

## OSCAR - Open Source CAR

### A powerful and efficient City Car

The goal is to demonstrate a vehicle which combines true practical usefulness with minimum energy consumption.

OSCAR is the prototype of an electric lightweight vehicle, consuming 6 KWh per 100 km from the grid.

This amount of energy can be generated from one liter of diesel. Alternatively, we installed 10 square meters of solar cells on a roof to power this car ca. 20.000 km per year - only with solar energy!

Oscar shows the development of a state of the art propulsion system, including batteries with high performance thermal management, electric traction system using lightweight high speed AC induction motor (exceeding 25,000 rpm) with high power density and fully integrated power electronics.



### Technical data

- 1liter per 100 km consumption equivalent 6 KWh / 100 km off the grid
- 100 to 300 km radius without recharging enough for everyday use
- seats 2 tall adults space miracle for 2 basketball players or one player plus 2 kids
- 130 km/h maximum speed
- 2,5 m long crosswise parking permitted a "built in" parking space!
- 1,55 m high traffic under control
- 1,20 m wide - slim and easily steered



### OSCAR @ Expo 2000

Jean Nouvel's Expo theme-park Mobility in Hannover intended to present reasons and motives of mobility, as well as the resulting problems and ways to their solution.

Not only for a great scenery, but also because it is the most energy efficient car, OSCAR was situated in 'pole position'.



On average, a car is seated with 1.3 persons. More than 90% of all trips are shorter than 9 km. Up to now, no vehicle has been optimized for these requirements. The lightweight electric vehicle is a big step in this direction.

**That's what we are doing.**

## High Efficiency Electric Drive System

### Aims

Developing and evaluating a complete, highly efficient drive unit for light weight ZEVs (zero emission vehicle).

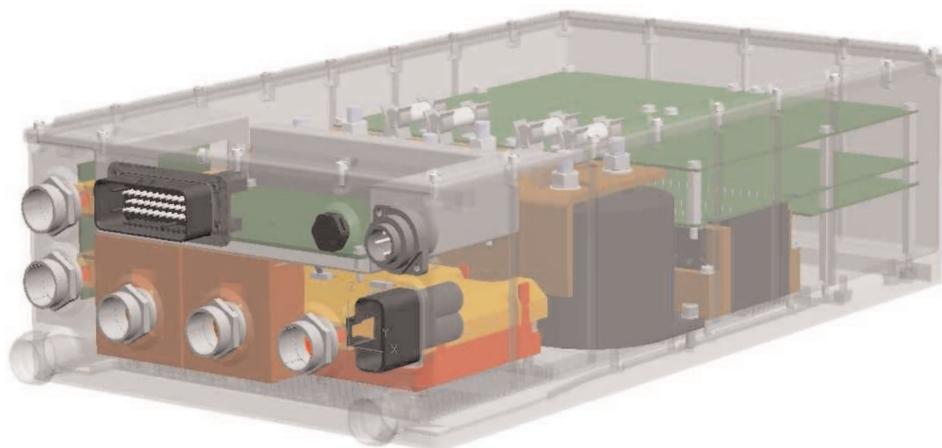
Comparison and energetic evaluation of the drive-concept with conventional combustion engines and fuel-cell systems within regenerative scenarios.

Integrating the drive into a lightweight vehicle.

Training engineers and scientists in alternative vehicle drives (sustainable proliferation of results).

Conveying knowledge and optimizing results by an early involvement of contractors in the design process.

## Power Electronics



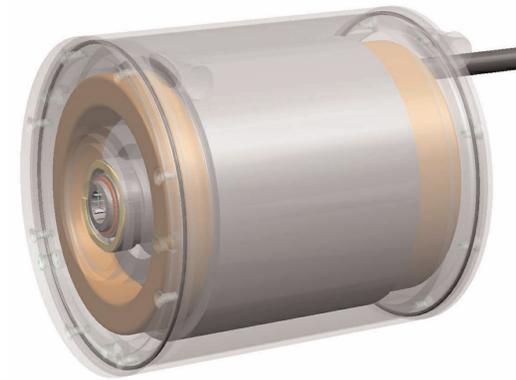
Progress by functional integration: the **AKASOL Powerbox**

Charger, drive (frequency) converter, 12 V converter as well as central parts of the driver information system and battery management are integrated into a single chassis.

