INVESTOR DAY 2018

Tuesday, September, 11, 2018
New York, New York

SECURE CONNECTIONS
FOR A SMARTER WORLD

Agenda

8:00 – 8:10am	IR Introduction	Jeff Palmer
8:10 – 8:40am	NXP Overview	Rick Clemmer
8:40 – 9:10am	Financial Overview	Peter Kelly
9:10 – 9:25am	Q&A	Rick Clemmer and Peter Kelly
9:25 – 9:45am	Mobile	Rafael Sotomayor
9:45 – 10:40am	Industrial	Geoff Lees
10:40 – 10:55am	Q&A	Rafael Sotomayor and Geoff Lees
10:55 – 11:10am	*Break*	
11:10 – 12:40pm	Automotive	Kurt Sievers, Torsten Lehmann and Jens Hinrichsen
12:40 – 12:55pm	Q&A	Kurt Sievers, Torsten Lehmann and Jens Hinrichsen
12:55 – 1:10pm	Go-to-Market	Steve Owen
1:10 – 1:30pm	Summary and Q&A	Rick Clemmer and NXP Management Team
1:30 – 2:30pm	Lunch	

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Forward-Looking Statement

This presentation or the subsequent discussion period includes forward-looking statements which include statements regarding our business strategy, financial condition, results of operations, market data and expectations, outlooks, projections, estimates, goals and targets, as well as any other statements which are not historical facts. By their nature, forward-looking statements are subject to numerous factors, risks and uncertainties that could cause actual outcomes and results to be materially different from those projected. These factors, risks and uncertainties include the following: market demand and semiconductor industry conditions, our ability to successfully introduce new technologies and products, the demand for the goods into which our products are incorporated, our ability to generate sufficient cash, raise sufficient capital or refinance our debt at or before maturity to meet both our debt service and research and development and capital investment requirements, our ability to accurately estimate demand and match our production capacity accordingly or obtain supplies from third-party producers, our access to production from third-party outsourcing partners, and any events that might affect their business or our relationship with them, our ability to secure adequate and timely supply of equipment and materials from suppliers, our ability to avoid operational problems and product defects and, if such issues were to arise, to rectify them quickly, our ability to form strategic partnerships and joint ventures and successfully cooperate with our alliance partners, our ability to win competitive bid selection processes to develop products for use in our customers' equipment and products, our ability to successfully hire and retain key management and senior product architects; and, our ability to maintain good relationships with our suppliers. In addition, this presentation contains information concerning the semiconductor industry and our business which is forward-looking in nature and is based on a variety of assumptions regarding the ways in which the semiconductor industry, our market segments and product areas will develop. We have based these assumptions on information currently available to us, if any one or more of these assumptions turn out to be incorrect, actual market results may differ from those predicted. While we do not know what impact any such differences may have on our business, if there are such differences, our future results of operations and financial condition, and the market price of the notes, could be materially adversely affected. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak to results only as of the date the statements were made. The forward-looking statements in this presentation are based on management's plans, objectives and information available as of the September 11, 2018 date of this presentation. Except for any ongoing obligation to disclose material information as required by the United States federal securities laws, NXP does not have any intention or obligation to publicly update or revise any forward-looking statements, whether to reflect any future events or circumstances or otherwise. Neither future distribution of this material nor the continued availability of this material in archive form on our website should be deemed to constitute an update or re-affirmation of these forward-looking statements as of any future date. For a discussion of potential risks and uncertainties, please refer to the risk factors listed in our SEC filings. Copies of our filings are available from our Investor Relations department or from the SEC website, www.sec.gov

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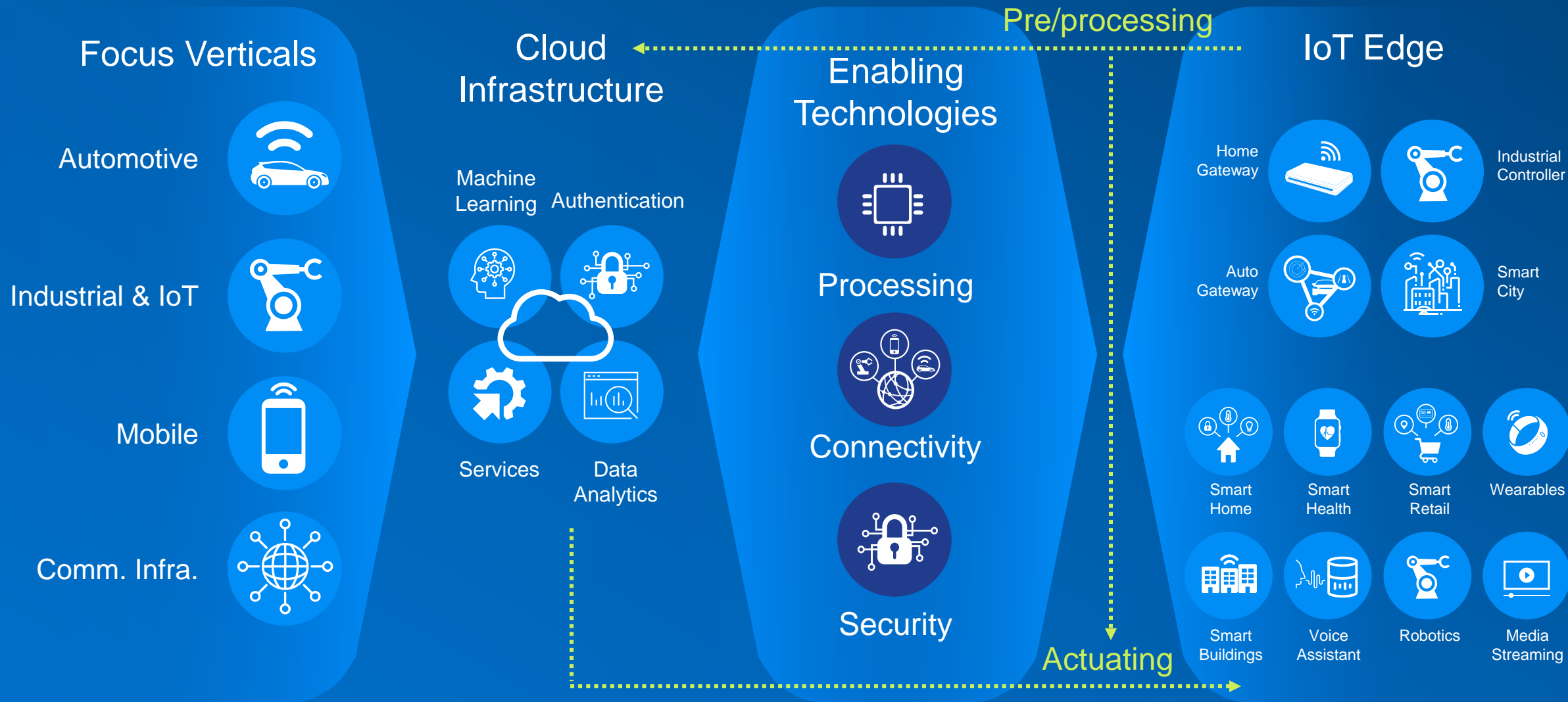# Secure Connections for the Smarter World… has Evolved

Focus Verticals
- Automotive
- Industrial & IoT
- Mobile
- Comm. Infra.

Cloud Infrastructure
- Machine Learning
- Authentication
- Services
- Data Analytics

Pre/processing

Enabling Technologies
- Processing
- Connectivity
- Security

Actuating

IoT Edge
- Home Gateway
- Industrial Controller
- Auto Gateway
- Smart City
- Smart Home
- Smart Health
- Smart Retail
- Wearables
- Smart Buildings
- Voice Assistant
- Robotics
- Media Streaming

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HPMS Market Leader with Sharp Focus, Broad Reach[1,2,3,4,5]

NXP 3Q18TTM Revenue by Operating Segment

42% Auto

4% Corporate & Other

6% SIS

19% SI&I

29% SCD

Strategic HPMS Business
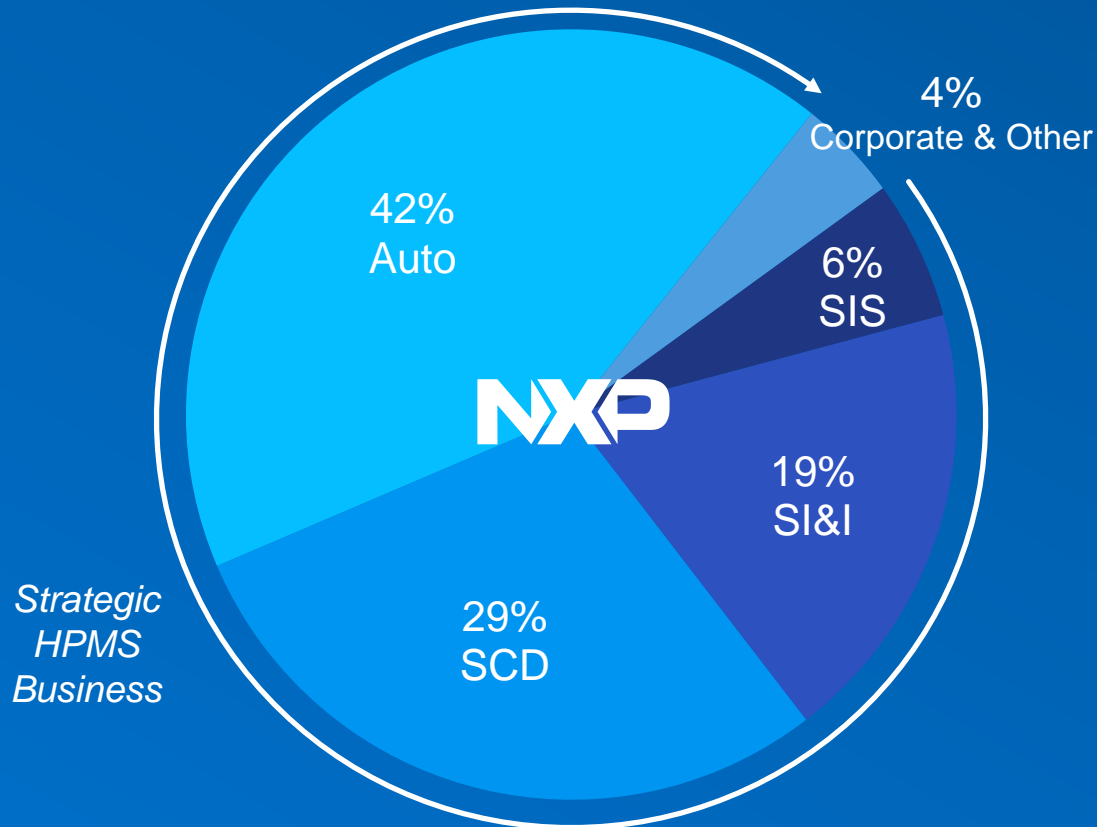
NXP: the HPMS leader

- #5 global non-memory semi supplier
- #1 global auto semi supplier
- Focused IoT processing: MCU–CrossOver–AP
  - #2 MCU supplier
- #1 secure identification

Goal: deliver >1.5x market growth

- Complementary portfolios and customers
- Opportunities to cross sell
- Ability to deliver complete solutions

Addressing 4 Major End Markets

Automotive

ADAS + Electrification

System solutions innovation with OEMs

Increased content drives growth

Industrial & IoT

Fragmented customer base

Processing needs are transforming markets

Scalable solutions as a differentiator

Mobile

~2B mobile phone and adjacent device market

Ongoing feature innovation & attach

Communication, Infrastructure & Other

Capex-driven wireless infrastructure market

Secular growth driven by new cellular standard

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Focused Leadership – End Markets[1]

NXP 3Q18TTM HPMS Revenue by End-market Exposure

- 49% Automotive
- 21% Industrial & IoT
- 17% Comm. Infra. & Other
- 13% Mobile
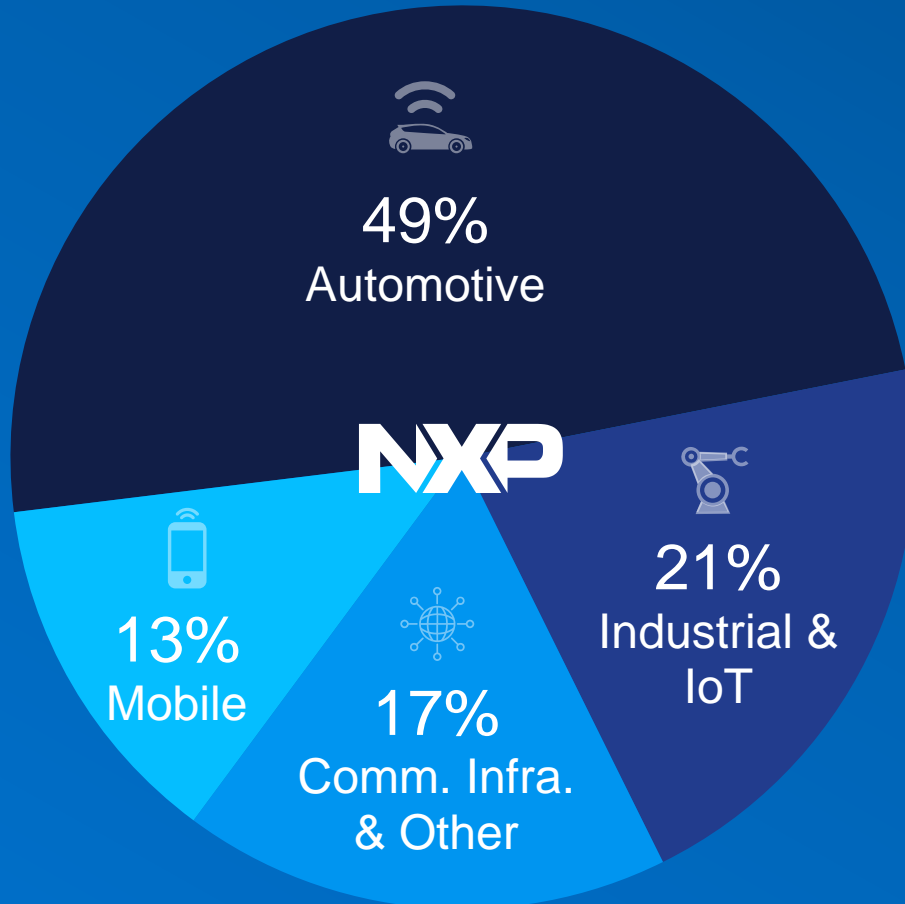
Broad end market exposure

- Long product life cycles
- High barriers to entry
- Application expertise

Recognized leadership in

- Automotive
- MCU and application processors
- Mobile transactions
- RF Power amplifiers. mMIMO
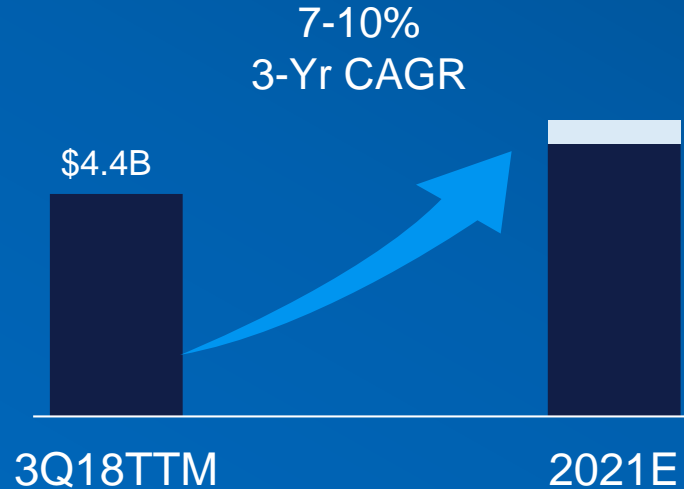- Secure identification, mobility, RFID

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Growth Opportunity Driven by Focus End Markets[1,2]

Growth by End Market

End Market	Percent 3Q18TTM Revenue	2018E – 2021E 3-yr. CAGR
Automotive	47%	Up 7 to 10%
Industrial & IoT	20%	Up 8 to 11%
Mobile	12%	Up 4 to 6%
Comm. Infra. & Other	17%	0 to up 2%
Corporate & Other	4%	(3%)
Total	100%	Up 5 - 7%

Bar chart labels:
- $9.4B — 2018 Street Est.
- $10.9B - $11.6B — 2021E
- 5-7% 3-Yr CAGR

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Automotive – NXP Leads, Accelerates in New Areas[1,2]

Revenue

7-10%
3-Yr CAGR

$4.4B

3Q18TTM   2021E

Market

5-7%
3-Yr CAGR

$27B

2018E   2021E

Growth drivers

- New business – above market growth
  - ADAS / radar, vehicle networks, electrification
- Core business – at market growth
  - Connected infotainment, powertrain, secure car access
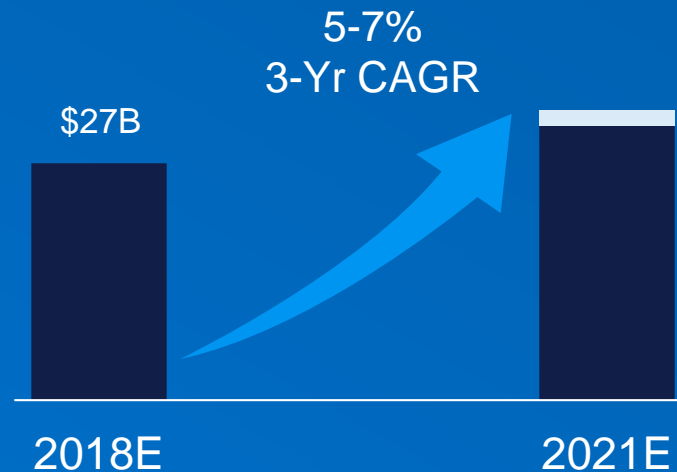
Value proposition

- Solution portfolio
- Innovation power
- Automotive safety & reliability

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Industrial & IoT – Highly Diversified[1,2,3,4]

Revenue

8-11%
3-Yr CAGR

$1.9B

3Q18TTM   2021E

Market

3-5%
3-Yr CAGR

$127B

2018E   2021E
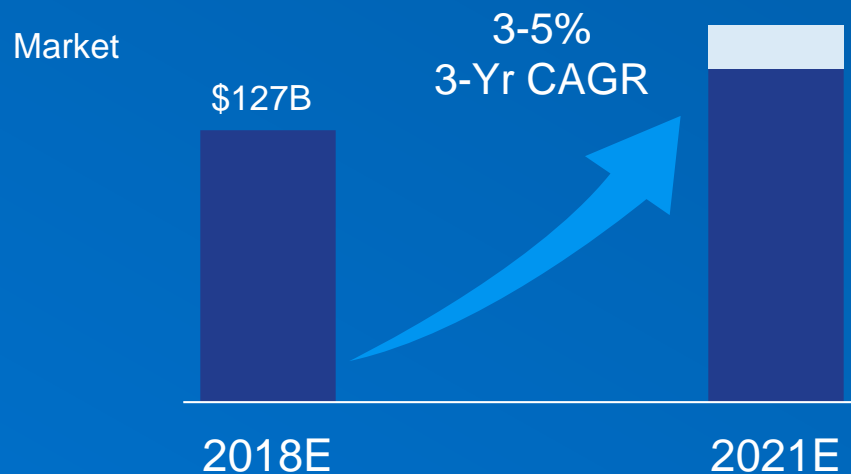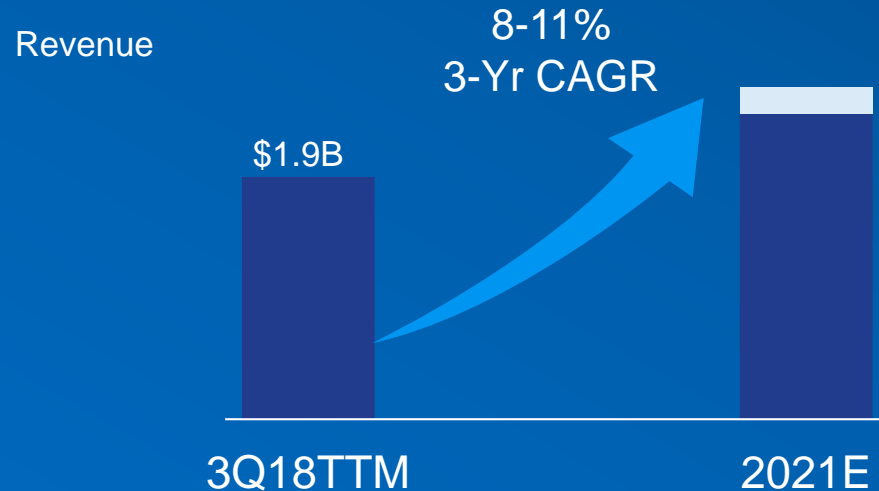
Growth drivers

- Processing
  - 32bit microcontrollers & cross-overs
  - IoT application processors
  - Analog mixed-signal & connectivity

Value proposition

- Broad, scalable solutions
- Common S/W tool environment
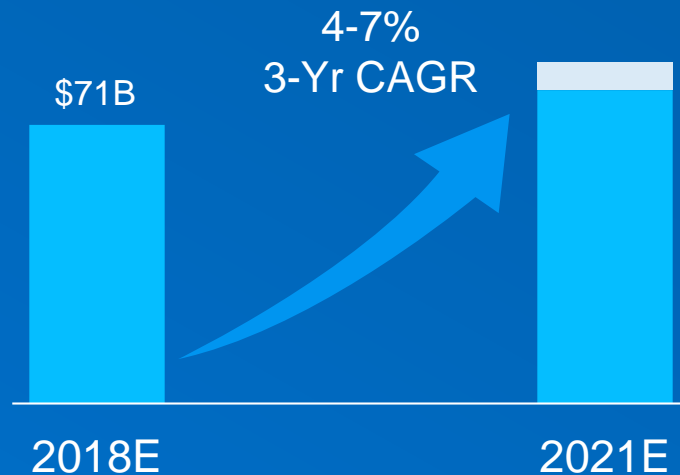- Deep application insights
- Channel reach

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Mobile – Specialty Supplier with High Moats[1,2,3,4]

Revenue

$1.2B

4-6%
3-Yr CAGR

3Q18TTM   2021E

Market

$71B

4-7%
3-Yr CAGR
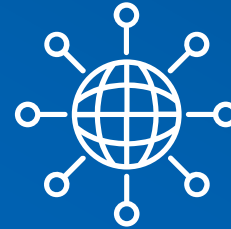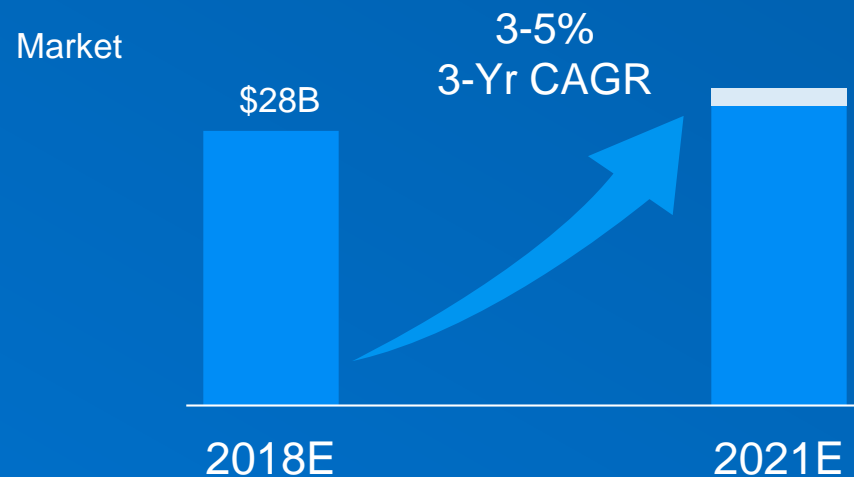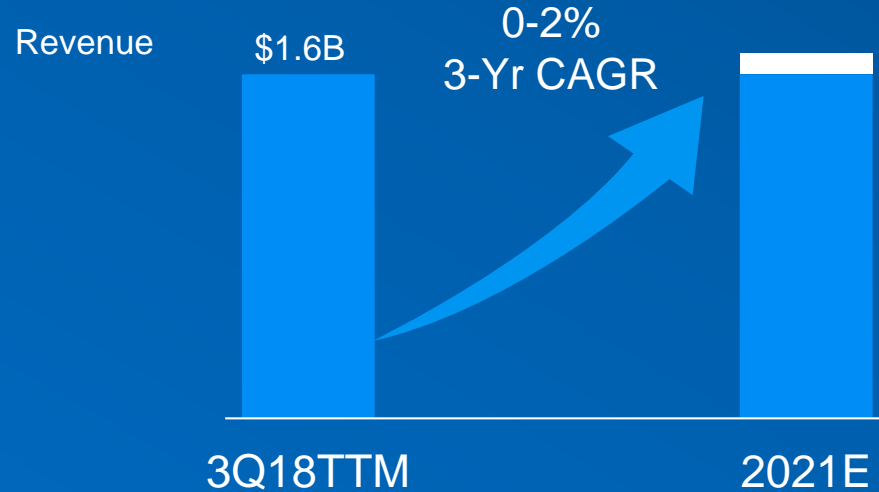
2018E   2021E
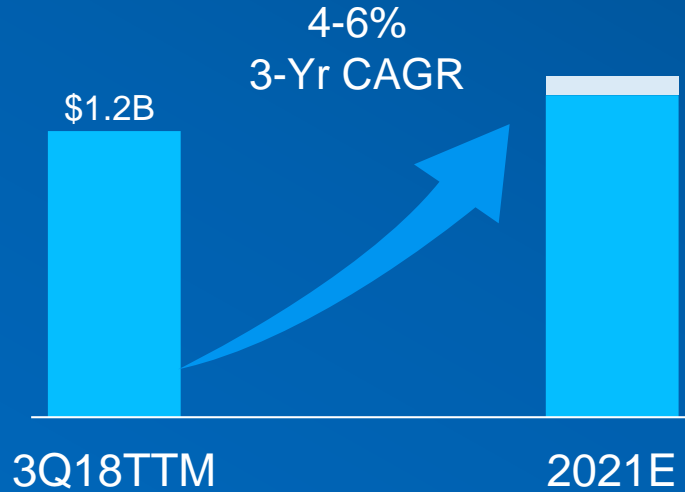
Growth drivers

- Mobile payment adoption
- New use cases (transit, access, etc.)
- High-speed mixed-signal interface

Value proposition

- Technology innovator and leadership
- Recognized ecosystem leader
- Deep application insights

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Comm. Infra. & Other – Cyclical and Project Oriented[1,2]

Revenue

$1.6B

0-2%
3-Yr CAGR

3Q18TTM   2021E

Market

$28B

3-5%
3-Yr CAGR

2018E   2021E

Growth drivers

- 5G basestation deployment will result in
  - Adoption of mMIMO
  - Continued leadership in LDMOS
  - Transition to GaN
- Leadership in transit, access and retail
  - MIFARE and RFID

Value proposition

- Broadest portfolio
- Technology leadership
- Deep application insights

Summary [1]

NXP 3Q18TTM HPMS Revenue by End-market Exposure

- 49% Automotive
- 21% Industrial & IoT
- 17% Comm. Infra. & Other
- 13% Mobile
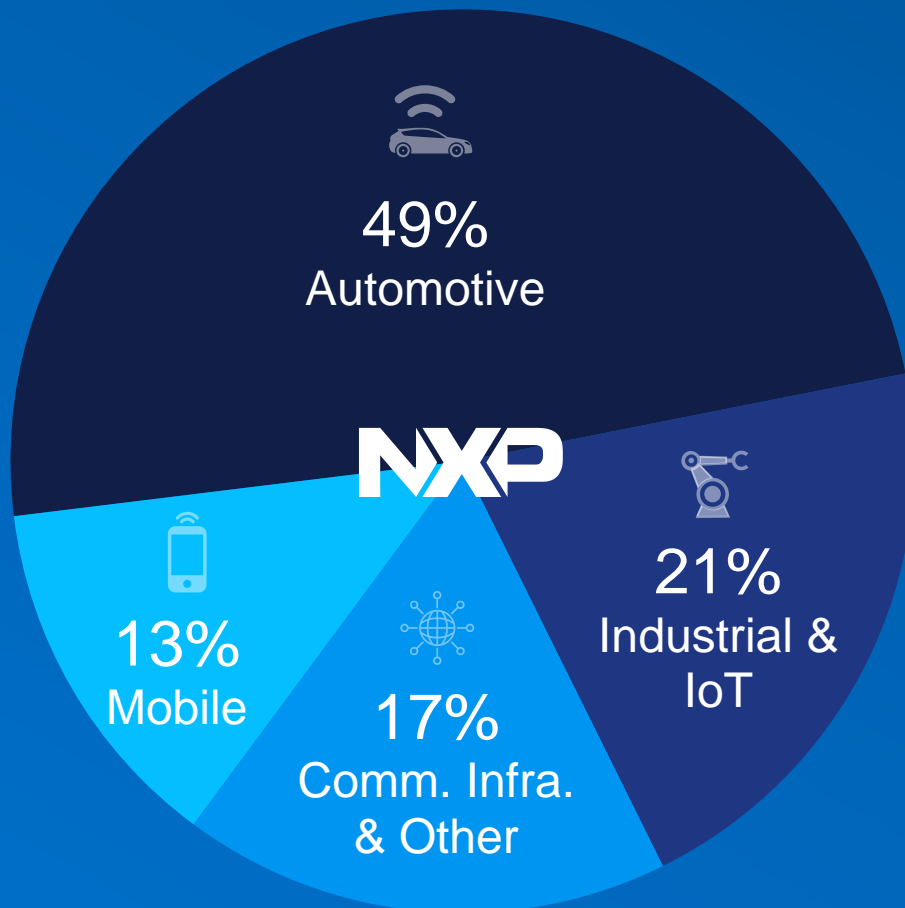
End Market	2018E – 2021E 3-yr. CAGR
Automotive	7 – 10%
Industrial	8 – 11%
Mobile	4 – 6%
Comm. Infrastructure & Other	0 – 2%
Corporate and Others	*(3%)*
NXP	5 – 7%

1. 3Q18 TTM financial data based on 4Q17-3Q18E (mid-point guide)

RF Infrastructure Leader[1]

Basestation Market

- Market leader in RF technology and systems solutions
- Multi-year cyclical market dynamics
- Expect 3-4x content increase versus 4G build-outs

Technology & Innovation Leadership

- Leader in LDMOS – continued usage for <3GHz bands
  - NXP continues to deliver performance leadership
- Highly integrated mMIMO solutions deliver 8x throughput
  - Significant content increase over existing architectures
- Industry's highest linearity GaN IP, optimized for 5G
  - GaN - Strong customer engagements & qualification
- Highest performance SiGe mmWave solutions for 20-40Ghz
  - SiGe mmWave shipping to US wireless carriers

NXP's RF Infrastructure SAM

Bar chart — NXP's RF Infrastructure SAM: 2015 = $1.6B, 2017 = $1.4B, 2019 = $1.6B, 2021 = $2B. Segments: 4G, Multi-Market, 5G mm-Wave, 5G mMIMO

Legend: ■ 4G ■ Multi-Market ■ 5G mm-Wave ■ 5G mMIMO

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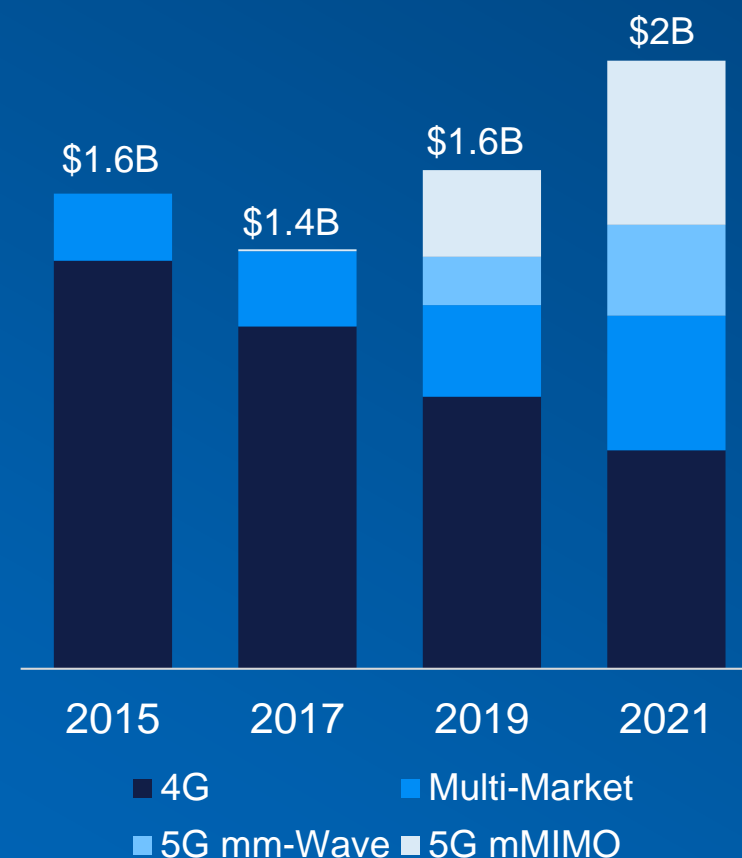
Regained Technology Leadership in SIS[1]

Personal ID

~$0.9B SAM

ePP, eID	#1
Payment	#2

- Payments on steady path since 1Q17
- Performance in line with market
- Leading technology
  - 40nm Flash P71 & JCOP 4
  - Unique full solution: HW / OS / Applet / MW

Smart Cities

~$0.5B SAM

Transit & Access	#1 RMS 5
Logistics & Retail	#1 RMS1.3

- leadership in transit & access with MIFARE®
  - 750+ cities world-wide & growing
- Global leader in RFID tag with UCODE, ICODE, NTAG
  - Broadest product portfolio, 20% less power consumption
  - Tag units expected to double by 2021
- Drive convergence of cards and mobile with MIFARE2GO
  - Transit solution of choice in Google Pay

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Maximizing Market Impact of NXP Networking Assets

- Differentiated technology and complex SoC execution capabilities

- Continued focus on core networking markets: 5G & enterprise deployments, CPE/SMB & security, datacenter offload

- Harmonize SW platform with i.MX to accelerate IoT infrastructure opportunity

- Shared HW platform with S32 Automotive portfolio to capture full potential of domain architecture

Automotive Networking

Outstanding SoC Execution, Accelerators

CORE NETWORKING

World-class IP, System know-how and Software

Smart Home and Industrial IoT

S32
Automotive gateways
ADAS platform

Layerscape
Service provider
Enterprise & CPE
Cloud & storage

i.MX
Home gateways
Edge-computing for factory & building automation

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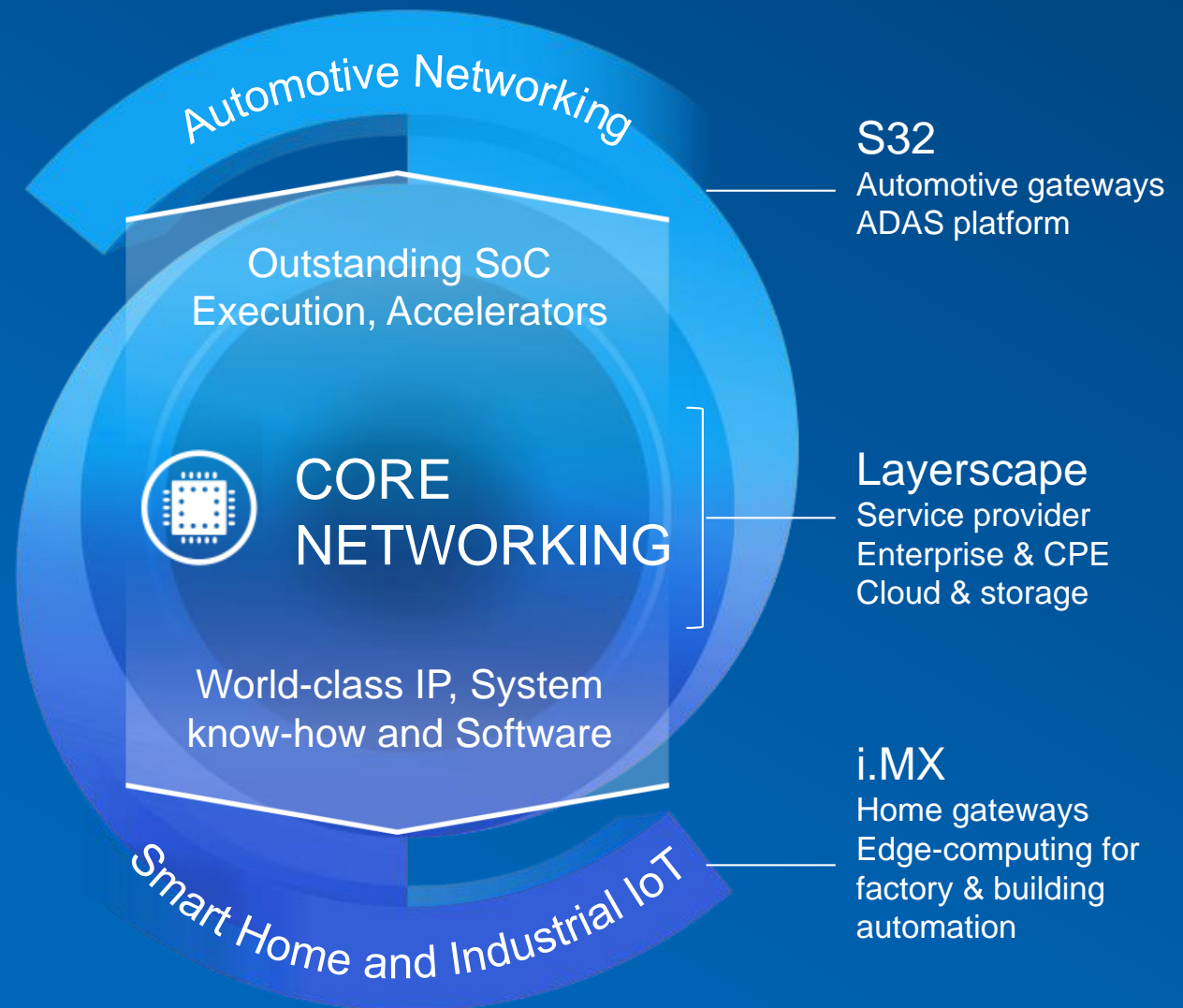
NXP Evolves its Structure to Support Profitable Growth

- ## Simplified organization
  - Drive execution of our stated strategy
  - Deliver platform & solutions at scale
  - Collaborative growth
  - Strengthened focus, speed, efficiency

- ## Kurt Sievers is named president
  - Oversees all NXP business lines
  - Builds on outstanding track record of success, leading NXP to #1 position in Automotive
  - Will lead our business to broader leadership in Secure Connections for the Smarter World

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► NXP investment thesis

Our focus is operating profit

Progress since our last analyst day?

