

# ARM Investment Case

February 2011



# ARM Overview

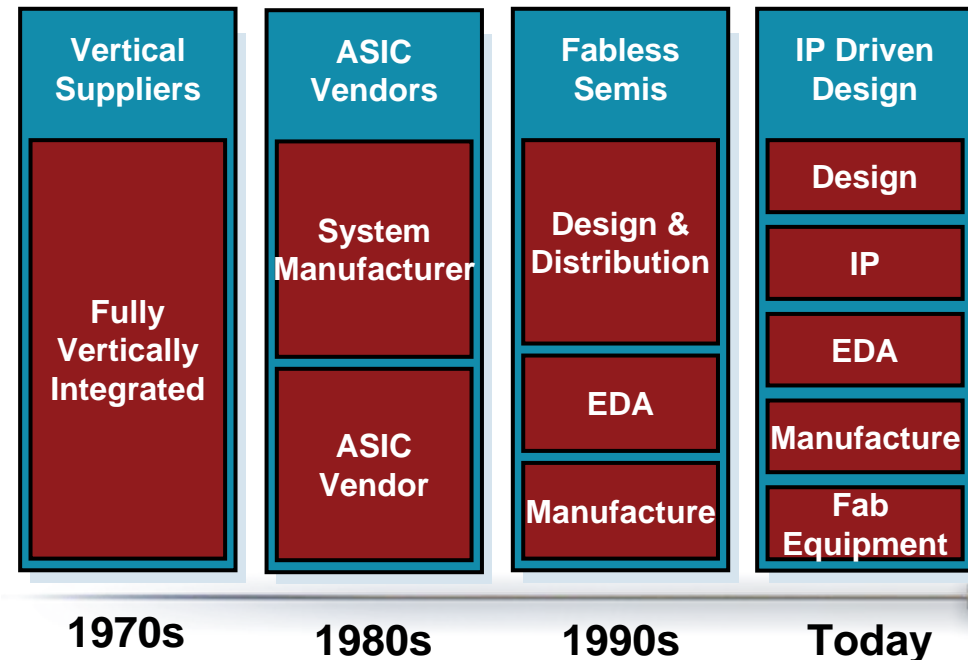
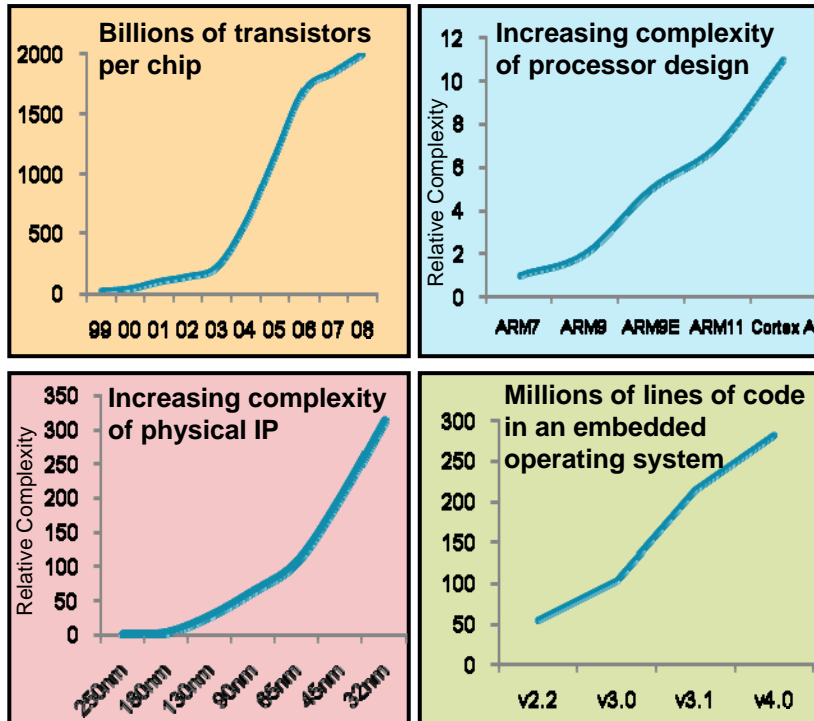
ARM is the world's leading semiconductor IP company



- Licensing and royalty business model delivers operational leverage and robust cash generation
- Gaining share in long-term secular growth markets
- Strong competitive position for long-term sustainable growth

# Disaggregation of the Semi Industry

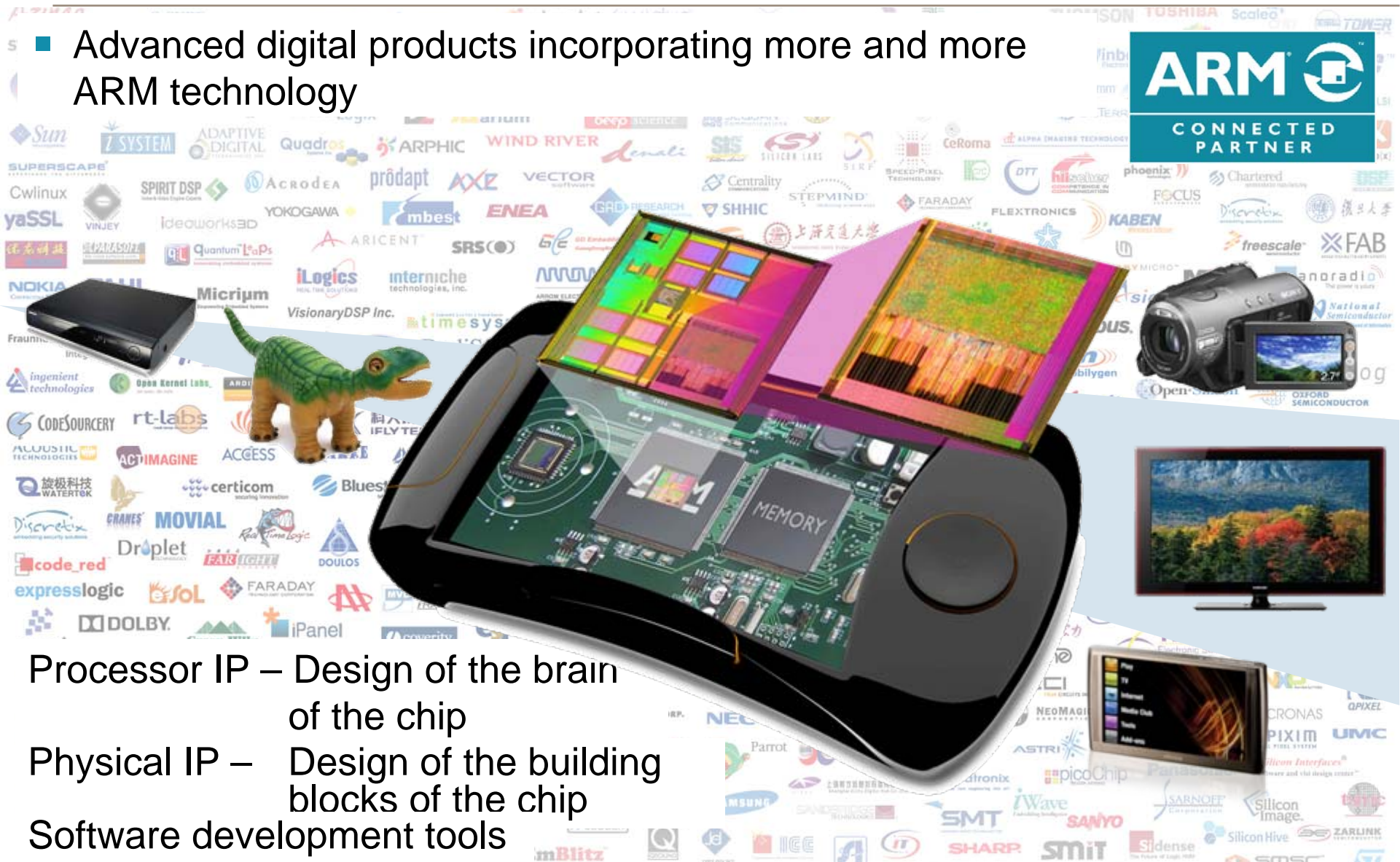
- Technical progress drives industry evolution
- Increased complexity has exponential effect on design costs
- Rising costs create need for specialisation and outsourcing



