

HORIBA



12th Japanese – German Economic Forum

Enabling Technologies for SMART MOBILITY

Phil Burnside

25th April 2018

Topics

- Global Mega & Automotive trends
- Impact to Automotive OEMs
- HORIBA Cultural Philosophy
- HORIBA Enabling Technologies
- Your invitation



Everything begins with measurement.

HORIBA's "Measurement Technologies" and analysis solutions are always at the front lines of innovation.

Global mega trends information was consolidated and synthesised from 11 sources (120+ reports)

McKinsey

strategy&



Roland
Berger

European Environment Agency



F R O S T & S U L L I V A N

EY

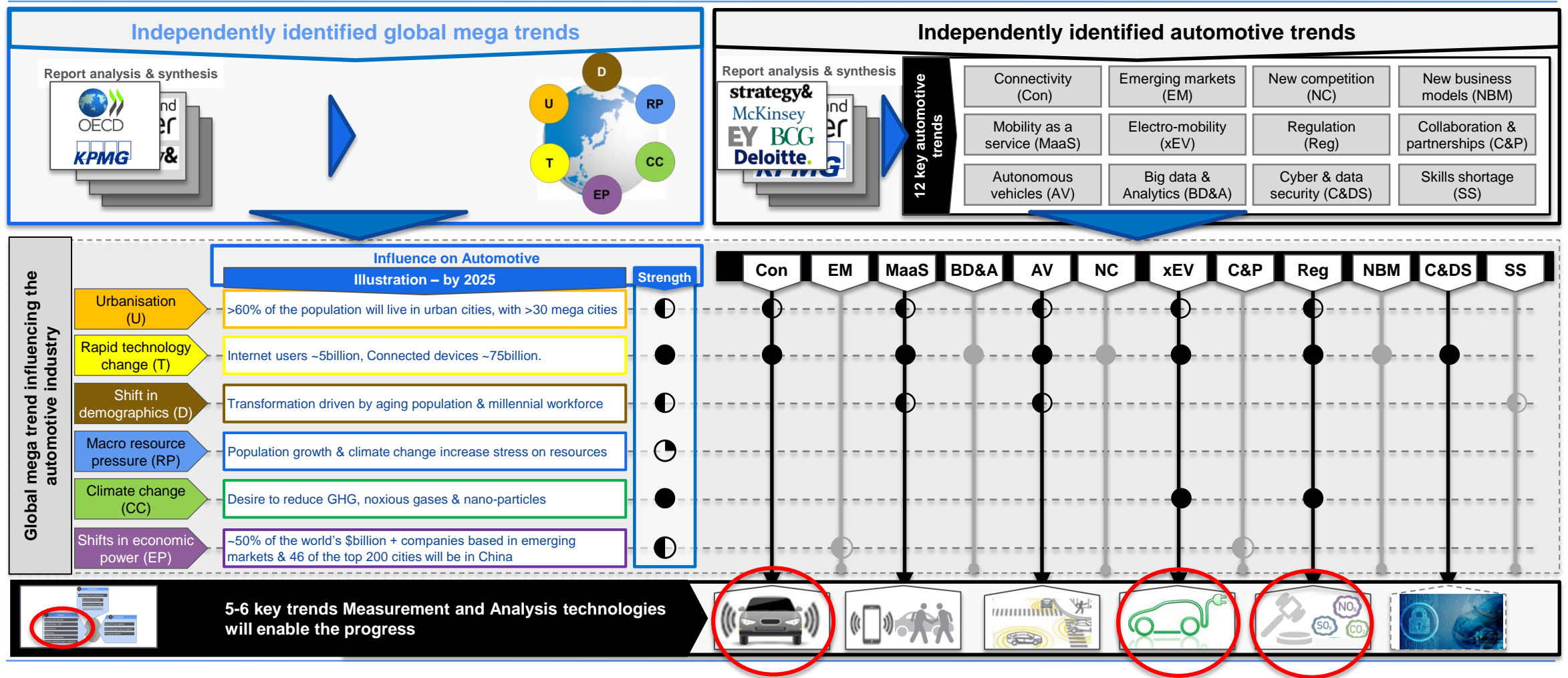
BCG
THE BOSTON CONSULTING GROUP



Booz | Allen | Hamilton

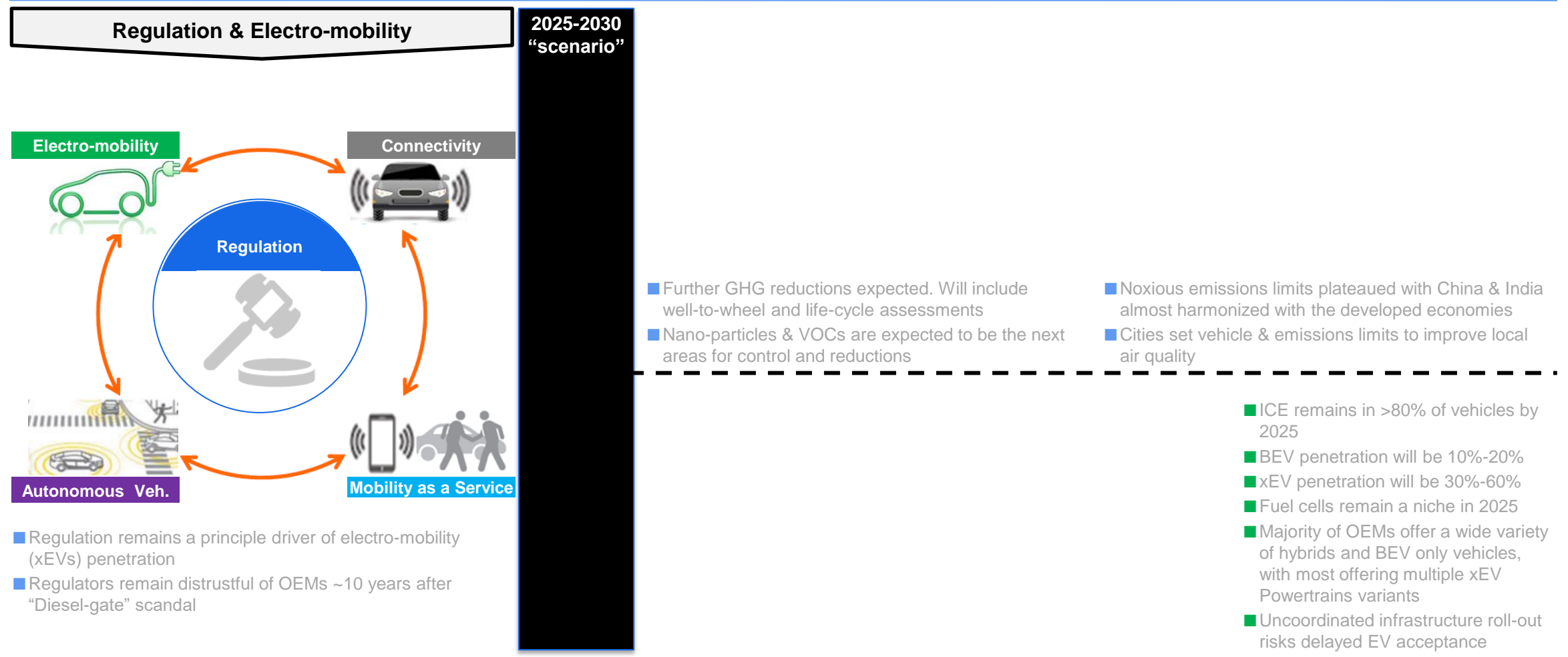
Source: MIRA

Global mega & automotive trends interact & reinforce key product attributes / services which will be critical in defining the future of the market



