



晶心科技股份有限公司法說會

2021/03/05

投資安全聲明

除簡報內所提供之歷史信息外，簡報事項係屬預測性陳述，受到風險及不確定性因素影響，可能造成實際結果與陳述內容發生不符，這些不確定性因素包括但不限於：天氣、競爭性產品及其定價的影響、產業及市場對半導體產品之供給及需求移轉、新產品大量量產之能力、技術急遽演進、半導體產業景氣以及整體經濟環境之變化。

簡報大綱



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產品應用



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新產品及生態系統



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公司簡介

<http://www.andestech.com> 

晶心亮點

- 2005年3月設立於台灣新竹科學園區。
- 根基穩健的高科技上市公司。
- 員工人數達220人；80%為工程師。
- 獲得TSMC 2015年新的 IP OIP Award 。
- 晉升為RISC-V國際聯盟(前身為RISC-V基金會) 首席會員。(2020)
- 獲得AI Global Media頒發「2020年最傑出嵌入式處理器IP供應商」。
- 向量處理器核心NX27V獲頒「新竹科學園區優良廠商創新產品獎」(2020)



晶心任務

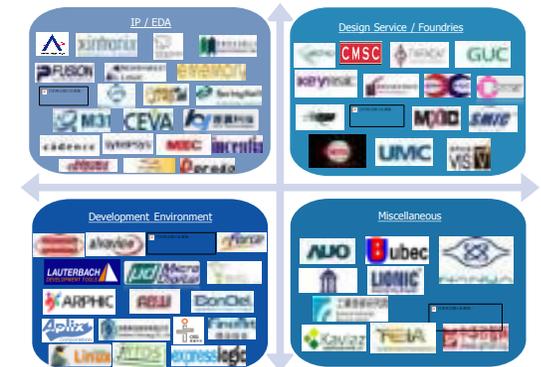
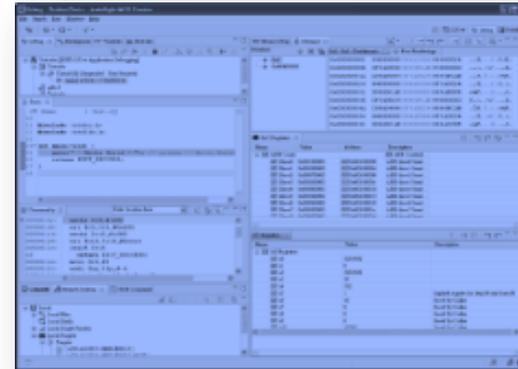
- 創新架構高效能/低功耗嵌入式處理器。

晶心利基

- 智能及環保之電子設備
- 雲端應用,人工智慧及物聯網

重要里程碑

- ❖ **200+** commercial licensees
 - Geographically distributed in Taiwan, China, Korea, Japan, Europe, and USA
 - **500+** license agreements signed
- ❖ AndeSight™ IDE:
 - **19,000+** installations
- ❖ Eco-system:
 - **160+** partners
- ❖ **6B+** Accumulative SoC Shipped



