Competitiveness & Innovation in the EU Automotive Industry

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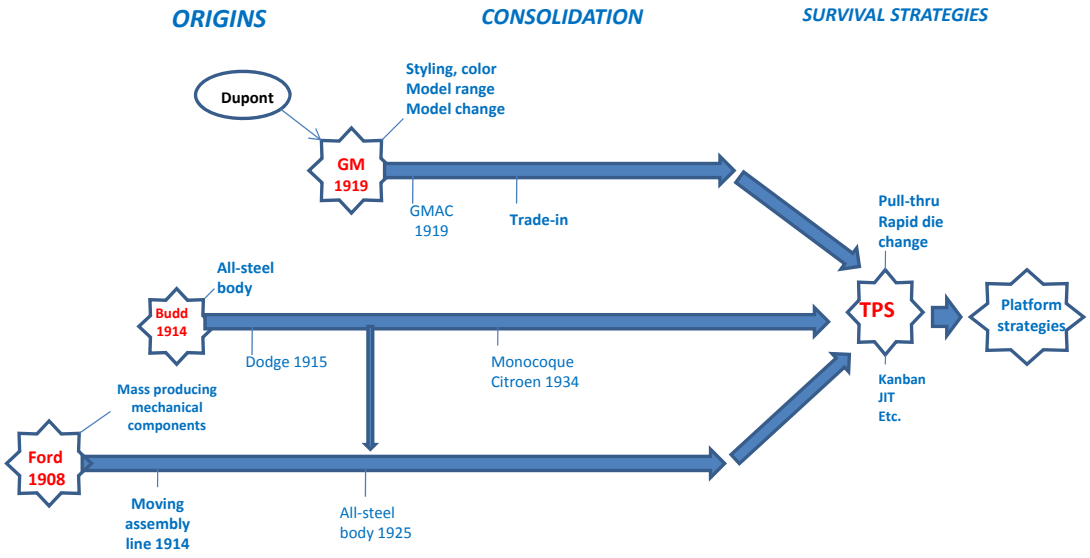
THE INDUSTRY TODAY – A US MODEL?

Key elements of mass car production



Ford v Budd:
technology in a modern 'assembly' plant

(source: Nieuwenhuis & Wells 2007) :

Process	Origin	Typical cost (Budd)	Typical cost (Ford)
Press shop	Budd	£200million	
Die sets/model	Budd	£40-130million	
Body-in-white	Budd	£100-200million	
Paint plant	Budd	£400-600million	
Preassembly	Ford		£20-100million
Trim/final assy	Ford		£20-100million
Engines	Ford		£500mn/plant
Totals		£740-1130mn	£540-700mn

WILL NEW TECHNOLOGIES UNDERMINE THIS MODEL? – EV?

Products are now available

Electrification of the car – timescale?

e.g.: powertrain developments

1900	1910	1920	1960	1980	1990	2000	2010	2020	2030
magneto	→								
	Battery & coil	→							
	Self starter		Electronic fuel injection	→					
				Electronic ignition	→				
					Engine management	→			
						Hybrid electric	→		
							Plug-in hybrid	→	
								FCV?	→
BEV	→								

EVs are still an incentive-driven market: e.g. Norway

Norway has around 15 years experience of private electric vehicle use.

Like all EV markets, this is incentive-driven.

EV Incentives in Oslo:

Free entry to city
Use of bus lanes
Free parking
Free charging
No sales tax
No road tax

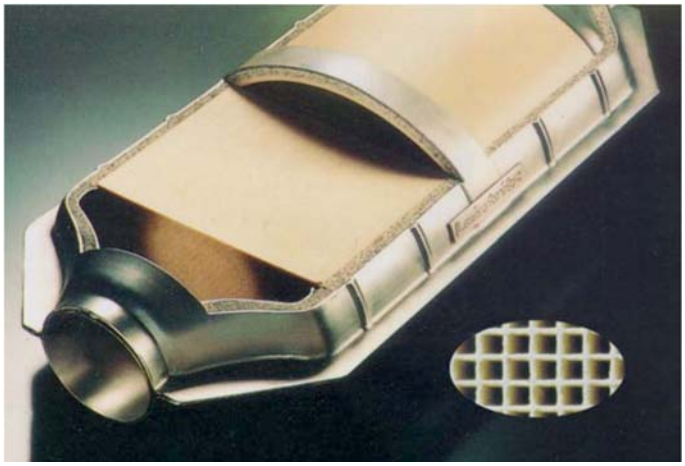
Government policy can lead to innovation

new technologies draw new suppliers into the supply chain.

e.g. Johnson Matthey

History in banking and commodities (precious metals)

Now one of the largest suppliers of catalytic converters:



(picture courtesy of Johnson Matthey plc)

e.g. EU leading role in carbon reduction

EU legislation leads the world

v

Forces EU car industry to develop new technologies

v

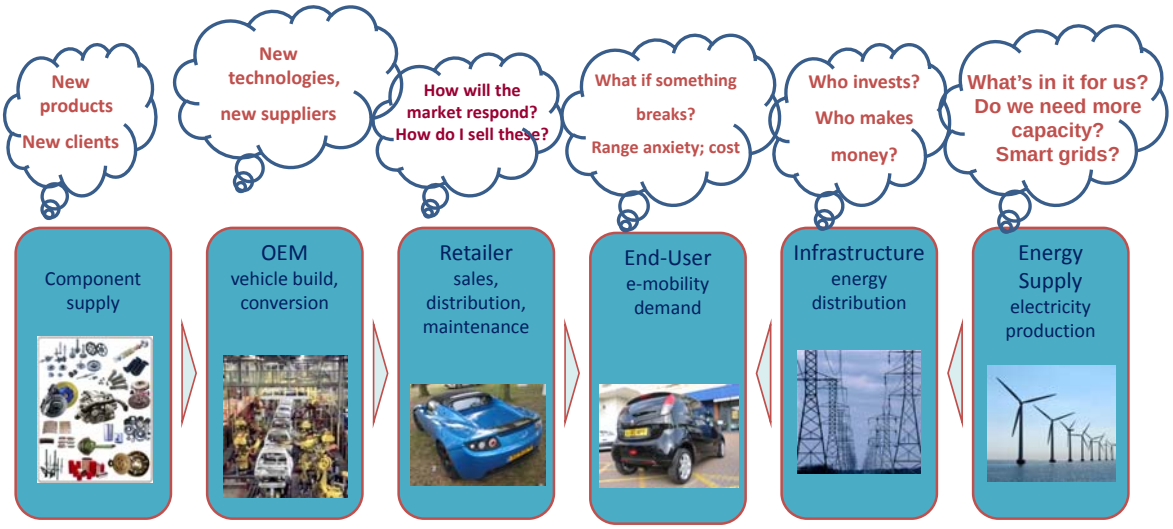
EU legislation is adopted by other jurisdictions

(even the US is now considering adopting EU standards, under pressure from Ford)

v

Whose car makers are then forced to use EU technology solutions

BUT THERE IS INERTIA IN THE VALUE CHAIN…OFTEN BECAUSE OF PERCEIVED RISKS



Risks are perceived differently at all stages along the emerging EV value chain

Media and regulators are impatient

Why are we not all driving EVs yet?

But, How long does it normally take for new technologies to appear in mainstream cars?

1914 GP de l'ACF

Some specifications were very advanced:

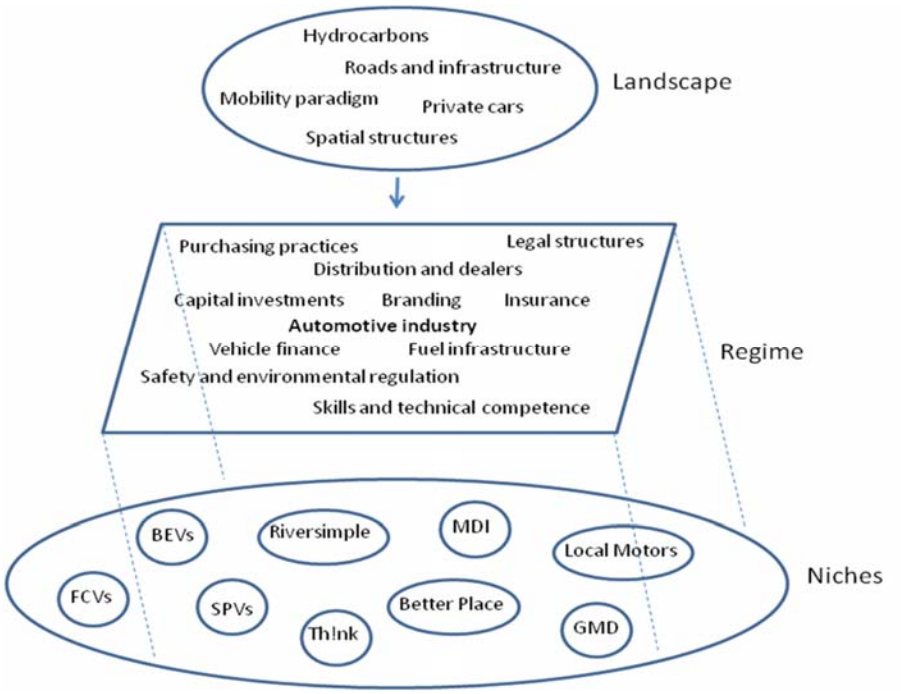
MAKE	Valve gear	Valves / cyl.	gears	Brakes	Results
Mercedes	DOHC	4	4	2	1,2,3
Peugeot	DOHC	4	4	4	4,7
Sunbeam	DOHC	4	4	2	5
Nagant	DOHC	2	5	2	6
Fiat	DOHC	3	4	4	11

1914 GP to Production: 10-70 years!

Yrs to mainstream	Technology
10	4 wheel brakes
40-60	Double overhead camshaft
70	Multi-valve heads
70	5 speed gearbox

NOT JUST TECHNOLOGIES – SOCIAL, REGULATORY, PSYCHOLOGICAL FACTORS MUST ALSO CHANGE…

Socio-technical regime - automotive (Wells, Nieuwenhuis & Orsato, 2012):



NEW BUSINESS MODELS MAY BE NEEDED, BUT WHAT ACTIVITIES SHOULD THEY CAPTURE?...

