Industrial Power Control
Investor and Analyst Webcast
London, 20 November 2012



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Division President
Industrial Power Control (IPC)

Table of Contents

- IPC Segment Overview
- Growth Drivers and Market Opportunities
- Why We Are Winning
- Summary

Disclaimer:

This presentation contains forward-looking statements about the business, financial condition and earnings performance of the Infineon Group.

These statements are based on assumptions and projections resting upon currently available information and present estimates. They are subject to a multitude of uncertainties and risks. Actual business development may therefore differ materially from what has been expected.

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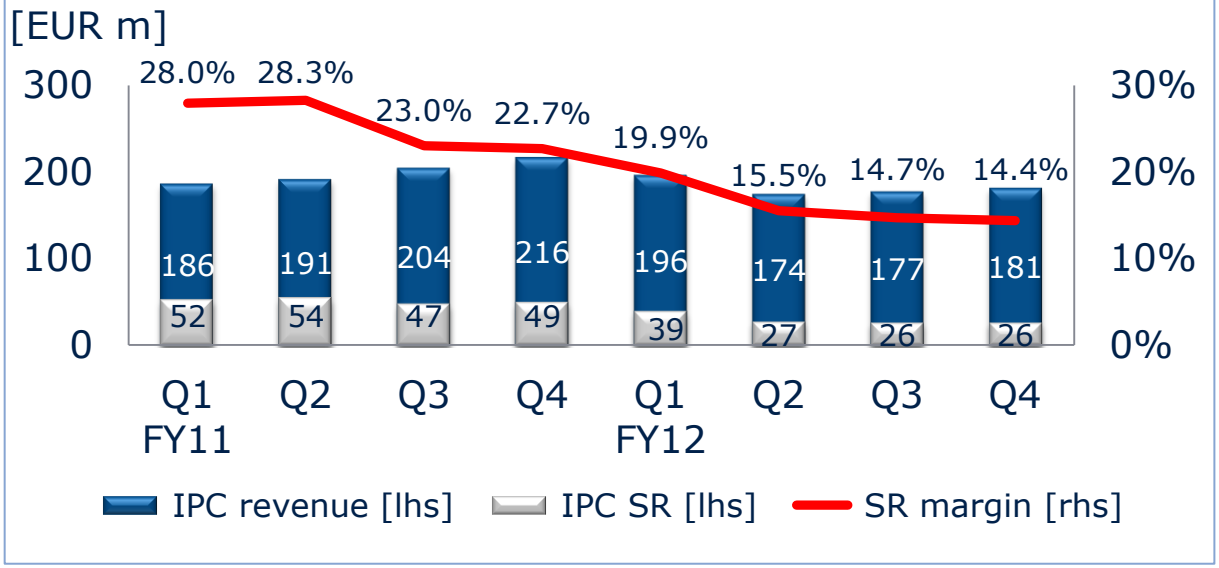
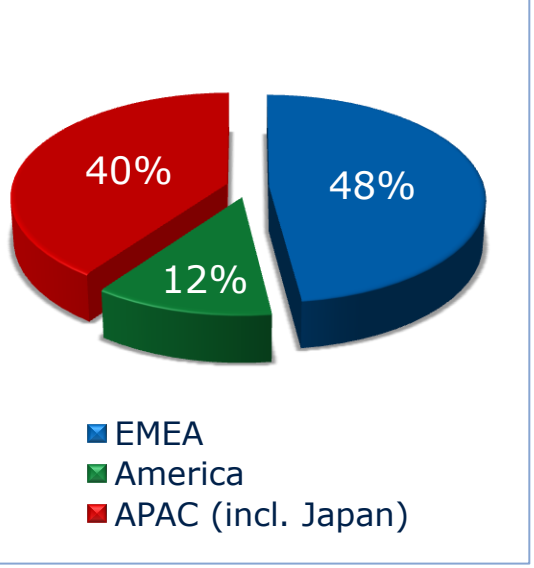
Industrial Power Control (IPC) at a Glance

Revenue and Segment Result development



Revenue split by region*



- Strong sales in Asia, but also Europe given customer base there.
- Revenue stable for last quarters, but very weak order entry given overall economic situation.
- Margin compression driven by top line plus cost of investment in capacity and higher OpEx.

* Based on revenues by fulfillment region for FY 2012.

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Top Customers and Distributors

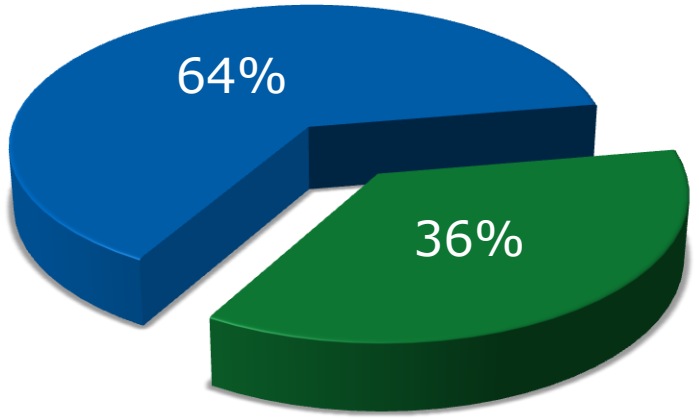
Top customers

ABB
BOMBARDIER
ALSTOM
Danfoss
ENERCON
ENERGY FOR THE WORLD
Rockwell Automation
Schneider Electric
SEMIKRON
innovation + service
SMA
SIEMENS
YASKAWA

Top distributors

ARROW
AVNET
WPG
World Peace Group
北京晶川电子技术发展有限责任公司
Beijing Jingchuan Electronic Technology Development Co.,Ltd

Revenue split by sales channel*



* Based on revenues by fulfillment region for FY 2012.

