

Where innovation starts

Car Challenges

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Interreg IVB project E-Mobility NSR
Haarlam
10-10-2013

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The car is a high tech system



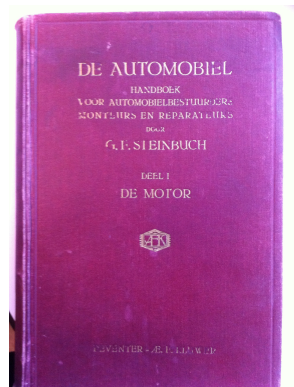
Did you know that:
in the waferfab of
NXP in Nijmegen yearly 700.000.000 (700M) ICs are
manufactured for the automotive market.





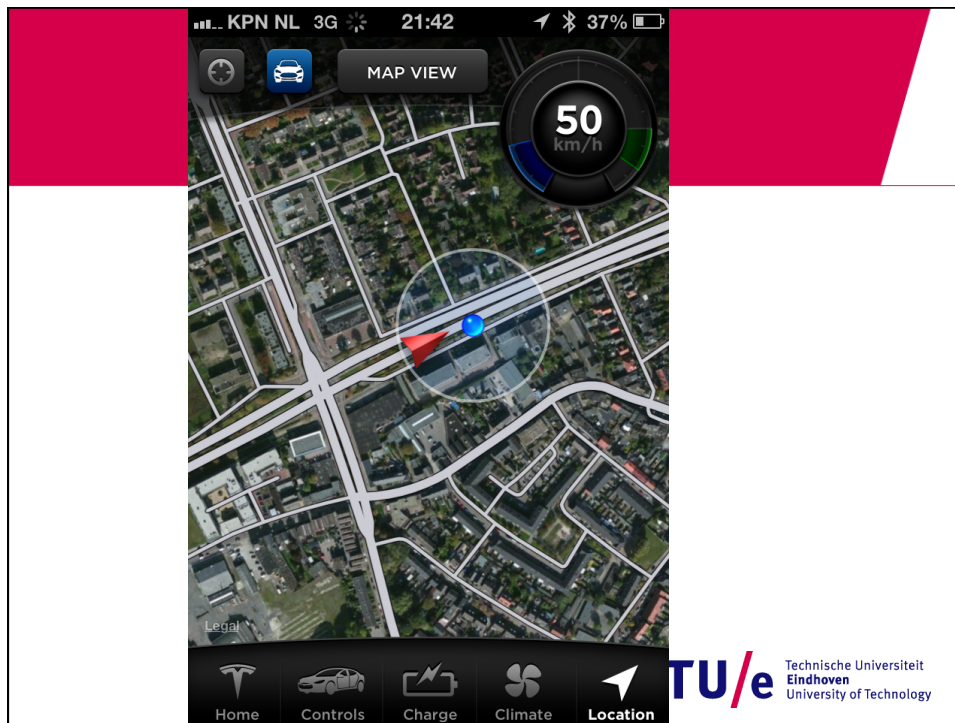
Did you know that:
EVERY DAY 6.000.000.000 anonymous
 measurements from cars worldwide are received by
 TomTom?

1913



2013



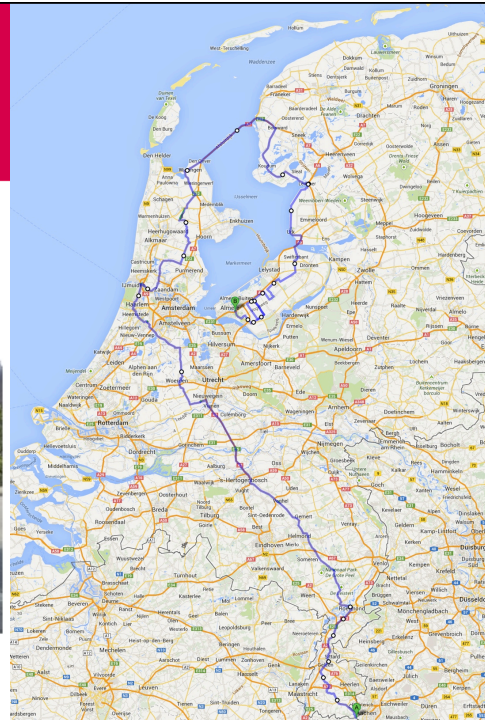


Performance: experience

- 420 hp
- 85 kWh = 360-460 km range
- 0-100 km/h: 4.2 s
- @95 km/h: 165 Wh/km
- @120 km/h: 200 Wh/km
- Charging: 3x16A at home, 50km/h (10kW)
- 0.03 €/km
- 70-120 k€

