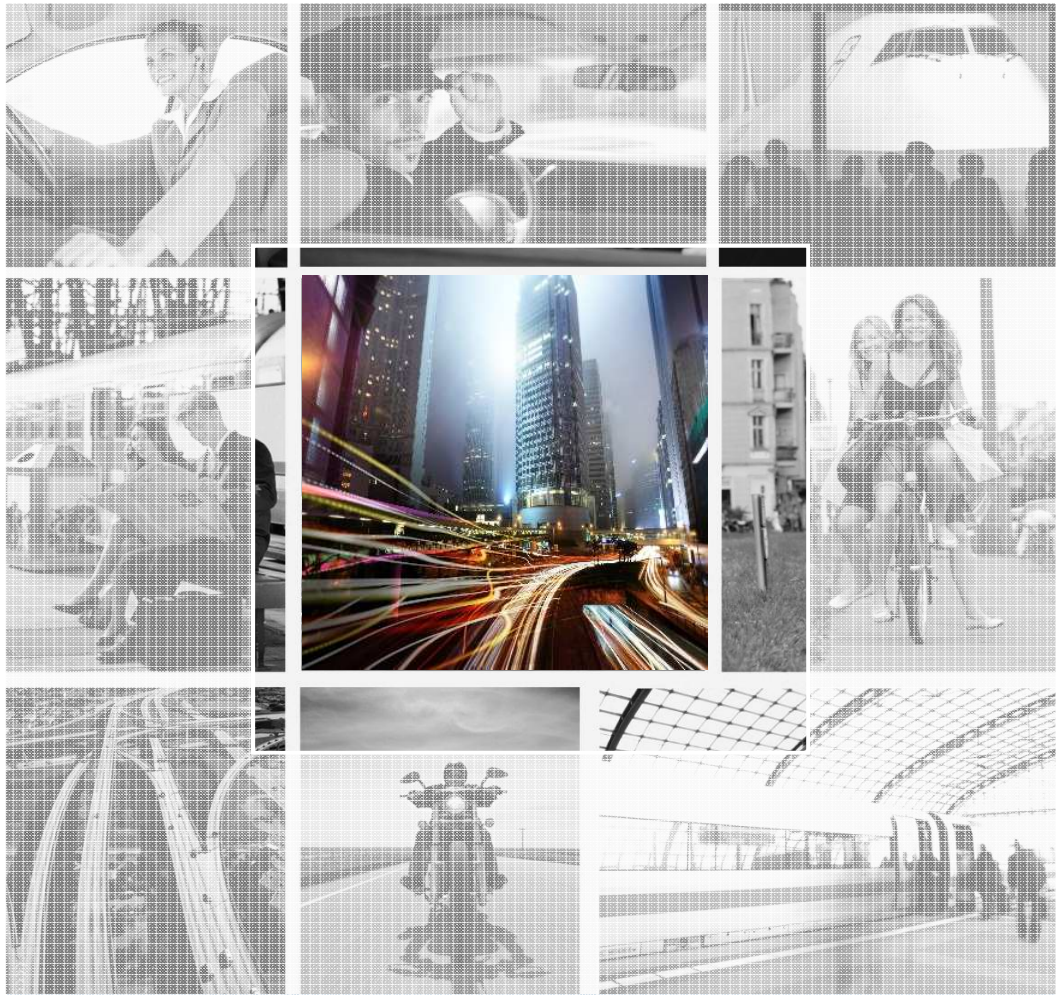
Arthur D Little

Global Automotive Mobility Study

An end customer perspective on shared cars, autonomous vehicles and electric cars

Excerpt of Arthur D. Little's Global Study

August 2015



Arthur D. Little has conducted a global study on the future automotive mobility trends

- Arthur D. Little is a thought leader on automotive and urban mobility trends.
- During our recent global automotive study, we have analyzed the impact of key automotive megatrends car sharing, autonomous driving and electric mobility
- For 10 countries, many thousands of end customers have been interviewed with statistical relevance for automotive core markets
- The study revealed customer requirements, concerns and desired solutions that go far beyond OEMs current product strategies and / or global or local political legislation activities
- The study supports an updated perspective on the global car sharing market, reveals the hidden acceptance and requirements of customers with regard to autonomous driving and sheds a completely new light on the current hype of electrical mobility

Source: Arthur D. Little

Preview: quotes and initial highlights of study results

Owning a car will become more important again!

