

VDMA Fuel Cell Survey 2017

Economic Situation and Outlook of the Fuel Cell Industry in Germany

**Hannover Fair
Public Forum, Hall 27
26 April 2017**

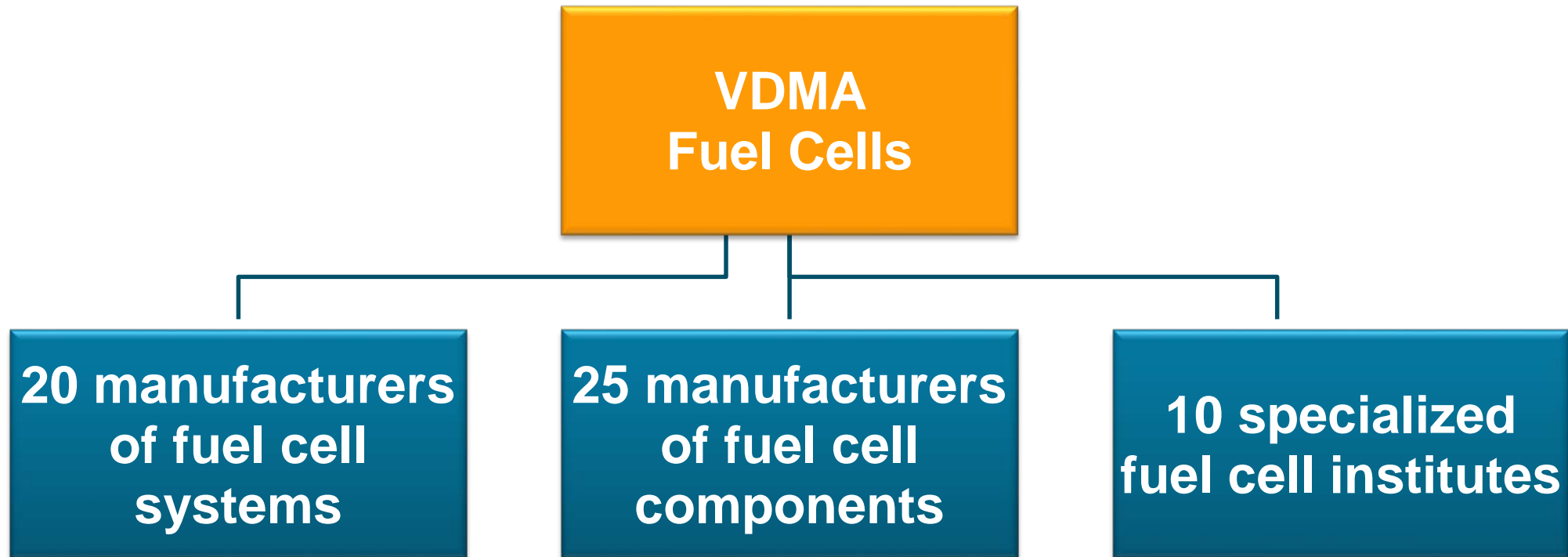
VDMA Fuel Cells

Members



VDMA Fuel Cells

Member's structure

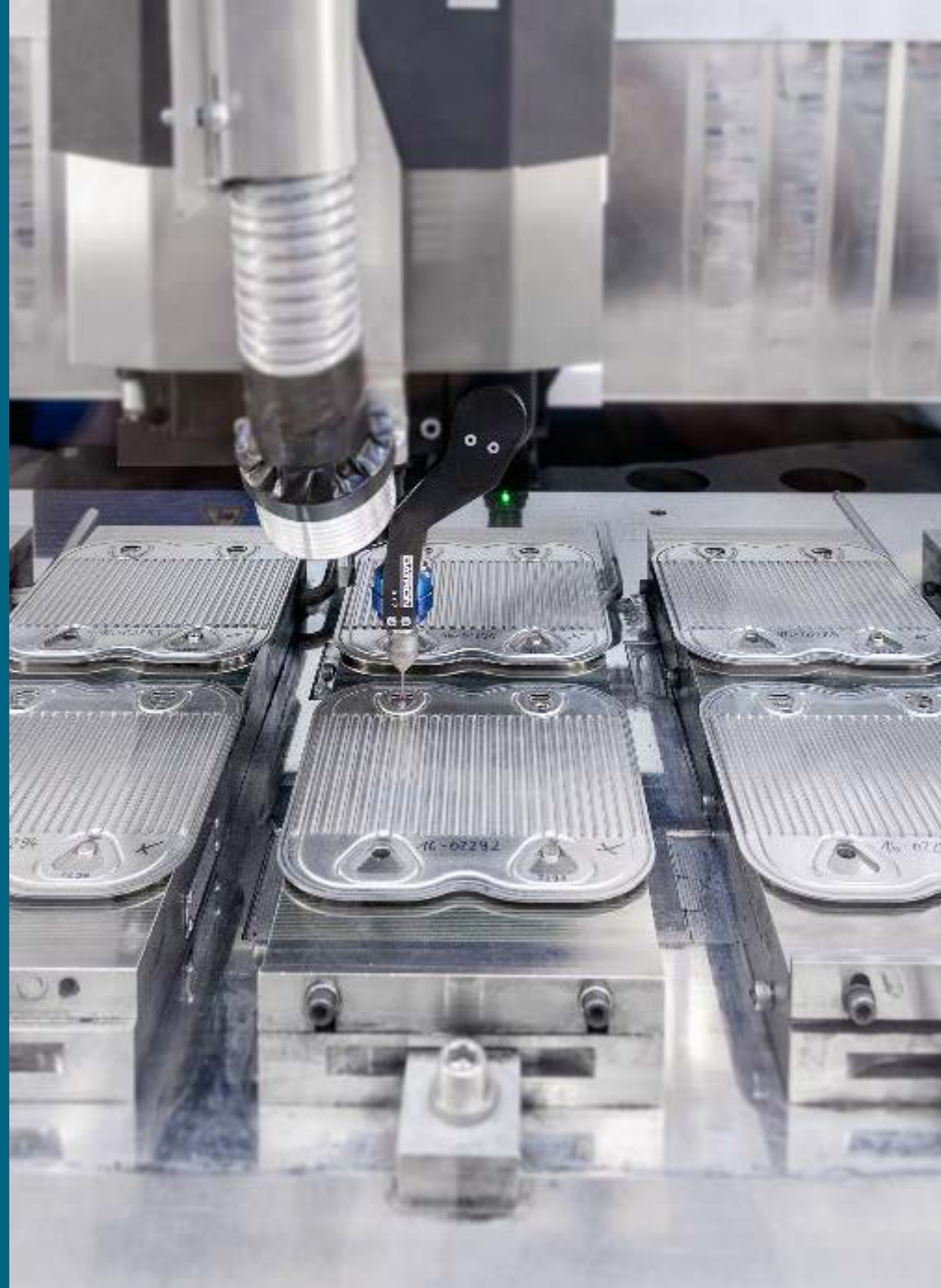


VDMA Fuel Cells Survey 2017

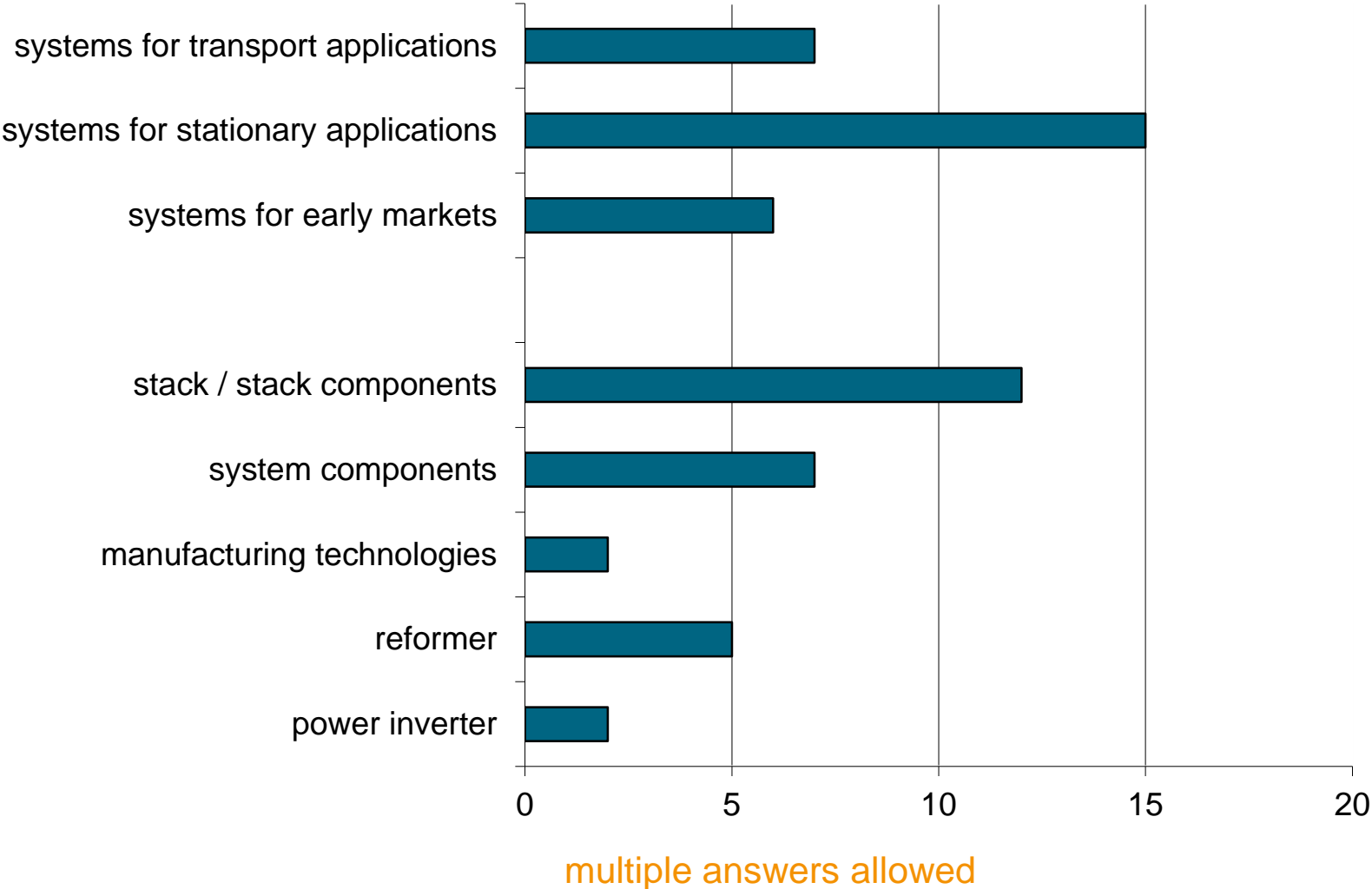
**Economic Situation and Outlook of the
Fuel Cell Industry in Germany**

