Semiconductor Market Outlook

Analog Semiconductor Leaders' Forum
October 2011

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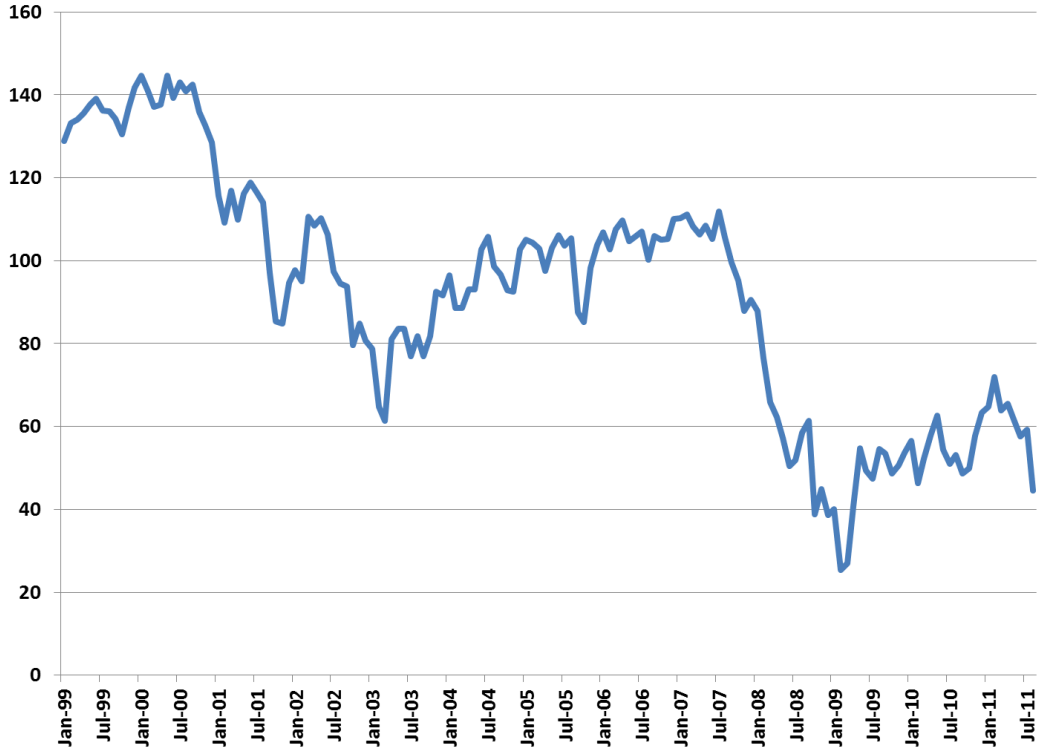
Q3 2011 Update

- Economic Outlook
- Semiconductor End Markets
- Semiconductor Forecast
- MAP Model Data: Analog, Power Management
- Foundries

Macroeconomic Conditions Weak

U.S. Consumer Confidence



Source: Conference Board

- Macroeconomic conditions deteriorated over the summer
- Consumer spending weakened as fears of political and economic instability weighed on consumers

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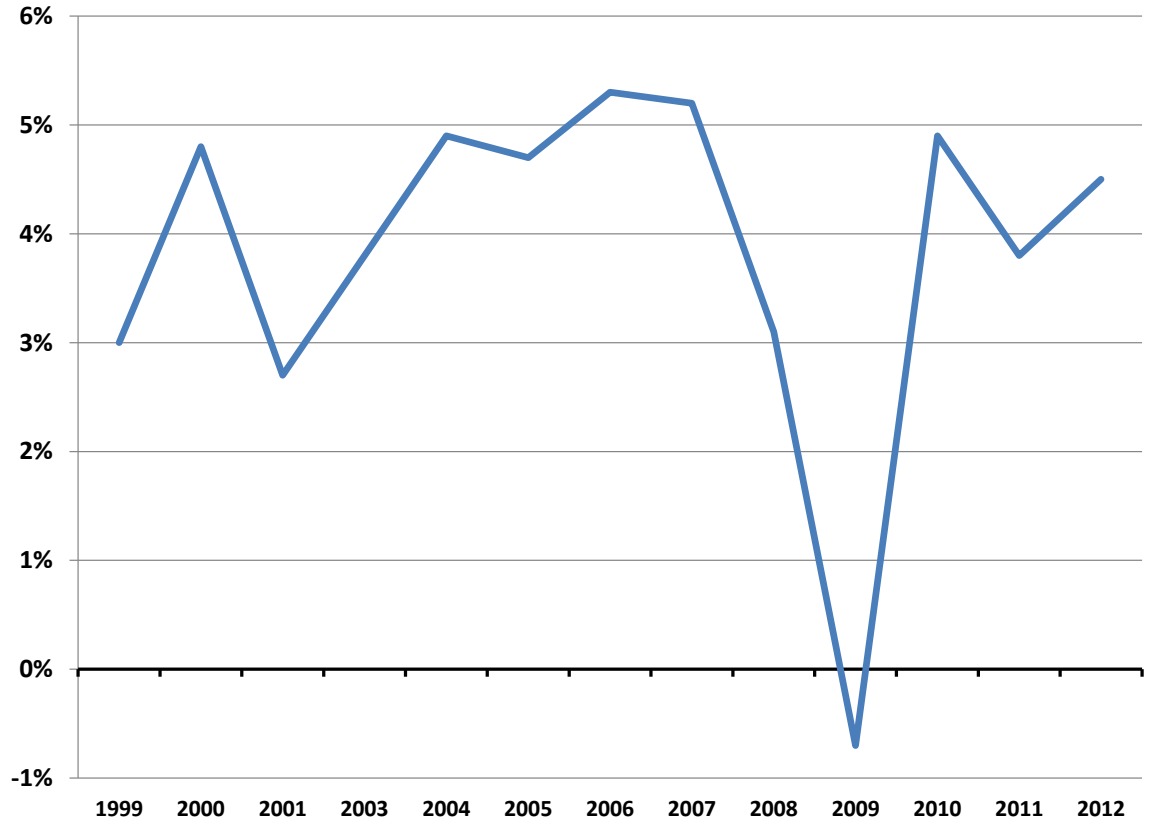
Macroeconomic Conditions Weak

- Automotive seeing a pickup in sales, but slow recovery after Japan earthquake
- Industrials suffering from slowing orders
- In the short term, no positive catalyst to change the economic stagnation

Macro Indicators Point to Downside Risks

World GDP



Source: CIA and Semico Research Corp.

- World GDP drops to 3.8% growth in 2011 after 4.9% growth in 2010
- Improving in 2012 to 4.5% growth
- Main drivers in 2012 include
  - OEMs burning inventories in Q3 & Q4 2011
  - Improved U.S. & Europe economies

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World Outlook 2011

GDP

- China 9.5%
- India 7%
- Korea 6.5%
- Brazil 5.2% 7th largest
- US 2.1%
- EU 1.5%
- Japan 1.1%

Semiconductor End Markets

PC's Disappointing 2H 2011

- Motherboard builds for desktops and servers are slowing in Q3 and expected to continue slowing in Q4
- AMD CPUs are selling out
- Nvidia will introduce its new 28nm GPU this fall putting competitive pressure on AMD graphics
- Back-to-school demand weaker than usual
- Emerging-market demand remains strongest
- Western Europe continues to remain weak

Cell Phones
Mixed Results

- Smart Phones still the promise land
- Asian PCB suppliers report smart phone builds remain robust +10% in Q3, weaker in Q4
- Other phone segments weak in Q3 and Q4

Consumer Electronics

- **PCB shipments below seasonal levels for:**
  - **Set-top boxes**
  - **DVD players**
  - **Digital video**
  - **Cameras**
  - **HDTVs**
  - **MP3 Players**
  - **eReaders**
- **The one exception: Apple Tablets**

Tablets:
The Current Explosion & Shakeout

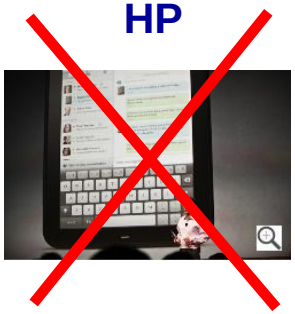
Google

Apple

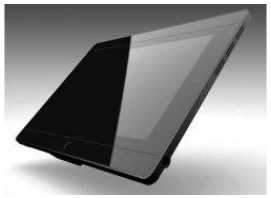
Toshiba

RIM PlayBook

HP



Acer



Samsung

…And 90 Others

Streak 5

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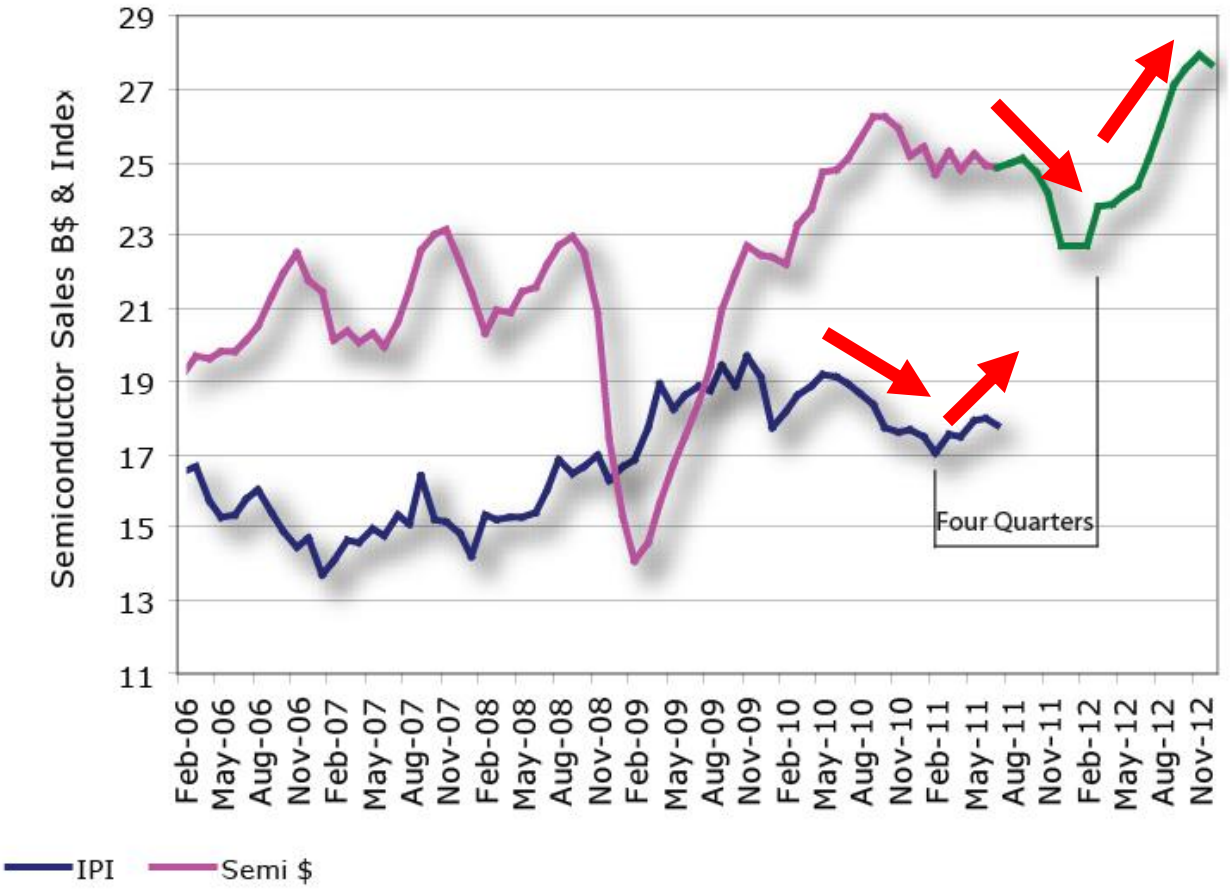
Who Will HP Sell to?