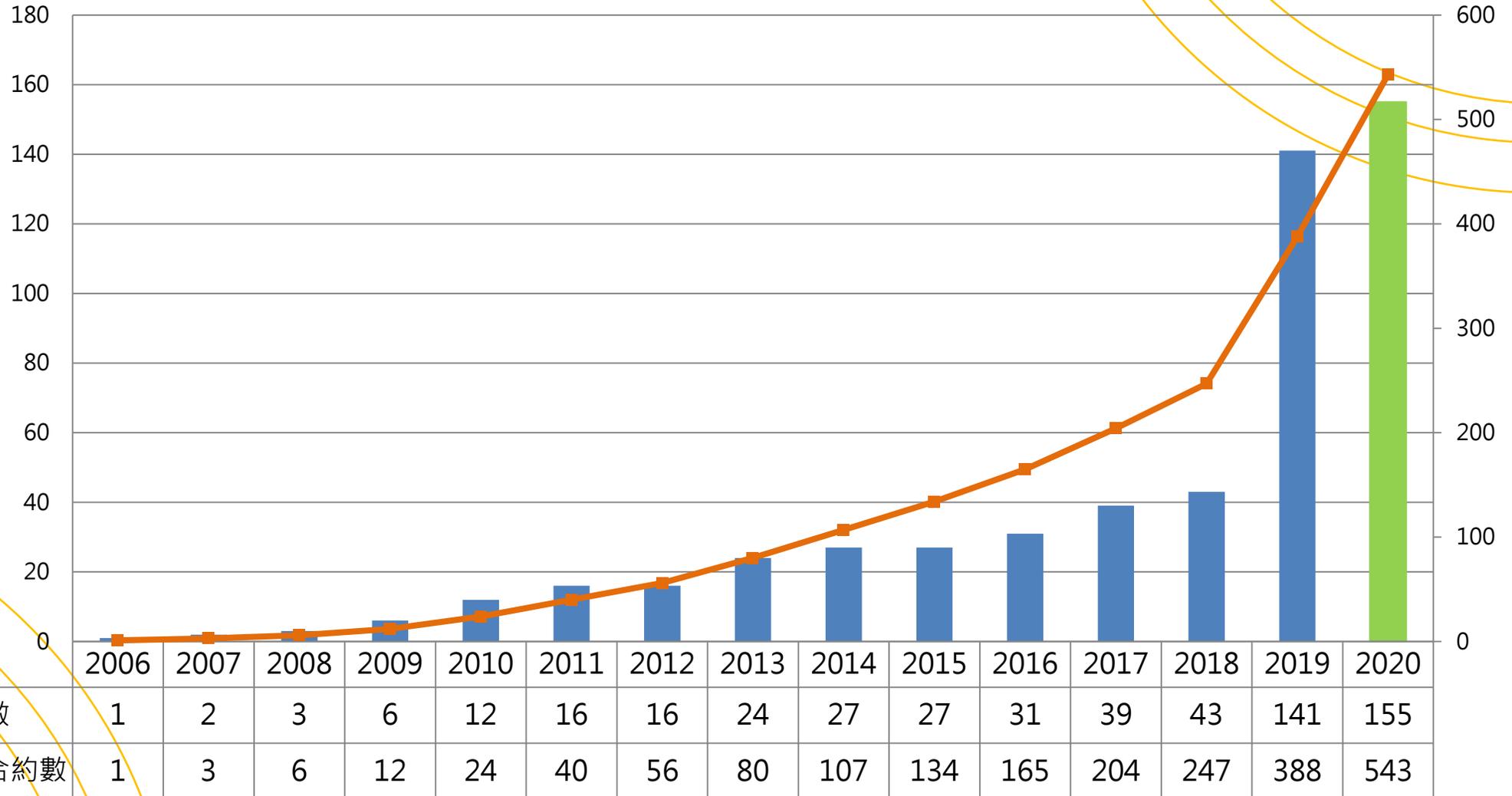


營運成果

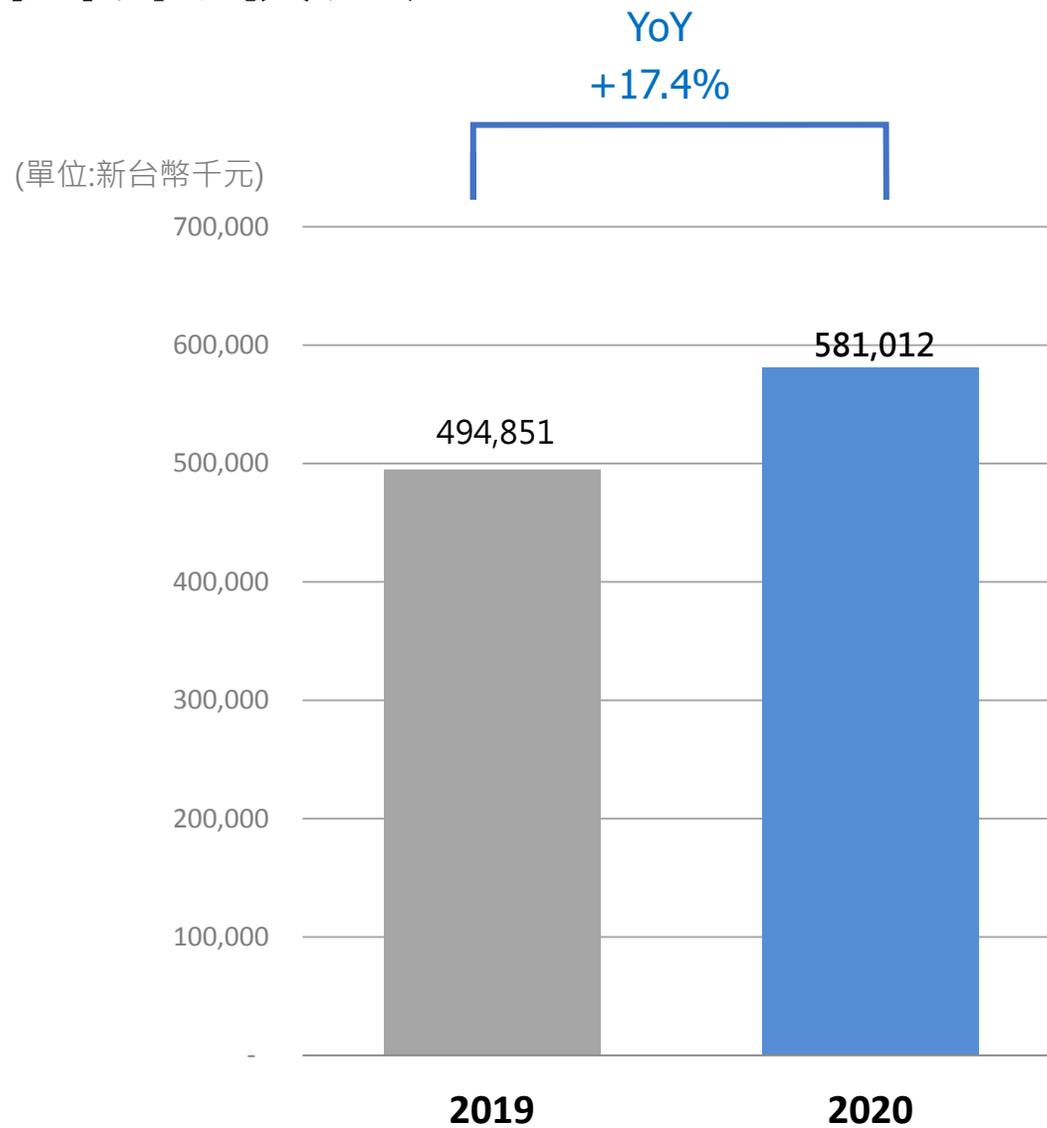
<http://www.andestech.com>