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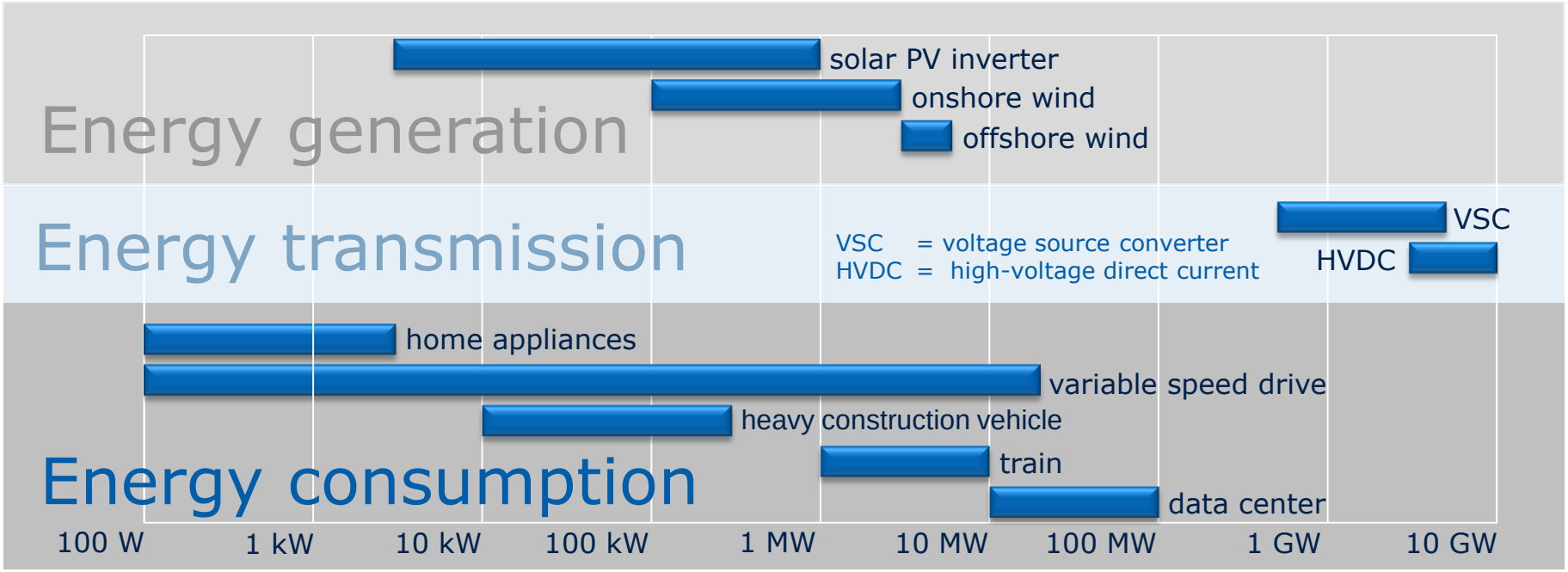
IPC Portfolio Addresses Applications Across a Broad Spectrum of Power Levels



Driver ICs + Discretes



~0.1 kW – ~10 kW

Driver Boards + IGBT modules



~1 kW – ~1.6 MW

Stacks



~100 kW – ~10 MW

Power level of applications and products are approximate.

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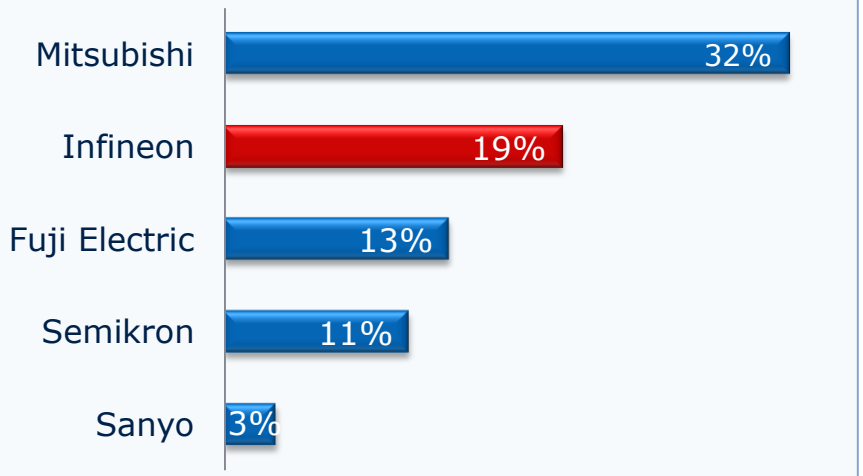
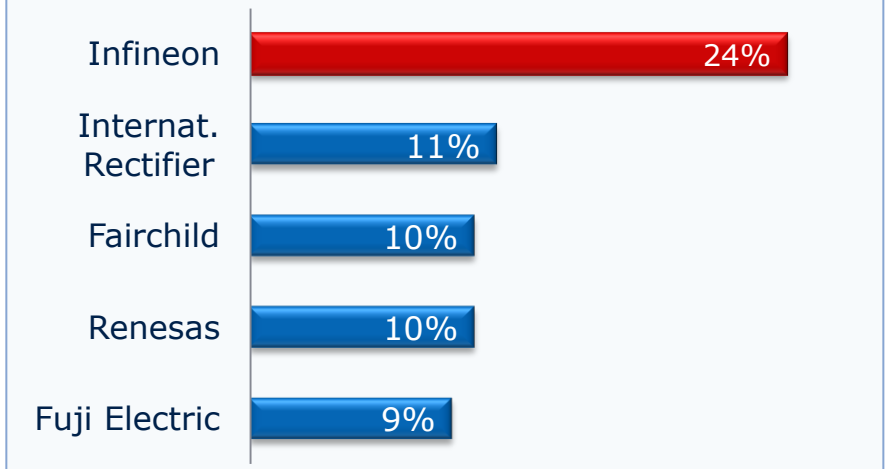
Market Shares Worldwide

