

Copyright Jeongche Yoon

Automotive landscape 2025: Opportunities and challenges ahead

Budapest, 2011 June 9th



Roland Berger
Strategy Consultants



Amrop



Roland Berger
Strategy Consultants

A. Introduction

Roland Berger
Strategy Consultants



Amrop

Your speakers today – Roland Berger



**ROLAND
ZSILINIZSKY,
MBA**

Principal
Roland Berger, Prague

Tel.: +420 210 219 524

Fax: +420 210 219 510

roland_zsilinszky@cz.rolandberger.com

-
- > 4+ years of consulting experience
 - > Coordination of Automotive CC activities in the CEE region
 - > E-mobility development in the Czech Republic
 - > Foreign market entry and growth strategy development projects
 - > Organizations' performance improvement projects
 - > 10 + years of industry experience



**FRIGYES
SCHANNEN**

Managing Director
Roland Berger, Budapest

Tel.: +36 1 3017070

Fax: +36 1 3532434

frigyes_schannen@hu.rolandberger.com

-
- > 10+ years of consulting experience
 - > Regional strategies and market development
 - > CEE sourcing projects with special focus on country and competence selection
 - > Efficiency improvements and cost optimization programs
 - > Commercial due diligences
 - > Hungarian transportation, energy and financial sector projects

Your speakers today – Amrop



**HANS-
MATTHIAS
RUPPERT**

Managing Partner
Amrop Delta, Düsseldorf

Tel.: +49 211 17 92 49 - 0
Fax: +49 211 17 92 49 - 10
matthias.ruppert@amrop.de

- > Several projects in the high-tech industry, mechanical and plant engineering, electrical engineering and automotive sectors
- > Management audit advisory for companies in Central & Eastern Europe and in China & Japan
- > Global Practice Leader in the Automotive&Industrial segment



**DAVID
YOUNG**

Partner
Amrop Kohlmann&Young,
Budapest

Tel.: +361 391 0950
Fax: +361 391 0951
david.young@amrop.hu

- > Wide range of senior executive search assignments in the energy, technology, media, professional services and high-tech manufacturing sectors
- > International projects covering all of Europe and in the Hungarian market as well
- > Management audit and executive coaching assignments



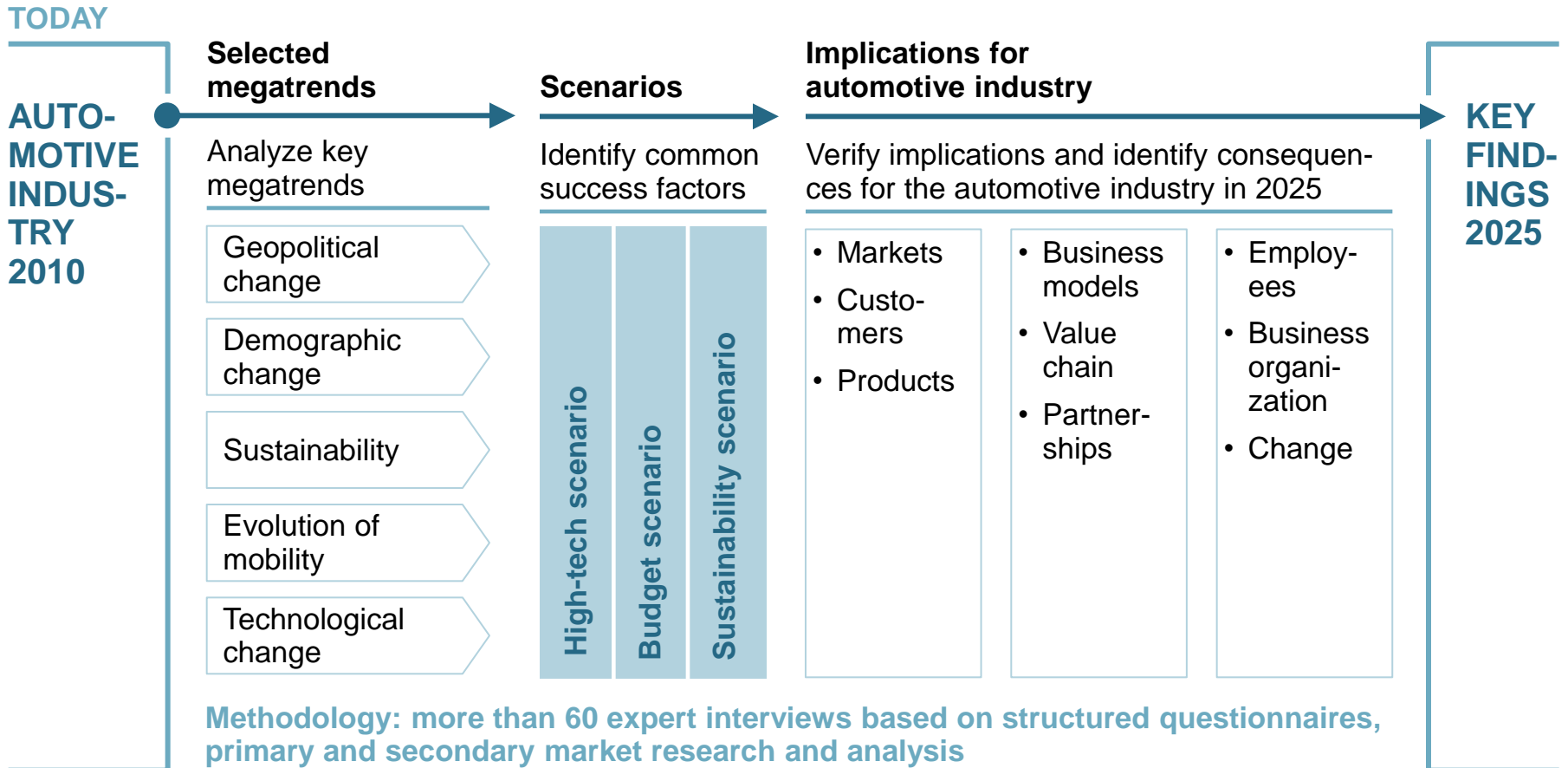
**RICHARD
KOHLMANN**

Partner
Amrop Kohlmann&Young,
Budapest

Tel.: +361 391 0950
Fax: +361 391 0951
richard.kohlmann@amrop.hu

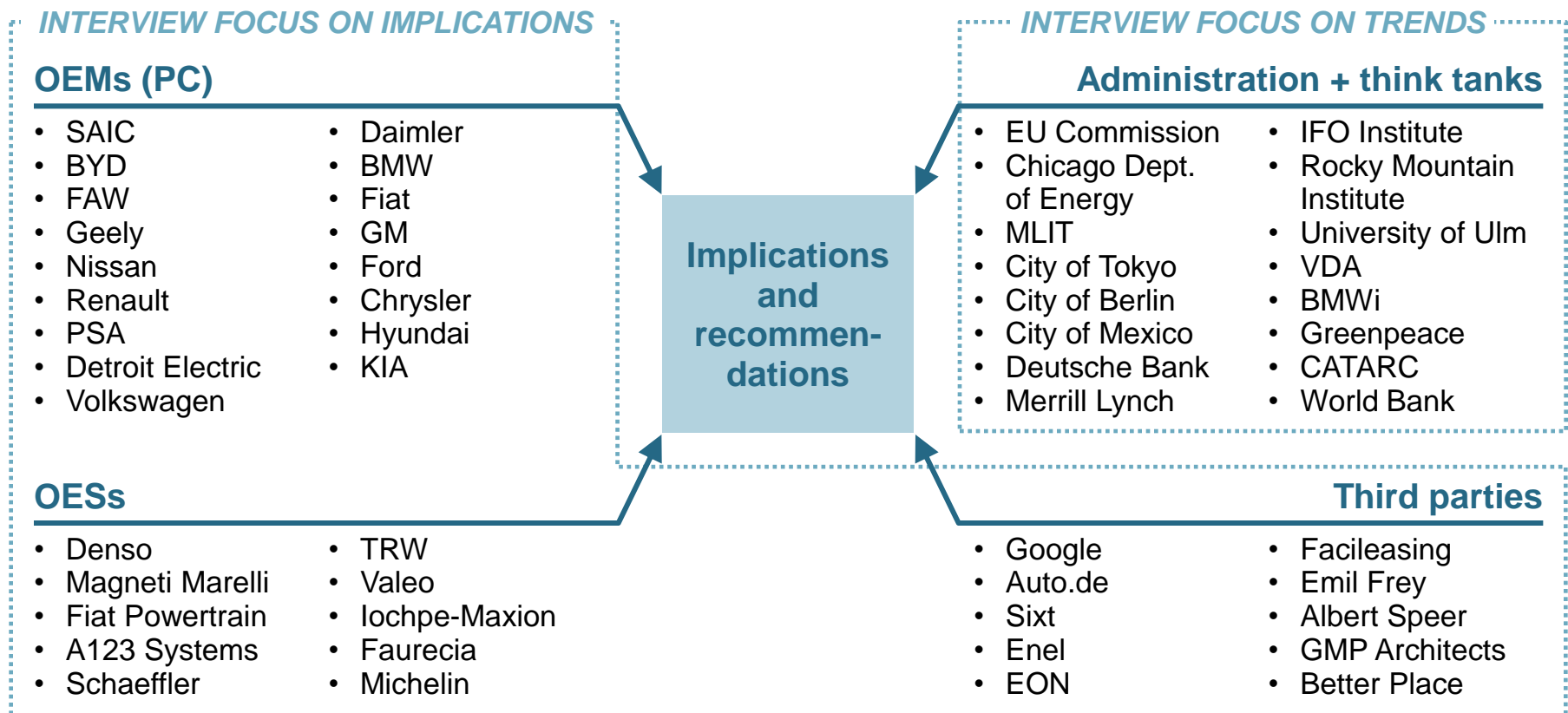
- > Placing top executives across a broad spectrum, which includes: Telecommunication + Automotive & Manufacturing + FMCG & Retail + Banking & Insurance sectors for World leader companies
- > Management Audits & Assesments, Executive Coaching + Board Searches & Advice + HR Consultancy + Interim Management

Key success factors for three scenarios were finally defined based on the study results



We conducted more than 60 expert interviews to verify the megatrends and their implications

Selected interview partners



A photograph of a tunnel with rows of bright lights on the ceiling, creating a sense of depth and perspective. The lights are blurred due to motion or a shallow depth of field.

