Road transport

WHY

ELECTRIC?

What is at stake?

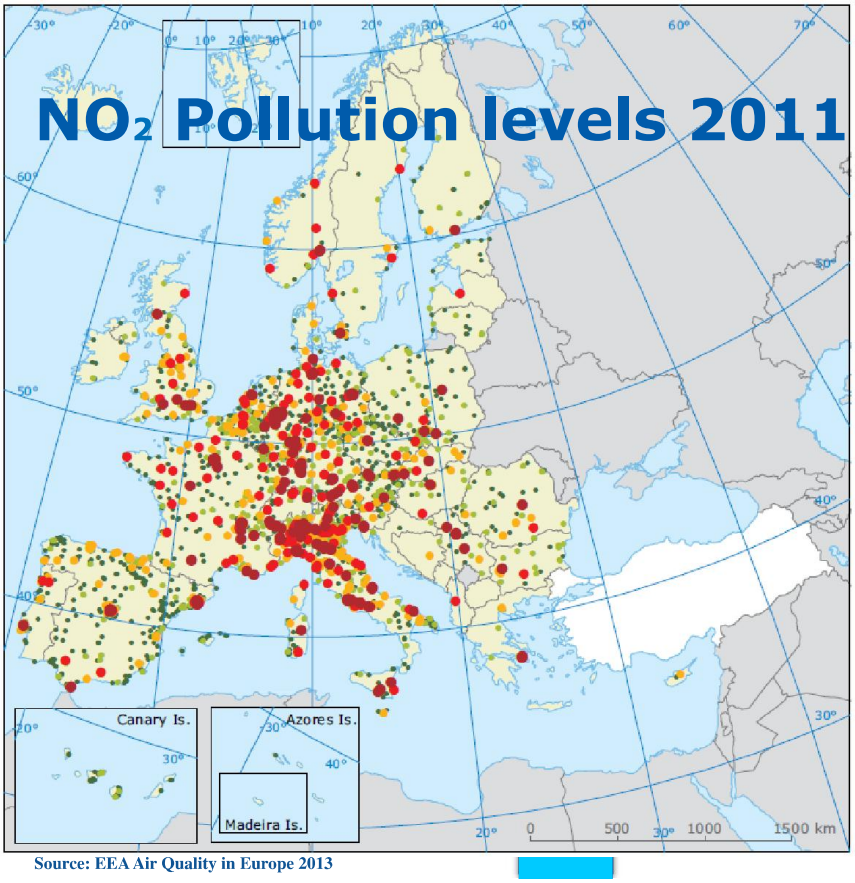
Electro-mobility is one of the largest opportunities to radically change the transport system & make a quantum leap into the next generation of sustainable mobility

- **Reduce emissions (both pollution and GHG)** - sustainable growth
- **Energy independence** (less reliance on fossil energy)
- **Competitiveness of EU automotive** sector
- Competitiveness/innovation of **EU electronics industry**

More than 13 million EU jobs!

THE NEW CHALLENGE IS

REALITY!

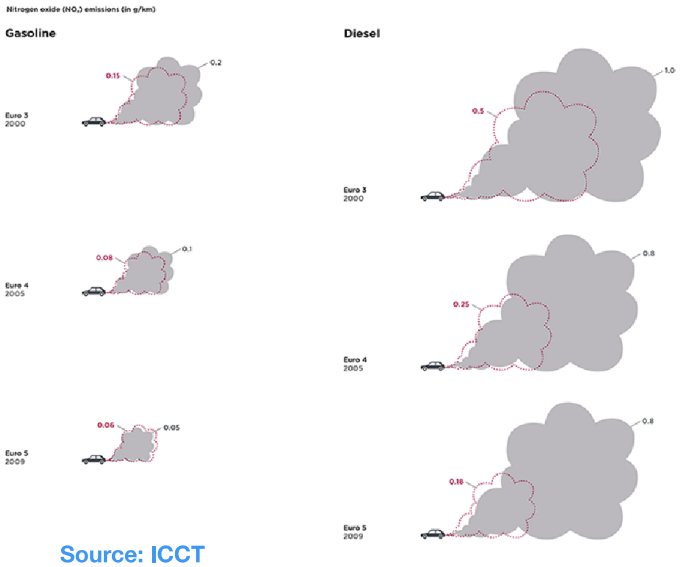


Source: EEA Air Quality in Europe 2013

European Commission

Pollutant emissions

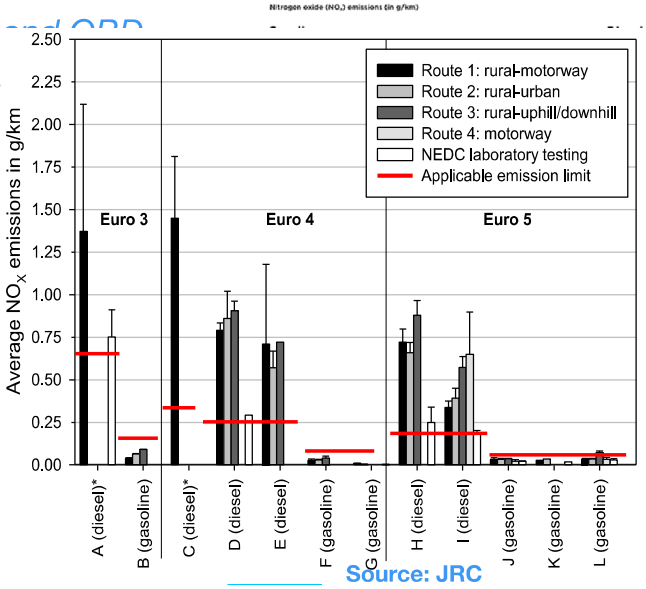
We have introduced:
Stricter and stricter emissions regulations for light and heavy duty over the years
PM Number standards
Enhanced durability and OBD
Yet…

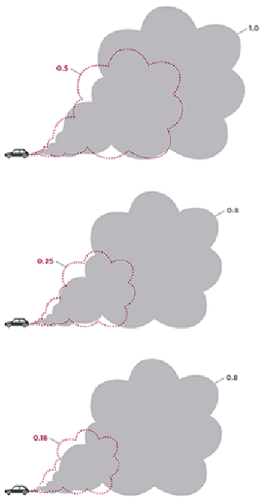


Source: ICCT

Pollutant emissions

Stricter and stricter emissions regulations for light and heavy duty over the years
PM Number standard introduced
Enhanced durability and OBD
Yet researchers find.