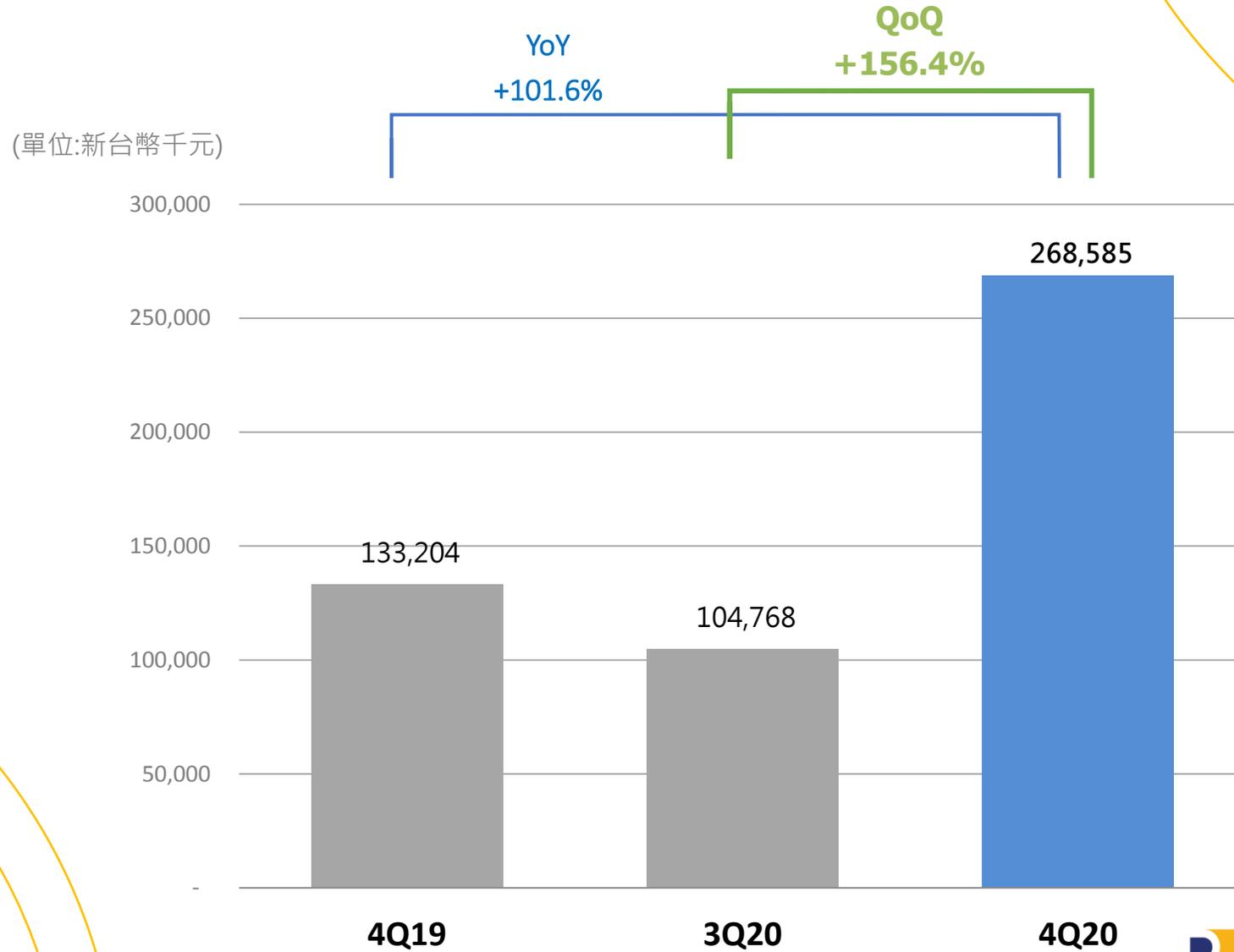
IP 授權合約數穩健成長



2020年度營業收入



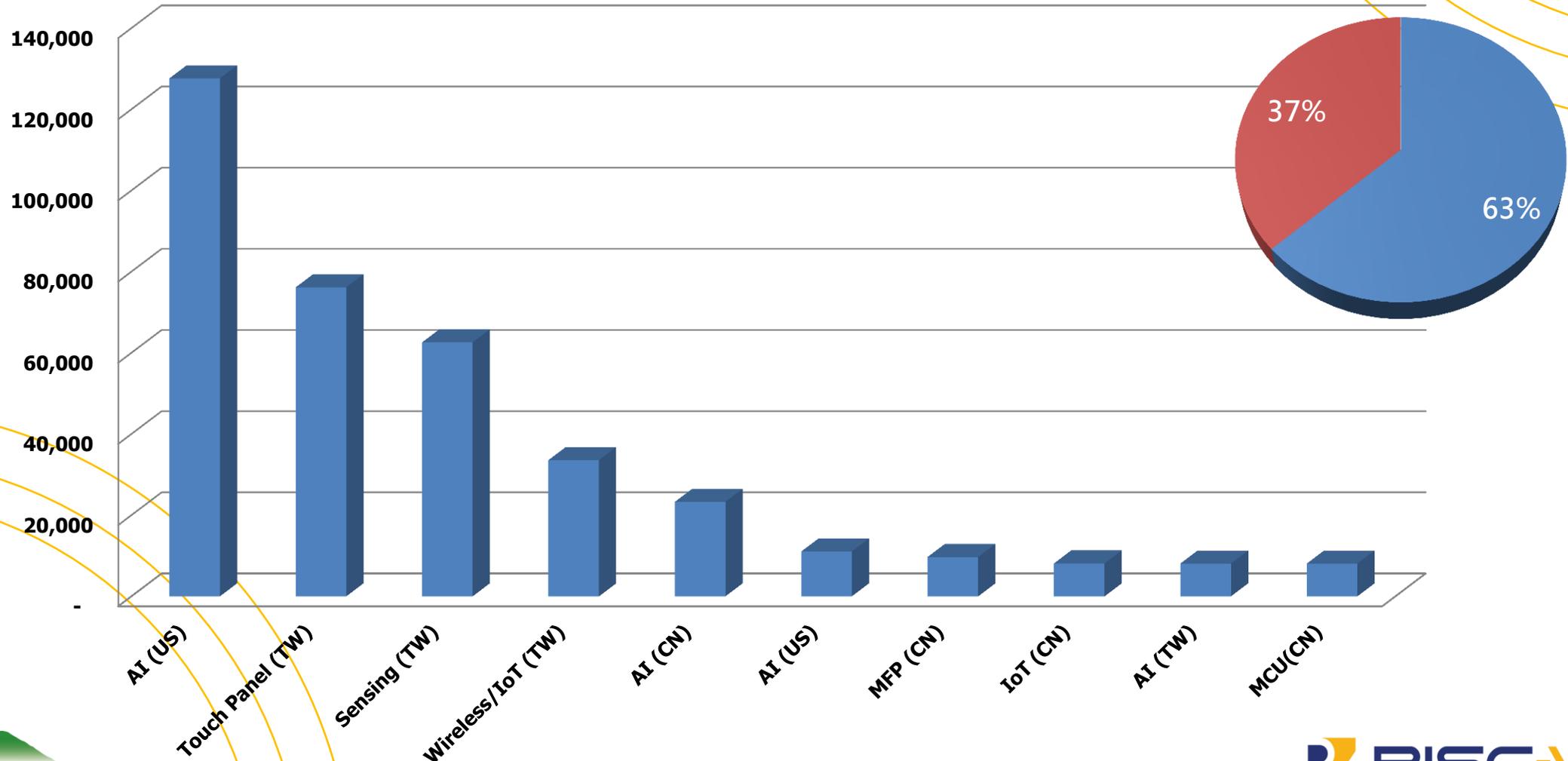
2020年第四季營業收入