Only a minority of drivers would be willing to get rid of their own car – even if today's car sharing services got more convenient.

Customers are undecided: only one third already accepts autonomous driving!

Only one third of customers consider the car brand important when it comes to car sharing – a major challenge for OEMs!

Data security of autonomous driving: concerns of the Europeans are shared and strongly shared also the U.S. citizens!

For customers, the clean, shared and autonomous car will be a preferred mobility solution.

Car sharing market will become disrupted soon!

Apple and Google have never delivered any car to the public – but globally, end customers trust them more to deliver autonomous driving than any OEM!

Source: Arthur D. Little

Contents: sneak a peak in Arthur D. Littles actual automotive mobility study

Source: Arthur D. Little

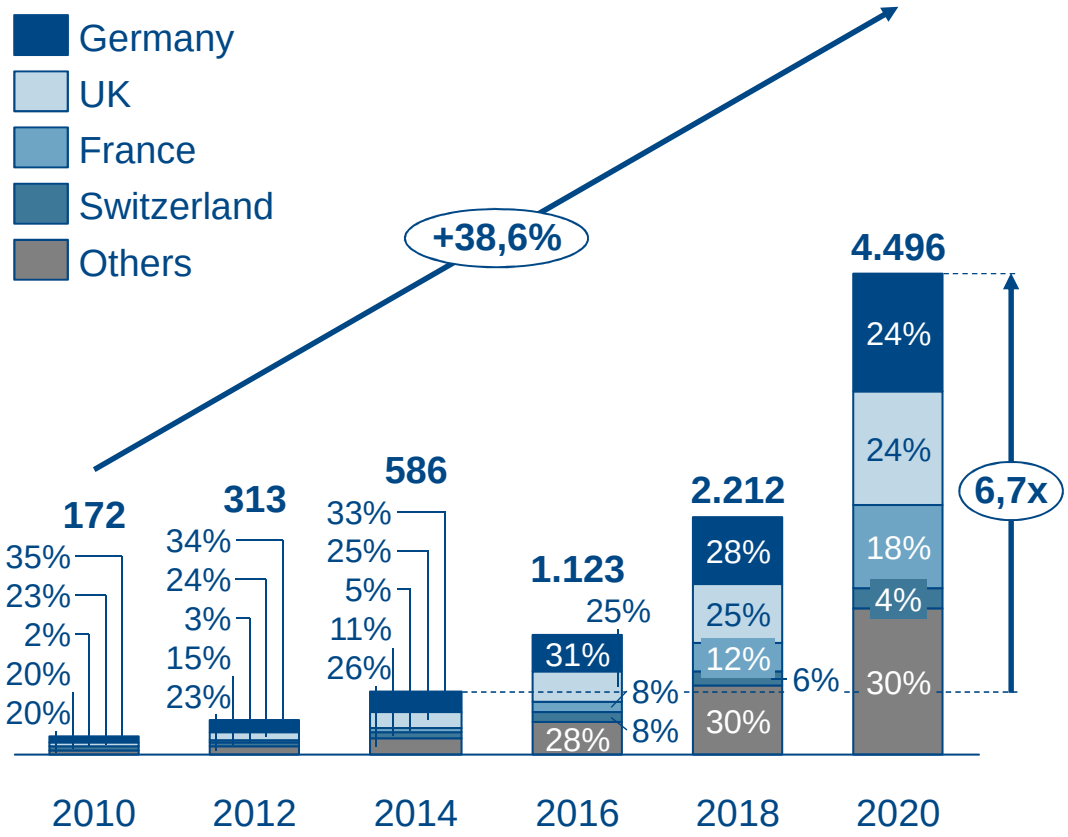
Development pf car sharing will be fast but remain a small market – until the market takes the next evolution: Peer-to-peer car business models will disrupt the current car sharing market