IGBT modules 2011*



Discrete IGBTs 2011*



Highlights

- Total market size: $4.1bn.
- Biggest markets: Europe, China, Japan with ~$1bn each.
- Infineon #1 in EMEA (32% m/s), and #1 in Americas (33% m/s).

- Total market size: $1,120m.
- Biggest markets: Europe, China, Japan with ~$300m each.
- 1.5%-points market share gain in 2011 (incl. "bare die" business).

* Source: IMS Research (an IHS company) „Power Semiconductor Discretes & Modules – Edition 2012", August 2012.

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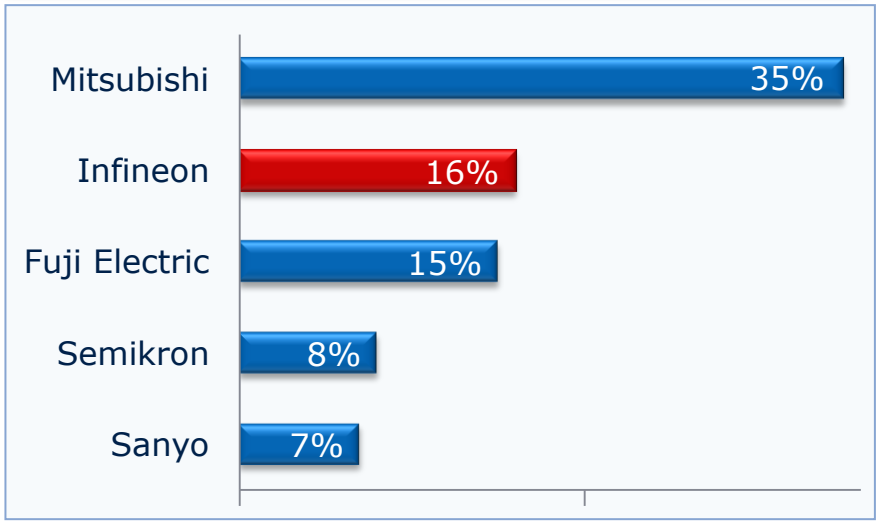
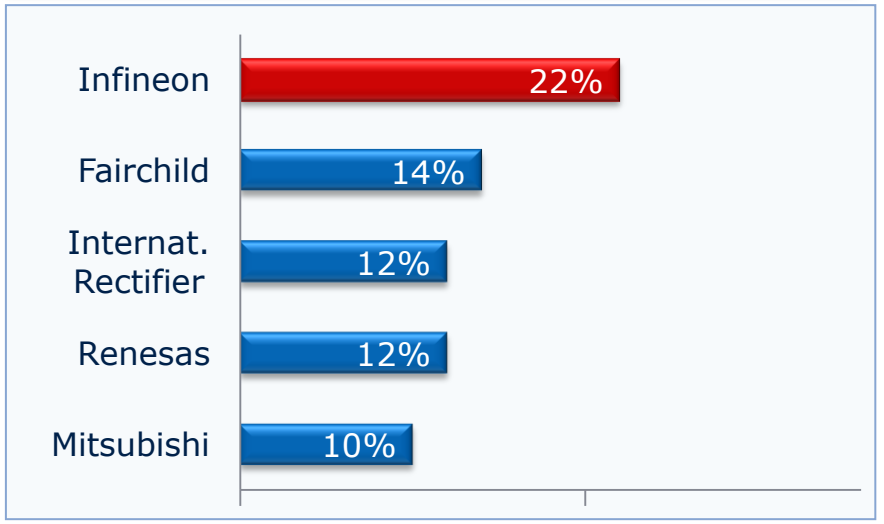
Market Shares in China

IGBT modules 2011*



Discrete IGBTs 2011*



Highlights

- Market size: $1,170m.
- Infineon #1 in APAC (excl. China) with 33% market share.
- Strong position in mid- to high-power modules.

Highlights

- Market size: $309m.
- Infineon also #1 in APAC (excl. China) with 19% market share.
- Major applications: home appliances, induction cooking.

* Source: IMS Research (an IHS company) „Power Semiconductor Discretes & Modules – Edition 2012“, August 2012.

