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Summary

Dynamic, Versatile E-Flex-Concept Opel Flextreme Emits less than 40 g/km CO₂

- Plug-in Electric Vehicle Features 55 Km of Emissions-Free Range
- E-Flex architecture with diesel engine extends driving range
- Dynamic, sporty, compact electro-monocab concept car
- FlexDoors® and FlexLoad®: New for doors, tailgate and luggage solutions – and an extra mobility option

Opel's Flextreme concept car, which makes its premiere at the International Motor Show (IAA) in Frankfurt (September 13 – 23, 2007), boasts the body of a dynamic monocab, as well as the completely new environmentally friendly E-Flex electric propulsion concept and a host of innovative details. Flextreme is part of GM's ongoing commitment to develop vehicles that reduce CO₂ emissions and the automobile's dependency on petroleum. In contrast to conventional vehicles and hybrids, GM's E-Flex system uses an electric motor, powered by a lithium-ion battery, to propel the Opel Flextreme concept for up to 55 km of electric-drive-only range. A 1.3 turbo-diesel onboard engine generates additional electricity to replenish the battery and extend the vehicle's driving range fully charged, the Flextreme's 55-km all-electric driving range is enough for most daily commuters in Europe to travel without using any diesel fuel or emitting any CO₂.

The Flextreme takes the new design language debuted in the GTC Coupé at the Geneva Motor Show several steps further. With the rear-hinged back doors (FlexDoor®) that enable comfortable access to the interior, a large transparent roof and two tailgate doors that open from the side and swing upwards (FlexLoad®), the concept car embodies Opel's tradition of particularly flexible and practical body concepts with attractive designs. This also includes the FlexLoad's additional underfloor luggage compartment the latest in a series of innovative Opel solutions such as the Zafira's seating system (Flex7)



and the integrated rear carrier system FlexFix found in the Corsa and Antara. And the big surprise is the integration of two high-tech electric personal transporters, ingeniously packaged below the cargo floor. They can be used in areas that cars cannot enter, thereby adding an extra mobility option. The electric scooters provide up to a 38 km (23 miles) of clean mobility.

For the IAA, FlexLoad® carries special cargo in tune with the Flextreme's electric propulsion: electrically-powered Segway® Personal Transporters (PTs). These high-tech transportation devices ⁽¹⁾ have been modified for their mobile garage. With a twist of the handlebar-mounted release, the handlebar telescopically retracts and rotates downwards for easy loading into the Flexload® compartment. Once docked, the batteries of the Segways can be charged along with the Flextreme's batteries.

Propulsion: Low-emission mobility with E-Flex technology

The Flextreme's drivetrain is a good indication of what low-emission mobility could look like in the mid-term. It is based on General Motors' electric vehicle architecture E-Flex and is always electrically powered. The energy source is a lithium-ion battery, and additional energy comes from a 1.3-liter CDTI engine as needed. This engine is not connected to the wheels; it is only on board to charge the batteries when they are empty and no plug-in facility is available, thereby extending the operating range. The concept car's diesel engine features latest technology that helps to further reduce exhaust and noise emissions. The cylinders' pressure-based closed loop technology is used to control the combustion process. Based on the current European test cycle for plug-in vehicles, the Flextreme is expected to emit less than 40 g of CO₂ per km.(according to European test procedure ECE R101 for range extender vehicles).

Plug-in – full capacity after three hours of charging at 220 volts

The E-Flex strategy is based on combining various drivetrain systems in the same vehicle architecture, depending on what energy source is readily available in the driver's area. The concept has already been presented in two further versions: at the Detroit Motor Show in January 2007, it debuted with a 1.0-liter, three-cylinder turbo gasoline engine designed for operation with gasoline or E85 (a mixture of 85 percent ethanol and 15 percent gasoline).



And at the Shanghai Motor Show in April 2007, GM presented the electric concept car with hydrogen fuel cell propulsion.

Exterior design: Dynamic design language in compact monocab form

The Flextreame body's key characteristics highlight the new elements of Opel design language: more sculpted surfacing molding, clear style elements such as narrow, boomerang-shaped lights and sloping swage line in the side graphics. The 4555 mm long Flextreame was also designed following the motto of technological efficiency: vehicle weight and aerodynamics are optimized by using advanced materials and simulation technology. The result is a wide range of innovative solutions.