Change in Market Share

	Current Market Share	Samsung	Lenovo	Dell
HP	18%	0%	0%	0%
Dell	13%	13%	13%	31%
Lenovo	12%	12%	30%	12%
Samsung	4%	23%	4%	4%

Semiconductor Forecast

Semico IPI



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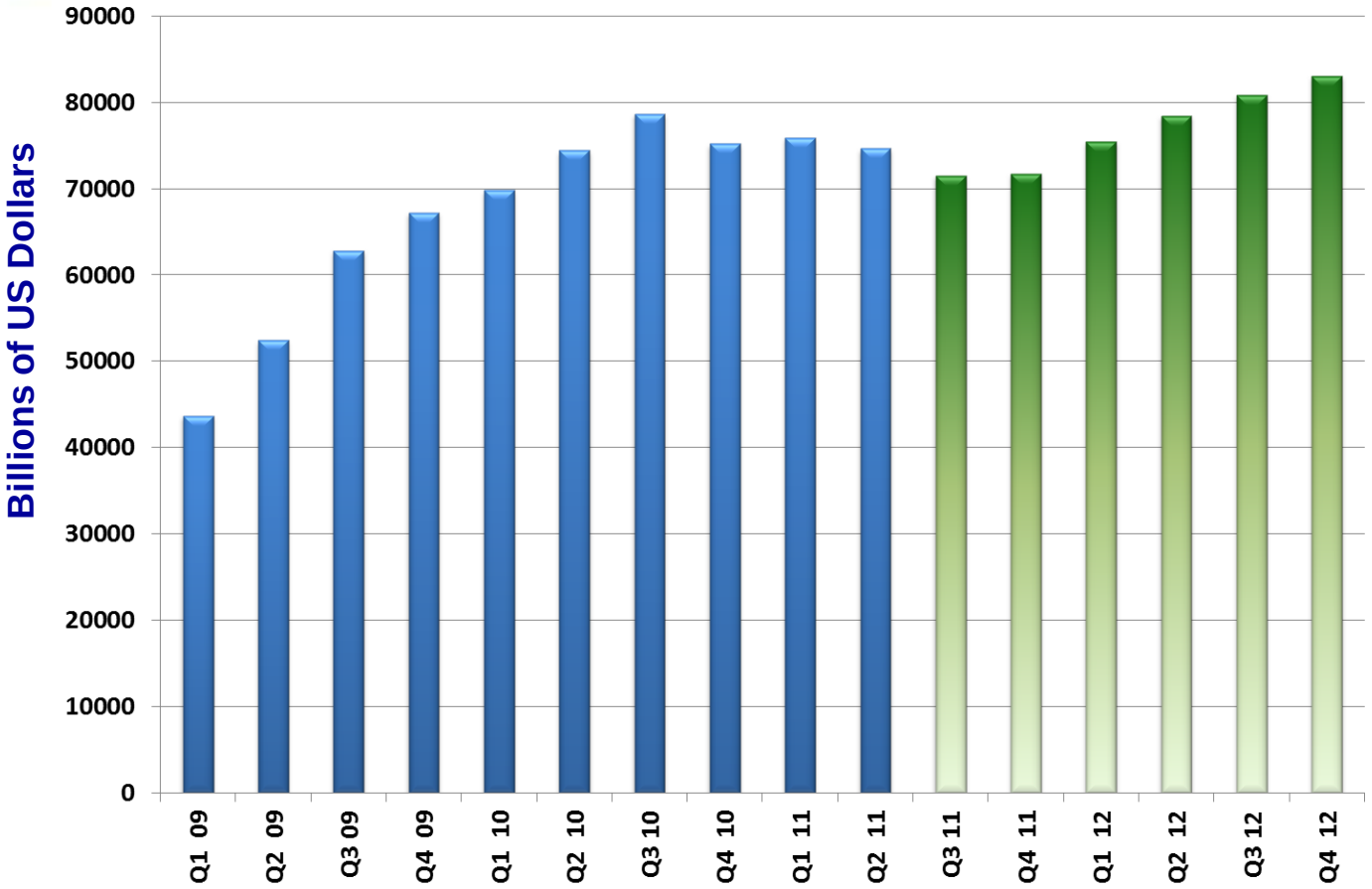
***IPI = Inflection Point Indicator**

Semi Revenue Forecast

2011 & 2012 by Quarter



2011 Down -1.4%

2012 Up 8%

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World Situation Reverses Semiconductor Inventory Trends

- ✓ U.S. deficit debate
- ✓ European financial issues
- ✓ Perceived Asian weakness

Resulted in:

- ❑ Nervous OEMs
- ❑ Drop in consumer confidence
- ❑ Supply chain has pulled back, inventories now being burned off

2011/12 Forecast Assumptions

- End products continue to have richer semiconductor content
  - More memory, radios, MEMS, applications and baseband processors
- Consumer spending less
  - HDTVs, set-top boxes, cameras, games etc.
- New capacity ramping 2011/12
- Capex being reduced
- Aggregate IC ASPs falling
- Market will over react to this slowdown

Semiconductor Forecast Overview

- 2010 annual growth 31.8%
- 2011 annual growth -1.4%
- 2011 CapEx 14%
- 2011 Capacity utilization
  - 90+% @ beginning of year
  - < 80% @ year end
- 2012 annual growth 8.0%

Semico MAP Model Data

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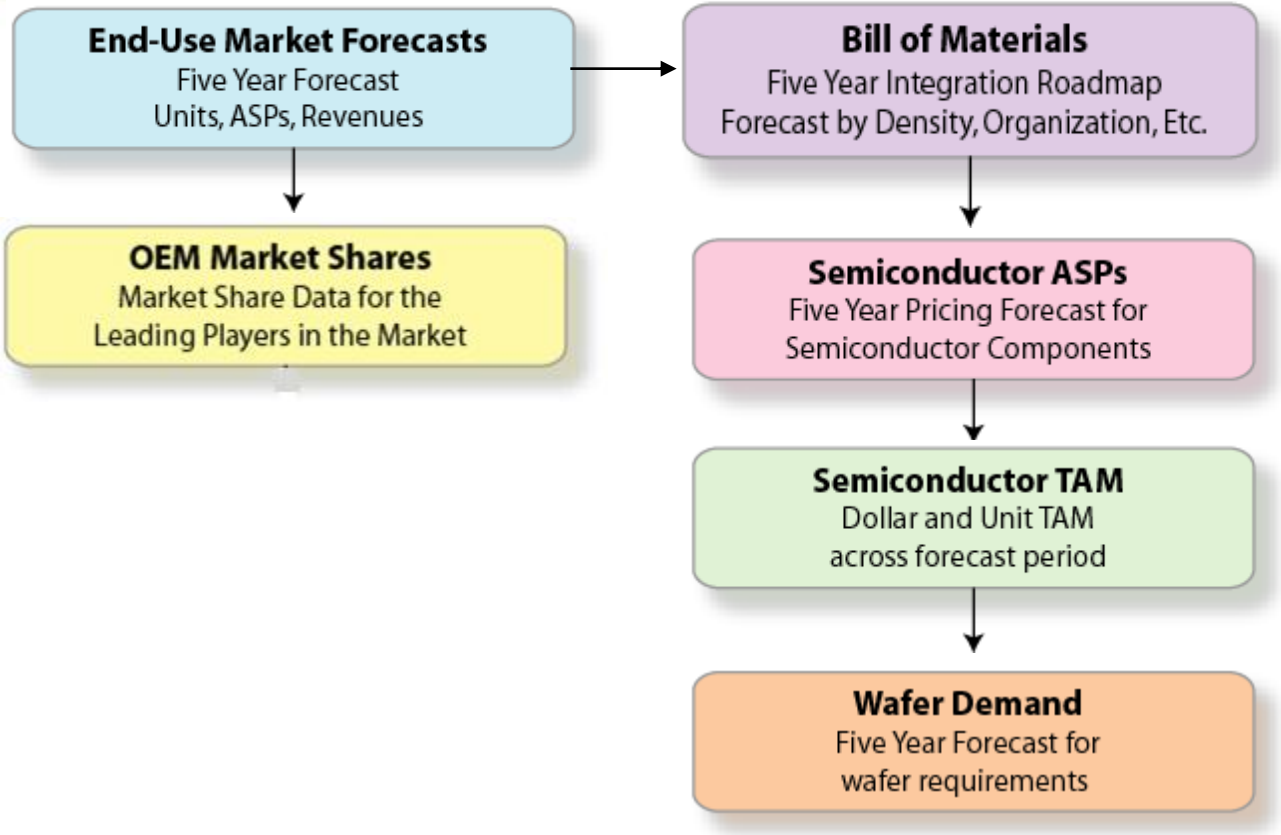
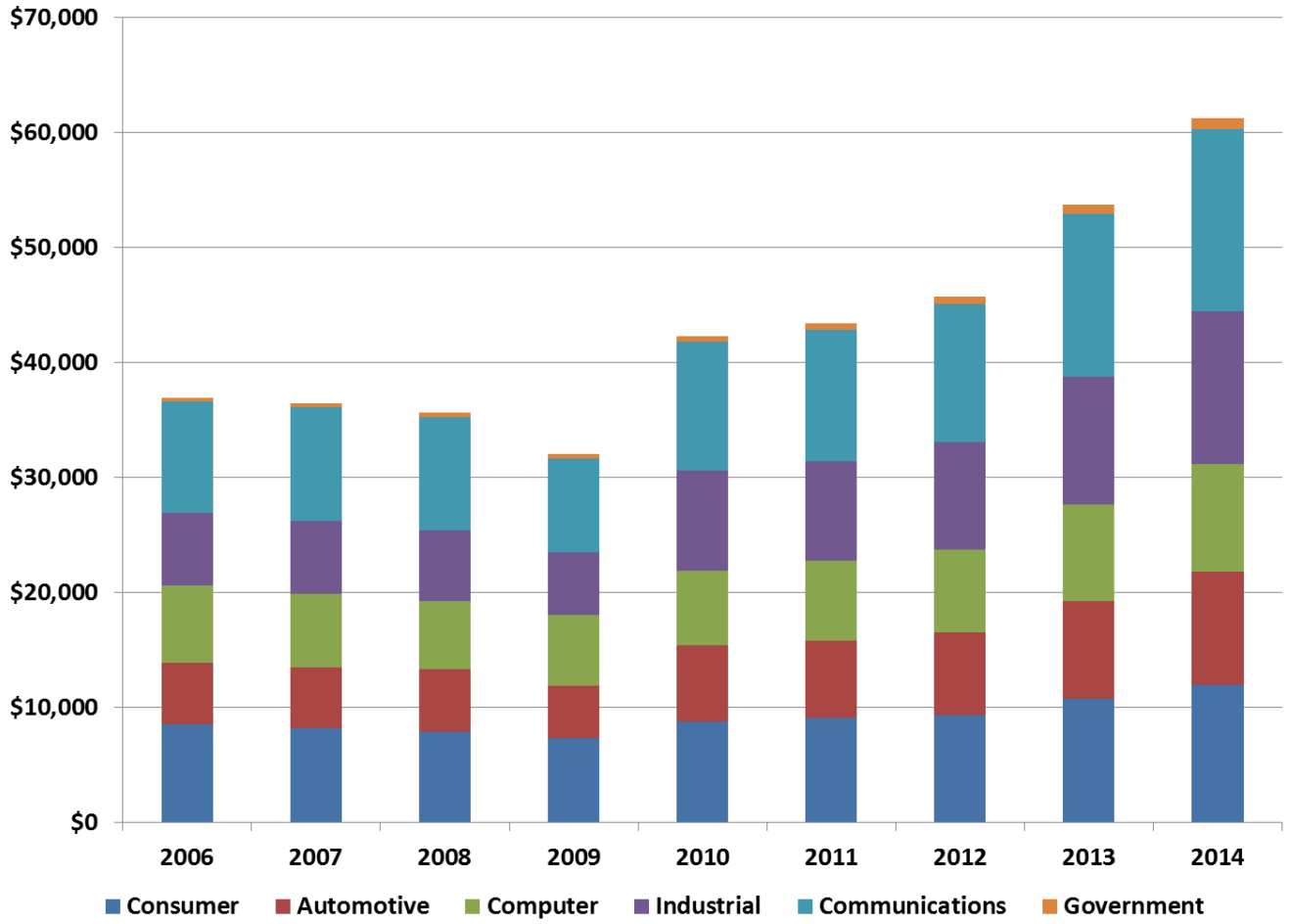
Semico MAP Model
Semiconductor End-Use Market Database



