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The electric wheel - a breakthrough in car efficiency

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Since the first automobile emerged in the 1880's, the design of a car with an internal combustion chamber has been prevalent in human society. The car industry and the oil industry have become interdependent on this design, based on the combustion of crude oil. This interdependence can be observed in the struggle for survival of several car companies. Huge losses are made by General Motors, Ford and other car companies because they continue to think in the old ways, holding on to the production of big expensive and inefficient machines as long as possible. Soon this way of thinking will be extinct because the incentives in these industries are changing. The increasing fuel costs and pressure from lobby groups, civilians and politicians that care about the environment of the earth are changing the fundamental basis of the car. Super efficient new technologies have been developed which will soon arrive at a home near you.

The future of the car is based on direct power in the wheels. By transferring power without any gearing but by using an electromotor that spins itself inside the wheel, huge energy losses are averted, leading to a super efficient car. Link the four electric wheels to an embedded software and hardware system and optimum force control and traction is obtained without heavy mechanical solutions. Another beauty of the system is braking. By reversing the magnets in the wheel in the opposite direction, the forward motion of the car is converted back into electrical power. The advantage of this system is that it reduces the power necessary to propel the car by half compared by a geared traction motor thanks to the reduction of friction losses/mechanical efficiency.

The electric power of the car can be supplied in different ways. The best solution would be to mount a generator that can use a variety of fuels, powering the battery train that supplies electric power directly to the wheels on a constant basis. In this setting the radius of the car, the power, the loading time, the comfort and so on are not any different then in standard cars with an internal combustion system. Because the car becomes far more efficient, fuel and environmental costs can be reduced drastically, leading also to signficant reductions in economical costs when the lifetime of the car is taken into account. This technology has been developed independently in different forms by a variety of large and small companies. Some examples: The Tweel from Michelin, the VDO eCorner from Siemens, the Wheelmotor from PML flightlink, the Wheel from e-Traction and the colt prototype from Mitsubishi.

The technology has also been proven in a variety of prototypes. PML Flightlink has applied their technology to two mini's which now have a quad electrical wheel system:

Item	Specification
Emissions	Zero
Autonomy	1000 - 1500 km
Top speed	240 kph
Acceleration	0-100 kph in 4.5 secs
Braking	No mechanical brakes
Fuel	Carbon neutral option
BHP	> 640 bhp
Fuel consumption	65 - 80 mpg

e-Traction has retrofitted two busses with a quad electrical wheel system:

The troubling question is why this technology, which can slash fuel usage in half, is not already applied in large quantities in the cars and busses of today. The main reason is that markets are not functioning as they should because the incentives for car companies and the oil industry to halt such progress is still bigger. Consider the companies that make gearboxes, which would no longer be needed with an electrical wheel system. Consider the decreasing dependence on crude oil, if such a technology would quickly be implemented worldwide. Such technologies mean a fundamental shift in industries, were some will win and others will lose big-time. If the incentives start to change financially because people don't want gas guzzling cars anymore, and the pressure grows hard enough to truly innovate, then innovation will come. Which company will be the first that starts to produce the electric wheel in ten thousand cars annually cannot be foretold, but that it will happen in the coming five years, is a certainty.