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Drives By Far Biggest Application Segment; Renewables About 20%

Revenue split by application in FY 2012: EUR 728m












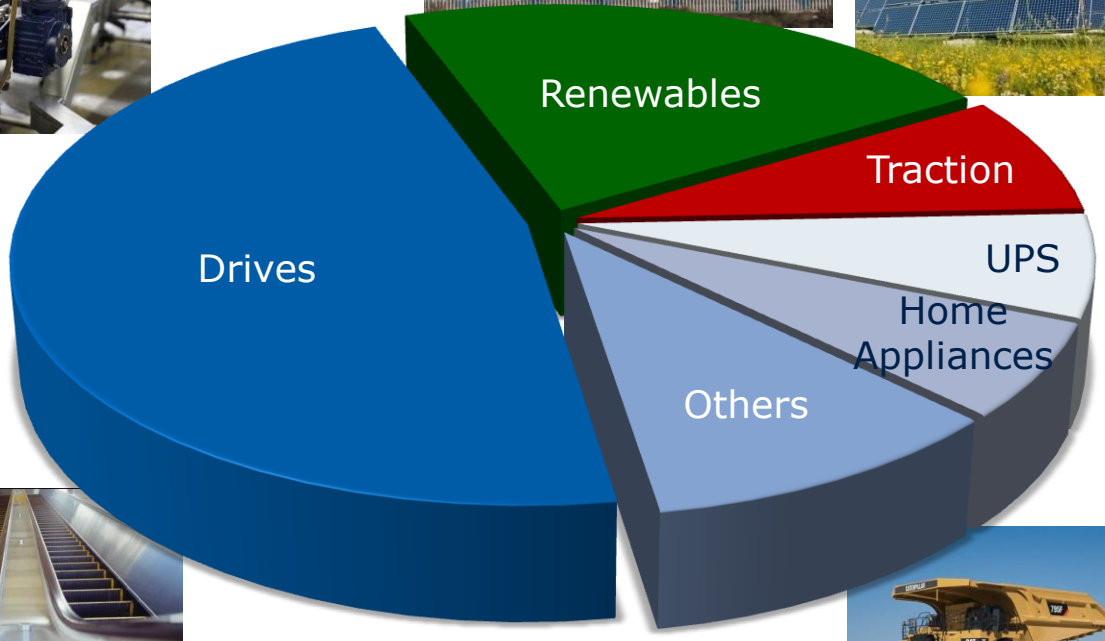

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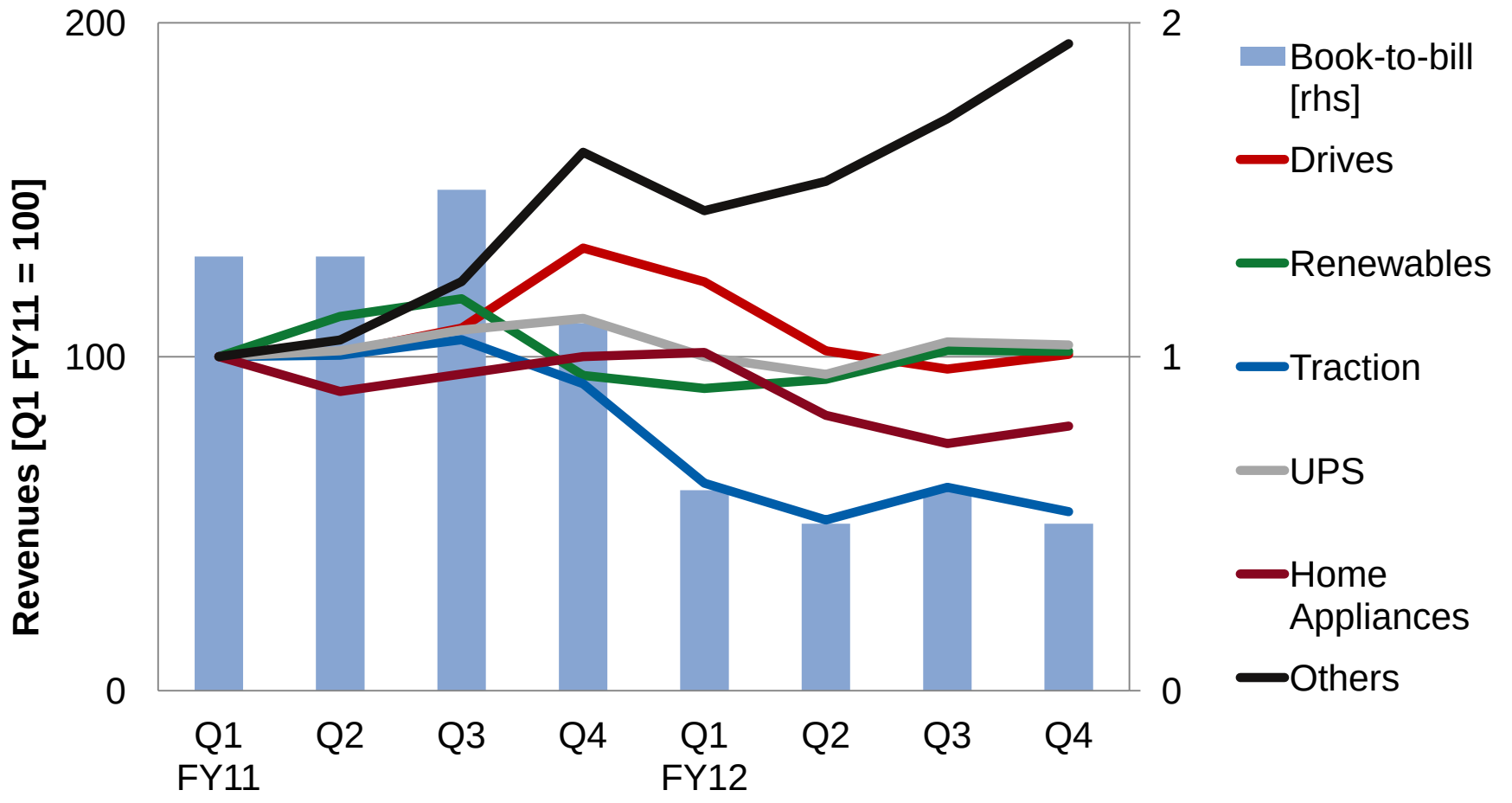
Bookings Cyclically at Very Low Levels