2013 Tesla Model S European Range Record

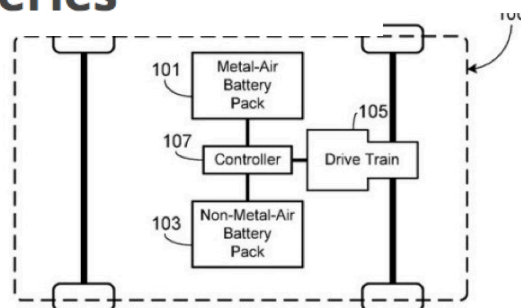
625 km with one
battery charge (80 kWh)
130 Wh/km



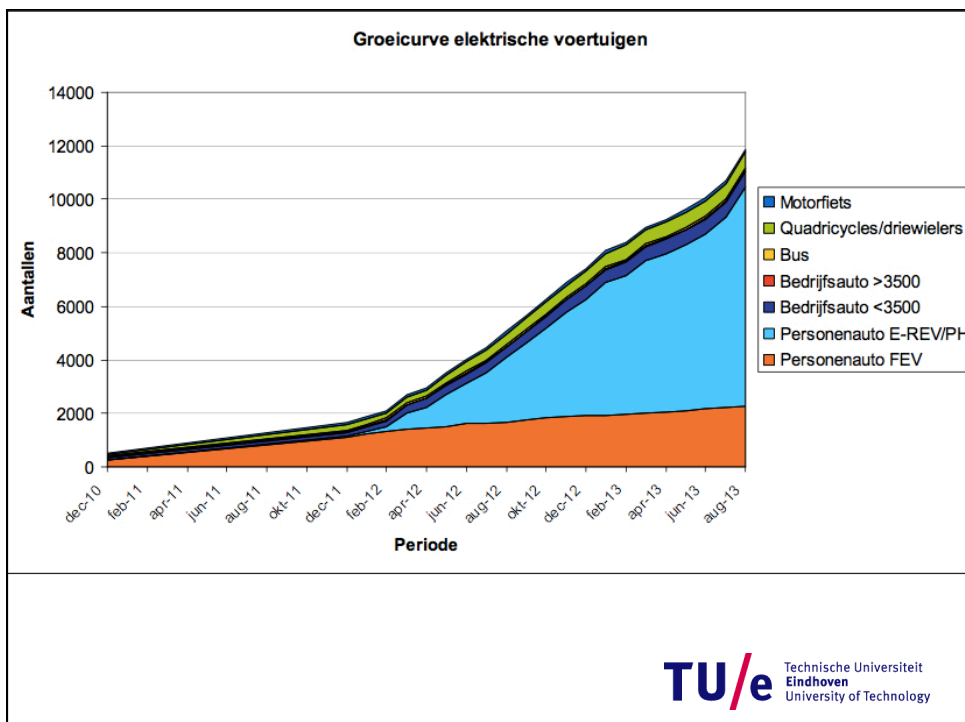
Near future?

New Tesla Patent: 400-Mile Battery Pack Using Metal-Air & Lithium-Ion Batteries

8%/jaar less €



Tesla Motors is exclusively an electric car maker, with Elon Musk expressing disdain for cars like the Chevy Volt and BMW i3, which pack gas-powered range-extendors. But Tesla may be working on a different kind of hybrid; a hybrid battery pack that could extend the range of



Type voertuig	Aantal per	31-12-2011	31-12-2012	31-07-2013	31-08-2013
Personenauto (FEV)		1.124	1.910	2.216	2.282
Personenauto (E-REV, PHEV) #		17	4.348	7.106	8.163
Bedrijfsauto < 3500		158	494	588	609
Bedrijfsauto > 3500		22	23	27	31
Bus *		68	67	71	72
Quadracycles (voorheen driewielig)		181	469	581	597
Motorfiets		88	99	119	124
Totaal op de weg		1.658	7.410	10.708	11.878
Bromfietsen		2.484	2.853	3.056	3.062
Snorfietsen		14.311	17.748	19.082	19.278
Brommobielen		n.a.	107	124	127
Totaal inclusief brom/snorfiets/brommobiel		18.453	28.118	32.970	34.345