MAP = Market Analysis and Planning

Total Analog Revenue by End Market

($ in Millions)



Source: Semico MAP Model

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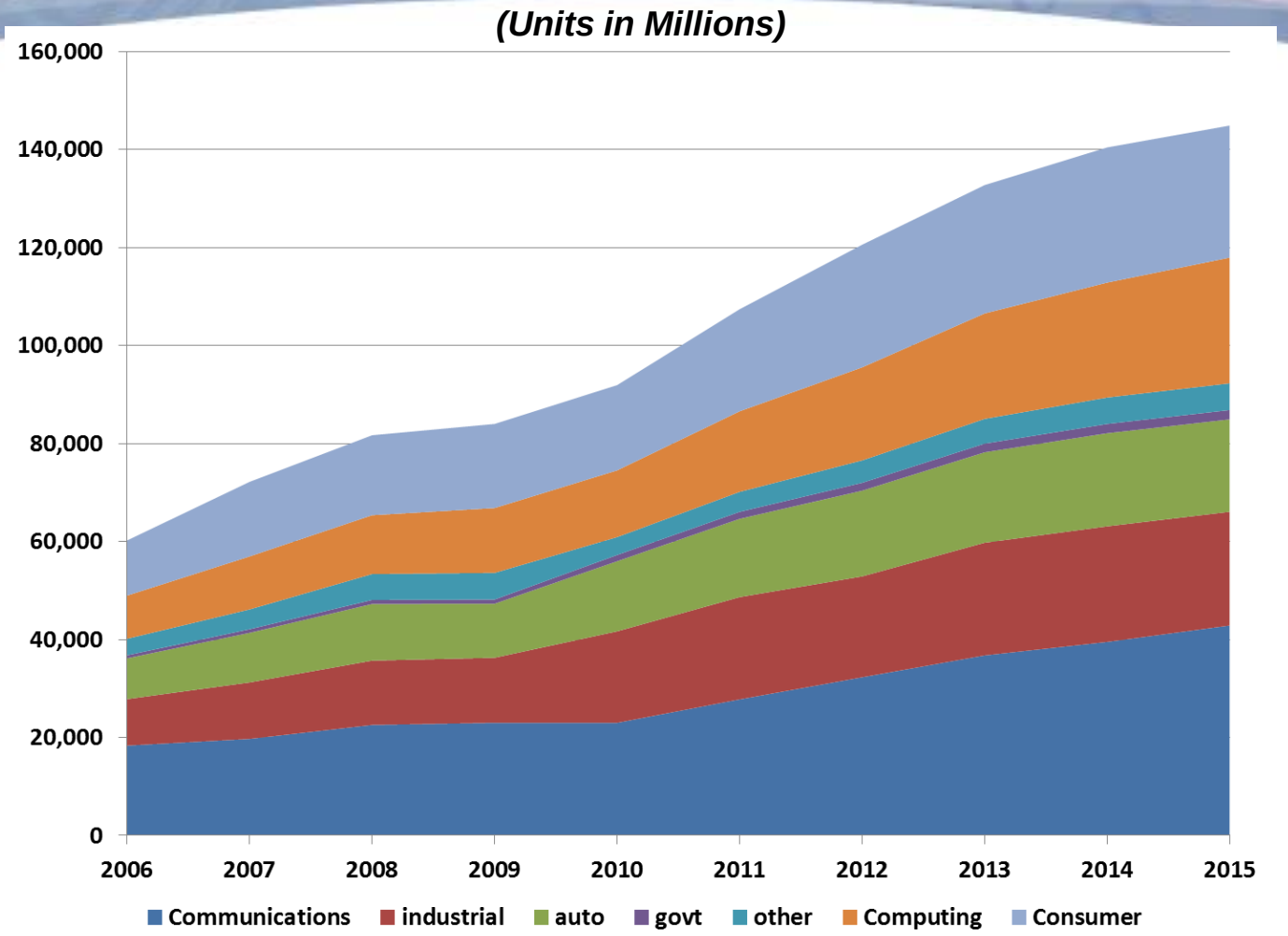
Total Analog Units by End Market



Source: Semico MAP Model

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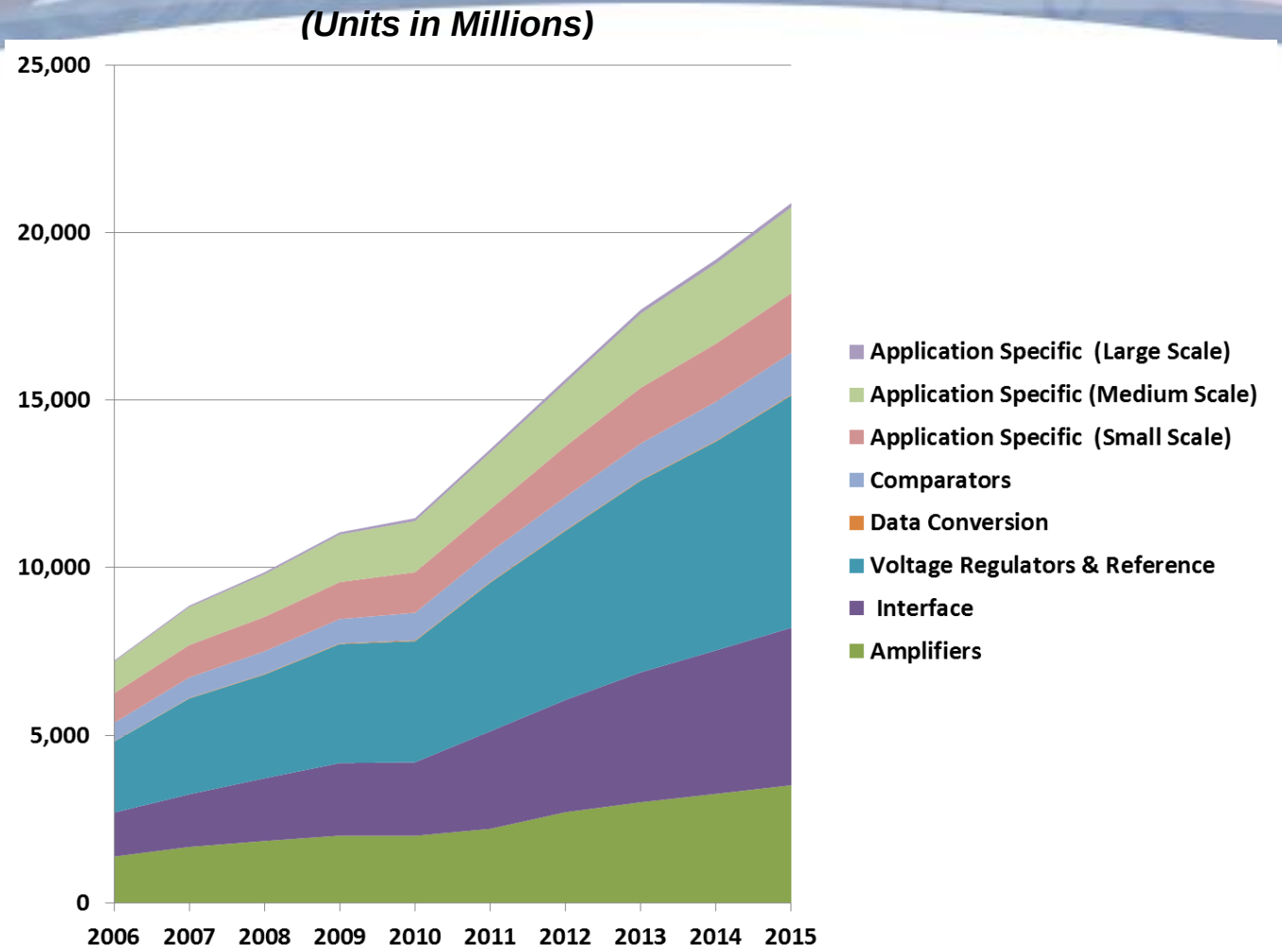
Analog Units: Computing



