Arm Limited is a subsidiary of ☰ SoftBank

A backward glance and a forward view

Ian Thornton, Head of Investor Relations

Tokyo

18 May 2018
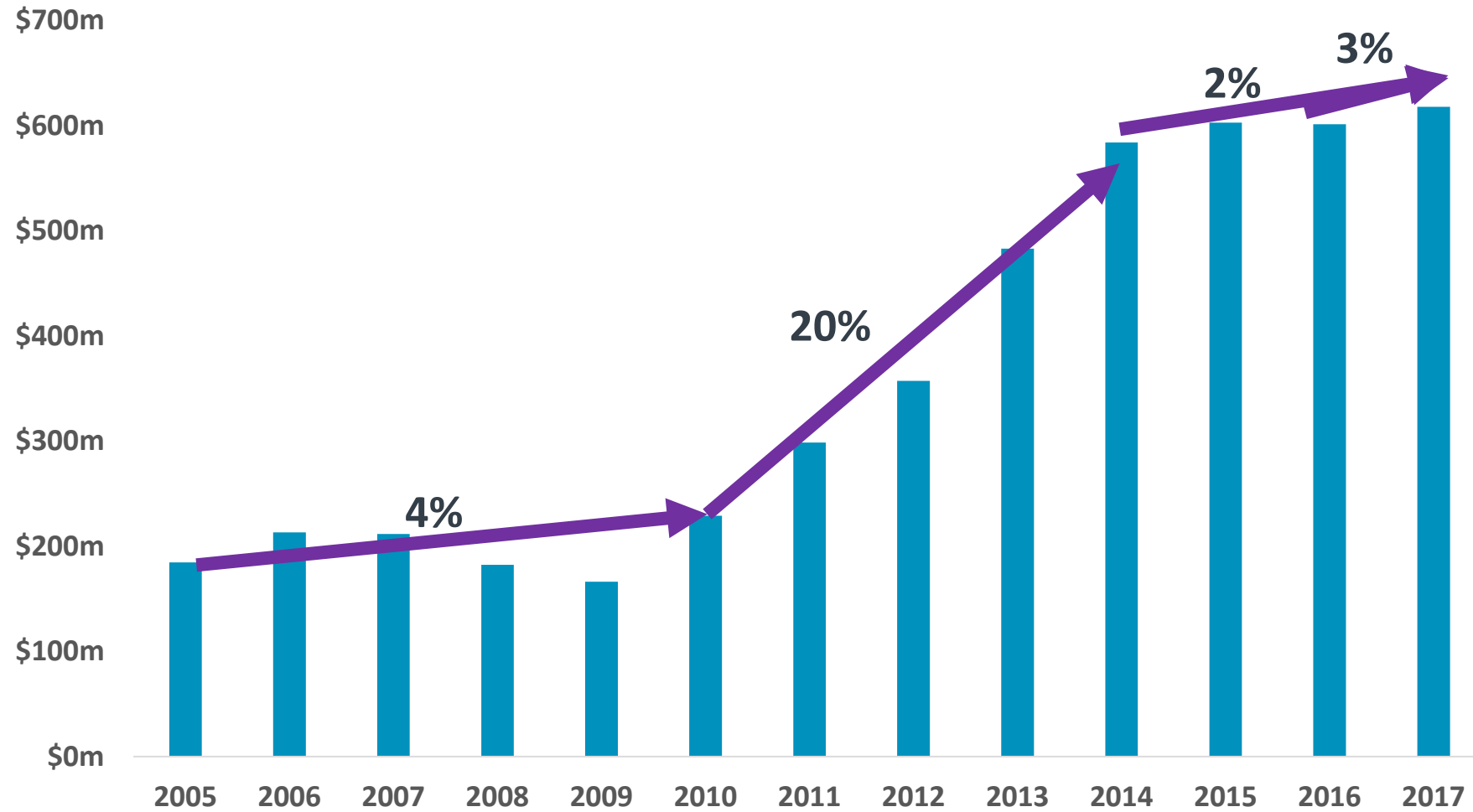
Arm update

A Backward Glance: Progress in 2017

- Financials
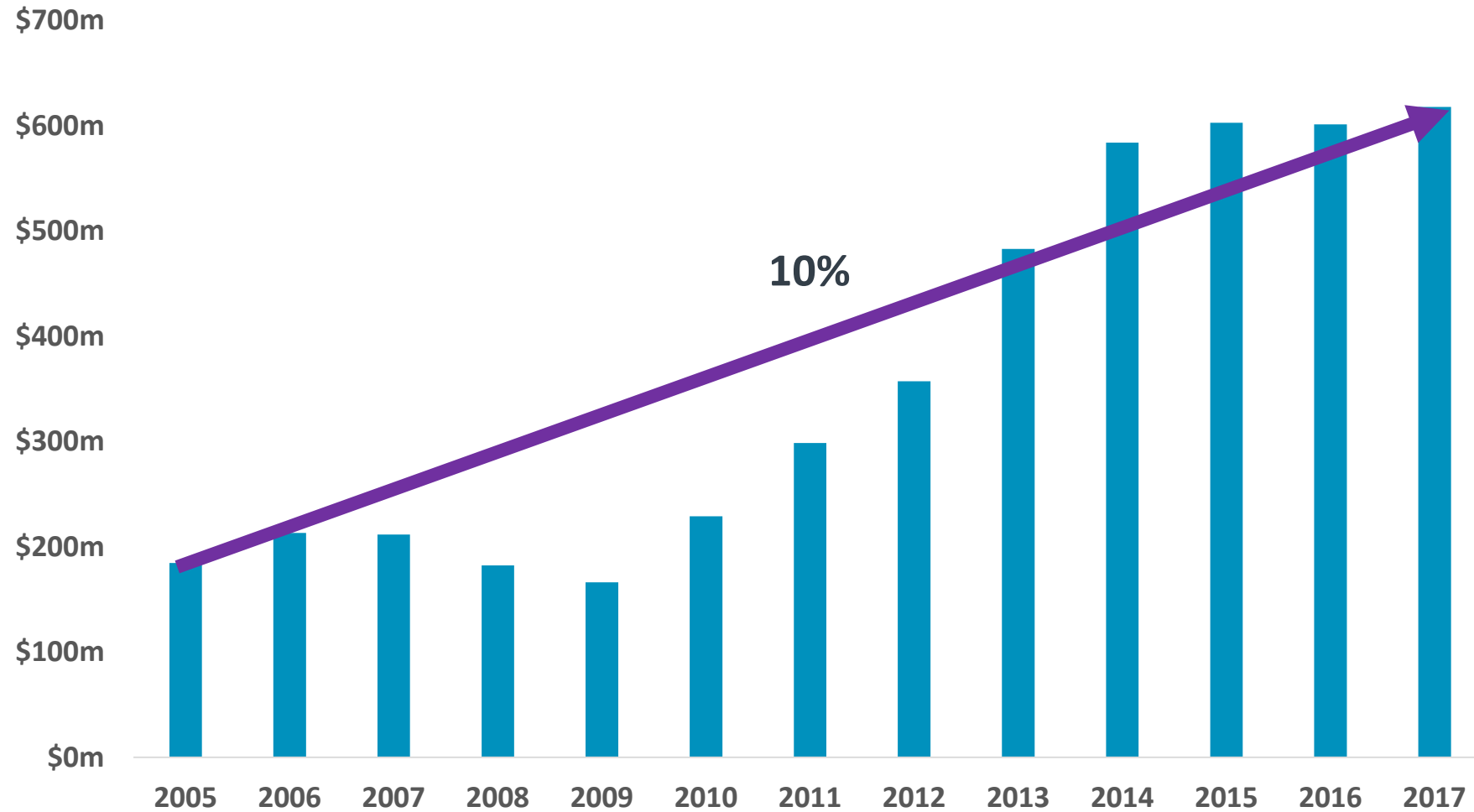- Investments / hiring
- Meltdown / Spectre