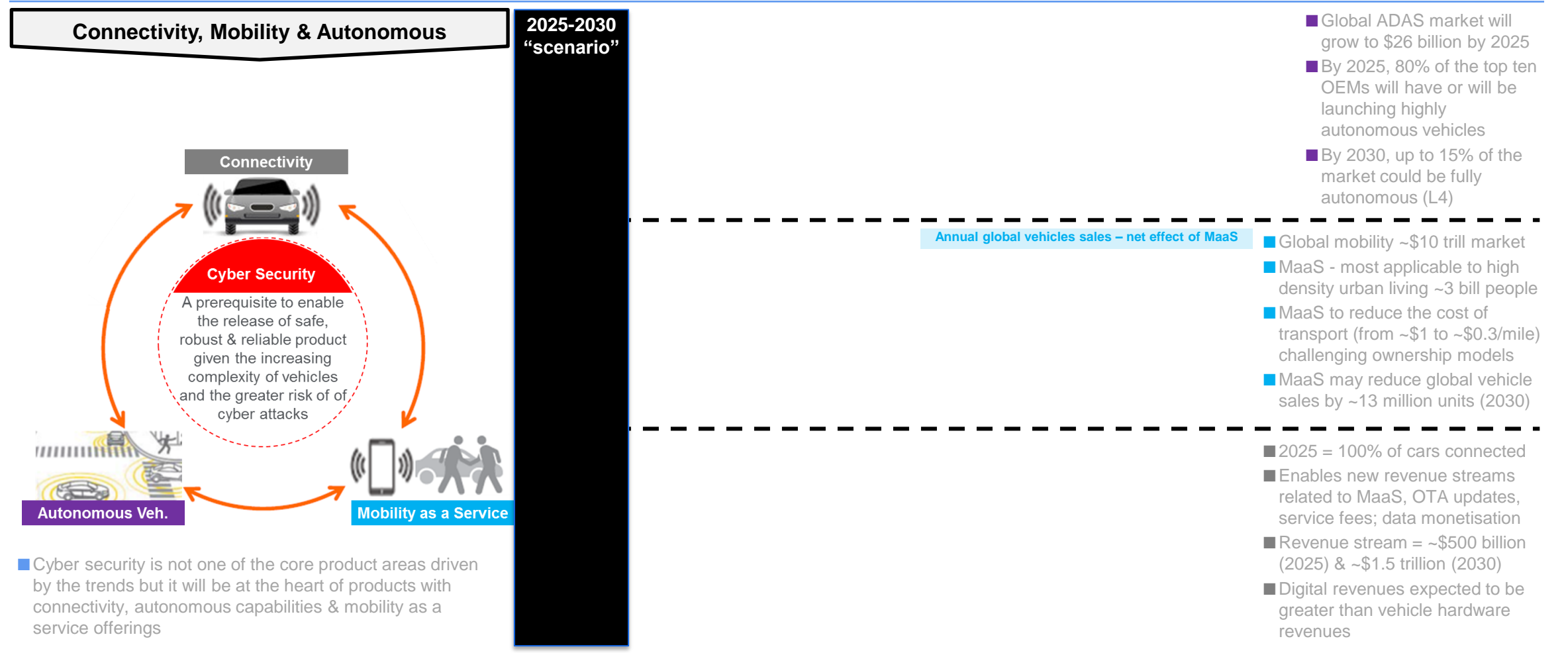
Source: MIRA, HP, OECD, Booz Allen Hamilton, BCG, Frost & Sullivan, KPMG, Roland Berger, PWC (Strategy&), McKinsey & Company, EY

Headline: Reductions in national and city-level regulated emission levels are expected and nanoparticles & VOCs will come under increasing scrutiny



Source: MIRA, McKinsey & Company, EY, Ricardo, PWC (Strategy&), KPMG, Roland Berger

Headline: Connectivity, MaaS & Autonomous vehicles are all interlinked with cyber security central to delivering successful robust products