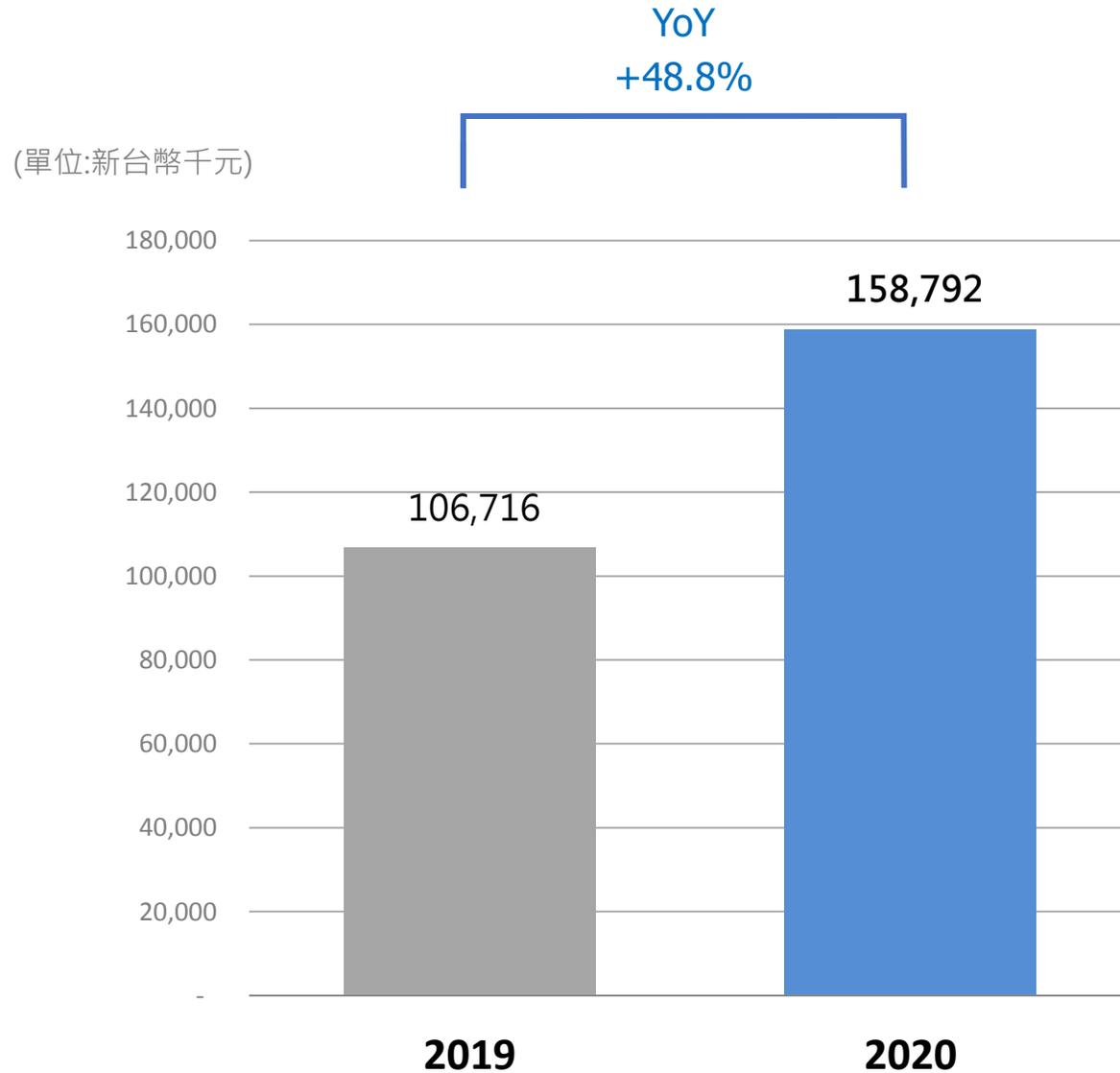
2020年度前十大客戶之應用分析

單位: 新台幣千元

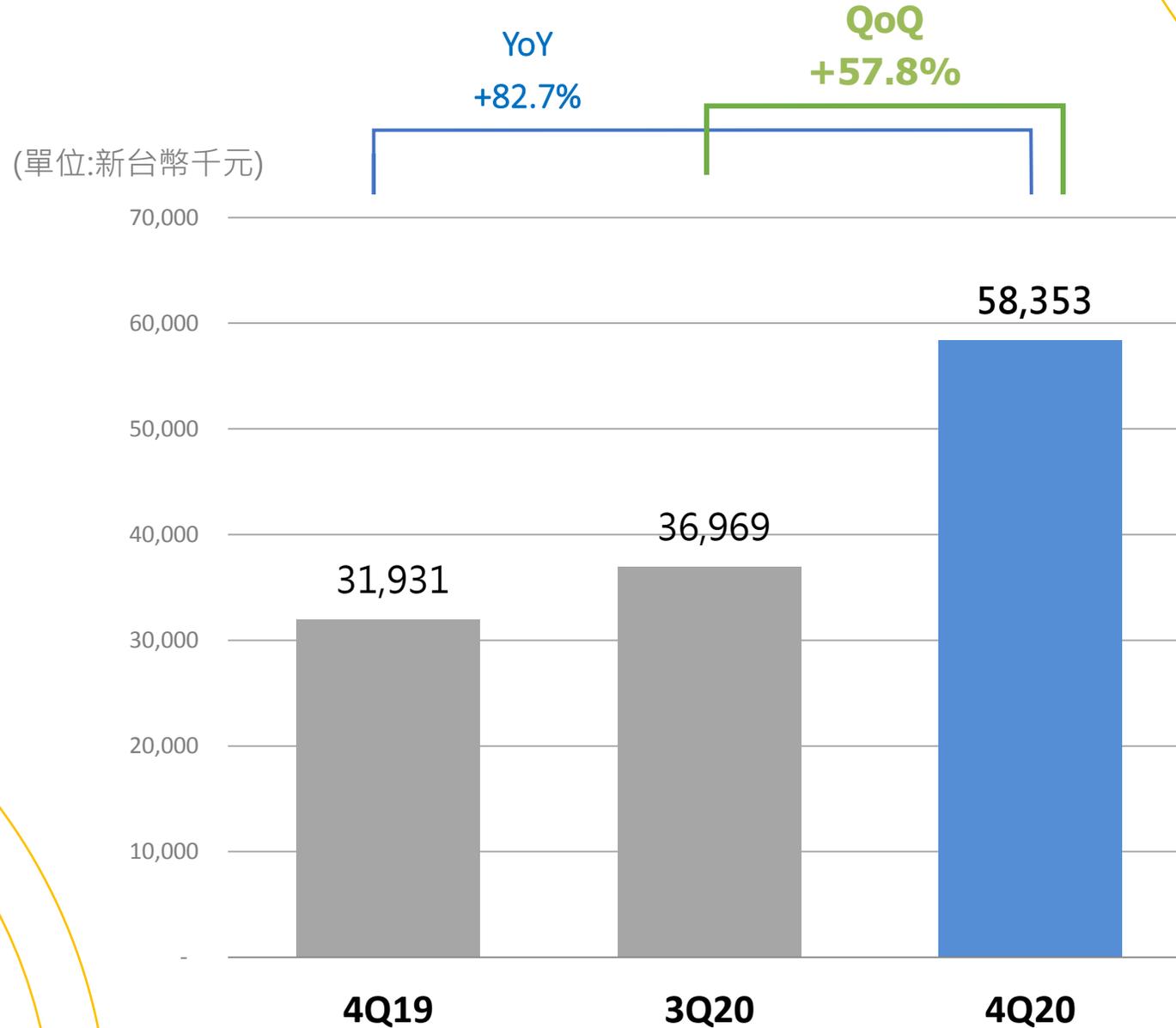
前十大客戶貢獻63%的營收