A Forward View:

- Market forecasts
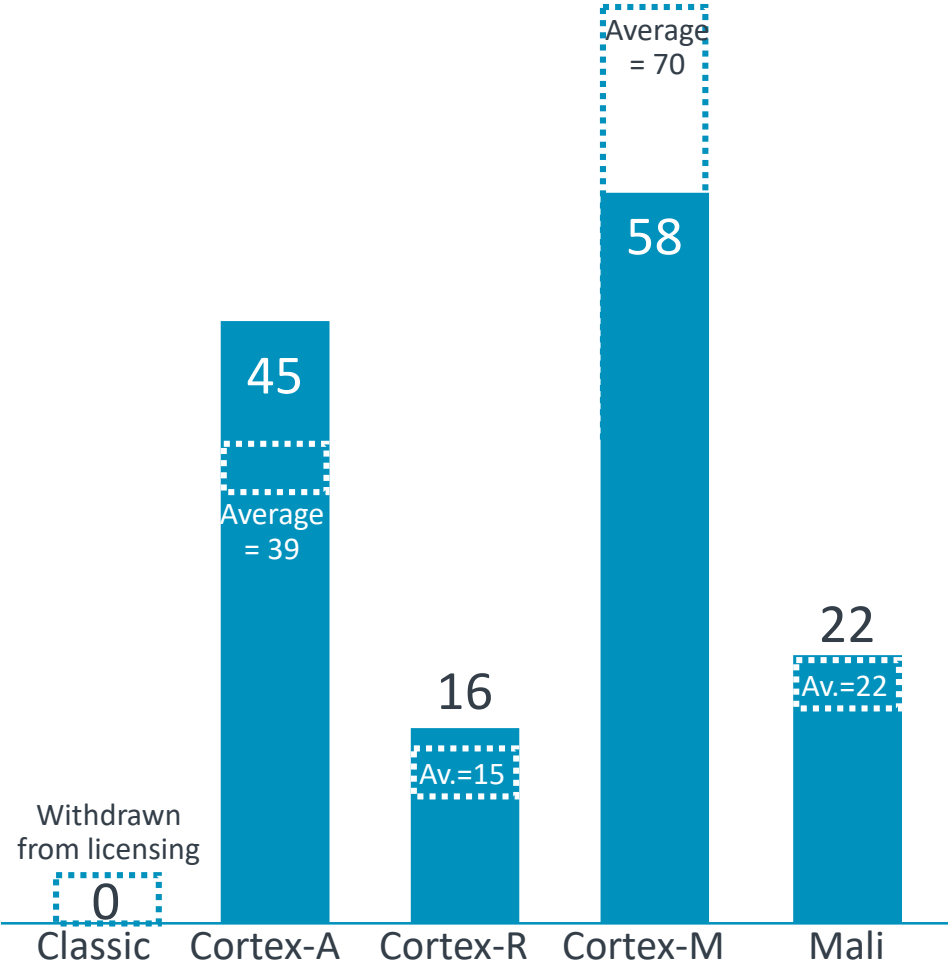- Arm China JV
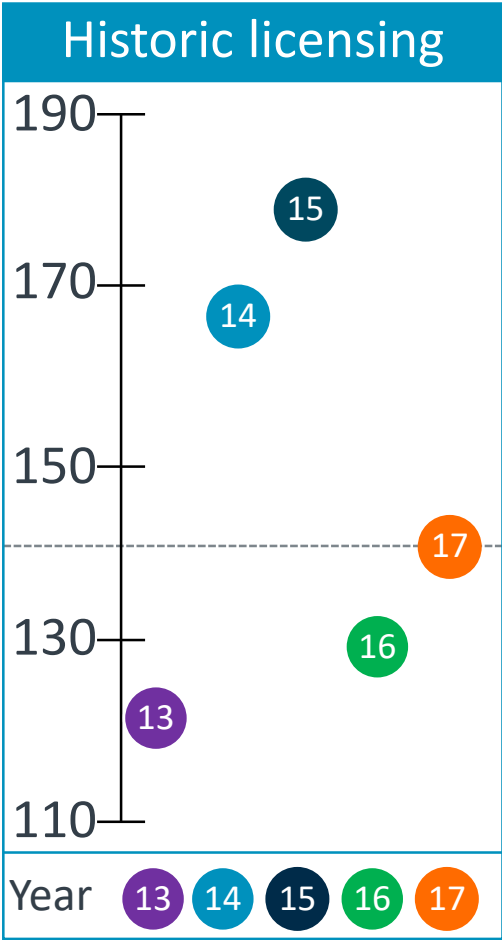- New technology for smartphones and IoT

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Licensing

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2017 Licensing: Revenue

arm

2017 Licensing: Revenue

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2017 Licensing: 141 is the mid-point of normal range

Historic licensing

© 2018 Arm Limited

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DesignStart Pro – Launched June 2017

DesignStart for Cortex-M0 and Cortex-M3

Faster access to IoT processors

No upfront fee

Accelerating the next trillion IoT devices

*DesignStart gives companies easy access to Arm IP. There is no upfront license fee, the partner pays royalties once chips enter production.