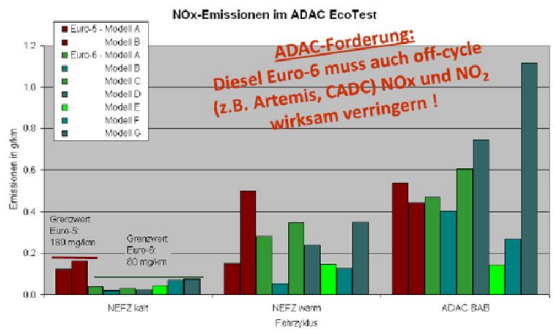




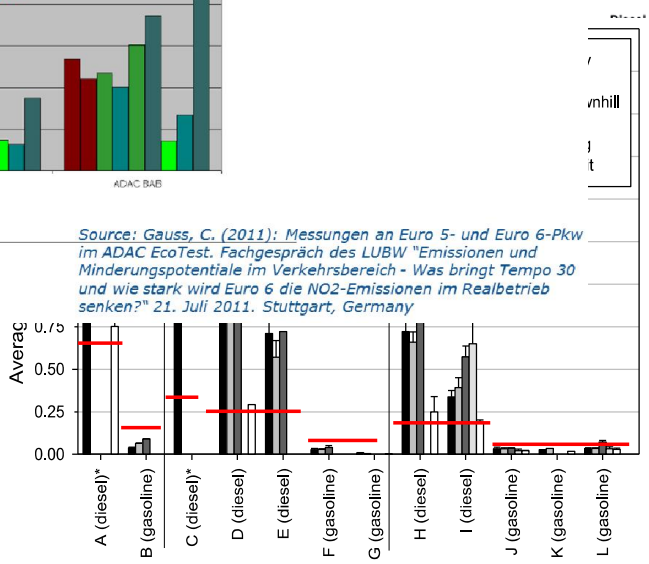
Source: JRC

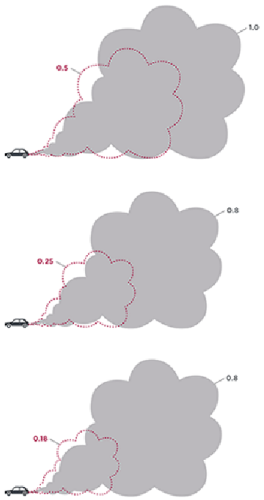
Pollutant emissions

Maßnahmen zur NO_x-Minderung



vy duty over the years

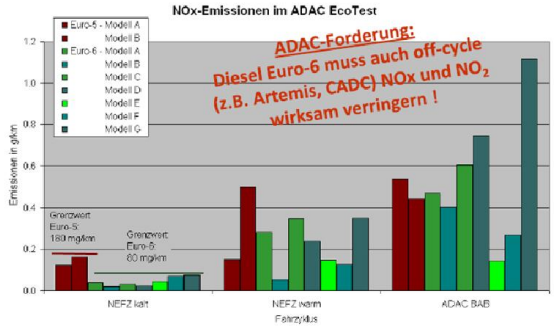




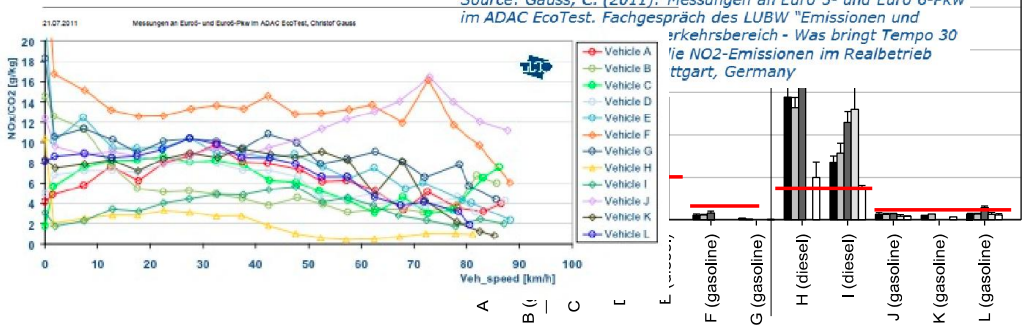
Source: Gauss, C. (2011): Messungen an Euro 5- und Euro 6-Pkw im ADAC EcoTest. Fachgespräch des LUBW "Emissionen und Minderungspotentiale im Verkehrsbereich - Was bringt Tempo 30 und wie stark wird Euro 6 die NO2-Emissionen im Realbetrieb senken?" 21. Juli 2011. Stuttgart, Germany

Pollutant emissions

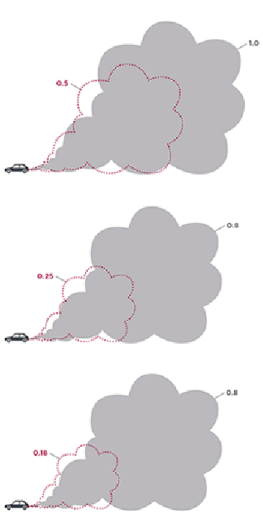
Maßnahmen zur NO_x-Minderung



...vy duty over the years

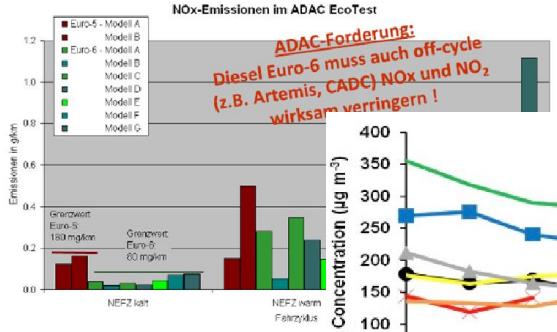


Source: Gauss, C. (2011): Messungen an Euro 5- und Euro 6-Pkw im ADAC EcoTest. Fachgespräch des LUBW "Emissionen und ...erkehrsbereich - Was bringt Tempo 30 ...die NO2-Emissionen im Realbetrieb ...ttgart, Germany



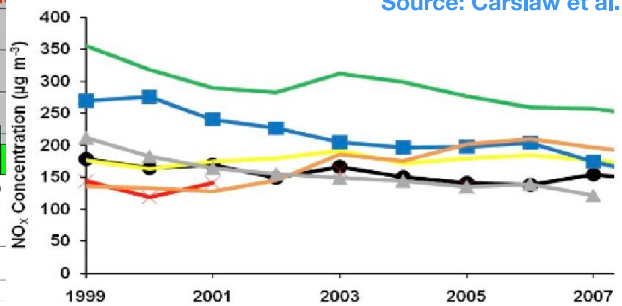
Pollutant emissions

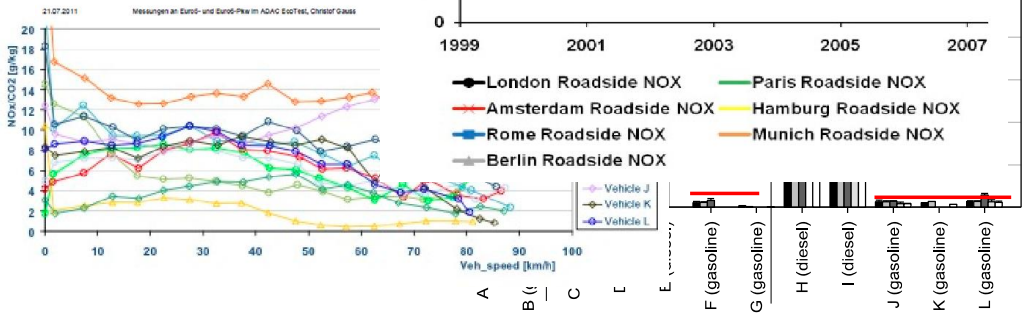
Maßnahmen zur NO_x-Minderung

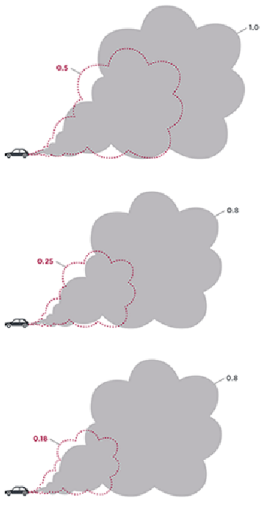


...vy duty over the years

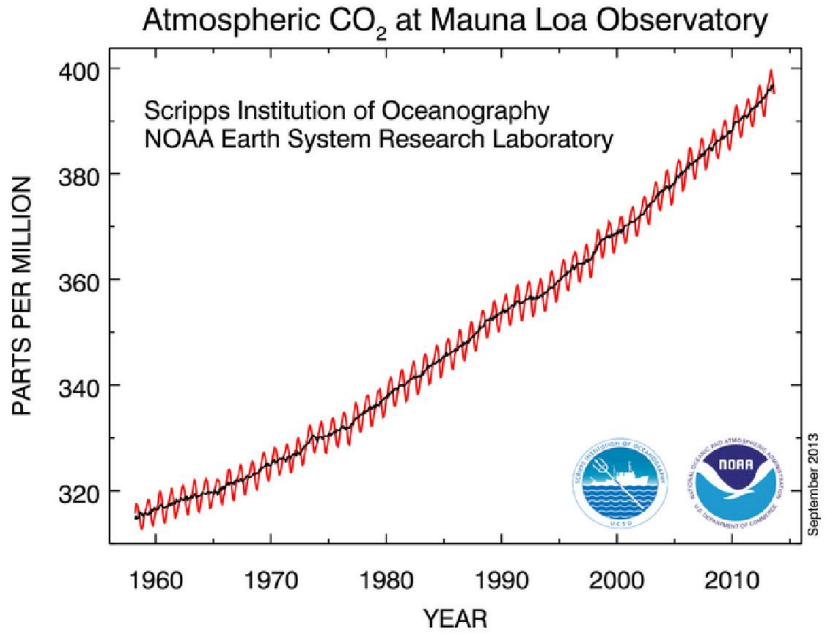
Source: Carslaw et al.