* Inclusief trolleybussen ; # Exclusief volledig hybride voertuigen

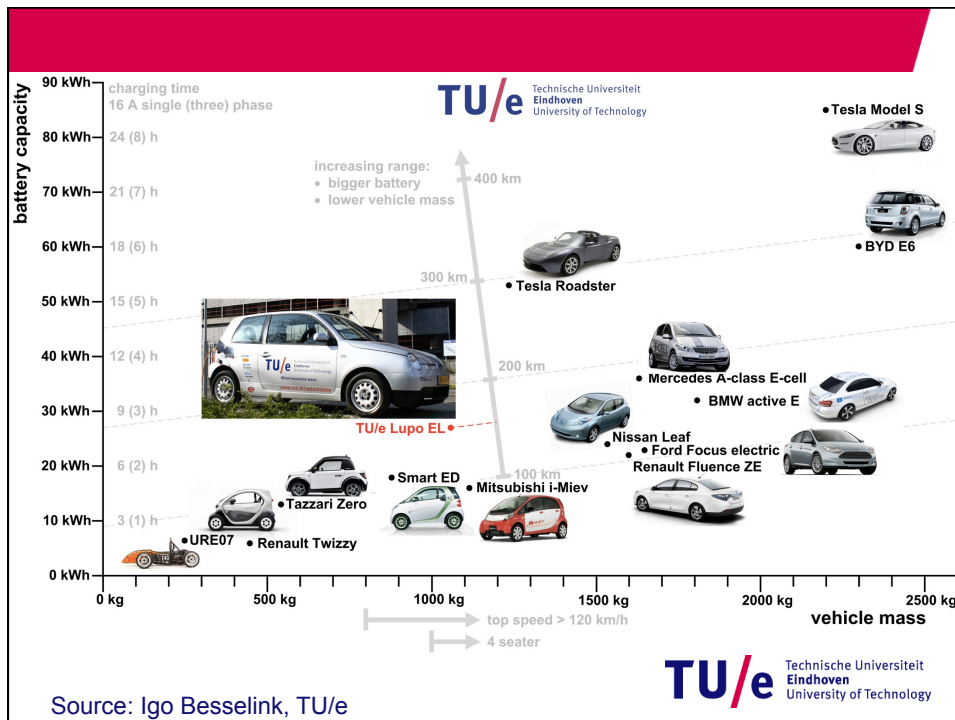
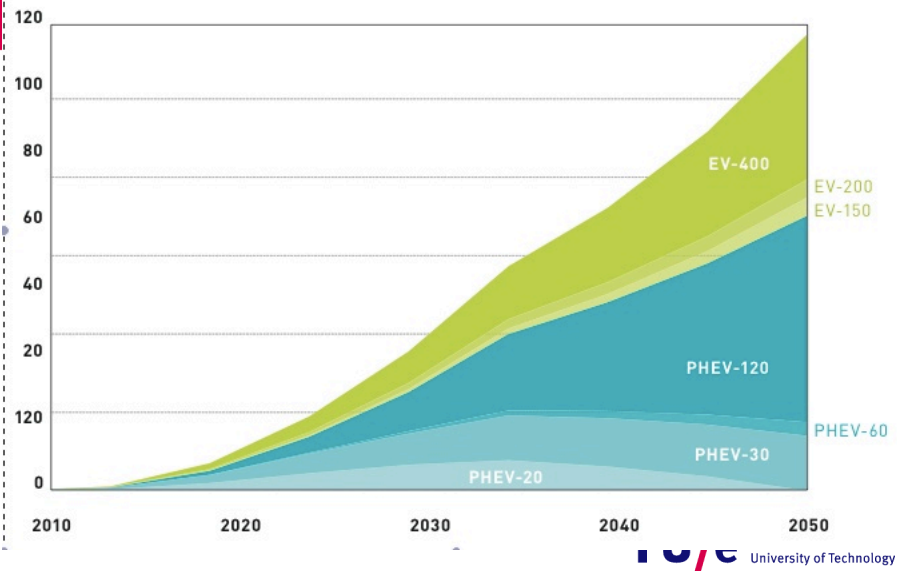
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€/maand	aanschaf	ZZP 42%	ZZP 42%	BV 52%	BV 52%
		2013	2014	2013	2014
Twizy	8000+60/mnd	143	202	139	151
Zoe	21000+100/mnd	274	351	267	287
BMW i3	35500	239	368	230	276
BMW i3 RE	40000	261	489	289	350
Leaf	36000	329	354	232	290
Prius	40000	302	489	289	350
Outlander	50000	351	584	336	412
Ampera	46000	332	546	317	387
Tesla 70k	70000	431	673	418	564