B. Summary of key findings

Roland Berger
Strategy Consultants



Five key megatrends will shape the automotive industry in 2025

Summary of key findings

1 Geopolitical change

- Globally 4 economic and social models predominate
- European model with stagnating population but dynamic economic development
- China will be the second largest economy in 2025 but with almost lowest GDP per capita
- Protectionist measures introduced, further push on CO2 emission targets
- Growing demand for rare raw materials especially on electrified cars

2 Demographic change

- 16 % growth in population by 2025 to 8.1 bn – out of it 84% will belong to developing countries
- CEE region with negative growth – cz 0.01%, sk 0.00%
- Median age of population will bypass 40 years – trend towards aging (Japan 51, Europe 46)
- 30 megacities with over 10 m population – Moscow the only from the CEE

3 Sustainability

- 14 % of green house gas sources account for transportation fuels
- Eastern Europe is expected to decrease the CO2 emissions by 10 % till 2025
- Increasing share of renewable energy will lead to price fluctuation

4 Evolution of mobility

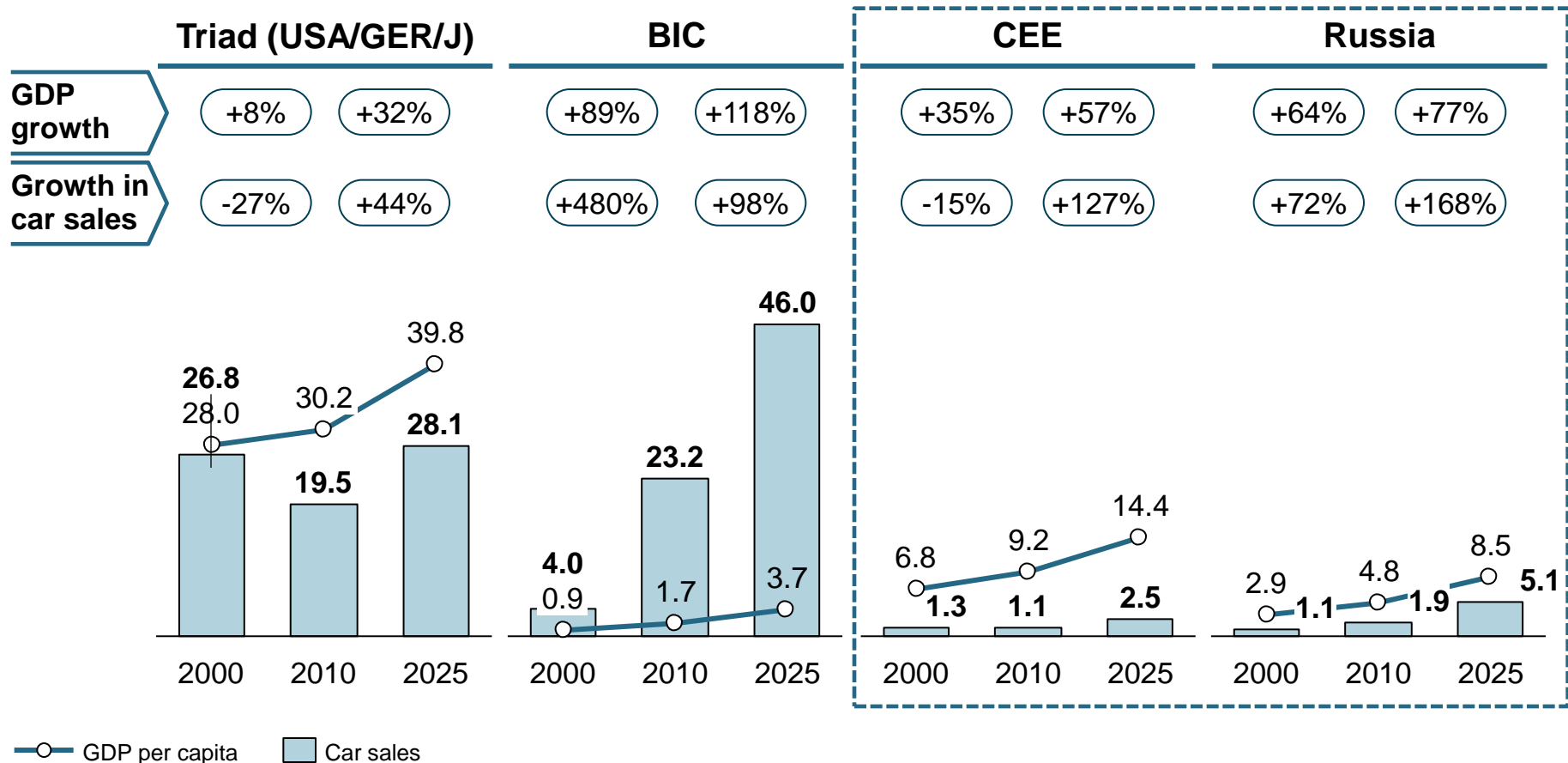
- Overall motorization will increase
- World wide travel km increases by 1.7% from (2000-2025) in CEE by 1.6%, China 6.8%, India 5.6%
- Low cost cars as commodity answering the demand for basic transportation
- 75 % of cars with less than 2000 cc (67% in 2010), in CEE 96% compared to 86% in 2010
- Demotorization trend especially in younger generations (car on priority list down from place 7 to 17)

5 Technological change

- OEMs offering a broad technological portfolio
- Various fuel forecasts show a wide range of expectation
- Light weight, intelligent solutions including new features – internet as strongest driver

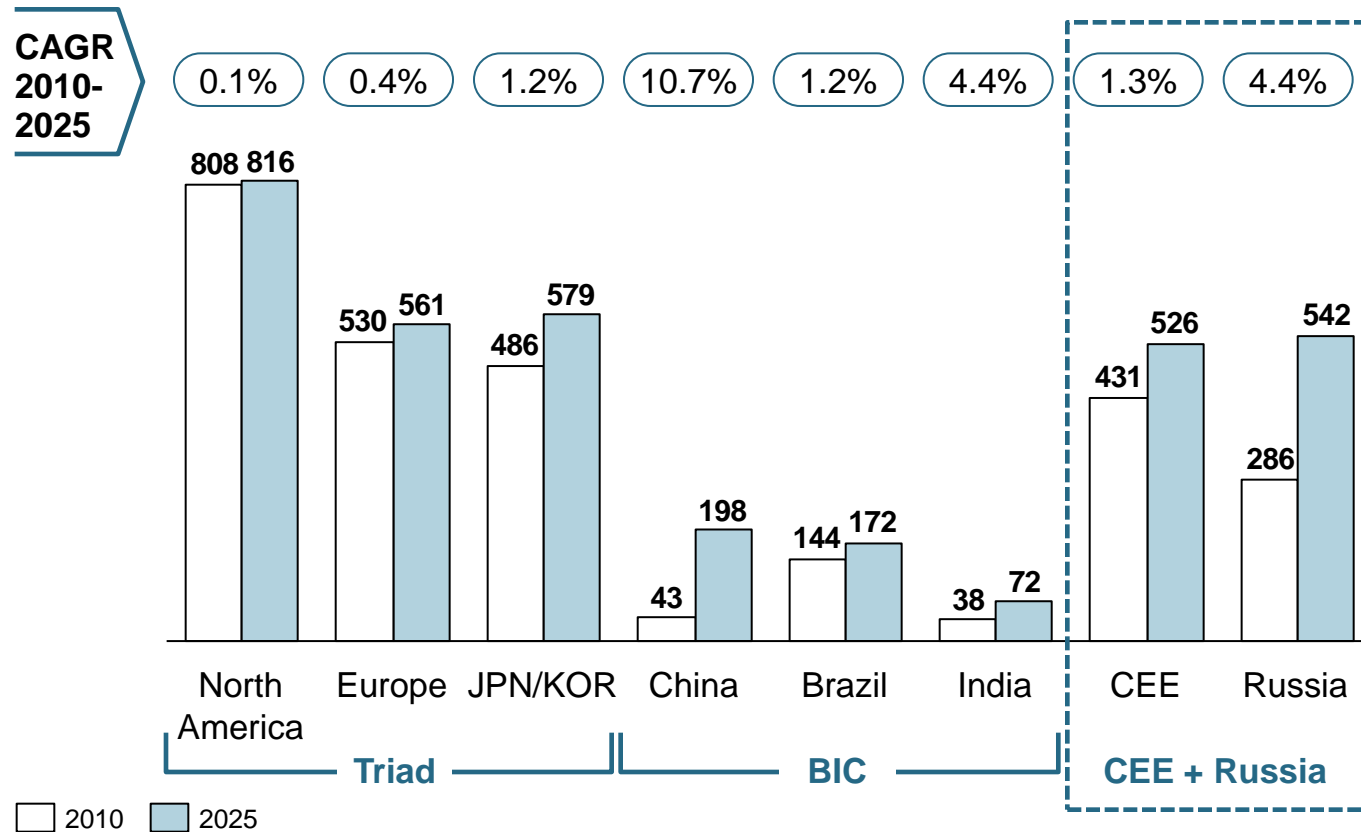
After recession the car sales in CEE countries are expected to grow faster than BIC till 2025 but not as much as Russia