Global warming progresses



Source: EEA Air Quality in Europe 2013

CO2 emissions regulation compliance has the same problems

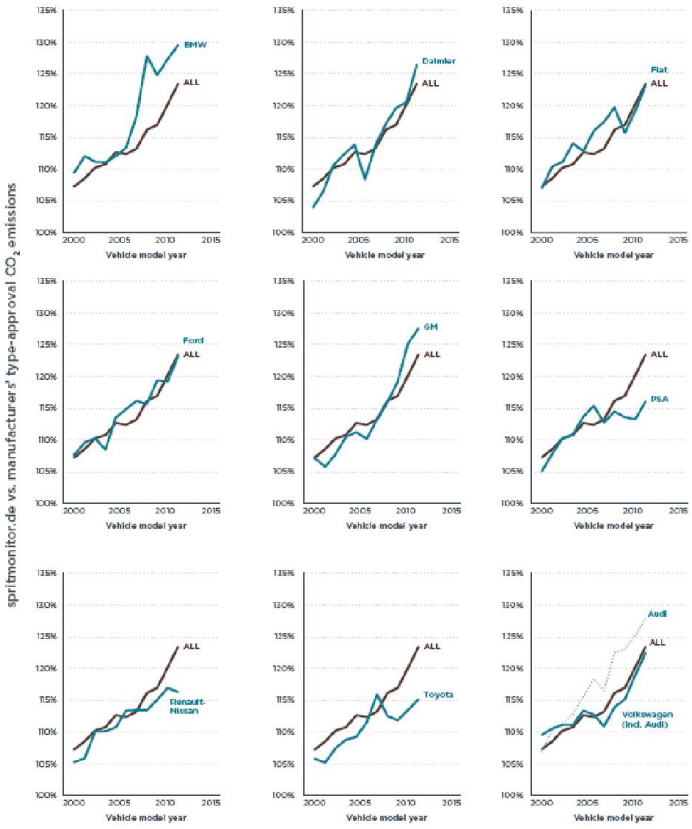
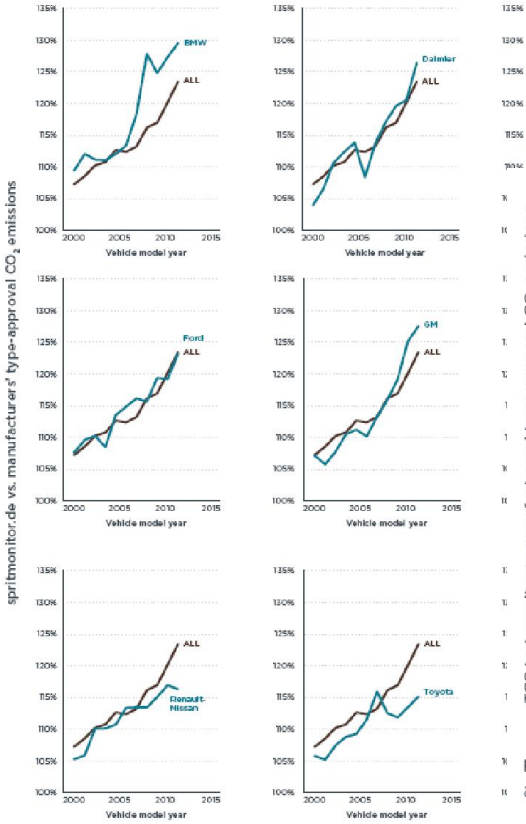


Figure 7. Divergence, spritmonitor.de vs. manufacturers' type-approval CO_2 emissions

Source: ICCT

CO2 emissions regulation compliance has the same problems



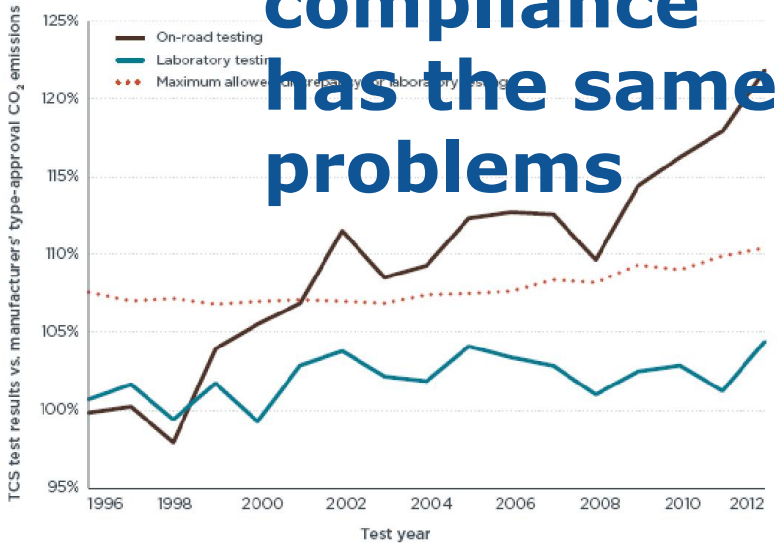


Figure 28. Divergence, TCS on-road and laboratory testing vs. manufacturers' type-approval CO_2 values.

Figure 7. Divergence, spritmonitor.de vs. manufacturers' type-approval CO_2 emissions

Source: ICCT

European Commission

The press discovered it long ago

auto motor sport

NEWS TEST SPORT MAGAZIN COMMUNITY KONFIGURAT

Sie sind hier: Home Tests Technik ECE-Verbrauch: Rollen-Spiele

Technik

ECE-Verbrauch: Rollen-Spiele

Auf einem Rollen-Prüfstand lassen die Hersteller ihre Auto-Verbäuche ermitteln. Die haben jedoch mit dem realen Konsum wenig zu tun. Schuld ist der Prüfzyklus.

Wenn eine Handwerkerrechnung 50 oder gar 60 Prozent höher ausfällt als der Kostenvoranschlag, fühlt man sich als Kunde über den Tisch gezogen. Beim europäischen Normverbrauch, auch ECE-Verbrauch (Economic Comission for Europe) genannt, sind solche Diskrepanzen dagegen nichts Ungewöhnliches, wie Tests von auto motor und sport belegen. Ein besonders krasses Beispiel dafür ist der Lexus GS 450h, der statt 7,9 L/100 km saftige 12,7 Liter verbraucht.

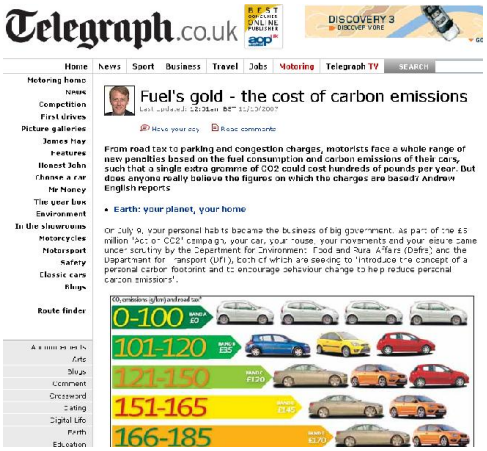
Unzulänglichkeiten beim NEFZ-Test

Schuld daran ist der seit 1996 gültige so genannte Neue Europäische Fahrzyklus (kurz NEFZ) mit seinem Tempolimit bei 120 km/h. Eine Begrenzung, mit dem diese EU-Vorschrift zwar dicht an der statistisch ermittelten Durchschnittsgeschwindigkeit von 117 km/h auf deutschen Autobahnen liegt, in dem aber dennoch eine Menge Zündstoff steckt. Schließlich wird auch der Kohlendioxid-Ausstoß gemessen - die Basis für den ECE-Verbrauch.

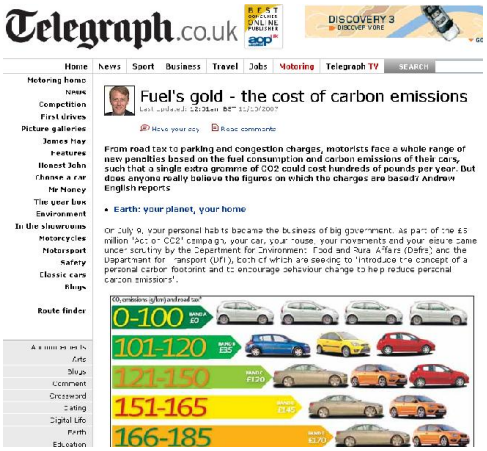
Der Fahrzyklus ist nach nur 20 Minuten beendet, dann wirft der Prüfstand Abgaswerte aus, die zu einem Verbrauch umgerechnet werden. Diese Werte lassen sich zwar von Auto zu Auto vergleichen, sind aber unter idealen Bedingungen und bei niedrigem Durchschnittstempo bestimmt worden.