Revenue by application



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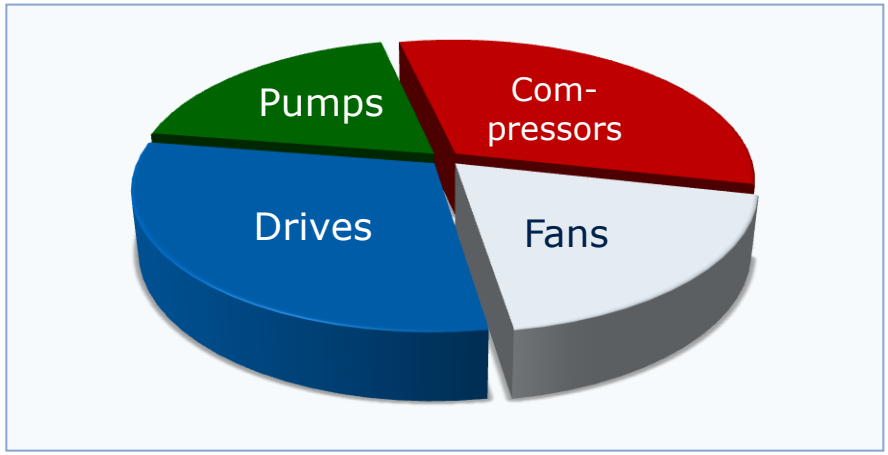
Factory Automation: Huge Savings Potential By Variable Speed Drive (VSD)



Global electricity demand by end-use application of electric motors



Source: International Energy Agency: "Walking the Torque, May 2012

Comments

- About 300m electric motors are in use worldwide, responsible for ~2/3rd of the total industrial power consumption. Depending on the application, up to 30% power can be saved by VSD. Today, just 15% of all electric motors are VSD-controlled.
- "Mechanic goes electric"; e.g. hydraulic is replaced by electric motors.
- Rising labor cost in low labor cost countries drives automation level.

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Wind: All-time High in 2012; 2013 to Suffer From PTC Cuts in the US

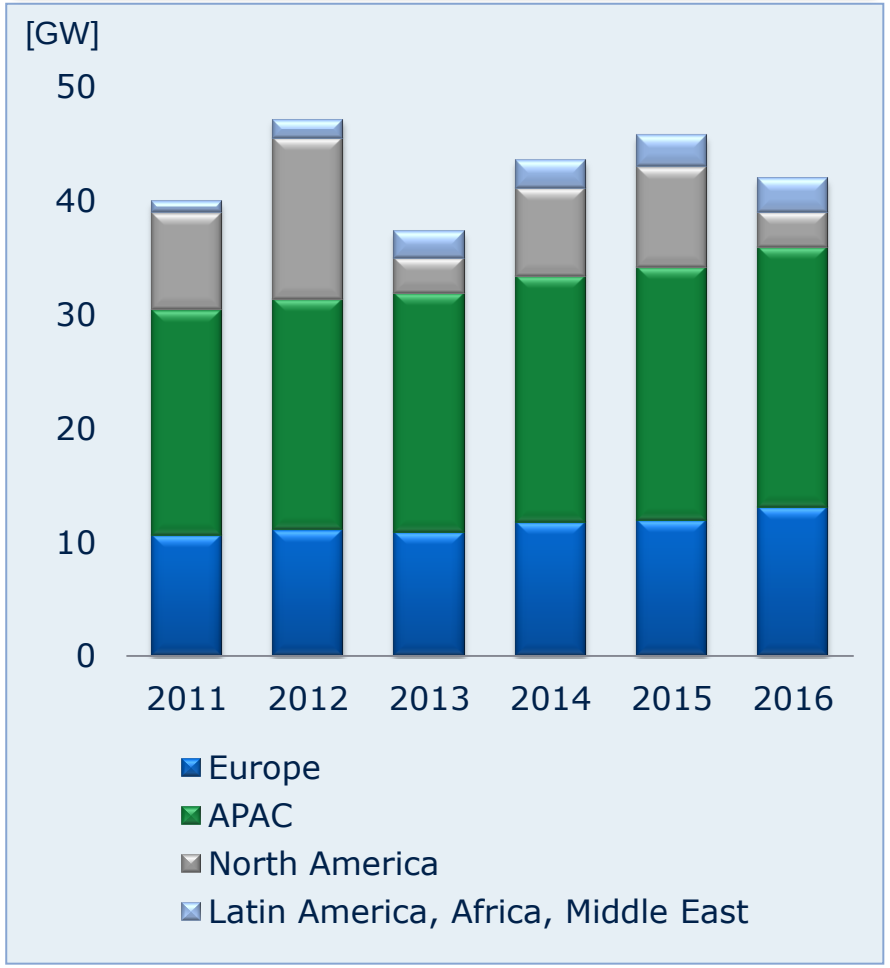


Comments

- Drop in the US wind market due to cuts in PTC*.
- Ongoing grid coupling problems in China still limit faster growth of new installations.
- South America on the rise.
- Europe stable (both in new installations and repowering).

*PTC = renewable energy production tax credits.