Real GDP per capita ['000 EUR]; car sales [m units] 2000-2025



With the growing population and growing wealth in the BRIC markets, the overall motorization rate will increase until 2025

Cars per 1,000 inhabitants 2010-2025 ['000 vehicles]

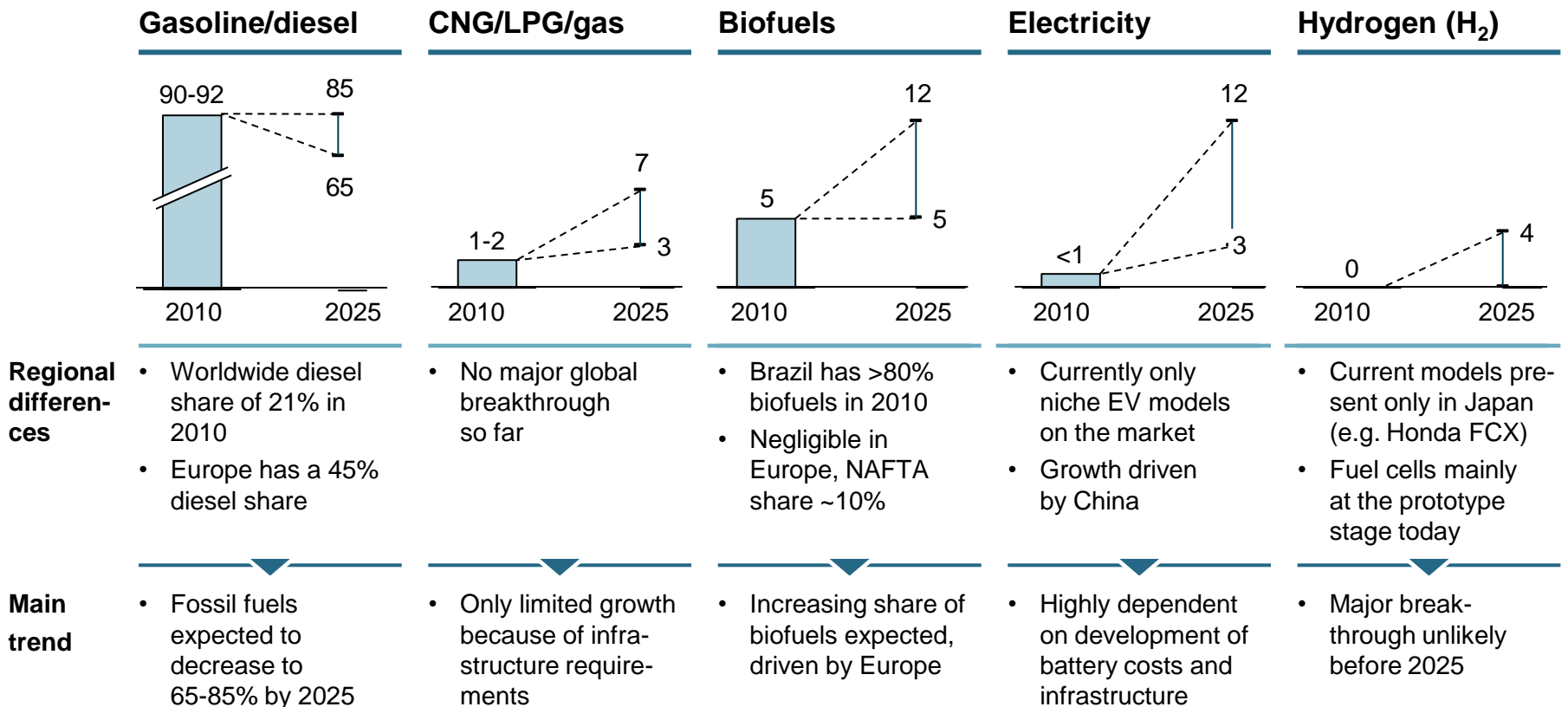


COMMENTS

- Growth in triad markets limited between 0.1% and 1.2% p.a. till 2015
- Much stronger growth in BRIC markets, ranging from 1.2% to 10.7% p.a.
- CEE and Russia will converge close to European and Japanese standards by 2025

Various fuel forecasts show a wide range of expectations – Gasoline/diesel remain most utilized fuel through 2025

Comparison of various fuel forecasts 2010-2025 [%]¹⁾



1) Min - max ranges based on current forecasts

Automotive landscape 2025: Implications of megatrends (1/2)

Key findings of the automotive 2025 study

- 1 | SHIFT TO ASIA**
 There will be a **dramatic shift of sales & production capacity** to Asia – regional trade blocks expected to grow, leading to shift toward **low-cost locations. 300,000 jobs in Europe at risk**

- 2 | SMALL IS BEAUTIFUL**
A/B segment with disproportionately strong growth. At the same time extremely successful **low-cost cars** answering the rising demand of no-frill transportation – **a global phenomenon**

- 3 | DEMOTORIZING**
 Especially among younger people, the **car loses its pole position in their emotional preferences** – the **motorization rate is decreasing in big cities**, and by 2025 not just in mature industrial nations

- 4 | POWERTRAIN ELECTRIFICATION**
 In the most positive of all cases, **electric vehicles** will account for **~10% of new vehicle sales by 2025**, hybrids will reach 40% share – **internal combustion engines** will **still** account for **50%**

- 5 | ALWAYS ONLINE, ALWAYS CONNECTED**
 By **2025**, many **vehicles will be always online**, sending and receiving information: Connectivity is a key factor – but **intelligent traffic solutions** will **remain a vision well beyond 2025**

Automotive landscape 2025: Implications of megatrends (2/2)

Key findings of automotive 2025 study

6

NEW BUSINESS MODELS

Established players have to **deal with low-cost challengers, technology challengers** and the rise of **new business models**: mobility ecosystems incl. car sharing have to be taken seriously by 2025

7

LACK OF ENGINEERS & SPECIALISTS

Countries with aging populations are lacking of engineers & specialists, esp. when it comes to MINT subjects – **OEMs/OESs cannot significantly increase their R&D departments abroad**

8

"GLO/CAL" BUSINESS ORGANIZATIONS

Successful global players will **move away from centralized organizations**: global at a local level – In 2025 these companies will have a number of **regional HQs to adjust & act fast locally**

9

INDUSTRY FLEXIBILIZATION

Need for automotive industry to open up & be able to **learn from other industries**, e.g. IT, suppliers – it will be the **most flexible businesses that will survive**

10

PROLIFERATION MEETS CONSOLIDATION

While consolidation trend will be continuing **among OESs, OEMs are likely to see a (re-) proliferation. New players**, also from outside the industry **will emerge**