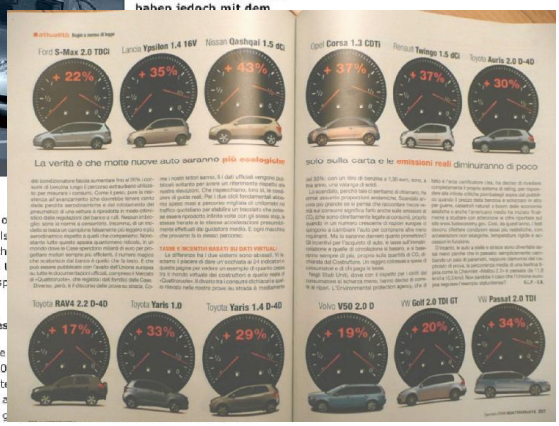
Innovation

The press discovered it long ago



The press discovered it long ago



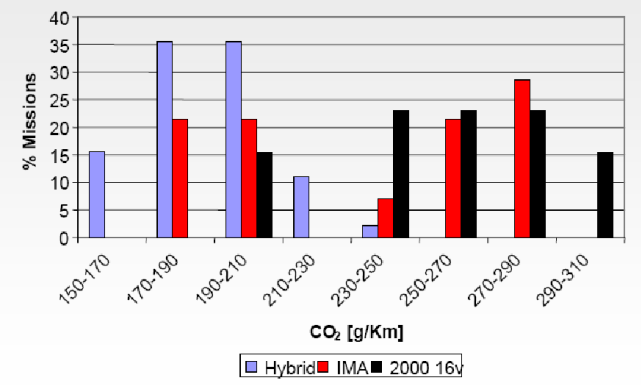


Source: Quattroruote

Wenn eine Handwerkerrechnung 50 o
Kostenvoranschlag, fühlt man sich als
Normverbrauch, auch ECE-Verbrauch
solche Diskrepanzen dagegen nichts
belegen. Ein besonders krasses Beisp
km saftige 12,7 Liter verbraucht.
Unzulänglichkeiten beim NEFZ-Tes
Schuld daran ist der seit 1996 gültige
NEFZ) mit seinem Tempolimit bei 120
zwar dicht an der statistisch ermittelte
deutschen Autobahnen liegt, in dem a
wird auch der Kohlendioxid-Ausstoß
Der Fahrzyklus ist nach nur 20 Minuten beendet, dann wirft der Prüfstand Abgaswerte aus, die zu einem Verbrauch umgerechnet werden. Diese Werte lassen sich zwar von Auto zu Auto vergleichen, sind aber unter idealen Bedingungen und bei niedrigem Durchschnittstempo bestimmt worden.
Innovation

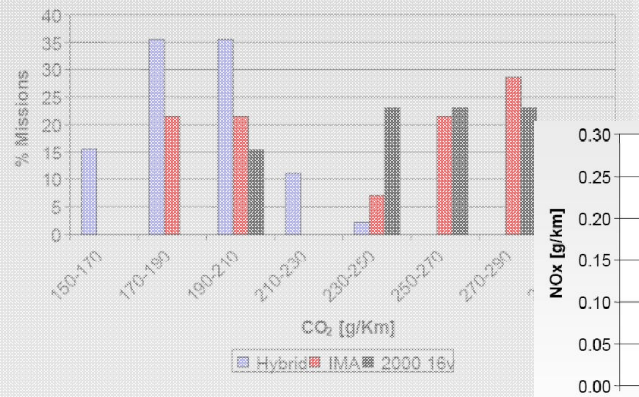
The press discovered it long ago

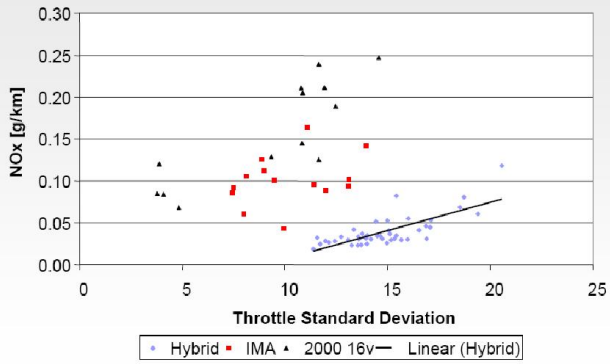
And there are scientific results too



Source: Rome La Sapienza University

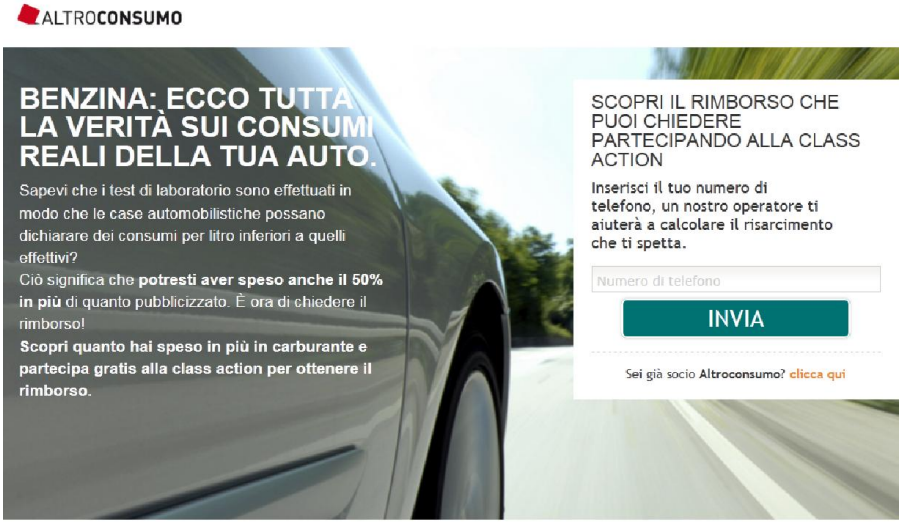
And there are scientific results too





Source: Rome La Sapienza University

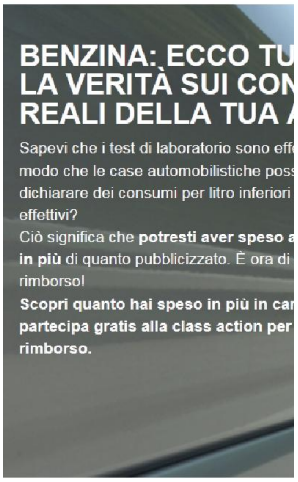
Consumers are getting angry: class actions in US and EU



Come fanno i produttori a dichiarare consumi così bassi? Semplice!
Fanno i test per stabilire i consumi dichiarati usando molti trucchi: lubrificanti speciali, peso ridotto del veicolo, un nastro per avvolgere l'auto e ridurre l'attrito, pneumatici ipergonfi...
Per dimostrare questo divario, anche noi abbiamo rifatto il test su Panda 1.2 e Golf 1.6 TDI e i dati di consumo emersi sono davvero molto lontani.

Consumers are getting angry: class actions in US, Canada and EU

ALTROCONSUMO



Come fanno i produttori a dichiarare c
Fanno i test per stabilire i consumi dic
per avvolgere l'auto e ridurre l'attrito,
Per dimostrare questo divario, anche n
davvero molto lontani.

Ford Is Being Sued Over Fuel Efficiency Claims

ALEX DAVIES
MAR. 1, 2013, 2:12 PM | 2,717 | 6

FACEBOOK LINKEDIN TWITTER GOOGLE+

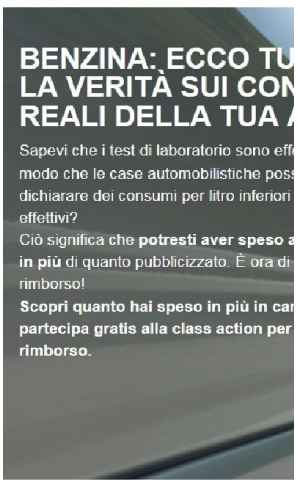
Two similar lawsuits against Ford over an allegedly "false and misleading" marketing campaign, which promised excellent fuel economy in the automaker's C-Max Hybrid and Fusion Hybrid cars, have been consolidated in California.

Ford Motor Company

The 2013 Fusion at its Times Square launch in September.