51

- Arm's most popular processors have no up-front fee

- First 5,000 chips also royalty free

- Click-to-accept licensing agreement

- Targeted at academia, start-ups and small business units in large companies

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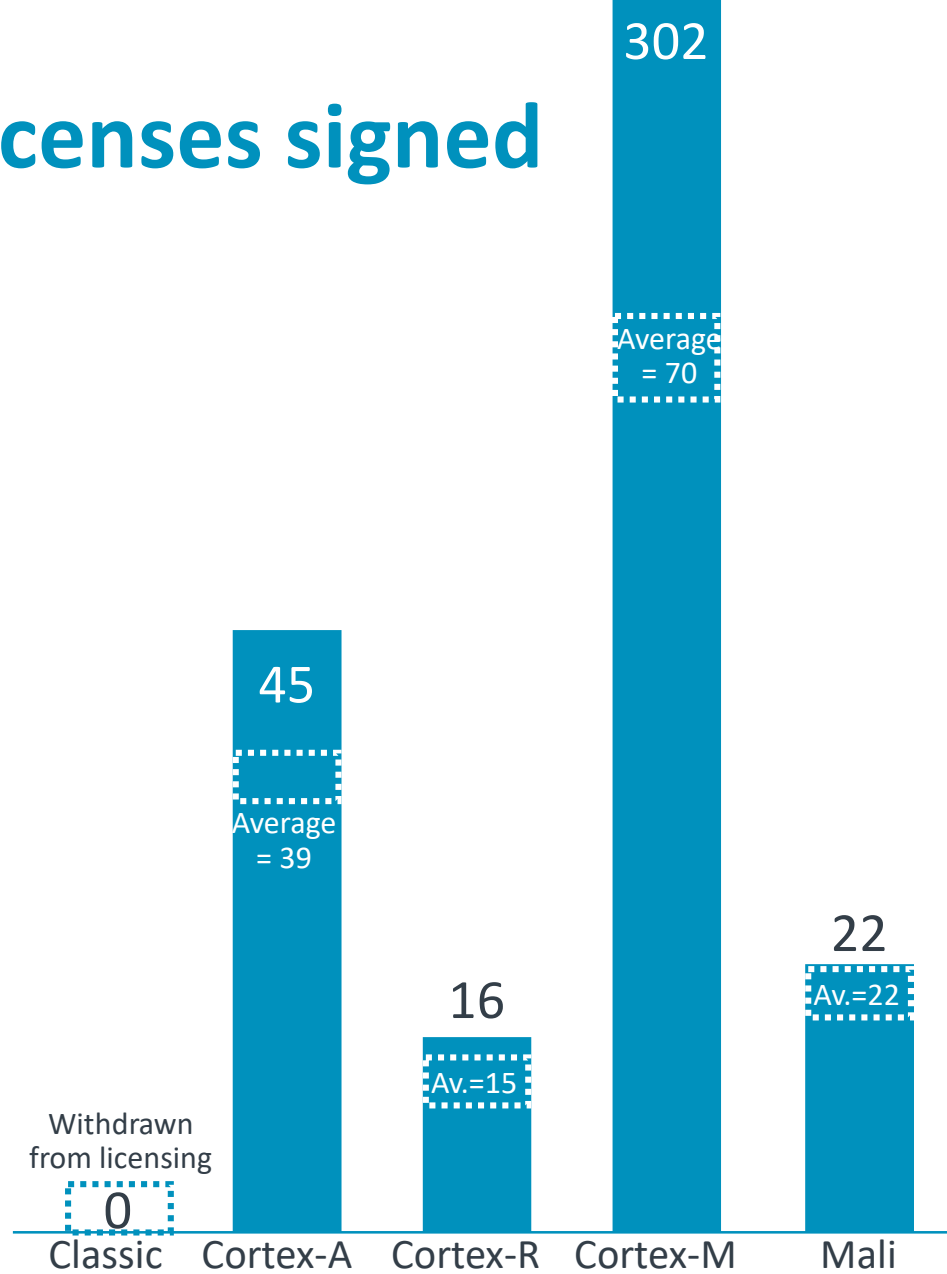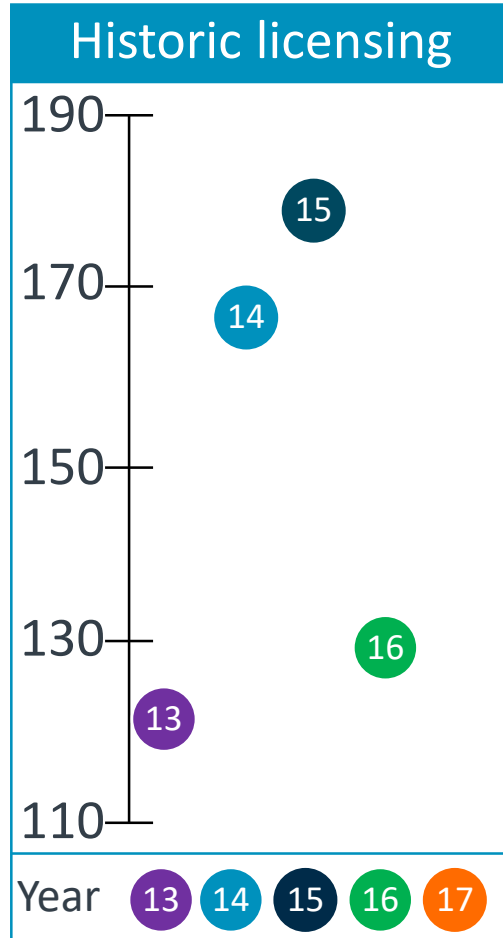# DesignStart – Enabling the entire industry to build chips

244
Cortex-M licenses in
284
days in Fiscal 2017

DesignStart Pro
Launched 20 June 2017
License-fee free; royalty bearing

>2600
Cortex-M downloads
to date

DesignStart Eval
Launched end June 2017
No fees. Evaluation only.
Optimised for FPGA

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2017 Licensing: 385 licenses signed

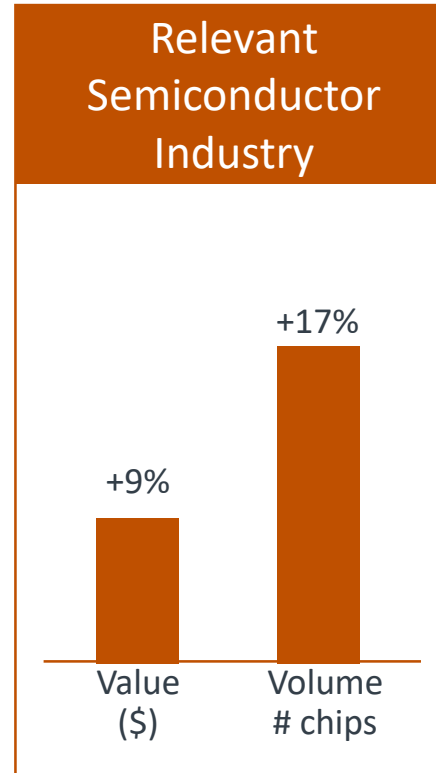## Historic licensing

190 —
170 —
150 —
130 —
110 —

15
14
16
13
17

Year: 13 14 15 16 17

Withdrawn from licensing
0

Classic

45
Average = 39
Cortex-A

16
Av.=15
Cortex-R

302
Average = 70
Cortex-M

22
Av.=22
Mali

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Royalties

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2017: Industry growth vs Arm growth

$410bn

Overall Semiconductor Industry

+22% Value ($)
+14% Volume # chips
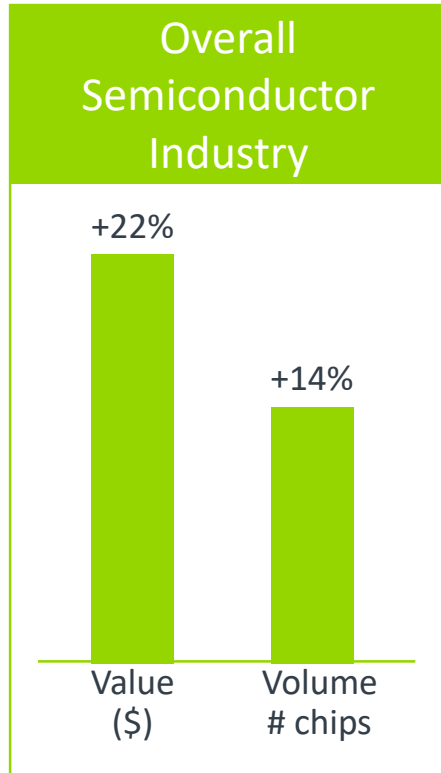
Strong growth in memory and graphics for data centre

$165bn

Relevant Semiconductor Industry

+9% Value ($)
+17% Volume # chips

Strong growth in MCUs; slower growth in apps for mobile

$1.1bn

Arm Royalty Revenue

+12% Value ($)
+20% Volume # chips
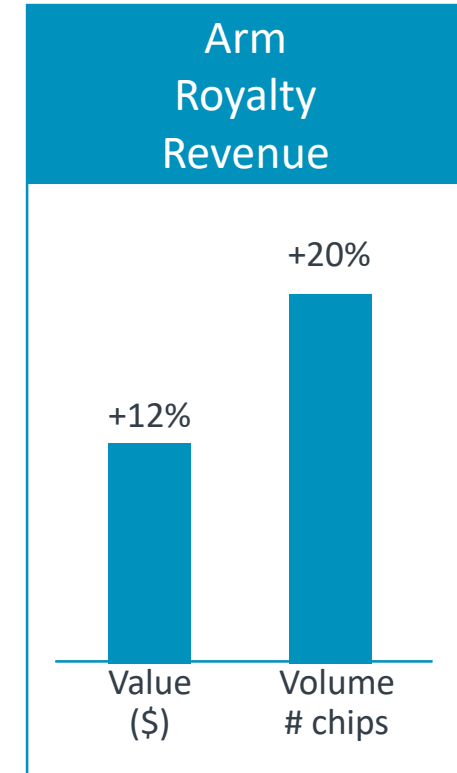
Arm gaining share in embedded Royalty rate increasing