2020年度權利金收入



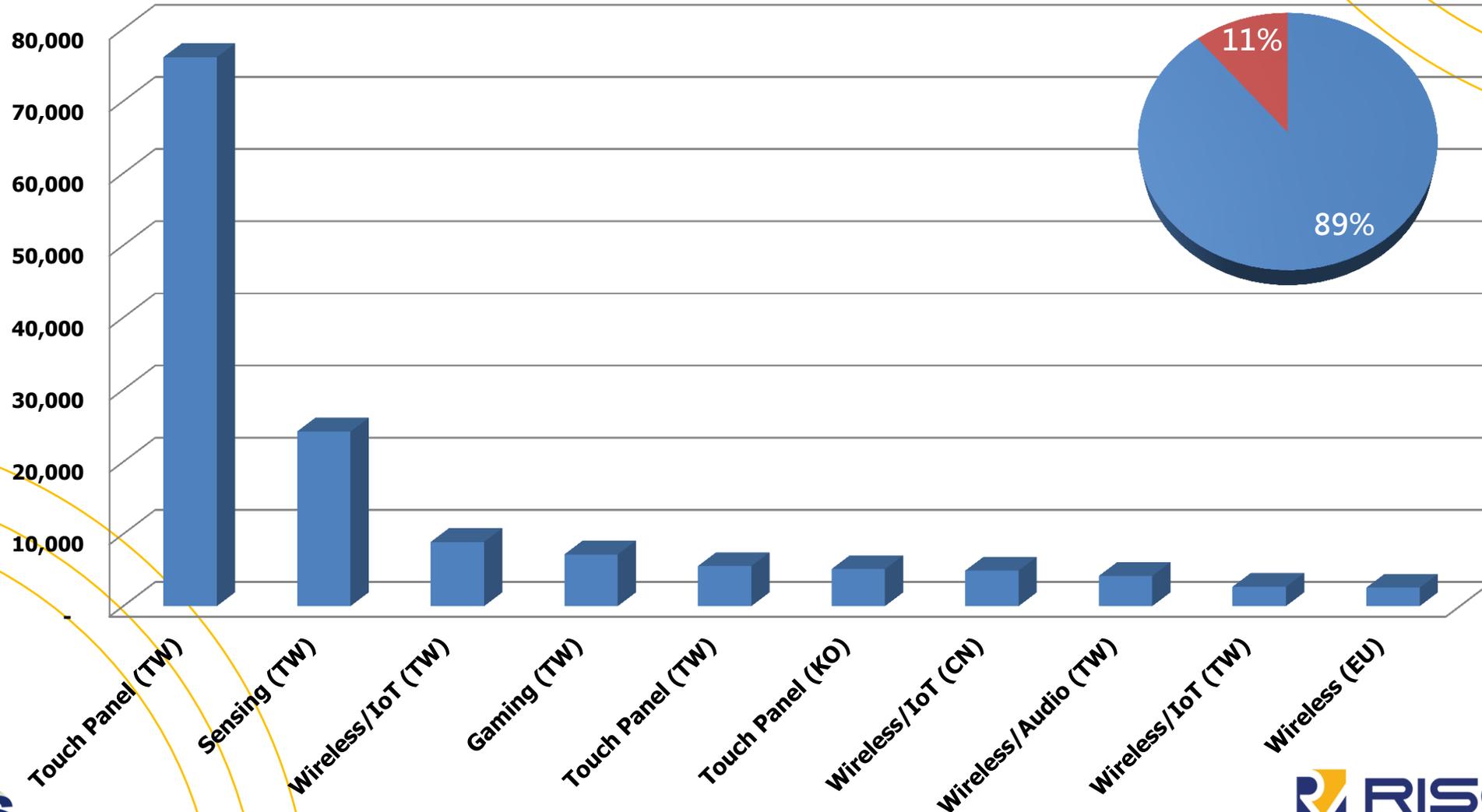
2020年第四季權利金收入



2020年度權利金應用分析

單位: 新台幣千元