Source: MIRA, Accenture, Bain, Deloitte, Morgan Stanley, Roland Berger, KPMG, PWC (Strategy&), McKinsey & Company, EY

Diesel decimated, massive growth in xEV, but unprecedented levels of investment for battery production required

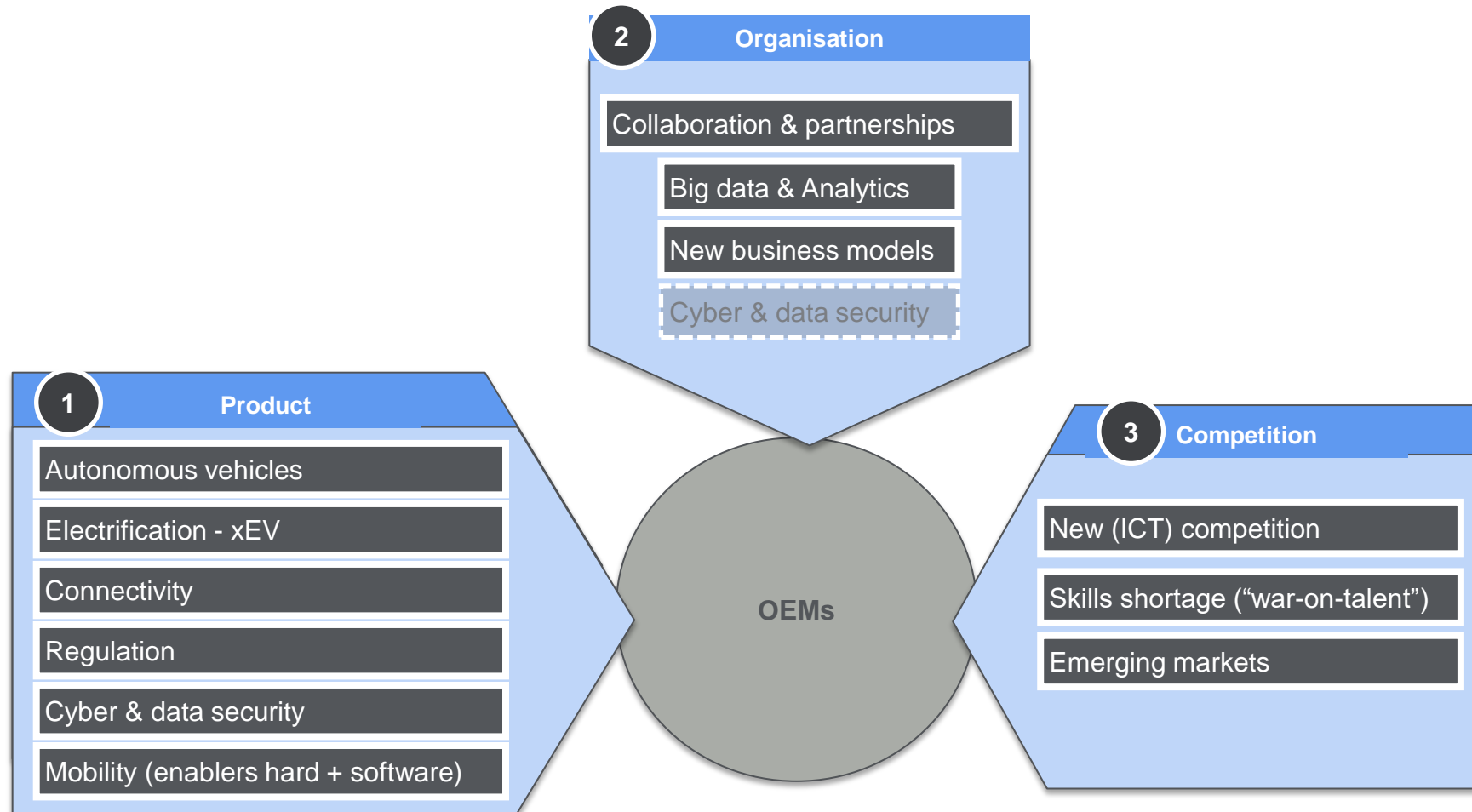
EVs: ~20% in 2025 & >50% in 2030

Massive growth in EV and xEV products across major markets

Diesel decimated. Niche application on SUV & large saloons. FCEV niche

Source: MIRA, vehicle OEMs, PWC (Strategy&), Ricardo, McKinsey & Company, * industry wide