Sources: ARM estimates

# ARM Technology

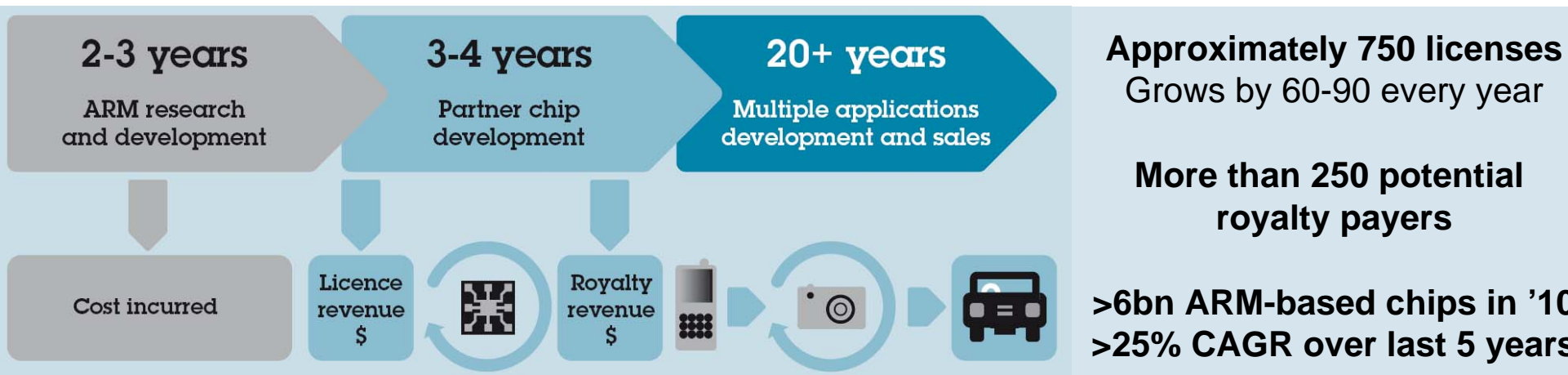
- Advanced digital products incorporating more and more ARM technology



- Processor IP – Design of the brain of the chip
- Physical IP – Design of the building blocks of the chip
- Software development tools

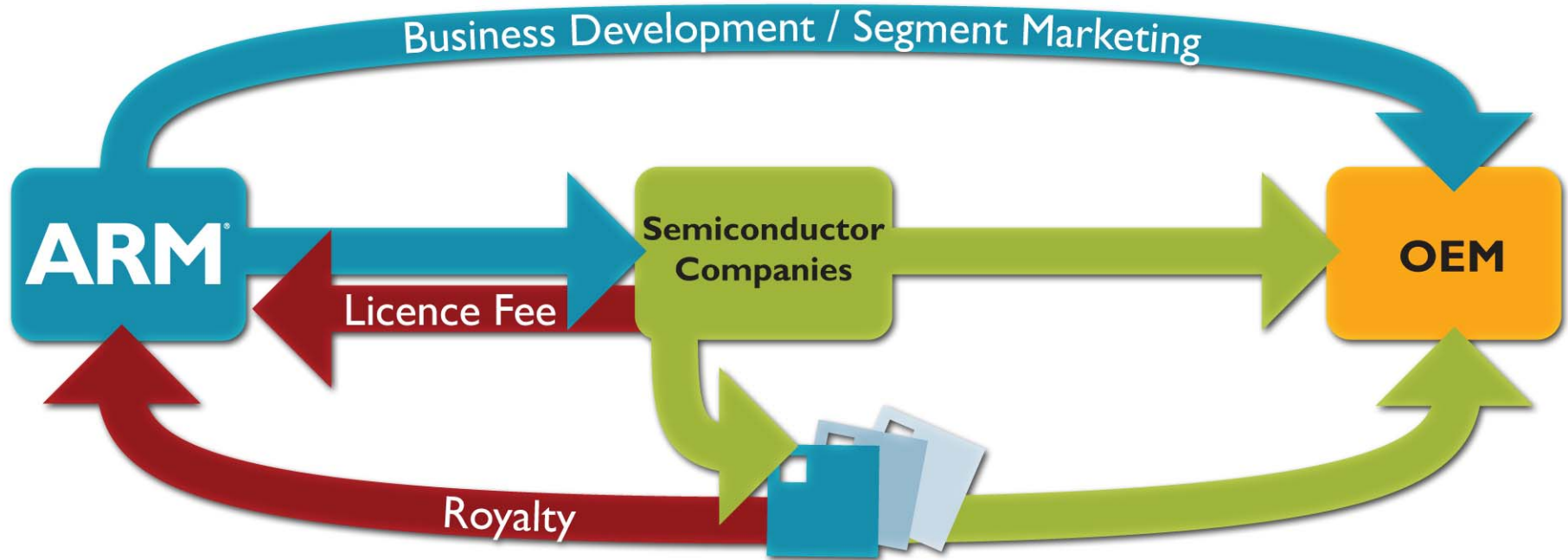
# ARM Introduction

- Global leader in the development of semiconductor IP
  - R&D outsourcing for semiconductor companies
- Innovative business model yields high margins
  - Upfront license fee – flexible licensing models
  - Ongoing royalties – typically based on a percentage of chip price
  - Technology reused across multiple applications
- Long-term, secular growth markets