**Revenues, Employment and Systems in
Stationary Applications and Early Markets**

**Dr. Manfred Stefener, Chairman
Johannes Schiel, Managing Director
VDMA Fuel Cells**



VDMA Fuel Cells Survey – 36 Participants

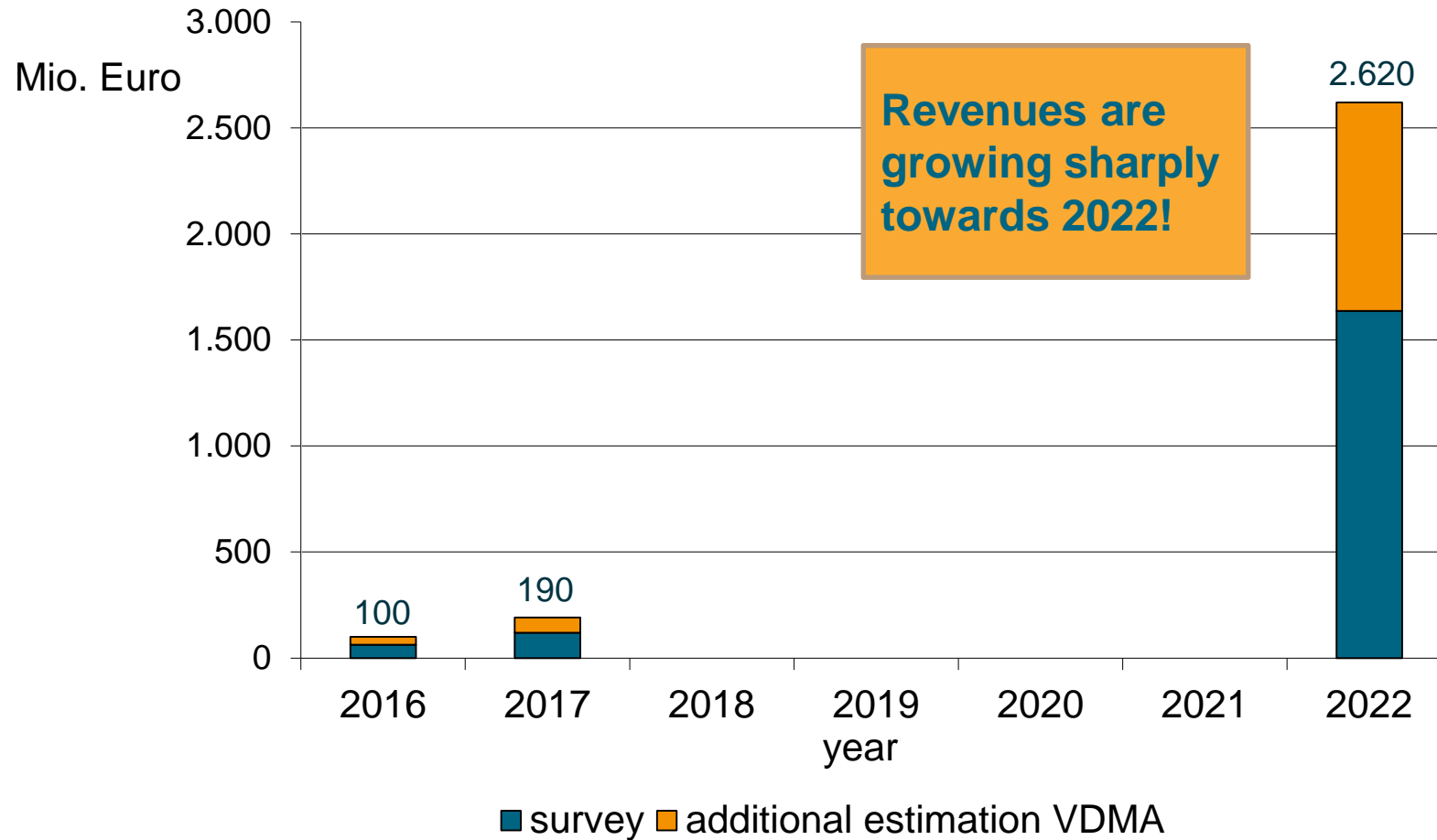


VDMA Fuel Cells – Survey 2016/2017

Revenues – Stationary and Early Markets in Germany in Million Euro



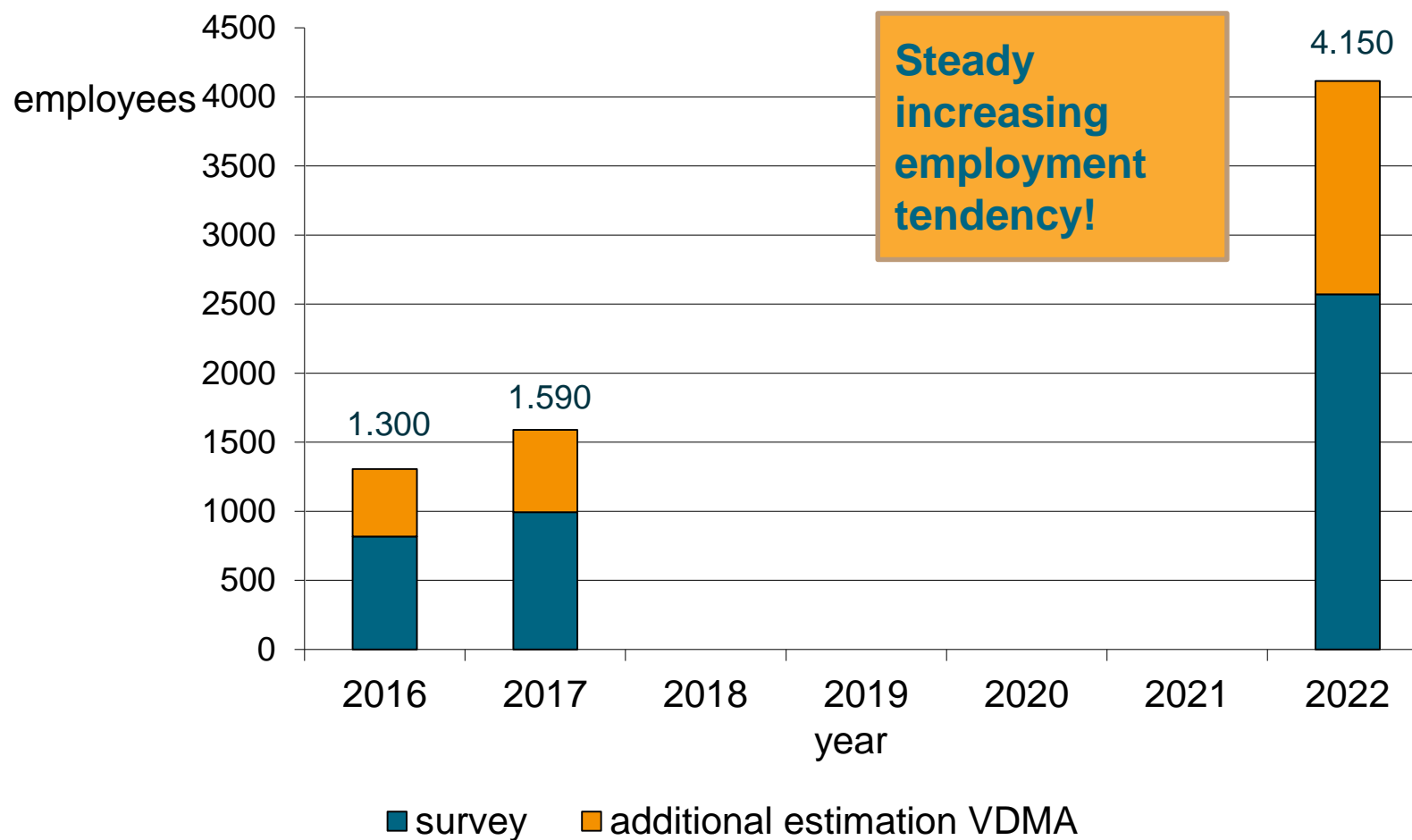
revenues from production in Germany



VDMA Fuel Cells – Survey 2016/2017

Employees – Stationary and Early Markets in Germany

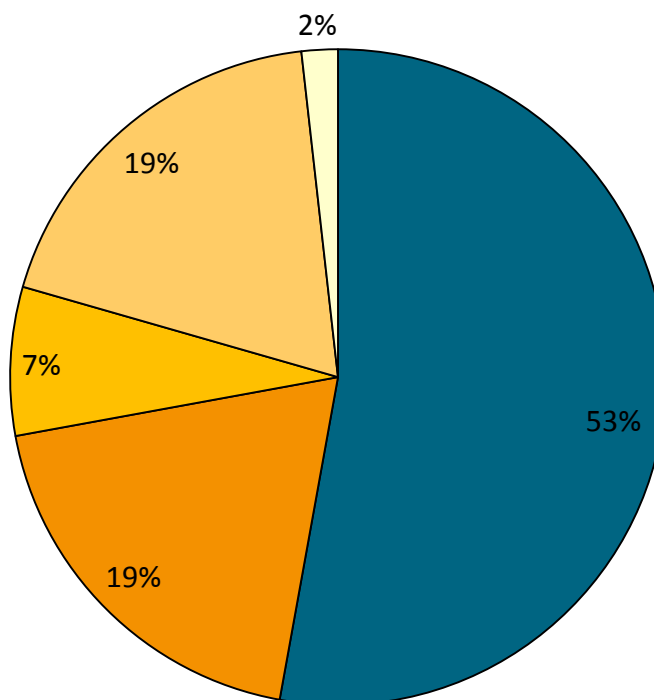
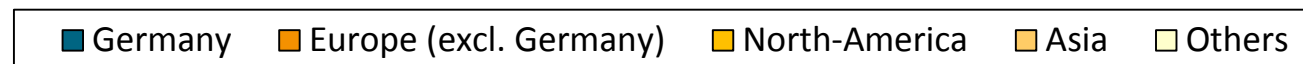
employees in Germany