Financial model

Why invest in NXPI

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NXP Investment Thesis

Market Leader in Growing Markets

Focused on Strong Profitable Growth

Shareholder Friendly

All Excess Cash Returned to Shareholders

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Consistent Non-GAAP Operating Profit Growth[1]

$4.4B
IPO

$9.3B Revenue

STDP Divestment

FSL Merger

RF Power Divestment

Sound Solutions Divestment

Non-GAAP Operating Margin

	2010	2011	2012	2013	2014	2015	2016	2017	
Non-GAAP Operating Margin	16.0%	19.9%	19.1%	23.3%	25.0%	27.6%	26.6%	29.4%	
Non-GAAP Operating Income	$0.7B	$0.8B	$0.8B	$1.1B	$1.4B	$1.7B	$2.5B	$2.7B	Non-GAAP Operating Income
Financial Leverage	3.5x	2.7x	2.6x	1.9x	1.7x	3.9x	2.5x	1.0x	Financial Leverage

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NXP Focus is the Growth in Operating Profit[1,2]

Operating Profit ($) Growth
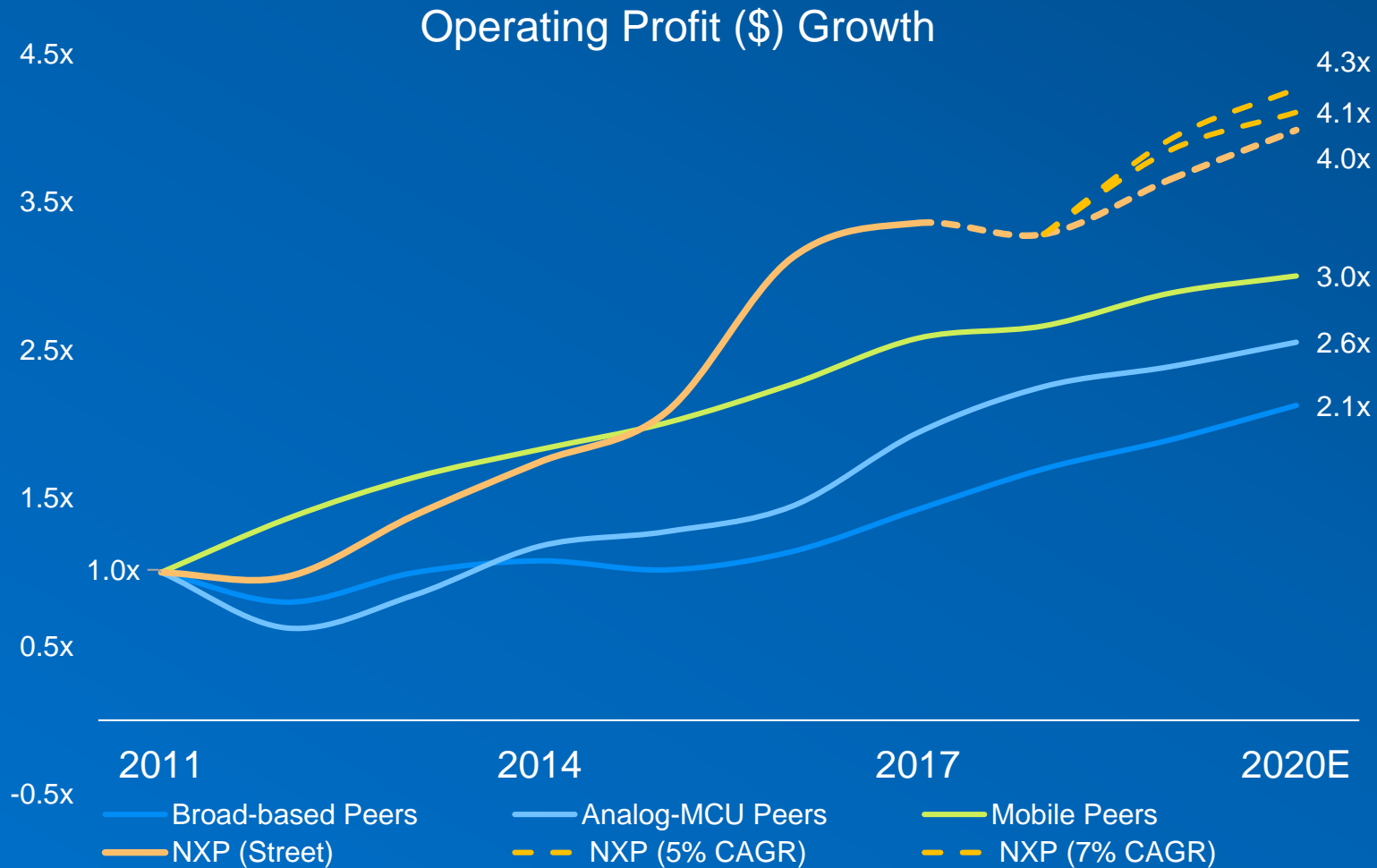
NXP focus

- High RMS
- Employee engagement
- Customer satisfaction (net promoter scores)

Legend:
- Broad-based Peers
- Analog-MCU Peers
- Mobile Peers
- NXP (Street)
- NXP (5% CAGR)
- NXP (7% CAGR)

Chart values: 4.3x, 4.1x, 4.0x, 3.0x, 2.6x, 2.1x

Y-axis: 4.5x, 3.5x, 2.5x, 1.5x, 1.0x, 0.5x, -0.5x

X-axis: 2011, 2014, 2017, 2020E

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Growth Opportunity Driven by Focus End Markets[1,2]

Growth by End Market

$9.4B

5 – 7%
3 – Yr. CAGR

$10.9B – $11.6B

2018
Street Est.

2021E

End Market	Percent 3Q18TTM Revenue	2018E – 2021E 3-yr. CAGR
Automotive	47%	Up 7 to 10%
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Mobile	12%	Up 4 to 6%
Comm. Infra. & Other	17%	0 to up 2%
Corporate & Other	4%	(3%)
Total	100%	Up 5 – 7%

1. 2018 Street Estimate based on FactSet
2. 3Q18TTM financial data based on 4Q17-3Q18E (mid-point guide).

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Drivers of Product Revenue Growth

Automotive		Growth: 7 – 10% 3–yr. CAGR • #1 Global auto semi supplier • Leadership in all focus areas	• ADAS/Radar, vehicle networks, electrification • Connected infotainment, powertrain, secure car access
Industrial & IoT		Growth: 8 – 11% 3–yr. CAGR • Leader in GP MCU & AP • Driving analog attach to MCU	• Broad based industrial • High Performance edge & media processing • Low-power edge & node processing
Mobile		Growth: 4 – 6% 3–yr. CAGR • Specialty mobile supplier • Leader in mobile payments • Specialty analog & interface	• Mobile wallet use-cases expansion • Custom interfaces, voice & audio and charging
Comm. Infra. & Other		Growth: 0 – 2% 3–yr. CAGR • Leader in secure identity-access • Leader in RF power	• mMIMO & 5G build-out to drive RF power • Recognized security leadership & expertise • Repurposing network processor IP & expertise

Source: End-markets as defined by the NXP Strategy Office

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End-market to Operating Segment Map (aka Jeff's "Decoder Ring")[1]

End-Market	Auto 7 – 10% CAGR	SCD 8 – 11% CAGR	SI&I 0 – 2% CAGR	SIS 0 – 2% CAGR
Automotive 7 – 10% CAGR	• Entire Auto	• Infotainment AP		
Industrial & IoT 8 – 11% CAGR		• Industrial & IoT MCU • Industrial & IoT AP • Low power connectivity • NFC readers	• High perf. analog • AC-DC power • Specialty ASSPs	
Mobile 4 – 6% CAGR		• Mobile wallet	• Custom interfaces • Power management • Voice & audio	
Comm. Infra. & Other 0 – 2% CAGR			• Specialty RF • Digital networking	• Entire SIS

Business Lines

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FINANCIAL OVERVIEW

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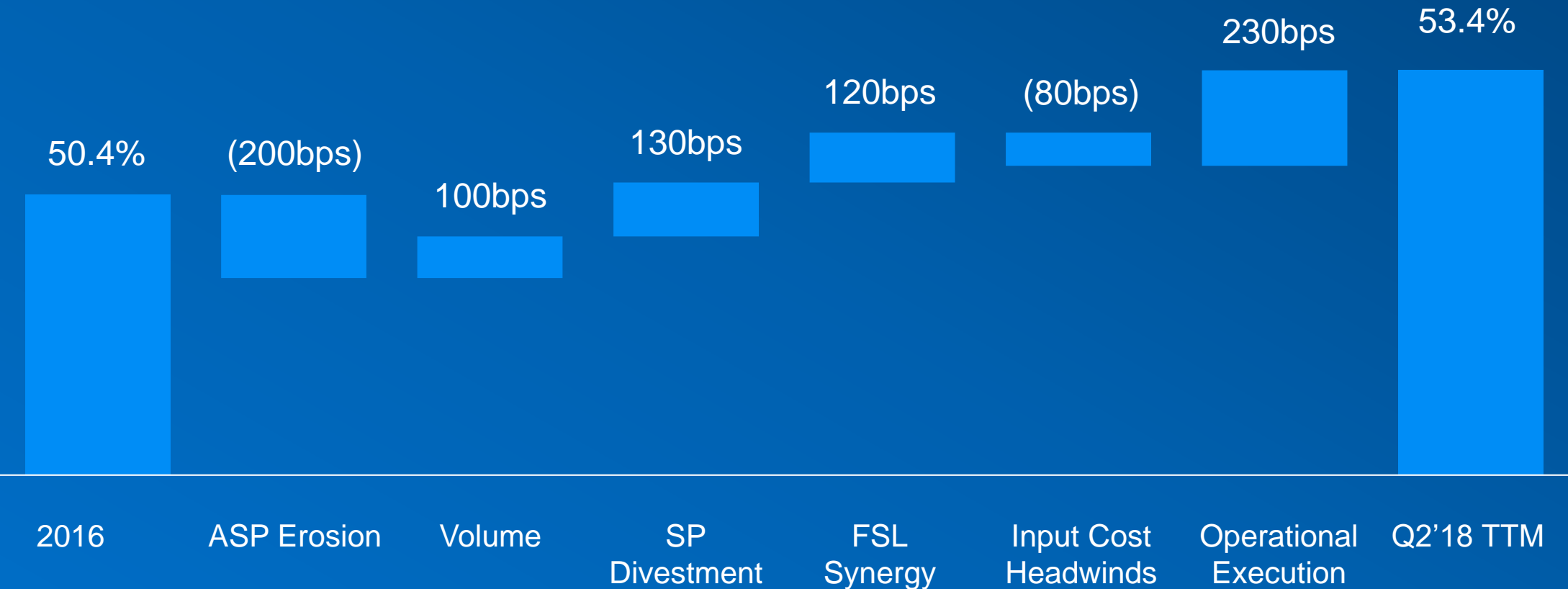# Performance Versus the NXP Analyst Day 2016[1,2,3]

Business Lines (% '17 Revenue)	Analyst Day 2016	2017 Y-Y	3Q18TTM Y-Y	Comment vs. Expectations at Analyst Day 2016
Auto (41%)	Up 6 to 9%	11%	9%	Performance at high-end of range
SCD (30%)	Up 10 to 15%	21%	14%	Momentum above plan
SI&I (21%)	Up 5 to 9%	3%	(5%)	Legacy DN products decline
SIS (6%)	Up 2 to 5%	(29%)	3%	Bank-card market saturation
Total NXP Revenue Growth	5 – 7%	10%	7%	
Non-GAAP Gross Margin	53 – 57%	53.4%	53.3%	Mix and input costs
Non-GAAP R&D %	14 – 16%	15.7%	16.7%	Investing for future growth
Non-GAAP SG&A %	6 – 8%	8.3%	8.0%	
Non-GAAP Operating Margin	31 – 34%	29.5%	28.6%	

1. Reconciliations of non-GAAP measures throughout this presentation to the most comparable measures calculated in accordance with GAAP can be found in the "NXP Historic Financial Model" file in the Financial Information page of the NXP Investor Relations section of our website at www.nxp.com/investor.
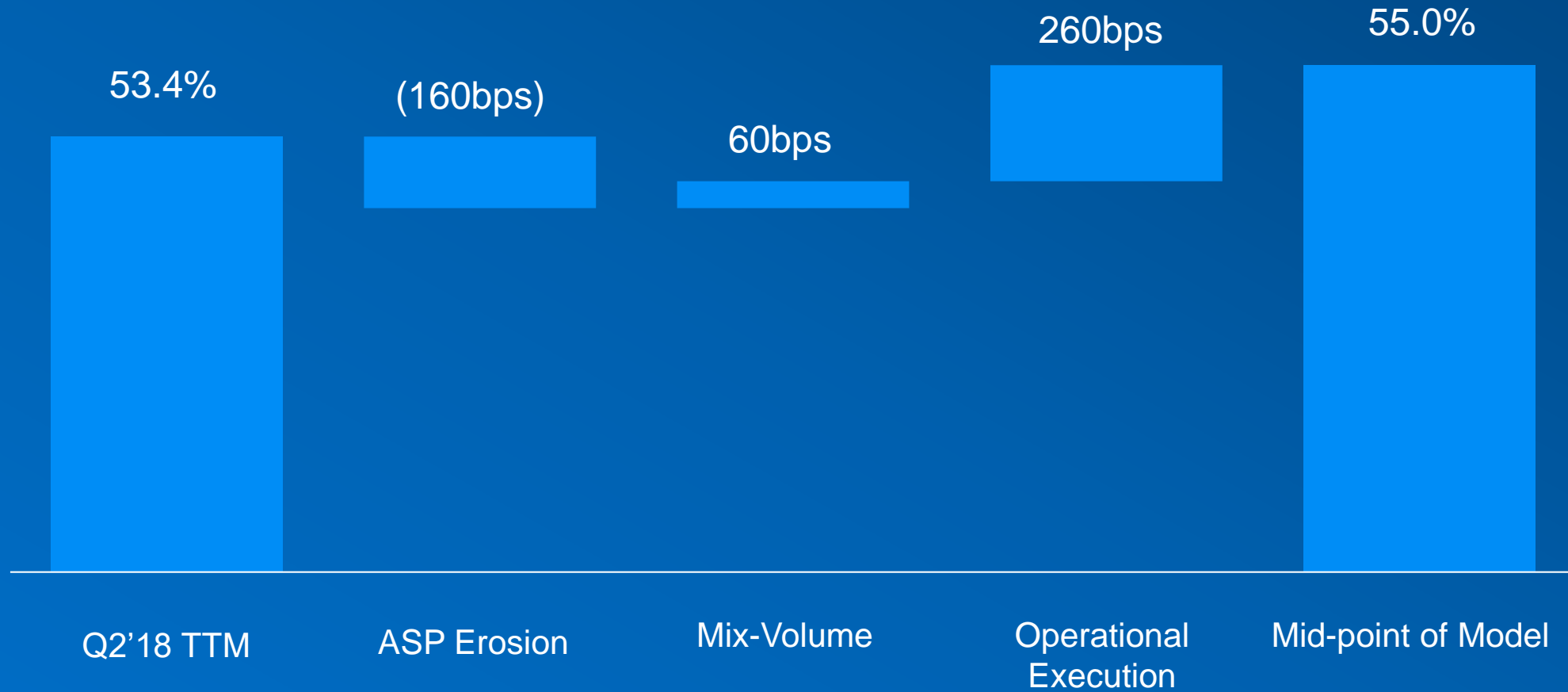2. 2017 Y-Y and 3Q18TTM Y-Y, excludes Standard Products
3. 3Q18 TTM financial data based on 4Q17-3Q18E (mid-point guide).
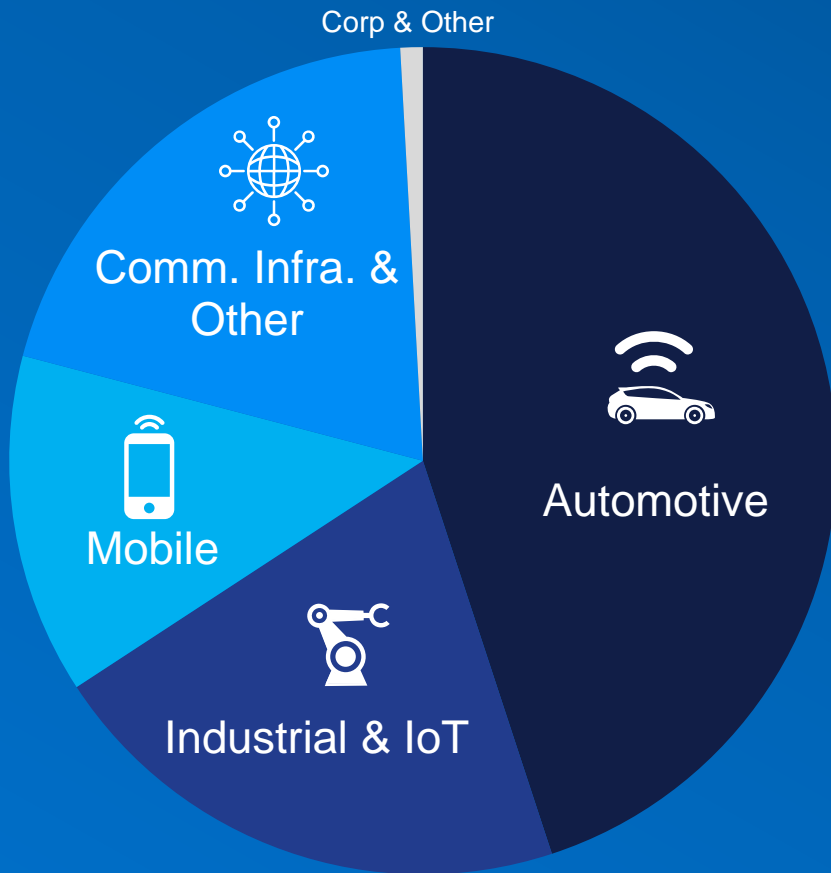
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Track Record of Non-GAAP Gross Margin Expansion[1]

2016	ASP Erosion	Volume	SP Divestment	FSL Synergy	Input Cost Headwinds	Operational Execution	Q2'18 TTM
50.4%	(200bps)	100bps	130bps	120bps	(80bps)	230bps	53.4%

1. All values are either actual non-GAAP results or NXP Finance estimates

Path to Mid-Point of Model Non-GAAP Gross Margin Exiting 2019[1]

	53.4%	(160bps)	60bps	260bps	55.0%
	Q2'18 TTM	ASP Erosion	Mix-Volume	Operational Execution	Mid-point of Model

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Focused R&D Investments to Drive Future Growth[1,2]

Non-GAAP R&D Investment

Pie chart segments: Corp & Other, Comm. Infra. & Other, Mobile, Industrial & IoT, Automotive

Major R&D Investments

- **Automotive: up 15% CAGR**
  - Processing & Networking: S32, auto gateway, i.MX-auto, Ethernet
  - ADAS: radar, vision, V2X
  - Power: power management, battery management systems

- **Industrial: up 15% CAGR**
  - Processing: i.MX – Hi-perf edge, i.MX RT – Ultra-low power, GP MCU

- **Mobile: 3% CAGR**
  - Security: eSE, RF, new applications
  - High-speed interfaces
  - Wireless charging

- **Comm. Infra. & Other: down 6% CAGR**
  - RF: GaN & LDMOS Pwr Amp., mmWave, mMIMO, new applications
  - Networking: 64-bit Layerscape
  - Consumer security solutions

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NXP investment thesis

Our focus is operating profit

Progress since our last analyst day?

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Why invest in NXPI

Financial Model[1]

	2018E – 2021E
Focused Market Growth[1]	3 - 5%
NXP Growth[1]	5 - 7%
Non-GAAP Gross Margin	53 - 57%
Non-GAAP R&D	14 - 16%
Non-GAAP SG&A	6 - 8%
Non-GAAP Operating Margin	31 - 34%
Non-GAAP Operating Income Growth	~8 - 14%

Modeling Housekeeping Issues[1]

	2019E	2020E	2021E
Non-GAAP Cash Taxes	8%	11%	12%
Incidental Taxes	$166M	$26M	-
Stock Based Compensation	$365M	$365M	$350M
Non-Controlling Interest	$50M	$45M	$45M

1. Incidental taxes associated with the gain on various disposals and the breakup fee from Qualcomm

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Why invest in NXPI

Shareholder Friendly

Strong focus on cash management, and who the cash belongs to

Strong financial alignment of management and shareholders

Experienced management team who are committed to the company and focused on driving value for shareholders

Always ready to listen to our shareholders

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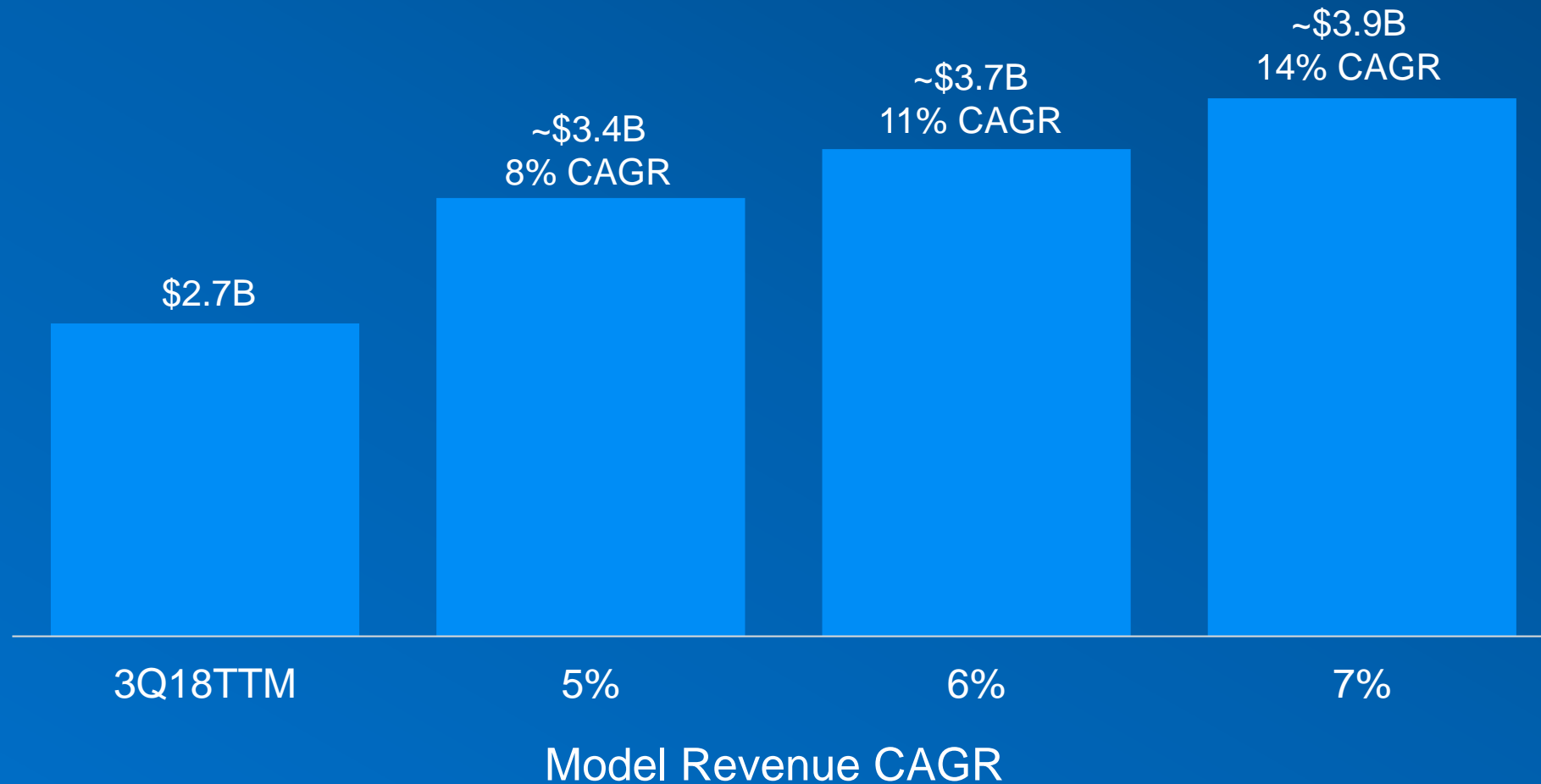
2019 – 2021 We Will Generate Significant Non-GAAP FCF[1,2]

- Capital Generation
  - Potential to generate $7B – $8B of cumulative non-GAAP free cash flow
  - Business supports additional debt capacity of up to 2x – adding $2B – $4B of cash
  - Results in $9B – $12B to invest in the business and/or return to our owners

- Capital Return Options
  - Dividends: Target payout ratio of 20% to 25% of CFO
  - Buybacks: We have the capacity to continue to do substantial buybacks
    - NXP will still be subject to a deemed dividend on buy backs in 2019

**Strong Business Model, Balance Sheet, and Cash Flow!
Significant opportunity to create shareholder value!**

1. CFO = Cash flow from operations ;FCF = Non-GAAP free cash flow, defined as cash flow from operations, less net capital expenditures on property, plant and equipment
2. Assumes mid-point of long-term model

INVESTOR DAY 2018

Mobile

Rafael Sotomayor
Senior VP & General Manager

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Agenda

MOBILE

Market & Outlook

Analog

Mobile Wallet

Beyond Mobile

$1.2B Mobile Business Expected to Grow 4-6%[1,2]

Phone Volume

0 - 1%
3-Yr CAGR

2018E   2021E
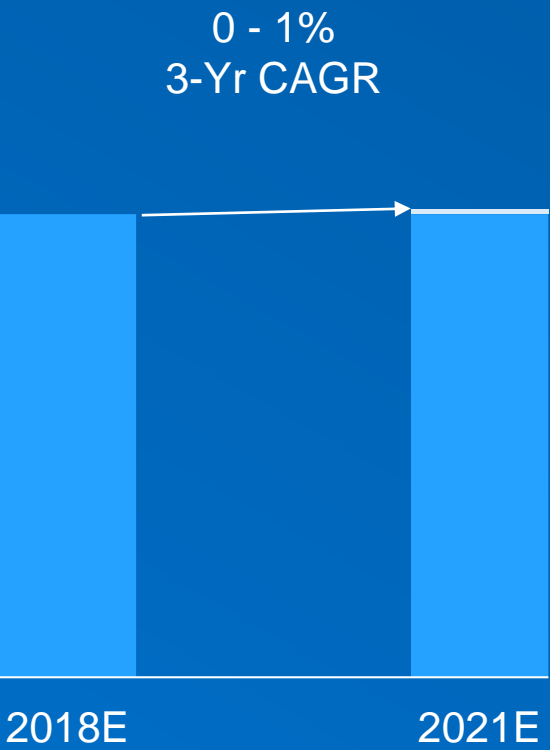
Revenue & Growth Drivers

Analog Portfolio
Custom interfaces
voice & audio, charging

Secure Mobile Wallet
eSE/NFC attach-rate increase
through use-cases expansions

Revenue Outlook
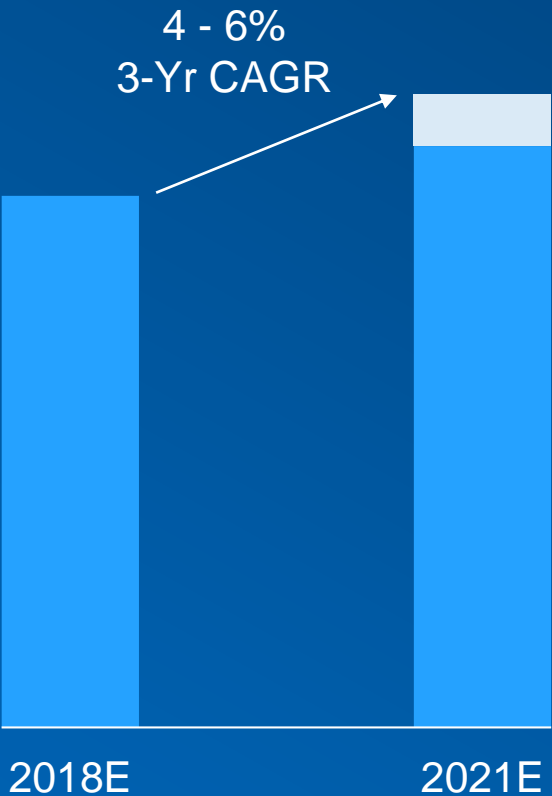
4 - 6%
3-Yr CAGR

2018E   2021E

NXP

Selectively Leveraging Our Analog Portfolio in Mobile[1]

Interfaces
High Performance Custom ICs

Custom high-performance interfaces

Connector and cable interfaces
Switches, authentication, protection…

Multi-generation stickiness
In-depth system knowledge

>6B
Interface ICs shipped

Voice and Audio
Smart Haptic & Stereo Amp Leader in Voice Enhancement

Voice, audio & haptic solutions
Smart amp, haptic driver, algorithms

Hi-Fi audio with speaker protection
Highest dynamic range, bass sounds

Best voice calling experience
Noise, echo, wind suppression

>1B
Smart amps shipped

>3B
Phones with NXP voice software

Charging
Certified QC4.0 Charging Fast Charging with Type-C PD

End-to-end USB-C, PD3.0
Direct charger, AC-DC, OVP,…

2X faster, 2X cooler charging
2:1 direct charging

SAM CAGR 40%

Growth Driven Enabling OEMs and Services

NEW Customers
- Tier 1 Mobile
- Next Tier Mobile
- Wearables

Applets
Secure OS
NFC
eSE
Trust Provisioning
Secure Manufacturing

NXP Secure Services 2GO

NEW Services
- Payment
- Transit
- Government
- Enterprise & Hospitality

Reduce barriers for technology adoption
Reduce time-to-market
Enable more use cases into mobile wallet platform

Mobile Wallet Use-Cases Expansion Drives Growth[1]

Attach Rate: Opportunity

NFC/SE AR %

30%
50%

2018E
2021E

Soure: NXP CMI

Expanding Use-cases
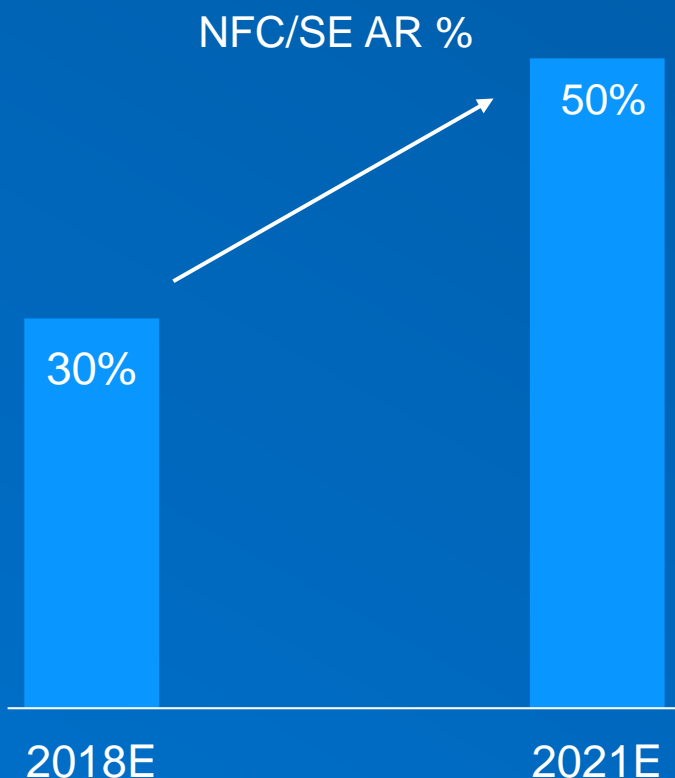
| Payment | Transit | Access | eID | eUICC |

Continued leadership in mobile payment
From high-end smart phone to feature phones & wearables

Driving mobile transit
From China to other regions

Deploying mobile access use-cases
Car, building, university access…

NXP

Transit: A Catalyst for Increased NFC Wallet Adoption[1]

Payment | **Transit** | Access | eID | eUICC

China

China Cities Deployment NFC-based Mobile Transit

100
50
10
2015 2016 2017 2018
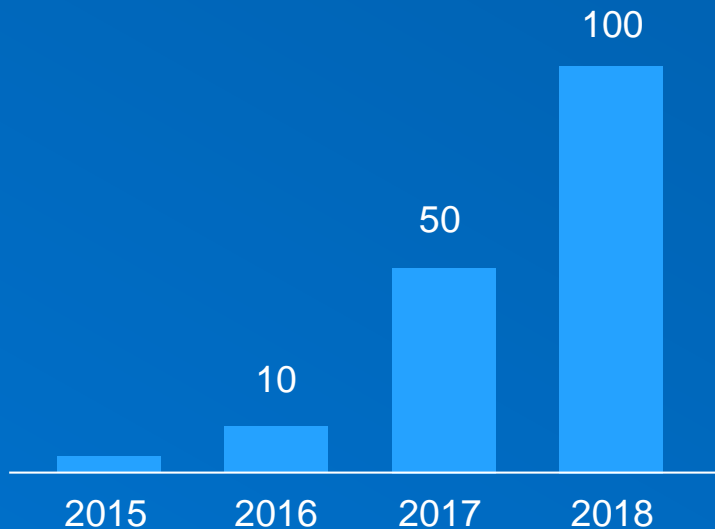
- 1M NFC transactions/day in Beijing
- > 500M of population covered in 2018

RoW

Japan

US (4 cities)

UK

Russia (3 cities)

More to come in 2019

52

1. Source: NXP CMI

Reliance Jio Phone
Partnered with NXP to drive innovative secure services in India

- Driving secure mobile payment to the masses

- JioPhone and JioPhone2:
  Two feature phones enabled with secure services

- Secure services
  - Closed loop P2P payment
  - UPI payment initiative
  - Mobile point of sale (mPOS) support
  - Mobile transit services throughout India

- NXP Provides
  - Hardware components: SE/NFC
  - Secure OS and Applications
  - Service Enablement

<$25 ⟶ <$45
JioPhone   JioPhone2

The Next Wave of Use Cases

Payment · Transit · **Access** · eID · eUICC

Things

People

Places

University ID
Gov ID (coming)