Market development wind



Source: IHS: "Global Wind Energy Market Forecast", June 2012

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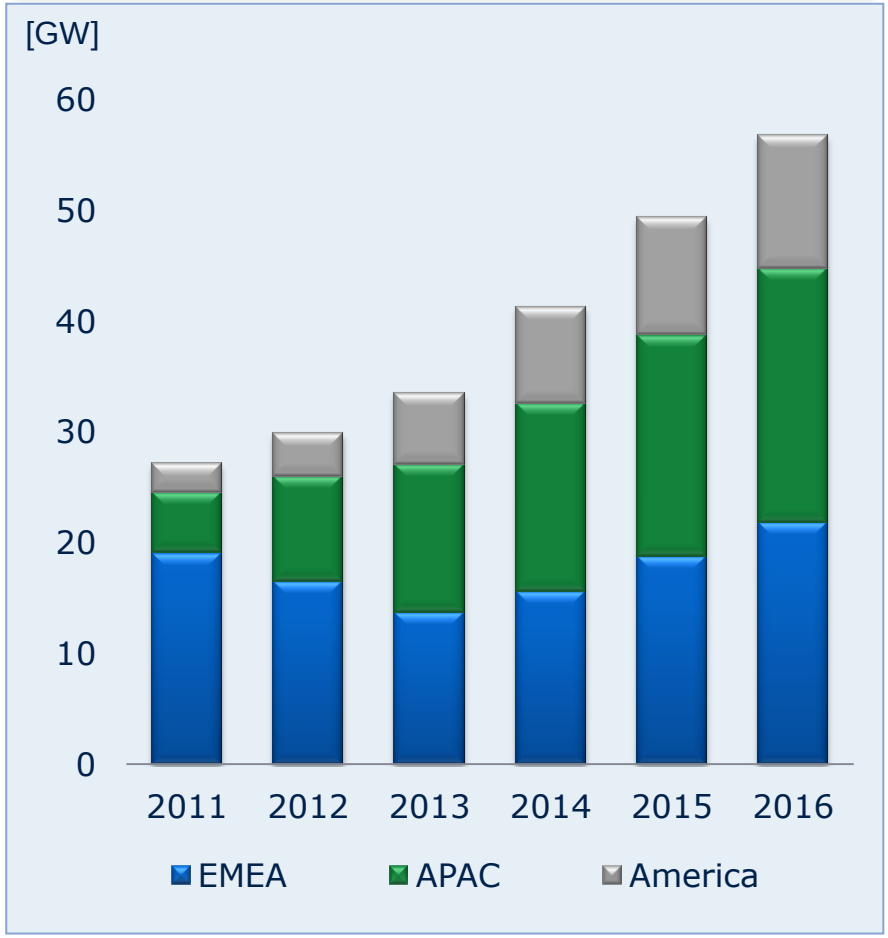
Photovoltaics: Europe to Dip in 2013; APAC And the Americas Continue to Grow



Comments

- Germany: Rush in 2012 before FiTs are cut.
- Japan: New FiTs since July 2012 as part of the new clean energy policy.
- China: Expected to be the biggest market from 2013 onwards. Utility-scale installations (100 – 500 kW) are dominating the market.

Development of PV inverters



Source: IMS Reserch (an IHS company): "The World Market for Photovoltaic Inverters 2012", July 2012.

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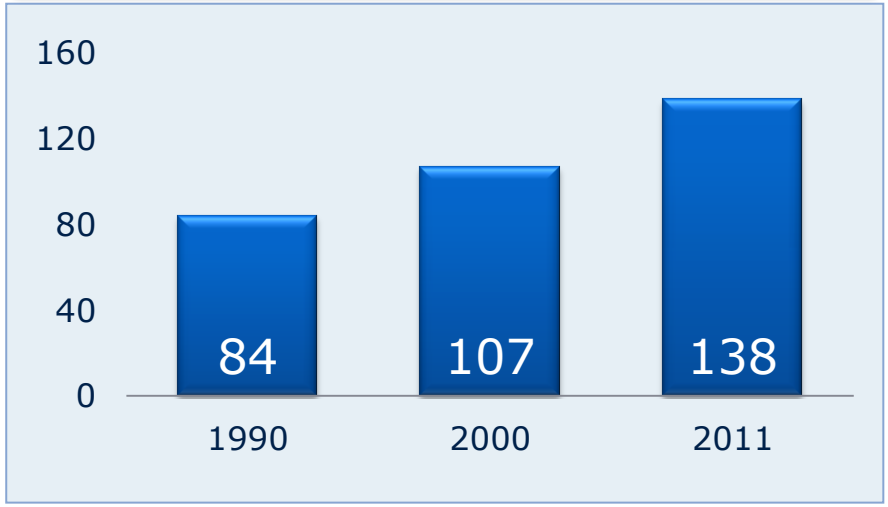
Besides High-speed Trains, Metro Trains Are an Attractive Segment of Traction



Bangkok Skytrain. Courtesy of Siemens.

Market dev. metro systems



Source: SCI Verkehr: “Metrofahrzeuge – Weltweite Marktentwicklung”, 2012

Comments

- Deployment of metro systems driven by increasing urbanization, especially in APAC and the Gulf states.
- Expansion of express railway network included in China’s 12th FYP.
- Semiconductor content per MW of metro trains is comparable to that of high-speed trains.

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Growth Driver Industrial and Off-Road Vehicles

Forklift truck



Hybrid bus



Mining



Trends

- General advantage of pure electric and diesel-electric drives over diesel:
  - less fuel consumption,
  - less CO_2 emission,
  - less noise pollution,
  - less downtime (due to less frequent refueling, less frequent maintenance).
- First industrial vehicles already on the market; hybrid buses and mining vehicles on the rise.