Consumers are getting angry: class actions in US, Canada and EU

ALTROCONSUMO



Come fanno i produttori a dichiarare c
Fanno i test per stabilire i consumi dic
per avvolgere l'auto e ridurre l'attrito,
Per dimostrare questo divario, anche n
davvero molto lontani.

Ford Is Being Sued Over Fuel Efficiency Claims

ALEX DAVIES
MAR. 1, 2013, 2:12 PM | 2,717

FACEBOOK LINKEDIN

Two similar lawsuits against Ford over an allegedly "false and misleading" marketing campaign, which promised excellent fuel economy in the automaker's C-Max Hybrid and Fusion Hybrid cars, have been consolidated in California.

Hyundai, Kia fuel-efficiency class-action settlements total $70M

Deal offers lump sum payments and other options to current and former owners and lessees

The Canadian Press Posted: Jan 27, 2014 9:42 PM ET | Last Updated: Jan 27, 2014 9:42 PM ET

Hyundai Auto Canada Corp. and its affiliate, Kia Canada Inc., have reached settlements with combined valued of almost $70 million in class action suits involving the fuel economy ratings of some of their vehicles. (Kim Hong-Ji/Reuters)

125 shares
Facebook
Twitter
Reddit
Google

Hyundai Auto Canada Corp. and its affiliate, Kia Canada Inc., have reached settlements with combined valued of almost $70 million in class action suits involving the fuel economy ratings of some of their vehicles.

The deal offers lump sum payments and other options to current and former owners and lessees of some 130,000 model year 2011 to 2013 Hyundai vehicles and some 41,000 Kia vehicles from the same model years.

The value of the Hyundai settlement is up to $46.65 million, while the Kia deal is worth up to $23 million, the companies said.

Stay Connected with CBC News

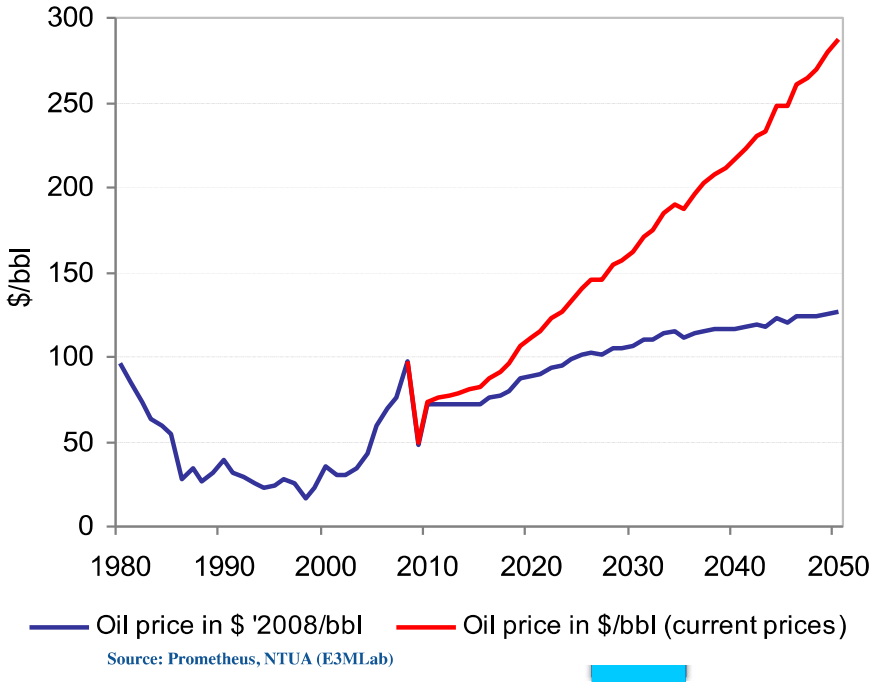
Mobile Facebook Podcasts Twitter Alerts Newsletter

Top News Headlines

'Our lives are shattered,' court hears in Justin Bourque hearing

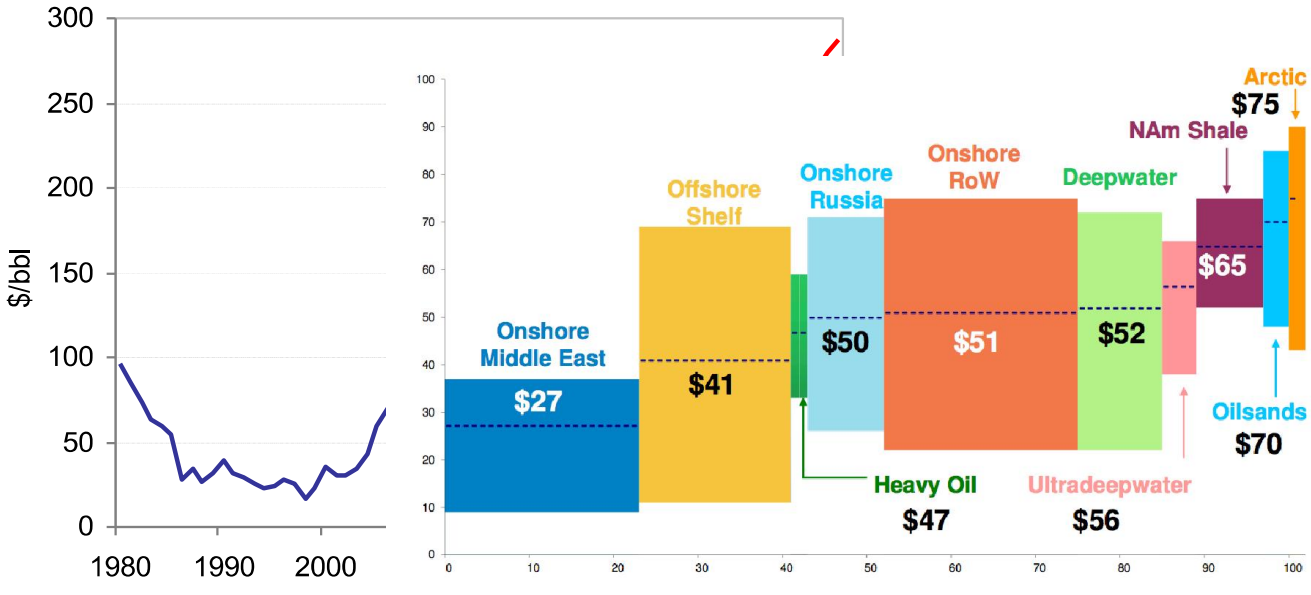
- RCMP commissioner, CSIS official testify at Senate committee
- PSA test should be dropped as screen for prostate cancer, review says

Even if currently low, oil might get ever higher prices, if we get it...



Source: Prometheus, NTUA (E3MLab)

Even if currently low, oil might get ever higher prices, if we get it... or dirtier and dirtier



Source: IEA, Morgan Stanley et al

Source: Prometheus, NTUA (E3MLab)

What about competitveness?

EU manufacturer in leading positions by type and number of models

Developing product lines and not just single models

Expanding in China

But:

Disappointing sales?

Compare with hybrids (they were an easier sell)

Conditions important (Norway)

Customers are not used to this type of vehicle and need education and reassurance, information MUST be correct or the whole concept might be killed after the hype

IT'S AGAIN ALL ABOUT

REALITY!

Why reality counts for Evs?

- Real life performance is even more important for Evs due to:

- **Range in real driving conditions**
- **Auxiliaries energy consumption**
- **Impact on battery life**
- **Real charging times (time/100km)**
- **Temperature effects**

All these effects reduce vehicle performance and attractiveness

- Some EVs give the impression of a normal vehicle: they're not

- Same «flexibilities» as for ICEs testing probably used on Evs to increase advertised range -> wrong message

- A conventional car might have range discrepancies, but it's enough to fill her up

Why reality for electrified vehicles?

- First hand experience might be disturbing (France TV report)

- **Wrong information on charging point**
- **Some were not working or open to public**
- **Car put on a truck – ON NATIONAL TV!**

- Technology must improve:

- **From derivative to clean sheet of paper**
- **Better energy density for batteries**
- **Cheaper components (but economy of scale an important driver)**

- Give alternatives to customers to fit needs:

- **Battery sizes -> ranges TESLA**
- **Pure HEV, EV – PHEV – REV versions of same vehicles BMW, TOYOTA**
- **Mobility solutions BMW, FIAT, PSA**
- **Real fast charging in emergencies, not baseline case**

- PHEV/EREV an important bridging technology

- Pure Evs best for (sub)urban use

Reality on environmental effects too

Contraddicting information about:

- **LCA of the battery**
- **Battery durability (how many batteries per car life?)**
- **LCA of the whole vehicle (emissions in production phase)**
- **CO2 emissions per km with different electricity generation sources**
- **Polluting emissions per km with different electricity generation sources (in any case no local pollution)**

Reliable data are needed to feed public debate and guide policies in the different member states

WHAT ABOUT

EU RESEARCH?