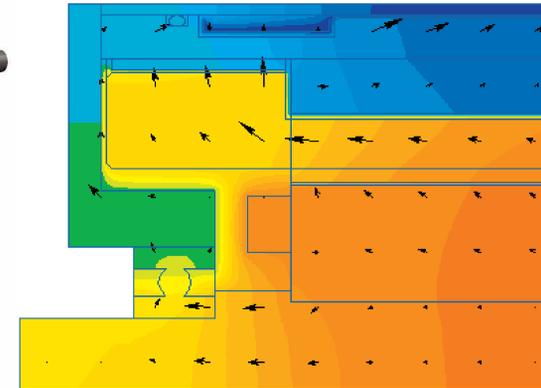
### Technical specifications:

- 50V to 400V DC; 280A DC
- 100 kVA max
- Volume < 7,4 l
- weight < 12 kg
- IP 66, all plugable
- foil capacitors
- 500 A IGBTs

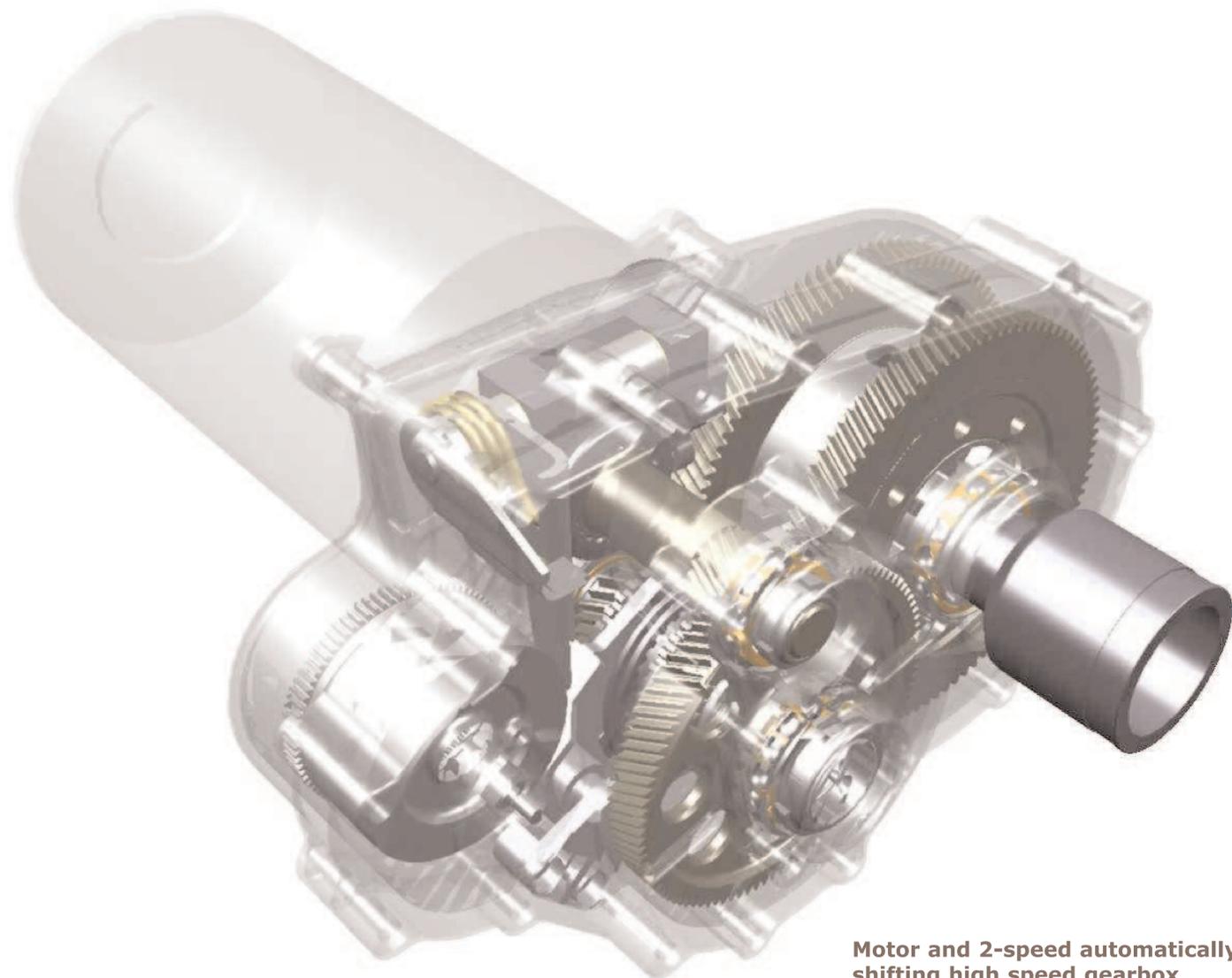
## High Performance Electric Drive



AC induction motor with high power density



Thermal simulation



Motor and 2-speed automatically shifting high speed gearbox

### Technical Specification (high speed version)

- Weight 21 kg
- Up to 25,000 rpm
- Up to 20 kW continuous power, > 40.5 kW max
- Up to 25 Nm nominal torque, > 49.5 Nm max
- Efficiency up to 94.9 % (sinus)