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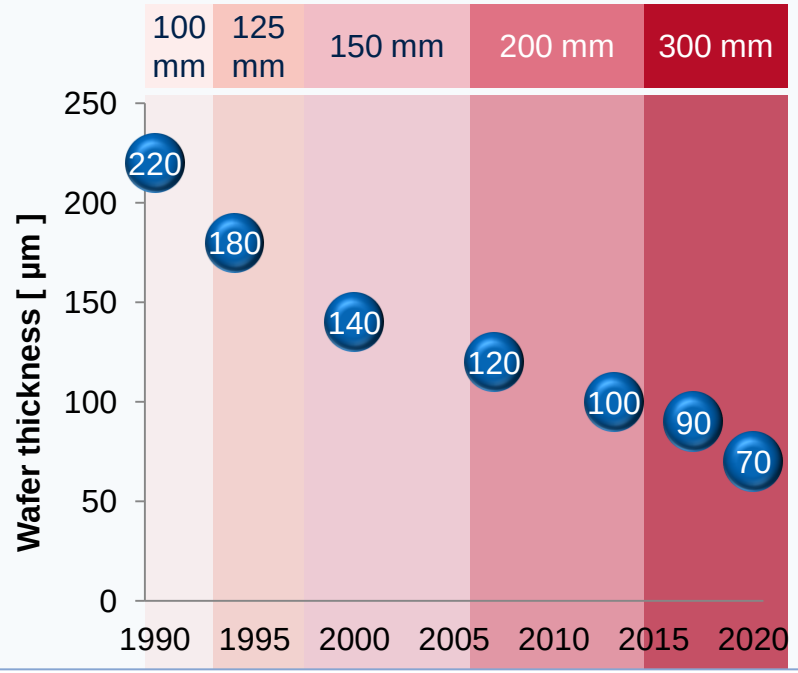
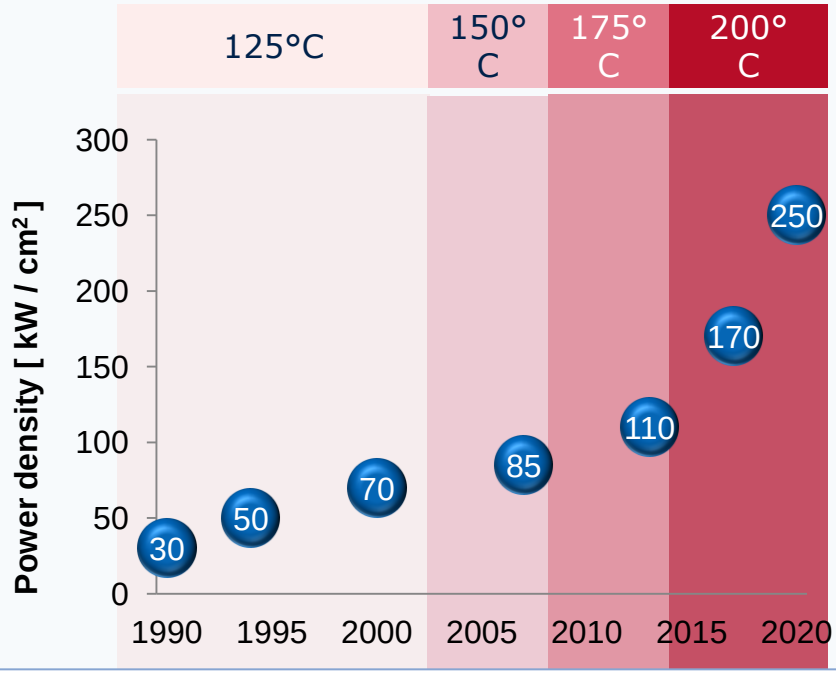
Infineon's Technology Roadmap Focuses on Increasing Wafer Size and Power Density

Increasing wafer size and decreasing wafer thickness



- Wafer thickness will reach 70 µm for 1200-Volt-IGBT products at the end of this decade.

Improvements in power density



- Thinner wafers, improvements in transistor design and higher junction temperatures allow increasing power density.

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New Materials: Silicon-Carbide (SiC)

2001: SiC diode thinQ™	2011: SiC JFET CoolSiC™	2012: SiC Easy Module
		

- Infineon has a ten year track record in SiC technology.
- SiC is used where highest efficiency is key: a.) PV inverters, b.) power supplies for high-end PCs, servers (data centers), telecom.
- SiC is a challenging technology: about a decade from diode to transistor.
- Infineon also provides specialized control circuits and drivers that maximize benefits of SiC technologies.

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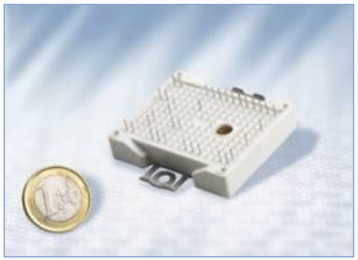
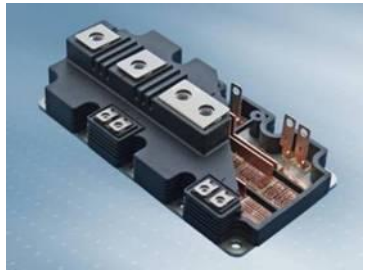
Infineon Further Advances Performance Through Innovations in Modules

Ever-increasing power density

1995	2001	2007	2014
			
IGBT2 ■ 34mm module ■ 1200 V ■ **0.46 kW/cm²** ■ Tj=125° C	**IGBT3** ■ EconoPACK™2 ■ 1200 V ■ **0.89 kW/cm²** ■ Tj=125° C	**IGBT4** ■ EasyPACK2B ■ 1200 V ■ **1.16 kW/cm²** ■ Tj=150° C	**IGBT5** .XT technology ■ PrimePACK™2 ■ 1200 V ■ **1.31 kW/cm²** ■ Tj=175° C

Note: 280% absolute increase of power density. At constant junction temperature (125°C) it would have been >180%.