European Green Cars Initiative PPP

Industrial Advisory Group

ERTRAC

EPoSS
European Technology Platform on Smart Systems Integration

SMARTGRIDS

EIRAC
European Intermodal Research Advisory Council

Members (also representing ETPs ERTRAC, EPoSS, SmartGrids, EIRAC):

AVL – Bosch – Continental – ECT – FEV - Fiat Research Center – Iberdrola – IFP - KU Leuven - Procter & Gamble – PTV – Renault – Ricardo – Schachinger – Siemens – Valeo - VDI/VDE-IT – Volkswagen – Volvo

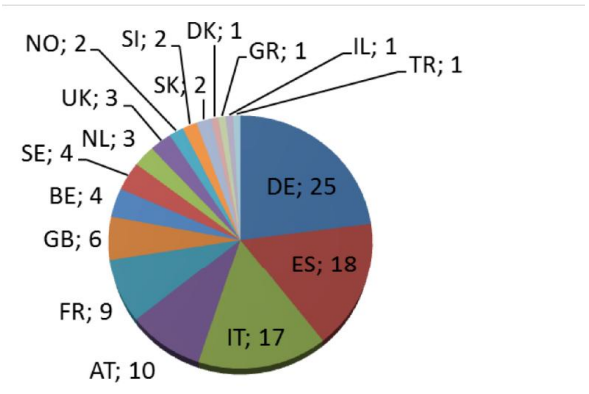
+

DG RTD - DG INFSO/CONNECT - DG MOVE - DG ENVI - DG ENTR - EIB

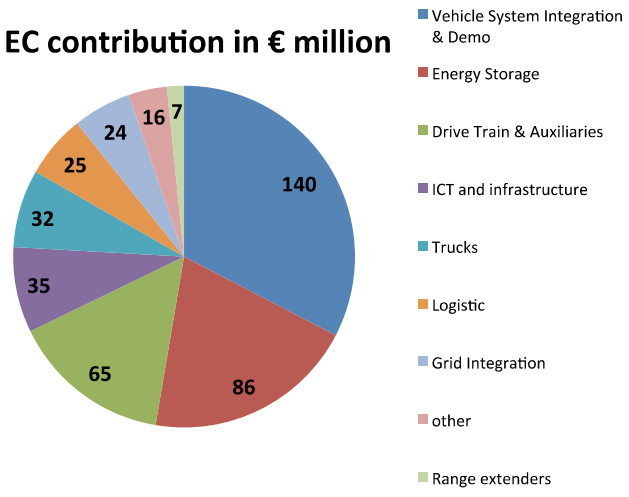
Research and Innovation

European Green Cars Initiative PPP

115 projects, of which around 95 on electrification
Almost complete coverage of the EGCI roadmap

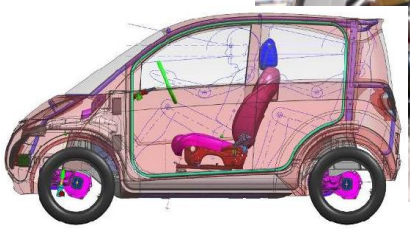


Member State participation



Research and Innovation

WIDE-MOB



Mission:

Building blocks concepts for efficient and safe multiuse urban electrical vehicles

Focus:

- Development of state-of-the-art building blocks critical systems
- Demonstrate and validate the integration of the developed systems into a next generation low weight and safe Electrical Vehicles for urban mobility

Coordinator: Fiat Research Center
Total budget: 3,9M€
EC contribution: 2,6M€
Start date: 1/12/2010
Duration: 36 months

Research Topics and results:

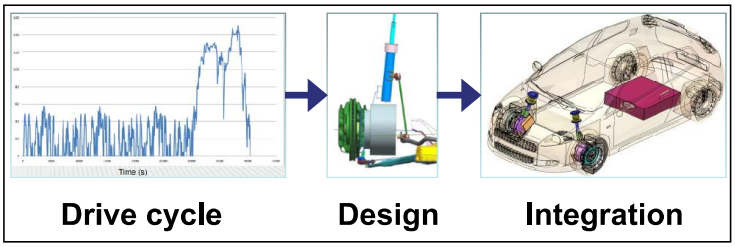
- Exceptional crashworthy performance for such small vehicle demonstrated
- Embedded solar panels distributed on both horizontal and vertical surfaces with adaptive electronics ensuring ~20 km/d free
- Modular and reconfigurable design addressing the WIDEst needs with ergonomic on board space
- Distributed fail safe propulsion (before Tesla) with largely similar powered axles

http://eeepro.shef.ac.uk/wide-mob/index.html

EUNICE

Mission:

Eco-design and Validation of a new generation of motor in-Wheel Concept for Electric Vehicles



Focus:

- New "motor in wheel" solution for "B segment" electric vehicles
- Robustness and safety, with high power density for equivalent ICE performance (52kW continuous operation, 100kW peak)
- Compatible with existing platforms with minimum changes

Coordinator: Tecnalia
Total budget: 4,8M€
EC contribution: 2,9M€
Start date: 1/9/2012
Duration: 36 months

Research Topics and results:

- Functional requirement definition:
  - Interfaces between partners being defined
  - Torque- Speed characteristic for high performance & drivability
  - Definition of vehicle dynamics targets
- Integration on a McPherson suspension type:
  - Research in highly integrated topologies
  - Thermo mechanical constraints definition
- First feasibility milestone successfully passed

http://www.eunice-project.eu/

HiWi

Mission:

"Next Generation High Efficiency Motors and Power Trains"

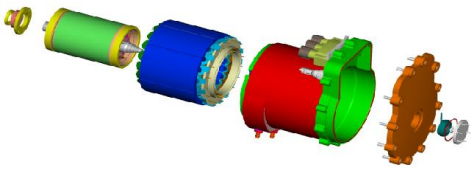
Focus:

- Innovative Technologies for Integrated FEV/HEV platforms
- Innovative magnetic machine technologies
- Safety first adaptive electronic controllers
- New standards and guidelines for uptake of FEV/HEV

Coordinator: University of Cambridge
Total costs: ± 3.5m€
EC contribution: 2.4m€
Start date: 1/12/2010
Duration: 36 months

Research Topics:

- Novel Magnetic Materials
  - Nanoscale modelling & simulation
  - New nano-macro production methods
  - Excellent results, better magnetic performance with just 10% of Dy
- Innovative Motor Designs
  - New topologies for high efficiency
  - New controller systems and technology
  - Multi-physics modelling and simulation
- Power Controllers
  - Fault-tolerant adaptive electronic controllers
  - Efficient bidirectional power coupling between the drive and accumulator pack

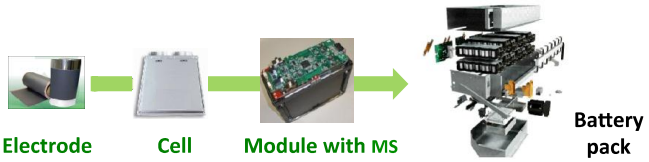


GREENLION

http://www.greenlionproject.eu

Mission:

Manufacturing processes for greener and cheaper Li-Ion batteries (electrodes, cells & modules)



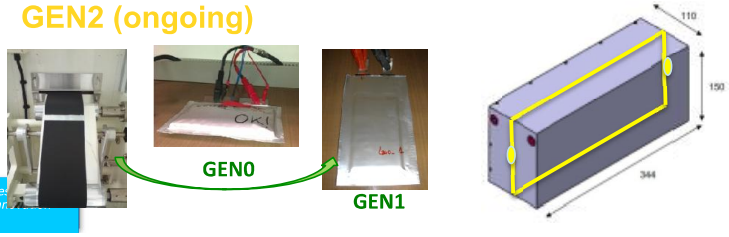
Focus:

- More environmentally friendly production of battery components
- Substantial shortening of the battery assembly procedures: automated module assembly
- Easier and more effective disassembly and end-of-life recycling

Coordinator: IK4-CIDETEC
Total costs: 8,6M€
EC contribution: 5,6M€
Start date: 1/11/2011
Duration: 48 months

Research Topics and results:

- Aqueous processing of ELECTRODES using natural binders
  - 0.5 m^2 Graphite & NMC with CMC
- CELL assembly
  - GEN0 (C/LFP) and GEN1 (C/NMC; 1.5Ah)
  - GEN2 power cell design
- Lighter MODULE design for automated assembly & easier disassembly coupled to GEN2 (ongoing)



SMARTOP

Mission:

to develop an autonomous smart roof for EVs integrating solar cells, storage systems and auxiliaries such as thermoelectric climatic control, electrochromic glazing, and courtesy LED lighting to increase comfort and fuel economy

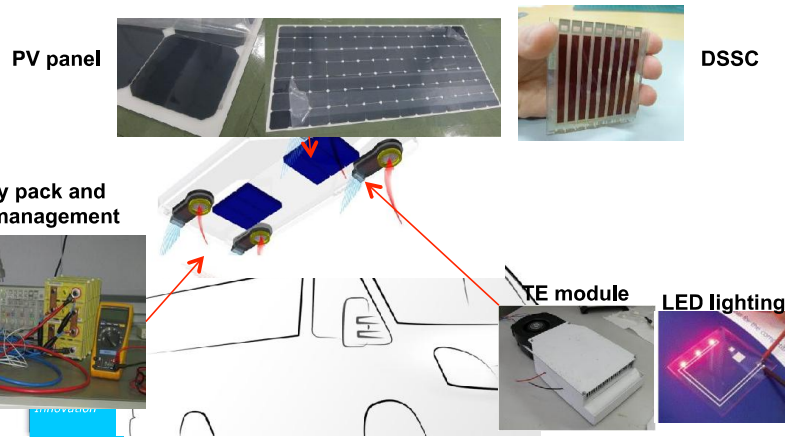
Focus:

- New flexible lightweight solar panels (DSSC, back contact c-Si)
- Peltier modules based on high efficiency thermoelectric materials
- Smart integration of Li-batteries, EC glasses, LED lights and electronic management

Coordinator: Fiat Research Center
Total costs: 3,9M€
EC contribution: 2,6M€
Start date: 1/12/2010
Duration: 36 months

Research Topics and results:

- Design of a modular roof component with energy generation and storage up to 1200 Wh per day
- Development of innovative and high performances sub-systems for power management
- Development of low cost, compact, low power consumption and robust electrified comfort auxiliaries



ENLIGHT

www.seam-cluster.eu & www.project-enlight.eu

Mission:

Development of highly innovative lightweight material technologies for structural parts of electric vehicles

Focus:

- highly innovative lightweight / low embedded CO_2 materials such as thermoplastics or bio-based materials,
- Manufacturing and joining capabilities for affordable medium-volume lightweight EVs.
- Design capabilities for affordable medium-volume lightweight EVs

Coordinator: Fraunhofer LBF
Total costs: 10,9M€
EC contribution: 7,1M€
Start date: 1/10/2012
Duration: 48 months

Research Topics and results:

- Conceptual lightweight design of defined modules of an advanced electric vehicle architecture with respect to weight and CO2 balance over life-time
- Development of highly advanced materials to a stage that they are applicable at least in medium volume production; considered are thermoplastic and fibre reinforced composites, advanced hybrid (Al/CFRP) and sandwich materials, bio-materials
- Manufacturing processes for these materials for medium-scale production

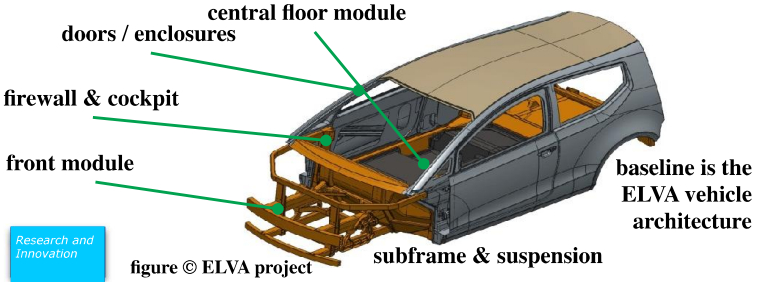


figure © ELVA project

European Commission

COnVENienT

Mission:

The project targets 30% reduction of fuel consumption in long-haul heavy-trucks, thanks to a suite of energy-saving technologies and solutions

Focus:

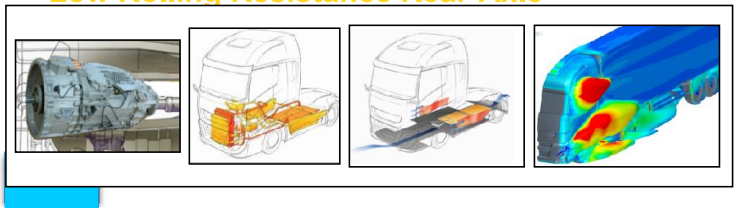
- Holistic approach to complete vehicle energy management, considering truck, semi-trailer, driver and mission as a whole.
- Demonstrate and validate sustainable fuel-saving technologies for heavy trucks.

http://www.convenient-project.eu

Coordinator: Centro Ricerche Fiat
Total costs: 16.6 M€
EC contribution: 9.9 M€
Start date: November 2012
Duration: 36 Months

Research Topics and results:

- Electric Hybrid transmission integration study
- Electrified auxiliaries development
- Dual level cooling system and Flat Heat Exchangers
- Active and passive aerodynamics devices for truck-semitrailer combination
- Holistic Energy Management at vehicle level
- Low Rolling Resistance Rear-Axle



European Commission

Mission:

The smallest, lightest, best foldable bike in the world, electric

Focus:

- Creating truly intermodal bike for last mile transport.
- Lightweight (7.5 kg) and easy to use, standard ergonomics while at diminutive size
- Conventional and pedelec version, retrofittable technology

Coordinator: Tecnologie urbane
EC contribution: 1.58 M€
Start date: November 2010
Duration: 42 Months

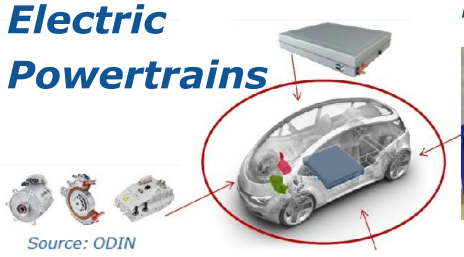
Research Topics and results:

Research and Innovation

http://www.bike-intermodal.eu/

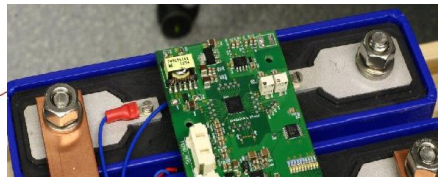
Over 30 EGCI projects @ DG CONNECT (+ 4 CIP projects)

Electric Powertrains



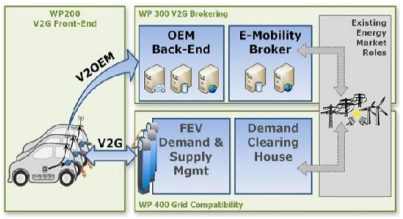
Source: ODIN

Battery Management



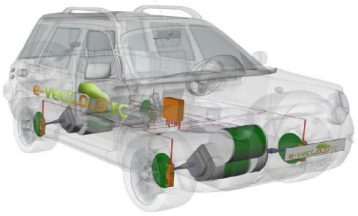
Source: ESTRELIA

Vehicle-to-Grid



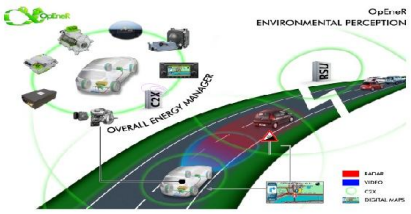
Source: e-DASH

Vehicle Dynamics



Source: E-VECTOORC

E/E Architectures



Source: OpEneR

Coordination & Support

SMART EV·VC

Source: Smart EV-VC

Research and Innovation

WHAT ABOUT

HYDROGEN?