# Creating OEM Pull

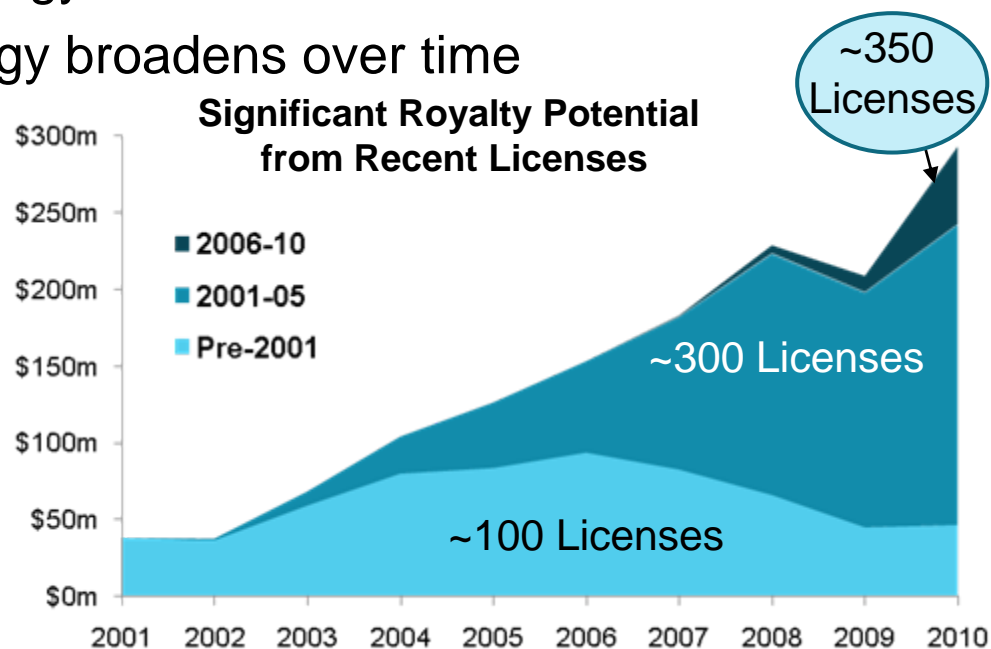
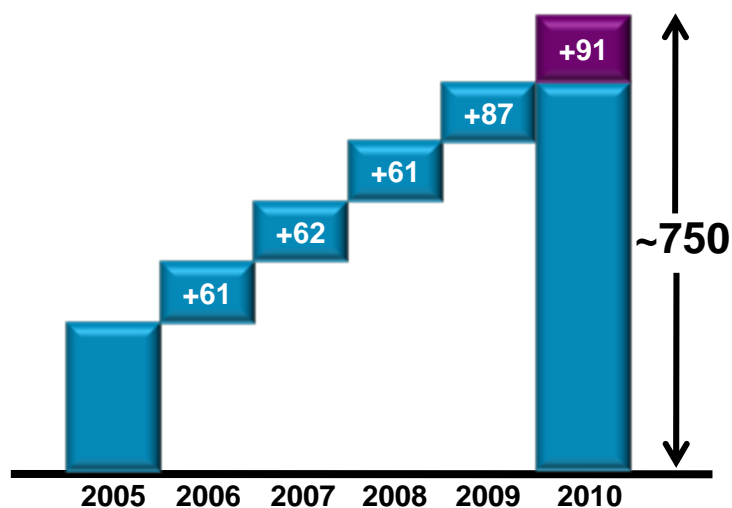
- OEMs play essential role in ARM business model



- Key OEM relationships drive technology
  - Roadmaps developed in partnership
  - Proven long-term success in multiple segments

# Cumulative Licensing Drives Royalties

- Licensing base typically grows by 60-90 licenses every year
  - Internet-connected consumer electronics from smartphones to DTV
  - Embedded applications such as microcontrollers and hard disk drives
- Growing base yields royalty revenues over long period
  - Leading semiconductor companies have made long-term, strategic commitments to ARM technology
  - Applicability of ARM technology broadens over time



# Key Growth Drivers

- Growth in mobile applications
  - Increasing value of ARM technology per device
  - More chips and higher priced chips
- Growth beyond mobile
  - Increasing ARM penetration into broader range of digital products
- Growth into new technology outsourcing
  - Physical IP, graphics IP and video IP increase ARM's value per device and penetration



# Increasing Value and Penetration

## Mobile Phones

ARM processors can be found in more than 95% of mobile phones

Average of 2.5 ARM-based chips per mobile phone, with smartphones containing between 2 and 5 ARM-based chips

Typical smartphone drives six times more royalty than typical "dumb-phone"

ARM processors used in:

- 2G/3G baseband connection
- Applications processor
- GPS, WiFi, Bluetooth
- Touchscreen, camera



## Mobile Computers

Smartphones are evolving into mobile computers

- 230m unit market in 2010
- Forecast 750m units in 2015

ARM in applications processor used to run:

- User interface, operating system, browser and plug-ins, email, gaming

ARM processors also used in:

- Hard disk drive controller
- WiFi, Bluetooth, WiMAX
- 2G/3G baseband connection



## Digital TV & STB

ARM market share ~30% in brands such as Samsung, Sony Bravia and Vizio

Digital TV becoming more internet connected, requiring web-browsers, plug-ins and PC-class OS. Driving need for smarter processor such as ARM

ST is market leader and recently announced they are moving to ARM



## PC & Peripherals

ARM technology can be found in many products in the home office

- Disk drives (85% share)
- Printers (65%)
- Networking (25%) such as broadband router, WiFi, BT and femto cell

As these products become more capable and more efficient, they create more opportunity for ARM



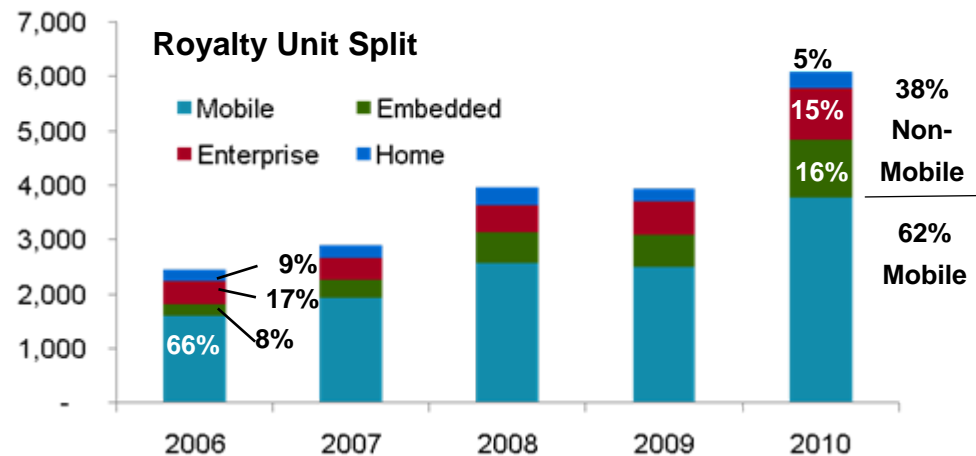
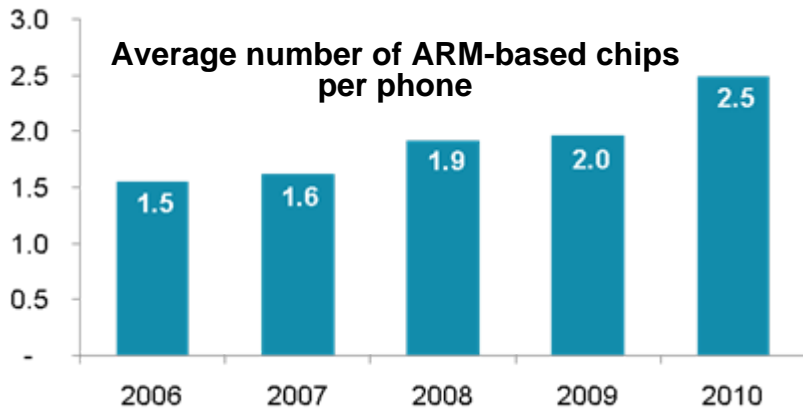
## Microcontrollers