Impact - The trends are putting the OEMs under increasing strategic & operational stress



Source: MIRA

ICT = Information, communications and technology companies: A collective term referring to silicon valley type companies e.g Apple / Uber / Google

HORIBA - Philosophy



Dr Masao HORIBA – founded HORIBA in 1947

CUSTOMERS



At the heart of our business is our customers and stakeholders
Measurement Technologies is our vehicle to success

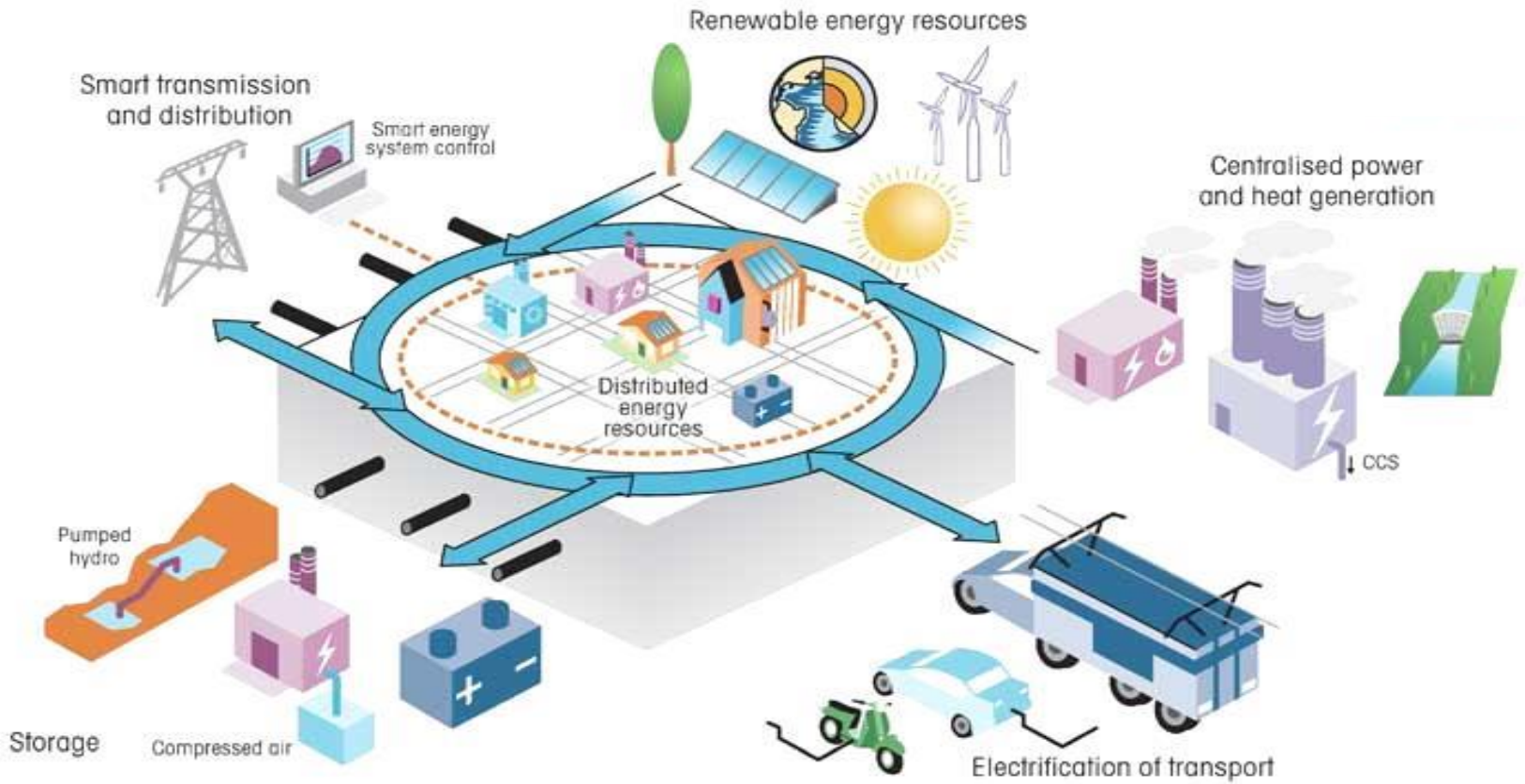
<p>1</p> <p>Partner in creating innovations</p> <p>All technological innovations begin with "Measurement" By making the unseen visible, to help realize productivity gains and contribute to global economic development</p>	<p>2</p> <p>Global environment preservation and improvement</p> <p>To contribute to building a sustainable society and the improvement of the global environment</p>	<p>3</p> <p>Contribution to human happiness</p> <p>To promote diversity and "Decent Work"</p>
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The motto originates from the belief that if we take interest and pride in the work that occupies most of the active time in our lives, in the place where we spend the large part of each day, then as a result our satisfaction with life will increase, and we will be able to enjoy our lives even more. Taking interest and pride in our work leads us to "Joy and Fun."