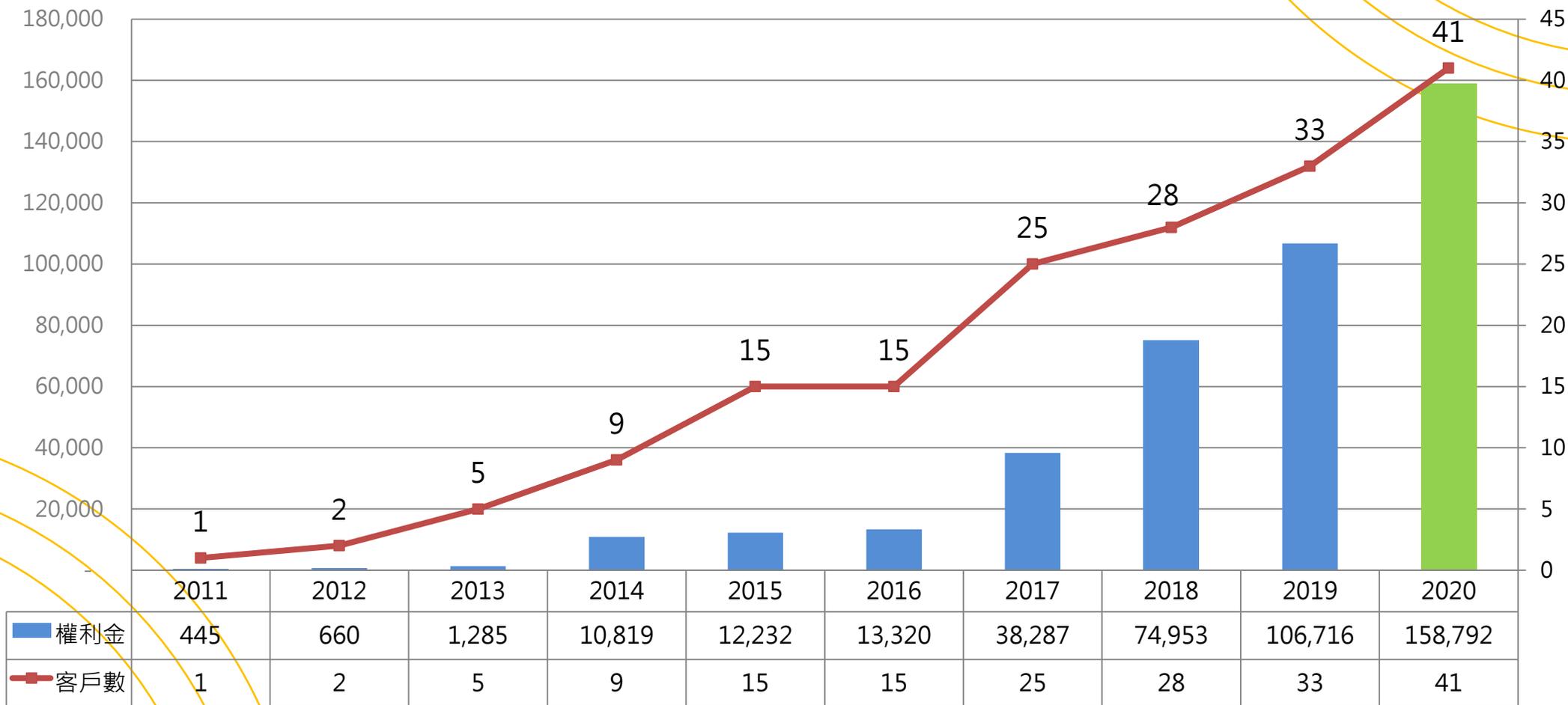
前十大權利金客戶貢獻比率 89%



2020年度權利金收入

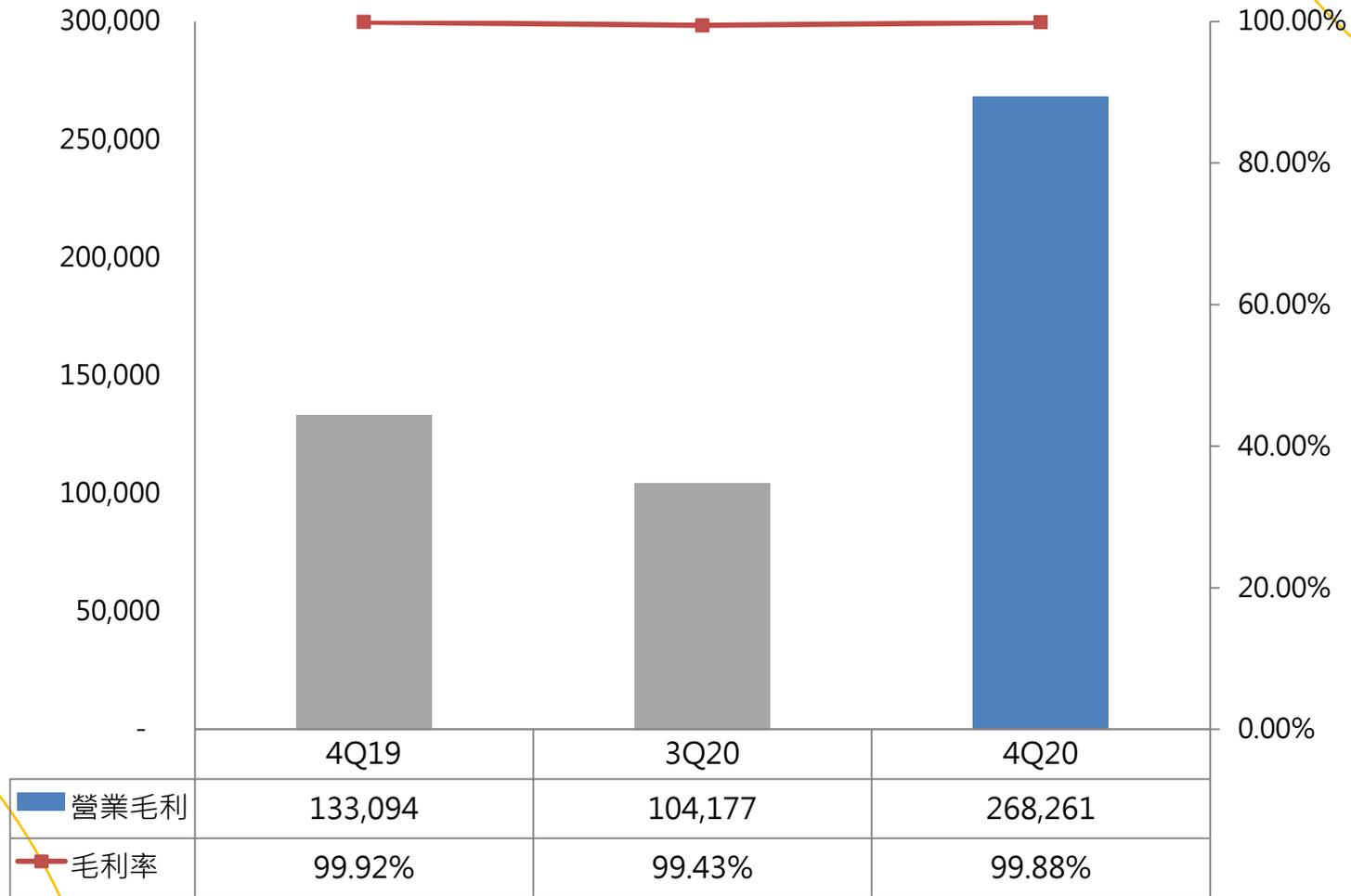
(單位:新台幣千元)

(單位:家數)