Microcontroller market is very large with mainly low-cost chips

ARM's market share ~10% but growing rapidly

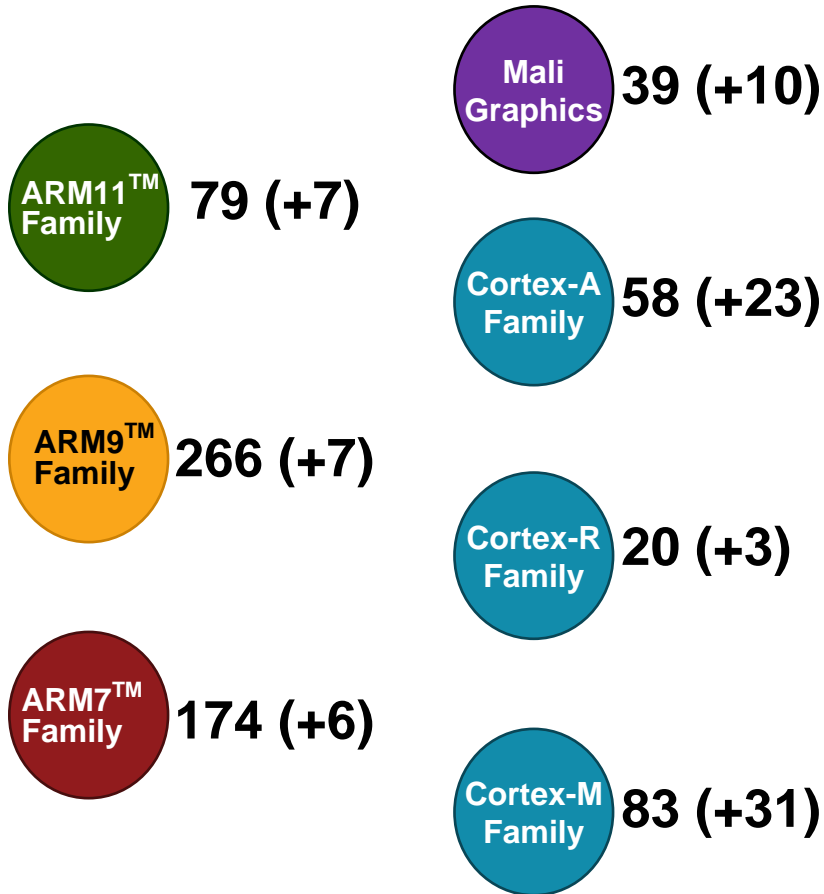
ARM processors used in:

- Electric motor controllers
- Monitors and sensors
- Medical applications
- Industrial robotics