Source: Semico MAP Model

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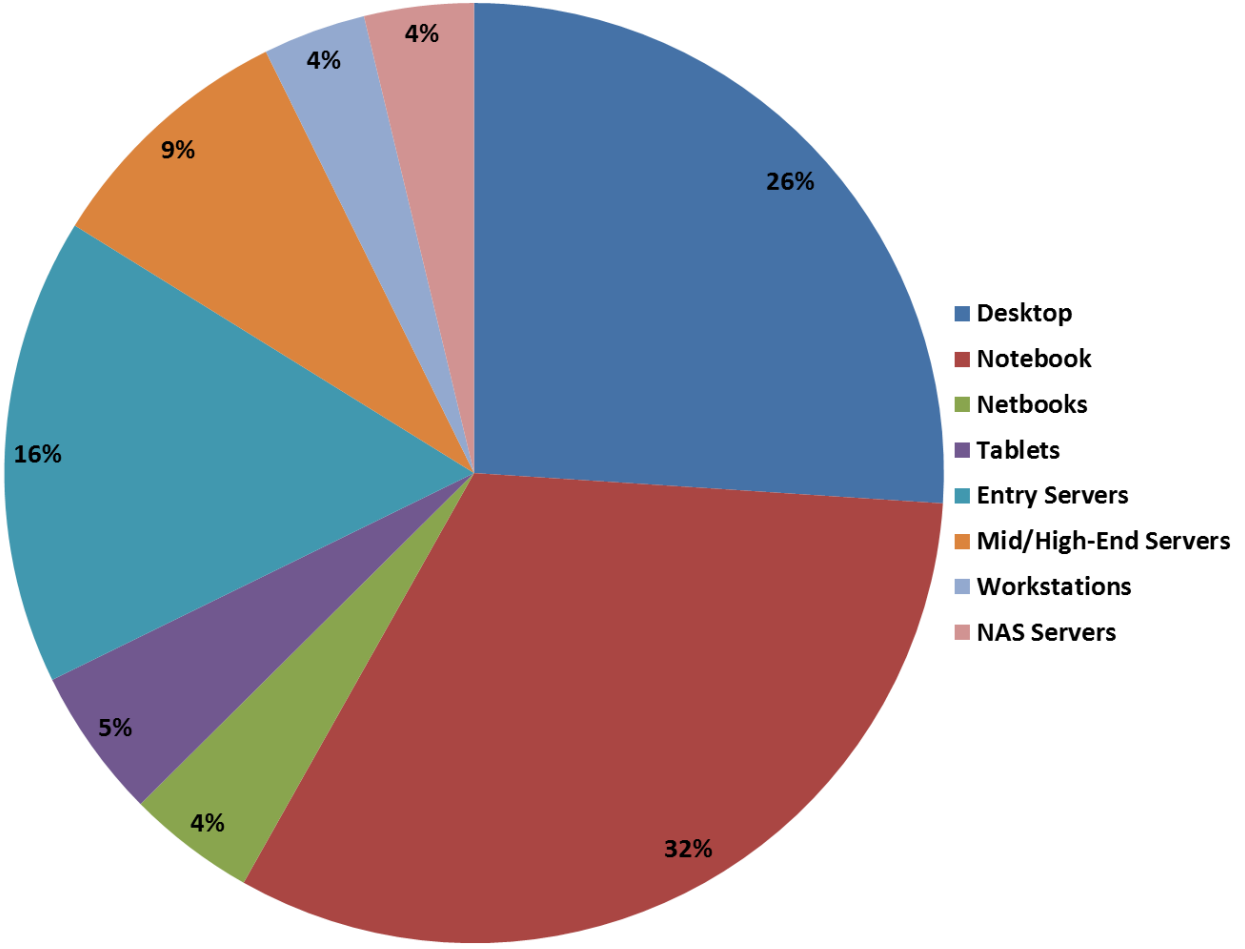
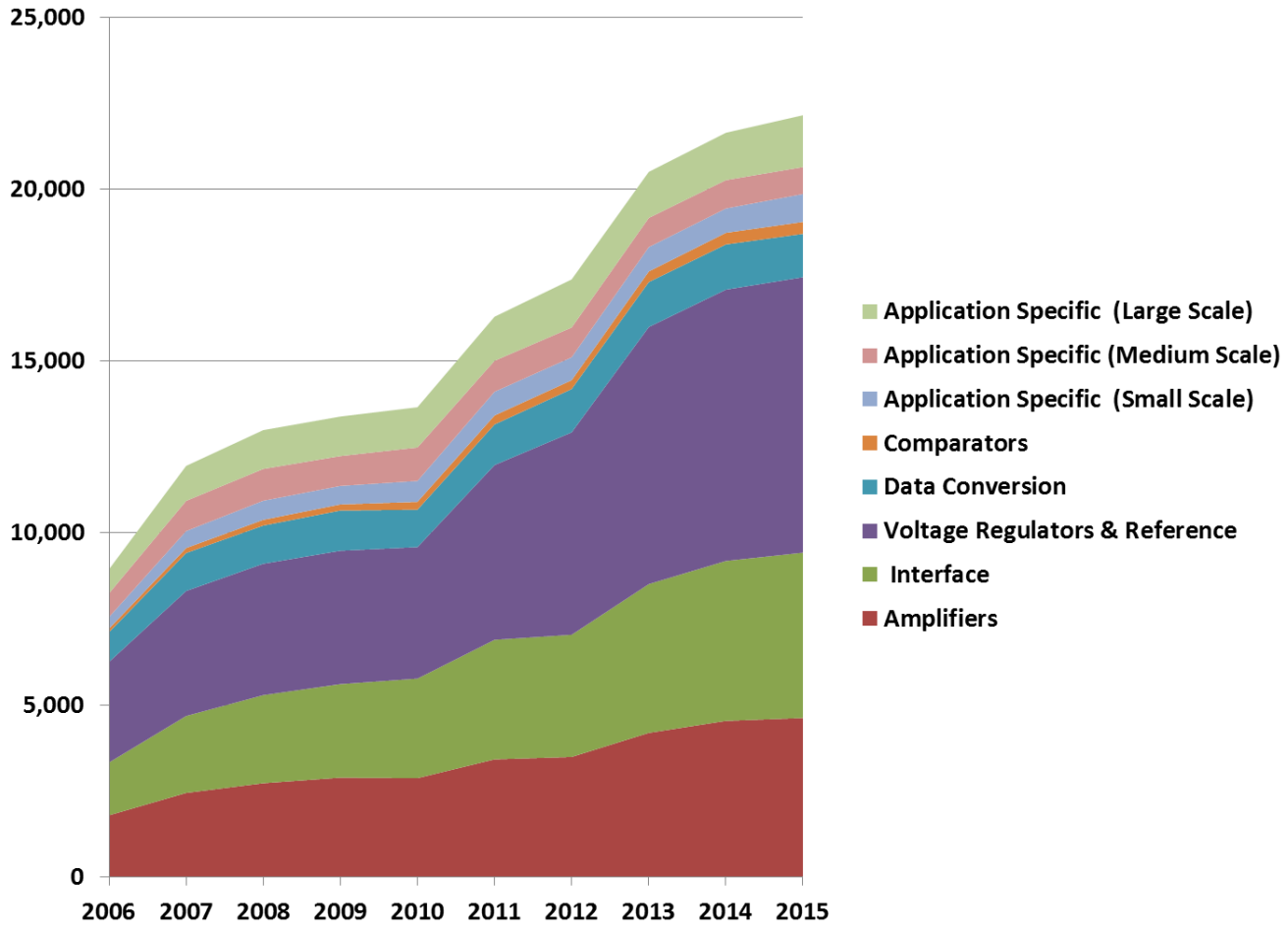
Computing Analog Units 2011



Source: Semico MAP Model

Analog Units: Consumer

(Units in Millions)



Source: Semico MAP Model

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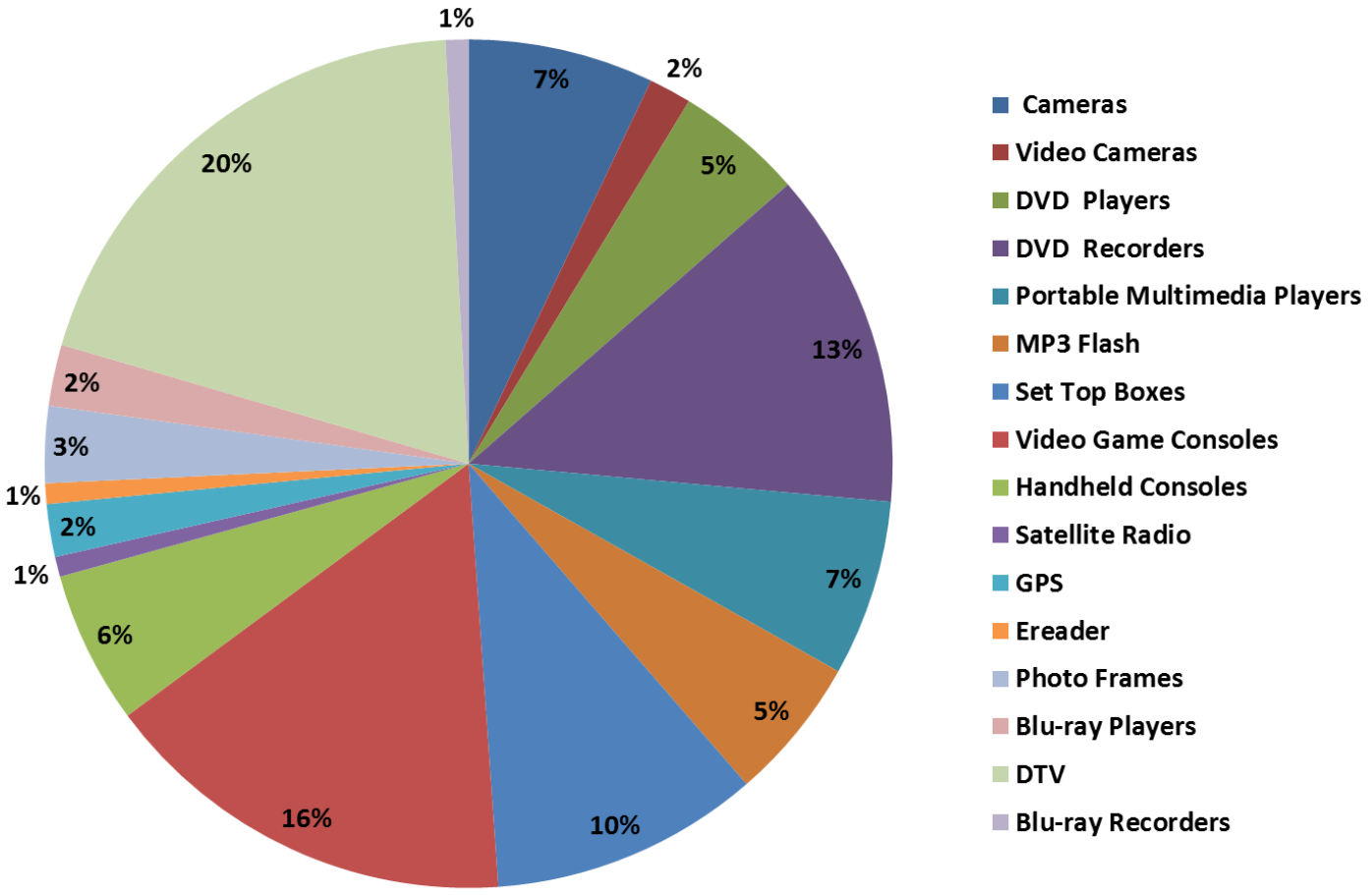
Analog by Consumer Mkt 2011