arm

Arm-based chip shipments

120bn

Arm-based chips shipped to date

39%

Market share in 2017

21.3bn

17.7bn

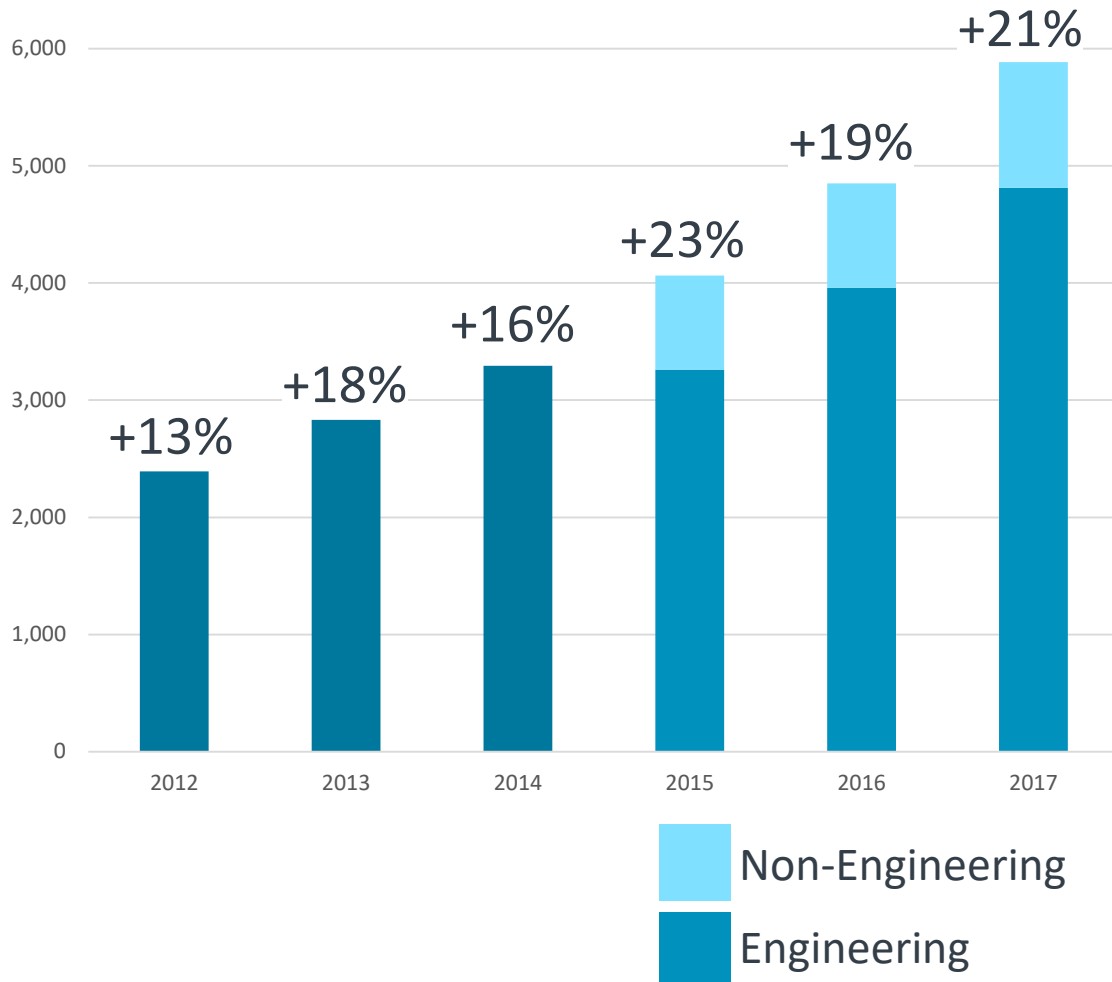Arm-powered SoCs shipped (billions)