Omoshiro-Okashiku

HORIBA Enabling Technologies



Scientific



Semiconductor



Process & Environmental



Automotive Test Systems

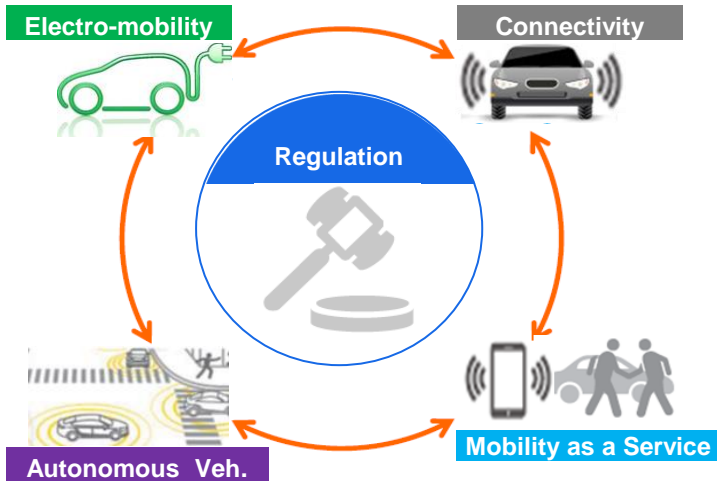


Enabling Technologies – Automotive Engineering

Providing powerful support to the automotive development industry

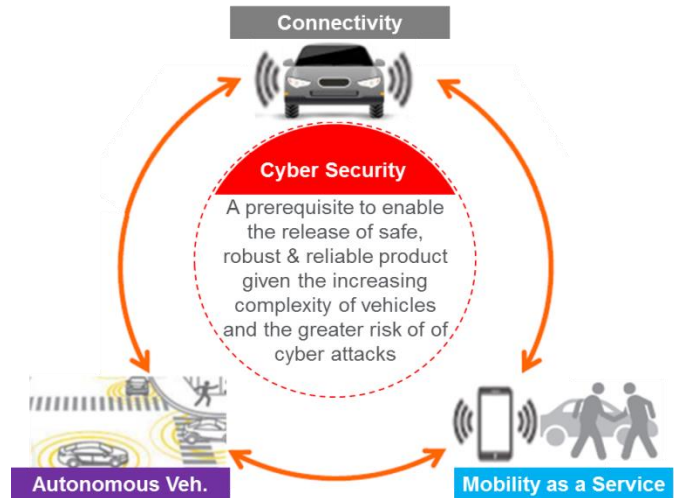
HORIBA's automotive **EMS (Emission Measurement Systems)** are used by national certification bodies throughout the world and hold a global market share of 80%*. HORIBA provides complete test and measurement solutions to the world's leading automotive manufacturers, including test systems for chassis, engines, power trains, catalysts and brakes. In July 2015 HORIBA acquired **HORIBA MIRA, Ltd.**, a U.K. registered vehicle engineering consultancy and testing services provider. With the addition of HORIBA MIRA, Ltd., the company has expanded beyond analysis and measurement to include the **Engineering Consultancy & Testing (ECT)** business. It is now well positioned to respond to diverse customer demands as future mobility requirements expand to include **advanced vehicle performance, autonomous vehicle development, battery development and general vehicle R&D challenges.**