VDMA Fuel Cells – Survey 2016/2017

Revenue - Stationary and Early Markets by markets* in percent

global revenues from production in Germany



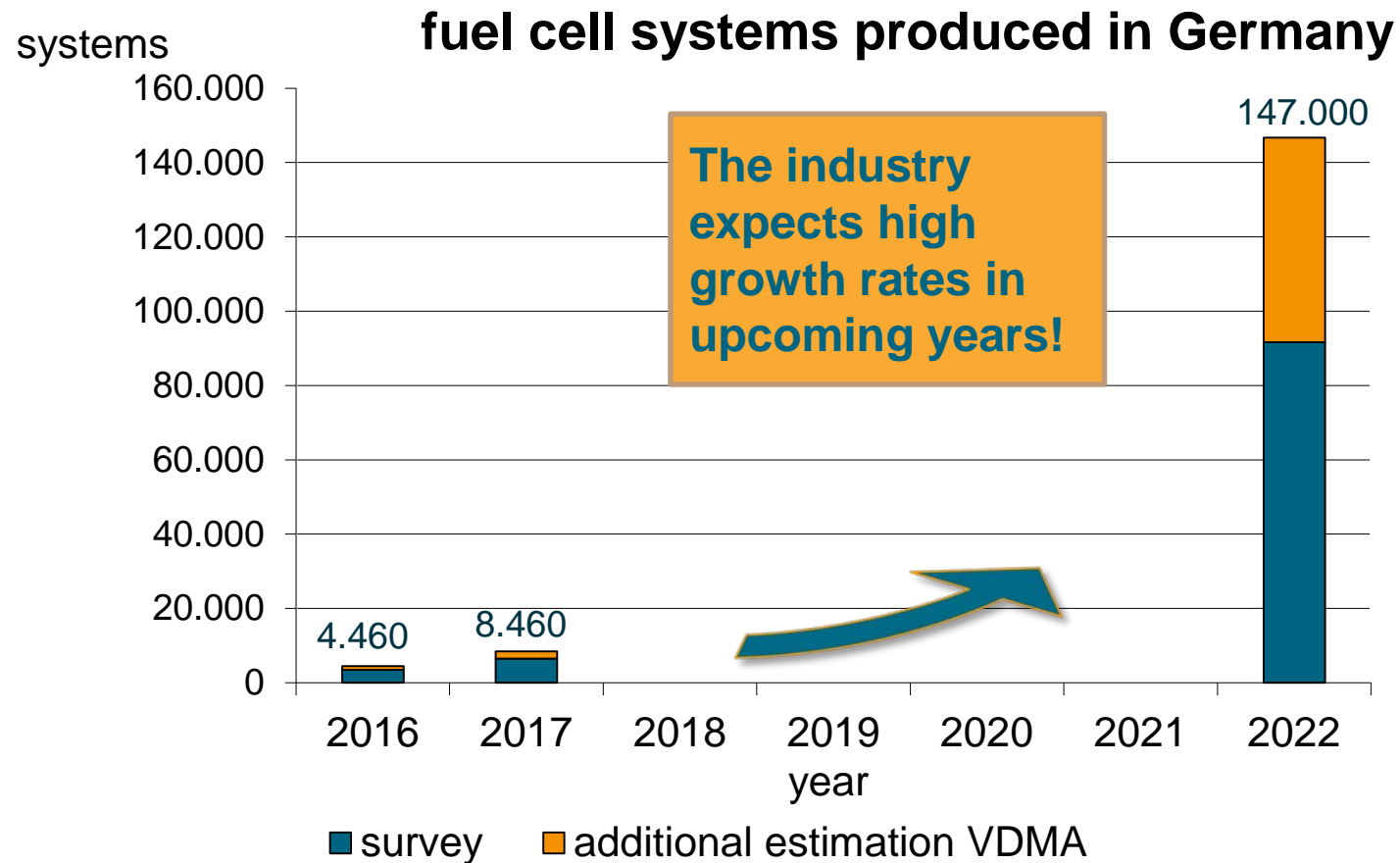
Global market variety is visible already in 2016!

* average market share

Export markets for goods and services sum up to 47%

VDMA Fuel Cells – Survey 2016/2017

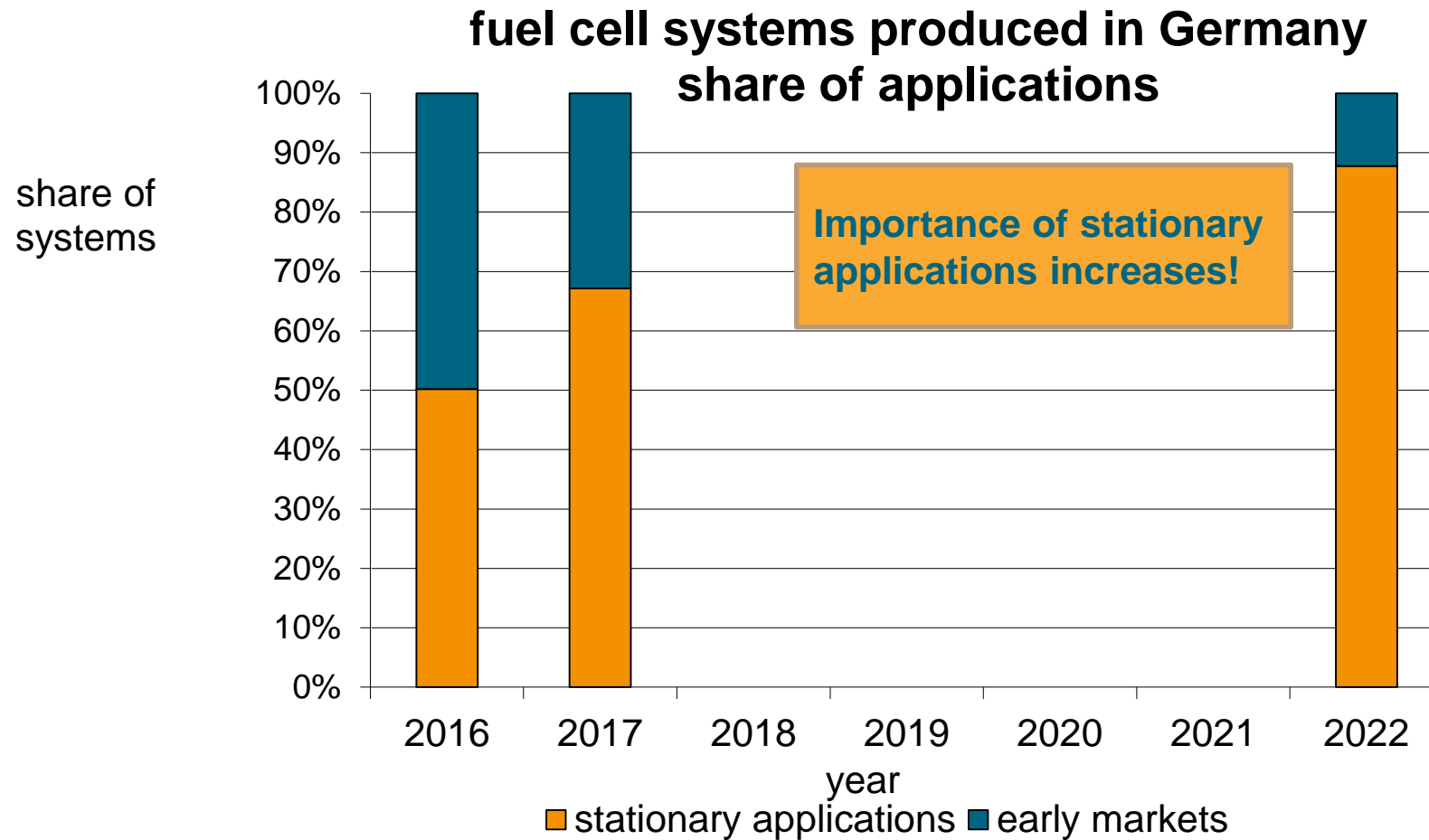
Units per year – fuel cell systems annually produced in Germany