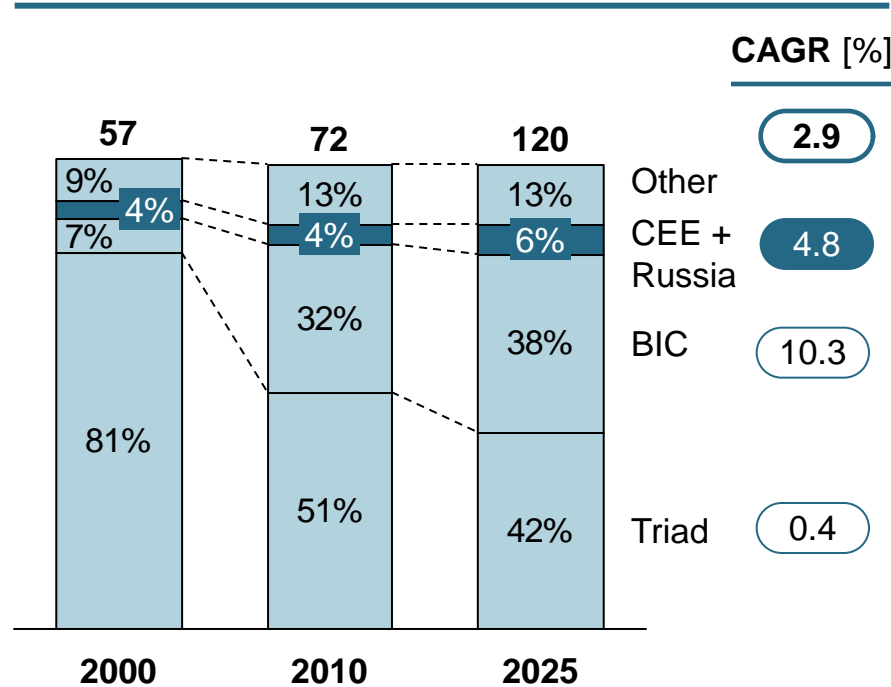


C. Details on implications

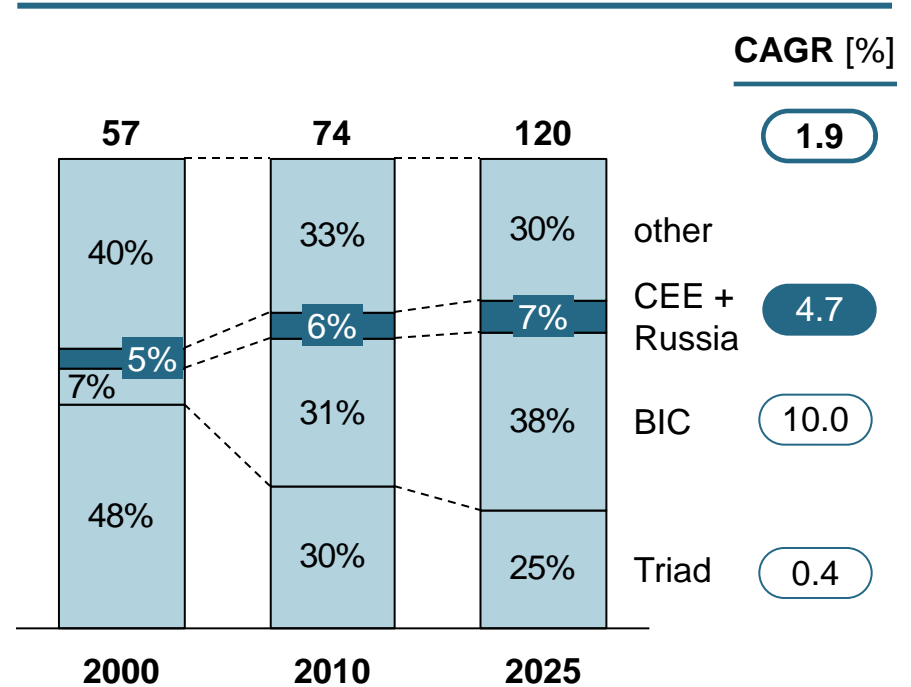
Sales and production are globally shifting to BRIC countries but production in CEE and Russia will maintain global share till 2025

Sales and production of light vehicles by region, 2000-2025 [m units]

Sales



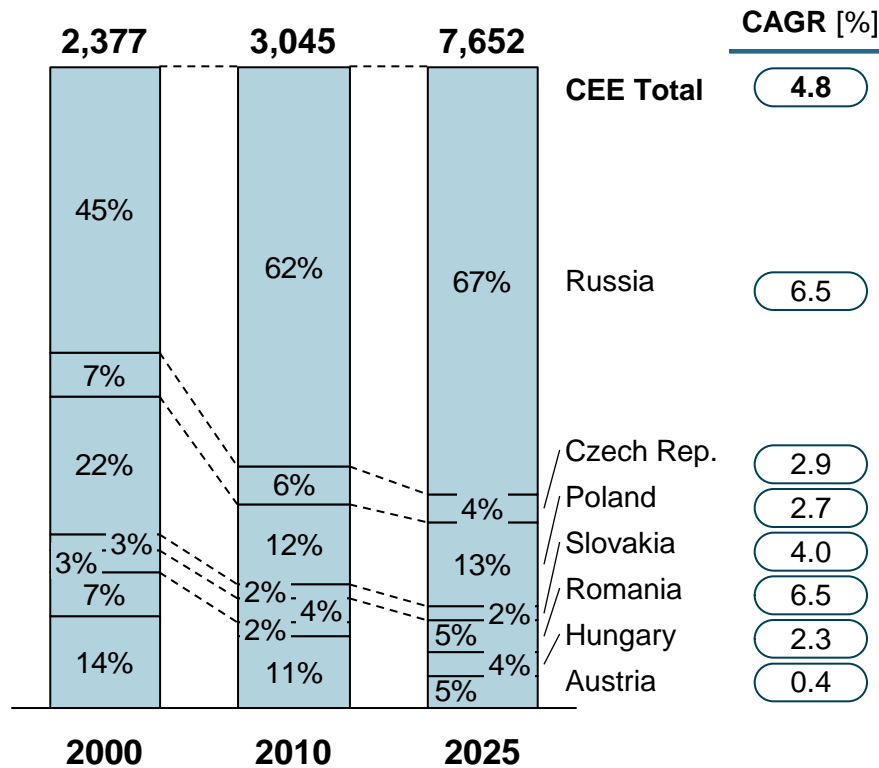
Production



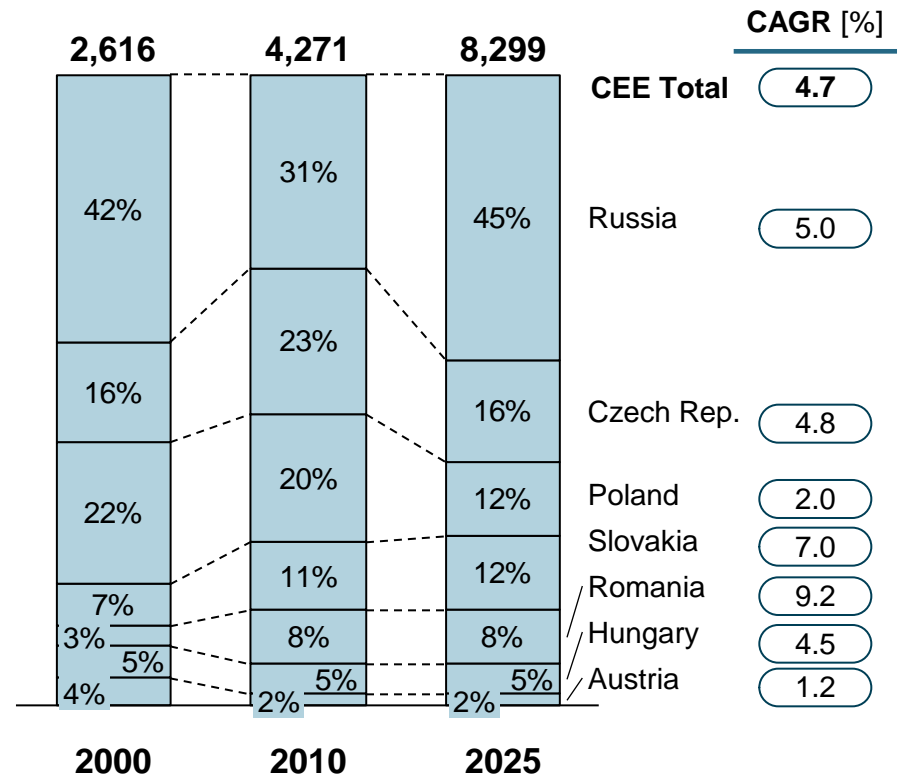
Russia dominates the growth in the focus region – SK, RO also with high pace of production growth over 4%

Sales and production of light vehicles in CEE region incl. Russia, 2000-2025 [ths units]

Sales

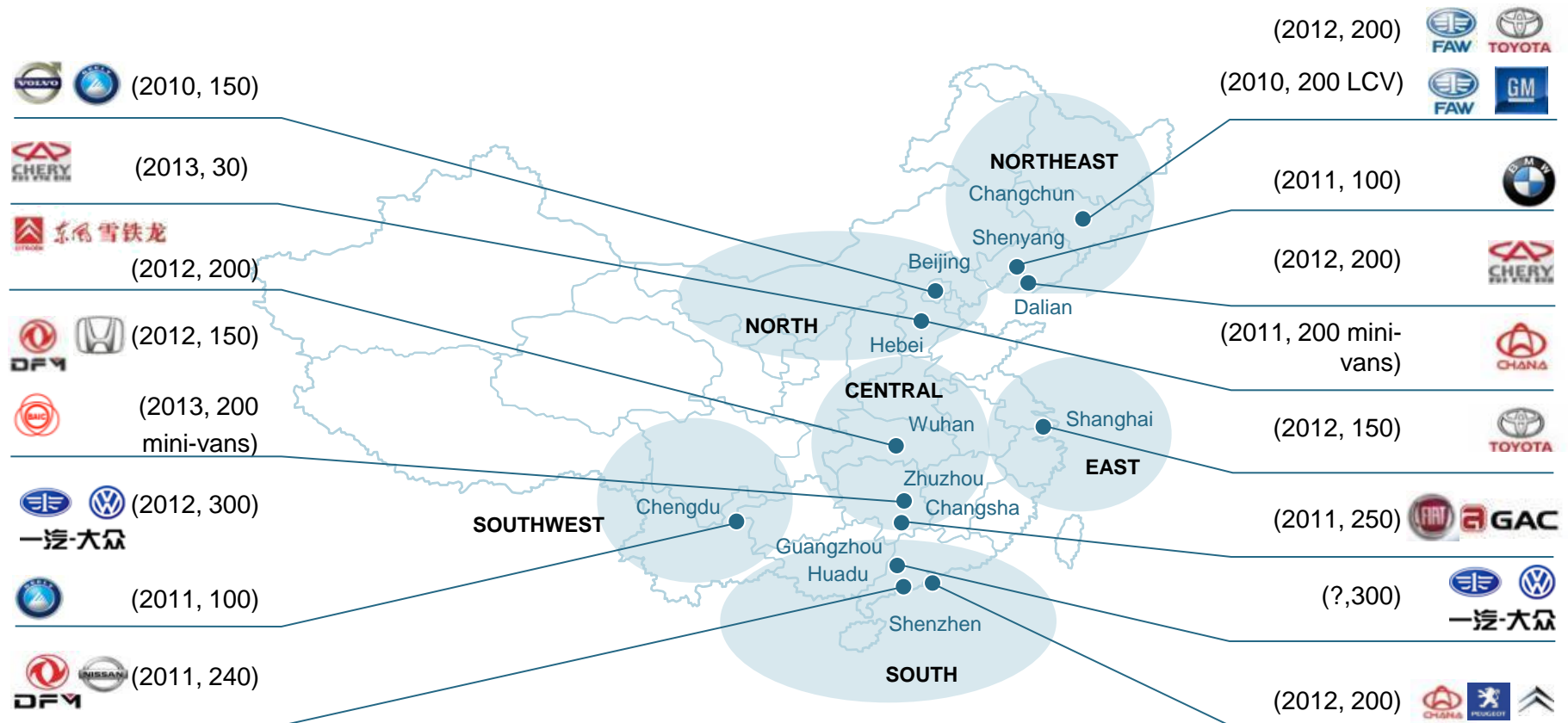


Production



Triad OEMs are shifting production capacity to China with numerous plants opening in the near future