20

15

10

5

0

1991

Calendar Years

2017

arm
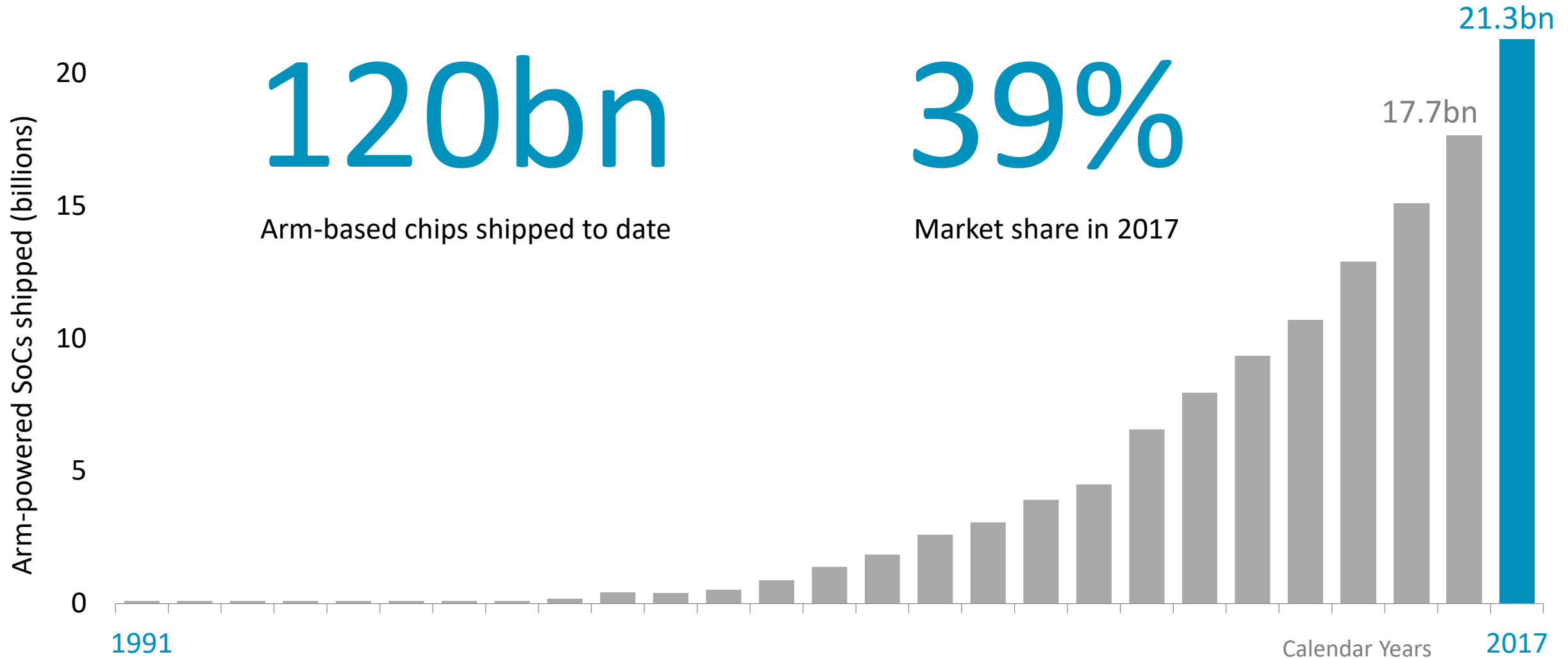
Investments Profitability

arm

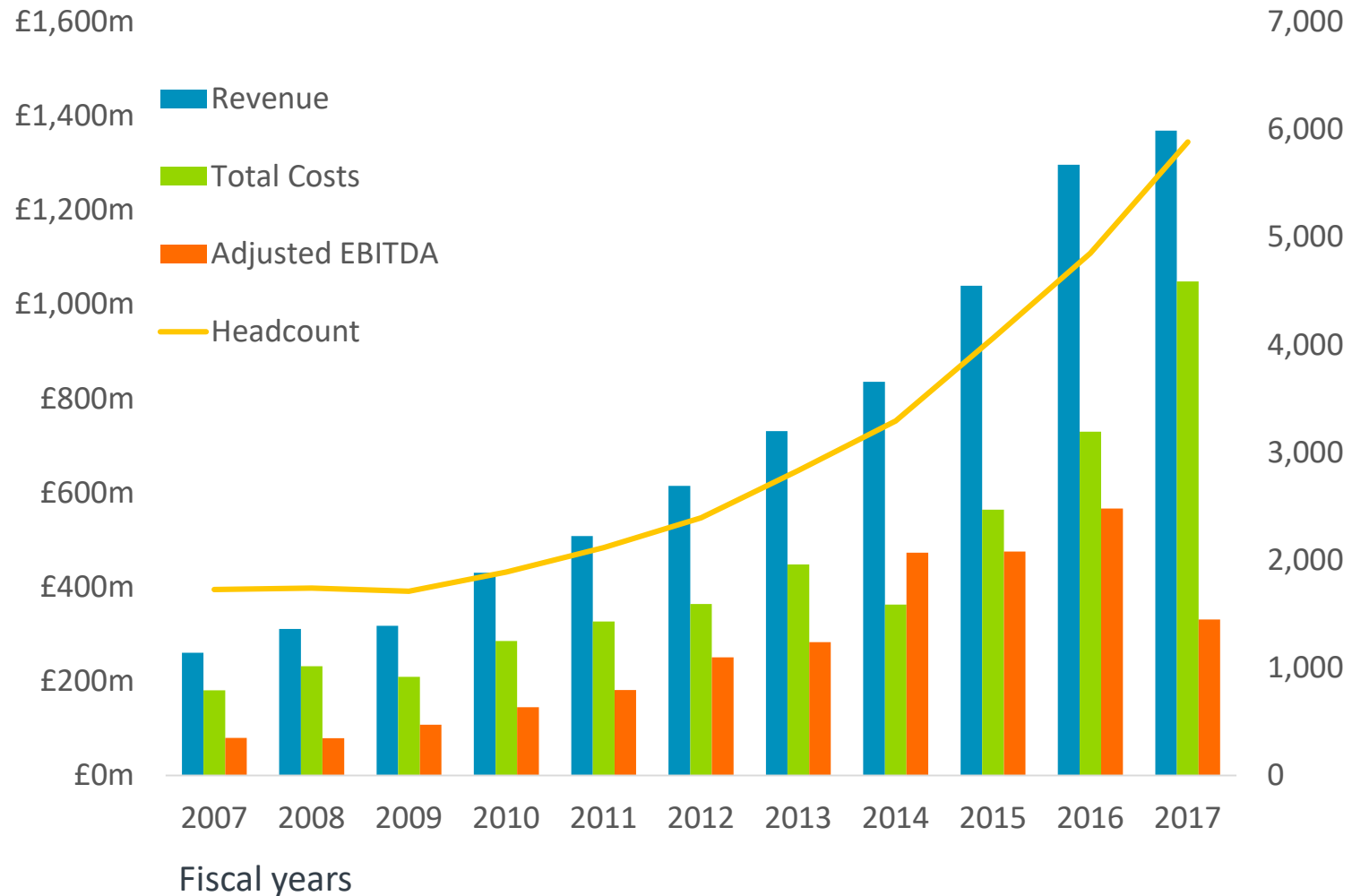# Investing in engineering to increase productive output

Arm recruitment is consistent with previous years

Focus on retaining quality as well as quantity; and on cultural and organisational integration

Expect to sustain this run rate for next 2-3 years

arm

Revenues, investments and profits

Until 2016 revenues grew faster than costs as Arm constrained investment in R&D to enable increasing profits

For the current phase of investment Arm expects costs to grow faster than revenues

This should yield even greater profits in the future
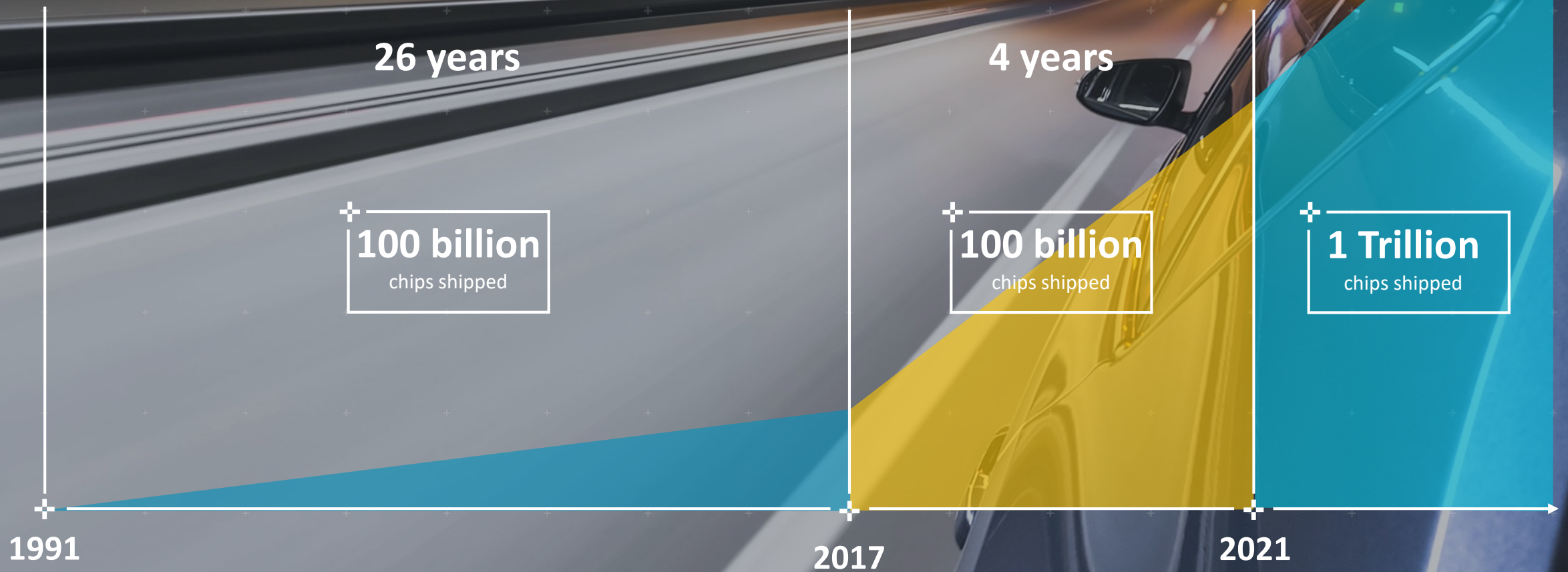
Managing
new risks and threats