- Changing demand for mobility requires a paradigm shift in the way mobility is provided and utilized – especially in cities
- A number of drivers are positively influencing both supply and demand of car sharing solutions worldwide, leading to substantial growth forecasts
- The European car sharing grows fast (+38% p.a.), but it is small (586 m EUR in 2014)
- Until 2020, only 169.000 vehicles will be added to the Car Sharing fleet in Europe
- The globally decreasing wish to own a car for “prestige” reason should contribute to faster development of car share business...
- ...but independence, comfort and convenience remain key car owning criteria, thus the car sharing business will remain an “added mobility option” for a significant period of time
- The recent Arthur D. Little end customer study reveals that for a global minority of people worldwide, owning a car will become less important than it is today
- More than 50 percent of customers never use car sharing services in any form
- Besides a more attractive pricing, four additional measures need to be taken to increase the use of car sharing
- Less than one third of survey respondents considers the brand important when it comes to shared cars
- Medium-sized cars are the predominantly demanded vehicle type when it comes to car sharing, with the exception of Japan that prefer small cars
- If there was a car sharing option fulfilling customer requirements, close to 50 percent of respondents would replace rides with their own car through shared cars
- But even if there were “appropriate” car sharing and new mobility services, a minority of people would consider getting rid of their own car

Source: Arthur D. Little

The European car sharing grows fast (+38% p.a.), but it is small (586 m EUR in 2014)

European car sharing market – Revenues, 2010-2020 [m EUR]



CAGR

34%
39%
72%
18%
45%

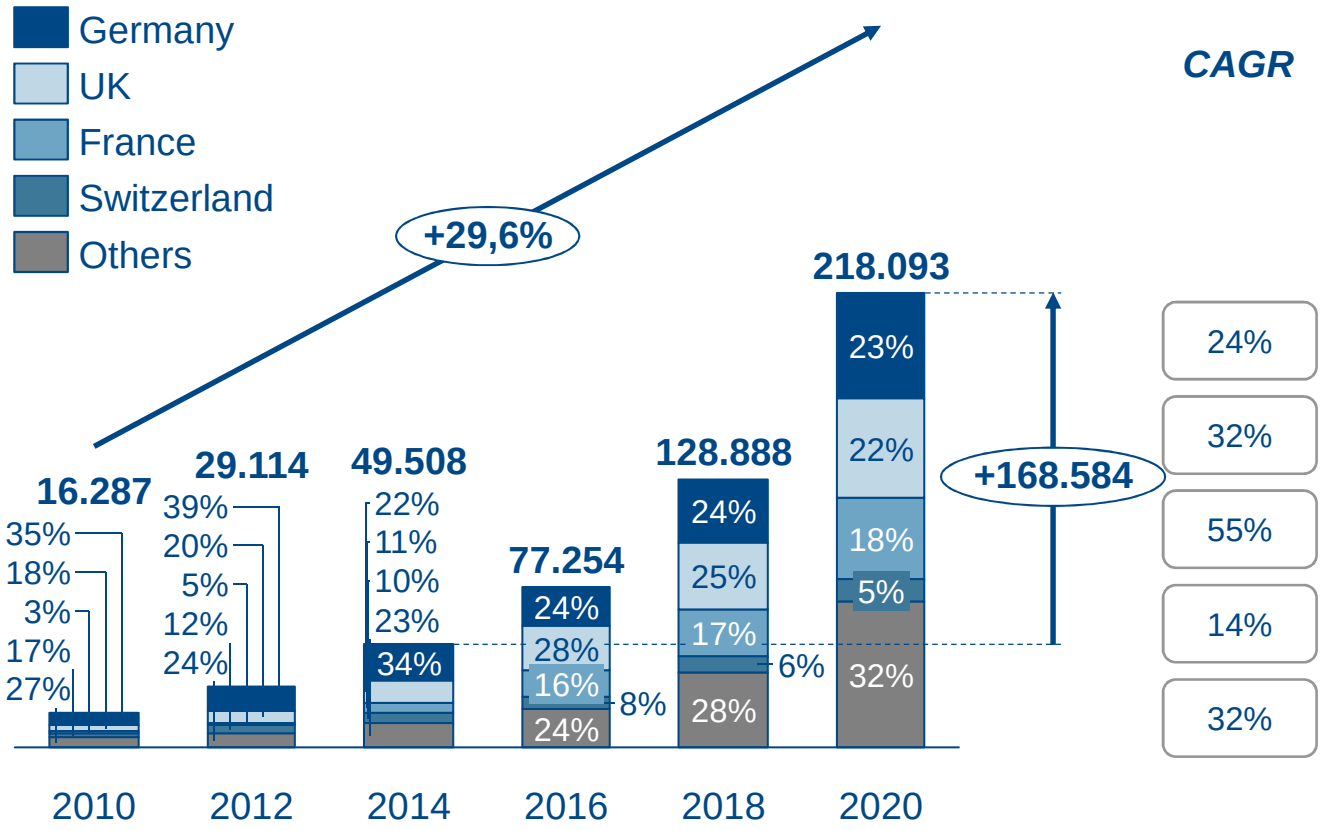
- Market volume in 2014: **586 m EUR**
- Market revenues **grow by ~39%** p.a.
- Until 2020 market volume is expected to reach **4,5 bn EUR**
- **France** is the **fastest growing** market
- **In 2020 56% of the market volume** will be concentrated **in Germany, France and UK**