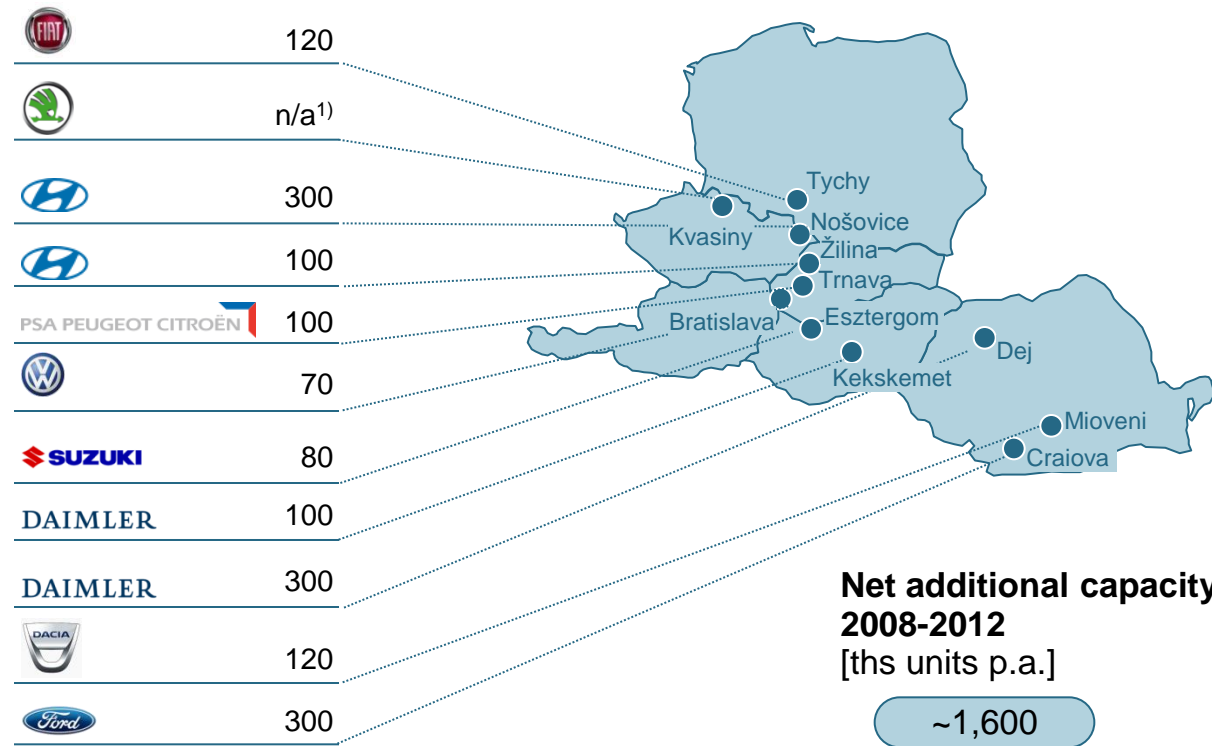
OEMs establishments / capacity extensions in China over 2010-2012 period



Legend (SOP, Capacity in '000)

CEE is still keeping its position of strong manufacturing region by ramping up production capacities in CZ, SK, RO and HU

OEMs establishments / capacity extensions in CEE (over 2008-2012 period)



COMMENTS

- Installed capacity in CEE is expected to increase by ~1.5 million cars annually to 4.6 m by 2012
- Most significant increases in capacity are expected in Romania (>700 ths car p.a.)
- Daimler and Hyundai with significant capacity extensions in the focus region

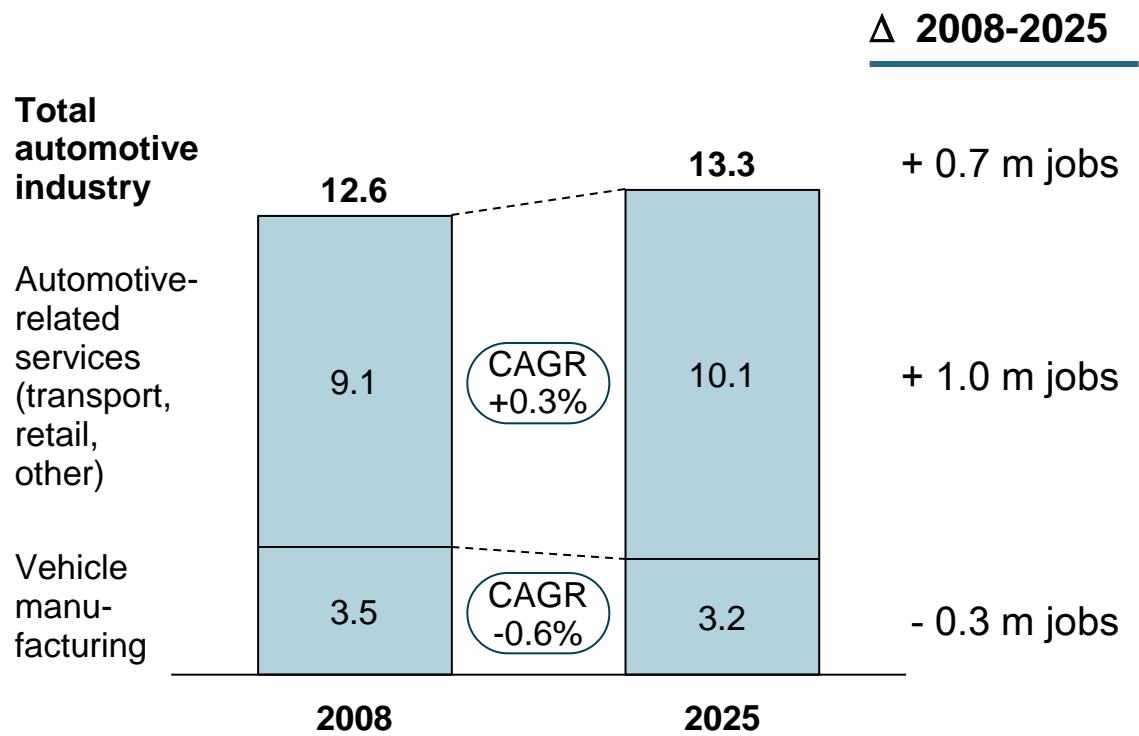
Legend (SOP, New/ extended capacity installed between 2008-2012 in '000)

Note: only significant SOPs above 50,000 units per year

1) details not available, net effect versus capacity reduction in Vrchlabí

The shift of production capacity to growing markets and low-cost centers could affect about 300.000 European jobs until 2025

Automotive-related employment in Europe 2008-2025 [m]



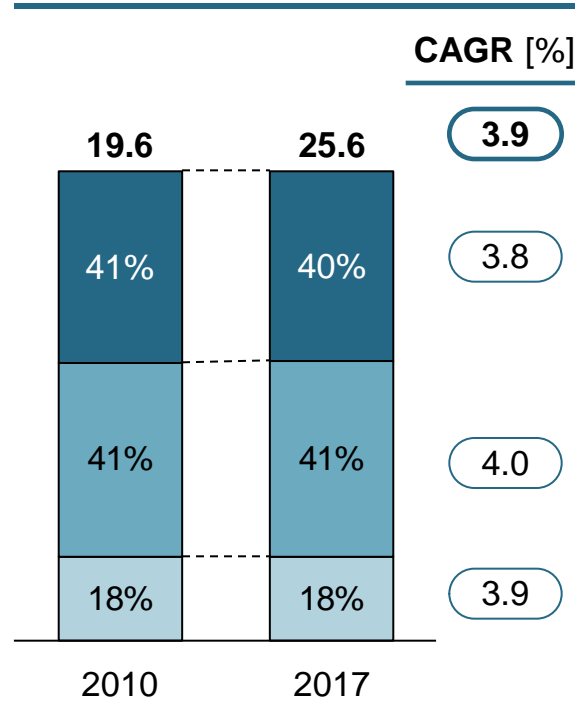
COMMENTS

- Employment in automotive manufacturing expected to decrease by 300,000 jobs. That equals a 9% drop
- In associated industries (services) the employment is projected to increase by 1 million workplaces
- The overall effect will be the creation of 700,000 new posts around the automotive industry