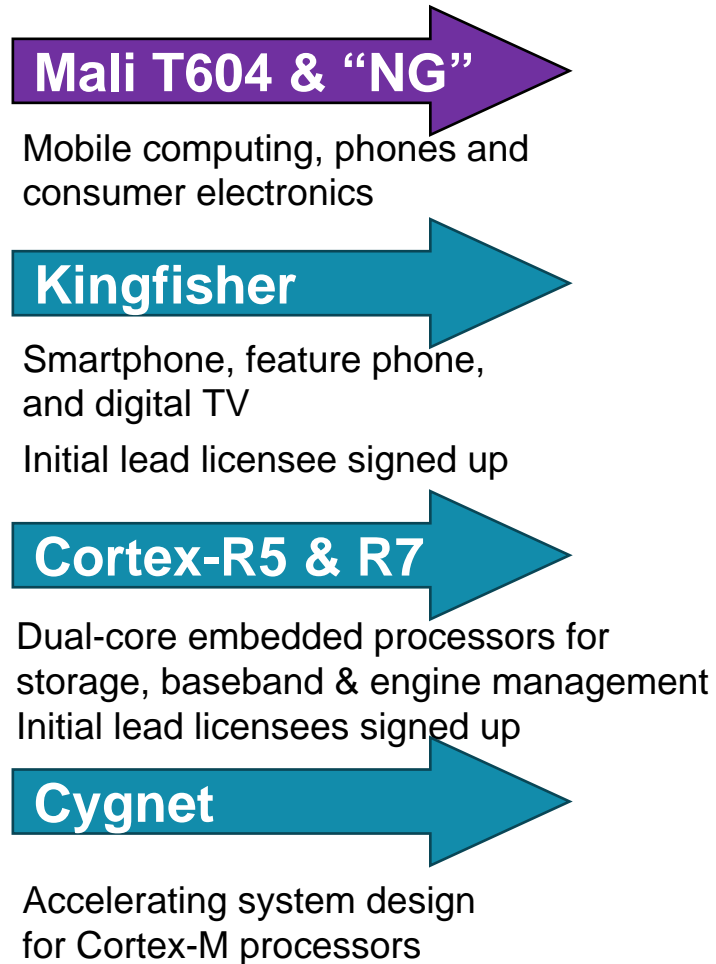


# Growing the Licensing Base

## Cumulative licenses (FY 2010 licensing shown in parenthesis\*)



## Processor Roadmap in 2011



## Estimated Royalty Opportunity for 2015

Application Processors  
4bn units per year

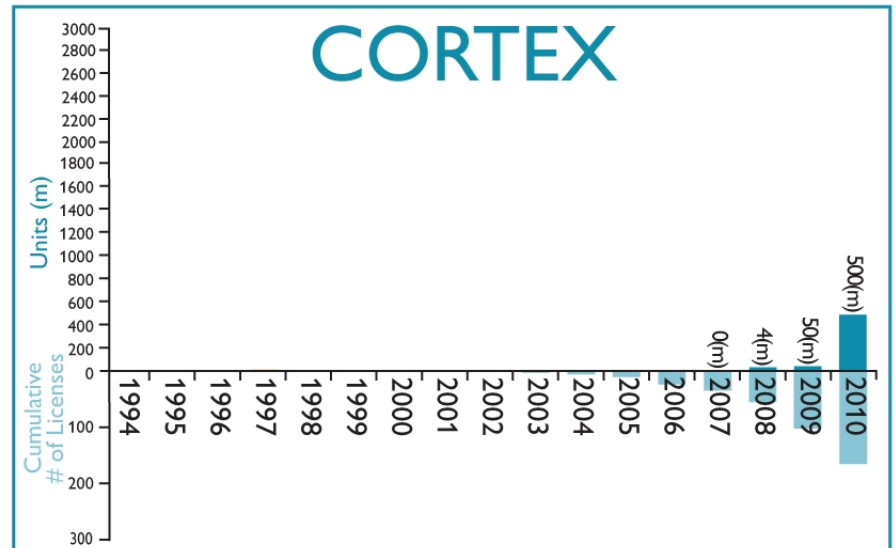
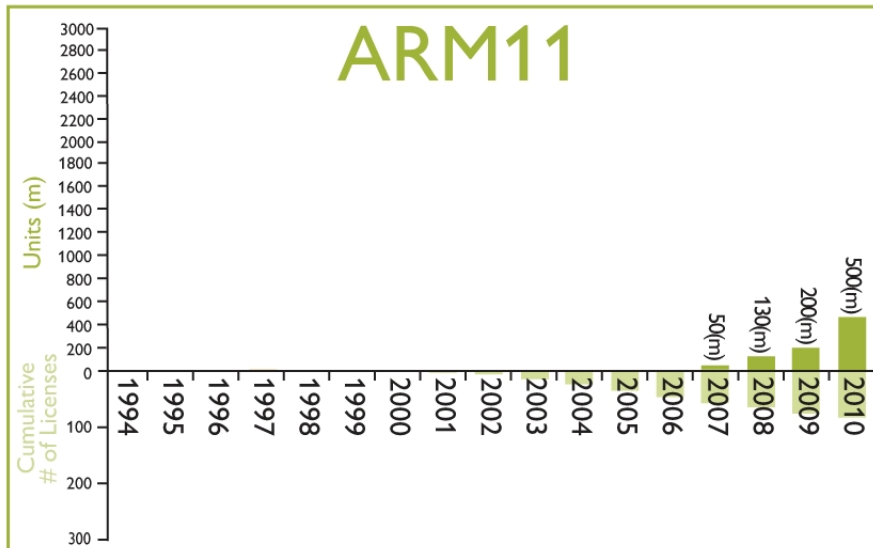
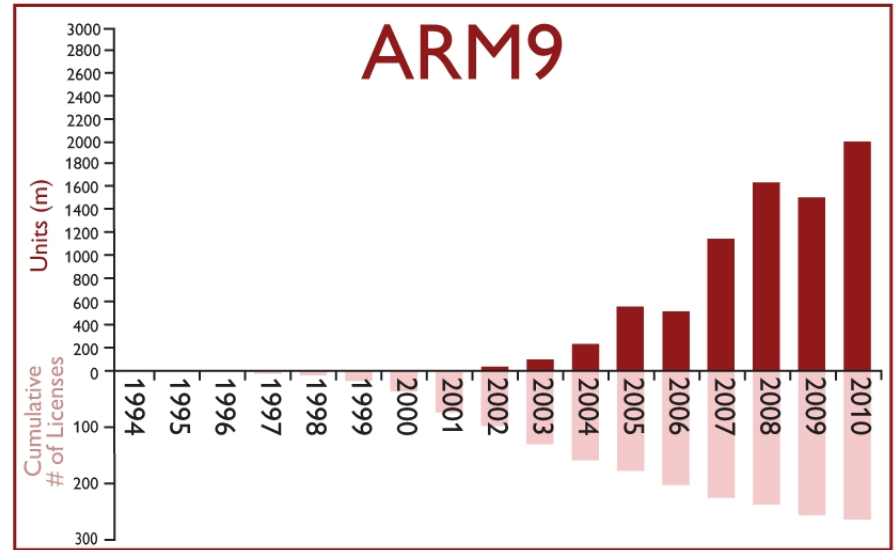
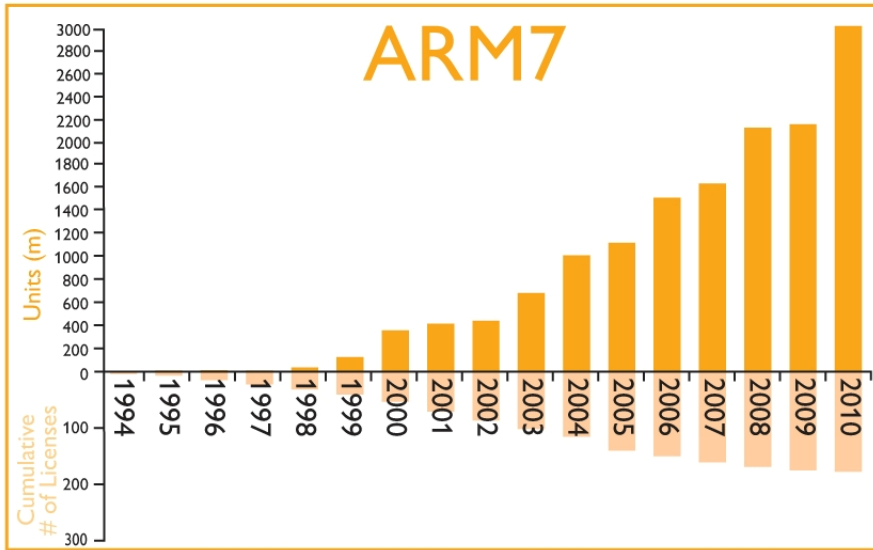
Real-time Embedded  
12bn units per year

Micro-controllers  
19bn units per year

Others = 24 (+4)

\*Note: Licensing numbers adjusted for licenses that are no longer expected to start generating royalties.

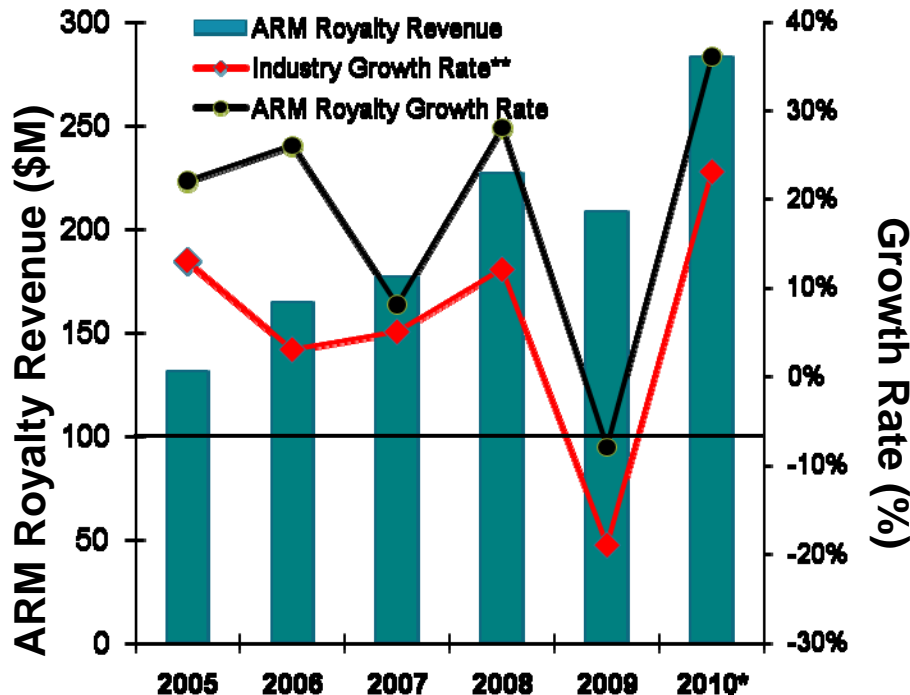
# Latest Technology Drives Royalty Growth