Regulation & Electro-mobility



Principal Products and Services

Connectivity, Mobility & Autonomous



Emission measurement systems Automotive emission analysers On-board emission measurement systems Driveline test systems Engine test systems Brake test systems
Drive recorders Vehicle development engineering Testing engineering Lease and management of R&D facilities

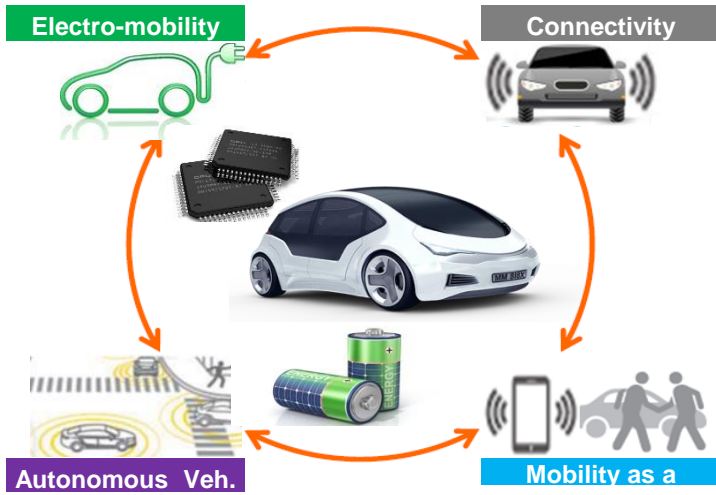
Enabling Technologies – Flow Control & Measurement

Contributing to yield enhancement and technology innovation in semiconductor manufacturing processes

HORIBA's flow control and measurement technologies are enabling the manufacturers of next generation automotive semiconductors, batteries, displays, LED's, and coated plastics. These high-precision gas and liquid controllers regulate flow rates in component manufacturing processes. They are indispensable components for high quality semiconductor and LED production. Our Chemical Concentration Monitors are used in semiconductor manufacturing to monitor concentrations of chemical cleaning agents. They ensure cleaning fluids are precisely delivered and properly used, thereby optimizing the cleaning process and boosting production yields. We own approximately 60% market share.