Source: Semico MAP Model

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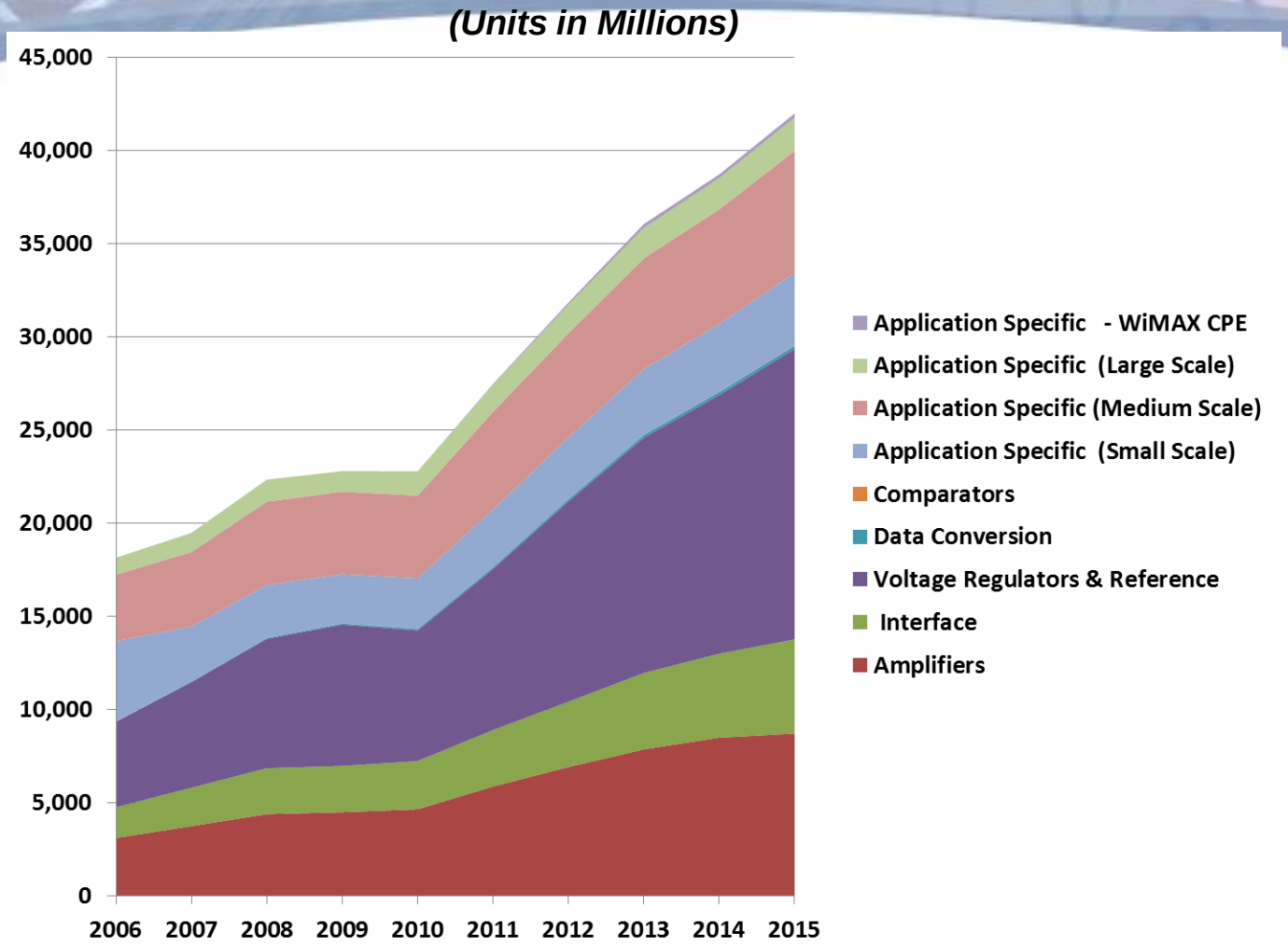
Analog by Communication



Source: Semico MAP Model

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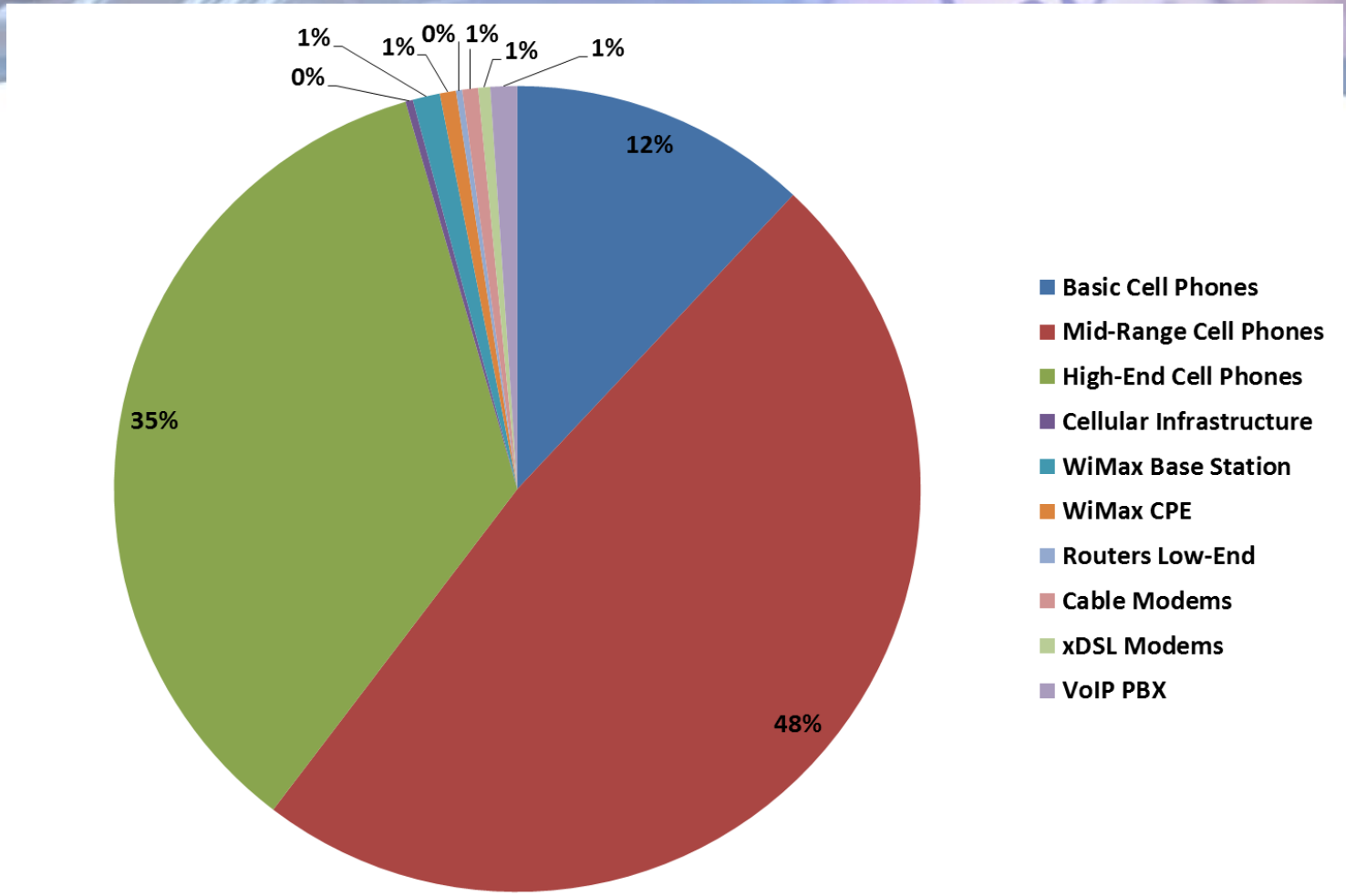
Analog by Communication Mkt 2011



Source: Semico MAP Model

Power Management Controlling the World

- *The power management IC (PMIC) has become a critical component in virtually every electronics product today.*
- *Much of this demand is being fueled by the global transition to green energy solutions.*
- At the heart of almost every electronic system is a power management IC (PMIC)

Power Management Applications

- Power management can be simple or complex
  - Process technology required to address these two divergent applications must, itself, be flexible.
  - Complex applications contain:
    - logic intelligence and analog control circuitry
      - Incorporates many voltage regulators
  - Simple applications include:
    - Just voltage regulator function for the system

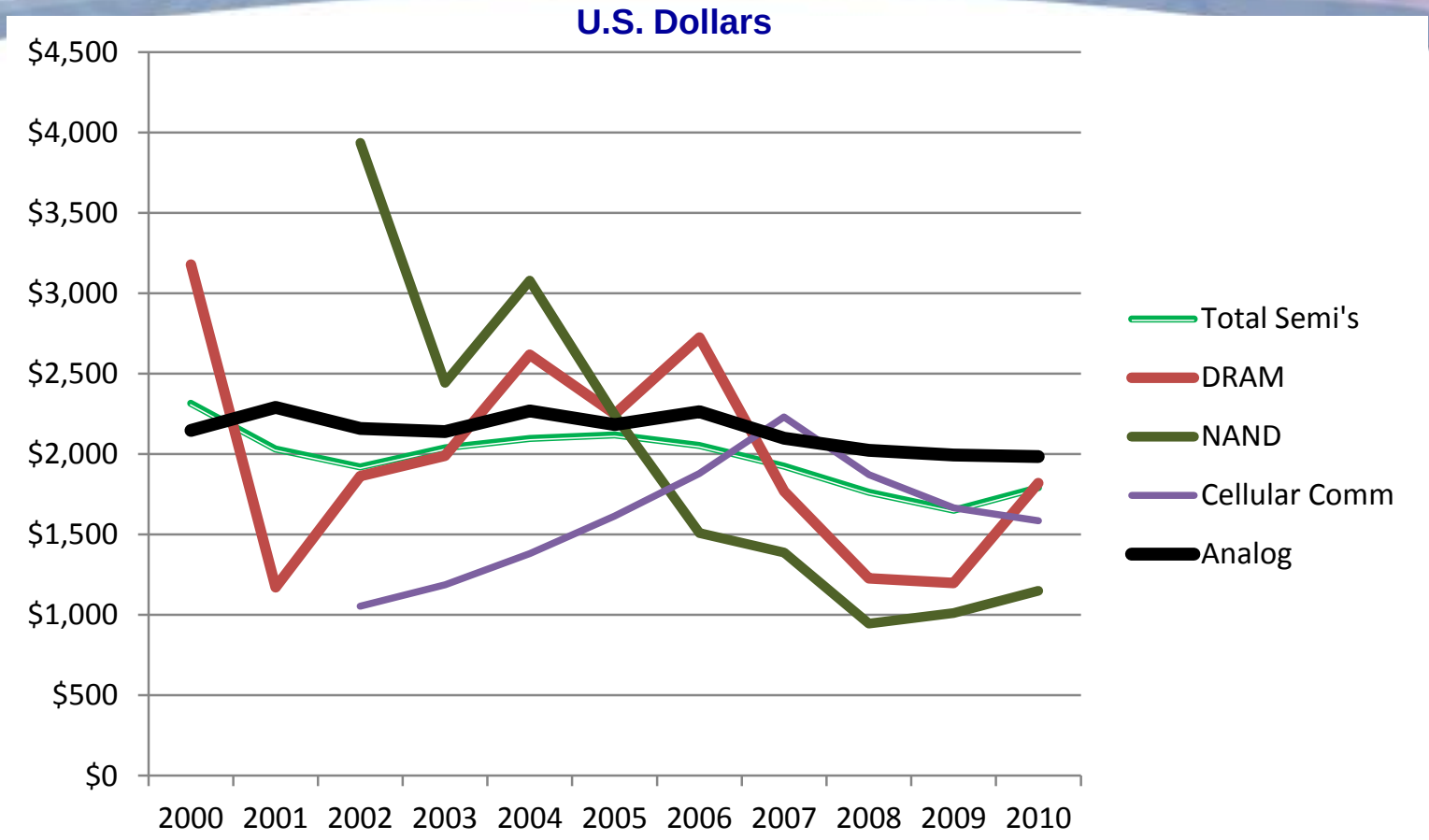
- Portable devices require high-efficiency power management
- The broadest and strongest market demand is for PMICs that operate in the 5V to 24V range.