Research and Innovation

Main achievements of FCH 1 JU

- **Transport:**
  - Demonstration of 49 buses, 37 passenger cars, 95 small vehicles
  - Bus H2 consumption halved compared to existing FC buses
  - 13 new refuelling stations in EU
  - H2 cost <10€/kg
- **Stationary Energy Production:**
  - 1000 domestic Combined Heat & Power (CHP) generators being installed
  - Cost -50%, efficiency 90%, lifetime up to 8 years *(current units: 70% efficiency, 3 years life span)*
- **Early markets:**
  - 9 fork lifts, 1 tow truck demonstrated
  - 19 back up power units installed

FCH JU portfolio of 127 projects

TRANSPORTATION & REFUELLING INFRASTRUCTURE	25 projects 8 demo 14 research 3 CSA	
HYDROGEN PRODUCTION & DISTRIBUTION	28 projects 4 demo 24 research	
STATIONARY POWER GENERATION & CHP	36 projects 9 demo 26 research 1 CSA	
EARLY MARKETS	21 project 13 demo 8 research	
CROSS-CUTTING	17 project	RCS, Safety, Education, PNR, …

Transport: CHIC: Clean Hydrogen in European Cities

European Commission

CHIC

26 Buses in 5 cities,

50% reduction of fuel consumption

- Operation of 26 fuel cell buses in 5 citi… Europe (Aargau, Bolzano, London, Milano, Oslo) and the respective infrastructure for a period of 5 years
- Transfer of learning from cities with experience in operating buses and infrastructure (Hamburg, Berlin, Cologne, Whistler; ~ 30 fuel cell buses) to the 5 cities
- Assessment of the technology with focus on environment, economy and society
- Dissemination to the general public and to cities preparing for the technology in the next step
- 2 filling stations per city
- Demonstration phase 2010-2016
- Cost 82 M€, 26 M€ funding
- http://chic-project.eu/

Research and Innovation

Hydrogen production: NEXPEL

European Commission

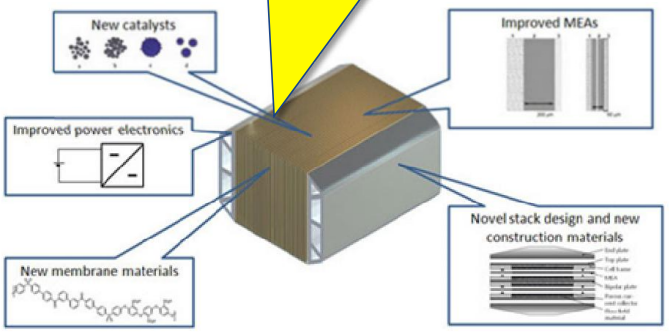
Electrolyser membrane
Target:
75% efficiency, life span of 40000 h

Next-Generation PEM Electrolyser For Sustainable Hydrogen Production

Construction and demo of an efficient PEM electrolyser integrated with Renewable Energy Sources (RES)
Goals: improvement of components, reduce cost and improve stability.

Advanced stack design using components suitable for mass production and highly efficient power electronics.

http://www.sintef.no/Projectweb/nexpel/



fumatech
Fraunhofer ISE
CEA
HELION HYDROGEN POWER
Statoil
SINTEF

Research and Innovation

WHAT ABOUT THE FUTURE?

Research and Innovation

EU Research and innovation is investing in the future of sustainable transport

Horizon 2020 will fund heavily clean automotive propulsion

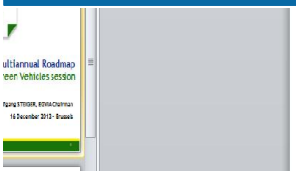
Transport calls will support cleaning conventional engines in real life

From EGCI to EGVI, to support electrification and alternative fuels technology

*Focus on **application**, growth and jobs*

Research and Innovation

European Commission



EGVI Roadmap

	2-Wheelers	Passenger Cars & LDV	Trucks	Buses
Resources	• Alternative / lightweight materials • Alternative fuels and energies • Advanced materials, Equipment, Nano- / Microtechnologies			
Integration	• Advancement and adaption of resources for green vehicles			
Modules	• Processing, integrating advanced (lightweight) materials & technologies • Electrification & hybridization; Components for sensing & control; • Energy Storage, functional integration; design for manufacturing • Power electronics			
Systems	• Drivetrain for alternative / renewable fuels; • Reliability and robustness • Advanced ICE and ICE in context of electrification & hybridization • PT systems design, optimization, modularization and integration			
Vehicles	• PT integration, E/E architecture, thermal management, weight reduction • Simulation, prototyping, testing, recycling • Safety & security of data • Novel vehicle concepts; tailored trucks			
Integration	• Interfaces and interaction to infrastructure outside vehicles, e.g. smart grid integration, IST for energy efficiency			
Infrastructure	• Grid and road infrastructures • Data networks • Intermodal hubs			

Research and Innovation

European Commission

2014 CALL 'GREEN VEHICLES'

- ***Huge success, 79 proposals in total***
- ***Recently completed evaluation***
- ***Results in next months after procedure and beneficiary validation completed***
- **Electrified vehicle-related topics and proposals:**

- GV.1-2014 Next generation of competitive Li-ion batteries – 10
- GV.2-2014 Optimised & systematic energy management in EV – 14
- GV.4-2014 Hybrid light & heavy duty vehicles – 7
- GV.5-2014 Electric two-wheelers & new light vehicle concepts - 40

Research and Innovation

EGVI PPP in Work Programme 2015

GV6: Powertrain control for heavy-duty vehicles with optimised emissions ***RTD***

GV.8: Electric vehicles' enhanced performance and integration into the transport system and the grid ***CNECT***

Topic GV.8-2015

Major challenges:

- **Limited driving range – biggest deployment challenge; redesign of E&E architecture and components to achieve:**
  - ***increased efficiency and range***
  - ***transition to FEV***
- **BMS is fundamental for electrified vehicle performance, energy efficiency & range, safety, battery life & reliability.**
- **ICT is providing:**
  - ***better range prediction & offering personalised options & services to the driver***
  - ***supporting recharging or high-powered fast recharging coordinated with the local electric grid***

Topic GV.8-2015

Proposals should address one of the following domains, and could include interfaces between them:

• EV concepts featuring a complete revision of the E&E architecture to reduce complexity, the number of components & interconnections, while improving energy efficiency, functionality & modularity

- ***May be supported by drive-by-wire, wireless communication, advanced energy storage***
- ***Should address safety, security, reliability & robustness, including EM compatibility***
- ***Should pursue a high degree of standardisation, covering the entire EV value chain***

Topic GV.8-2015

Proposals should address one of the following domains, and could include interfaces between them:

• BMS research focused on a combination of:

- ***Novel BMS designs with improved thermal management, power density and life time, safety & reliability***
- ***Improved modelling & simulation tools for BMS improvement***
- ***Standardisation of BMS components & interfaces***
- ***Test methodologies & procedures to evaluate the functional safety, reliability & lifetime of battery systems***

Topic GV.8-2015

Proposals should address one of the following domains, and could include interfaces between them:

• Integration of the overall cycle of EV energy mgt into a comprehensive EV battery & ICT-based re-charging system mgt

- ***Digital support for EVs***
  - ***service provision based on wireless / power line communication interfaces; roaming management, energy consumption & supply; cost aspects***

- ***Interoperability of EVs with the communication infrastructure and electricity grid***
  - ***regarding locally deployed smart-grid & smart-metering systems; investigating operational issues***

Topic GV.8-2015

Expected impact:

- ***Improvements in the cost-performance ratio of EV***
- ***Enhancements to vehicle range and/or weight, battery life and reliability without compromising on safety***
- ***Standardised BMS components and interfaces***
- ***Progress on ICT-based technologies for coordinated EV recharging.***
- ***Improved attractiveness of EVs, achieved through seamless energy management (spanning the entire cycle from re-charging spot selection/reservation to plug-out after re-charging).***
- ***Contributions to standardisation, strengthening competiveness of the EU industry***

Funding schemes: Research and Innovation Actions
Budget: Call closing 15-10-2015 , 20M€

RTD: maurizio.maggiore@ec.europa.eu
CONNECT: stefanos.gouvras@ec.europa.eu

More information:

HORIZON 2020:
http://ec.europa.eu/research/participants/portal/desktop/en/home.html

Contractual Public-Private Partnerships in research and innovation:
http://ec.europa.eu/research/industrial_technologies/ppp-in-research_en.html