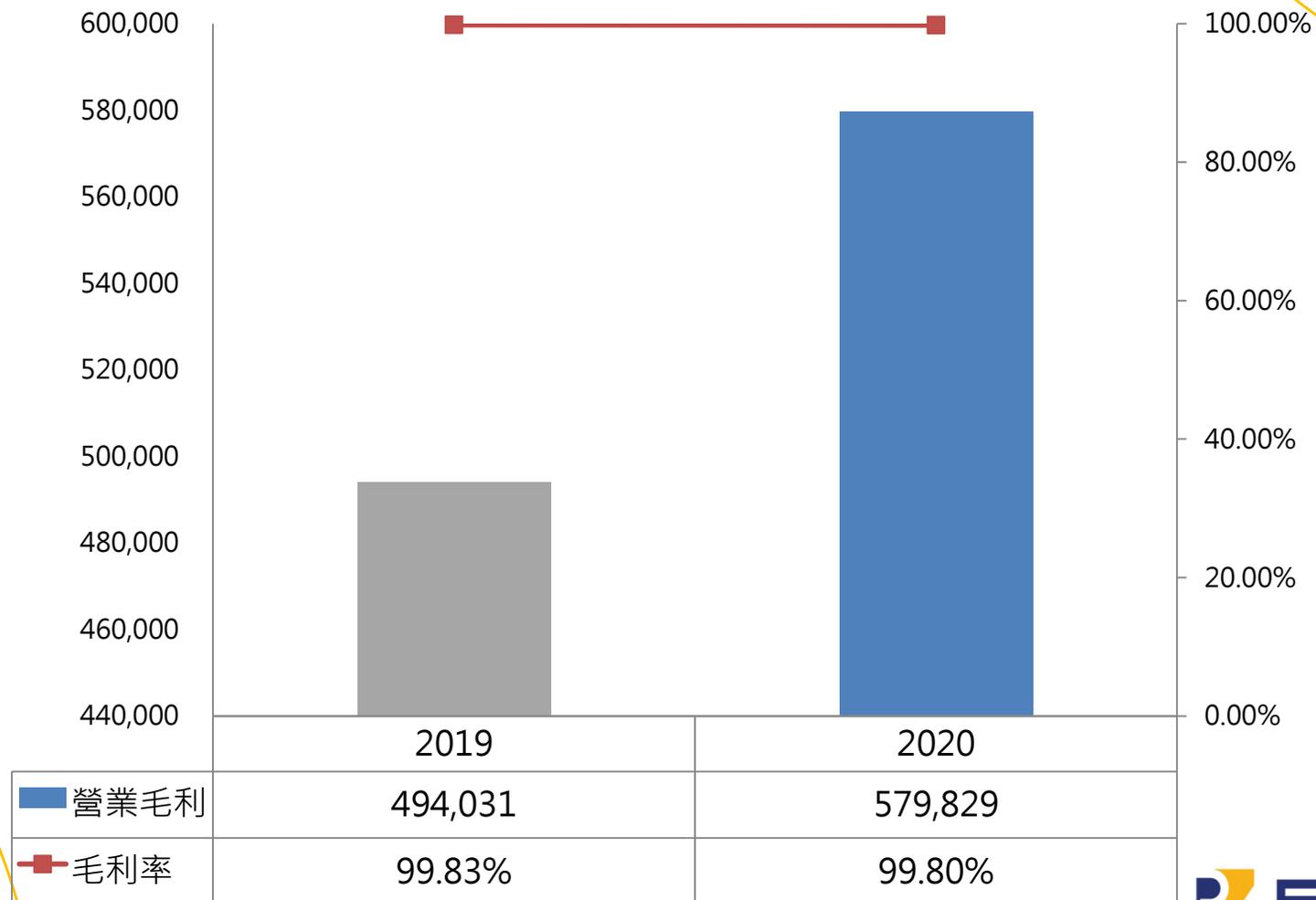
2020年第四季營業毛利與毛利率

(單位:新台幣千元)

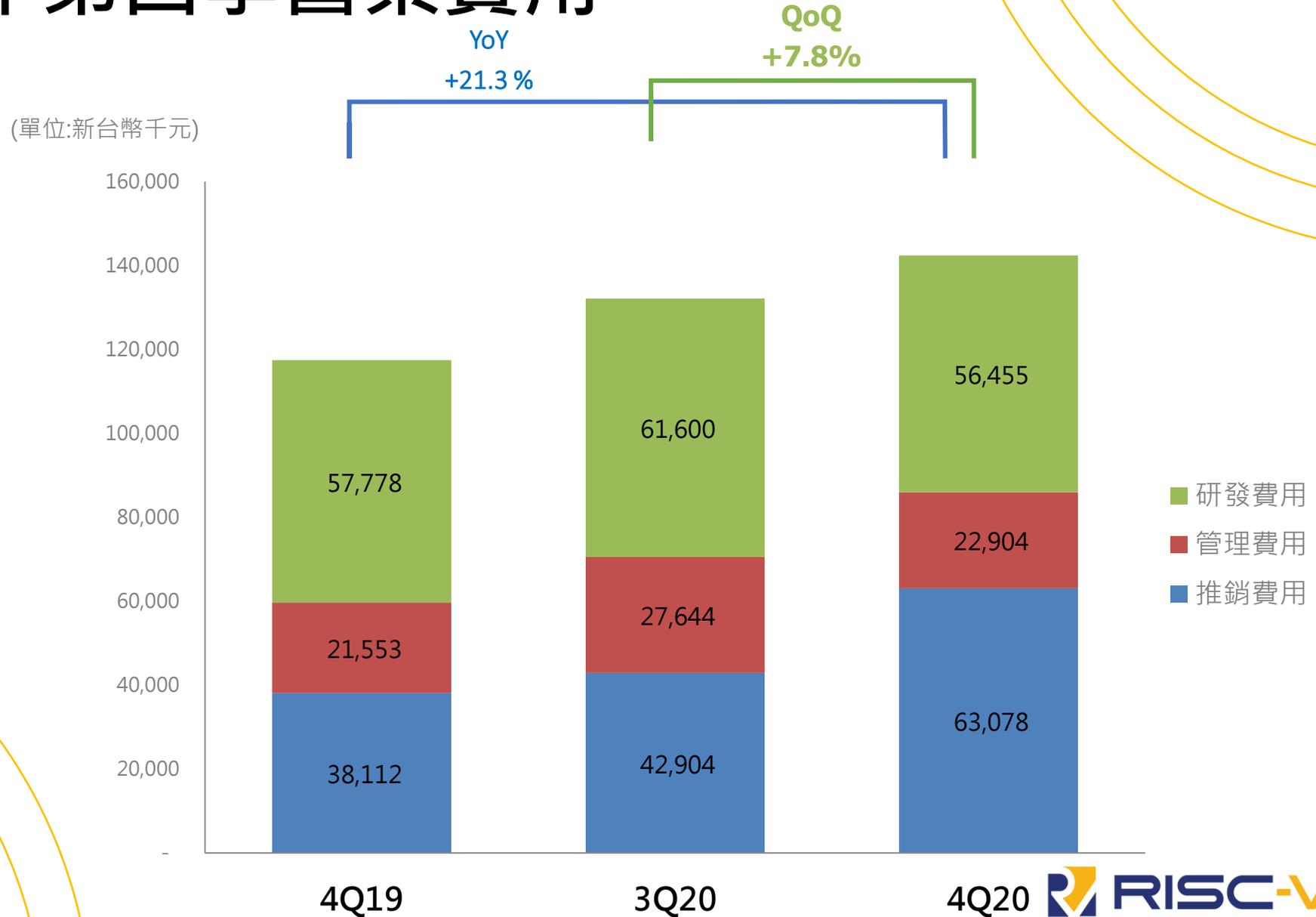


2020年度營業毛利與毛利率

(單位:新台幣千元)