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SPECTRE

MELTDOWN

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Forward View

© Arm 2018

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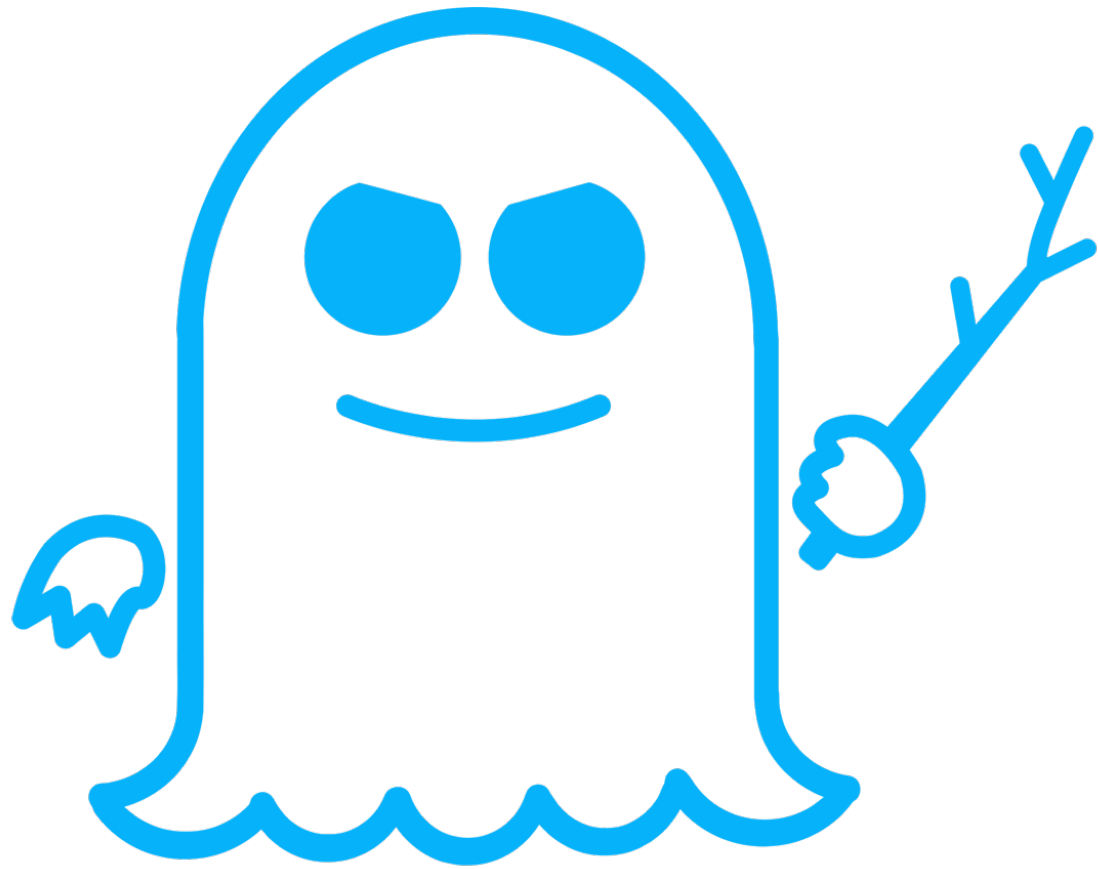
Forecasting future growth

On track for 100 billion Arm-based chips shipped 2017 + 2018 + 2019 + 2020

26 years

4 years

100 billion
chips shipped

100 billion
chips shipped

1 Trillion
chips shipped

1991

2017

2021

Arm's expanding opportunity

		2017		2026
		Market Share	Market Value	Market Value
Mobile Computing	Applications processor	90%	$21bn	$32bn
	Other mobile chips	45%	$14bn	$18bn
Infrastructure	Networking	20%	$14bn	$19bn
	Servers	~1%	$17bn	$22bn
Automotive	IVI and ADAS	90%	$4bn	$15bn
	Other automotive chips	10%	$8bn	$15bn

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Arm's expanding opportunity

		2017		2026
		Market Share	Market Value	Market Value
Embedded	Controller in IoT Devices	90%	$7bn	$24bn
	Microcontrollers/ SIM Cards	20%	$17bn	$21bn
Other Markets	Consumer Electronics	40%	$21bn	$27bn
	Other chips	40%	$7bn	$10bn
Total Market	All chips with processors (current TAM)	39%	$130bn	$200bn
	All addressable chips (future TAM)	25%	$165bn	$220bn

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Arm China

A Joint Venture: Built on strong foundations

Arm has great success in China

>200

CUSTOMERS

95%

Chinese designed SoC based on ARM processor technology

10bn

Chips shipped by Chinese partners using ARM processor technology

x140

Growth in volume shipment by Chinese partners 2006-2017

China landscape

China is investing to become a net exporter of semiconductors

China already has world class chip developers

Some companies desire technology optimised for local market

Some Government projects are accessible to technology

- Chinese developed
- Chinese owned
- Chinese controlled

Arm decided to create "Arm China" Joint Venture

49%

51%

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Largest single shareholder

HOPU
厚樸

Multiple investors

arm
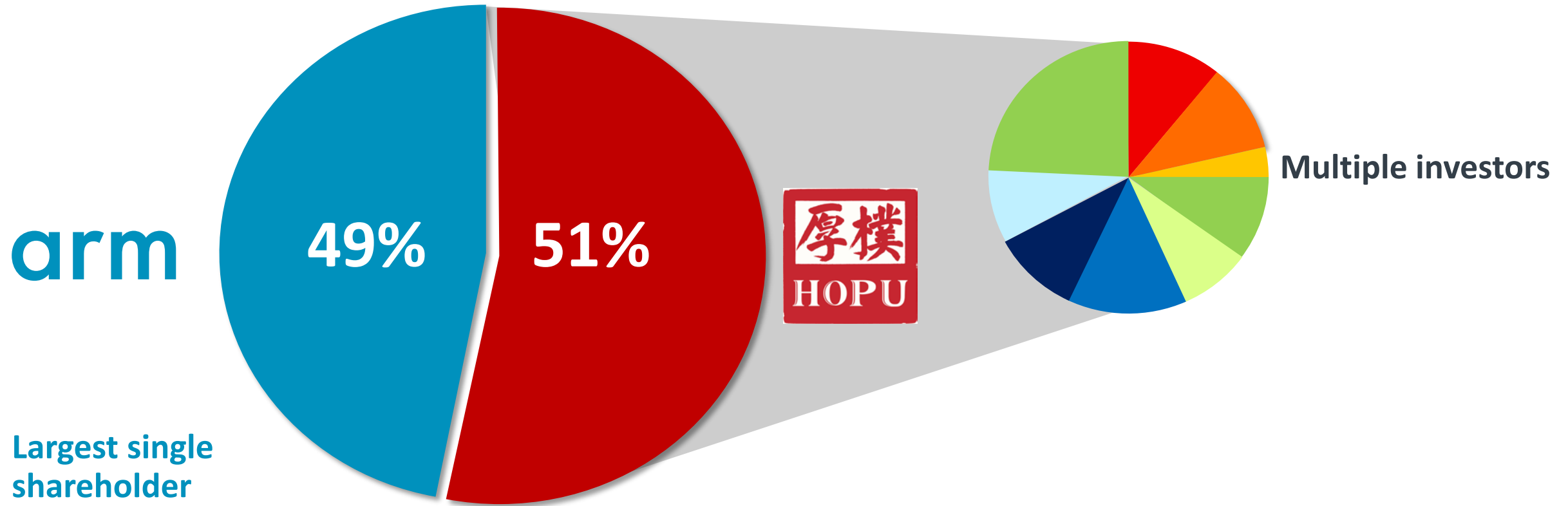
Strong foundation for development in China