Modular, flexible low-voltage BC-DMOS is the key to success

- Technology needed to build today's PMICs has to have several components to be successful

- Example: Dongbu HiTek's BD180LV process is a 0.18µm BCDMOS
  - Technology rated to 30V operation.
  - It combines 30V n-LDMOS with dense 1.8V CMOS logic
  - Well-characterized analog components including 5V analog CMOS, bipolar transistors, and passive components,
  - Provides a rich set of components for designers to use.
  - The 24V process strikes the right balance among power performance, reliability, and process complexity parameters.

Analog Revenue Per Wafer Above Average and Stable



Source: SIA/WSTS and Semico Research Corp.

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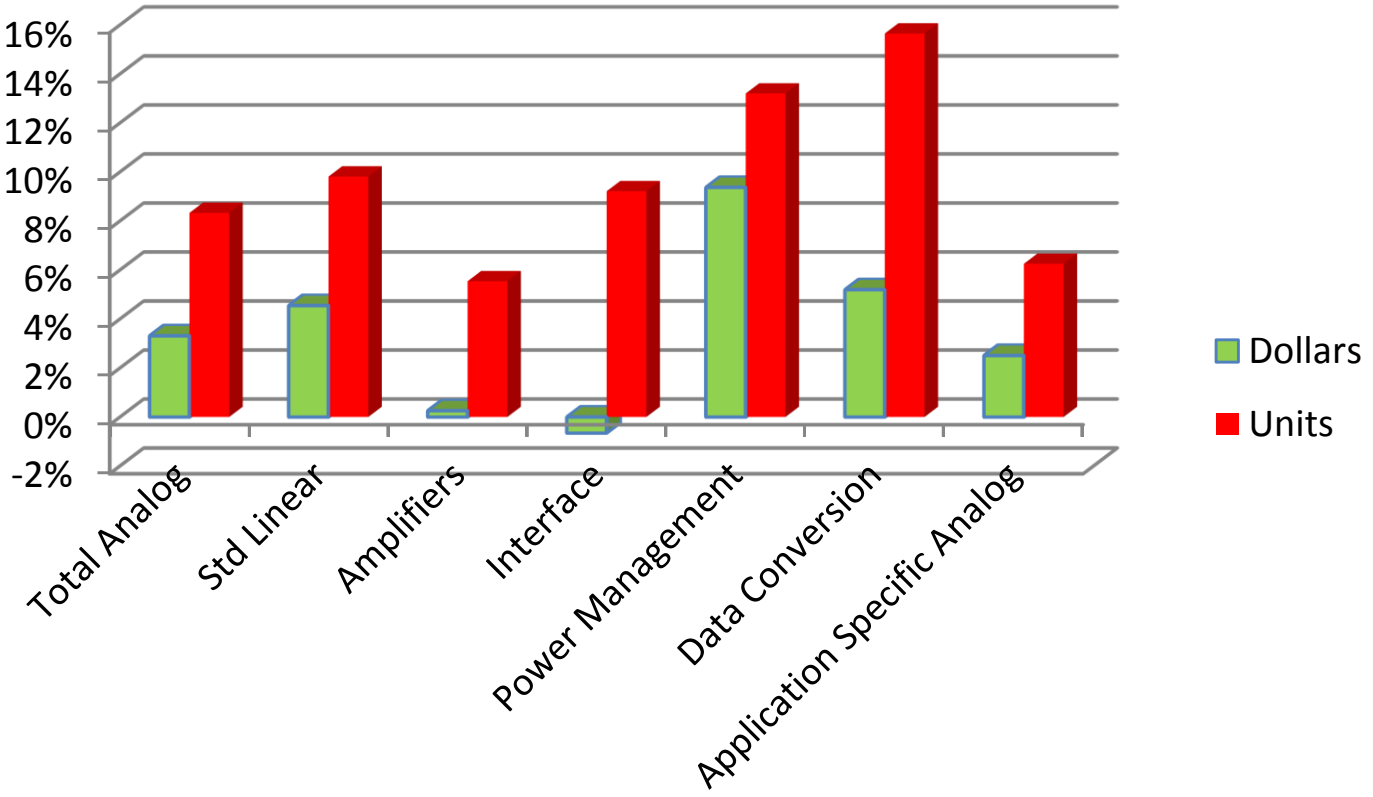
Power Mgmt Units Grow Above Average While Maintaining ASPs

CAGR 2000-2010



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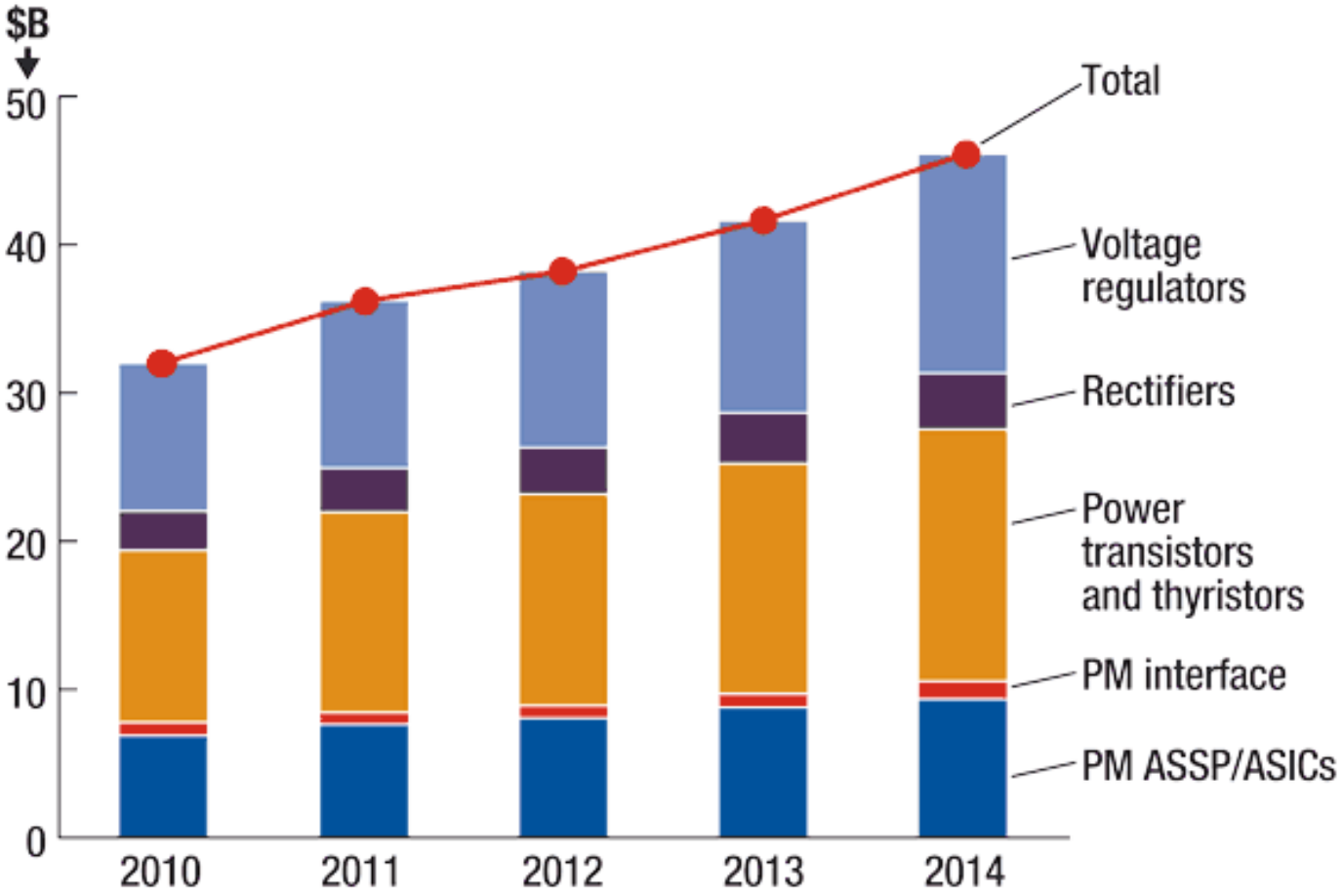
Power Management Market Forecast



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Power Management

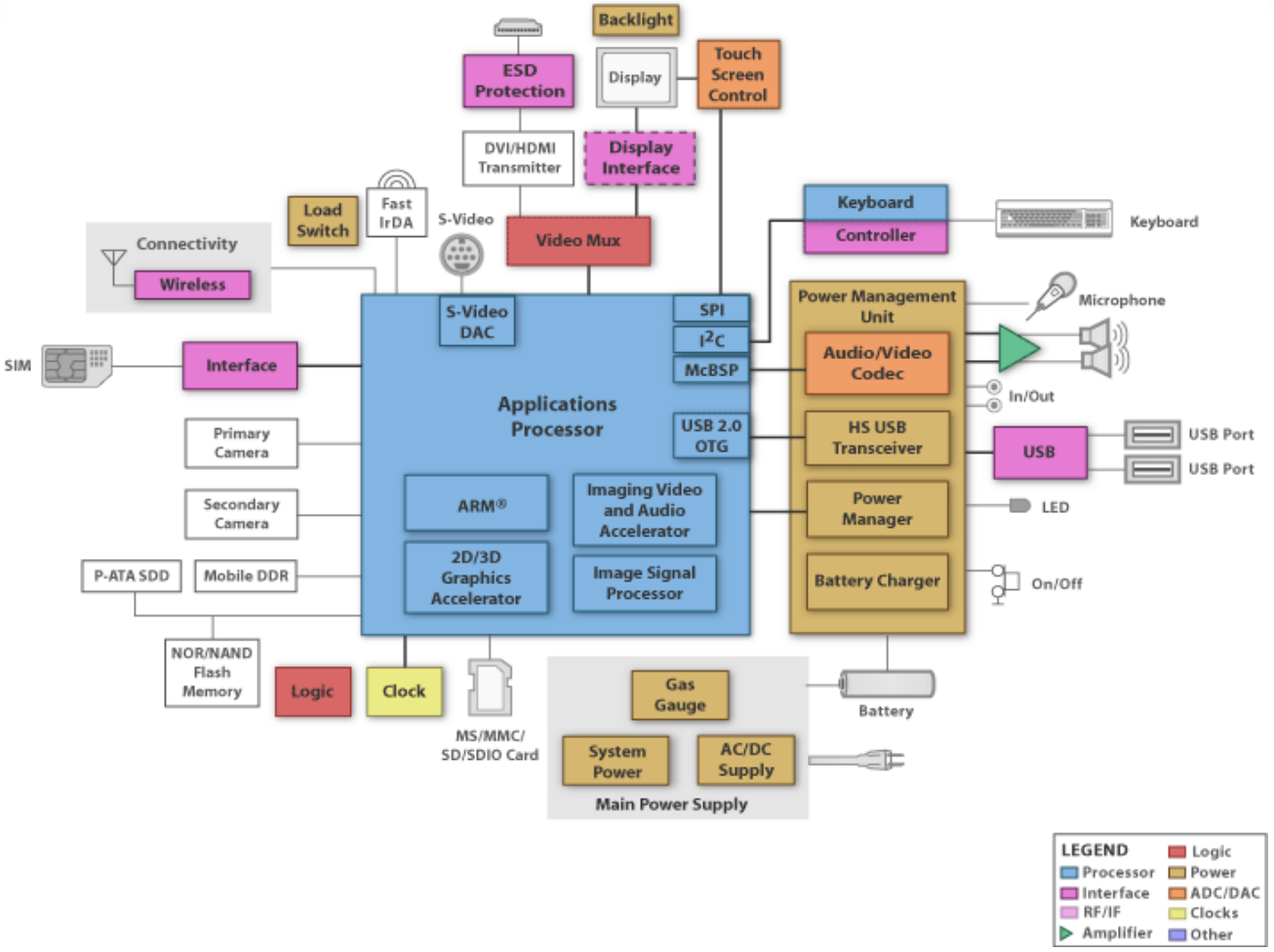
Suppliers

- TI/NSC #1
- Maxim #2
- Linear Tech #3
- ST #4
- ADI
- Atmel
- Dialog Semiconductor
- Fairchild
- Fujitsu
- Infineon
- Micrel
- Qualcomm
- Renesas
- Samsung