The bottom edge of the windshield has been pulled far forward, so the hood with its characteristic crease is very short. The integrated power socket in the cowl panel allows the car to be charged at any mains supply.

A look at the front of the car quickly reveals that the front grill and rims are covered by lightweight transparent trim, which is made from polycarbonate to improve aerodynamics while maintaining visual aesthetics. The same is true for the special light alloy wheels. Their look remains unchanged, yet disruptive air turbulence is avoided.

Like the wheel design, the large boomerang-like curved front light units are visually deceptive. The designers continue a theme which began with the GTC Concept that debuted at the Geneva Motor Show, and take it to a new level. The vertically oriented front lights slice up the front end in an unusual manner. The boomerang shaped high tech LED headlamp unit houses lightweight crossbeam, fog lamps and air intake for brake cooling which are particularly small in comparison to current trends. The optical illusion continues with the tail lights: at first glance, the concept car appears to have none. The curved rear lights are completely integrated into the tailgates and hidden beneath glass.

Just like all the other windows and a large part of the roof, the windshield is made of especially light polycarbonate. The Flextreame's panoramic windshield provides a light and spacious interior ambience and stretches over most of the roof, which is reinforced by a spine-like composite structure that extends all the way to the rear floor.



Doors: Unconventional and practical

In keeping with the vehicle's extraordinary features, access to the FlexLoad® luggage compartment is through two butterfly rear tailgate doors that individually swing open upwards along the central axis of the vehicle. The advantage is that the Flexextreme's trunk is accessible from the side when parked tightly against a wall or another vehicle.

Another key Flexextreme innovation is the trademarked FlexDoors® driver and passenger doors: while the front doors open in the conventional manner, the rear doors are rear-hinged. And as there is no center roof pillar (B-pillar), opening both doors on one side creates a large opening for easy entry. The large side opening makes it much easier for parents to secure children in seats in the rear than is the case with conventional doors.

Interior: Futuristic and top technology

Honeycomb structures, which are characterized by low weight and high rigidity, are used extensively in the Flexextreme's interior. This functional, geometric structure can be found in the instrument panel's lower portion, cabin floor, cargo floor and above the center tunnel where the lithium-ion batteries are located.

Innovative lightweight construction is used for the seats which are anchored to the car's floor by a mono track rather than the usual two, creating more foot space in the rear. The seats have a light and elegant look thanks to refined upholstery, with some parts in fabric/mesh and corners made of especially soft material. The steering wheel hub also houses a high-tech feature: a full-size driver airbag that is packaged with a special vacuum technique that reduces its overall volume to the minimum.

Set directly under the windshield, the large panoramic display (size: 1.20 m x 0.10 m) in the interior is especially eye-catching. The display fields are configurable. They can show a complete all-around view of the car's surroundings, for example, as instead of exterior mirrors the Flexextreme has two side cameras, one front-facing and one rear-view camera. Alternatively the displays can also show information about the car, radio, phone, etc.



One touch is enough

A second display on the center console features touch-screen operation. At the top, the programmable one-touch buttons are designed like computer shortcuts. They provide easy access to various intuitive menus, including air conditioning, communication/infotainment and navigation functions. The buttons can be freely programmed and adapted to new infotainment systems. Slightly further down is the Flextreame's touch screen drive selector gate with three driving positions: D, P and R (drive, park and reverse). The gears can also be comfortably selected via touch screen control.

A clever storage system at the front and back of the center tunnel offer brand-typical flexibility. Front and rear passengers can stow items such as mobile phones, MP3 players, iPods and PDAs in two drawers. The best part: the electrical devices are recharged in the drawers by induction and Bluetooth-capable systems can transmit their data to the onboard infotainment system.

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Text and photos can be downloaded from the Internet at <http://media.opel.com>.

(1) The Segway PT is a two-wheeled transportation device that uses a unique combination of sensors, propulsion and intelligence to balance in place and move in response to the way the rider moves his or her body forwards, backwards, left or right. With no need for gasoline, and easy battery charging from any 110/220 volt outlet, the Segway PT is one of the most energy efficient, environmentally friendly individual transportation options available today. Designed for maneuverability in urban and pedestrian environments, it can travel 20 km/h for up to 38 km on a full battery.