den Elektrostrang und die Leistungselektronik. Mit ABB und Alpiq wurde eine Heimladestation entwickelt, die jetzt auch von Mitsubishi und Nissan angeboten wird. Und das Nachwuchsunternehmen Evtec hat sich um die komplette Fahrzeugelektronik gekümmert. «Es ist ein Schweizer Modell», freut sich Piffaretti.

Viele Komponenten für das Auto wurden zudem aus bestehenden Grossserien genommen. So stecken im Lampo 3 auch 30 Kilogramm Corvette. «Die ganze Windschutzscheibe haben wir von Chevrolet», verrät Piffaretti. Auch im Interieur sieht einiges nach GM-Technik aus.

Nicht ganz perfekt ist der Zusammenbau, gibt der Tessiner Konstrukteur und Designer freimütig zu. «Das passt nicht alles perfekt, es ist wirklich ein reiner Prototyp. Da würde man bei einer Produktion noch nachbessern müssen.»

Von grossen Stückzahlen geht zwar niemand aus, aber ein paar Einzelstücke wären denkbar. Am Genfer Salon steht jedes Jahr mehr als eine Manufaktur, die selbst geschneiderte Modelle zu den entsprechenden Preisen offeriert. Und wenn sich ein Tesla Roadster für mehr als 100 000 Franken verkaufen lässt, warum nicht auch ein Protoscar Lampo?

Hintergrund

Lampo-Familie 1, 2 und 3

Seit der Tour de Sol im Jahr 1986 tüftelt der studierte Automobildesigner Marco Piffaretti, 45, an Elektroautos. Und das so erfolgreich, dass seine Firma Protoscar unter anderem für Daimler, General Motors und Nissan Entwicklungsaufträge in diesem Bereich übernimmt. Erfahrung gesammelt hat der Tessiner zudem als Leiter des Grossversuchs VEL1, ein Praxistest mit 400 Elektromobilen und 80 öffentlichen Ladestationen.

Mit seiner ersten Genfer Studie Lampo (im Bild blau) wurde die Öffentlichkeit auf Protoscar aufmerksam. Der «Blitz» mit zwei Elektromotoren leistete 286 PS bei 200 Kilometern Reichweite. Nur ein Jahr später folgte am Salon der Lampo 2 (gelb) mit 408 PS und deutlich weiterentwickelt. Das jetzt vorgestellte Modell Nummer 3 bildet den Abschluss der Miniserie. Der neue Prototyp ist komplett standardisiert und könnte schon als Kleinserie gebaut werden. Es ist der erste serienreife Elektrosportwagen aus der Schweiz.