Sustain access to the Chinese market

Increase adoption of Arm technology

Partnerships with government & ecosystem

Localised products can be licensed globally by Arm Ltd

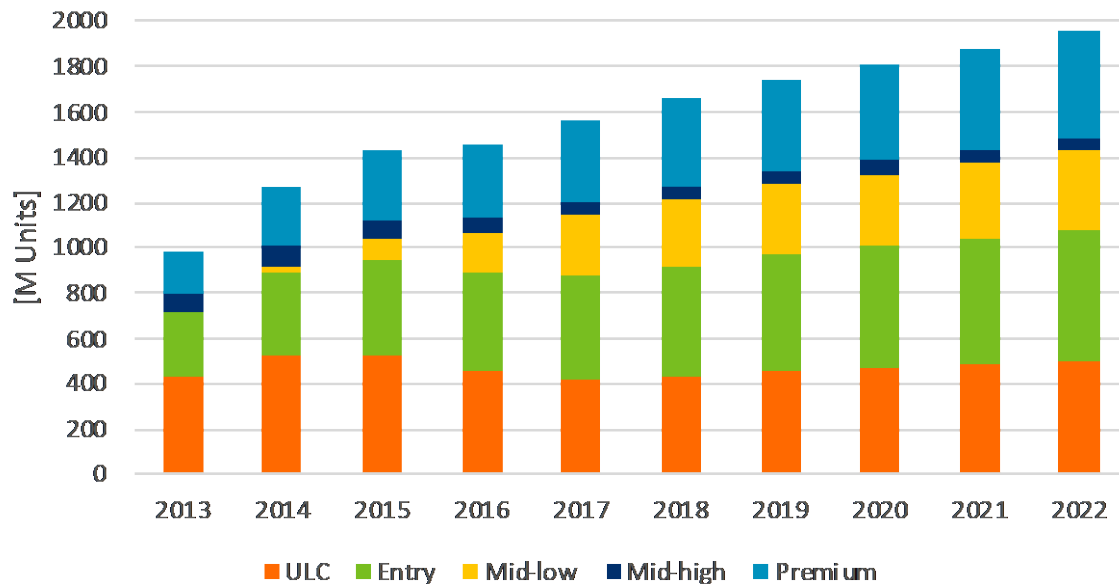Reduced risk & enable other investment opportunities

Making smartphones smarter

Smartphone – Growing volume and technology

Mobile - 1.6Bn today, ~2.0Bn by 2022

Smartphone CAGR 4.3% over next 5 years

Global Smartphone Sales Forecast

Source: Strategy Analytics and Arm

Technology increasing opportunity

High-resolution display at all price points enabling capabilities for new and richer user experiences
- AAA Game play,
- HD video and
- AR/MR

AI for Natural Language and visual understanding

5G Modem enabling increased compute

3D and 360 video capture and playback
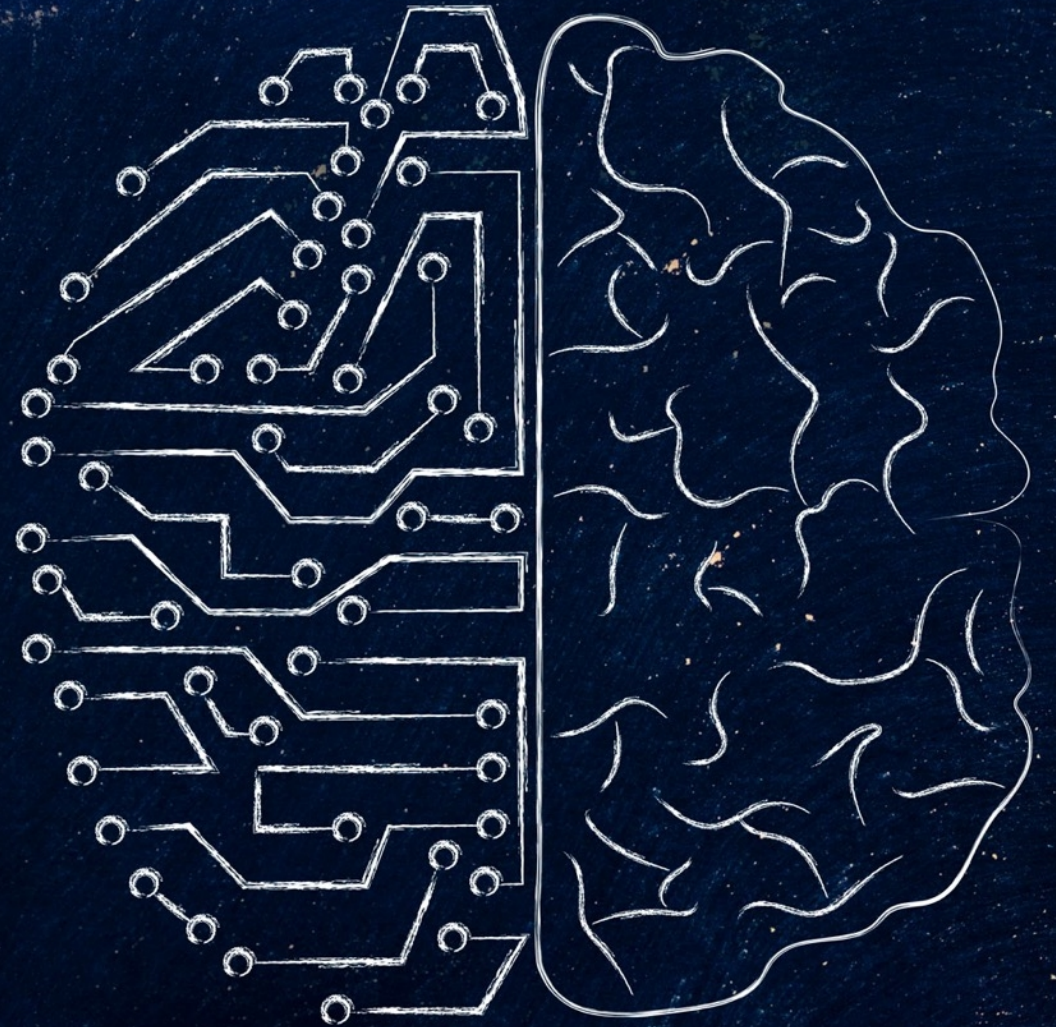
Feature phone users transition to 4G smartphones

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Project Trillium:
Arm ML for All Devices

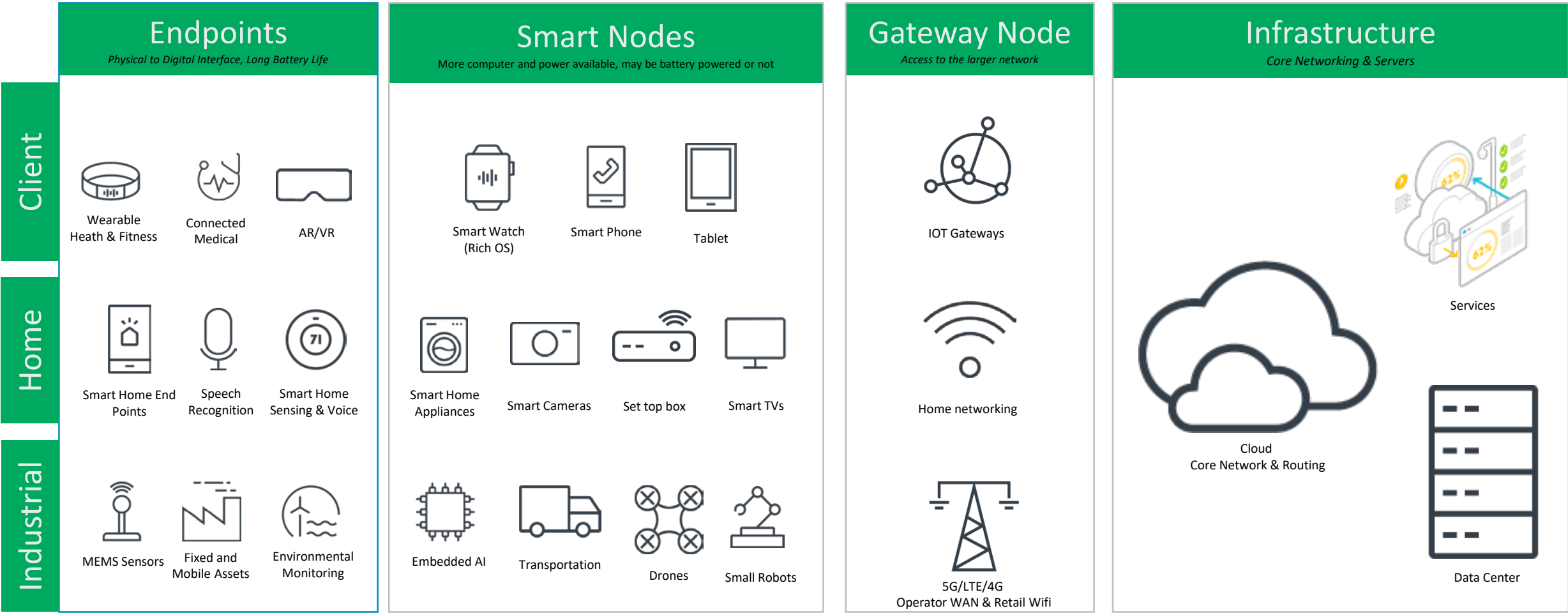Arm ML suite of IP: designed for unmatched versatility and scalability:
+ Machine Learning (ML) processor
+ Object Detection (OD) processor
+ Neural Network (NN) software libraries