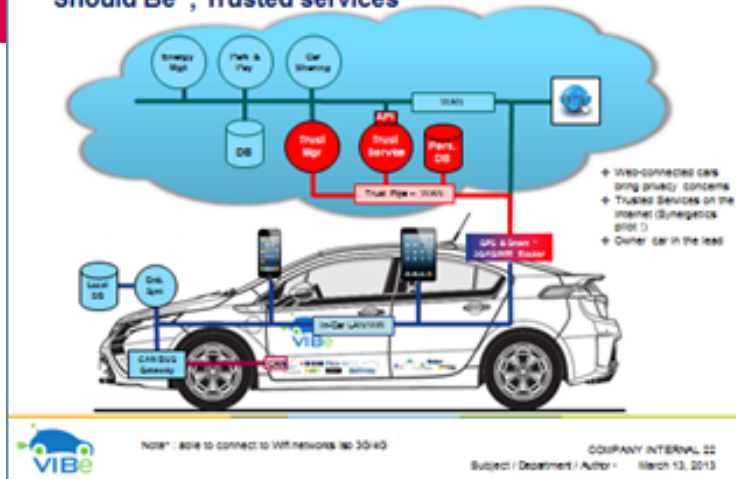
bij 20.000 km/jaar

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FIG 1. WORLD EV/PHEV SALES (MILLIONS/YEAR)*



VIBe Initiative "Should Be"; Trusted services



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By 2040 Autonomous Cars Forecast To Comprise 75 Percent of All Vehicles

PUBLISHED SEPTEMBER 26, 2012
BY JEFF COBB

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advertisement...

This year the state of Nevada issued a driver's license to a Google Prius. How long before a variety of driverless vehicles become the norm? If ever?

If you follow the headlines as do a lot of people, you'll note today's youngest drivers have less-to-no interest in driving automobiles. While marketers are chasing the elusive "Gen Y" species with a variety of lures, perhaps these younger folks' sensibility is a sign of things to come, given a recent pronouncement that by 2040 three out of four cars will be autonomous.

This prediction for 75 percent driverless vehicles comes via eminent members of the world's largest professional association for the advancement of technology, the Institute of Electrical and Electronics Engineers (IEEE).

Over the next 28 years, they say, vehicular travel and the automotive landscape as we know it will radically evolve toward driverless cars.

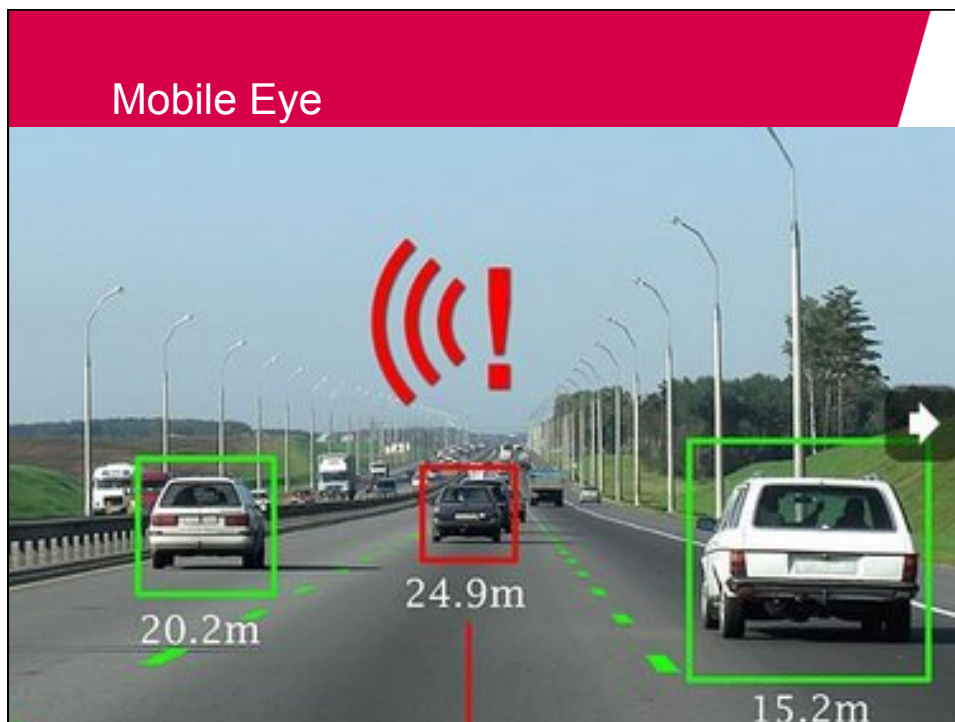
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Structure Bachelor (BSc) Automotive Technology



Subfields

Professor Maarten Steinbuch :
“Modern cars are intelligent high tech systems.”

<u>The Digital Car</u>	Computation for AU, sensing computing and actuating, vehicle networking, automotive software engineering
<u>The Controlled Car</u>	Dynamics and Signals, Systems, Vehicle dynamics and mechanical vibrations, control engineering
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