Xiaomi
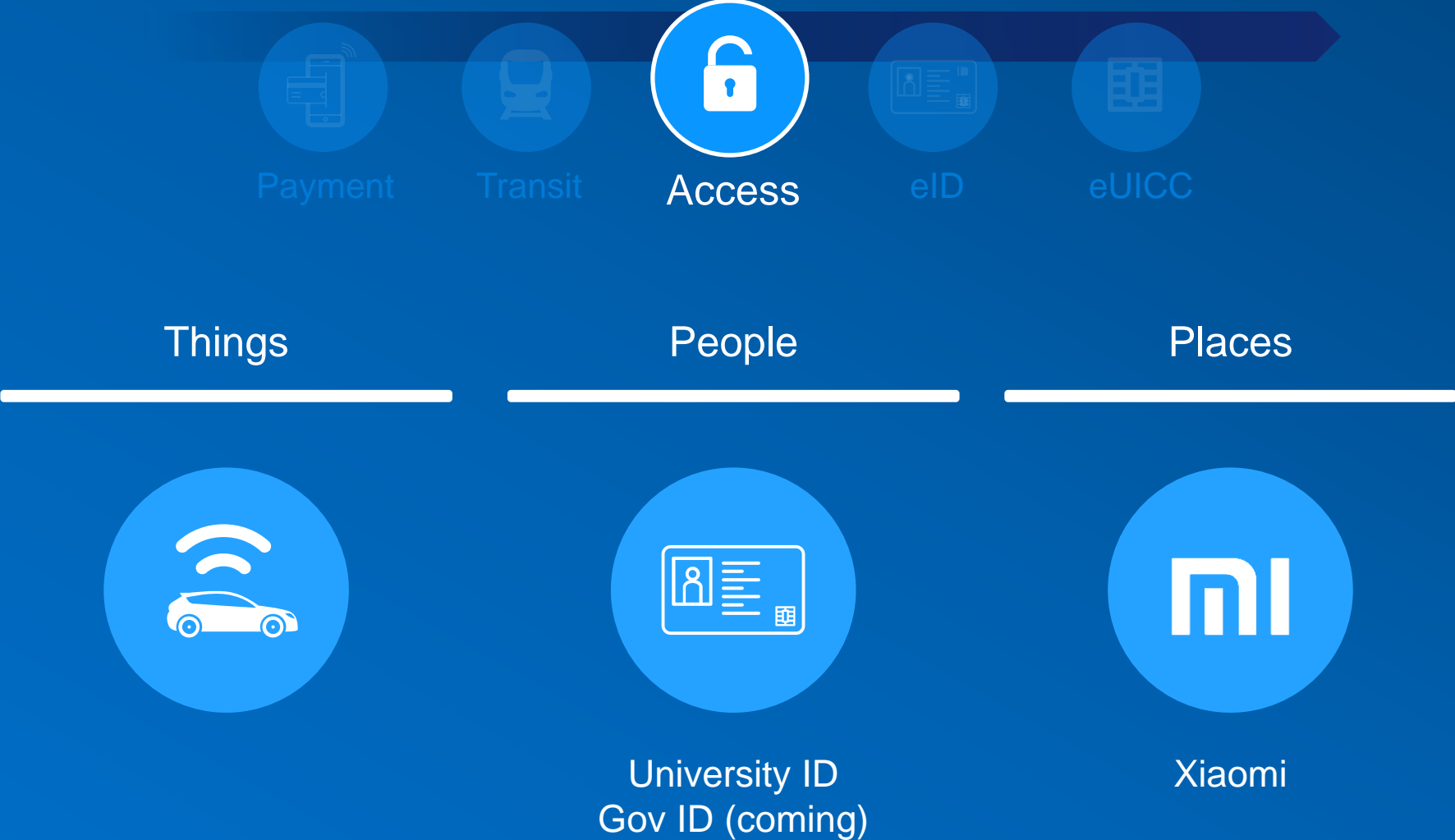
Expanding Security Platform to IoT

55

INVESTOR DAY 2018

Industrial & IoT

Geoff Lees
Senior VP & General Manager

INVESTOR DAY 2018

Agenda

INDUSTRIAL & IOT

The AI / IoT Disruption & NXP Growth Opportunity

Understanding Customer Pain Points

NXP Solutions:

- Unique Processing Continuum

- Simplifying Software & Systems Complexity

Summary

The AI / IoT Era Will Create New Industry Leaders[1]

Mainframe · Mini-Computer · PCs · Cell Phones · AI / IoT

Units Shipped (Millions): 10,000 · 1000 · 100 · 10 · 1 · 0.1 · 0.01

1950 · 1960 · 1970 · 1980 · 1990 · 2000 · 2010 · 2020E

"The 4th Tectonic Shift in Computing"

Security

- Edge Processing
- Machine Learning
- Connected Data

NXP
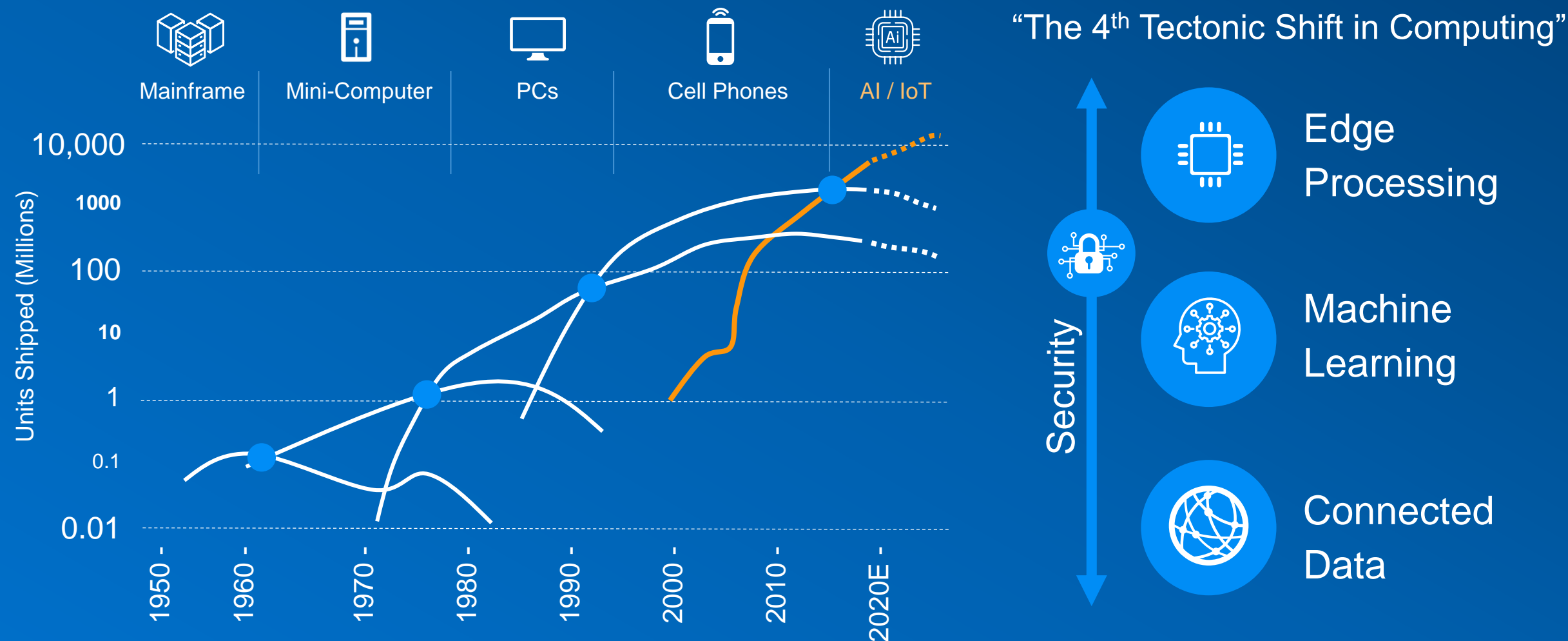
AI / IoT Disruption is the New Growth Engine[1,2,3,4] …

IoT Endpoints, Worldwide

31% CAGR

6.1 Bpcs

Industrial

Smart Home & Wearables

2.7 Bpcs

1.6 Bpcs

2016   2018E   2021E
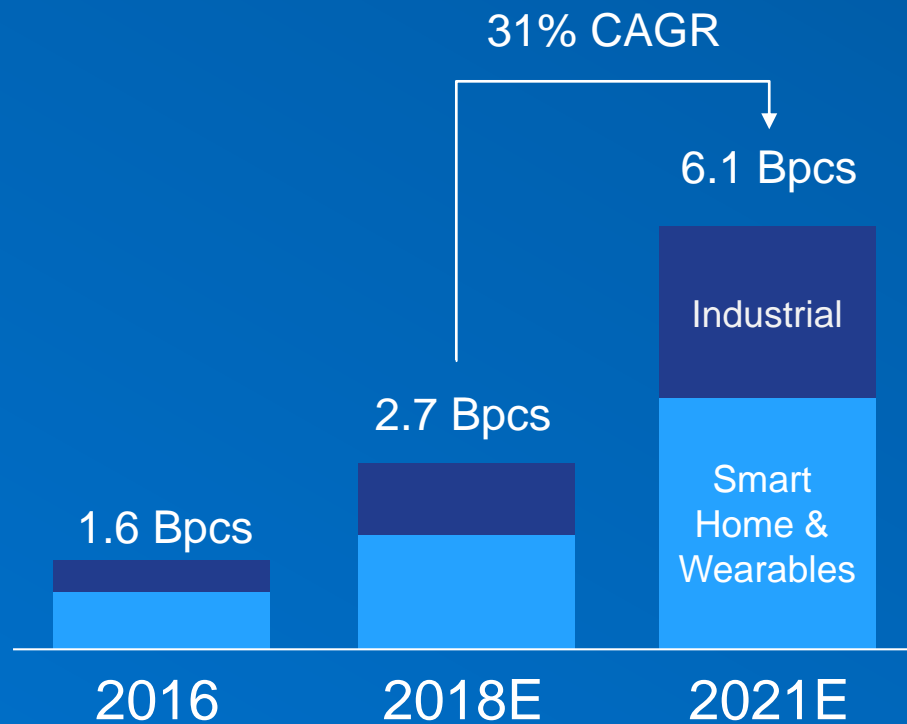
… Changing the Rules of Engagement with the Market

Less diverse end devices
Concentrated customer base
Defined ecosystem
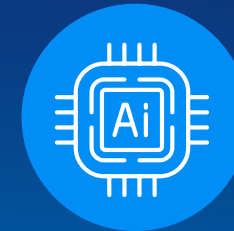
Very diverse end devices
Fragmented customer base
Wide range of applications & ecosystem

NXP

NXP Industrial & IoT SAM Outgrowing Focused TAM[1,2]

3-5% Ind. & IoT TAM CAGR

4% CAGR

$106B — 2016
$127B — 2018E
$143B — 2021E

5-7% Ind. & IoT SAM CAGR

6% CAGR

$24B — 2016
$28B — 2018E
$33B — 2021E
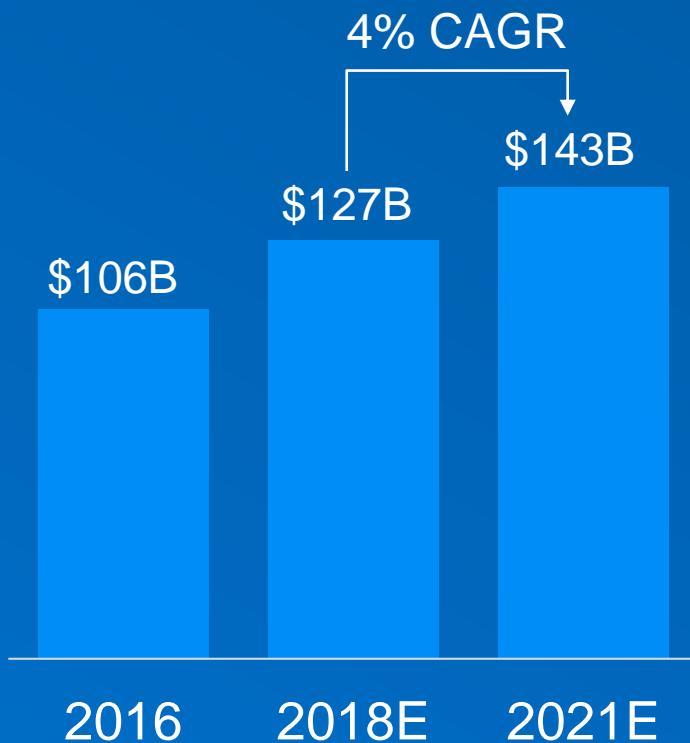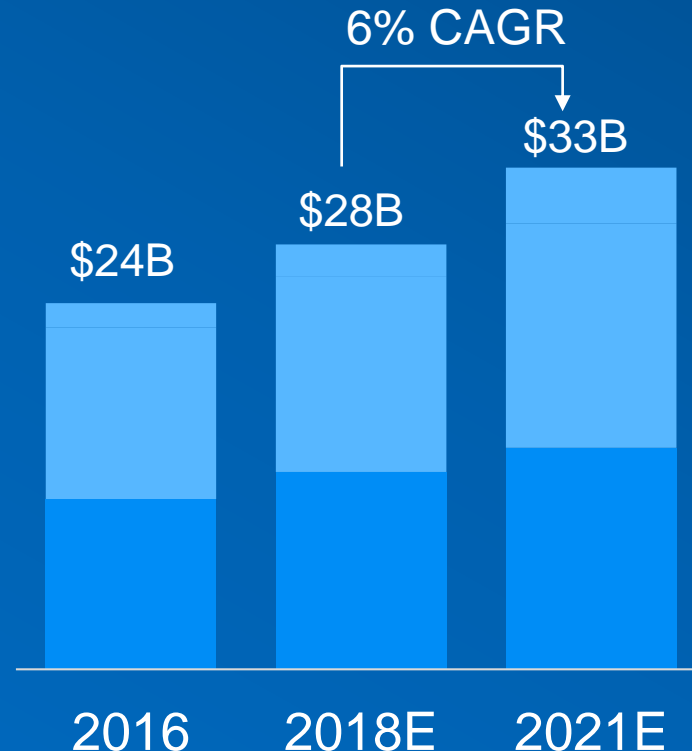
50% Higher SAM Growth

=

Analog, Power Mgmt., Connectivity
Portfolio Attach

+

Focus on
Embedded Processing

NXP Industrial & IoT Applications

Industrial Control & PLCs

Industrial Drive & Robotics

Smart Energy

Appliances

Smart Home and Building Control

Handheld Scanners, Printers, POS

Medical

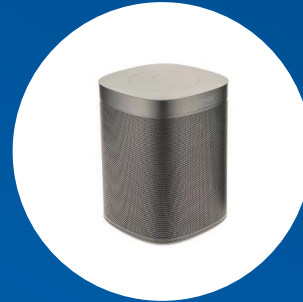PC Peripheral & Gaming

High End Audio

NXP

Customer Products

nest

Lumi

EDMI

SONOS

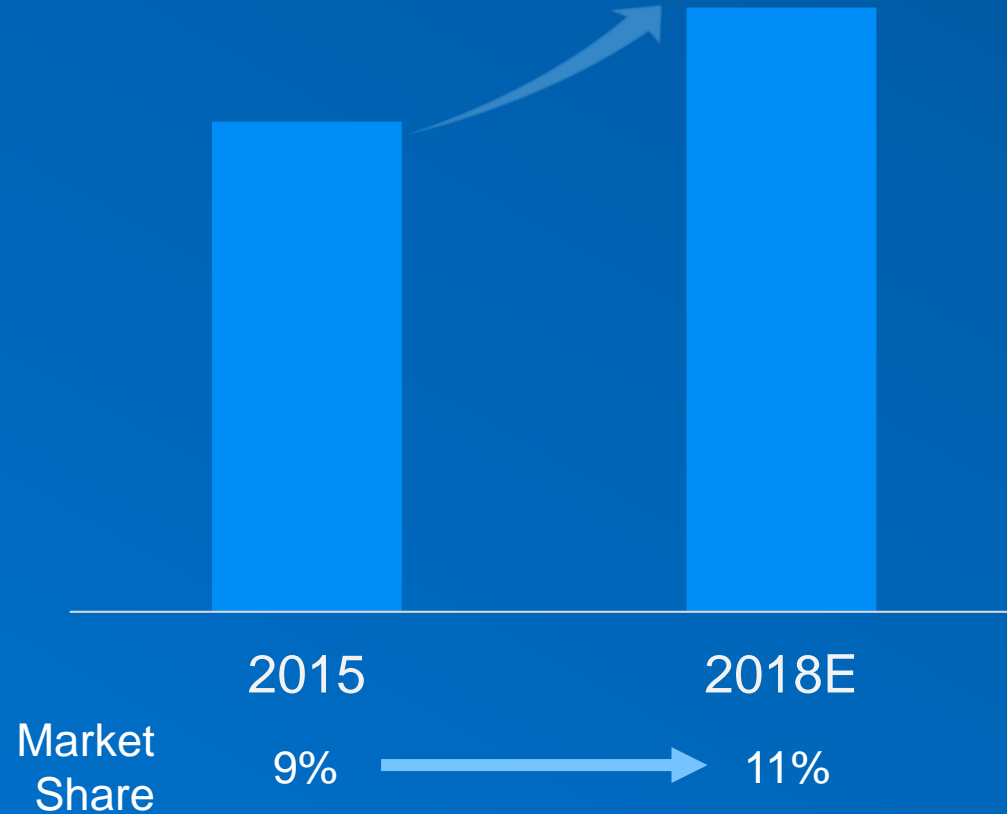GARMIN
SUUNTO

amazon

iRobot

SAMSUNG

Insulet

LANDI

htc

WHOIS

63

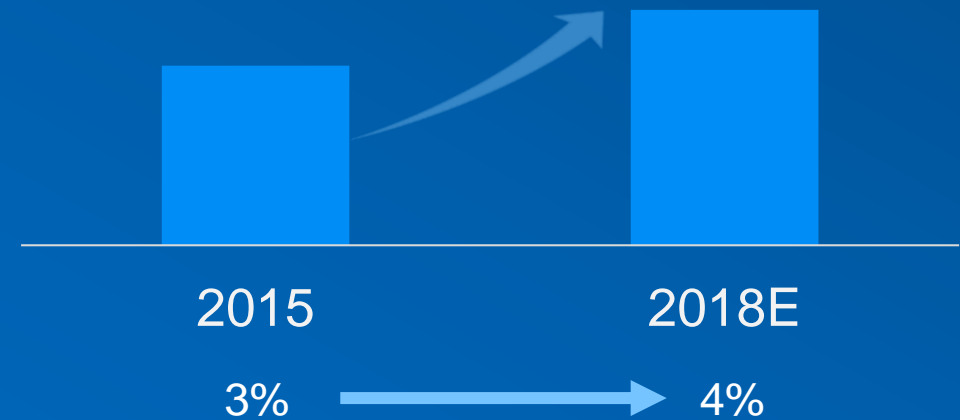# NXP $1.9B Industrial & IoT Business with Track Record[1]

Embedded Processing

+ 7% CAGR

2015   2018E

Analog, Power & Connectivity
Attach Portfolio

+9% CAGR

2015   2018E

Market
Share   9% → 11%   3% → 4%

NXP

Accelerating Industrial & IoT Revenue Growth
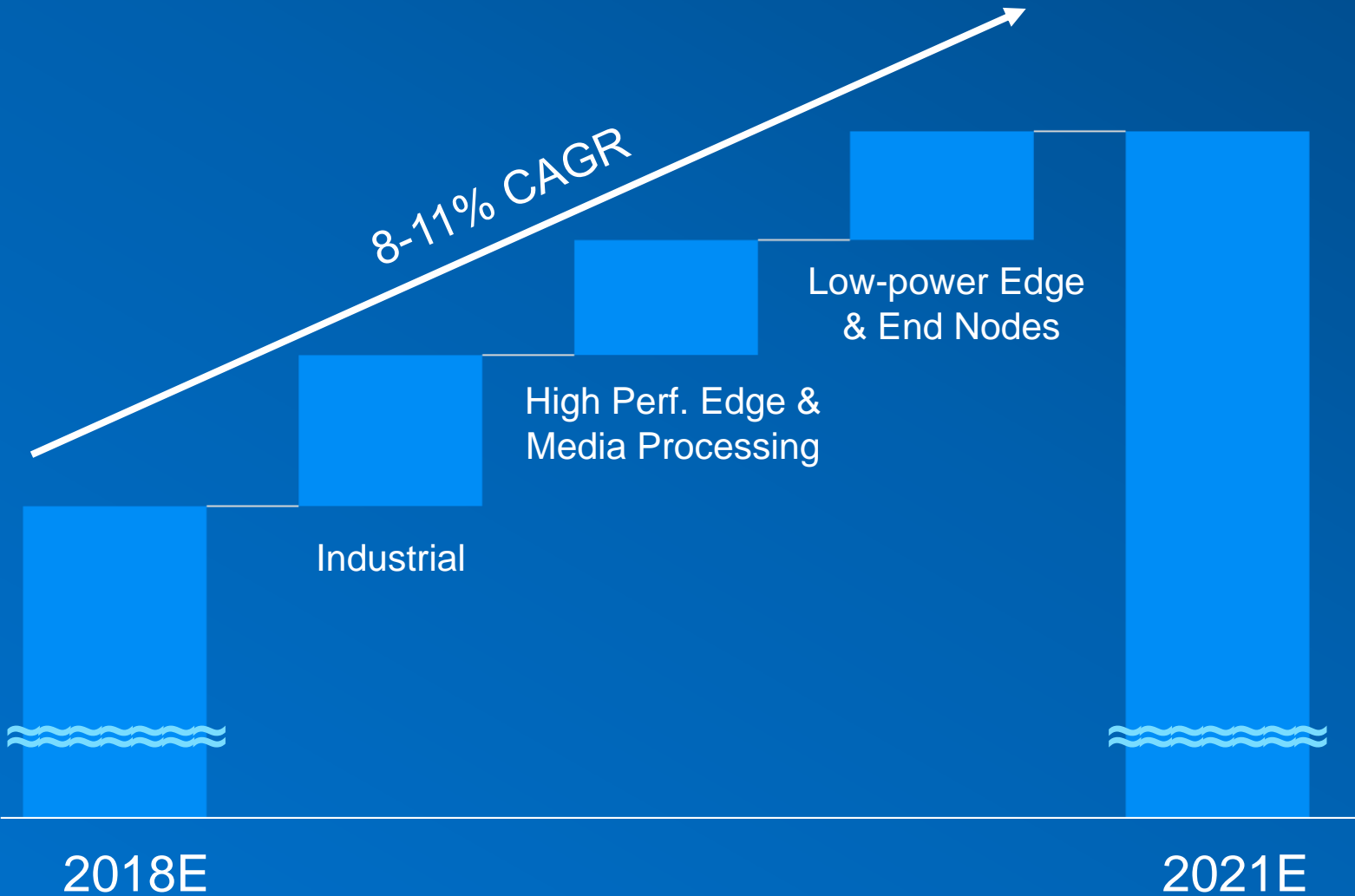
8-11% CAGR

Low-power Edge
& End Nodes

High Perf. Edge &
Media Processing

Industrial

2018E

2021E

NXP

Agenda

INDUSTRIAL & IOT

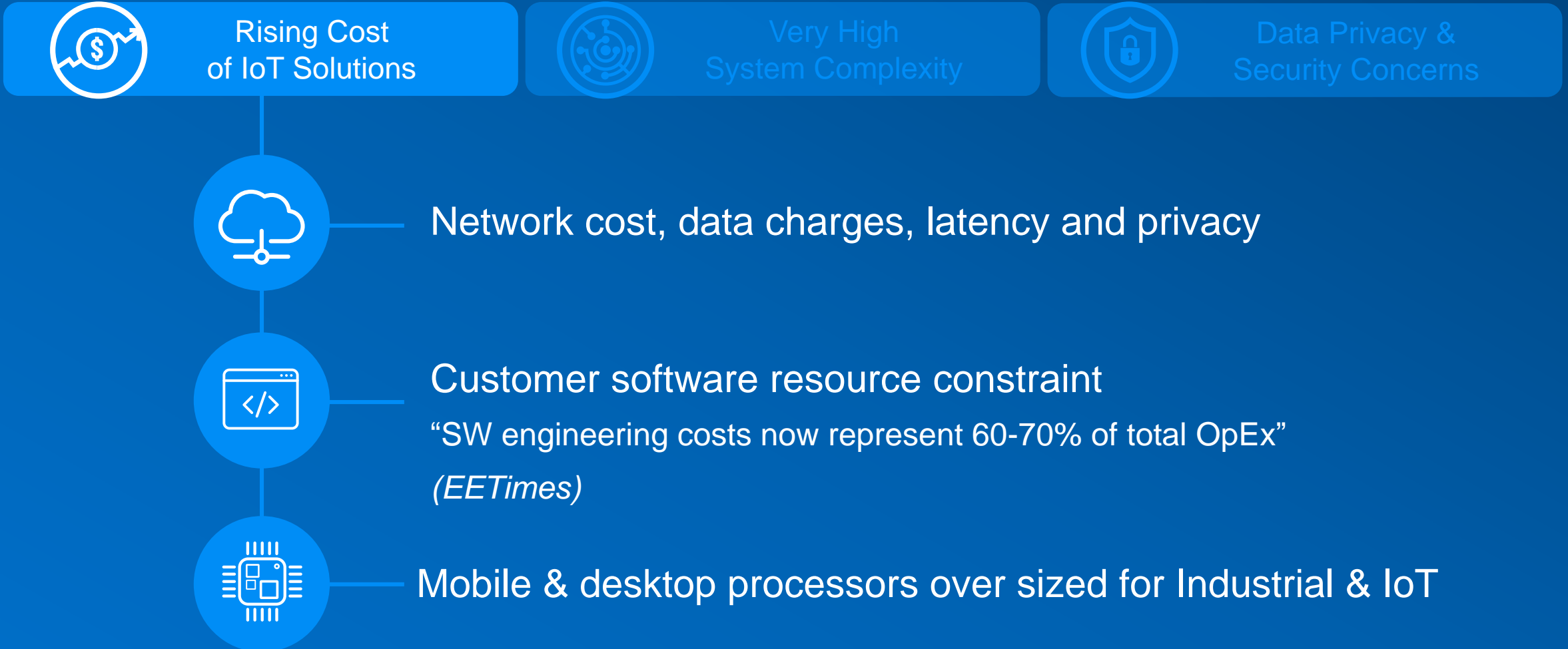The AI / IoT Disruption & NXP Growth Opportunity

Understanding Customer Pain Points

NXP Solutions:

- Unique Processing Continuum

- Simplifying Software & Systems Complexity

Summary

Customer Pain-Point: Rising Cost of IoT Solutions[1]

Rising Cost of IoT Solutions	Very High System Complexity	Data Privacy & Security Concerns

Network cost, data charges, latency and privacy

Customer software resource constraint

"SW engineering costs now represent 60-70% of total OpEx"

(EETimes)

Mobile & desktop processors over sized for Industrial & IoT

NXP

Customer Pain-points: System Complexity & Security[1]

Very High System Complexity

"70% of embedded developers decide on the processor's ecosystem first"

2017 Embedded Developers Survey

Embedded **EE Times**

Diverse cloud & AI solutions

aws · Baidu百度 · Google · IBM · Microsoft · Alibaba

Fragmented connectivity protocols

Bluetooth · WiFi · ZigBee · THREAD GROUP · Z-WAVE · sigfox · LoRa

Operating system & software portability

Zephyr · ANDROID · Amazon freeRTOS · Linux · Green Hills SOFTWARE

Data Privacy & Security Concerns

Data Breach Examples

Retail / Healthcare
Jun 2018, Feb 2015, May 2014, Sep 2014 , Dec 2013

Social Media / Search
June 2016, Aug 2013

Banking / Credit Rating
July 2017, June 2014

Airlines
Sep 2018

Government regulations

US-CERT
United States
Computer Emergency Readiness Team

GDPR
The General Data Protection Regulation

China Cyberspace Adm.

NXP

Agenda

The AI / IoT Disruption & NXP Growth Opportunity
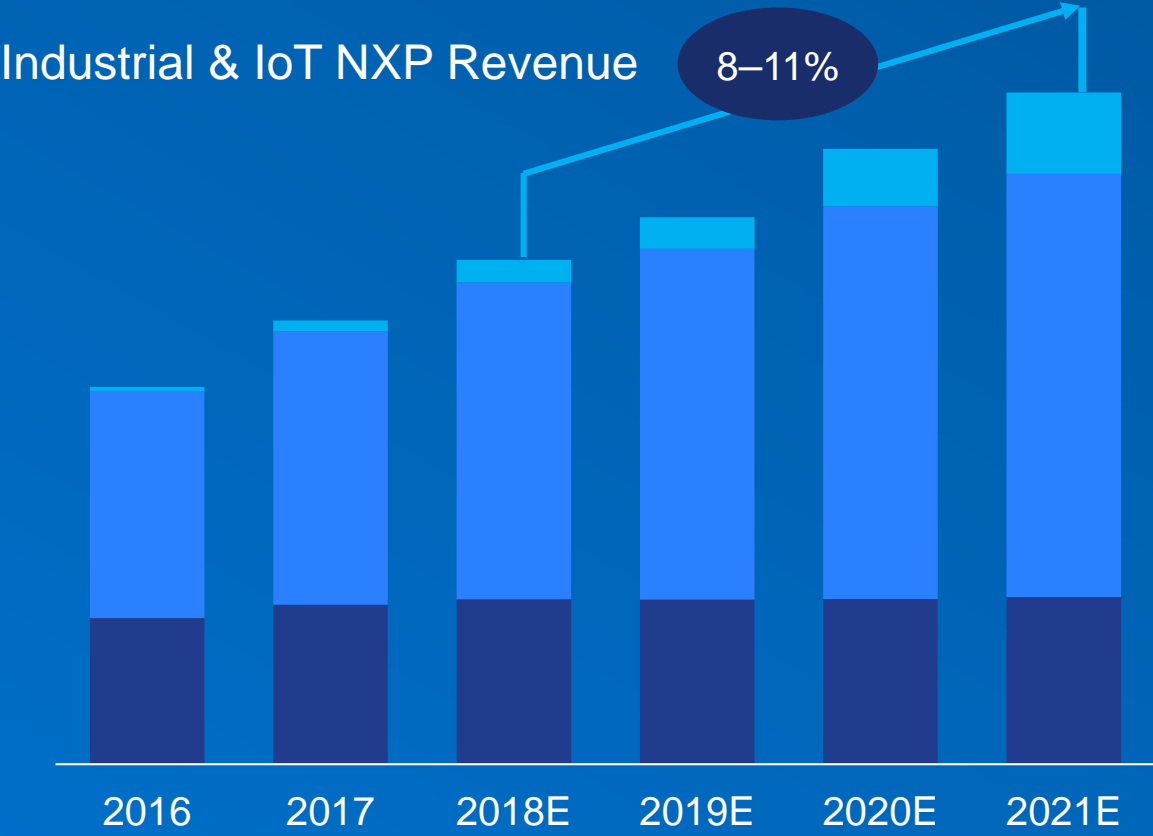
Understanding Customer Pain Points

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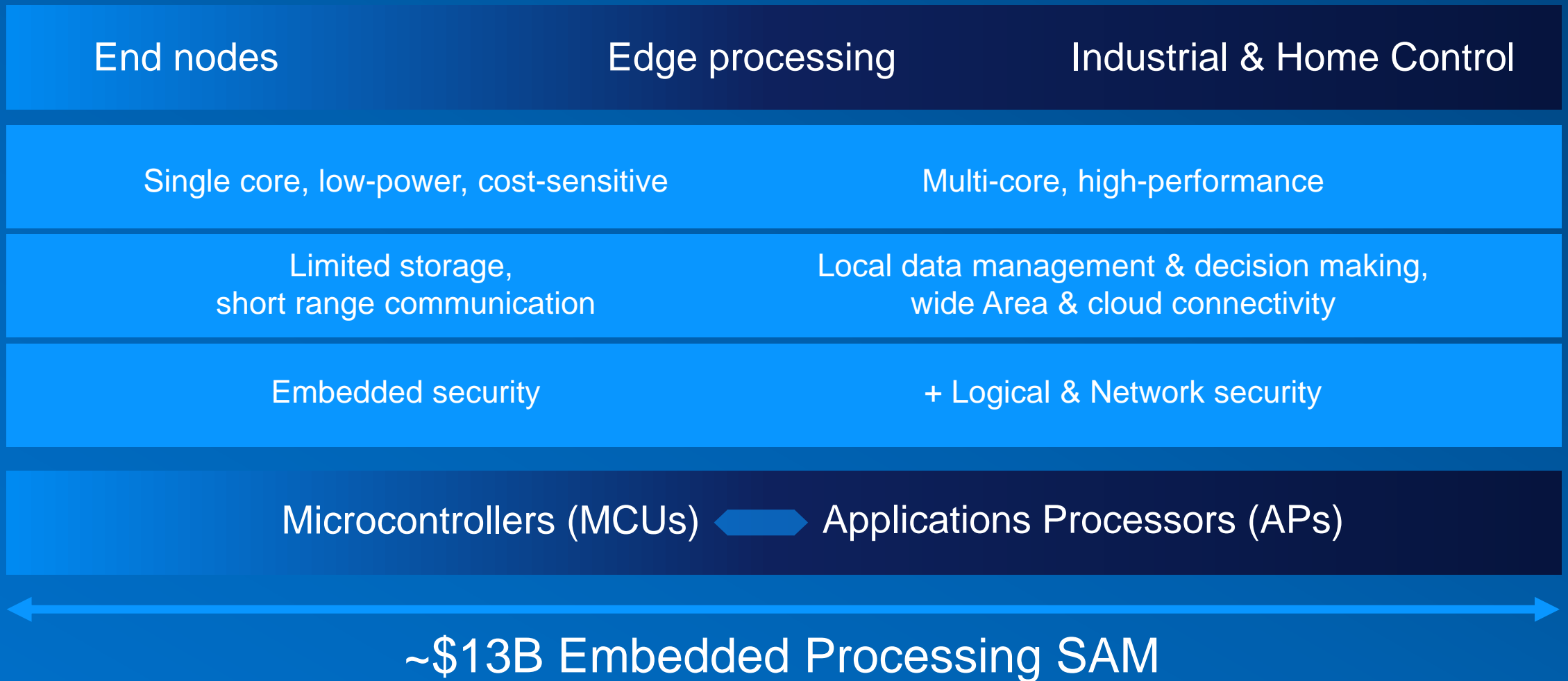
69

Consistent Broad Based Growth
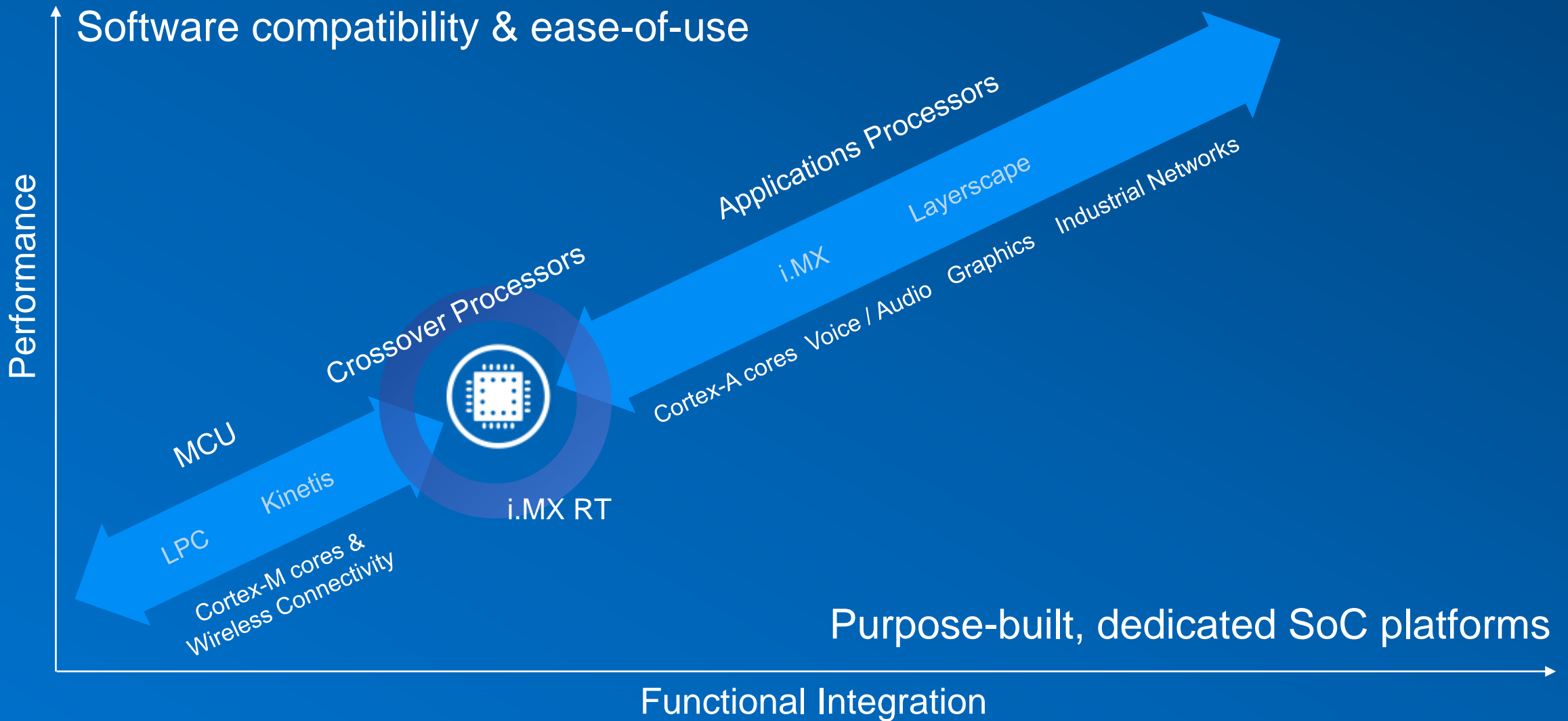## Accelerated by high impact growth portfolio