The industry expects high growth rates the next years

VDMA Fuel Cells – Survey 2016/2017

Share of applications – fuel cell systems annually produced in Germany



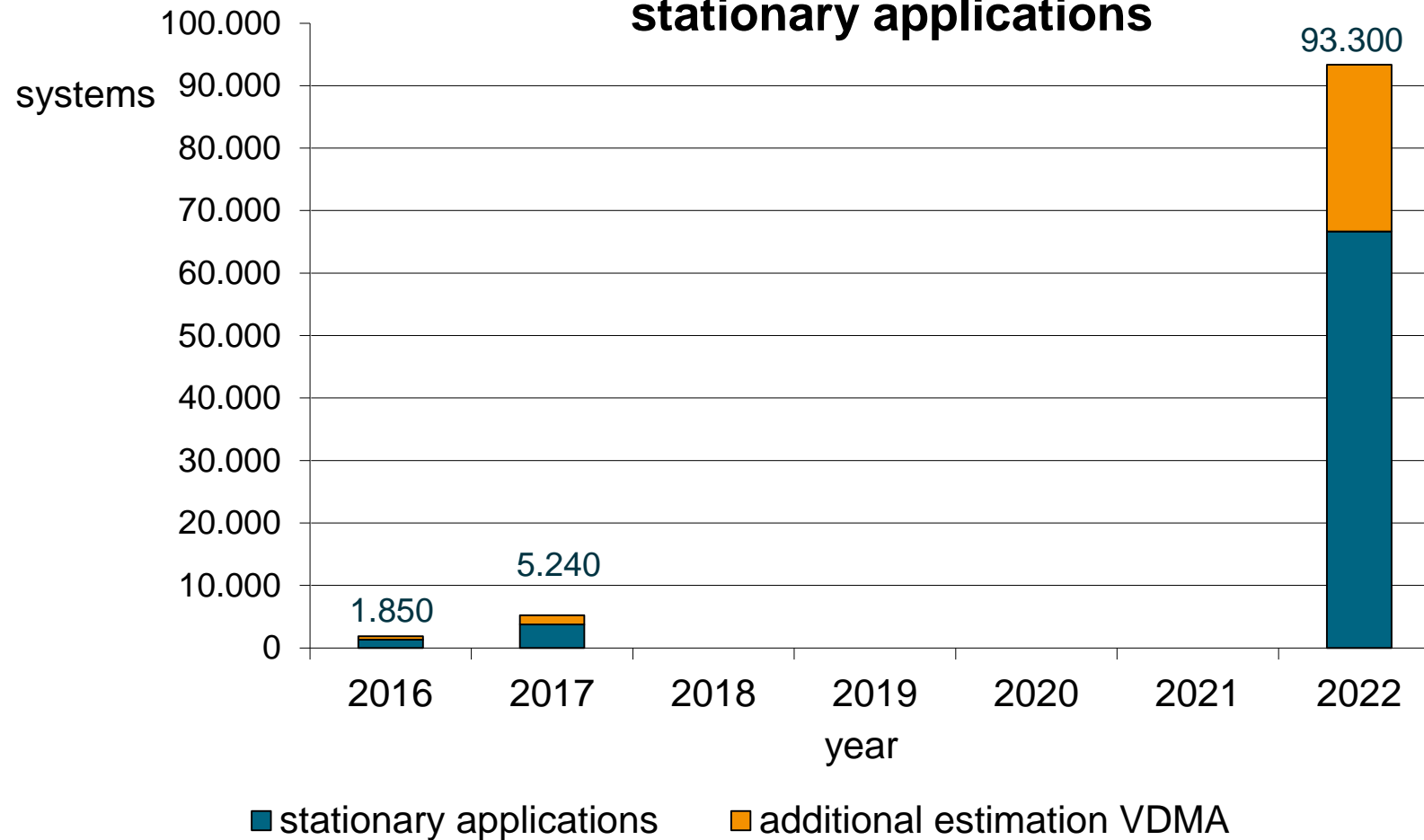
Importance of stationary applications increases!