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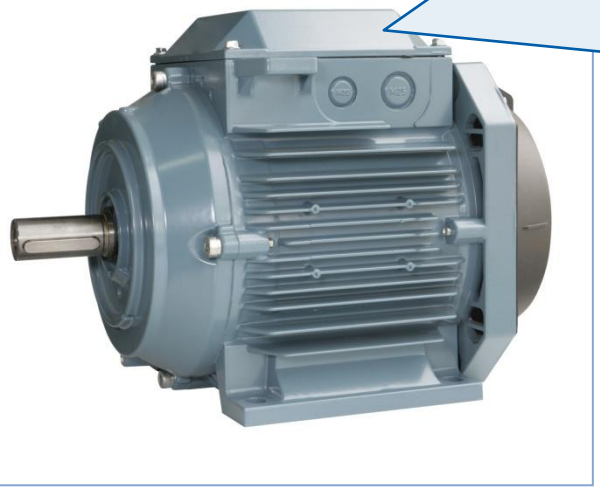
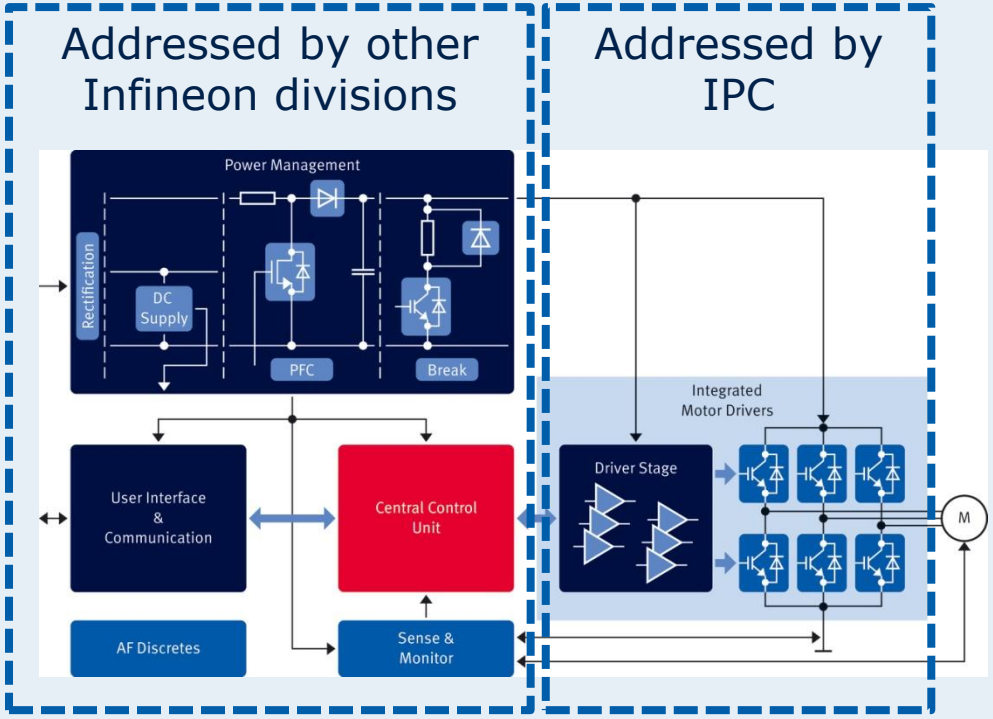
Broad Portfolio and Know-How Enable Infineon to Address System Solutions

Example: variable speed drive





- Combining our technologies, experience and customer relationships to boost Infineon's value-add at the system level.
- Value of power semiconductors is ~60-80% of total semi BoM.
- System know-how and application understanding are prerequisite to develop differentiated products and system solutions.

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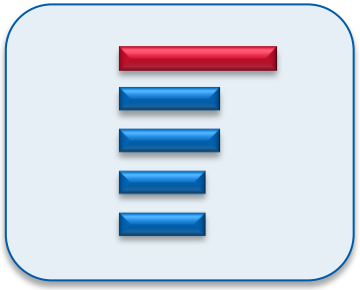
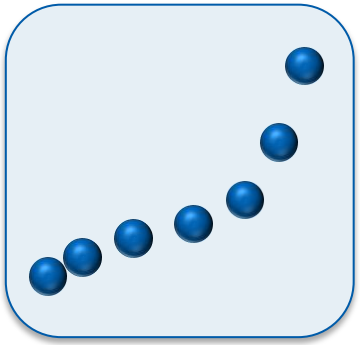
Summary



- Broad portfolio covering all relevant applications and end markets.
- Leading market share in all relevant product groups and regions.



- Strong secular mid- to long-term growth drivers:
  - automation,
  - renewable energies,
  - traction, CAV (commercial & agricultural vehicles),
  - electricity infrastructure and power supply backup solutions.



- Winning technologies:
  - chip / module technologies with superior power density;
  - strong capability in breakthrough material SiC.
- Broad portfolio and know-how enable Infineon to address system solutions; increasing focus on control ICs.

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ENERGY EFFICIENCY
MOBILITY
SECURITY

Innovative semiconductor solutions for energy efficiency, mobility and security.