Industrial & IoT NXP Revenue

8–11%

2016   2017   2018E   2019E   2020E   2021E

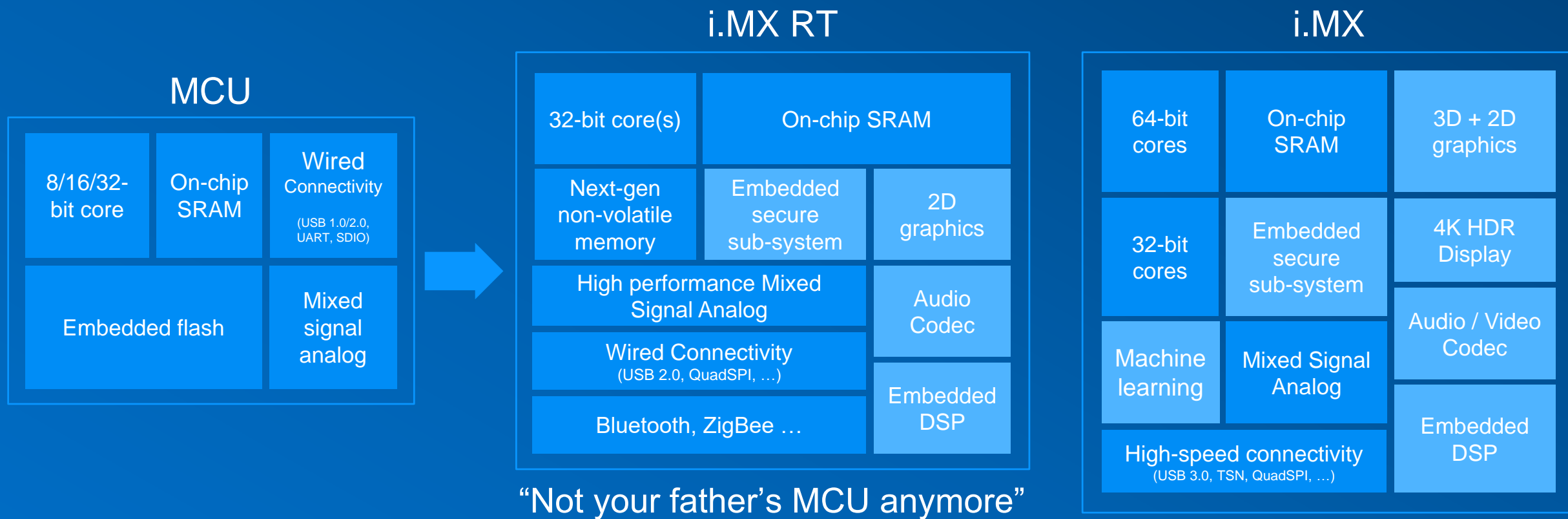|	CAGR '18- '21	Enabling Portfolio
New	45–60%	• Crossover processors • Ultra-low power processing • Connected MCUs
Core	9–11%	• High performance processing • 32-bit Arm MCUs • High performance analog
Legacy	0-1%	• 8/16/32-bit non-Arm MCUs

NXP

Industrial & IoT Processing Requirements[1]

End nodes	Edge processing	Industrial & Home Control
Single core, low-power, cost-sensitive		Multi-core, high-performance
Limited storage, short range communication		Local data management & decision making, wide Area & cloud connectivity
Embedded security		+ Logical & Network security

Microcontrollers (MCUs) ⬌ Applications Processors (APs)

⬌

~$13B Embedded Processing SAM

NXP

NXP Scalable Industrial & IoT Processing Continuum

Software compatibility & ease-of-use

Performance

Applications Processors

Layerscape

i.MX

Cortex-A cores Voice / Audio Graphics Industrial Networks

Crossover Processors

MCU

Kinetis

LPC

Cortex-M cores &
Wireless Connectivity

i.MX RT

Purpose-built, dedicated SoC platforms

Functional Integration

NXP

Dramatic Increase in Complexity of Embedded Processing

MCU

8/16/32-bit core	On-chip SRAM	Wired Connectivity (USB 1.0/2.0, UART, SDIO)
Embedded flash		Mixed signal analog

i.MX RT

32-bit core(s)	On-chip SRAM	
Next-gen non-volatile memory	Embedded secure sub-system	2D graphics
High performance Mixed Signal Analog		Audio Codec
Wired Connectivity (USB 2.0, QuadSPI, …)		
Bluetooth, ZigBee …		Embedded DSP

"Not your father's MCU anymore"

i.MX

64-bit cores	On-chip SRAM	3D + 2D graphics
32-bit cores	Embedded secure sub-system	4K HDR Display
Machine learning	Mixed Signal Analog	Audio / Video Codec
High-speed connectivity (USB 3.0, TSN, QuadSPI, …)		Embedded DSP

- **Millions** of transistors
- Older technology nodes
- Bulk silicon

- **Billions** of transistors
- 40nm & below technology nodes
- High-K Metal Gate, FD-SOI, FinFET

For representation only; Blocks not drawn to scale

NXP

Crossover Processing Market Opportunity[1,2,3]

% of SAM ('21)

Embedded Processing SAM ($B)

15
10
5
-

40%
10%
26%
24%

2016   2017   2018E   2019E   2020E   2021E

■ 8/16-bit MCUs   ■ 32-bit MCU   ■ Crossover Processors   ■ Industrial & IoT AP
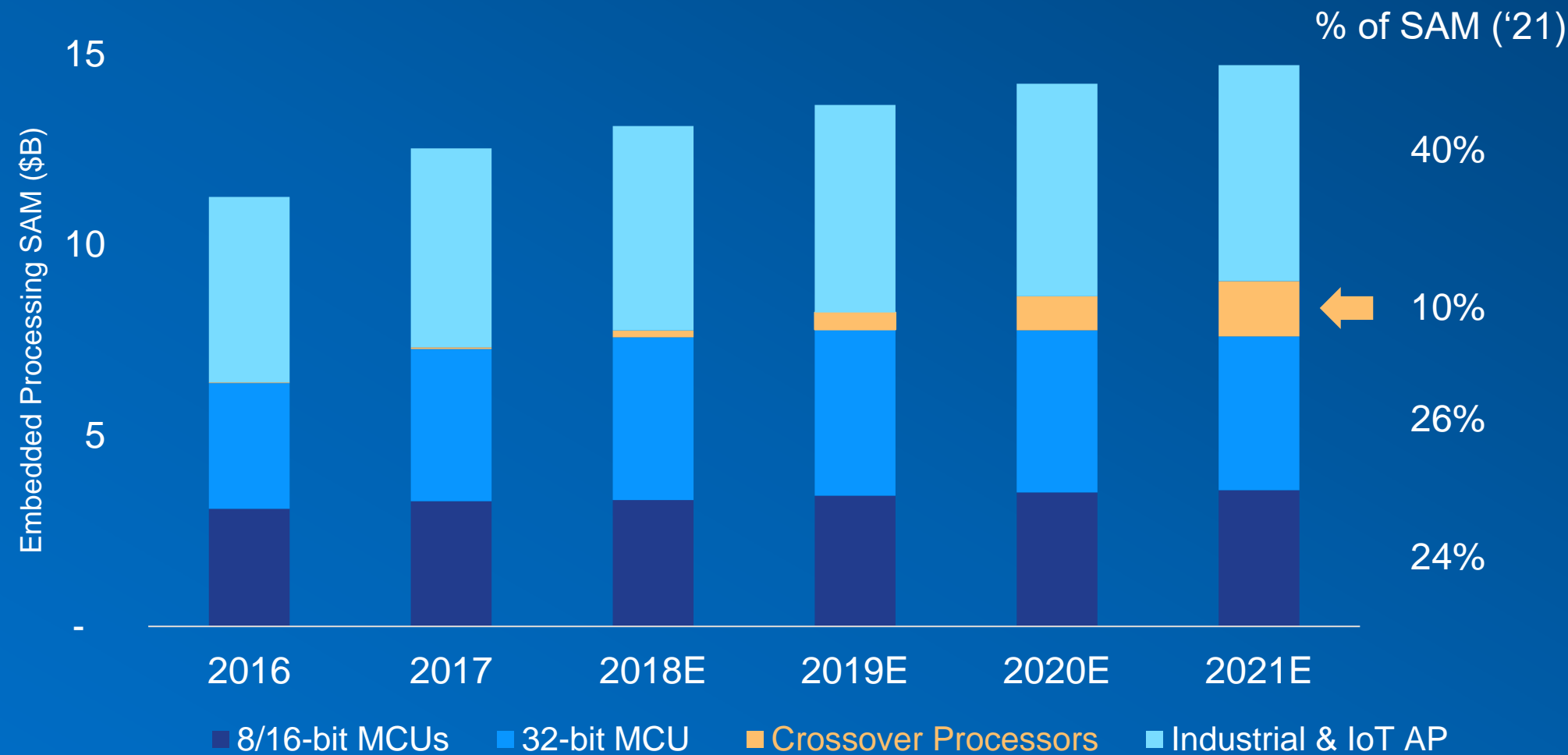
1. Source: WSTS, NXP
2. Definition: Embedded Processing = Applications Processors (AP) + MCU
3. Embedded processing SAM excludes Automotive, Comms. Infrastructure & Smartcard

NXP

Winning the Industrial Embedding Processing Challenge

Revenue Growth

100%

Low-power Edge & End Nodes

High Perf. Edge & Media

Industrial

Expected
2018 – 2021
Revenue Growth Drivers
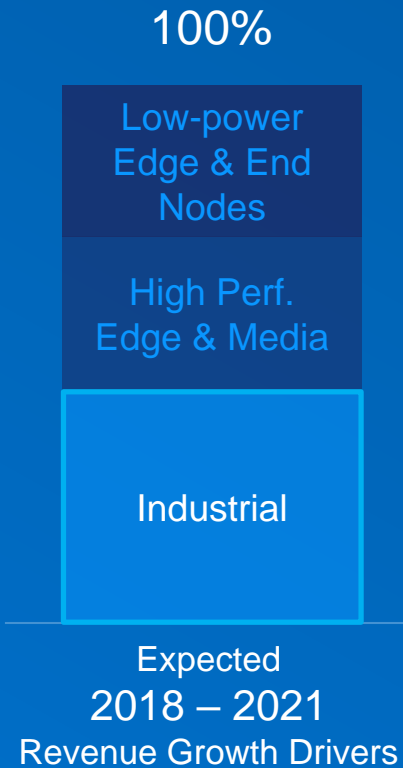
Key Applications

- Factory Automation
- Industrial Gateways
- Human-Machine Interface
- Machine Vision
- Robotics
- Industrial Scanners

Key Capabilities

- Scalability with Common Software
- Security
- Wired Connectivity

Key Portfolio Solutions

i.MX 6, 7, 8, 8M
High performance, 3D graphics

Layerscape
High-speed Ethernet, TSN

i.MX RT
Highest performing MCUs in the market

Kinetis & LPC
Low cost to high integration

NXP

Industrial Processing Needs Addressed by NXP

Security
Reliability
Longevity
Software

Connectivity Data Rate

Scalable Processing

Access Point Routers

Firewalls

Programmable Logic Controllers (PLC)

Computer Numeric Control (CNC)

I/O Controllers

Machine Vision

Industrial Gateways

Human-Machine Interface

Handheld Devices

Graphics & Display

Industrial Processing Needs Addressed by NXP

Security   Reliability   Longevity   Software

Applications Processors

MCUs   **Crossover Processors**

Connectivity Data Rate

Access Point Routers

Industrial Gateways

Programmable Logic Controllers (PLC)

I/O Controllers

Computer Numeric Control (CNC)

Scalable Processing

Machine Vision

Human-Machine Interface

Handheld Devices

Graphics & Display

NXP

Growing in the High Performance Edge & Media Processing

Revenue Growth

100%

Low-power Edge & End Nodes

High Perf. Edge & Media

Industrial

Expected
2018 – 2021
Revenue Growth Drivers
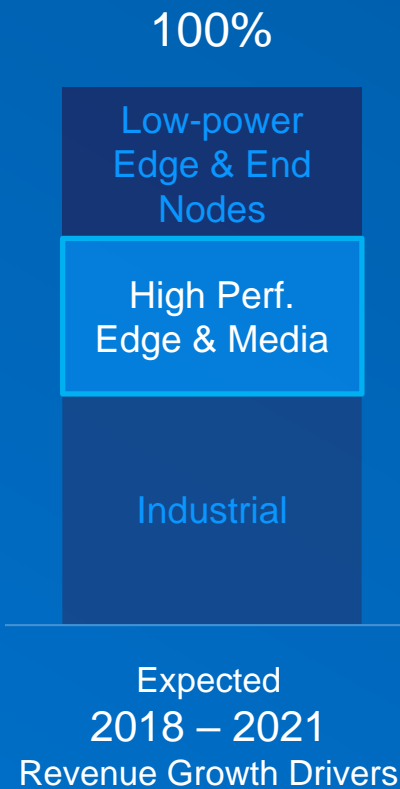
Key Applications

Media Streaming

Smart Home

Video Surveillance

Game Streaming

Video OTT

Video Conference

Key Capabilities

Audio / Video Codec

4K HDR & 3D Graphics

Voice & Natural Language

Key Portfolio Solutions

i.MX 8 & 8M
High perf., 4K HDR, 3D Graphics

i.MX 7
Balanced Power - Performance

i.MX RT Crossover
Highest performing MCUs in the market

Kinetis & LPC
High performance & Analog Mixed Signal

NXP

Enabling Audio & Voice Processing at the Edge[1]

"Voice control front end to grow at 29% CAGR ('17-'22) in the Smart Home"

Voice	Speech	Music
Low-cost addition of voice recognition (e.g. Alexa voice services) for end nodes	Wake-word, natural language processing & ML applications on integrated DSP	Dolby ATMOS & DTS X: advanced codecs for high-fidelity streaming on Cortex-A
Low-power i.MX, MCUs	Performance i.MX, RT Crossover	High Performance i.MX

One unified audio software framework to meet any customer need

NXP

Enabling Audio & Voice Processing at the Edge [1,2,3]

"Voice control front end to grow at 29% CAGR ('17-'22) in the Smart Home"

NXP Enabled Smart Speakers

Google Voice Assist

Google
ASSISTANT

Alexa Voice Services

amazon alexa
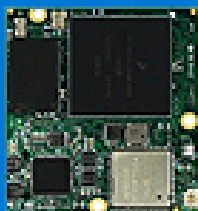
NXP i.MX7D
2-Mic Dev Kit for Amazon AVS

Voice Solutions for China

iFLYTEK 科大讯飞

NXP i.MX8M
Largest Voice Solution
provider for Mandarin

1. Source: Google Android Things developer website
2. Amazon AVS developer website
3. Source: ABI Research

NXP

Growing in Low-Power Edge & End Node Processing

Revenue Growth

100%

Low-power Edge & End Nodes

High Perf. Edge & Media

Industrial

Expected
2018 – 2021
Revenue Growth Drivers
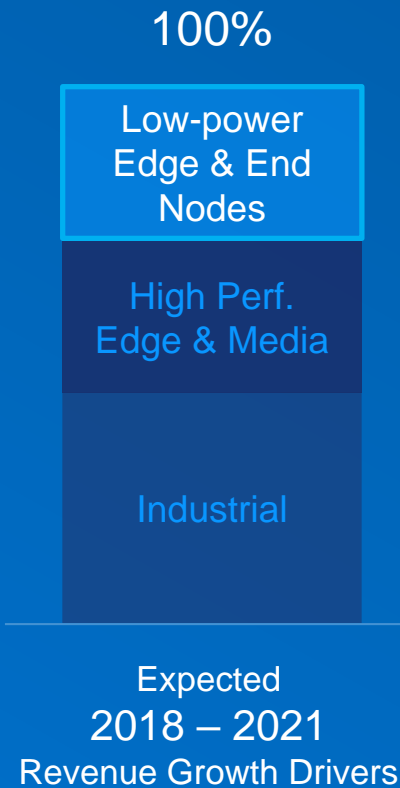
Key Applications

Smart Home

Connected Me

Smart Retail

Wearables

Smart Buildings

Voice Assistant

Key Capabilities

Ultra-low Power

Wireless Connectivity

Voice Control

Key Portfolio Solutions

i.MX 6
High performance, 3D graphics

i.MX 7ULP
Industry's best ultra-low power

i.MX RT
Highest performing MCU & DSP platform

Kinetis & LPC
Low cost to high integration

Connected MCUs
Multi-protocol (BLE, Zigbee, Thread)

NXP

Leading Low-Power Edge & End Node Solutions

Bringing Cloud to the End Node with Low-cost MCUs

NXP MCUXpresso Software

Amazon freeRTOS

Low-cost Voice Enablement with i.MX RT

NXP BoM
- i.MX RT1050 MCU
- Analog Amplifier
- Authentication Secure Element

Ultra-low power wearables with Low-power i.MX

- Industry's best power efficiency (15uW in deep sleep mode)
- Low power GPUs for wearables and IoT
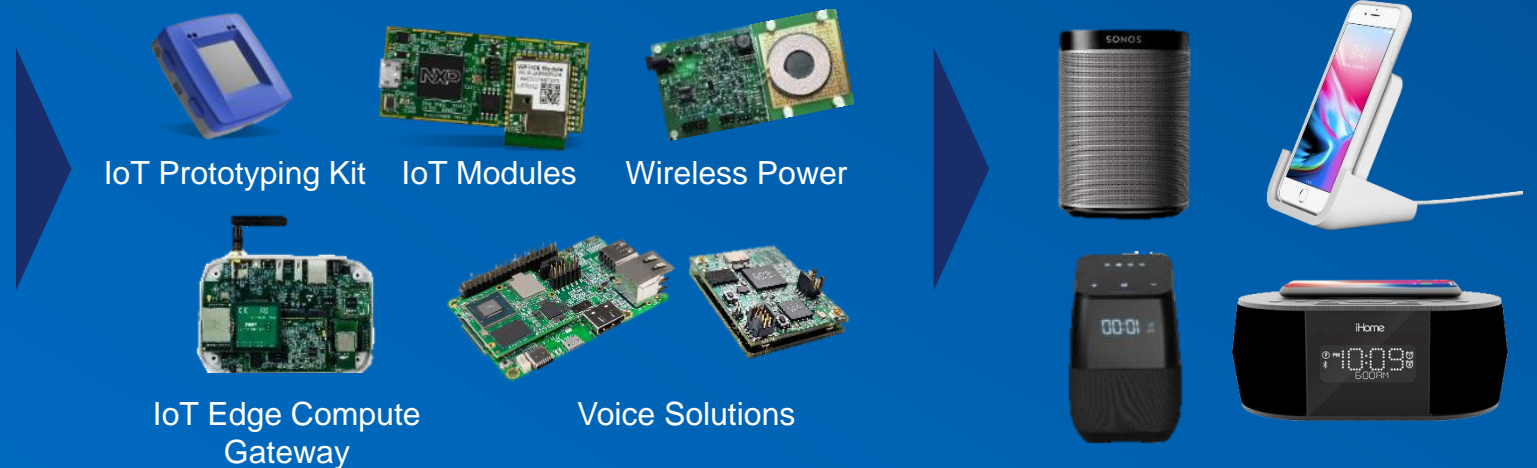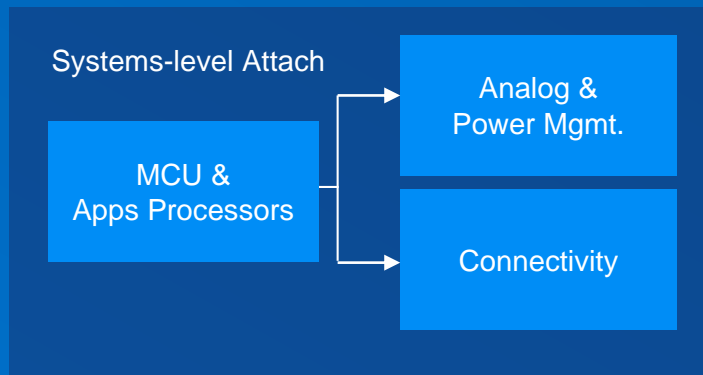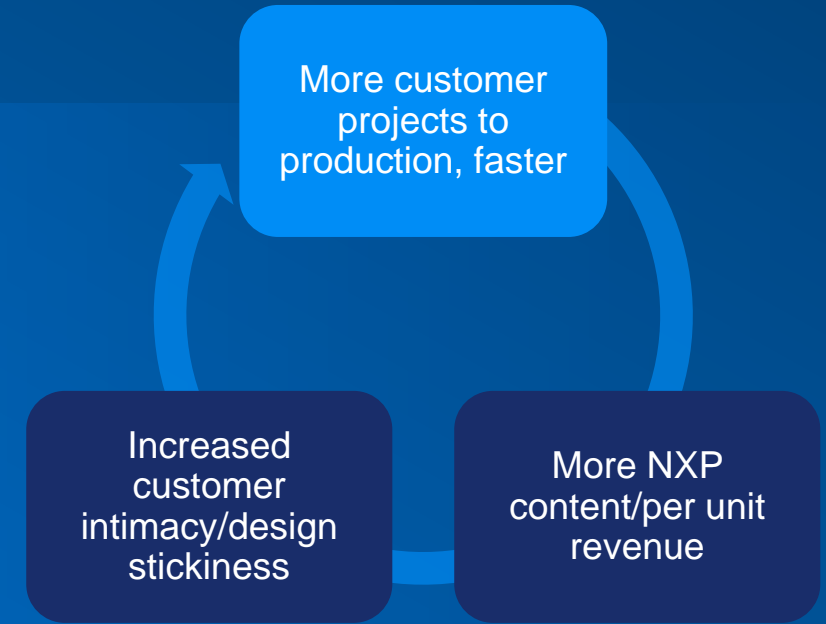- Industry's 1st Embedded Processor based on FD-SOI Technology

NXP Solutions for Industrial & IoT

Lead with the Processor
Basis for all intelligent systems

Bring the Software
Glue that holds the system together, delivers pricing power

Attach Peripheral Devices
Pull through incremental NXP content

More customer projects to production, faster

Increased customer intimacy/design stickiness

More NXP content/per unit revenue

Systems-level Attach

MCU & Apps Processors

Analog & Power Mgmt.

Connectivity

IoT Prototyping Kit   IoT Modules   Wireless Power

IoT Edge Compute Gateway

Voice Solutions

Agenda

The AI / IoT Disruption & NXP Growth Opportunity
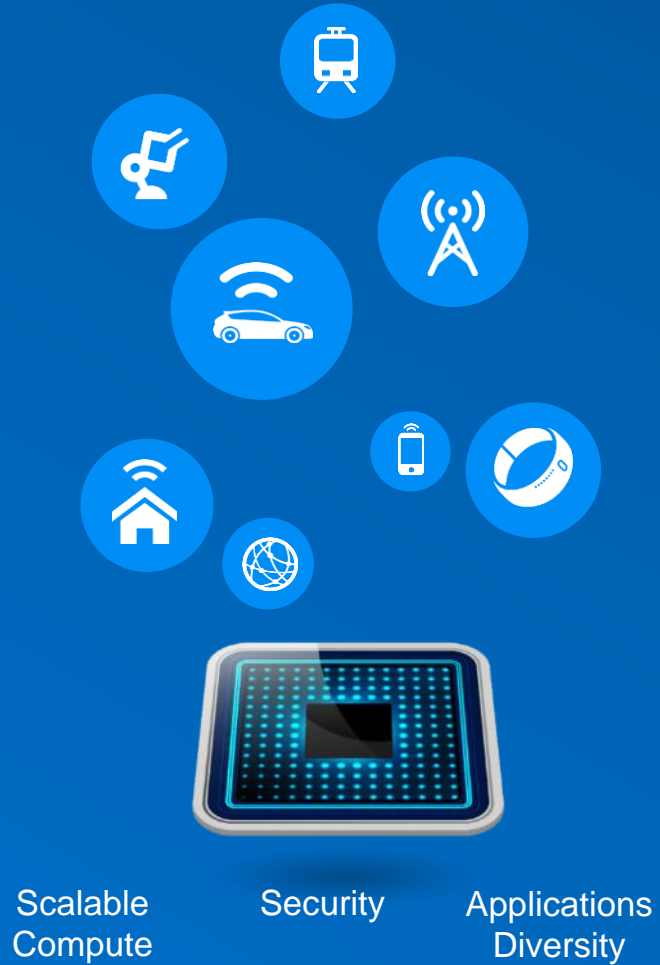
Understanding Customer Pain Points

NXP Solutions:
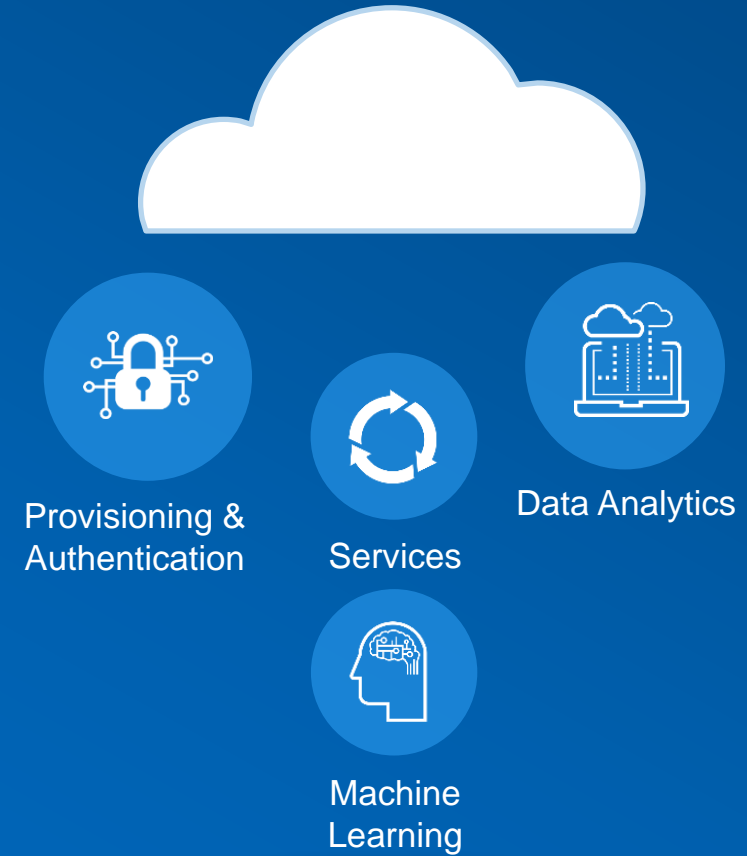
- Unique Processing Continuum

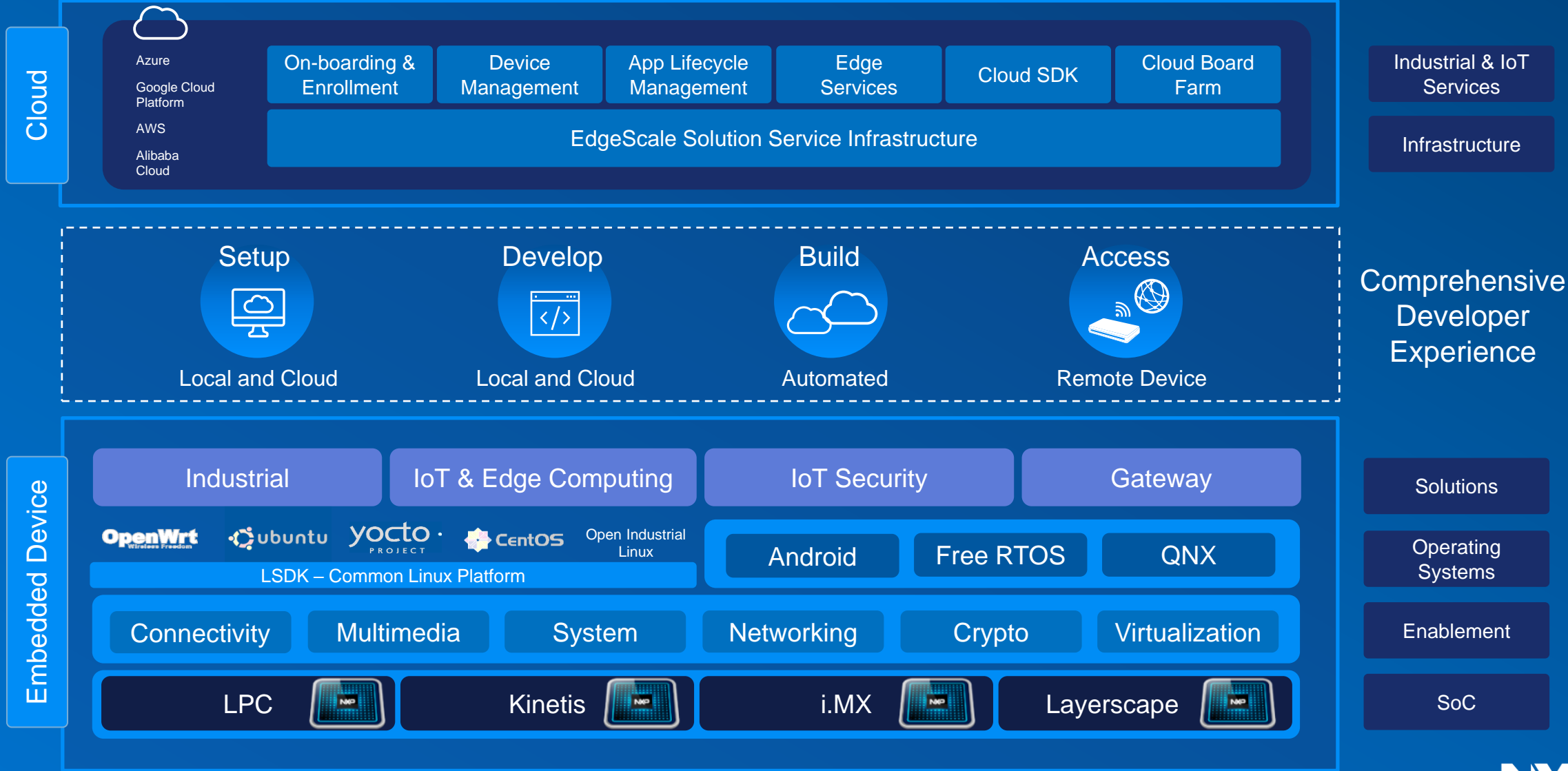- Simplifying Software & Systems Complexity

Summary

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Network Edge

Cloud Infrastructure

Scalable Compute   Security   Applications Diversity

Provisioning & Authentication   Services   Data Analytics

Machine Learning

NXP

Processing + Software 'Glue' Connects Network Edge to the Cloud

The Future of Developer Experience

Cloud

Azure
Google Cloud Platform
AWS
Alibaba Cloud

On-boarding & Enrollment	Device Management	App Lifecycle Management	Edge Services	Cloud SDK	Cloud Board Farm

EdgeScale Solution Service Infrastructure

Industrial & IoT Services

Infrastructure

Comprehensive Developer Experience

Setup
Local and Cloud

Develop
Local and Cloud

Build
Automated

Access
Remote Device

Embedded Device

Industrial	IoT & Edge Computing	IoT Security	Gateway

OpenWrt Wireless Freedom   **ubuntu**   **yocto** PROJECT   **CentOS**   Open Industrial Linux

LSDK – Common Linux Platform

Android	Free RTOS	QNX

Connectivity	Multimedia	System	Networking	Crypto	Virtualization

LPC	Kinetis	i.MX	Layerscape

Solutions

Operating Systems

Enablement

SoC

NXP

End-to-End Security in an Insecure World
Scalable security for different threat profiles

MCU / AP with Embedded Security

User Application Space

Trusted Execution

Embedded Security

MCU / AP with Isolated Secure Sub-System

User Application Space

Secure Sub-system

Secure OS

Isolation
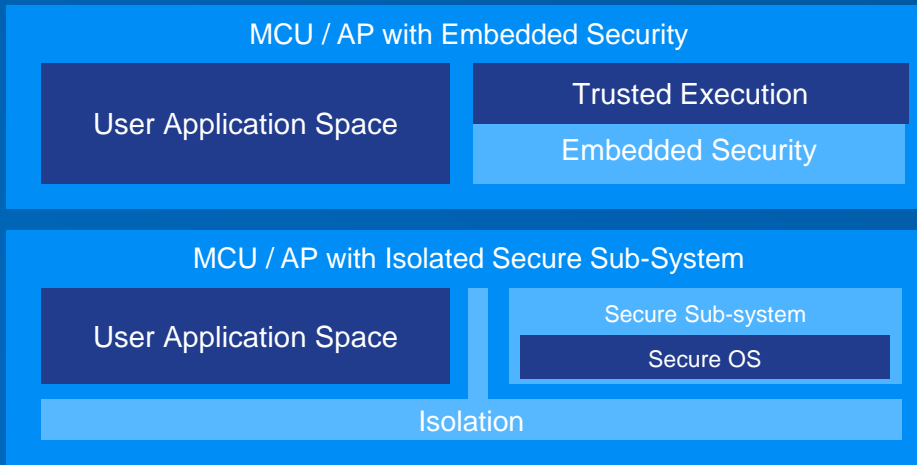
+ Software Enablement ↔

NXP Secure Service 2GO

Security with machine learning

Trusted execution and authentication

Tamper resistant storage

Hardware Root of Trust

Device lifecycle management

Over-the air updates

Provisioning & authentication

Secure encrypted communication

NXP Local Area Connectivity Solutions Leadership

Bluetooth™
BLE 5.0

ZigBee®
Zigbee 3.0

THREAD GROUP
Thread 1.1

✓ Ultra-low power BLE for Hearables

✓ Single-protocol MCUs
(BLE-only or Zigbee/Thread – only)

✓ Multi-protocol MCUs
(BLE + Zigbee/Thread)

2018 Industry Leading Wireless MCU launch

- Dual-core, multi-protocol connectivity with leading edge security
- Highest on-chip memory for expanded secure mesh networks
- All in a single chip

Wide Area Connectivity Solutions

Current Focus with 2018 – 2021 Revenue Impact

Turn-key Solutions NXP + Wi-Fi module/boards

'IoT-on-a-Chip'
i.MX + Wi-Fi/BT

- Modular design
- Scalable to customer need

Pre-certified for faster time-to-market

Future Solution

Integrated Wi-Fi chipset

- Internally developed 802.11ac/ax for top-tier enterprise customer

- Industrial & IoT 802.11ac + BLE scaled down solution in development
  - Sampling at end of 2019

NXP Enabling Machine Learning Revolution

Voice Processing

Smart Sense & Control

Gesture Control

Active Object Recognition

Personal / Property

Home Environment

Multi-camera Observation

Augmented Reality

TensorFlow Caffe2

Training in the cloud

Trained Models Inference Engines

ONNX K Keras

and others

Low-end Edge Compute	Mid-end Edge Compute	High-end Edge Compute
i.MX 6 1-2x Arm 32-bit Crossover & High. Perf. MCUs Arm 32-bit MCU +ML DSP	i.MX 7, 8 1-4x Arm 32/64-bit Performance GPUs Integrated DSP	i.MX 8, Layerscape Multi-core Arm 64-bit High performance • GPUs • DSP • Vector processing

Scalable & optimized inference engines across Embedded Processing continuum

NXP

Edge Compute Enabler – Scalable Inference[1]
Balancing cost vs. end-user experience

NXP Software Enablement for seamless ML deployment

Decision Making (Inference) Time

Gen. Purpose MCU (e.g. Cortex® - Mx)

5-10x reduction

High Compute MCU (e.g. Cortex® - M7)

5-10x reduction

Multi-core Applications Processor (GHz +) (e.g. Cortex® - Ax)

5x reduction

GPU / DSP complexes in Applications Processors

Kinetis, LPC

i.MX RT Crossover

i.MX & Layerscape

i.MX

Performance vs. Cost trade-off

Partnering with Google to bring ML Accelerator (TPU) to the edge

NXP i.MX Apps Processor   Google TPU
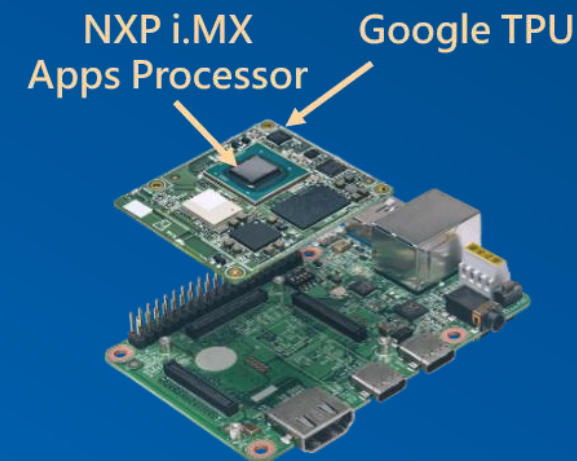
Bringing intelligence to the edge with Cloud IoT
Introducing the Edge TPU Development Kit