VDMA Fuel Cells – Survey 2016/2017

Stationary applications – fuel cell systems annually produced in Germany



fuel cell systems produced in Germany for stationary applications

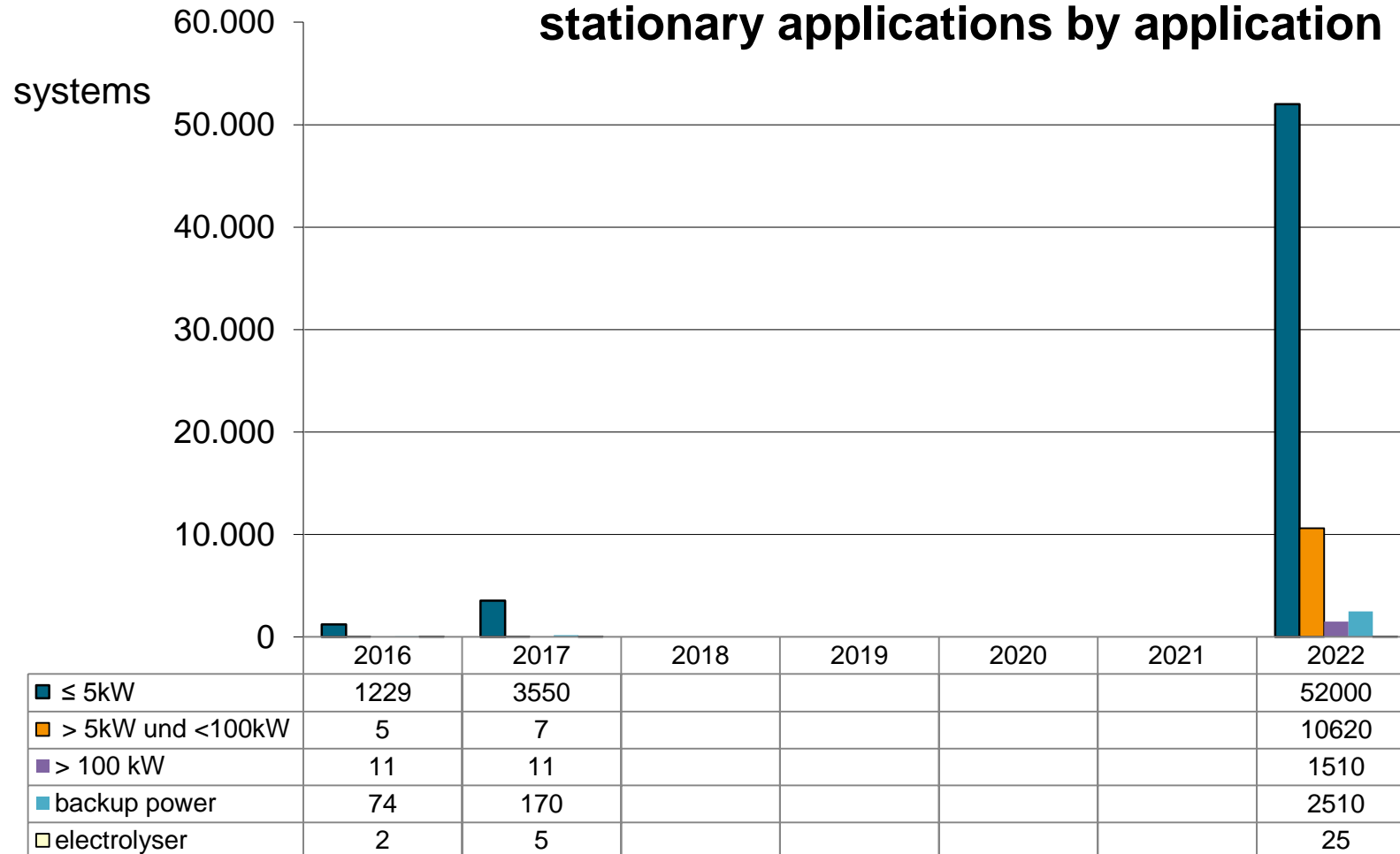


VDMA Fuel Cells – Survey 2016/2017

Stationary applications – fuel cell systems annually produced in Germany



fuel cell systems produced in Germany for stationary applications by application

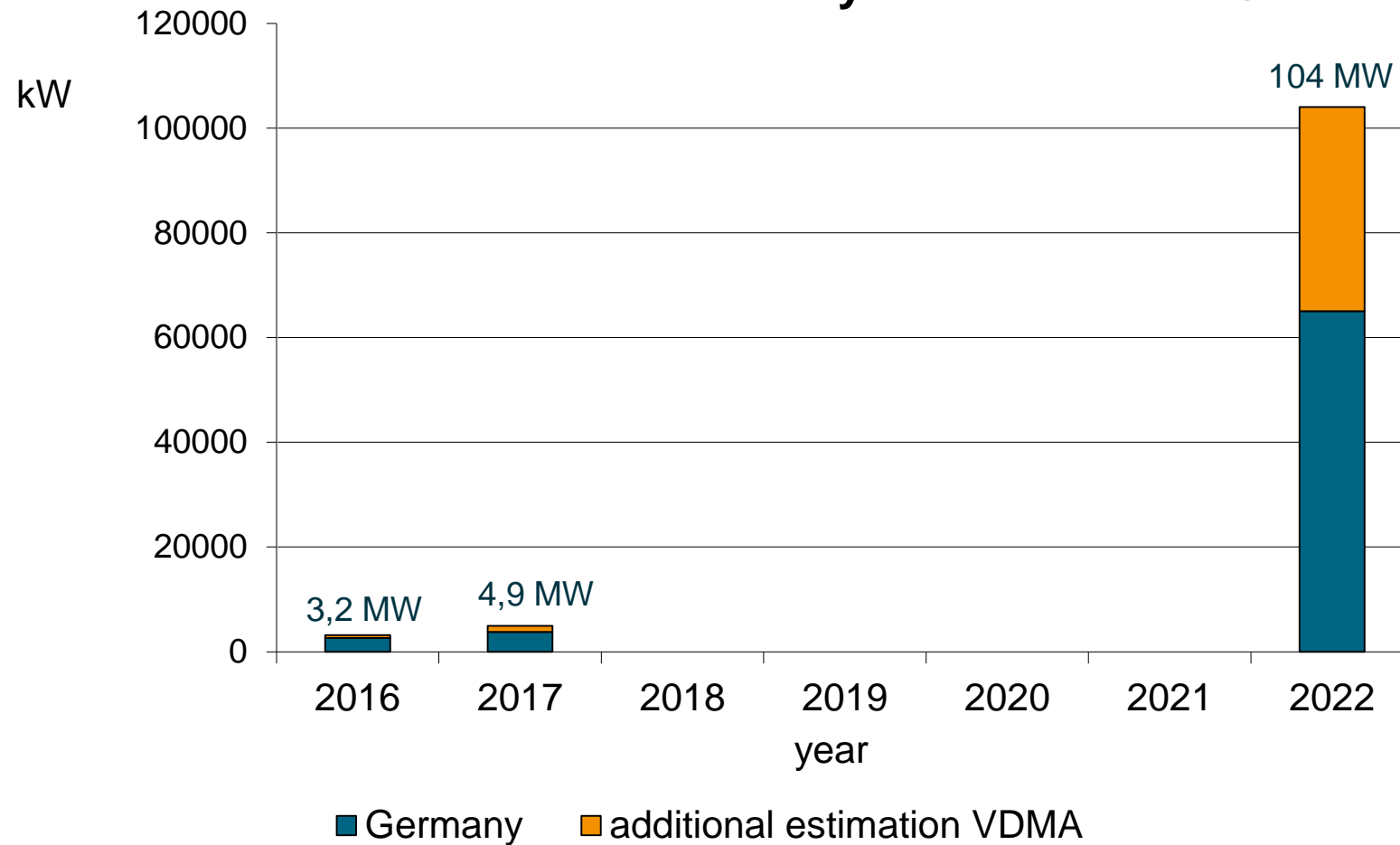


VDMA Fuel Cells – Survey 2016/2017

Stationary applications – annually installed fuel cell capacity in Germany

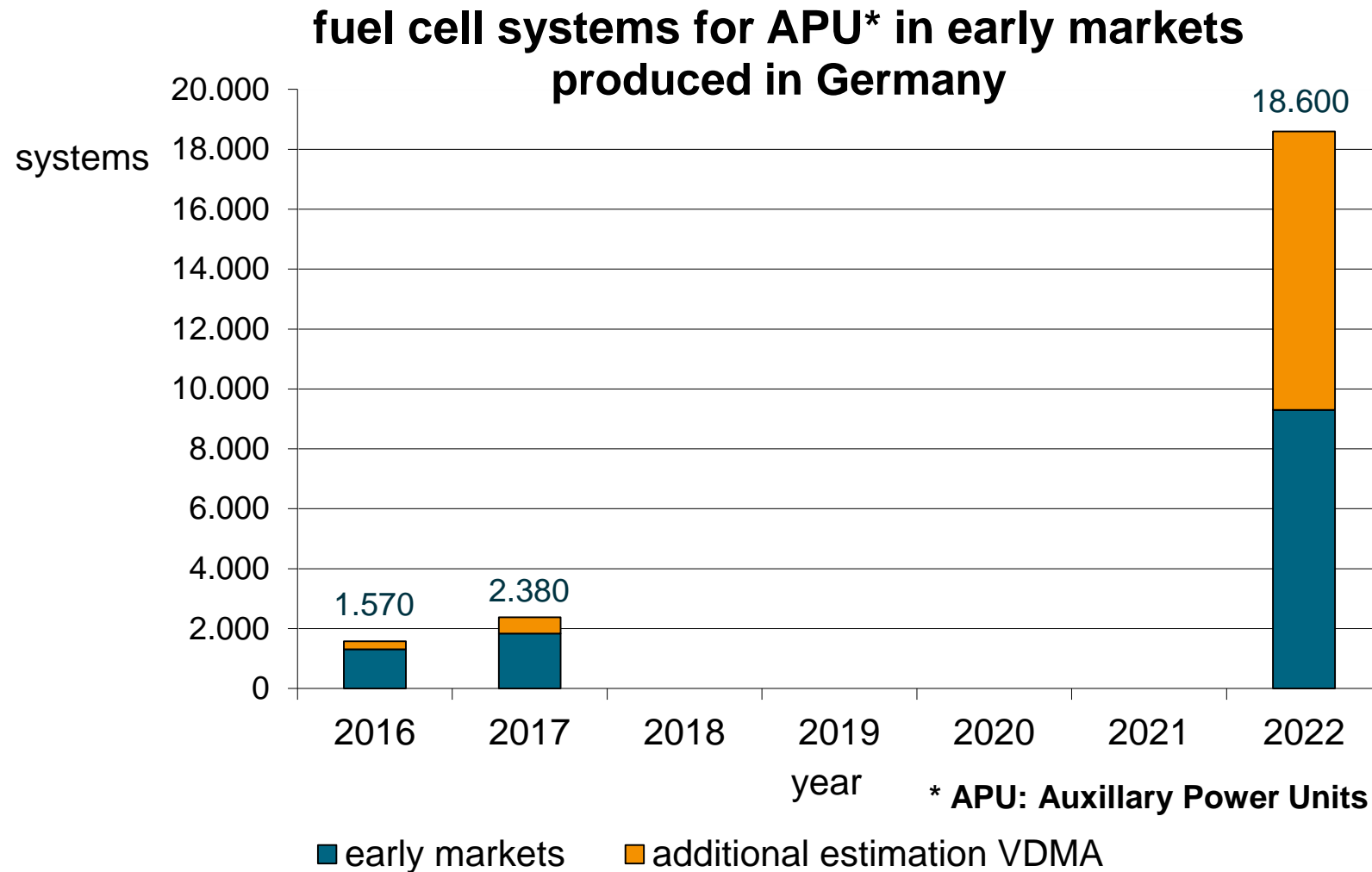


Annual stationary installations in Germany



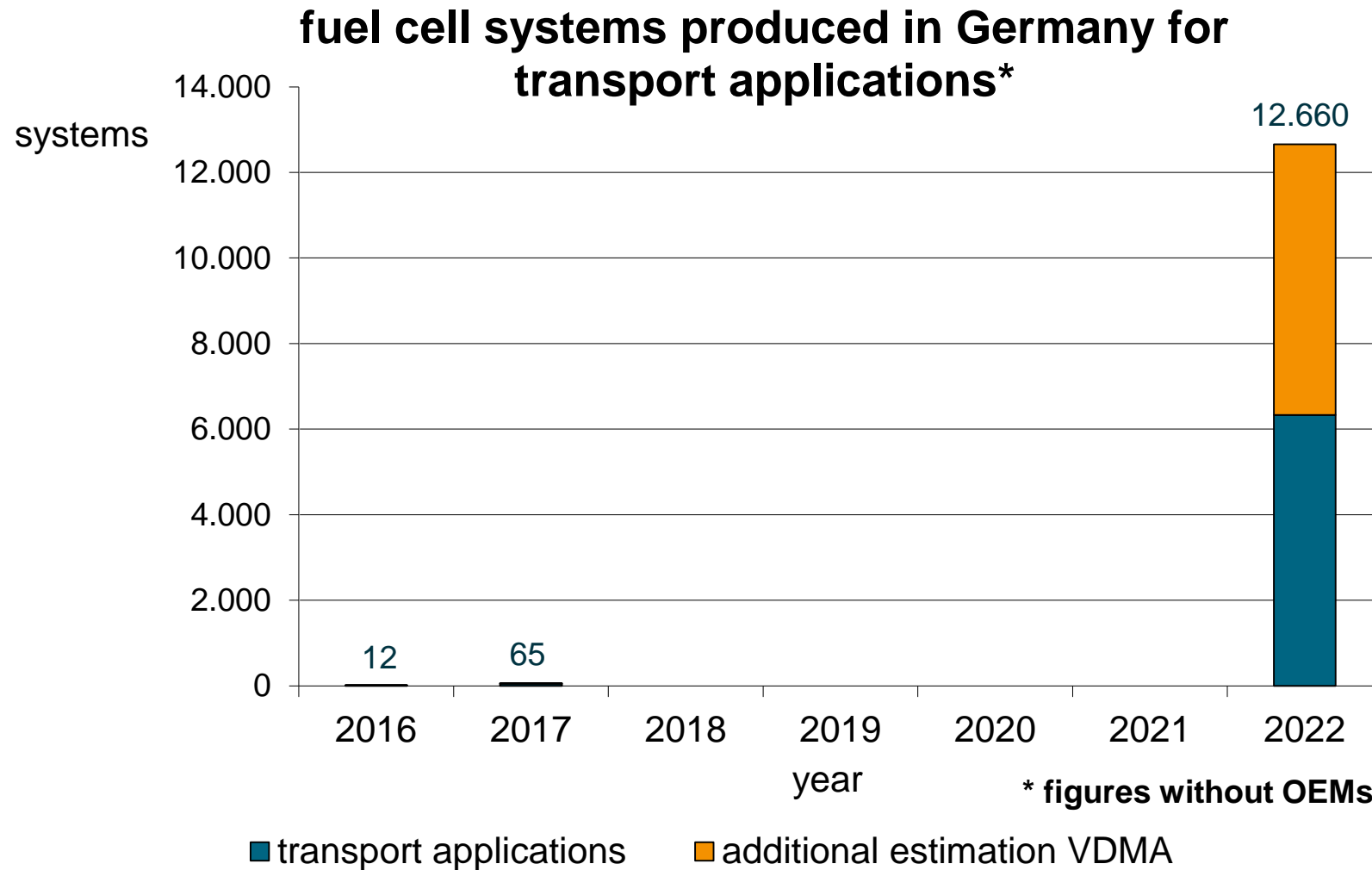
VDMA Fuel Cells – Survey 2016/2017

Units per year – APU in early markets



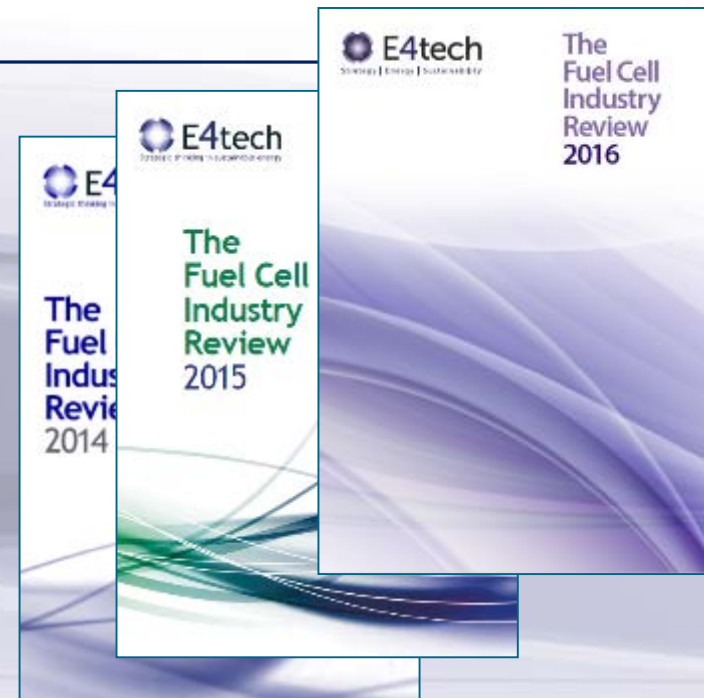