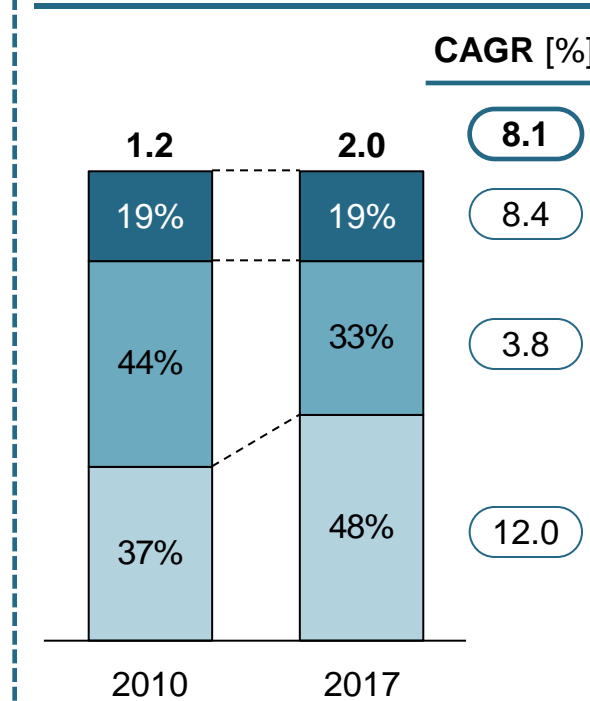
Small vehicles as the main driver in demand development in Eastern Europe – They will account for almost 50% sales in CEE by 2017

Light vehicles sales by segment, 2010-2017 [m units; %]

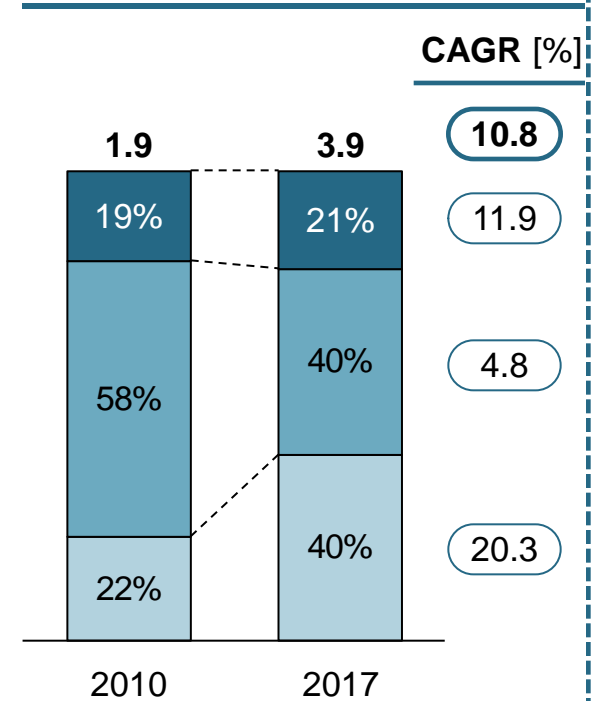
Triad



CEE



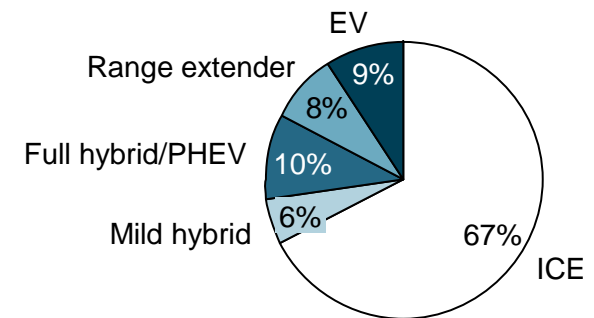
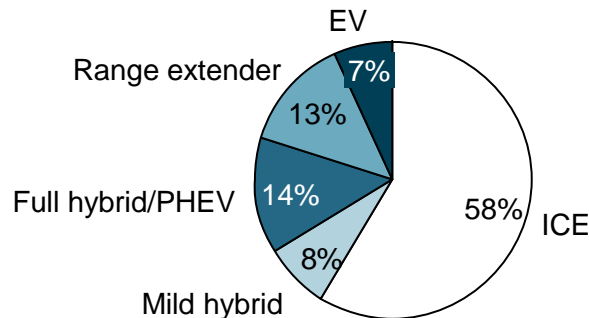
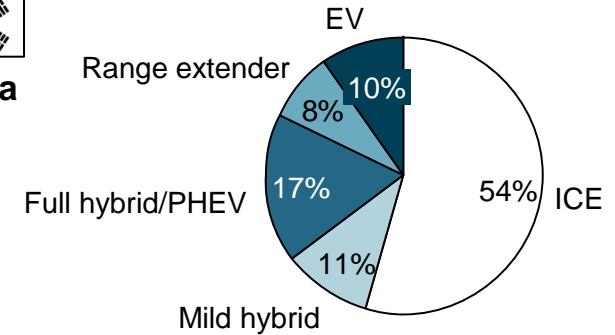
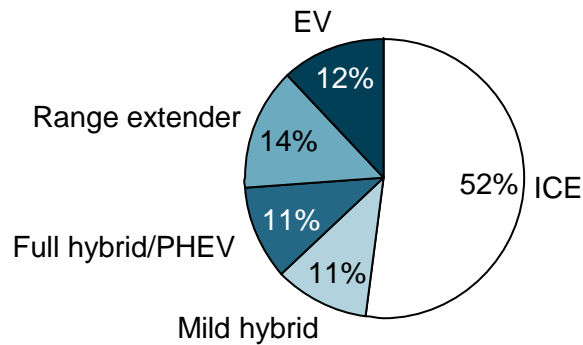
Russia



■ Large (E/F/above) ■ Mid-size (C/D) ■ Small (A/B)

The penetration of EVs and hybrids could exceed 40% in triad markets by 2025 – But the ICE powertrain will continue to dominate

Powertrain hybridization/electrification scenario in major regions – 2025¹⁾



1) Assumption: ICE includes micro hybrid functionality

Advancements in technology expected to create a fully intelligent and connected transportation system – But not before 2025

Intelligent vehicles



Collision notification



Collision warning



Driver assistance



Auto-pilot vehicles

Intelligent infrastructure



Traveler information



Electronic pay system



Incident management



Arterial management



Freeway management



Transit management systems



Emergency management systems



Commercial vehicle operations



Intermodal freight



Crash prevention and safety



Roadway operations & maintenance



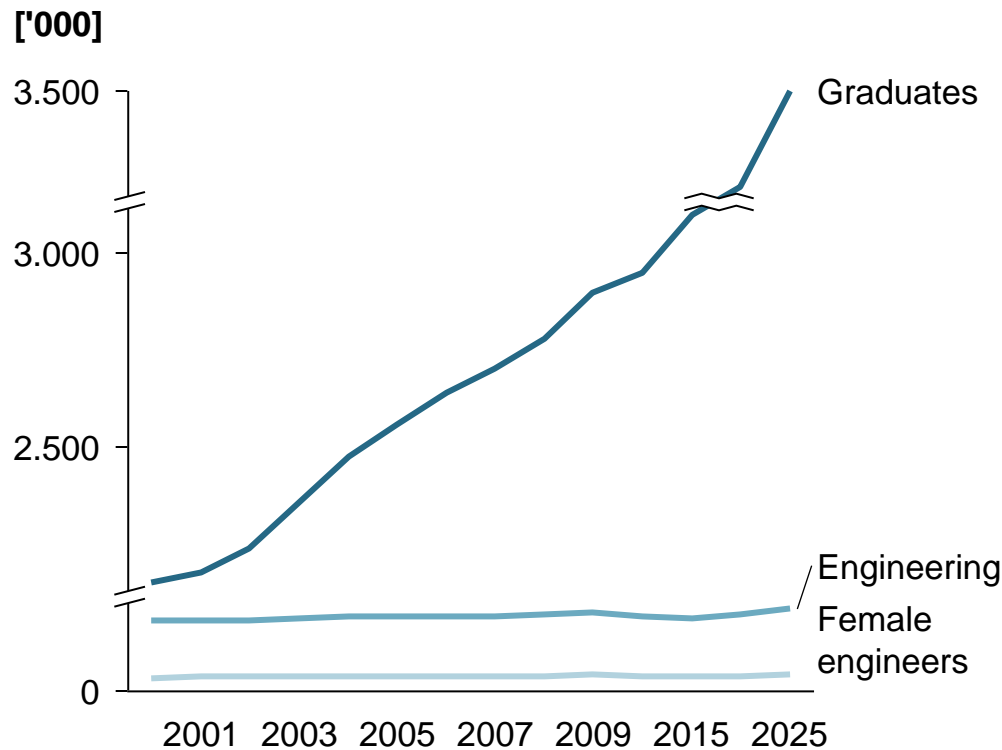
Roadway weather management



Information management

The STEM issue: statistics indicate a growing gap of qualified engineers and developers in mature markets