NXP

Industrial & IoT – NXP Value Proposition

Industrial Automation

- Open Industrial Linux (OpenIL)
- OT and IT convergence solution
- TSN scheduling service
- Zero-touch provisioning and replacement
- Zero down-time operation
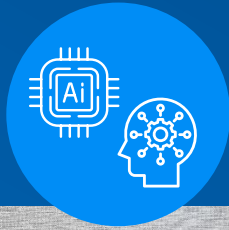
IoT Edge and AI / ML

- Edge AI / ML solutions
- Edge computing orchestration
- End-to-end dataflow construction and customization
- Digital device "shadow"
- Virtual function aggregation and virtual device management

IoT Security
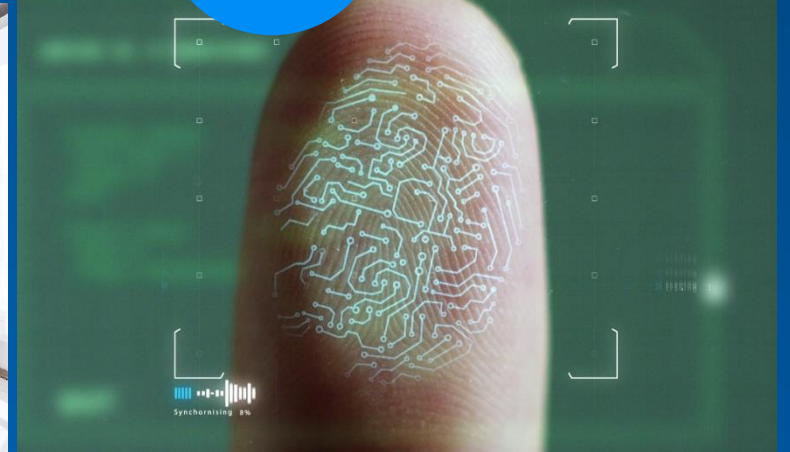
- Secure manufacturing
- Secure device on-boarding and provisioning
- Secure enrollment and re-enrollment
- Cloud integration
- Independent secure identity management

NXP

Agenda

The AI / IoT Disruption & NXP Growth Opportunity

Understanding Customer Pain Points

NXP Solutions:

- Unique Processing Continuum

- Simplifying Software & Systems Complexity

Summary

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Industrial & IoT Growth Expectations Summary[1,2]

2018 – 2021 3-Year CAGR

NXP Industrial & IoT Revenues	8-11%
Industrial & IoT SAM	5-7%
Industrial & IoT TAM	3-5%
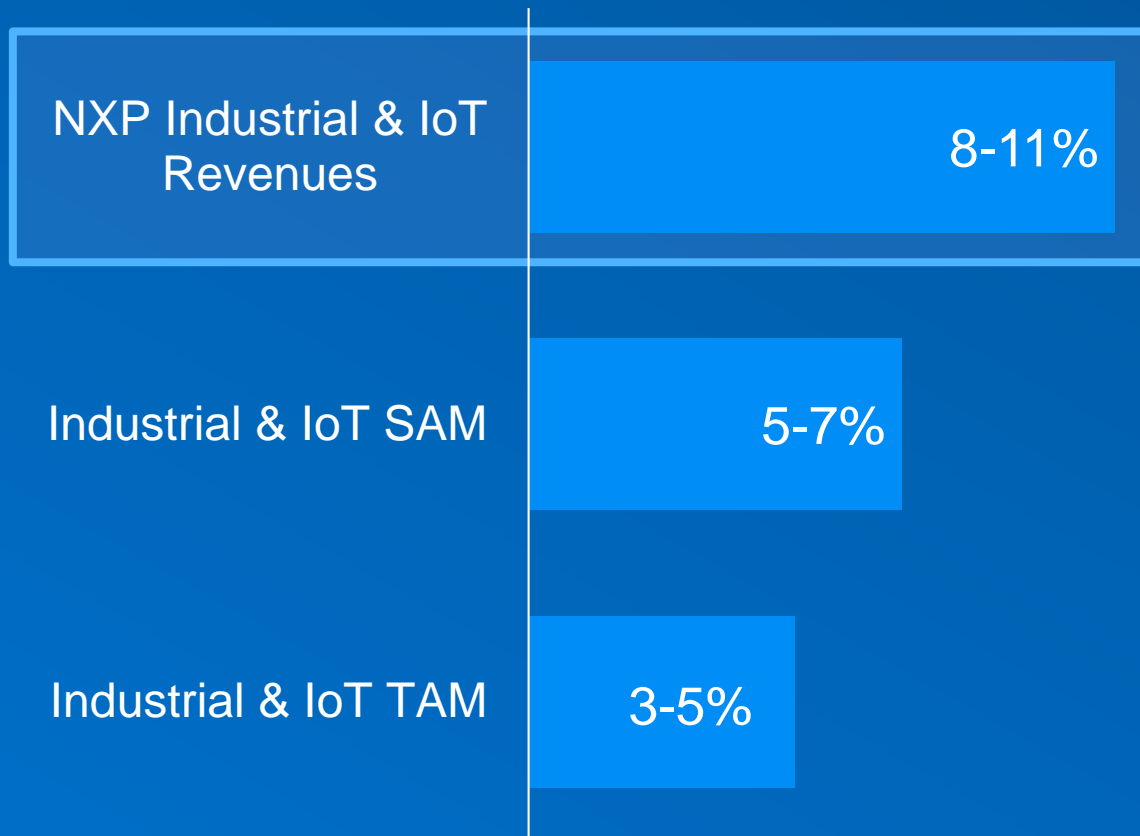
Broad-based growth + select high impact growth drivers

1 Industrial

2 High Performance Edge & Media Processing

3 Low-power Edge & End Nodes

Uniquely Positioned for Industrial & IoT Edge Compute

NXP

Broadest Portfolio
MCU / Crossover /
Application Processors

Complete Solutions
SDK / HW / SW
& Ecosystem

Seamless
Cloud Connectivity
& Lifecycle
Management

High-precision
Analog &
Audio/Video/Display

Security & Privacy
Embedded &
Systems Level

Systems Level Integration

Comprehensive Software Environment

Edge Compute Ecosystem

Edge Processing

INVESTOR DAY 2018

Automotive

Kurt Sievers

President

NXP | INVESTOR DAY 2018

Agenda

Megatrends

Tech Leadership: Domain Architecture

Customer Leadership: System Solutions

Growth

- ADAS ➜ Autonomy
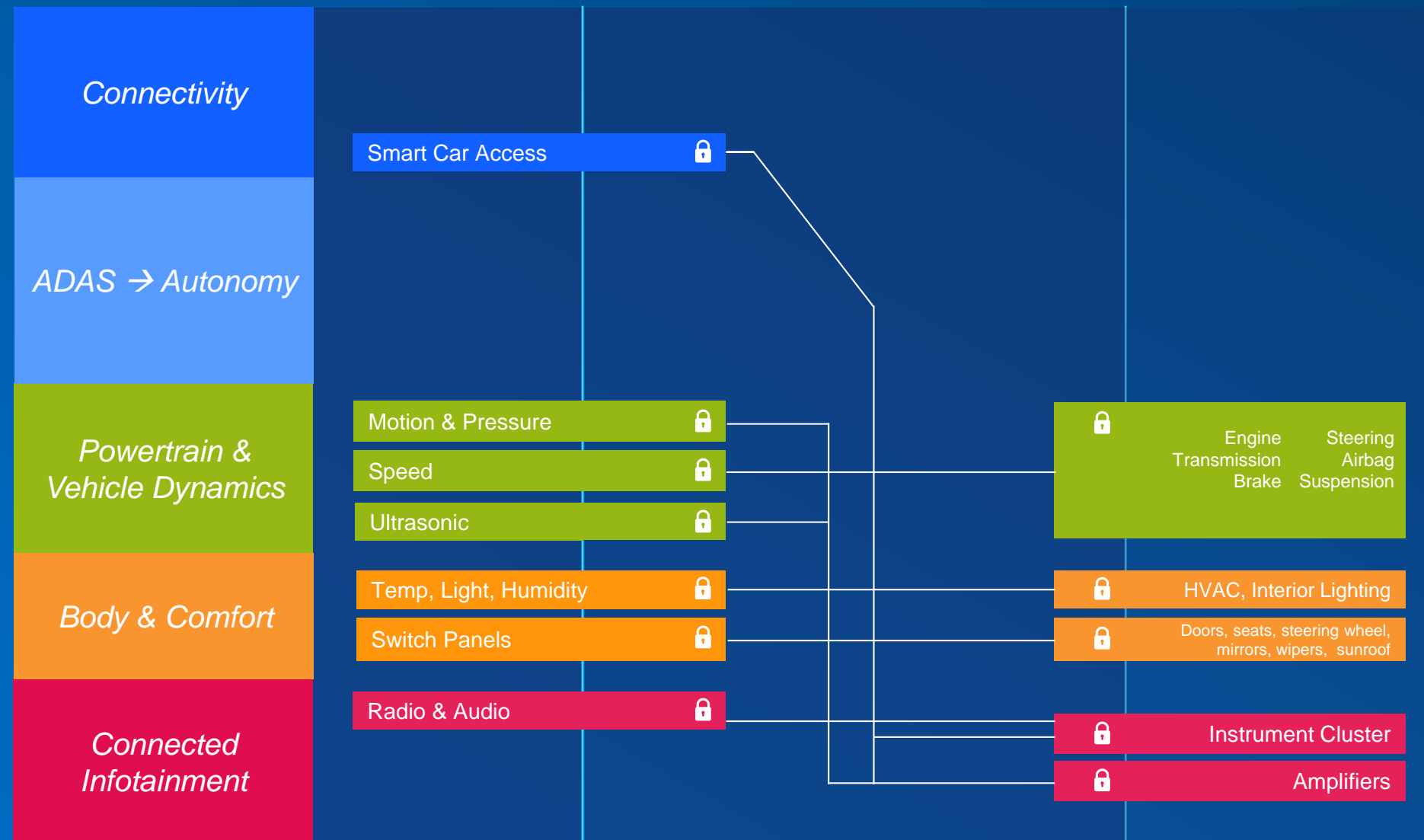- Connected Infotainment
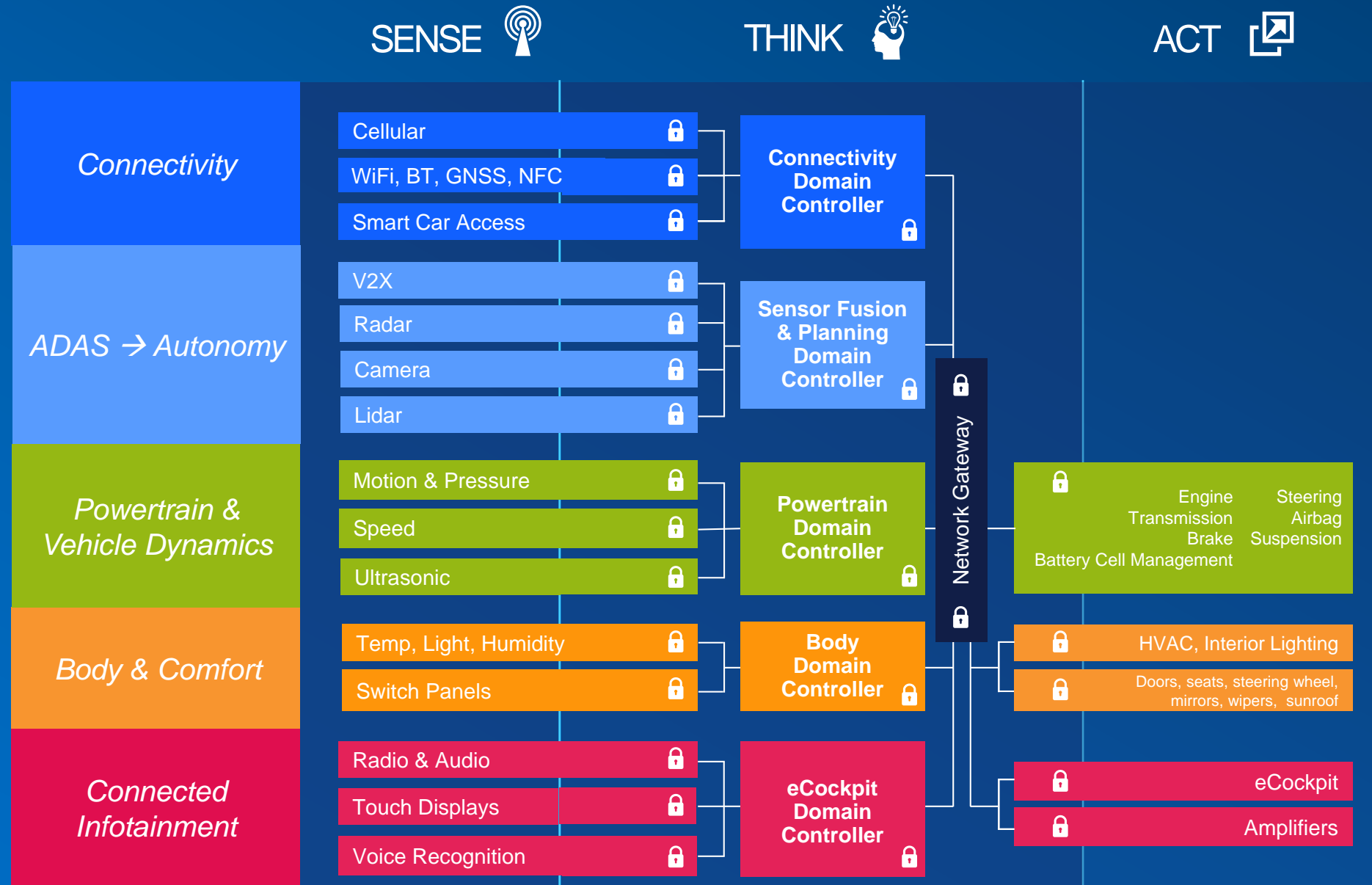- Network Infrastructure
- Electrification

Summary

Megatrends Transform Automotive Industry

Connected Infotainment

ADAS → Autonomy

Electrification

ZERO
Time Wasted

ZERO
Accidents/Congestion

ZERO
Emissions

Safe and Secure Mobility

NXP

Megatrends Sustainably Boost Semi Car Content[1,2]

Connected Infotainment

+$100 Premium
Experience

ADAS → Autonomy

+$150 Level 2
+$600 Level 3
+$1200 Level 4&5

Electrification

+$400 Hybrid
+$450 Full Electric

Safe and Secure Mobility

… from $380 average semi value (TAM) per car in 2018

1. Source: Strategy Analytics, NXP
2. Semi content based on 2020 price levels

NXP

Megatrends Drive Exponential Performance Requirement[1]

Data Generation
(TeraByte per hour)

2015	2020	2025
0.2	2	20

- Dramatically more sensors
- Higher precision
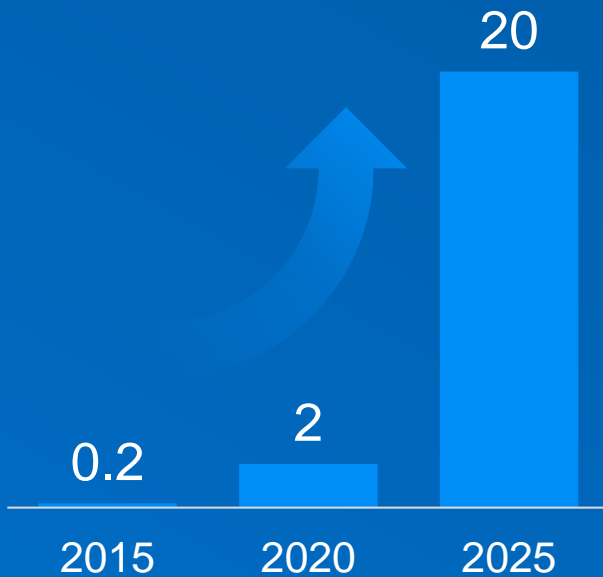
Compute Performance
(TFLOPS)

2015	2020	2025
0.2	2	100

- ADAS & autonomy
- e-Cockpit
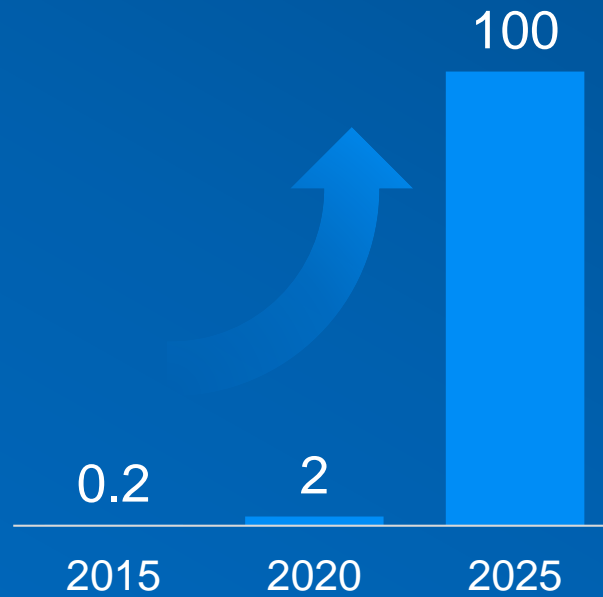
Network Bandwidth
(GigaBit per Second)

2015	2020	2025
0.1	1	10

- Loads of data (on & off board)
- Real-time distributed applications

Megatrends Force Vehicle Architecture Transformation

TODAY

TOMORROW

Connectivity

Powertrain & Vehicle Dynamics

Connected Infotainment

Domain Controller

Domain Controller

Gateway

Domain Controller

Domain Controller

Domain Controller

Body & Comfort

ADAS → Autonomy
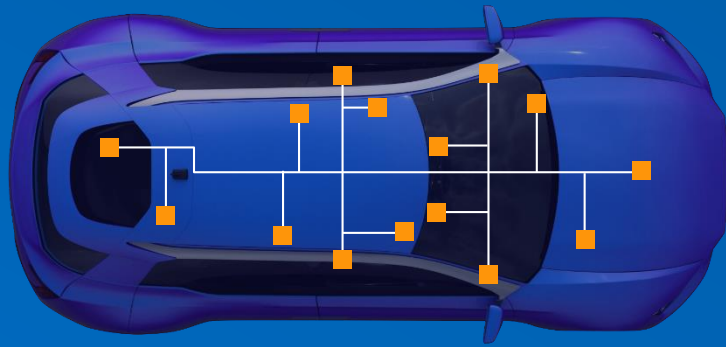
Distributed Flat Architecture

- Low bandwidth network
- One MCU per application
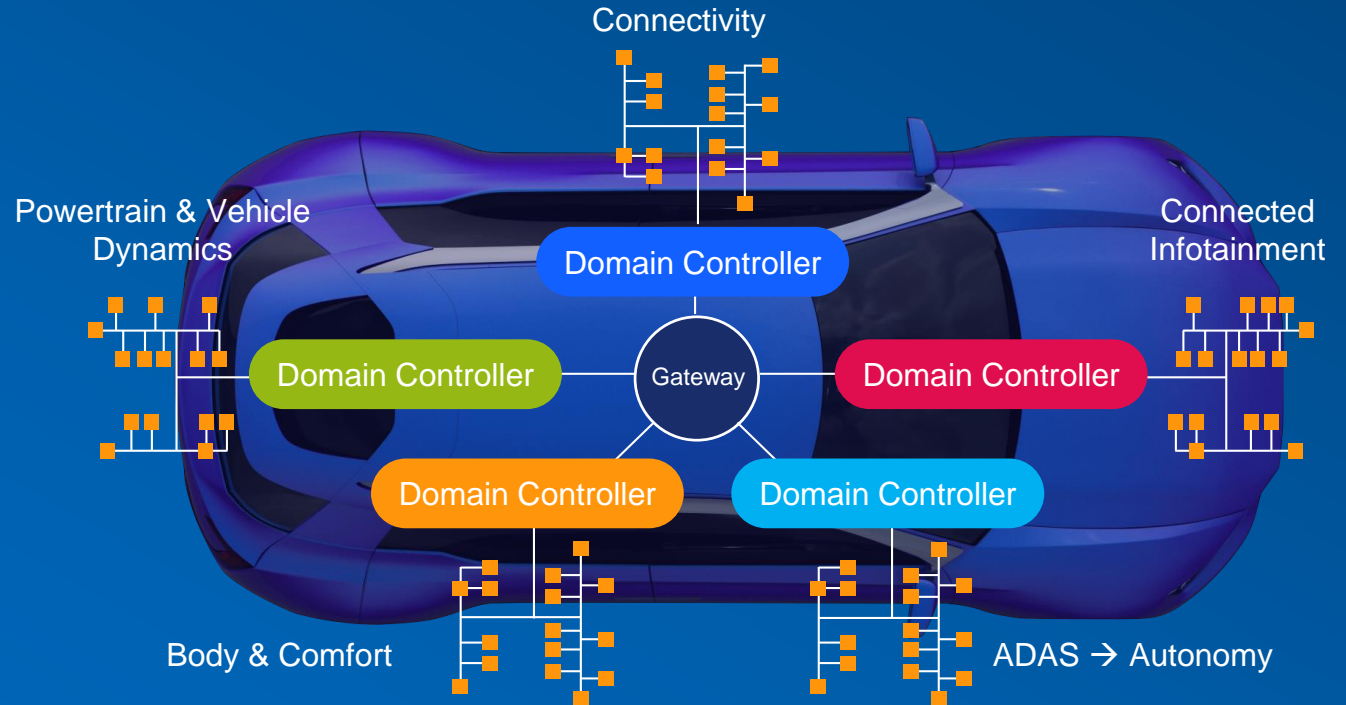
Domain Architecture

- High performance domain MPUs
- Edge nodes & sensors
- High bandwidth
- Gateway
- Safety & security

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Agenda

Megatrends

Tech Leadership: Domain Architecture

Customer Leadership: System Solutions

Growth

- ADAS ➔ Autonomy
- Connected Infotainment
- Network Infrastructure
- Electrification

Summary

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Domain Architecture

SENSE · THINK · ACT

- Domain MPUs
- Edge Nodes & Sensors
- High Bandwidth
- Gateway
- Safety & Security

Connectivity
- Cellular
- WiFi, BT, GNSS, NFC
- Smart Car Access
→ Connectivity Domain Controller

ADAS → Autonomy
- V2X
- Radar
- Camera
- Lidar
→ Sensor Fusion & Planning Domain Controller

Powertrain & Vehicle Dynamics
- Motion & Pressure
- Speed
- Ultrasonic
→ Powertrain Domain Controller → Engine, Transmission, Brake, Battery Cell Management, Steering, Airbag, Suspension

Body & Comfort
- Temp, Light, Humidity
- Switch Panels
→ Body Domain Controller → HVAC, Interior Lighting; Doors, seats, steering wheel, mirrors, wipers, sunroof

Connected Infotainment
- Radio & Audio
- Touch Displays
- Voice Recognition
→ eCockpit Domain Controller → eCockpit, Amplifiers

Network Gateway

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NXP Leads Transformation to Domain Architecture[1]

Market requirement

NXP unique differentiators

High Performance Domain Computing

- Leveraging scalable embedded compute platforms across NXP
- Deep domain specific applications know-how

Secure Network Processing

- Auto network processing / gateway #1 leadership
- Digital networking leadership

Scalable & Secure Network Architecture

- CAN/ LIN/ FlexRay #1 leadership
- Dedicated automotive Ethernet

Safety and Security

- Industry leading functional safety (ASIL D)
- Complete hardware & software security
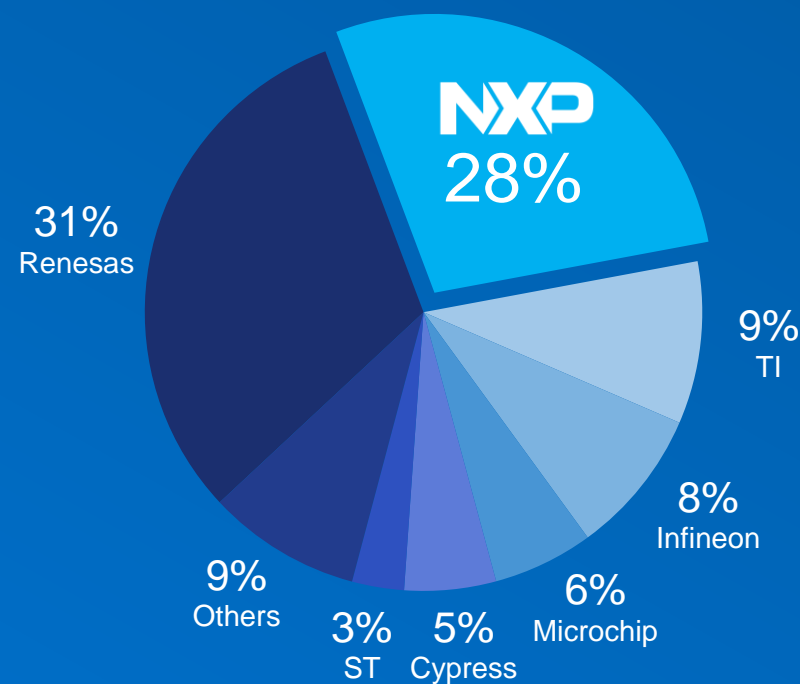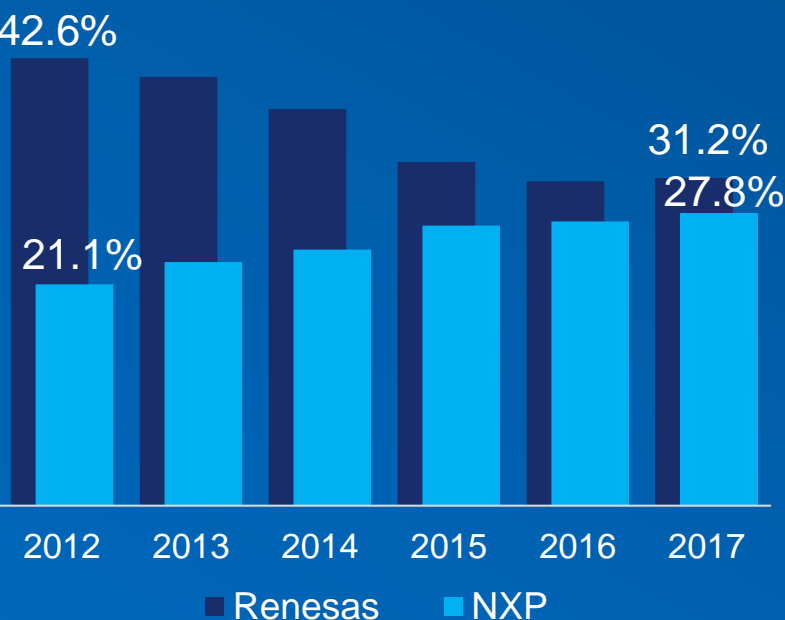
Auto Processors Tomorrow – Domain Architecture Requirements
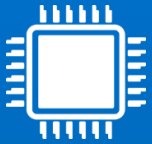
Performance

Optimized for domain control

Real-time

Scalable

Arm

Arm top to bottom

Arm Cortex-A, -R, and -M cores

Safe

ASIL D

Secure

Powerful hardware security engine (HSE)

Firmware upgradable public key encryption

No side channel attacks

OTA

Across most nodes

Scalable encrypted external NVM

Wide memory range, read while write

SW Reuse

Massive software Re-use within and across application domains

NXP

Auto Processors Tomorrow – NXP's Unique S32 Platform

Body & General Purpose

Arm Cortex	Memory	Application Specific IP
Interconnect		
Common Chassis		

Network Processing

Arm Cortex	Memory	Application Specific IP
Interconnect		
Common Chassis		

Radar

Arm Cortex	Memory	Application Specific IP
Interconnect		
Common Chassis		

Vision

Arm Cortex	Memory	Application Specific IP
Interconnect		
Common Chassis		

Safety & Powertrain

Arm Cortex	Memory	Application Specific IP
Interconnect		
Common Chassis		

Common Chassis

Safety	Peripherals
Security	Debug

Autonomy – Safety

Arm Cortex	Memory	Application Specific IP
Interconnect		
Common Chassis		

Reduces SW R&D[1] by 35%
Unified HW with identical SW environment

10x the Performance[2]
Multiple real time OS
ADAS AI accelerators

Safe and Secure
4 independent ASIL D paths
HW security engine
Ready for OTA

The World's First Fully Scalable Safe Auto Compute Platform

Unprecedented Design Win Pipeline ➔ 1.5x of Previous Generations

1. Based on analysis of existing NXP Software code in existing customers' applications
2. Based on publicly available competitor roadmap performance statements versus today's best safe auto platform

NXP

Agenda

Megatrends

Tech Leadership: Domain Architecture

Customer Leadership: System Solutions

Growth

- ADAS ➔ Autonomy

- Connected Infotainment

- Network Infrastructure

- Electrification

Summary

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Servicing Variety Of Customer Requirements

Established Tier-1s

System competence, scale, quality, logistics

▼

Global support
Zero defect quality
Component innovation

BOSCH · DENSO Crafting the Core · ZF · APTIV · Continental · HARMAN

Established OEMs

Vehicle level innovation, consumer focus

▼

System level R&D
Cross-industry insights
Architecture innovation

BMW · FCA FIAT CHRYSLER AUTOMOBILES · GM · RENAULT NISSAN MITSUBISHI · VW · DAIMLER · Ford · HYUNDAI KIA MOTORS · TOYOTA

New Entrants

Speed, cost, competence from other industries

▼

Integration support
Auto domain knowledge
System solutions & ref designs

WAYMO · Alibaba · NIO 蔚来 · GEELY · LG · Baidu 百度 · flex · 长安汽车 CHANGAN

NXP

Addressing Customer Requirements with System Solutions

Connected Infotainment
Up to $50 NXP content per car for premium infotainment system

Electric Vehicle
Up to $180 NXP content per car battery management

ADAS→Autonomy
Up to $360 NXP content per car for L4-5 imaging radar

Vehicle Infrastructure
Up to $45 NXP content per car network Infrastructure

Driving System Innovation with OEMs[1]

Strategic Innovation Alliance of Strong Partners
Join innovation on system level **tomorrow**

V2X and Platooning
Connectivity

Radar platforms for high res and short range
Driver Replacement

Battery management
Powertrain & Vehicle Dynamics

Next generation car access
Body & Comfort

Next generation car radio platform: AM robustness for e-vehicles
In-vehicle Experience

Central gateway 3.0, micro server, future car architectures
Secure Gateways & Networks
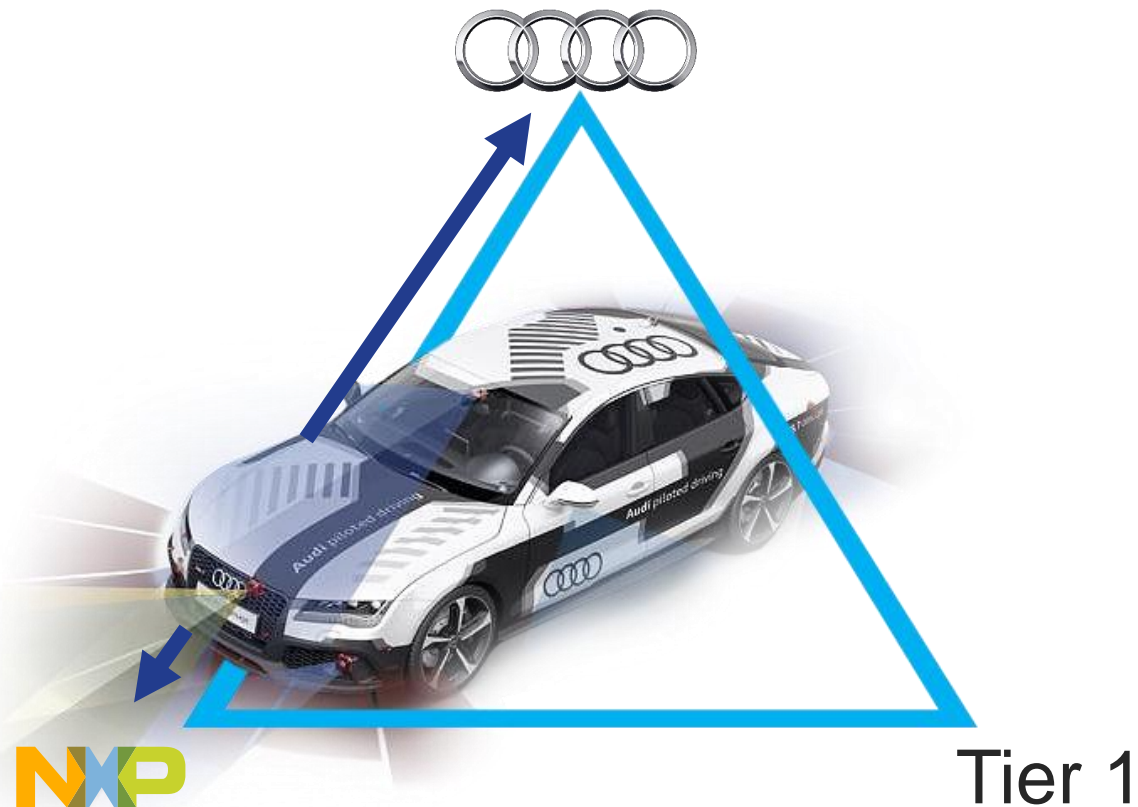
Tier 1

Agenda

Megatrends

Tech Leadership: Domain Architecture

Customer Leadership: System Solutions

Growth

- ADAS → Autonomy
- Connected Infotainment
- Network Infrastructure
- Electrification

Summary

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NXP Auto Leadership[1,2,3]
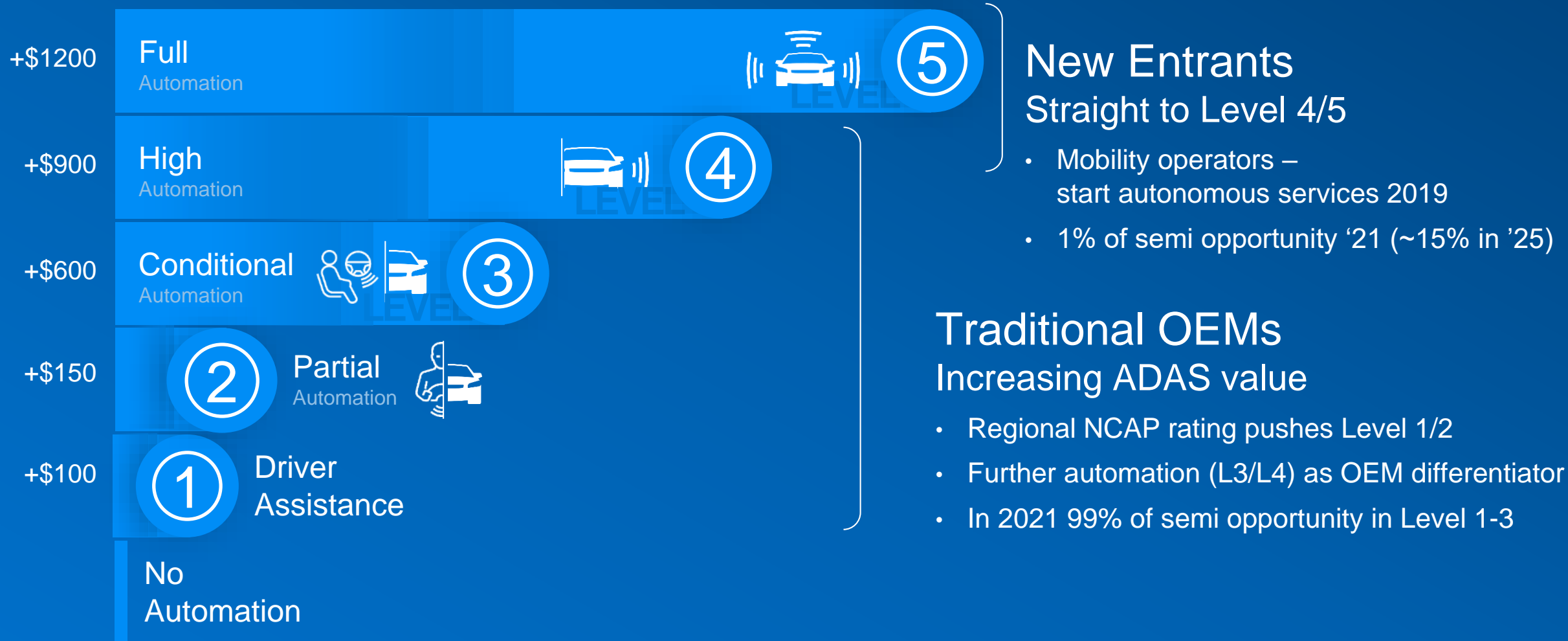
Technology Leadership