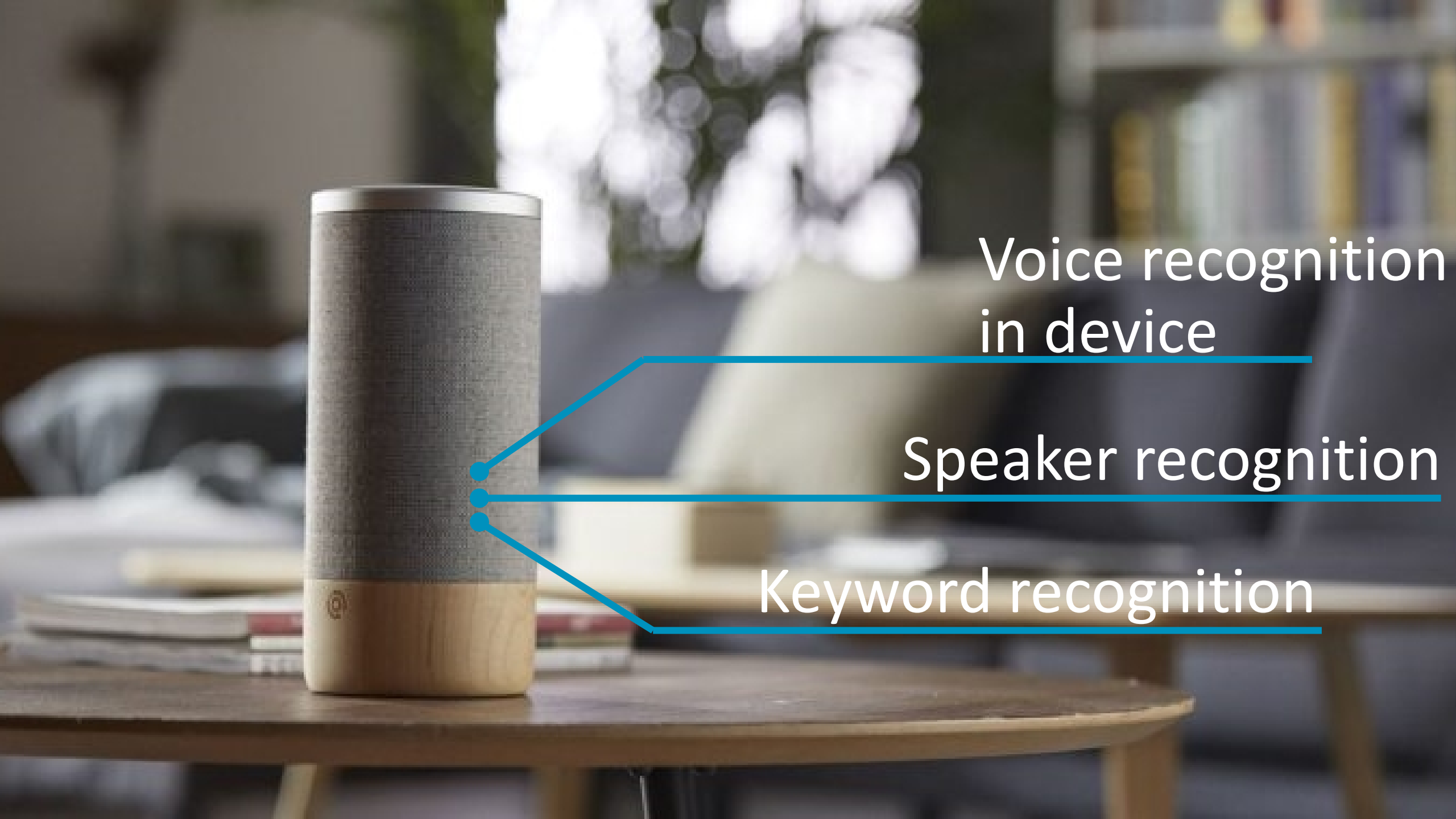Market growth in units (today to 2028):
+ Mobile - 1.7Bn to 2.2Bn

+ Smart IP Cameras - 160M to 1.3Bn

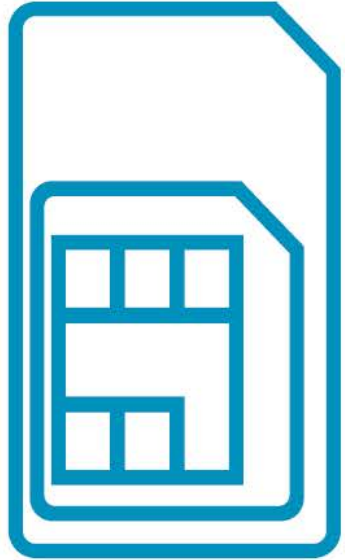+ AI-enabled devices - 300M to 3.2Bn

Machine learning will be everywhere

Endpoints
Physical to Digital Interface, Long Battery Life

Client

- Wearable Heath & Fitness
- Connected Medical
- AR/VR

Home

- Smart Home End Points
- Speech Recognition
- Smart Home Sensing & Voice

Industrial

- MEMS Sensors
- Fixed and Mobile Assets
- Environmental Monitoring

Smart Nodes
More computer and power available, may be battery powered or not

- Smart Watch (Rich OS)
- Smart Phone
- Tablet
- Smart Home Appliances
- Smart Cameras
- Set top box
- Smart TVs
- Embedded AI
- Transportation
- Drones
- Small Robots

Gateway Node
Access to the larger network

- IOT Gateways
- Home networking
- 5G/LTE/4G Operator WAN & Retail Wifi

Infrastructure
Core Networking & Servers

- Services
- Cloud Core Network & Routing
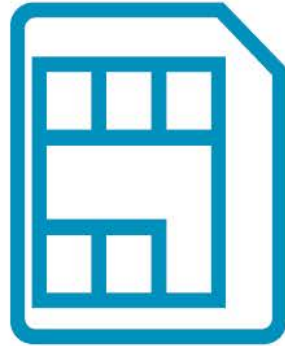- Data Center

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Voice recognition in device

Speaker recognition

Keyword recognition

Virtual SIM Card

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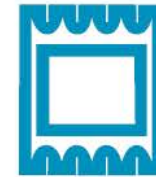
Mini SIM
25 x 15 mm
1996
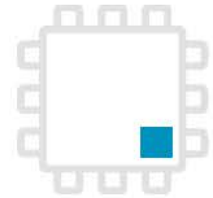
Micro SIM
15 x 12 mm
2003

Nano SIM
12.3 x 8.8 mm
2012

eSIM (MFF2)
6 x 5 mm
2016

iSIM

Miniaturization of IoT Devices

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