Connectivity, E-mobility & Autonomous

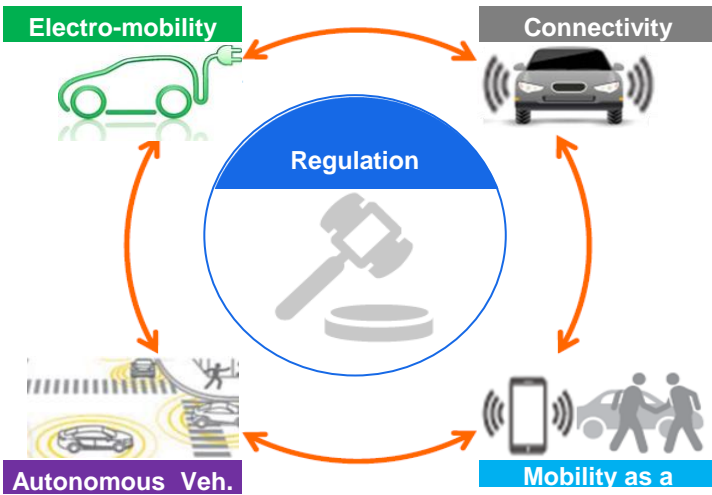


Enabling Technologies – Scientific Instruments

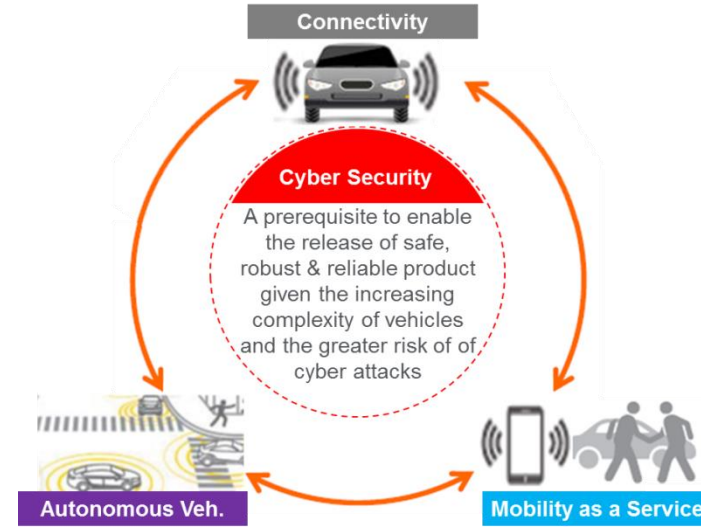
Scientific Instruments & Systems for use at the leading edge of scientific technology

HORIBA's analysers provide solutions for data acquisition and analysis for advanced research and pursuit of innovative products and processes that will enhance our lives and the world that surrounds us. Our instruments are used in energy, automotive industries, materials science, semiconductor processing and batteries. HORIBA's analysers use gas analysis by infrared rays, X-ray solid analysis, and dispersion technologies such as Raman or fluorescence spectroscopy.. HORIBA's analysers are widely used in basic research, foreign-object examination and defect analysis for electronic components, The segment develops basic analytical methods and core measurement technologies.

Regulation & Electro-mobility



Connectivity, Mobility & Autonomous



HORIBA's air pollution analysers have won high acclaim in the field as highly reliable analysers that demonstrate excellent precision and long-term stability at ppb* concentrations. They are used in over 50 countries to monitor air quality by municipal governments and private industries. Demand has been expanding for PM2.5-related monitoring.

Our Future Together....



HORIBA will keep investing in technologies and talents and refining “Invisible Values” with the spirit of “Joy and Fun”

Chairman & CEO Atsushi Horiba

A handwritten signature in black ink, appearing to read 'Atsushi Horiba'.

Continuous investment to accelerate growth

Proactively facing the changing trends in the automotive industry and mobility with our “Measurement Technologies”

Investing to respond to an increase in demand in the semiconductor industry

Accelerating multiple technology solutions

HORIBA operates five business segments in 27 countries providing indispensable products and solutions.

Your invitation to join us...



Visit our stand Hall 27 G55

Take the driving challenge

Meet our team of Japanese and German colleagues

Discuss HORIBA's Enabling Technologies

We want to hear about how we can help you?

Enjoy Happy Hour 1700hrs – 1800hrs

EXPLORE THE FUTURE

Thank you

Thank you

Omoshiro-okashiku
Joy and Fun

おもしろい
おかし



감사합니다

Cảm ơn

ありがとうございました

Dziękuję

धन्यवाद

Grazie

Merci

谢谢

நன்ற

ขอขอบคุณครับ

Obrigado

Σας ευχαριστούμε

Tack ska ni ha

شُكْرًا

Большое спасибо

Danke

Gracias