- 11% Power
- 24% MCU/MPU
- 33% Analog
- 15% Sensors
- 18% Other
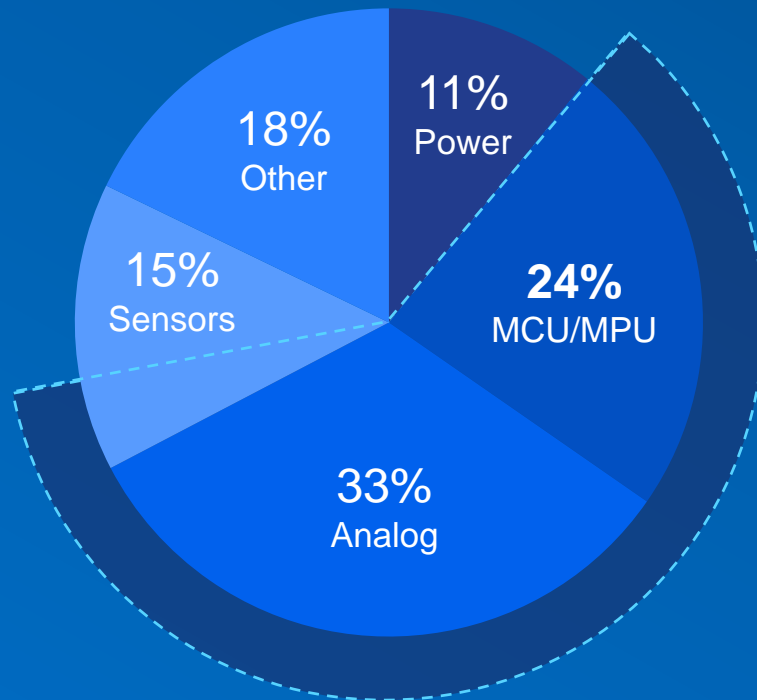
#1 Auto Analog
#1 Auto RF / DSP
#1 Auto Application Processors
#2 Auto Microcontrollers

Domain & Market Leadership

- 13% NXP
- 11% IFX
- 10% REN
- 8% TI
- 7% STM
- 51% Others
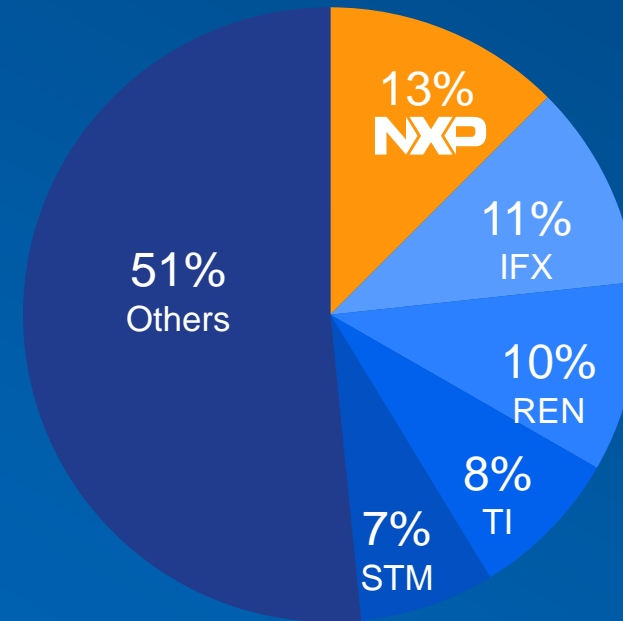
#1 Global Auto Semi 2017
(2017 NXP auto revenue excludes former standard products auto business)

TAM 2017: $34.5B

Auto TAM-F Growth 5-7% – Driven By Semi Content[1]

Global Vehicle Production (MU)

2012	2015	2018	2021
82	97	100 / 103	

2% (Max%), 1% (Min%)

Semi Content (TAM-F) / Vehicle ($)

2012	2015	2018	2021
223	280	315 / 324	

5% (Max%), 4% (Min%)

Auto Semi TAM-F ($B)

2012	2015	2018	2021
18	27	32 / 33	

7% (Max%), 5% (Min%)

Min% | Max%

CAGR 2018E - 2021E

NXP
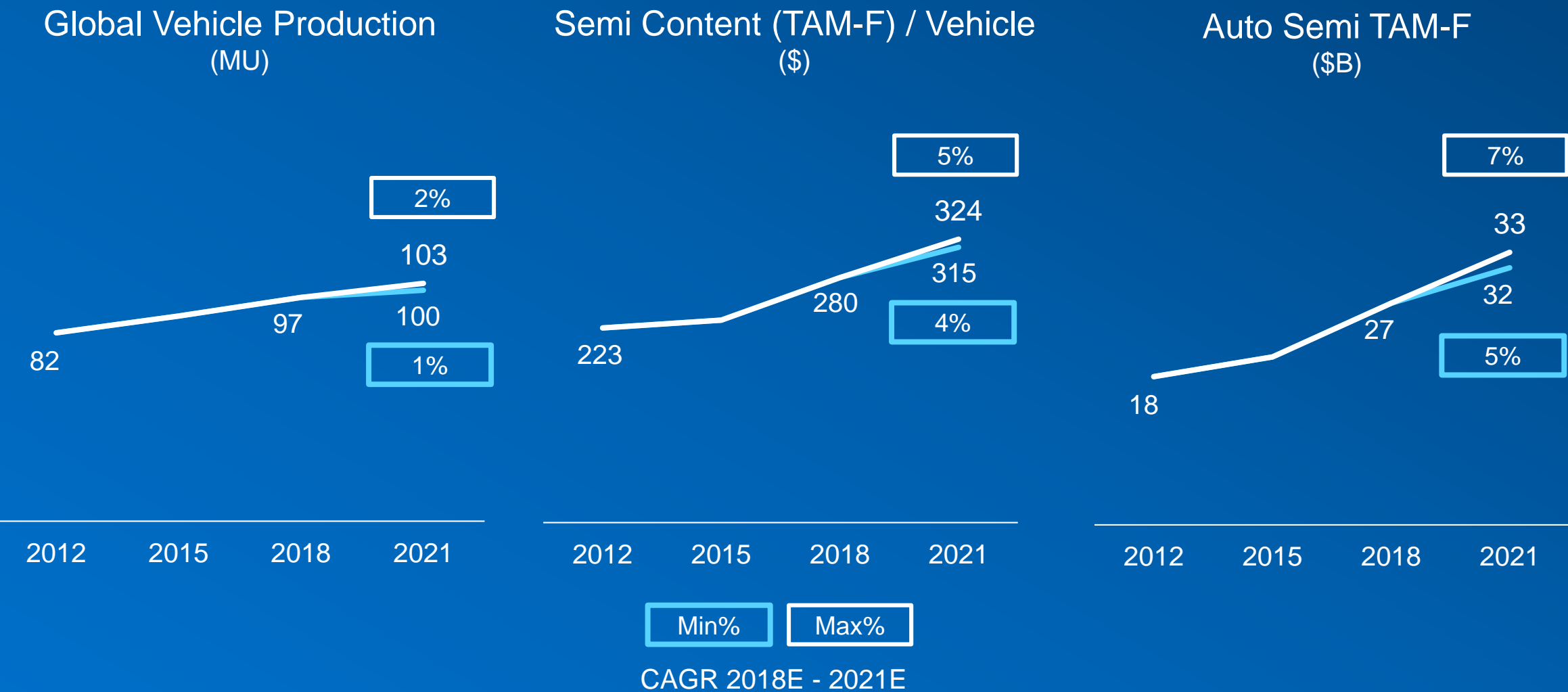
Leadership Across Vehicle Domains[1,2,3]

	Connectivity	Radar (ADAS → Autonomy)	Powertrain & Vehicle Dynamics	Body & Comfort	Connected Infotainment	Secure Networks & Gateways
Focus Market Size, 2018	$0.6B	$1.2B	$4.8B	$2.0B	$3.2B	$1.5B
Focus Market Growth 2018-2021	9%	19%	5%	5%	5%	16%
Focus Market NXP Rank, 2018E	#1	#1	#1	#1	#1	#1
Focus Market Relative Market Share, 2018E	~2.5	>1	~1.5	>1	~2	>3
OEMs						
Tier 1 Customers						

Consistent Broad Based Growth[1]
Accelerated by select new high growth applications

Automotive Revenue

7-10%

$4.2Bn

Legacy   Core   New

2014 2015 2016 2017 2018 2019 2020 2021
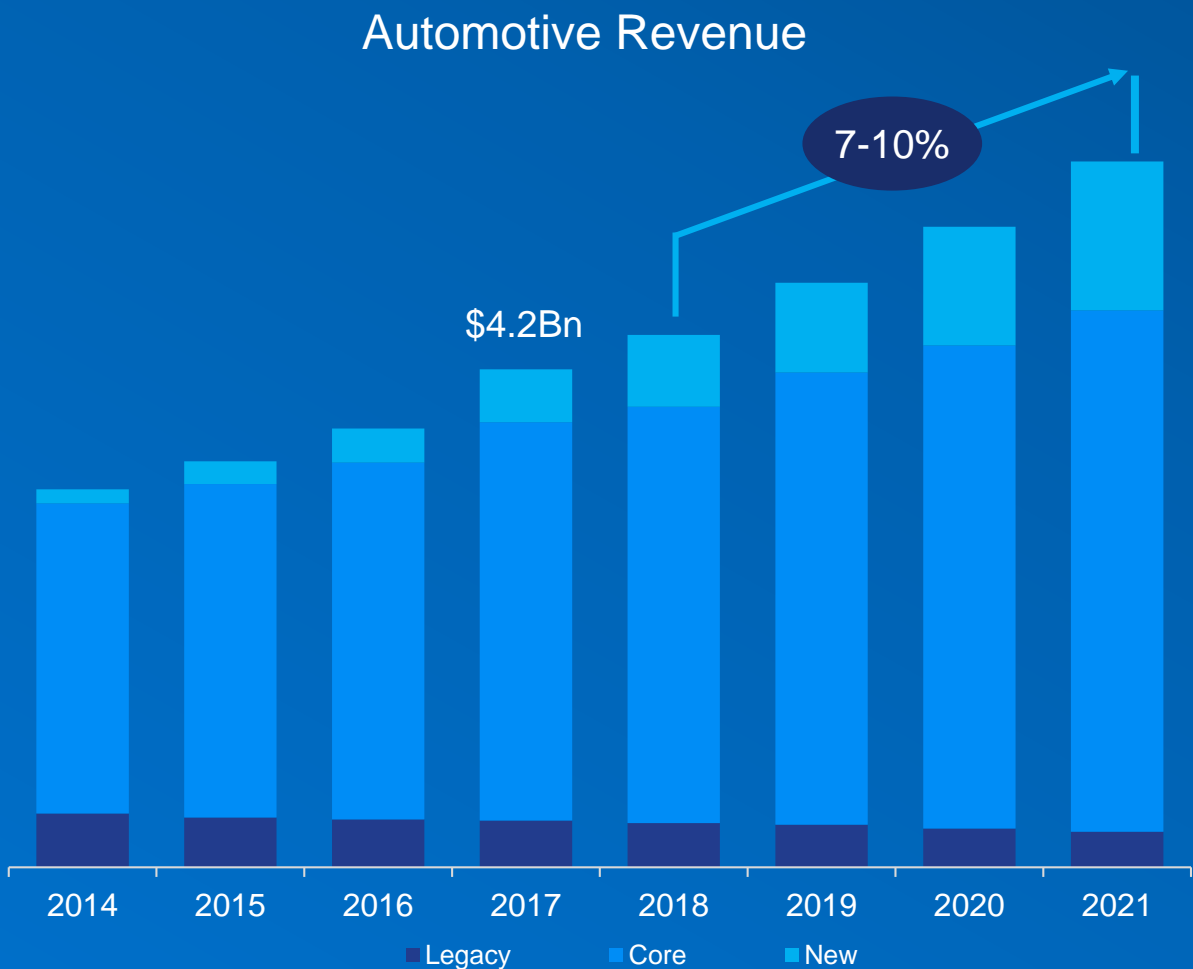
	CAGR '18- '21	Key Applications
New	20-28%	• Radar • Network Processing + Ethernet • Electrification • ADAS Vision, Fusion, V2X
Core	6-8%	• Connected Infotainment • Powertrain & Vehicle Dynamics • General Purpose MCU • Network Transceivers • Secure Car Access
Legacy	(7-8%)	• 8 bit MCU • Other

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Agenda

Megatrends

Tech Leadership: Domain Architecture

Customer Leadership: System Solutions

Growth

- ADAS ➔ Autonomy

- Connected Infotainment

- Network Infrastructure

- Electrification

Summary

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Increasing Autonomous Driving Levels Push ADAS $ Content

Semi Content Potential per Vehicle vs Level 0 in 2020

+$1200 — **Full** Automation — ⑤

+$900 — **High** Automation — ④

+$600 — **Conditional** Automation — ③

+$150 — ② **Partial** Automation

+$100 — ① **Driver Assistance**

No Automation

New Entrants
Straight to Level 4/5

- Mobility operators – start autonomous services 2019
- 1% of semi opportunity '21 (~15% in '25)

Traditional OEMs
Increasing ADAS value

- Regional NCAP rating pushes Level 1/2
- Further automation (L3/L4) as OEM differentiator
- In 2021 99% of semi opportunity in Level 1-3

1. Source: Strategy Analytics, NXP CMI

NXP

Automation Multiplies Sensors and Silicon Content

In Production
Level 1/2

In Development
Level 3

New Entrants
Level 4/5
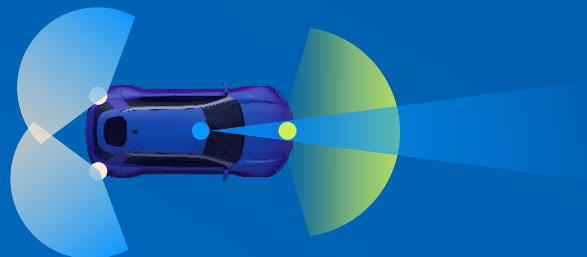
$100-$150
Silicon Value

units		
Radar	1-3	
Camera	1	
Lidar		
V2X		
Fusion		
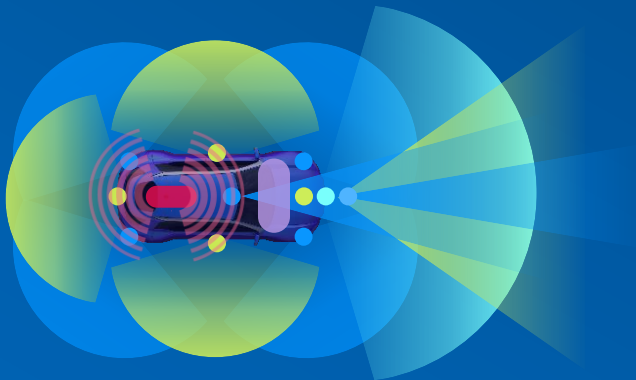
$600
Silicon Value

units		
Radar	4-6	
Camera	≥4	
Lidar	0-1	
V2X	0-1	
Fusion	1	
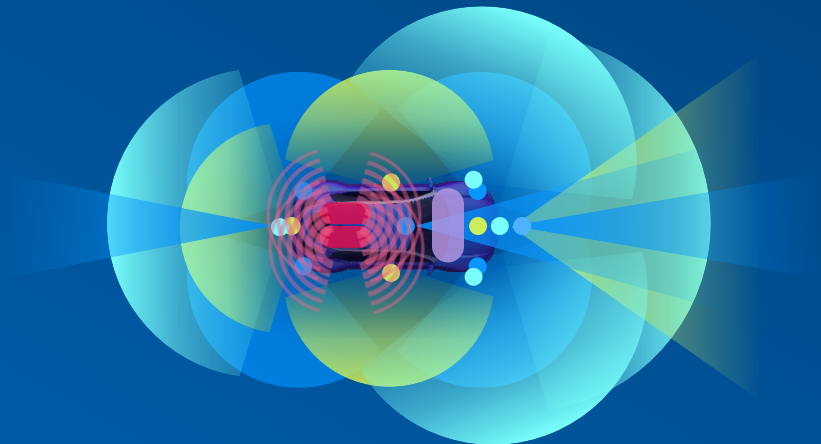
$900-$1200
Silicon Value

units		
Radar	6-10	
Camera	6-8	
Lidar	1-3	
V2X	1-2	
Fusion	1	

● 24GHz Radar ● 77GHz Radar ● Lidar ● Camera ● Fusion ● V2X

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1. Source: Strategy Analytics, NXP CMI

NXP

Radar: Largest ADAS Segment With Top Value Growth[1,2]

Market

$2.7B → $4.6B

19% CAGR

2018 — 2021

Bar segments (2021): Other, V2X, Fusion, Lidar, Parking Camera, ADAS Vision, Radar
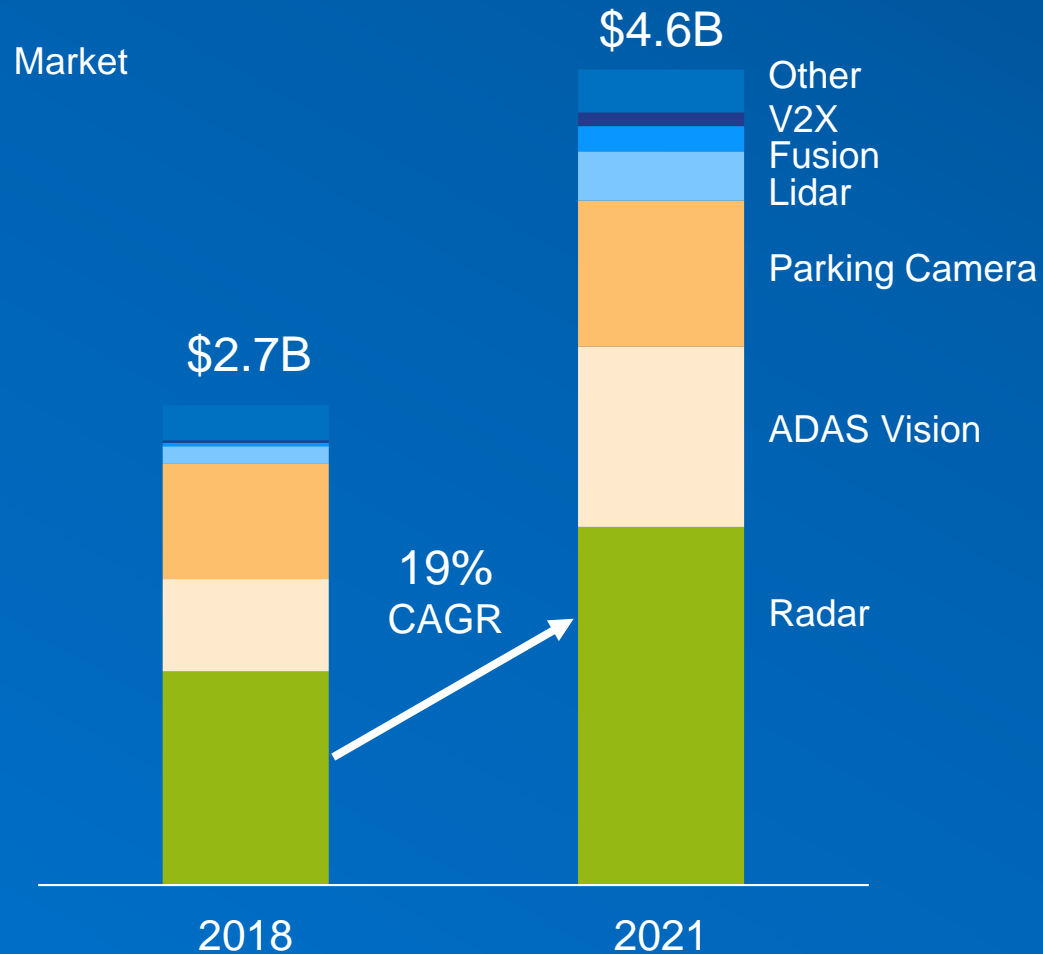
Radar

- Represents ~44% of ADAS TAM-F
- NCAP safety ratings drive penetration
- 360° view & imaging radar drive semi dollars

Other ADAS

- ADAS vision is NCAP driven
- Parking cameras maturing
- V2X: Volume car ramp starting 2019 with VW

NXP Strongly Positioned with Broad ADAS Play
ADAS Expected to Exceed 10% of NXP Automotive Revenue by 2019

V2X
- Leader: Modem, Processor, SW, Security
- In production with GM, ramping at VW 2019

"We trust NXP's V2X leadership & innovation that enables us to improve road safety by launching V2X as standard feature in volume cars from 2019."

Dr. Alexander Graf, Connected Car, Volkswagen AG

ADAS Vision
- Safe automotive vision SoC
- Partnerships with leading tier-1s

Radar
- #1 Leader, design wins at 10 of top 10 OEMs
- Major new wins with RFCMOS at 7 OEMS

Lidar
- Safe processing with AI
- Working with 5 Lidar leaders

Parking Camera
- Safe processing & machine learning
- Designed in at >10 major OEMs

System Selling
- Full solutions adding $ value
- Networking & power management

Fusion and Central Processing
- Safe processing with integrated AI capability
- Leading MIPS for automotive safety (ASIL-D)

NXP

Radar: Triple Acceleration for Semiconductor Value

More cars with radar
NCAP safety

+

More sensors per car
360° radar cocoon

+

More ICs & higher value per sensor
High resolution 360° imaging
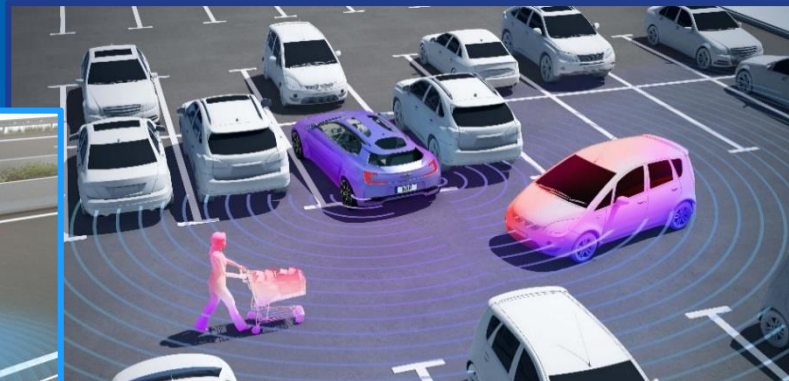
Blind spot detection
Automatic emergency brake

Front & rear cross traffic / people detection

Precise environment map and localization

Radar: Triple Acceleration for Semiconductor Value

More cars with radar
NCAP safety

More sensors per car
360° radar cocoon

More ICs & higher value per sensor
High resolution 360° imaging

Blind spot detection
Automatic emergency brake

Front & rear cross traffic / people detection

Precise environment map and localization

NXP

Radar: Taking Safety to New Levels – Saving Lives

Detecting other cars **+** Seeing pedestrians & bicycles **+** Full 360° surround view *small & low power sensors* **+** Precise Environmental Map *e.g. curbstones & pylons in distance*

NXP full performance span

Bulky	24GHz	77 GHz	Multiple 77 GHz	Small
High Power	SiGe	RFCMOS		Low Power
Low Res	Radar processing <1 GFlops	Advanced object detection 15-20 GFlops	Imaging Radar >350 GFlops	High Res

NXP Investment Focus

NXP
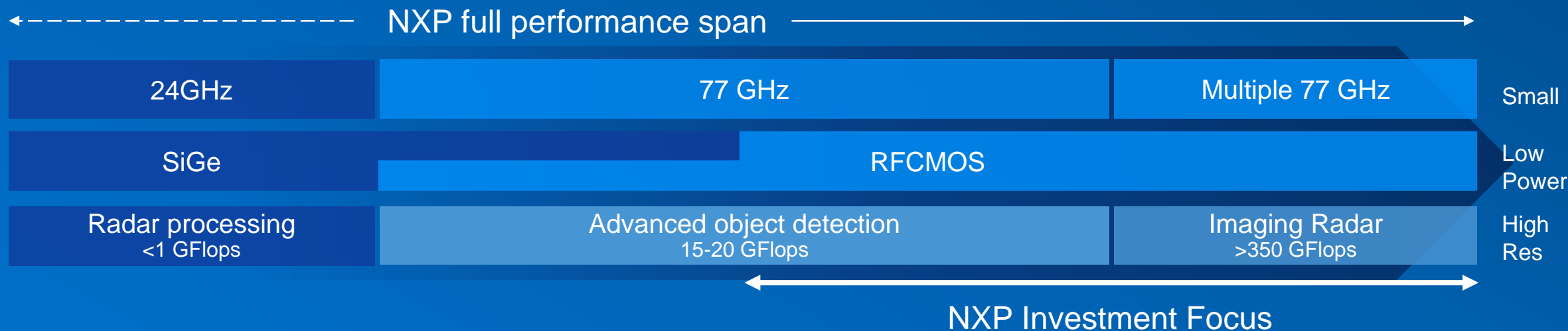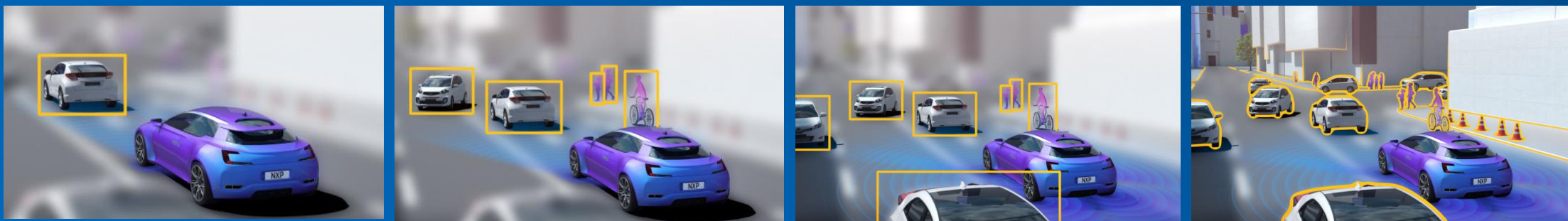
Radar: NXP's Unique Scalable Full System Solutions

Full 77GHz System Solution

- RFCMOS Transceiver
- S32 Radar processor
- Power Management
- Ethernet

+

Full Performance Span

Short Range
Mid Range
Long Range
Imaging Radar

4x NXP Transceiver

=

Winning Across All Segments

Premium OEMs

Mass Market

NCAP   Full Autonomous
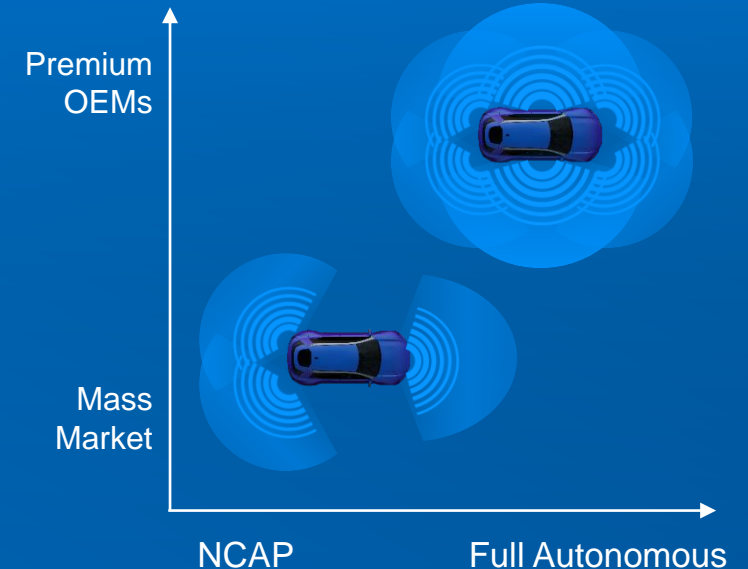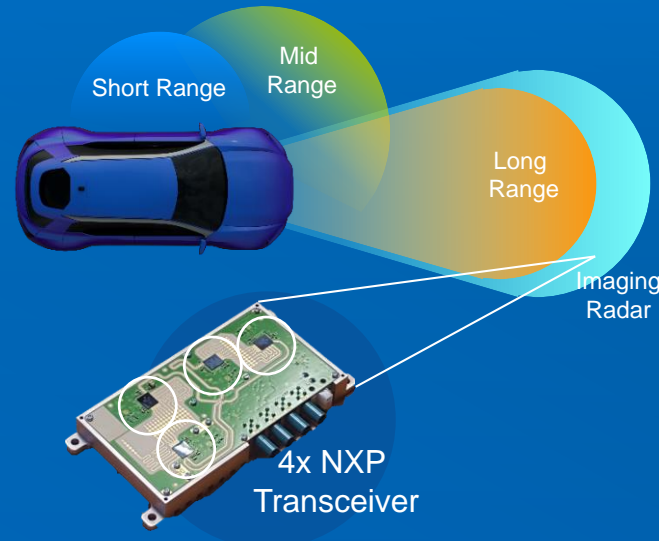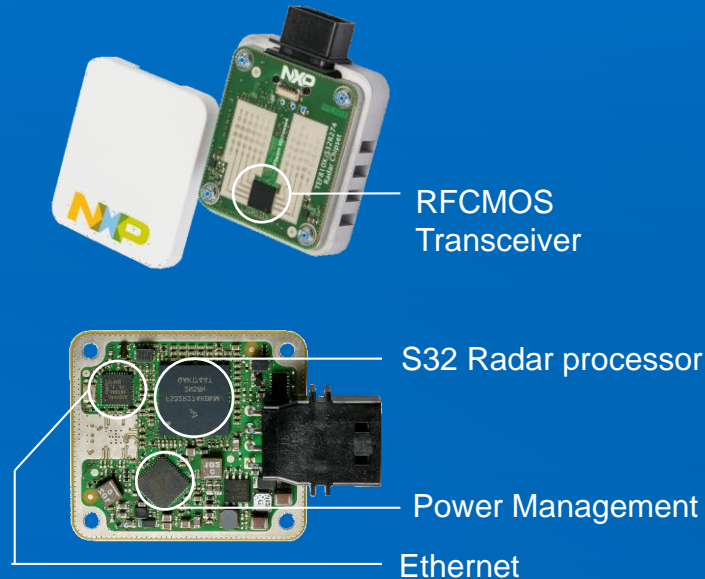
- Full reference design
- Plus Software Development Kit
- Plus Functional Safety

- SiGe & RFCMOS transceiver portfolio
- Scalable processor families
- From simple sensor to imaging radar

- Designed in with all top 10 OEMs…
- …while also growing with new players
- System solutions for China (e.g. GEELY)

Radar: Extending #1 Leadership Position

TAM-F Growth 19%   +   Outgrowing the Market   =   True Leadership Position

$2.0B

$1.2B

77GHz

24GHz

2018   2019   2020   2021

NXP vs. Market

1.4X

#1   #1

2018   2021
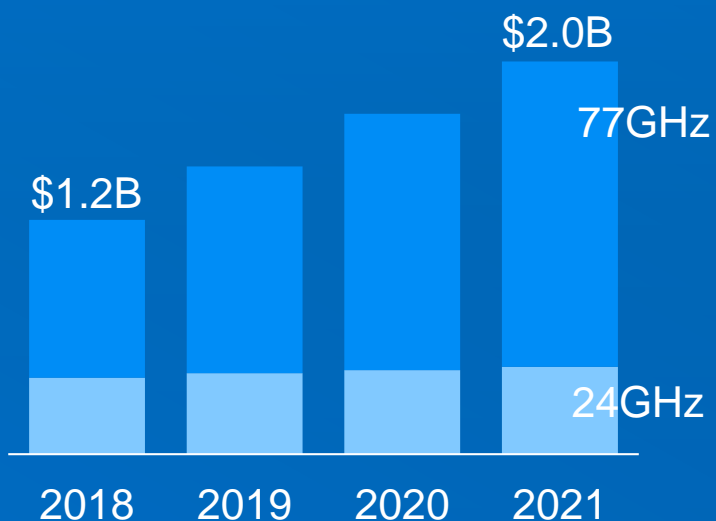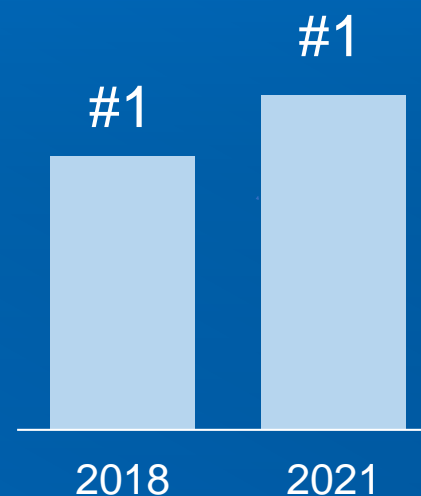
1	More cars with radar
2	More sensors per car
3	More ICs & higher value per sensor

Designed in at 10 of top 10 Car Makers

50+ vehicle platforms with NXP 77GHz solution ramping over next 3 years

NXP

Imaging Radar: Next Wave of Growth with L3-L5 Autonomy[1]
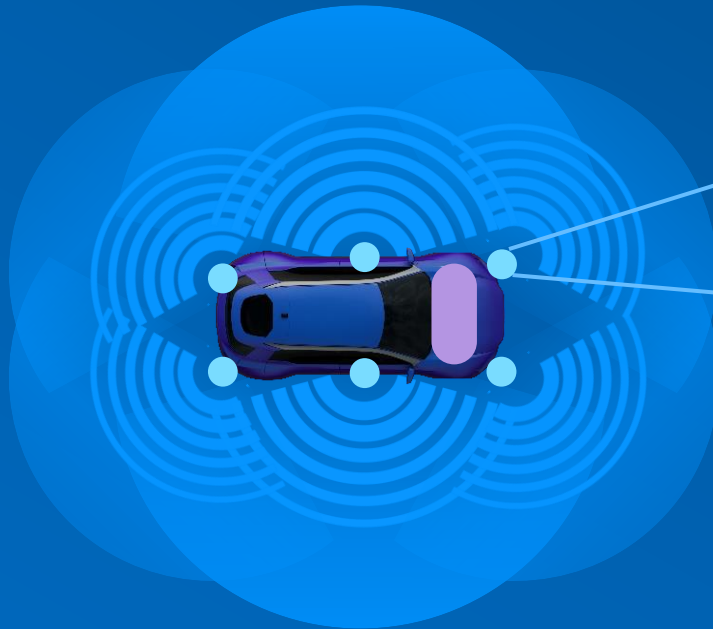
4-6 systems/car

Up to $360
Semi content per vehicle

- Imaging radar approaching Lidar-like resolution
- Capture precise environmental map
- Outperforming Lidar in adverse weather / light conditions

Imaging Radar Sensor System

4x 77GHz Radar Transceiver	High Performance Radar Processor	Safe Power Management
		Gbit Ethernet and CAN

up to $60 semi content

NXP
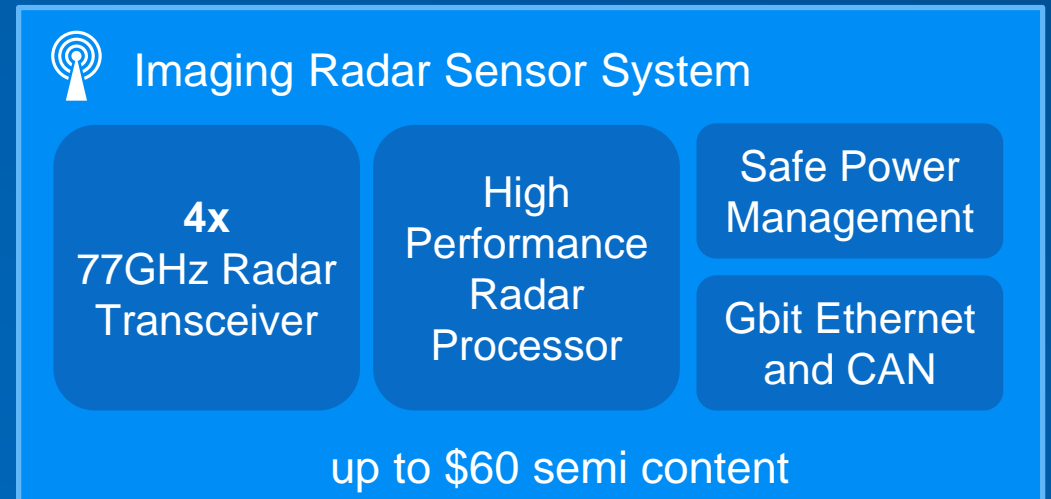
Processing: Further Growth by Enabling Safe Autonomous Driving

Safe Computing Leader

Decade of experience
Broad OEM adoption

New Safety Applications

Safety Companion
Safety checker and safe communication
to vehicle (ASIL-D)

Safety Co-pilot
Validate decisions &
provide fail operational backup
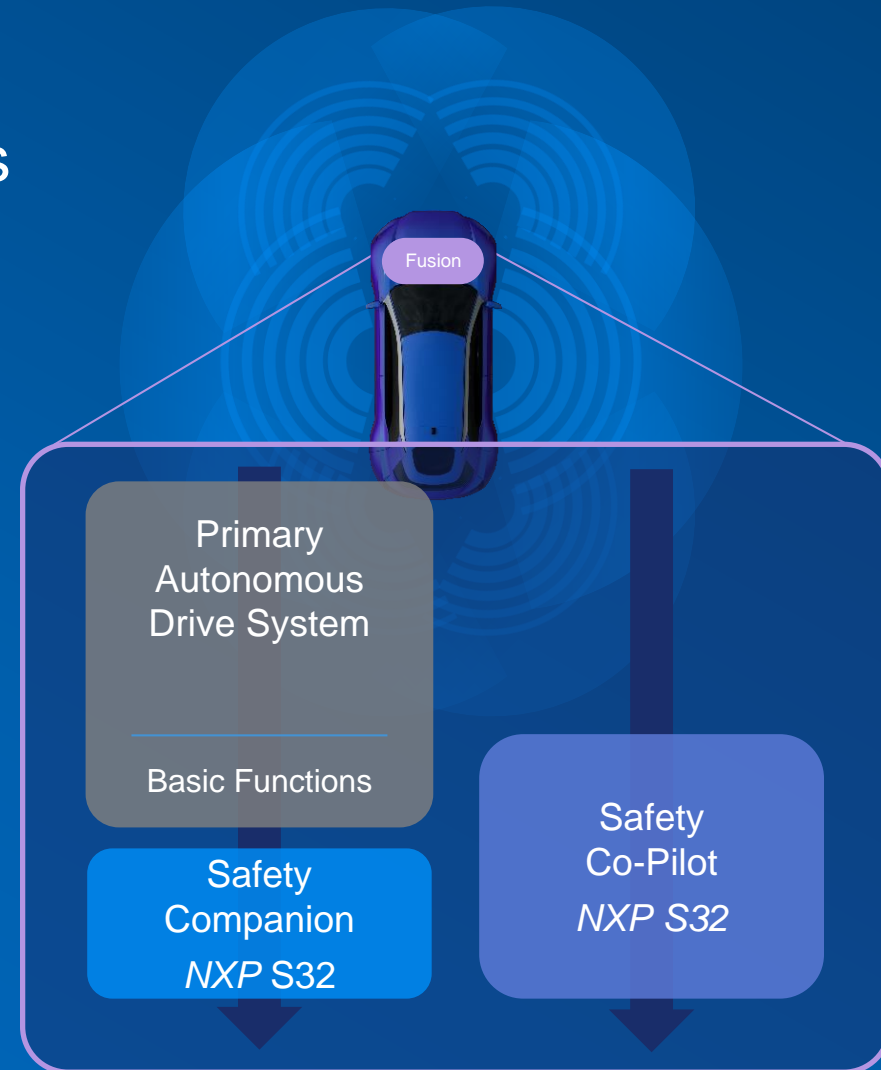
Fusion

Primary
Autonomous
Drive System

Basic Functions

Safety
Companion
NXP S32

Safety
Co-Pilot
NXP S32

1. ASIL-D: highest Automotive Safety Integrity Level

NXP

Increasing Consumer Expectations Drive Infotainment Growth

- Cockpit
- Multimedia
- Media Source
- Radio
- Audio
- Amplifier

Connected Infotainment: Key Differentiator & Sales Driver for OEMs

Cockpit ▶▶▶ Full digital eCockpit

Multimedia ▶▶▶ Multiple high resolution displays

Media Source ▶▶ Smartphone content, apps & services

Radio ▶▶▶ Digital radio & regional standards

Audio ▶▶▶ Noise cancellation, engine sound …

Amplifier ▶▶▶ Up to 32 channel Class D sound

Winning in Connected Infotainment with Full System Solution

NXP
i.MX Family

Fully Scalable Apps Processor Family

Designed in at 19 of top 20 OEMs

▼

i.MX8: Simplifying eCockpit

Up to 4K resolution

Cockpit   Multimedia   Media Source

NXP
Car DSP Family

Radio/Audio Car DSPs and 1-Chips

Designed in at 20 of top 20 OEMs

▼

Software defined radio: 6 ICs into 1

Advanced audio processing

Radio   Audio

NXP
Audio Amplifier

Scalable advanced Audio Amplifiers

Designed in at 15 of top 20 OEMs

▼

Leading full-digital class D

Best audio quality & broad range

Amplifier

NXP

Key Growth Drivers for NXP Connected Infotainment

eCockpit Drives Display Count

SoC Value

- i.MX8: driving up to 4 screens
- Value beyond the product: quality, supply, enablement & partnerships

Increasing Audio & Digital Radio

Radio & Audio $ Per Car

- Digital radio 1-chip drives adoption
- More NXP audio value: noise cancellation, engine sound, 5.1 etc.