VDMA Fuel Cells – Survey 2016/2017

Transport applications – fuel cell systems produced in Germany



Fuel Cell Industry Review 2016

Franz Lehner
Hannover Fair 2017
26.04.2017

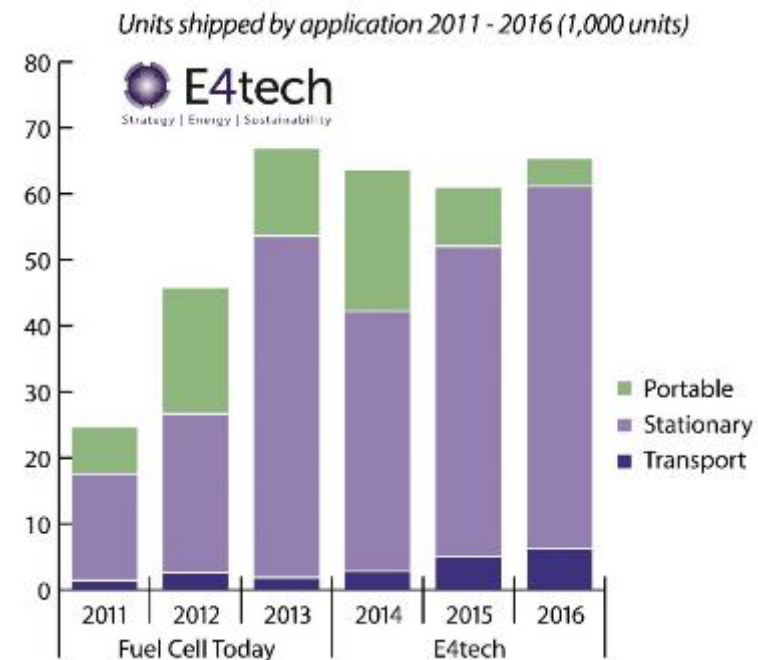
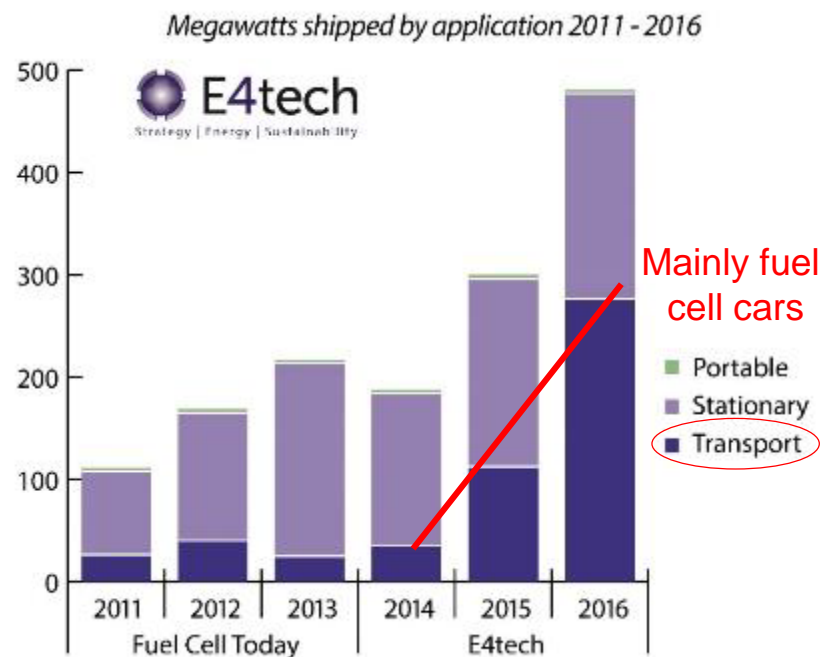


Global fuel cell industry is rapidly growing mainly due to transport applications, starting from low level

Continued strong growth in transport sector, dominated by Toyota's Mirai

Strong stationary *unit* sales due to domestic ene-farm fuel cell program in Japan; *MWs* growing slowly

Portable units decrease further as consumer chargers are discontinued



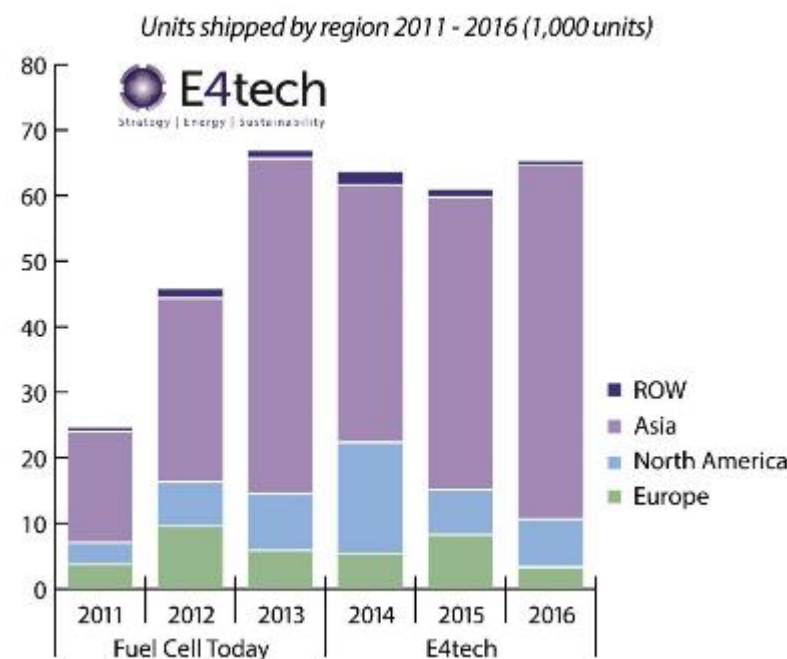
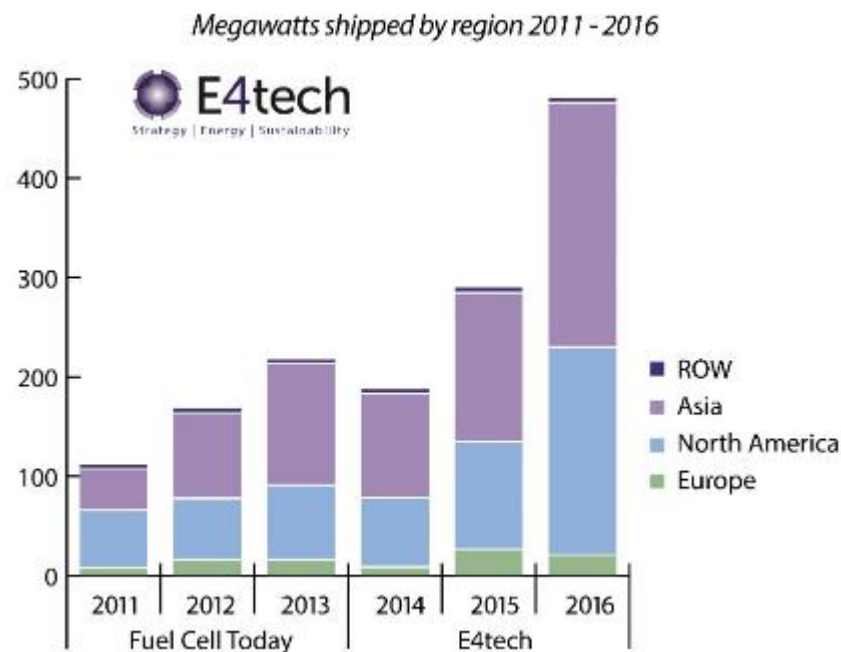
The detailed report can be downloaded for free from: www.FuelCellIndustryReview.com