Design Houses

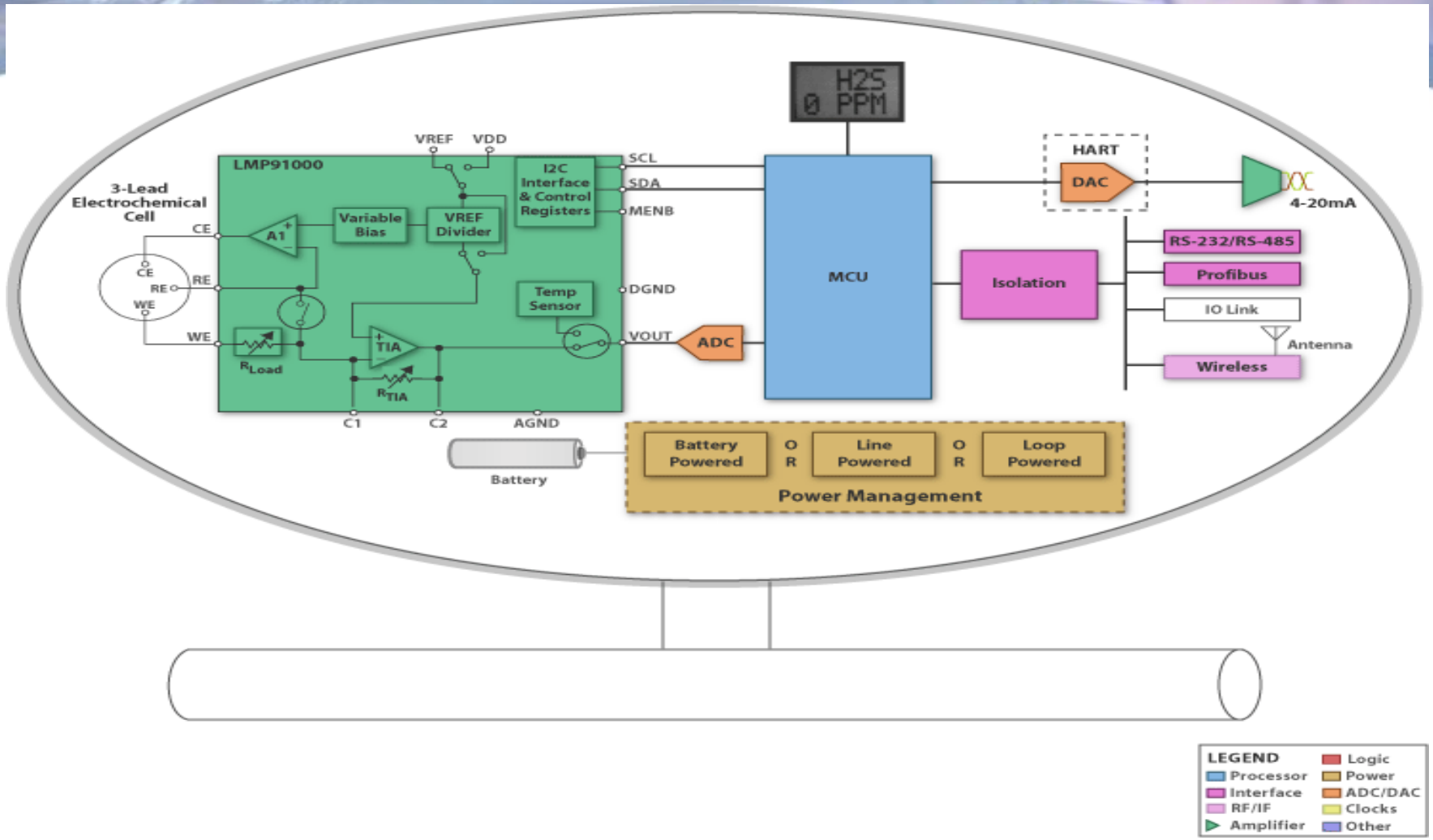
- Integrated Custom Power
- PIC
- Ic-pwr
- *IC Design Services*

Power Management Design
Mobile Internet Device



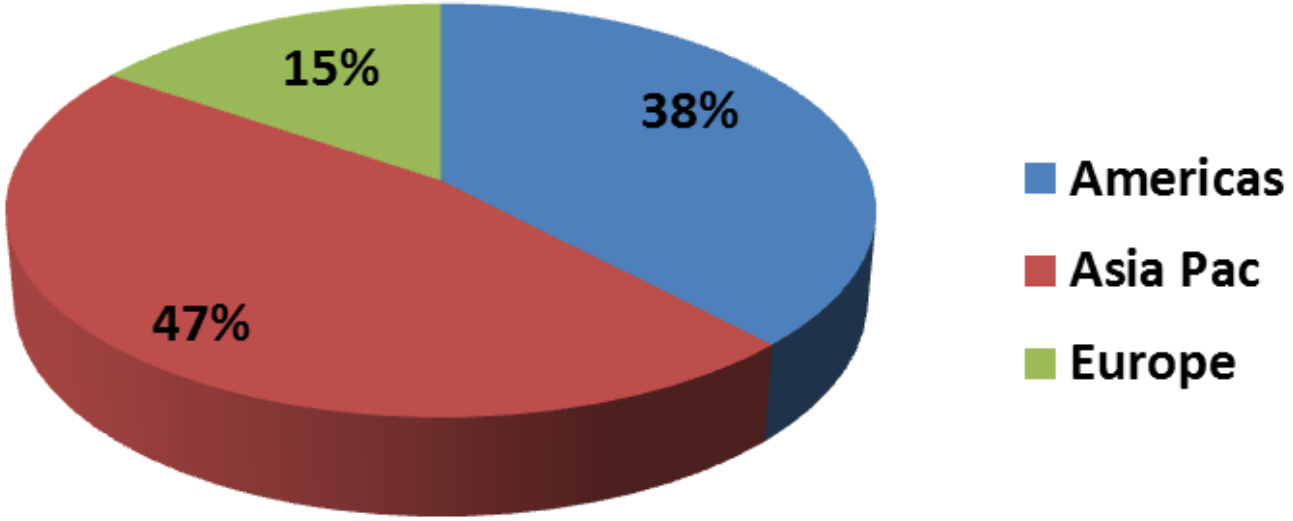
Source: TI

Power Management Design
Gas Meter

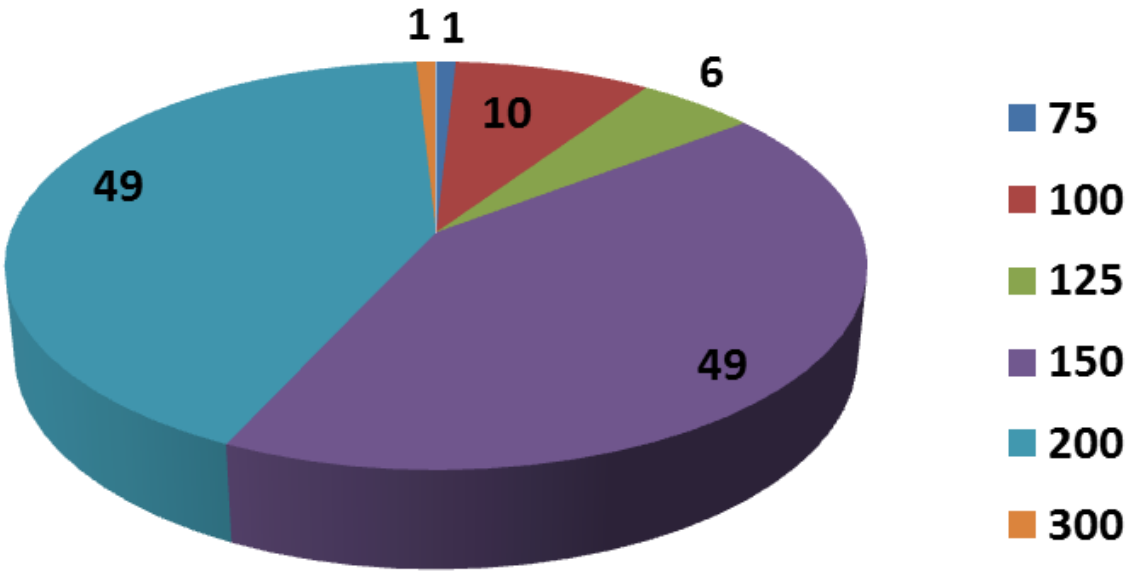


Source: TI

116 Analog Capable Fabs



Analog Fabs by Wafer Sze



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Analog Foundries

Americas

Supertex Inc.