Major Growth with Systems in China

Outgrowing Global Infotainment

- Full infotainment system solution & ecosystem accelerating customers
- Supporting China digital radio launch

Customer Success Confirms NXP Market Traction

eCockpit Drives Display Count
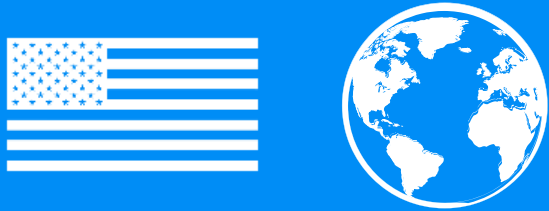
- Design in with 2 of top 3 US OEMs
- Record level i.MX awards last 2 years
- eCockpits with i.MX8 shipping 2019

Increasing Audio & Digital Radio

HARMAN
A SAMSUNG COMPANY

- NXP in ~30 car brands with Harman
- Amplifiers in premium car sound brands:

mark Levinson   JBL   BANG & OLUFSEN

harman/kardon   Bowers & Wilkins

"Our long-term partnership helps us to provide industry-leading solutions and new infotainment experiences to our customers."
David Slump, EVP Operations, Harman

Major Growth with Systems in China

AliOS

Autmotive OS by Alibaba Group

- Full NXP portfolio: i.MX, radio, audio
- Two major China OEMs won
- AliOS: Supporting China Digital Radio

"We look forward to redefining the future of the automobile sector in collaboration with our infotainment semiconductor partner NXP."
Gary Wang, General Manager, AliOS

NXP

#1 Leader for Connected Infotainment
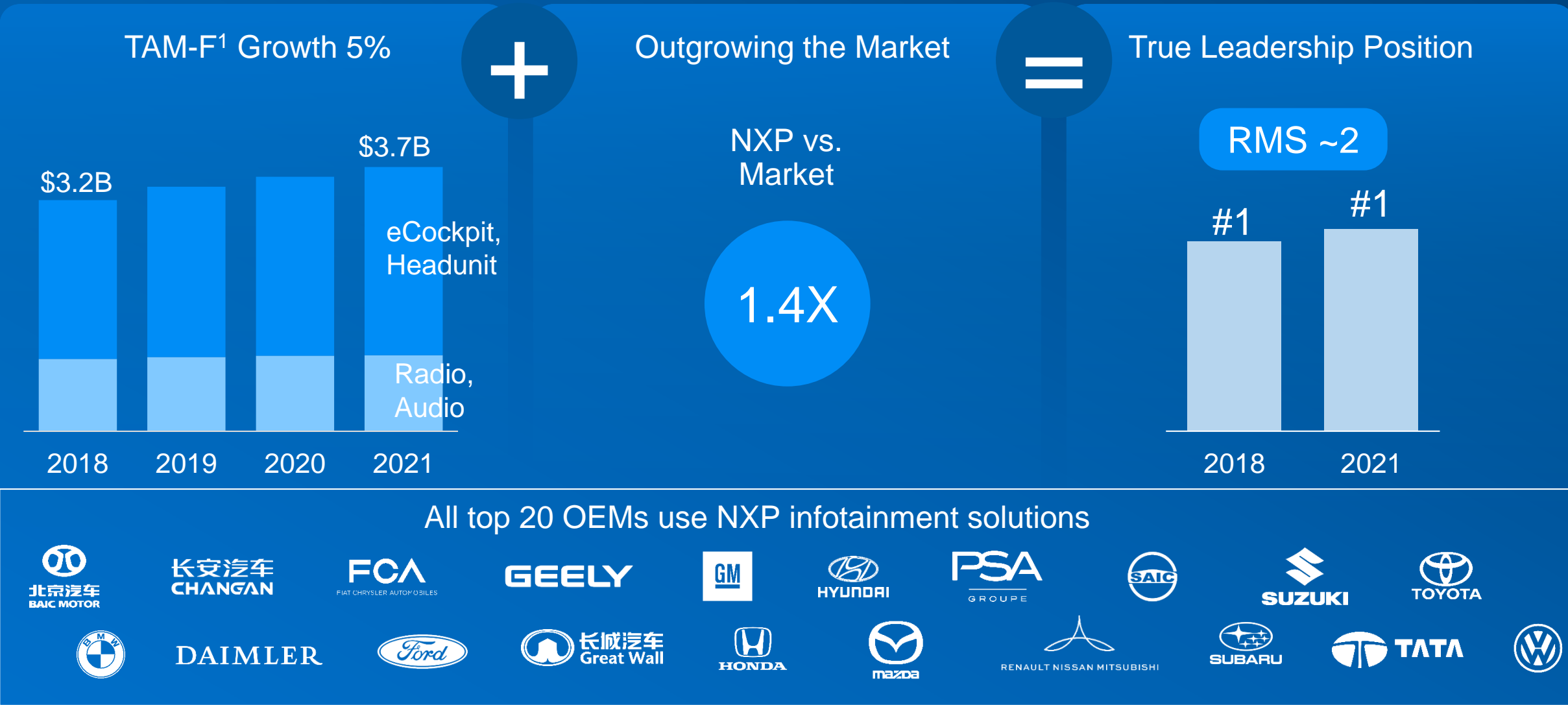
TAM-F[1] Growth 5%   +   ## Outgrowing the Market   =   ## True Leadership Position

$3.7B

$3.2B

eCockpit, Headunit

NXP vs. Market

1.4X

RMS ~2

Radio, Audio

#1   #1

| 2018 | 2019 | 2020 | 2021 |

2018   2021

All top 20 OEMs use NXP infotainment solutions

北京汽车 BAIC MOTOR | 长安汽车 CHANGAN | FCA FIAT CHRYSLER AUTOMOBILES | GEELY | GM | HYUNDAI | PSA GROUPE | SAIC | SUZUKI | TOYOTA

BMW | DAIMLER | Ford | 长城汽车 Great Wall | HONDA | mazda | RENAULT NISSAN MITSUBISHI | SUBARU | TATA | VW

NXP
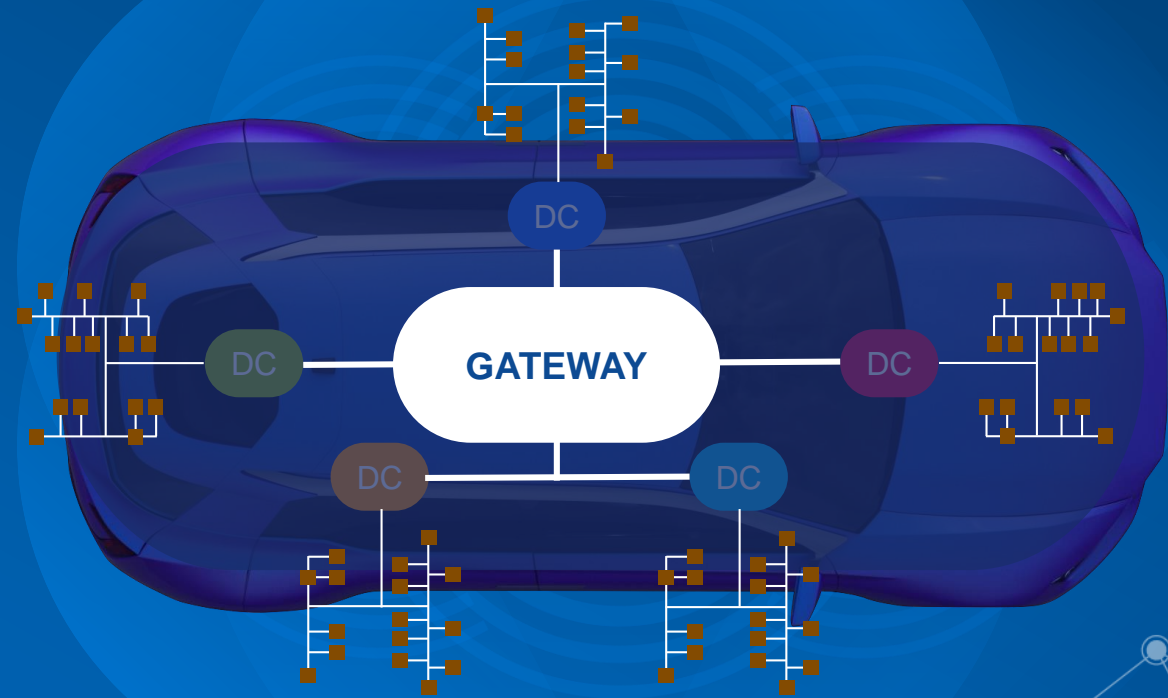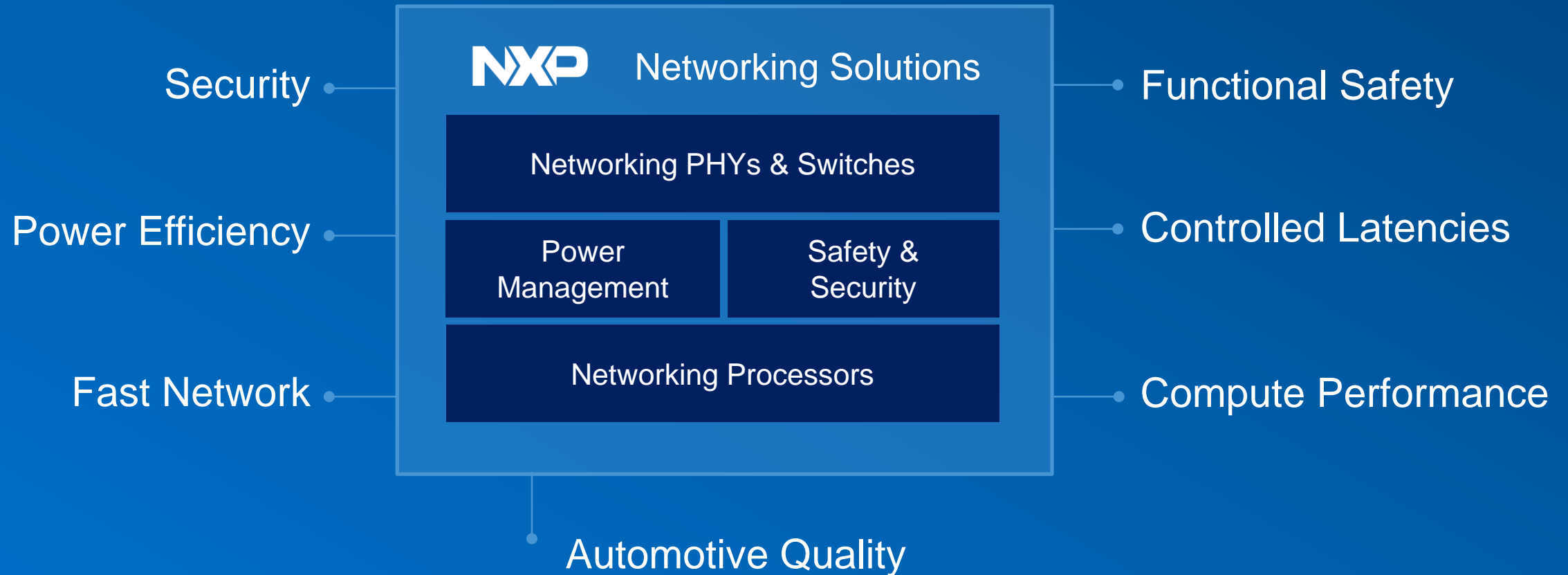
Automotive Networking Market Growing at 16% CAGR

$2.3B

$1.5B

2018   2019   2020   2021

Product Segments	CAGR 2018 – '21
Network Processing & Security	~12%
Safe Power Management	~14%
Network Transceivers and Switches	~17%

Network Processing   Safe Power Management   Ethernet   Network Transceivers, SBCs (CAN/LIN/FlexRay)

Source: NXP

NXP
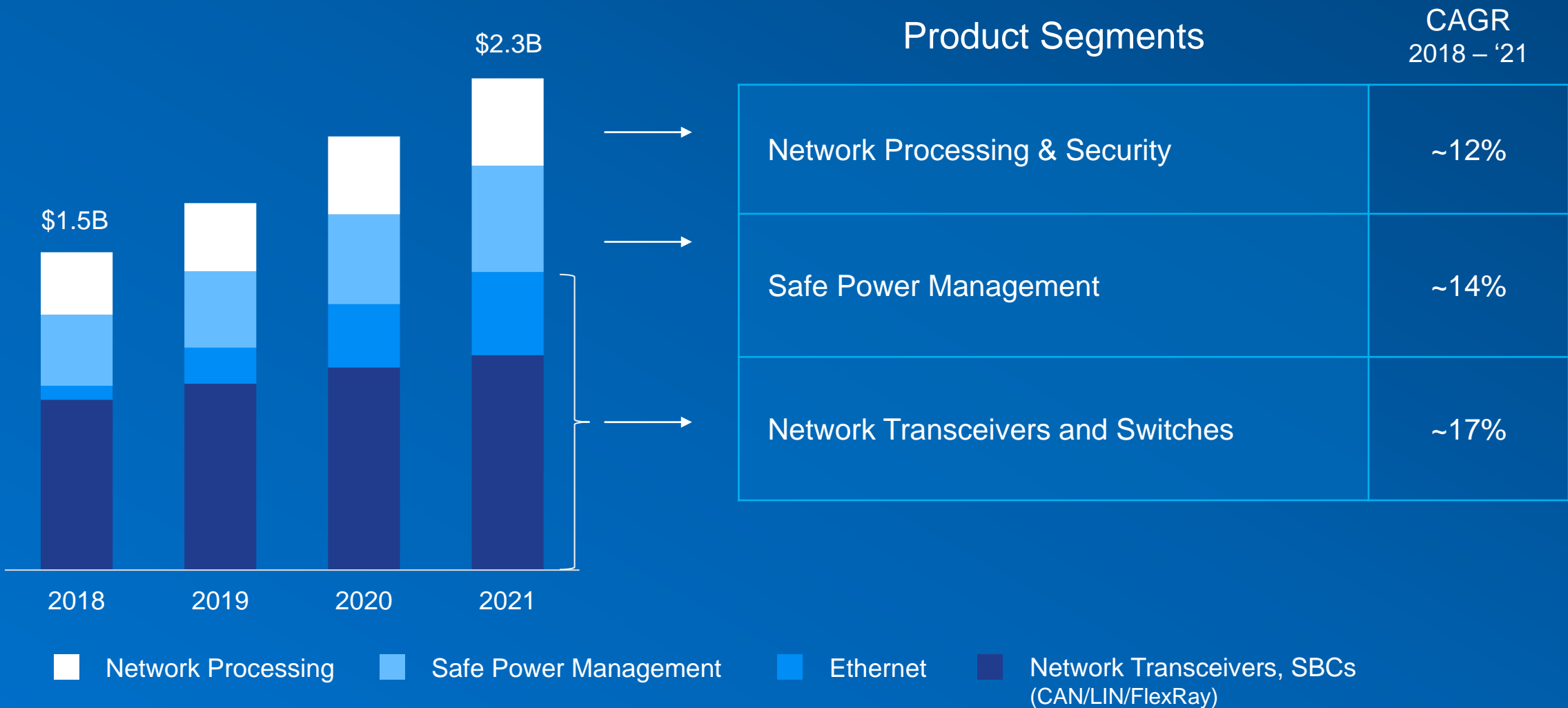
NXP Leads in Providing End-to-End Networking Solutions

Market Leadership
- #1 In-Vehicle Networking
- #1 Automotive Supplier
- Broadest Automotive Portfolio

System Expertise
- Networking Application Expertise
- Enablement Platforms
- System Functional Safety

Technology IP
- Network Processing IP
- Embedded Security IP
- In-Vehicle Networking PHY IP

- OEM focused go-to-market
- Trusted advisor role
- Faster innovation cycles
- Inherent security & safety

Source: Strategy Analytics, NXP

Leadership in Network Processing for ADAS Vehicles
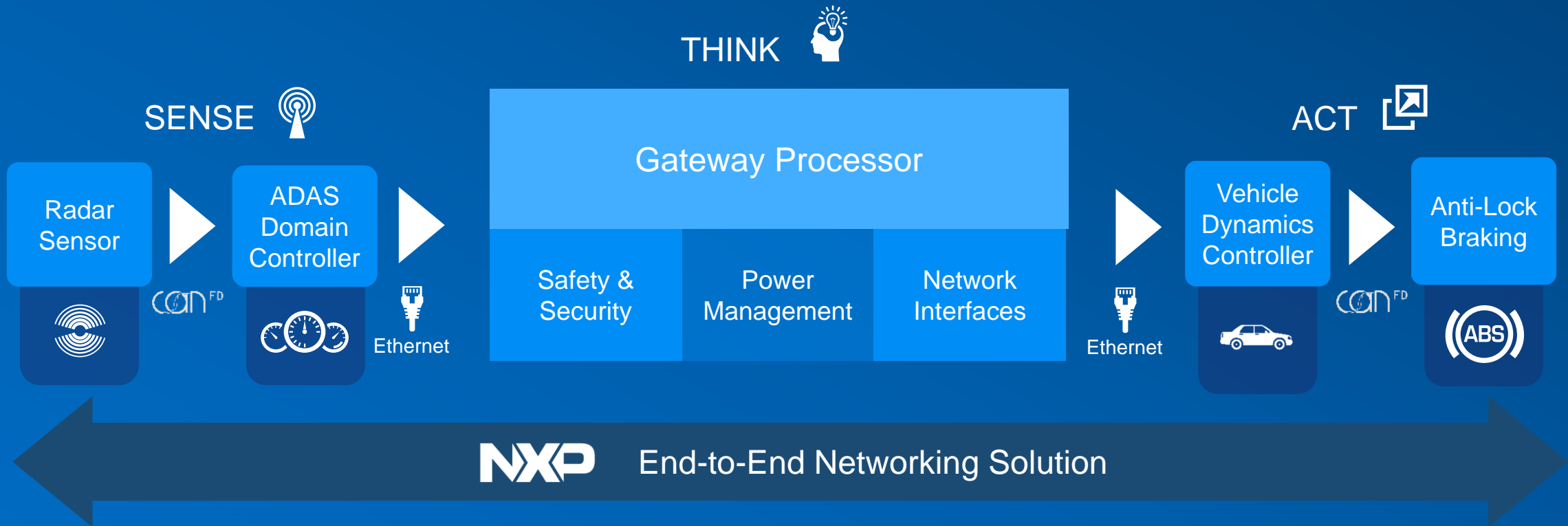
- By 2025 majority of all new cars will have a central gateway
- Network processing enables end-to-end security, over-the-air upgradeability and revenue-generating services

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Leadership in In-Vehicle Networking Interfaces

NXP Portfolio Covers all Standards

Data rate

- Connectivity
- Connected Infotainment
- ADAS ➔ Autonomy
- Powertrain & Vehicle Dynamics
- Body & Comfort

Gbps

100 Mbps

FlexRay™ 10 Mbps

CAN FD — 1-5 Mbps

lin — 20kbps

Complementary Major Networking Standards

Networking Growth

$/Vehicle

Fast

Secure

Smart

Robust

10-20   20-50   50-100
Nodes/Car
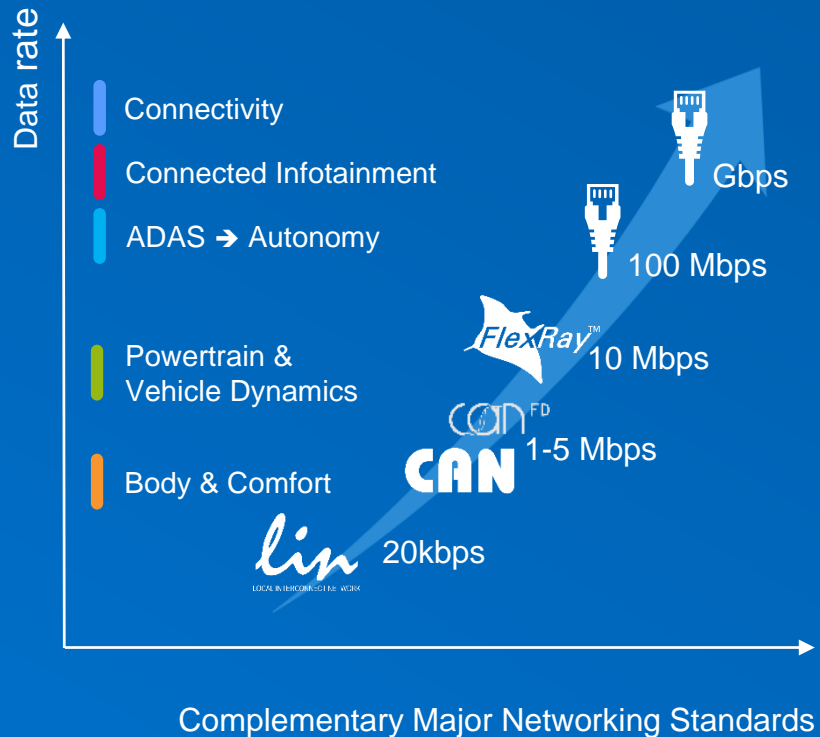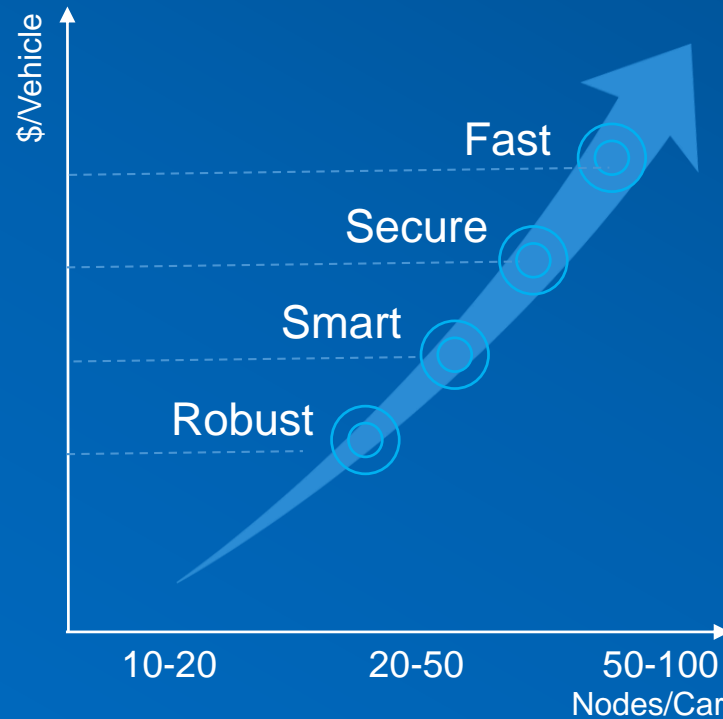
NXP Focus

- True automotive robust Ethernet solutions

- Lead standardization of multi-Gbit Ethernet

- Launch high-speed CAN FD solutions

- Introduce SecureCAN

NXP

Expand Leadership Position in Automotive Networking

SAM Growth 16%

$1.5B

$2.3B

2018 2019 2020 2021

+

Outgrowing the Market

	Network Processing	1.3x
	Safe Power Management	1.3x
	Ethernet	1.8x
	CAN / LIN / FlexRay	1x

=

True Leadership

#1 #1

2018 2021
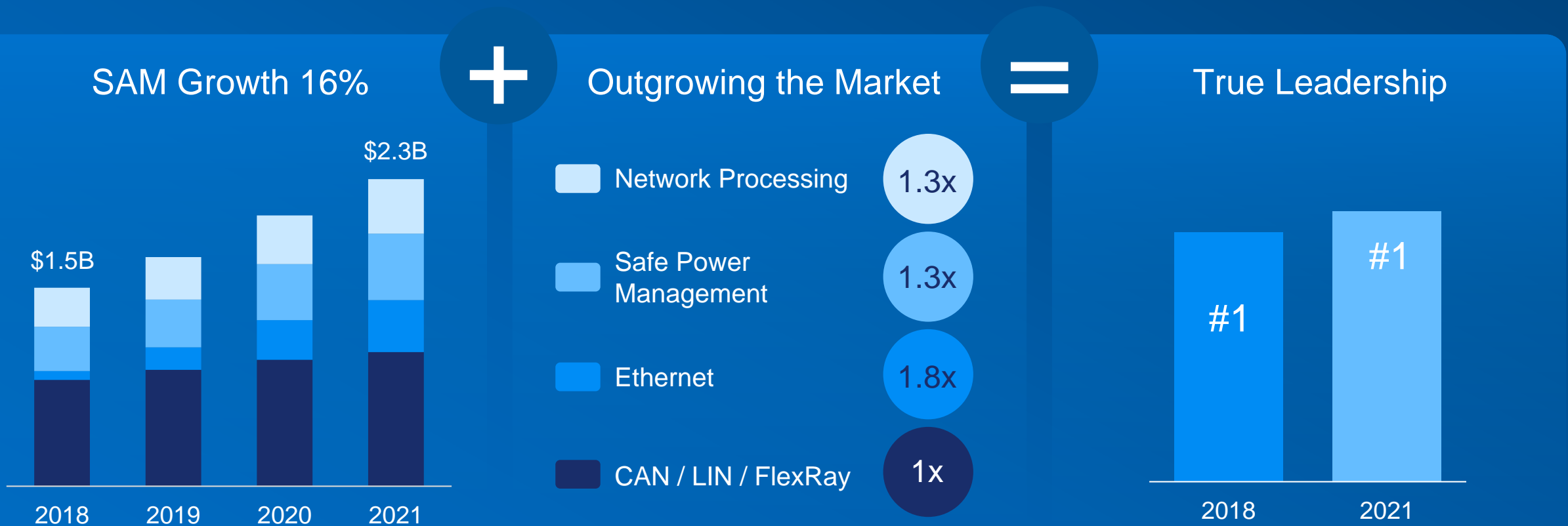
- NXP defines next generation vehicle architectures with OEMs as trusted advisor
- NXP won all major 2021+ gateway processor platforms
- NXP outgrows Ethernet market, defines multiple-Gbit automotive Ethernet PHY standards

146   Source: Strategy Analytics, NXP

NXP

NXP Automotive Networking Key Strategic Moves

NXP Digital Networking business

boosts

Automotive Network Processing

➕

Leading Ethernet & SerDes IP provider

OmniPHY

becomes part of NXP

Extend lead in automotive networking

Define next generation network processors and secure Ethernet solutions

NXP
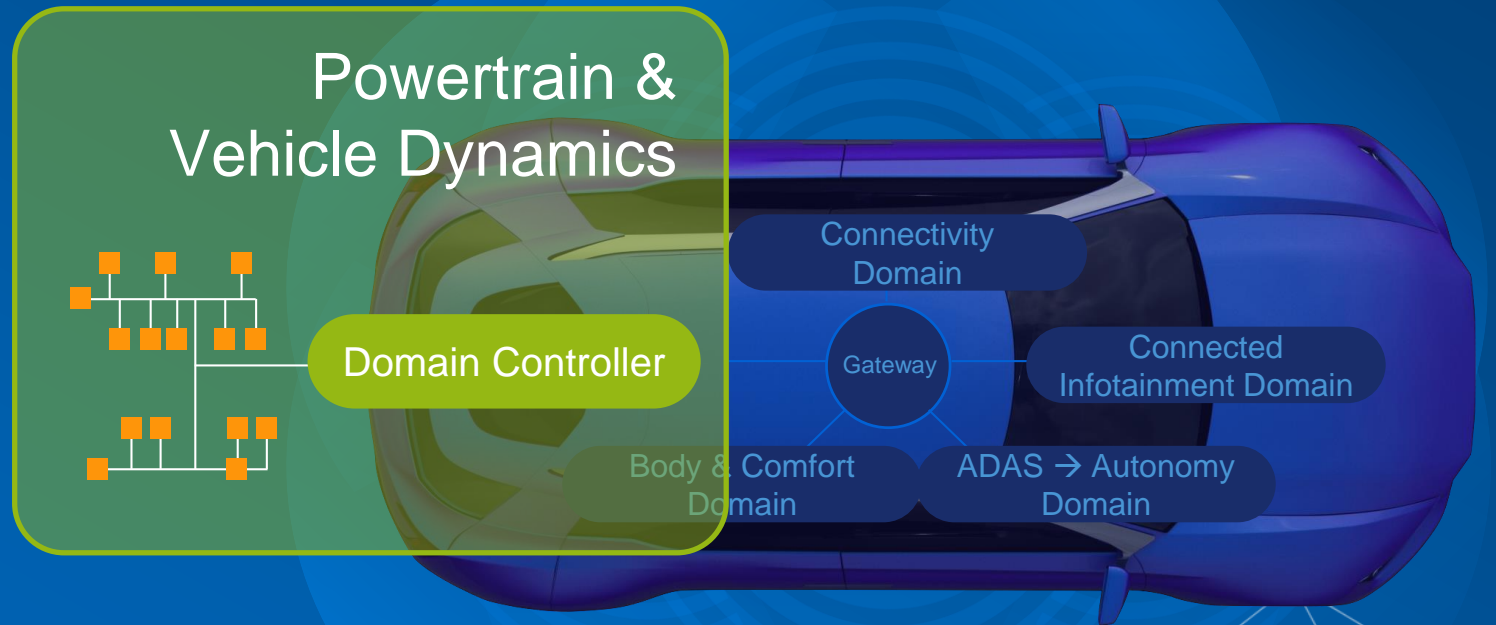
Electrification of Powertrains Boosts Semiconductor Content

Types of Powertrains	Combustion Engine (ICE)	Mild Hybrid (MHEV)	Full Hybrid (FHV)	Plug-in Hybrid (PHEV)	Range Extended EV (REEV)	Battery Electric Vehicle (BEV)
Combustion Engine	●●●●	●●●●	●●●	●●●	●●	
Battery System	LV	LV 48V	LV HV	LV HV	LV HV	LV HV
Mains Charging	-	-	-	⚡	⚡	⚡
Electric Traction	-	10 – 20kW	15 – 60kW	40 – 80kW	40 – 80kW	> 80kW
Added Semiconductor Value	-	+$200	+$350	+$400	+$425	+$450

Source: NXP, Strategy Analytics

NXP

Accelerated Growth of Electrified Vehicles
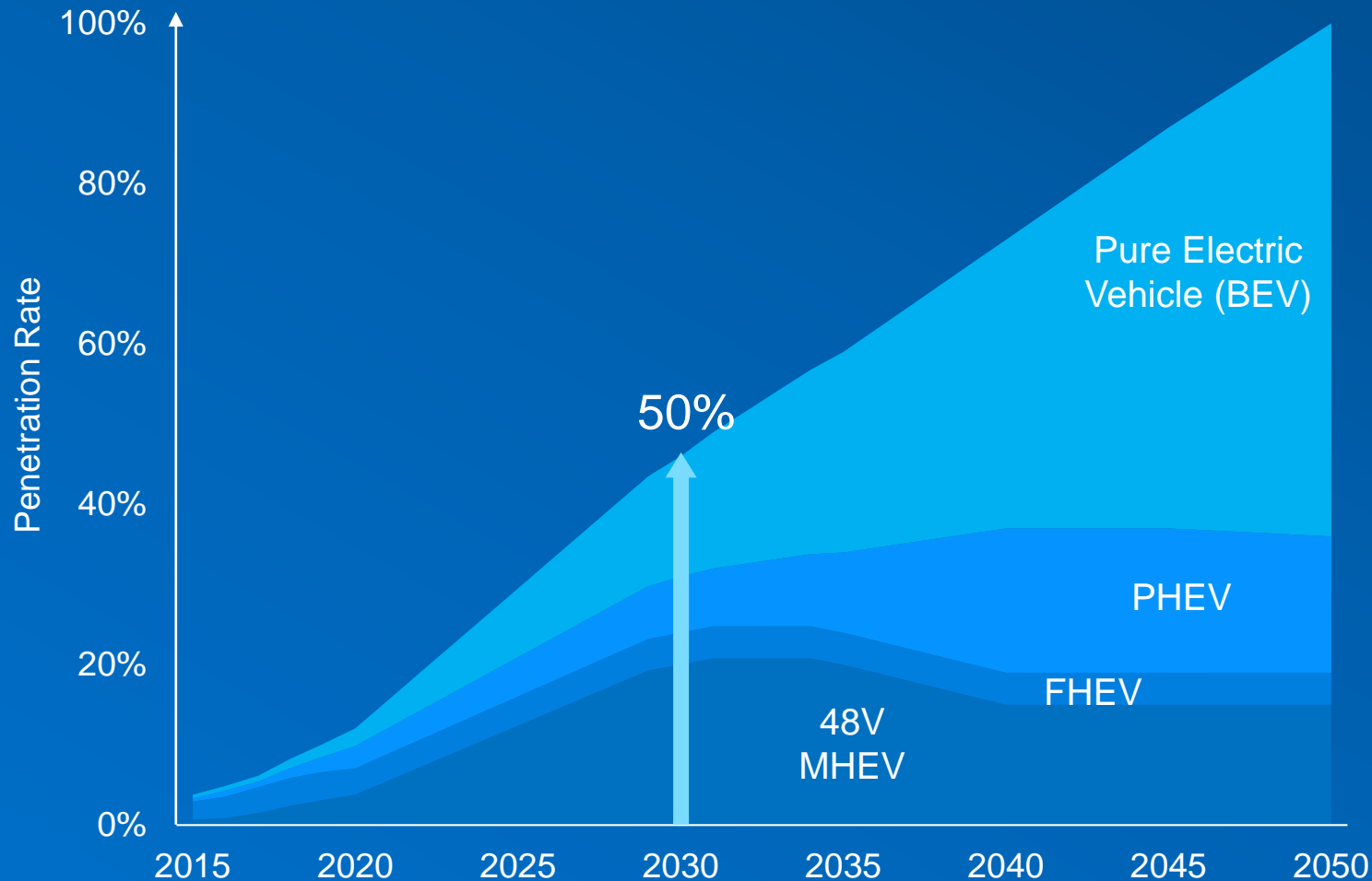
- 2030: ~50% of all vehicles sold contain electrified powertrains
- Dynamic market environment with emerging (xEV) OEMs
- China major market driver
- Europe leading in 48V hybrid