Source: Frost & Sullivan, Arthur D. Little

"Auch wenn der Car Sharing Markt signifikant wächst – der Volumeneinfluss auf den Gesamtmarkt bleibt niedrig"

Until 2020, only 169.000 vehicles will be added to the Car Sharing fleet in Europe

European car sharing market – Number of vehicles, 2010-2020 [units]



- Vehicle base in Europe as of 2014: **~49.500 units**
- The number of vehicles **grows by ~30%** p.a.
- Until 2020 **169.000 units** to be added to CS fleet
- **France** is the market with the **fastest growing** vehicle base: **55% p.a.**
- **In 2020 63% off all CS vehicles** will be concentrated in 3 countries: **Germany, UK and France**

Source: Frost & Sullivan, Arthur D. Little

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Autonomous driving will be accepted by a majority of customers, increasing per-person usage of own vehicles. Other transportation modes will suffer. Apple and Google are a threat!

- In automotive core markets, the use of passenger cars and the sum of kilometers driven will increase when autonomous driving becomes available
- In almost all markets, one third of drivers shows a high acceptance to use autonomous vehicles, one third is undecided
- The difference in acceptance of fully or partly autonomous cars is marginal
- But many are concerned regarding the security of their personal data – an issue that needs to be solved...
- ...whereas safety of autonomous cars is less an issue. Still, up to 37 percent of customers are concerned about safety - a point that needs to be addressed clearly
- Autonomous driving will not be a feature for service providers – the functionality will be crucial to secure manufacturer's revenues into the private market
- Autonomous vehicles are a huge threat to public transportation modes for short distance travels
- In Germany the premium OEMs are clearly in front concerning respondent's trust in their ability to deliver autonomous vehicles
- But on a global scale only Apple and Google are trusted most with Ford being closest
- Autonomous driving in traffic jams is the most attractive use case of autonomous or partly autonomous vehicles, followed by highway driving and pick-up/send-away
- Car use profiles will change: the autonomous vehicle of the future will become a place of relaxation and communication – interior concepts will need to follow this development