Example – Development of engineering graduates in the US



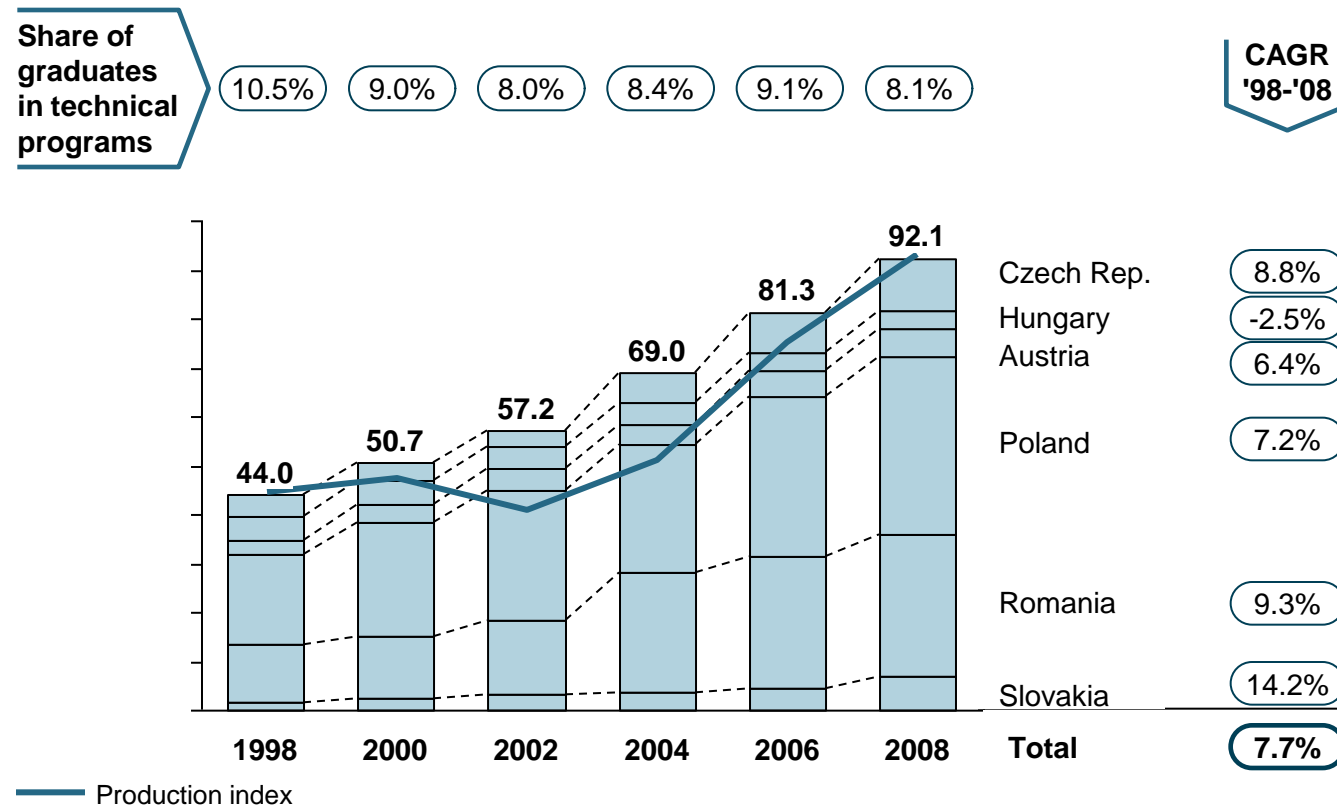
COMMENTS

- Despite a growing number of university graduates in the US the share of graduates in engineering fell from 8.5% in 1999 to 7.0% in 2008
- Female graduates are relatively stable at about 19.0% of all engineering graduates in the US

STEM: science, technology, engineering and mathematics

The number of graduates in technical programs doubled in CEE in last 10 years – However the share of these programs decreased

Graduates in technical programs in CEE, 1998-2008



COMMENTS

- CEE produced over 90 tsd graduates in technical disciplines in 2008 - 40% of which graduated in Poland
- Share of graduates in technical programs on total graduates is constantly decreasing
- Fastest growing production countries are also rapidly increasing number of technical students (RO, SK)

Note: Technical programs are represented by "Engineering and engineering trades" and "Manufacturing and processing"

Countries with aging populations are lacking of engineers & specialists – trend will increase until 2025

Changes will fundamentally impact on employment & qualification for OEM/OES [1/2]

		Notes/Consequences	Trend
Demographic Change	Shrinking and aging population in mature economies	Shrinking workforce and higher age average; Lower number of university graduates	⬇️
	Lack of graduates in STEM disciplines	Widening skills gap in R&D, technology development and manufacturing	⬇️
	Availability lack of needed engineering skills	Controlled migration of graduates & young professionals from emerging markets Allocation of workplaces according to resources	⬆️
	Rapid population growth in India, moderate in China, USA & Brazil	Possibility to outweigh missing graduates in STEM disciplines in western economies	⬆️
Market Change	Emerging markets pulling in local manufacturing	Rapid growths of local manufacturing capacities for both OEM and OES (incl. local engineers)	➡️
	Mature markets production capacities are under pressure	Shrinking labor resources and stagnant productivity Export may become too expensive	⬇️
	Mature markets R&D and design resources will shrink	Local markets require local know-how Labor cost advantage outperforms skills and experience gap	➡️

Notes: ⬆️ positive/opportunity for OEM and OES ➡️ OEM and OES have to adapt to changes ⬇️ negative/risk for OEM and OES
 STEM: science, technology, engineering and mathematics

Countries with aging populations are lacking of engineers & specialists – trend will increase until 2025

Changes will fundamentally impact on R&D for OEM and OES [2/2]

	Notes/Consequences	Trend	
Techno- logy Change	Technology shift to E-Mobility	Traditional powertrain application skills obsolete, Investments in electrical/chemical engineering resources	↑
	New all-time on-line and C2C and C2X connectivity	New skill sets and labor resources in on-board and infrastructure IT necessary	→
	E-Mobility infrastructure replaces existing fuel infrastructure	Infrastructure technology will appeal new suppliers (utilities)	→
	Increasing complexity of applied technology in transition phase	Additional skilled resources are need in order to managing the wide variety of technologies	→
	E-Mobility service will create new skill sets	Reduced mechanical and increased technology and IT skills are need to servicing the new E-Mobility cars	→
	New technology will see new manufacturers in the market	Uncertain threat to OEM	↓

Notes: ↑ positive/opportunity for OEM and OES → OEM and OES have to adapt to changes ↓ negative/risk for OEM and OES
 STEM: science, technology, engineering and mathematics

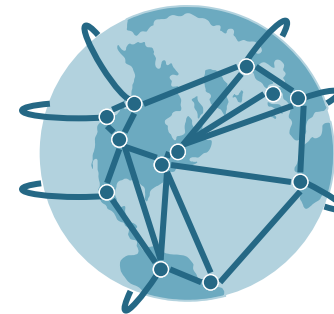
The automotive sector is getting glo/cal, acting global as well as adapting to local particularities

Worldwide presence



- Multi-regional locations
- Sequential launches of new products
- Centralization of development
- Dispersed production network
- Local/regional purchasing bases

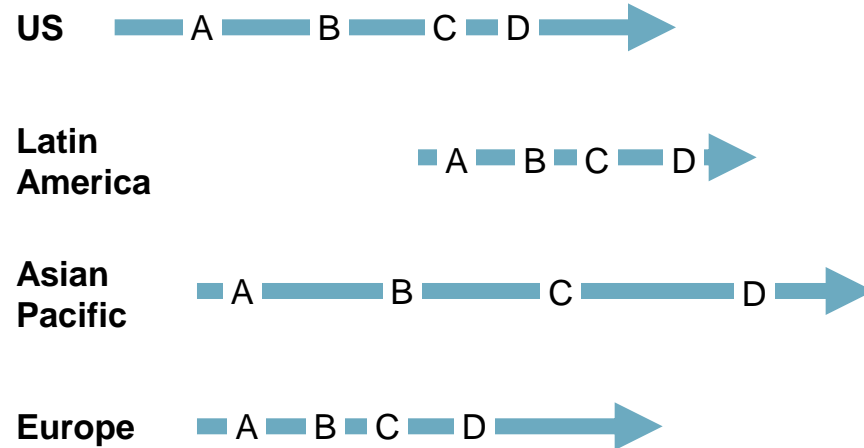
Worldwide integration



- Multi-regional Integration
- Simultaneous launch of models
- Network of development centers globally integrated
- Standardized production process and more flexible network
- Global purchasing base

Glo/cal product – New product architecture to comply with global needs and local design particularities

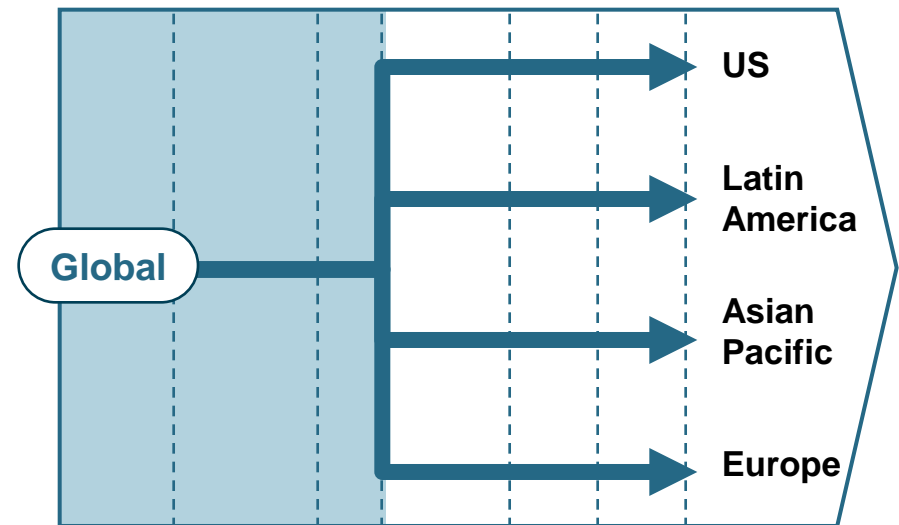
From tailor made projects



A – D: Quality gates

- • Long time lag between first and last market launch
- low-cost efficiency by downgrading and reduction of content – limited standards