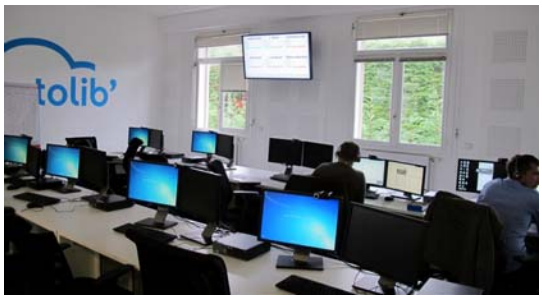
autolib

CASE STUDY

Autolib - Paris

Autolib

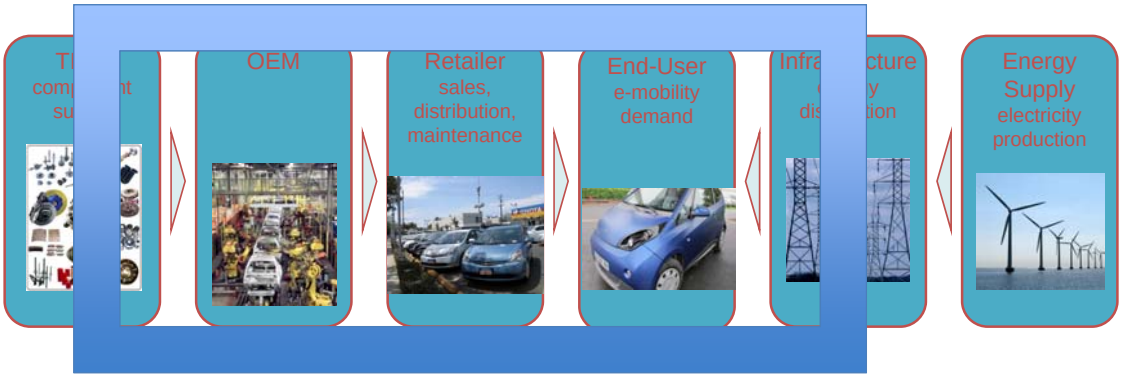
- Autolib is run by the Groupe Bolloré.
- Integrating battery technology, customer interface and project management.
- Unique design of car developed by CeComp and built by Pininfarina in Italy after mainstream car makers expressed no interest.



Autolib

- Bolloré makes chargers, card readers, and batteries.
- …and manages the call centre.
- Providing a 1-stop shop for the 47 communities in the Ile de France signed up to the scheme.
- When local authorities invest, Autolib pays for parking spaces.
- Scheme expected to break even in 2014 and return a profit from then onwards.
- 680 charging stations and 2000 cars by December 2012.

The Bolloré-Autolib Business Model

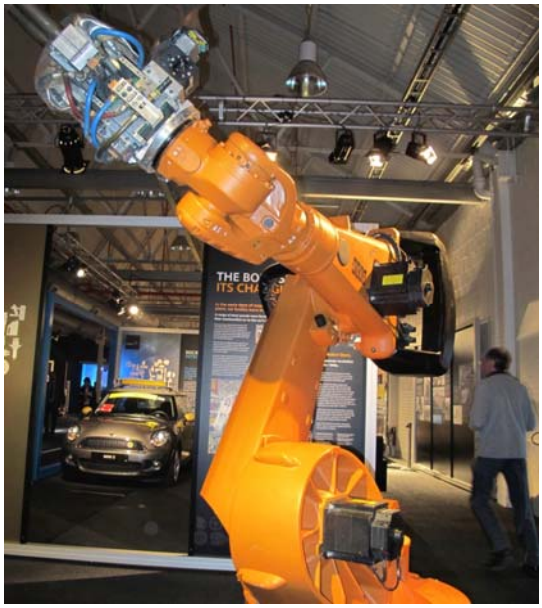


Bolloré captures a large part of the value chain

The inertia in the system is under-estimated

- Sunk investments in existing IC and steel body technology are considerable.
- But, the EU leads in low-carbon technologies both in powertrain and especially in alternative body/chassis structures
- Risk reduction is essential, hence:

Transition is initially on the margins; slow and small scale; e.g. a new sub-brand...



e.g. BMW i-series

Thank you – happy motoring…