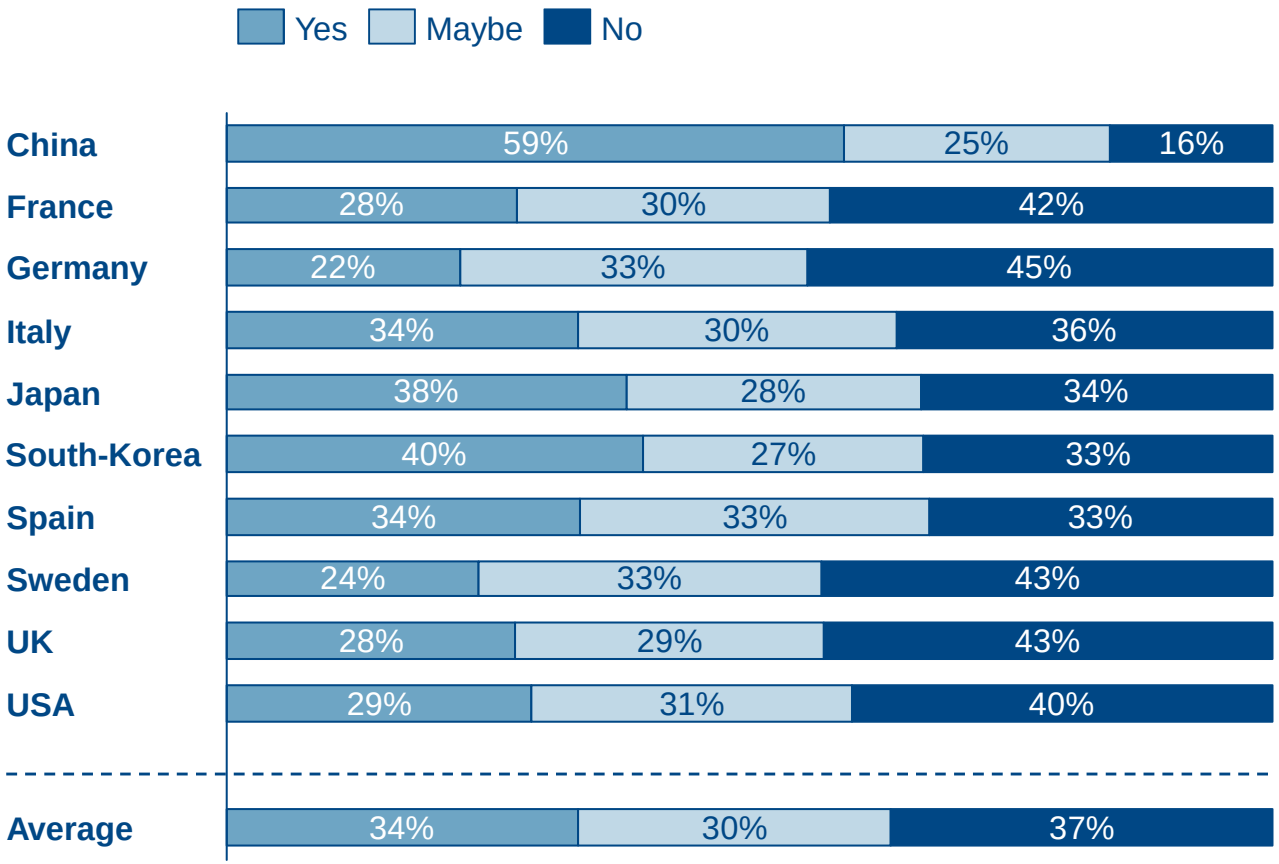
Source: Arthur D. Little

"Es wird eine große Herausforderung, zwei Drittel unentschiedene oder ablehnende Kunden vom autonomen Fahren zu überzeugen"

In almost all markets, one third of drivers shows a high acceptance to use autonomous vehicles, one third is undecided

Acceptance: fully autonomous cars

Question: Would you use cars that were fully autonomous?



Source: Arthur D. Little

Remarks

- Without having seen or tested any autonomous vehicle, between 20 and 60 percent of current car users clearly accepts autonomous driving
- Including the undecided, percentage range of people at least considering autonomous driving lies between 55 and 84 percent – a clear majority
- Still, up to 43 percent of drivers are hesitant to accept the new technology

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3 Electric vehicles from a customer perspective – Summary

The hype for electric vehicles does not have substance – the market will not accept them until key barriers are solved. Arthur D. Little can calculate the impact of potential measures

- Electric vehicles are currently not attractive for the vast majority of customers
- Price, limited operating reach and charging are the key reasons for customers not to purchase electric vehicles
- With the current price levels of electric cars, there is no chance to reach the ambitious targets of electric vehicle car parc in core markets (e.g. Germany: 1 Mio. vehicles until 2020)
- Example Germany: without massive inventions, the political target to bring 1 Mio. e-cars on the street until 2020 will not be reached – but appropriate measures can be calculated