Honeywell

ZARLINK SEMICONDUCTOR

IBM

GLOBALFOUNDRIES

BI-CMOS Foundry

MICREL Innovation Through Technology®

Europe

X-FAB MIXED-SIGNAL FOUNDRY EXPERTS

Infineon

LFoundry

austriamicrosystems a leap ahead in analog

STM

Plessey Semi

Telefunken

Far East

Dongbu HiTek

CSMC A LEADING ANALOG FOUNDRY

华虹-NEC Shanghai Hua Hong NEC Electronics Company, Limited

SMIC

tsmc

VIS

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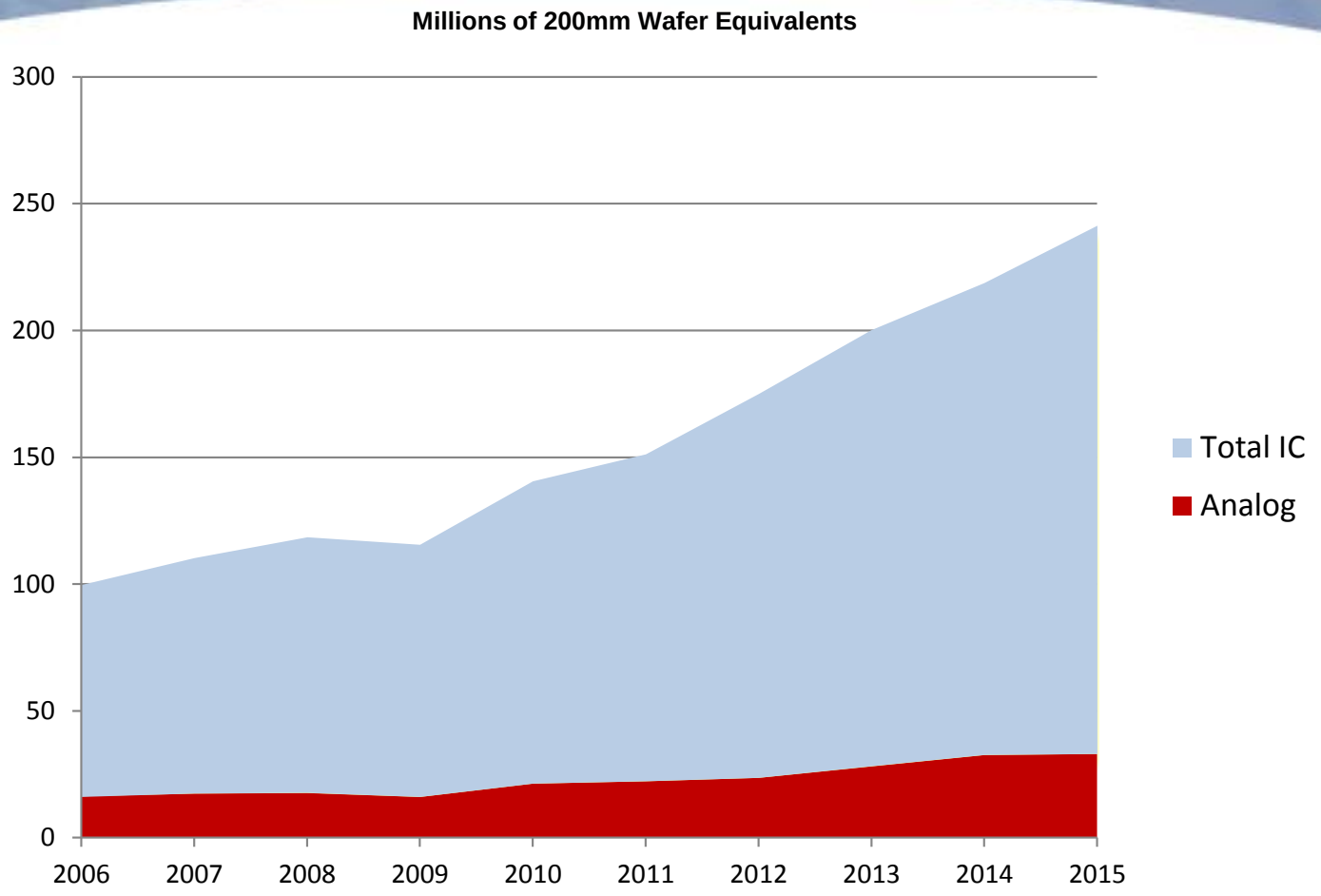
Foundry Market Share

Rank	Company	2009	2010
1	TSMC	$9,256	$13,167
2	UMC	$2,815	$3,958
3	GLOBALFOUNDR	$1,898	$3,544
4	SMIC	$1,070	$1,553
5	Dongbu	$450	$512
6	TowerJazz	$299	$509
7	Vanguard	$383	$501
8	MagnaChip	$262	$418
9	X-FAB	$252	$330
10	Grace	$250	$320

#1 Specialty Foundry

Analog Wafers versus Total IC Wafers



Source: Semico Wafer Demand Model

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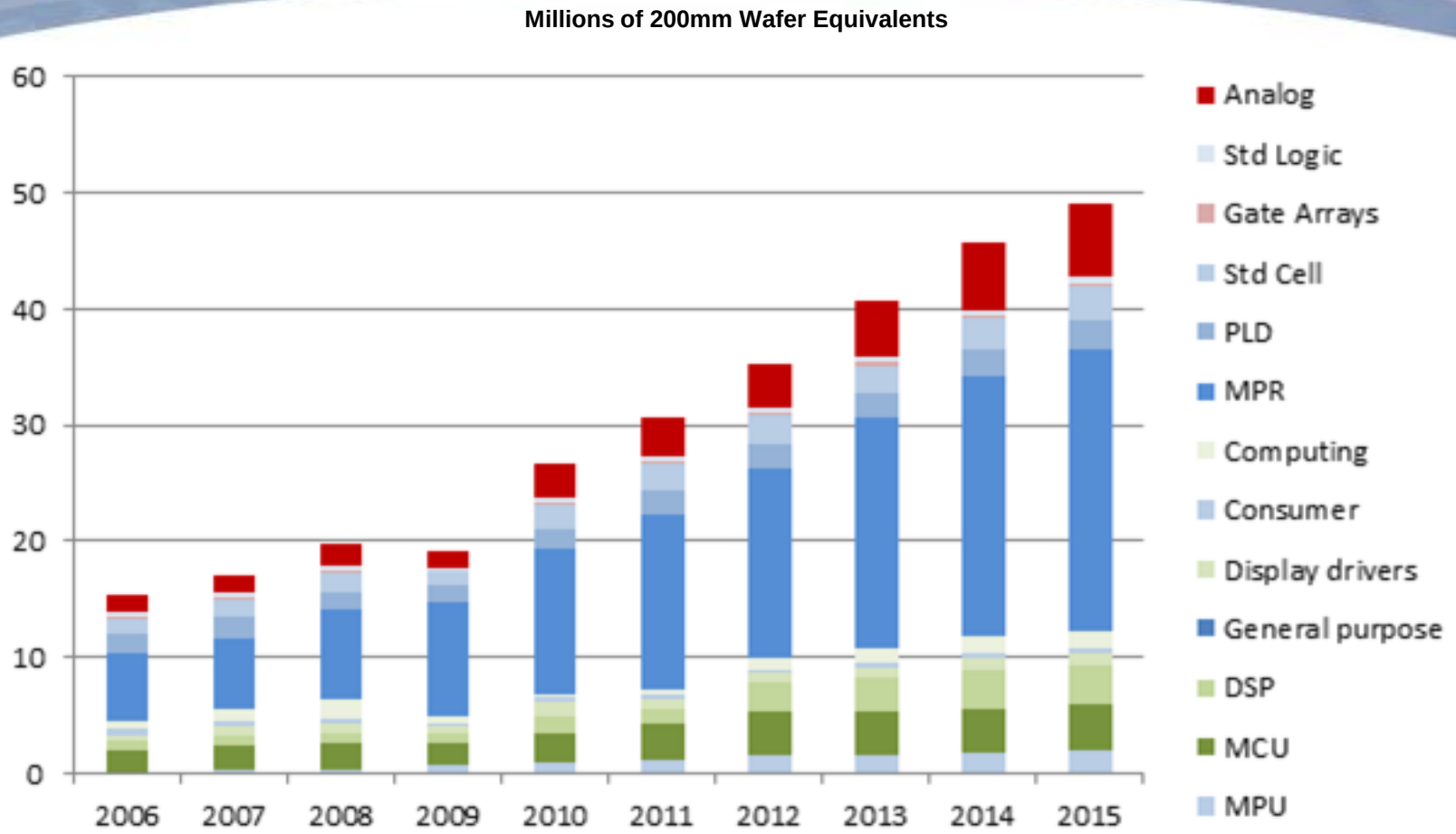
Foundry Wafer Demand by Product



Source: Semico Foundry Forecast

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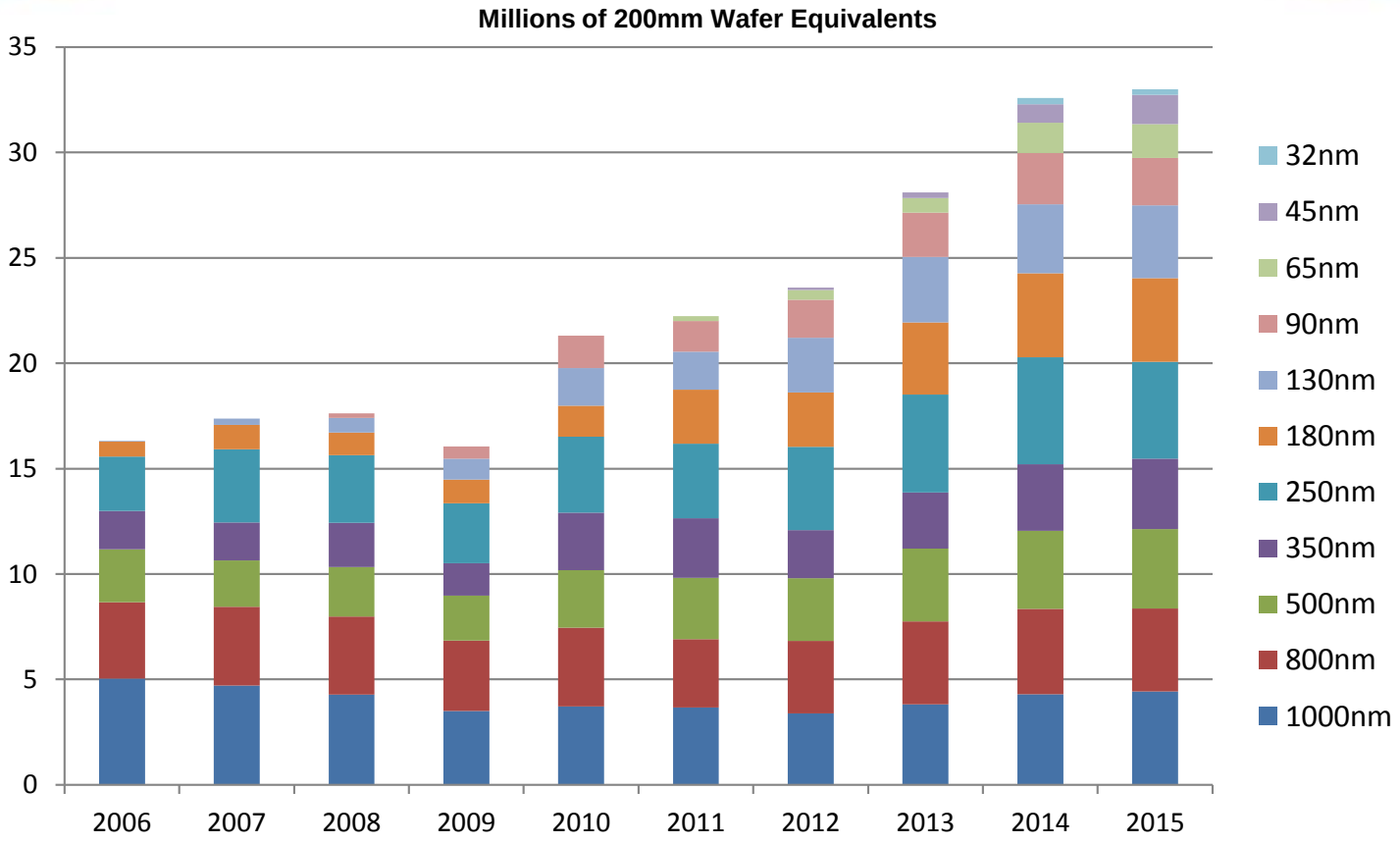
Analog Wafer Demand by Technology Node



Source: Semico Wafer Demand Model

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Questions for Semico

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