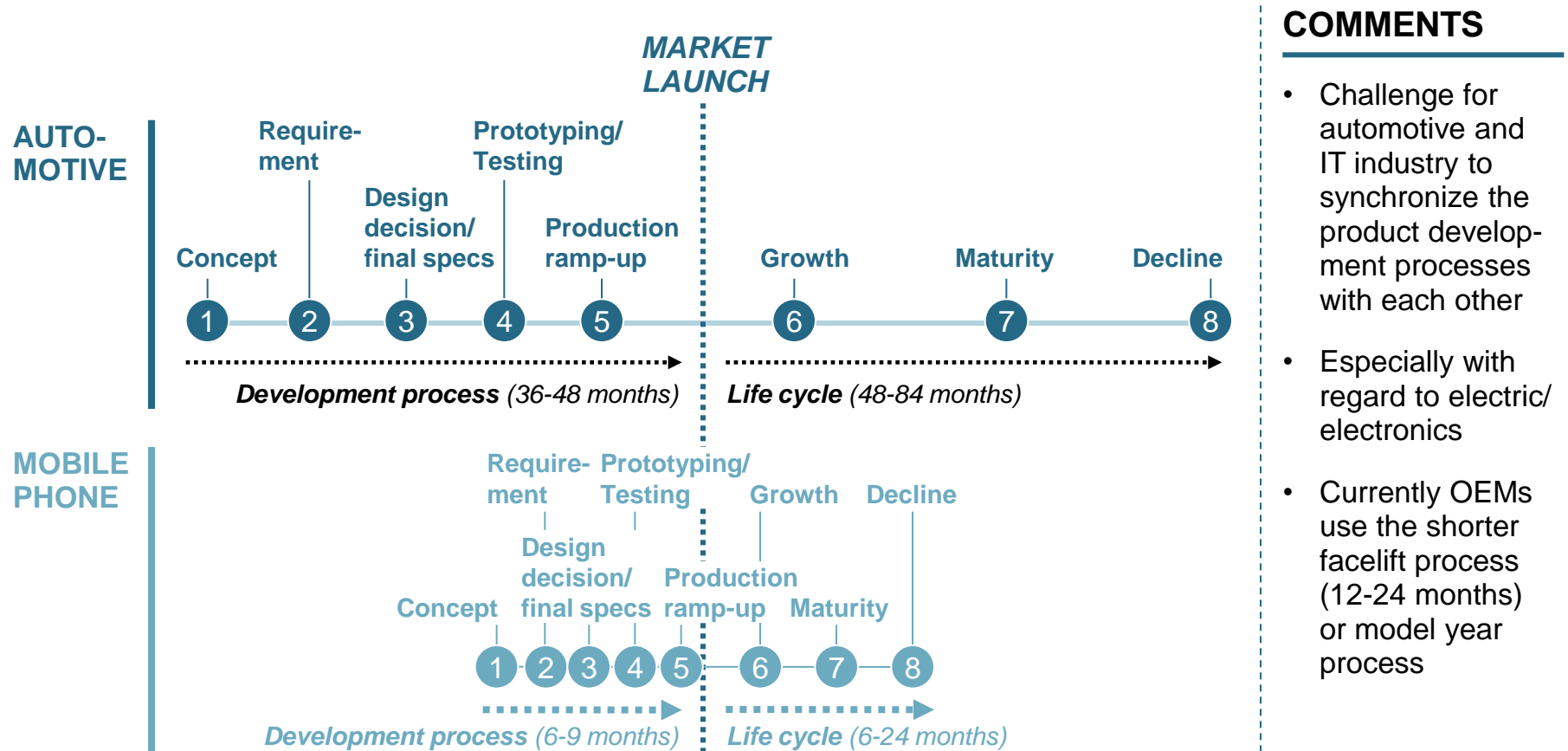
To glo/cal product based projects



- + • Near simultaneous roll-out
- Built-in regional requirements to optimize CAPEX

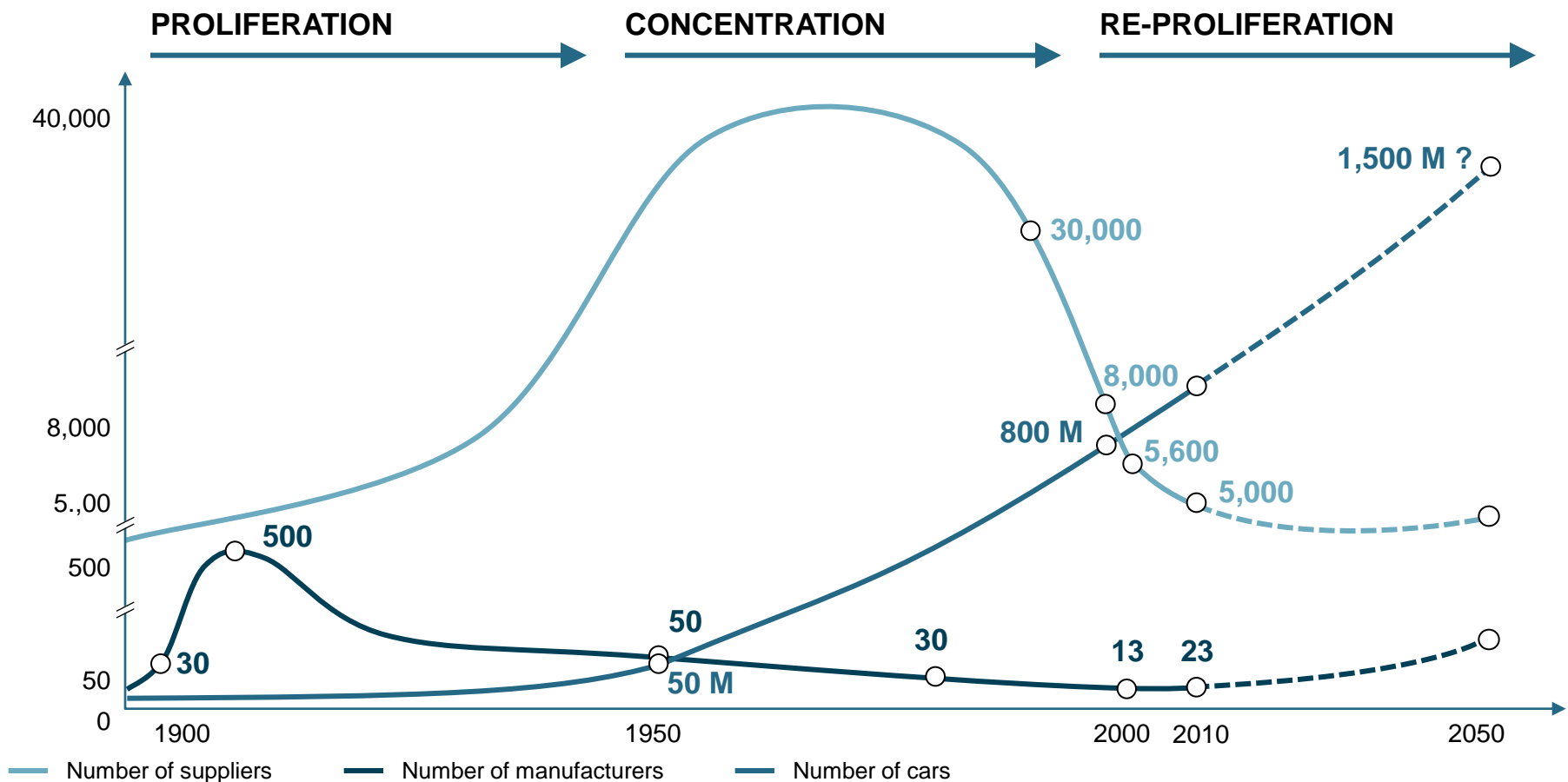
Increasing convergence of automotive and IT products require a stronger alignment of both industries

Timeline product development processes: Automotive vs. IT



The number of major OEMs has declined over the last decades – But re-proliferation may be expected

Industry proliferation/consolidation trends





D. Scenarios

Roland Berger
Strategy Consultants



Whatever the scenario, some common key success factors will become crucial




**KEY
SUCCESS
FACTORS**

Brand | Clear brand positioning and customer targets with a globalized approach

Product | Tailored design to specification, leveraging both high content features (eg. connected cars, ..) and low content features, greater level of customization to needs. Product & service approaches going toward customer relationship and are also offering mobility solutions

Operations | Glo/cal R&D approach and network, modularization, mix of more flexible plants and LCC plants. Capacity management driven by profitability

Partners | Strong relationships with well chosen partners: downstream (distribution, services providers), upstream (Tier-1), co-branding partners



It's character
that creates
impact!

Roland Berger
Strategy Consultants

Context
Driven
Executive
Search™



Amrop