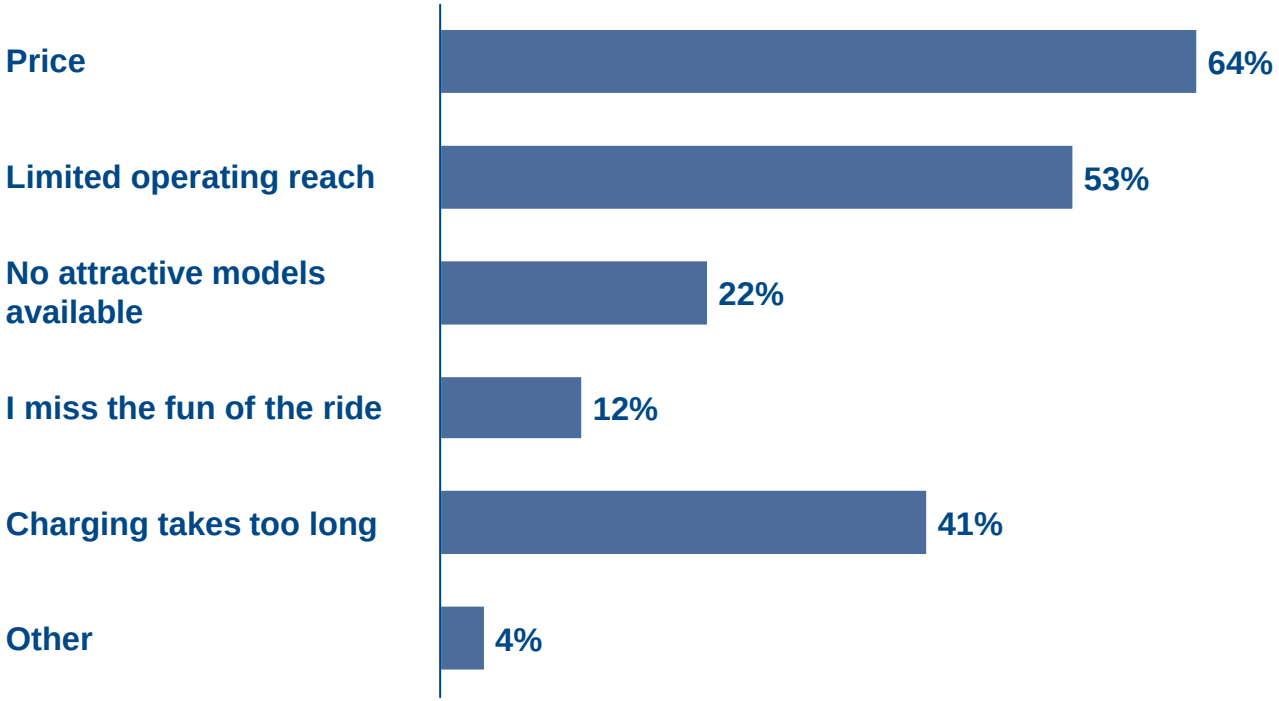
Source: Arthur D. Little

"Preis, limitierte Reichweite und ungenügende Lademöglichkeit sind die Kernbarrieren für den Durchbruch der elektrischen Mobilität - weltweit"

How attractive are electric vehicles for customers? Not very attractive!

Barriers for purchasing electric cars

Question: What are the factors that discourage you from purchasing an electric car?



Source: Arthur D. Little

Remarks

- Price, limited operating reach and charging are the key reasons for customers not to purchase electric vehicles
- Globally, respondents show varying importance of particular requirements – but they are the same everywhere

Arthur D. Little has been at the forefront of innovation since 1886. We are an acknowledged thought leader in linking strategy, innovation and transformation in technology-intensive and converging industries. We navigate our clients through changing business ecosystems to uncover new growth opportunities. We enable our clients in building innovation capabilities and transforming their organization.

Our consultants have strong practical industry experience combined with excellent knowledge of key trends and dynamics. Arthur D. Little is present in the most important business centers around the world. We are proud to serve most of the Fortune 1000 companies, in addition to other leading firms and public sector organizations.

For further information please visit www.adlittle.com

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