Currently limited fuel cell markets are mainly concentrated in US, Japan and South Korea

Leading markets for fuel cell applications are still Japan (mCHP systems and cars), South Korea (MW-class CHP) and US (MW-class CHP, forklifts and cars)

Thanks to an extensive support program, China is also becoming a lead market

Europe is technologically well positioned, but sales lag other regions



The detailed report can be downloaded for free from: www.FuelCellIndustryReview.com

Differentiation by types of applications

Application type	Portable	Stationary	Transport
Definition	Units that are built into, or charge up, products that are designed to be moved, including auxiliary power units (APU)	Units that provide electricity (and sometimes heat) but are not designed to be moved	Units that provide propulsive power or range extension to a vehicle
Typical power range	1 W to 20 kW	0.5 kW to 400 kW	1 kW to 100 kW
Typical technology	PEMFC DMFC	PEMFC MCFC AFC SOFC PAFC	PEMFC DMFC
Examples	<ul style="list-style-type: none"> • Non-motive APU (campervans, boats, lighting) • Military applications (portable soldier-borne power, skid mounted generators) • Portable products (torches, battery chargers), small personal electronics (mp3 player, cameras) 	<ul style="list-style-type: none"> • Large stationary combined heat and power (CHP) • Small stationary micro-CHP • Uninterruptible power supplies (UPS) 	<ul style="list-style-type: none"> • Materials handling vehicles • Fuel cell electric vehicles (FCEV) • Trucks and buses

The detailed report can be downloaded for free from: www.FuelCellIndustryReview.com

Contact



Manfred.Stefener@elcore.com



johannes.schiel@vdma.org