# Royalties Outperform Industry

## FY2010: ARM Outperforms Industry

- FY 2010 royalty revenue up 36%\*
- Industry up 23% over the relevant period†

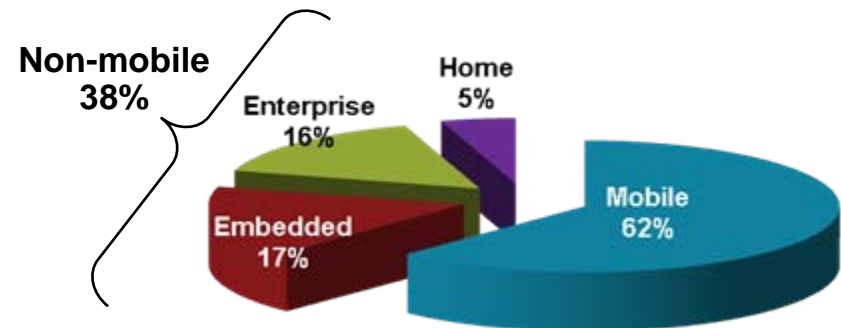


ARM \$ Royalty CAGR (05-10) = 17%  
 Industry \$ Revenue CAGR (05-10) = 4%

\*2010 excludes \$9m of royalty catch-up  
 \*\*Source: SIA December 2010  
 Offset 1 quarter to align with ARM's royalty revenue

## FY10: 6.1bn units (up 55%)

- Industry units (ex-memory) up ~30%
- ARM mobile shipments up ~50%  
 End market shipments up ~25%
- ARM STB/DTV shipments up ~60%  
 End market shipments up ~30%
- ARM hard disk shipments up ~60%  
 Market shipments up ~25%
- ARM MCU shipments up ~100%  
 Overall MCU market up ~45%



Sources:  
 SIA, December 2010  
 Gartner, January 2011

# Opportunity for ARM

## Low Cost Phones



**700m**

devices in 2015

Baseband Modem - \$

**1 x \$**

## Feature Phones



**650m**

devices in 2015

Apps Processor  
and baseband - \$\$\$

WiFi / BT /GPS - \$

Touchscreen/Camera - \$

**5 x \$**

## Smartphone



**1.1bn**

devices in 2015

Apps Processor - \$\$\$

3G BB - \$\$\$

WiFi / BT /GPS - \$

Touchscreen/Camera - \$

**8 x \$**

## Mobile Computer



**750m**

devices in 2015

Apps Processor - \$\$\$\$

3G BB - \$\$\$

WiFi / BT / GPS - \$

Touchscreen - \$

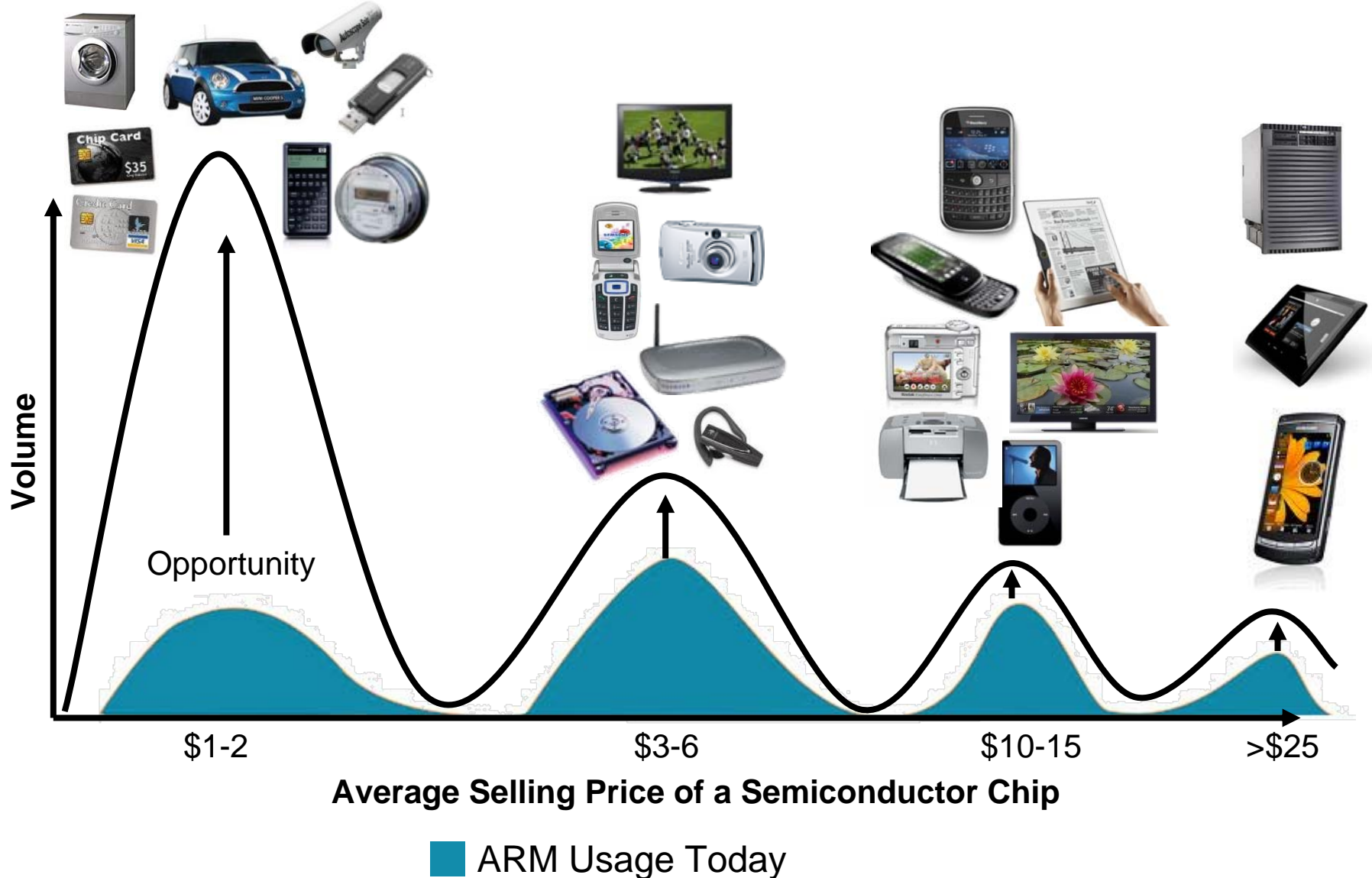
Camera - \$

Storage - \$

**6 x \$**

\$ = Unit of Royalty

# ARM's Opportunity at all Price Points



# Segments for ARM in 2010

	Devices Shipped (Million of Units)	2010 Devices	Chips/ Device	TAM 2010 Chips	2010 ARM	2010 Share
<b>Mobile</b>	Smart Phone	280	2-5	1,200	1,100	90%
	Feature Phone	760	1-3	1,900	1,700	90%
	Low End Voice	570	1	570	540	95%
	Portable Media Players	150	1-3	300	220	70%
	Mobile Computing* (apps only)	230	1	230	25	10%
<b>Non-Mobile</b>	PCs & Servers (apps only)	220	1	220	0	0%
	Digital Camera	130	1-2	200	160	80%
	Digital TV & Set-top-box	350	1-2	450	160	35%
	Networking	670	1-2	750	185	25%
	Printers	120	1	120	75	65%
	Hard Disk & Solid State Drives	670	1	670	560	85%
	Automotive	1,800	1	1,800	180	10%
	Smart Card	5,400	1	5,400	330	6%
	Microcontrollers	5,800	1	5,800	560	10%
	Others **	1,700	1	1,800	270	15%
<b>Total</b>		<b>19,000</b>		<b>22,000</b>	<b>6,100</b>	<b>28%</b>

Source: ABI, Gartner, Semico, Instat, IDC, and ARM estimates

\* Including tablets, netbooks and laptops

\*\* Includes other applications not listed such as headsets, DVD, game consoles, etc