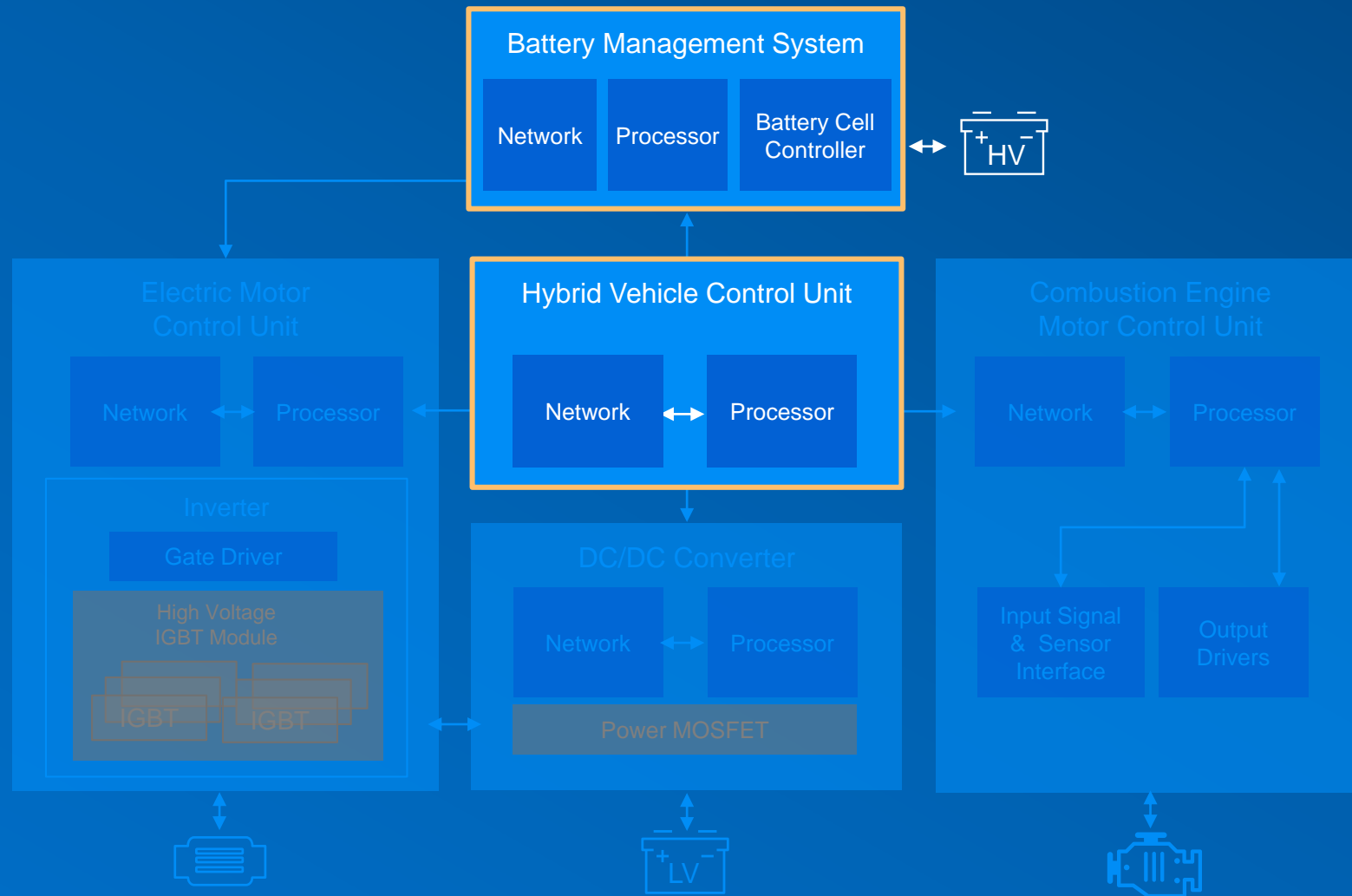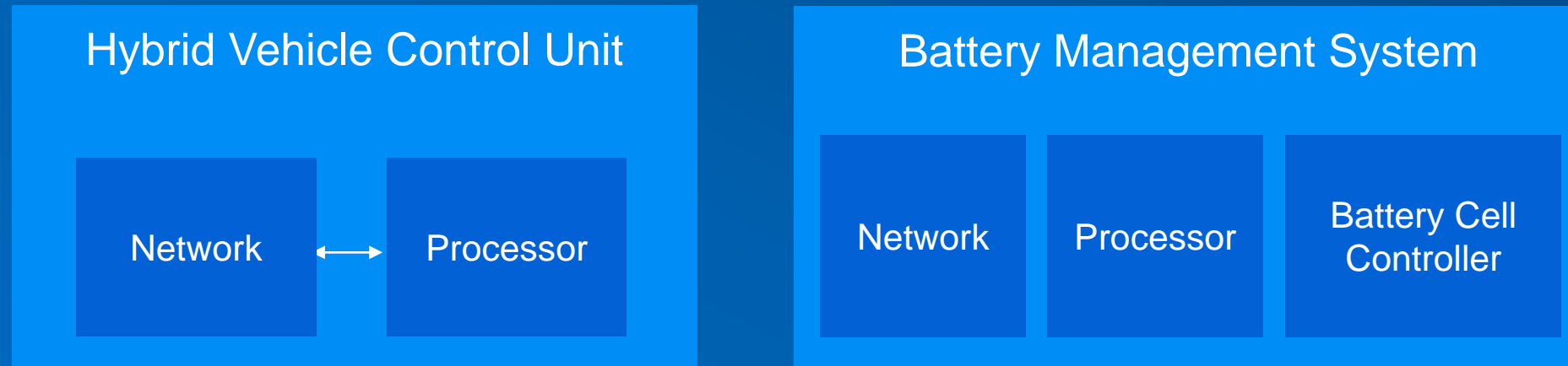Source: Strategy Analytics, HIS Markit, Evercore, NXP CMI

NXP Provides Leading Powertrain Control Solutions

System optimized, scalable, secure and safe

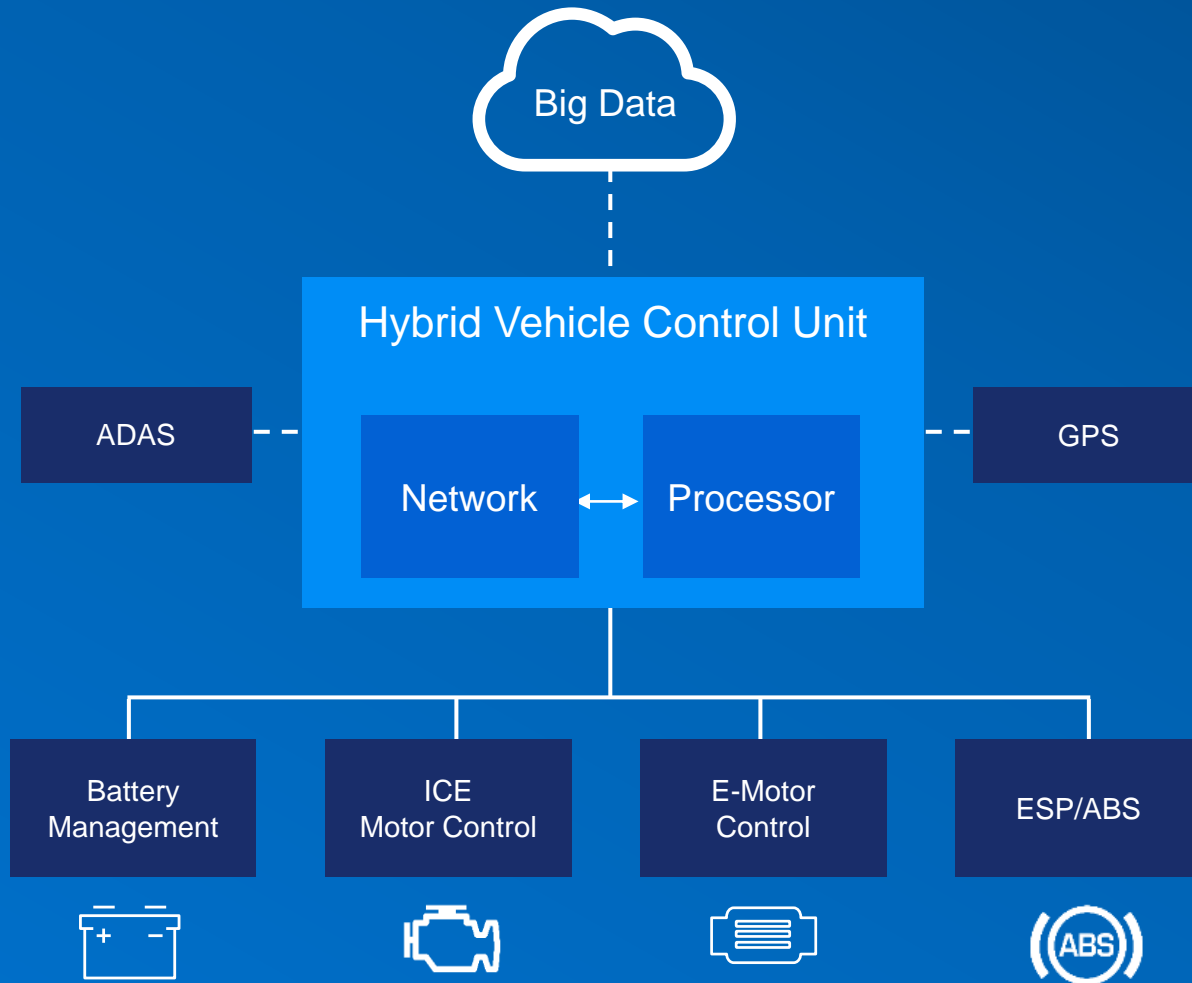# NXP Provides Leading Powertrain Control Solutions

System optimized, scalable, secure and safe

NXP Provides Leading Powertrain Control Solutions
System optimized, scalable, secure and safe

Hybrid Vehicle Control Unit

| Network | ⟷ | Processor |

Battery Management System

| Network | Processor | Battery Cell Controller |

NXP
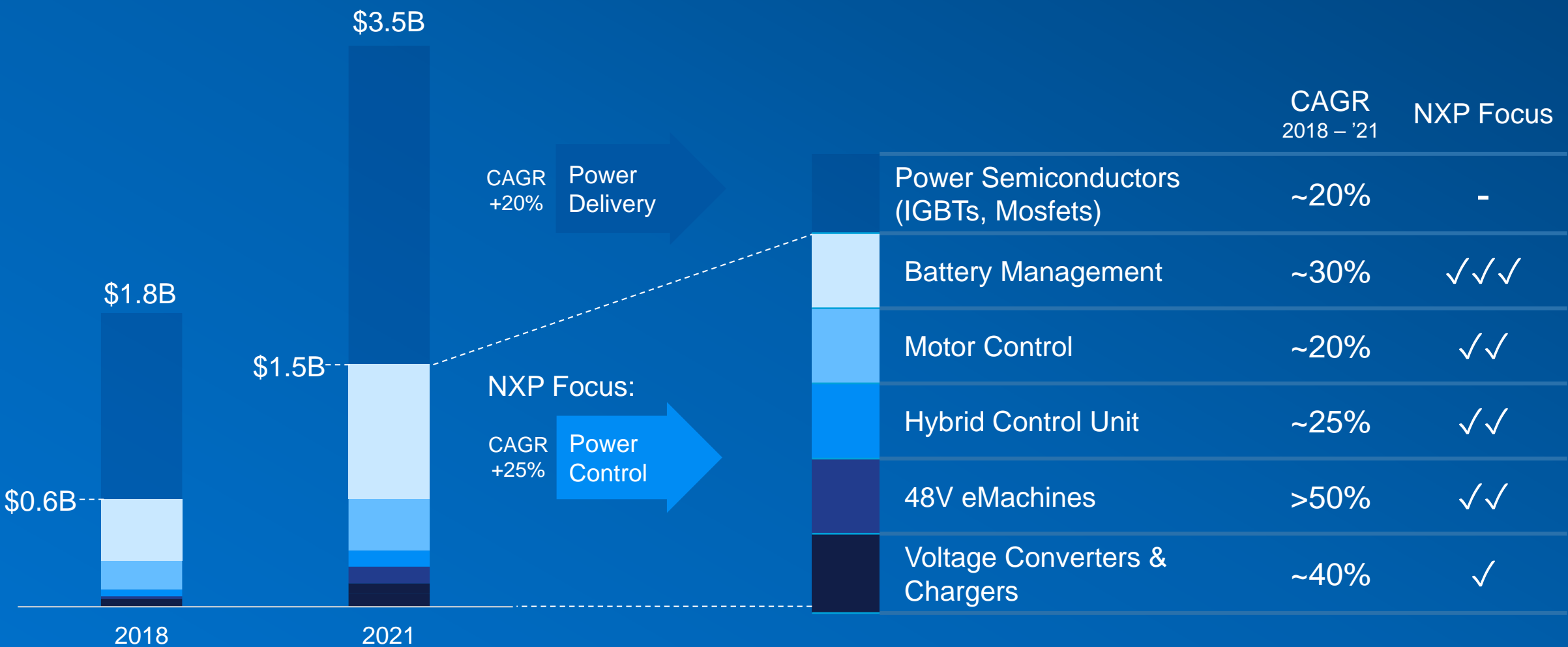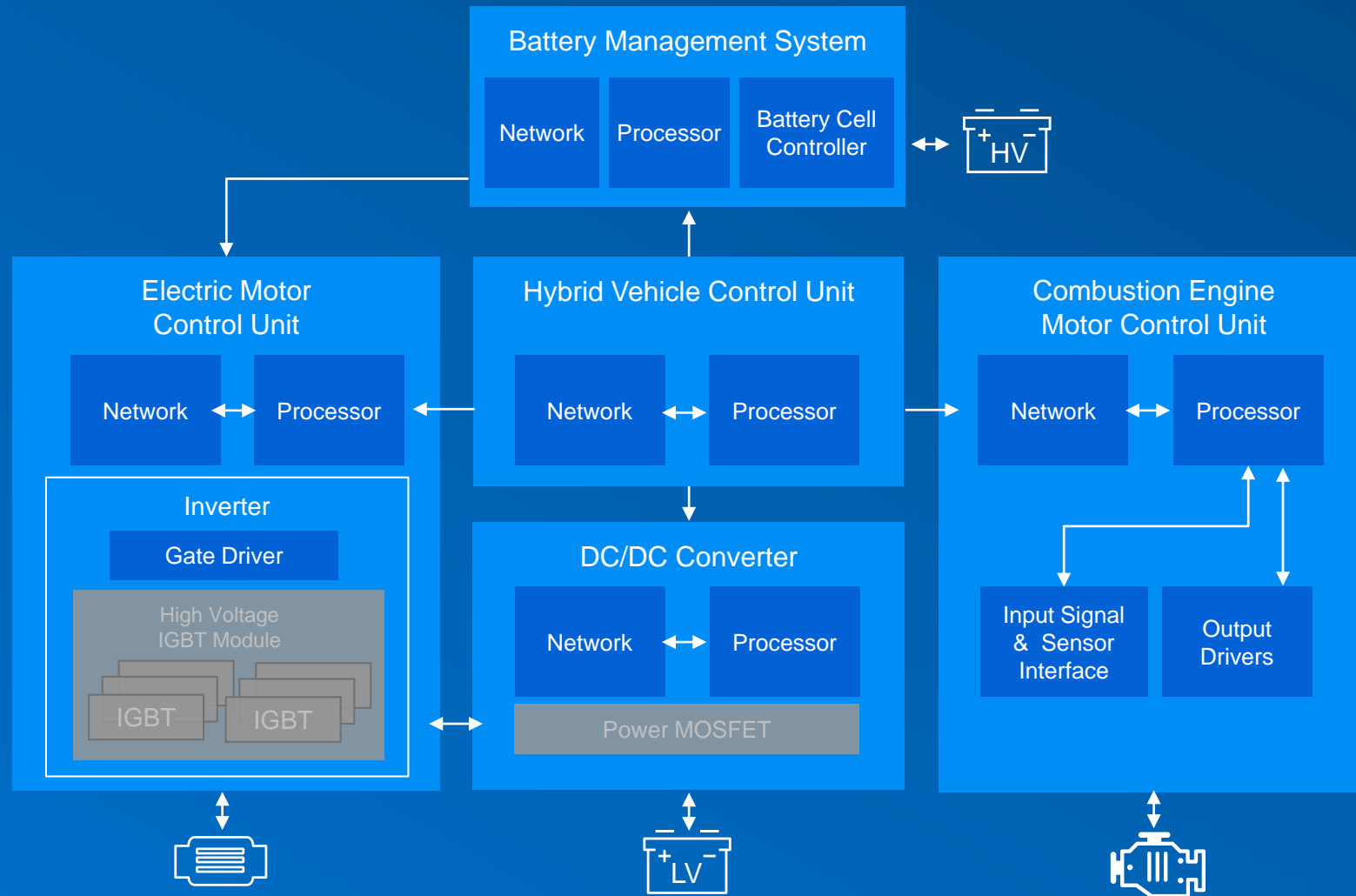
NXP S32 Enables Advanced Hybrid Control Units

Multicore high end processor with dedicated motor control and security peripherals

Big Data

Hybrid Vehicle Control Unit

ADAS

Network ⟷ Processor

GPS

Battery Management

ICE Motor Control

E-Motor Control

ESP/ABS

Optimize energy use

Trip optimization (ADAS & GPS)

Life time optimization (Analytics & AI)

Greenbox development platform

Development platform for S32 safe and secure processors

NXP Battery Management Scalable Across All EV Powertrains

400V: $100 /car
800V: $180 /car

$5 – 12 /car

$3 – 4 /car

| 6-Cell Battery Controller | MCU | Network |

Start/Stop ICE
14V Li-ion Battery

| 14-Cell Battery Controller | MCU | Network |

Mild Hybrid EV
48V Li-ion Battery

| 14-Cell Battery Controller | MCU | Network |

EV/PHEV
HV (High Voltage)
Li-ion Battery

Level of Electrification
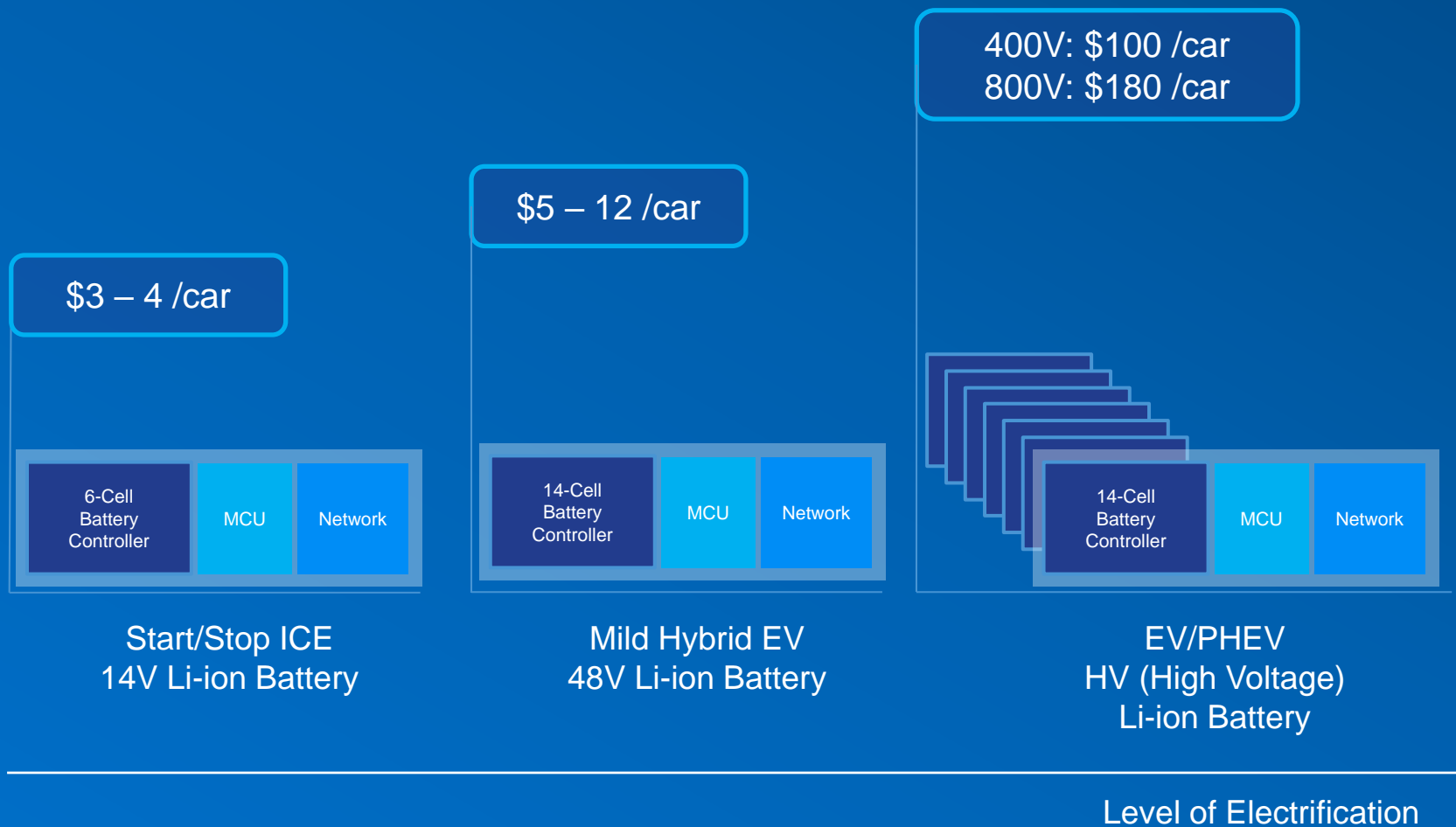
- Leading accuracy
- Fast & robust communication
- Highest BOM integration
- Hardware/software scalable
- ASIL-D functional safety

Source: NXP

NXP

NXP on Path to Leadership in Battery Management

SAM Growth 30%   **+**   Outgrowing the Market   **=**   Take Leadership Position[1]

$0.8B

$0.4B

NXP vs. Market Growth

1.6x

#4   #2   #1

2018   2021

2018   2021   2025

- Won key high-voltage HEV and BEV platforms from leading German, Chinese and US OEMs
- Won > 80% share in worldwide 14V & 48V MHEV platforms
- Partnering with globally leading battery makers

NXP

Agenda

Megatrends

Tech Leadership: Domain Architecture

Customer Leadership: System Solutions

Growth

- ADAS ➔ Autonomy
- Connected Infotainment
- Network Infrastructure
- Electrification

Summary

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Auto Growth: Broad-based + Select High Growth Drivers

2018–2021 3-Year CAGR

NXP Auto Revenues	7-10%
Auto Semi TAM-F	5-7%
Content / Car	4-5%
Car Production	1-2%
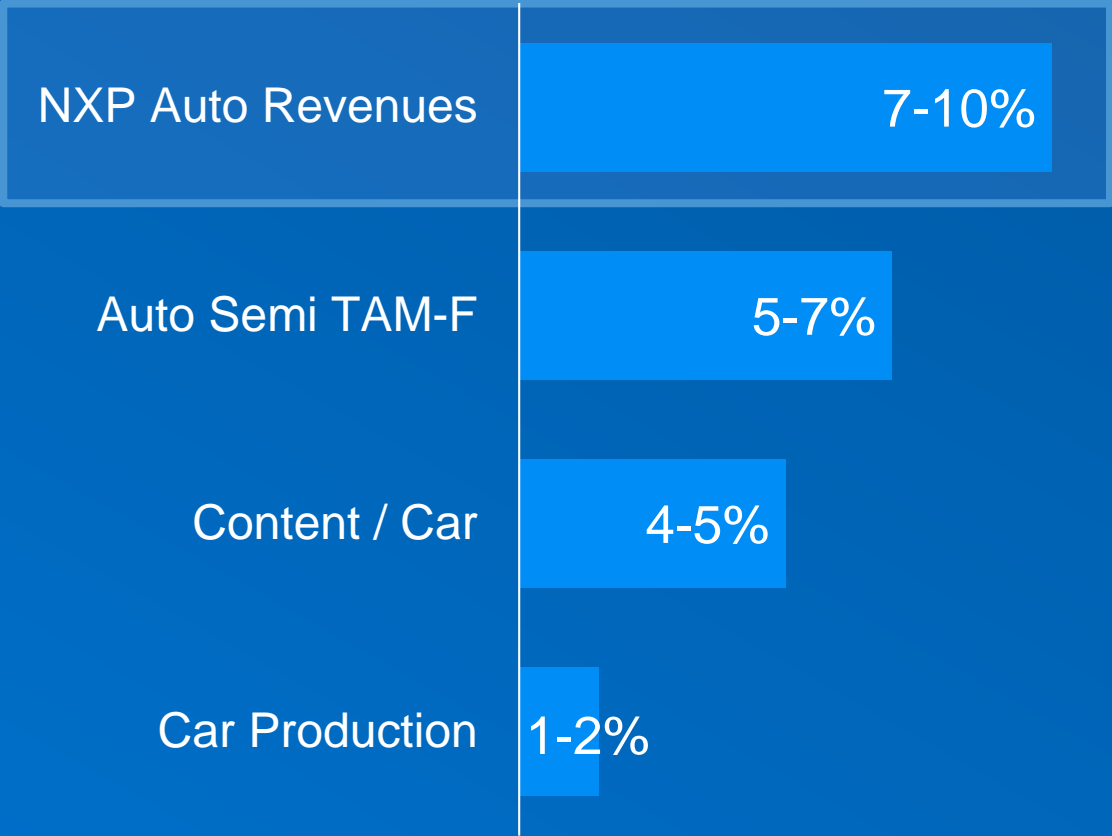
Growth Drivers on Top of Core Business

1 ADAS: Radar

2 Infotainment: e-Cockpit + Radio & Audio

3 Networking: Gateway + Network

4 Electrification: Battery Management

NXP

NXP Auto Value Proposition

Solution Portfolio

Complete system solutions for fastest TTM

Innovation Power

In-house high performance processing and networking

Safe and Secure

Leading with security and functional safety

Trusted global automotive partner: excellent quality, reliability, supply

Our Sales Engagements Have Become Stronger Over Past 21 Months

Strengthened our OEM connections while shaping new ecosystems

Leverage the Distribution Channel as a force multiplier (> 26k Customers)

World class customer technical support as a differentiator

NXP

NXP CONNECTS CHINA 2018
2018 恩智浦未来科技峰会

Dutch chip giant NXP expanding business in China

TECHNOLOGY   By He Weiwei, Huang Yi, and Li Jun

2018-09-07 17:40 GMT+8

NXP, a chip giant from the Netherlands, announced plans to work with a variety of Chinese tech brands at a recent tech summit in Shenzhen, south China's Guangdong Province.

The world's largest supplier of automotive semiconductors currently works with major Chinese companies like Baidu, Geely and Xiaomi. It's new partnerships include IrisKing – an iris recognition technology developer, Hangsheng Technology – an automotive supplier, and Foxconn Industrial Internet – a communications network equipment manufacturer

By He Weiwei, Huang Yi, and Li Jun QR

NXP, FII partners on IIoT

NXP eyes IOT, smart vehicle opportunities

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NXP Has Unrivalled Depth & Reach of Customer Access

Automotive

APTIV

BOSCH

Continental

DENSO

HARMAN
A SAMSUNG COMPANY

Industrial & IoT

amazon

Alibaba Group

Bai度百度

FOXCONN

Google

Microsoft

SIEMENS

Tencent 腾讯

Mobile

SAMSUNG

HUAWEI

MI

RELIANCE

Comm. Infra.

ERICSSON

HUAWEI

NEC

NOKIA

ZTE中兴

| 75% | 218 | 400 Sales & BD |
| NXP Revenues | Customers | 400 FAEs |

NXP

Mass Market & Distribution as a Force Multiplier

Physical

~8000
Distribution Sales &
1100
Certified FAEs

>30
Distribution Partners

300
Sales and FAEs

>26K
Customers

25% NXP Revenue

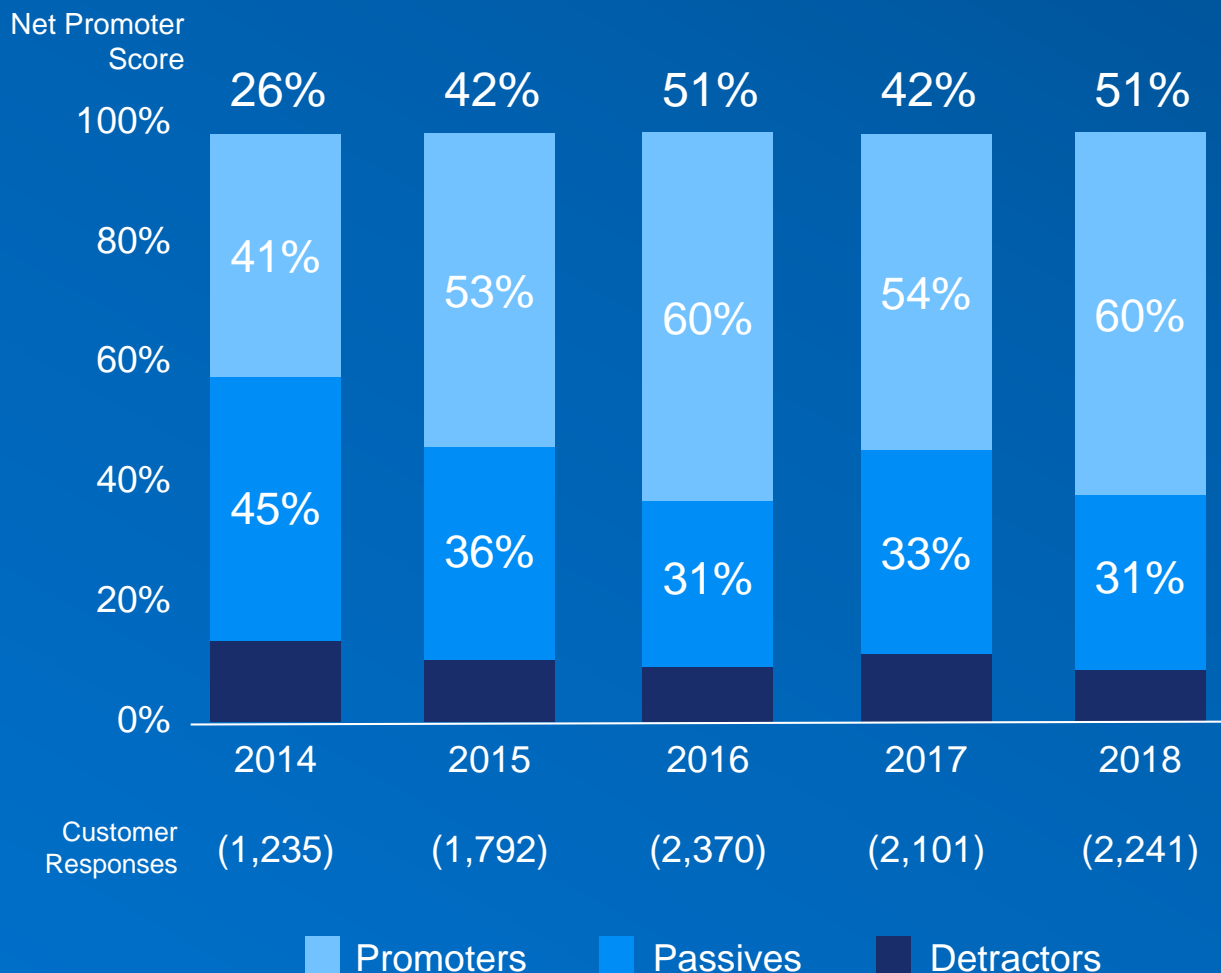Enable innovators
and future leaders

Digital

Digital Portals

Online Training
& Communities

Physical & Virtual
Tech Support

Complete Solutions
& Reference Designs

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Our Customers are Our Best Advocates[1]

Net Promoter Score

	2014	2015	2016	2017	2018
NPS	26%	42%	51%	42%	51%
Promoters	41%	53%	60%	54%	60%
Passives	45%	36%	31%	33%	31%
Customer Responses	(1,235)	(1,792)	(2,370)	(2,101)	(2,241)

Legend: Promoters, Passives, Detractors

- 95th percentile of technology companies
- Strong correlation with employee satisfaction
- 68% active promoters in mass market

>20% Design Win growth in 2017 in focus markets, driven by

- Processing leadership
- Attach in Industrial & IoT and Automotive

INVESTOR DAY 2018

Since April 2016…

Automotive

- Semi content $ / vehicle accelerates
- #1 auto processors position now at reach
- Reached true leadership in infotainment AP
- Developed & captured emerging networking gateway market
- Created new electrification solution portfolio
- Achieved radar #1 leadership position
- On track for 2019 ADAS revenue >10% Auto
- V2X ramping with GM, VW in 2019, + others
- Introduced leadership S32 16nmFF

Mobile

- Shipping single chip NFC-SE
- 4000 banks supporting mobile payment
- China mobile transit from 10 to 100 cities
- IoT Service2GO

Industrial & IoT

- IoT evolved into tangible edge & end-node opportunities to enable cloud disruption
- Grew share in GP embedded processing 9% to 11%
- Created & captured X-Over processor category
- First FinFET IoT app. processor
- Unified software platform across processing portfolio

Comm. Infra. & Other

- mMIMO true leadership
- 16nmFF Layerscape
- Leveraged DN IP & expertise into Auto, Industrial IoT
- 2X RAIN RFID revenue growth

Source: NXP

NXP

Continuing to Drive Profitable Growth

Automotive

Solution portfolio

Innovation powerhouse

Safety & reliability expertise

Industrial & IoT

Broad, scalable solutions

Common S/W tool environment

Channel reach

Mobile

Technology innovator & leadership

Recognized ecosystem leader

Focused application insights

Communication, Infrastructure & Other

Broadest portfolio (RF, tags)

Technology leadership

Deep application insights

NXP Uniquely Enables Disruptive Nature of the Cloud

Seamless cloud connectivity & lifecycle management

Broadest portfolio MCU / Crossover / application processors

Complete solutions SDK / HW / SW & ecosystem

Embedded & systems level security & privacy

High-precision analog & audio/video/display

Home Gateway

Industrial Controller

Auto Gateway

Smart City

Systems Level Integration

Edge Computing Ecosystem

Smart Industry

Smart Cities

Connected Vehicle

Smart Home

Connected Consumer

Secure Connections for a Smarter World [1]

Secure anchors & services for 40B processors

75% connected cars by 2025

Tagging 60B products per year by 2025

25% of cars by 2025 will be L2-3 ADAS 3x adoption rate

2B+ 5G subscribers by 2025

UWB potential: secure 3D device ranging in billions of phones & things

IoT Edge & end nodes from 6B units in '21 to >15B units in '25

Up to $350 radar for L4-5 ADAS

50% of cars are xEV by 2030

NXP

INVESTOR DAY 2018