# Segments for ARM in 2015

	Devices Shipped (Million of Units)	TAM 2010 Chips	10 ARM Share	TAM 2015 Devices	Chips/ Unit	TAM 2015 Chips
<b>Mobile</b>	Smart Phone	1,200	90%	1,100	3-5	4,000
	Feature Phone	1,900	90%	650	2-3	2,000
	Low End Voice	570	95%	700	1-2	1,300
	Portable Media Players	300	70%	120	1-3	250
	Mobile Computing* (apps only)	230	10%	750	1	750
<b>Non-Mobile</b>	PCs & Servers (apps only)	220	0%	250	1	250
	Digital Camera	200	80%	150	1-2	250
	Digital TV & Set-top-box	450	35%	500	1-4	1,200
	Networking	750	25%	800	1-2	1,400
	Printers	120	65%	200	1	200
	Hard Disk & Solid State Drives	670	85%	1,100	1	1,100
	Automotive	1,800	10%	2,200	1	2,200
	Smart Card	5,400	6%	7,700	1	7,700
	Microcontrollers	5,800	10%	9,000	1	9,000
	Others **	1,800	15%	2,000	1	2,000
<b>Total</b>		<b>22,000</b>	<b>28%</b>	<b>27,000</b>		<b>34,000</b>

Key Growth Areas for ARM



Source: ABI, Gartner, Semico, Instat, IDC, and ARM estimates

\* Including tablets, netbooks and laptops

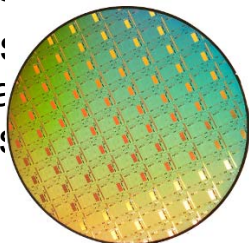
\*\* Includes other applications not listed such as headsets, DVD, game consoles, etc

# Extending the Model

- Physical IP and multimedia IP markets represent further outsourcing opportunity
  - Technology complexity increasing, drives cost and risk
  - ARM develops technology and amortises costs over many licenses
  - Additional royalty streams per chip

## Physical IP

- Leading-edge physical IP available from 250nm to 20nm
- Foundries licensing ARM technology for next generation processes
- >30% of PIPD royalties generated from technology at 65nm or below
  - 12 of top 20 semi: driving ARM royalties from foundries



## Multimedia IP

- 39 licenses for graphics and video
- Samsung, ST and Mediatek licensees
- First licenses now delivering royalties
  - Volume expected to grow in 2011



# Physical IP Licensing Base

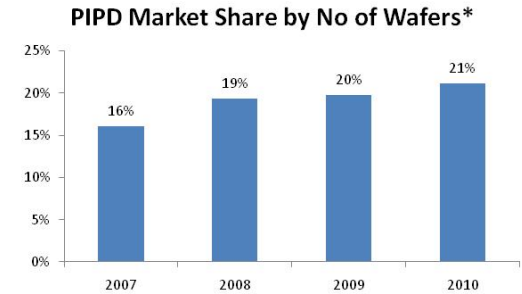
- ARM develops and licenses physical IP for leading ASIC, foundry and fabless semis
  - 32/28nm licenses signed with all advanced foundries
    - Working on 20nm
  - Over 30 foundries have licensed 77 platforms on process nodes from 250nm to 20nm
  - Nine new platforms licensed in 2010
    - Higher than historical average
- Over 30 platforms yielding royalties
  - 6 platforms driving royalties at advanced nodes at 65nm or below
  - 12 of top 20 semis are driving ARM royalties from foundries
- Collaboration with IBM to 14nm

Platforms Licensed by Foundry	22/20	32/28	45/40	65nm	90nm	130nm	180nm -250nm
Chartered		✓	✓	✓	✓		✓
Dongbu						✓	✓
GlobalFoundries		✓					
Grace							✓
HHNEC							✓
IBM (CMOS & SOI)	✓	✓	✓	✓	✓	✓	✓
Magnachip							✓
Samsung		✓	✓	✓	✓		
SMIC				✓	✓	✓	✓
Tower						✓	✓
TSMC	✓	✓	✓	✓	✓	✓	✓
UMC				✓	✓	✓	✓
Vanguard							✓
X-Fab							✓

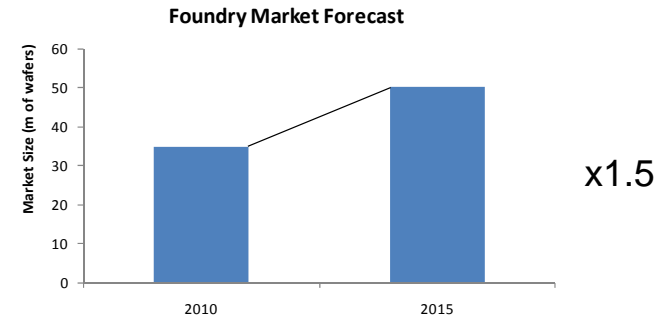


# PIPD's Market Development

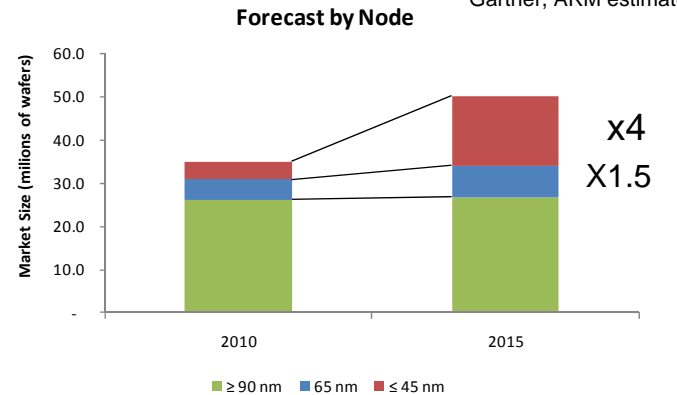
- PIPD market share has grown steadily
  - All major foundries licensed physical IP
- Foundry wafer volume expected to grow significantly as IDMs continue to outsource
- ARM well positioned for long-term royalty growth
  - Advanced foundries signed up for geometries at 45nm and below
  - Leading fabless semis starting to make outsourcing decisions
- Creates opportunity for growth as advanced nodes are forecast to become fastest growing nodes



\* 200mm equivalent wafers



Gartner, ARM estimates

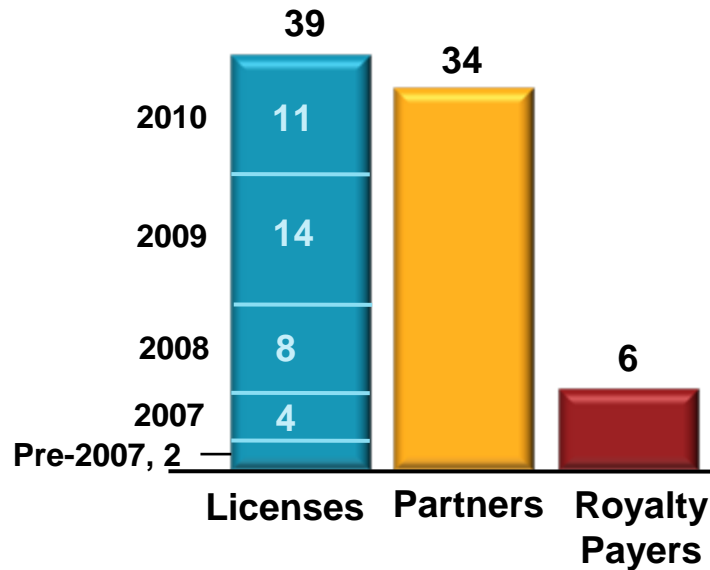


Gartner, ARM estimates

# Extending IP Outsourcing: Media

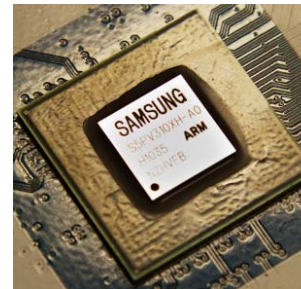
## Growing the Media Processor Licensing Base

- 39 licenses for graphics and video
  - 8 licenses added in Q4 2010



## Growing Shipments in Mobile and Non-Mobile Applications

- More Mali-based chips shipping into mobile and consumer electronics devices



Samsung announced that Mali-based Orion delivered 5 times more graphics performance than their previous design

STMicroelectronics announced 10 major STB design wins for Mali-based STi7108



# Competitive Landscape

---

- ARM had ~30% market share of total embedded processor market in 2008 – up from ~20% in 2006
  - Remaining 70% mostly customers' proprietary designs
  - Some market-share held by smaller IP companies
- Customers will outsource when ...
  - No longer able to monetise investment in differentiation
  - OEM wants ARM-based solution to lower costs
- Key areas of competition
  - Netbooks – expansion opportunity for ARM technology but modest royalty impact in short term
  - Microcontrollers – ARM developing as the standard; removing structural cost
  - Physical IP – ARM well positioned as leading semiconductor companies consider outsourcing; processor synergy with physical IP

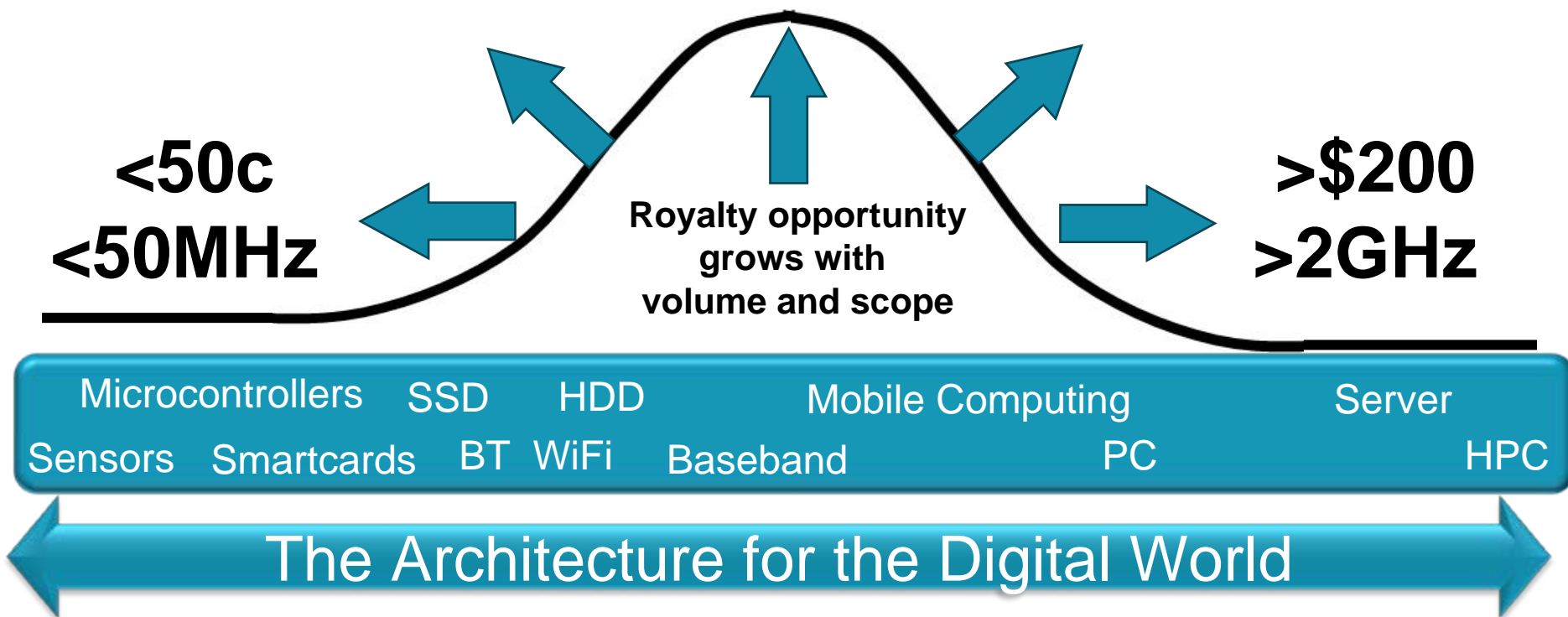
# Visibility of Future Growth

---

- Good visibility of customer long-term product roadmaps and technology needs
  - Rarely revert to in-house designs
  - Re-equip with next generation technology every 1-2 years
  - Long-term strategic relationships and licensing sales cycles give 6-18 months visibility
  - Backlog contributes meaningful revenue each quarter
- Royalty revenues provide increasing visibility
  - Critical mass, diversity of end-market applications and growing market share
  - Revenues recognised one quarter in arrears

# ARM's 2020 Vision

- ARM is growing into new markets and product categories
  - From sensors to servers, from 50c to \$200, from <50MHz to >2GHz
- Today's processor licenses drive shipments beyond 2015
- Expect over 100 billion cumulative ARM based chips by 2020



# From Revenue to Profits and Cash

FY2009 Revenues	\$m	£m	%revs	
Licensing	208.2	132.5	33%	95% of revenues earned in US dollars
Royalty	335.3	217.7	53%	
Other	87.8	56.4	14%	Royalties approximately 50% of revenues
<b>Total</b>	<b>631.3</b>	<b>406.6</b>	<b>100%</b>	
COGS		23.3		R&D expensed as incurred
<b>Gross Margin</b>		<b>94.3%</b>		
<b>Operating Costs</b>		<b>219.0</b>		Approximately 50% of costs in USD 10% move in \$/£ impacts EPS by ~15%
Operating Margin		40.4%		
Profit Before Tax		167.4		Operating margins and earnings will increase as royalties grow
<b>EPS</b>		<b>9.34p</b>		
<b>Free Cash Flow</b>		<b>£290.1</b>		Cash generative, debt free

# ARM – Investment Case Summary

---

- World leading position in a long-term secular growth market
- Attractive long-term licensing and royalty business model
  - Substantial license base drives future royalty growth
  - About half of customers currently paying royalty
  - Licensing base incrementing by 60-90 new licenses each year
  - >6 billion ARM-based chips shipped in 2010, 25% CAGR over 5 years
- Technology becoming more broadly applicable
  - 95% market penetration in cellphones; increasing value per phone
  - Increasing penetration beyond mobile
  - Extending the business model with video, graphics and physical IP
- Royalty growth drives margin expansion
- Royalty stream generates growing and increasingly predictable cash flow