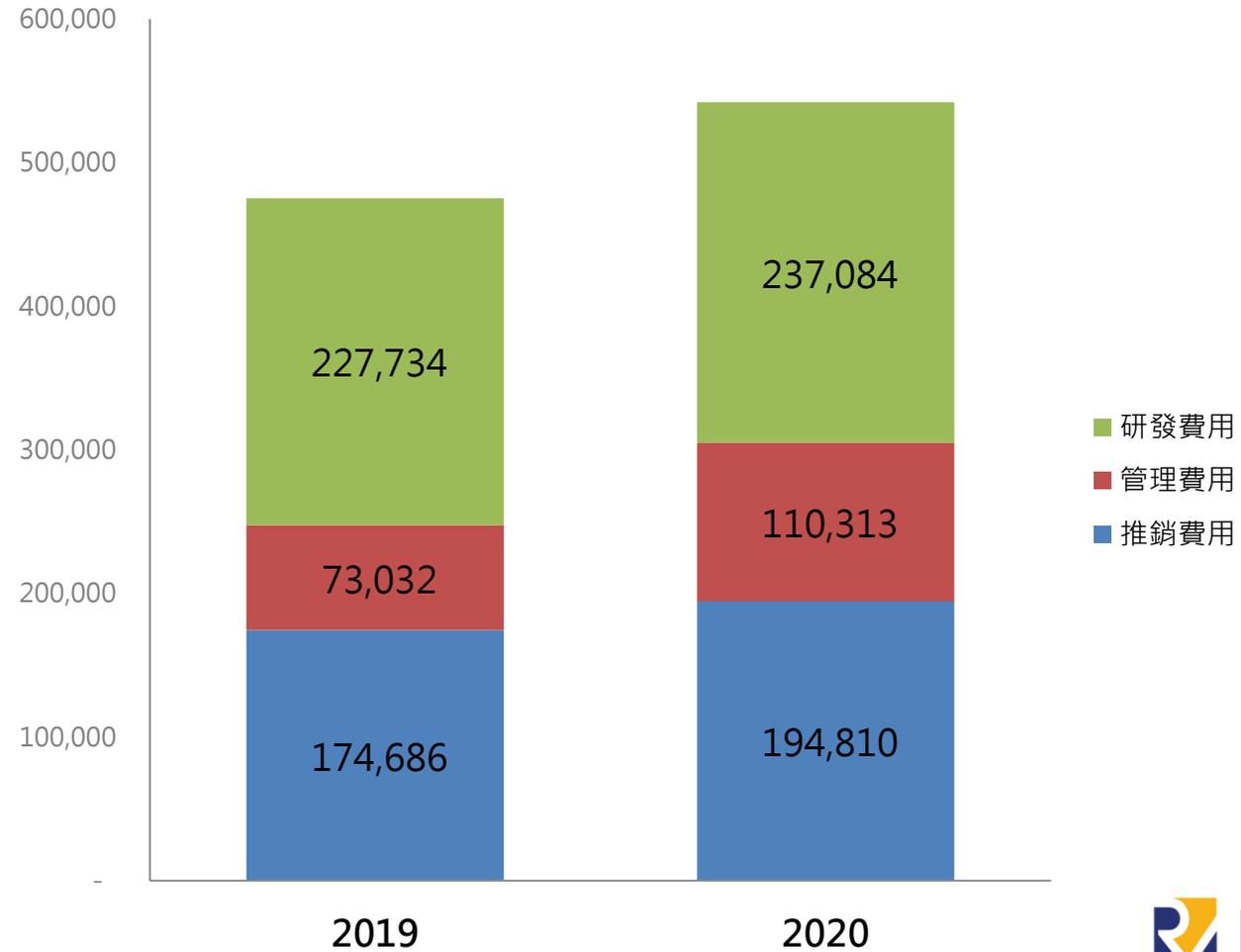
2020年第四季營業費用



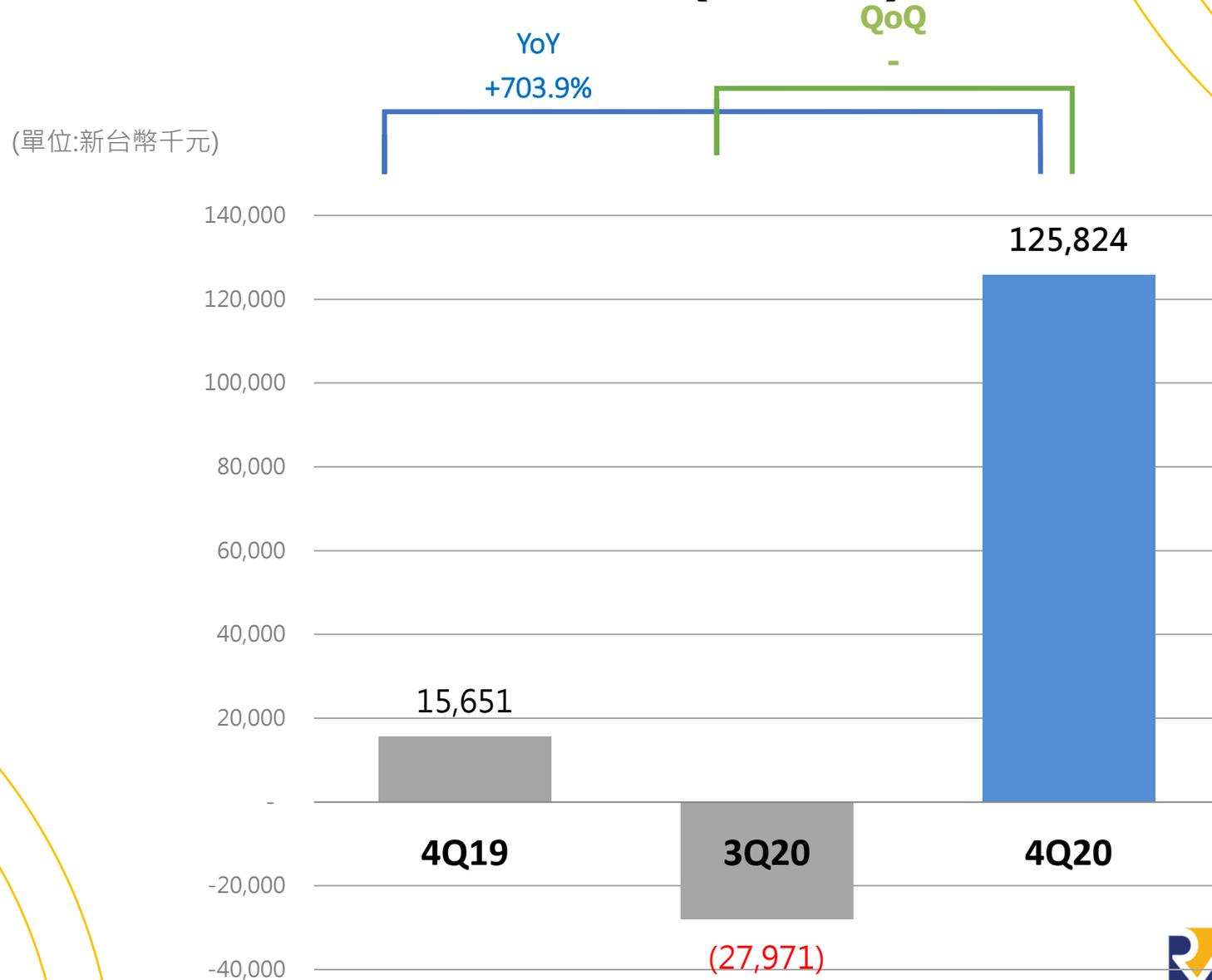
2020年度營業費用

YoY
+14%

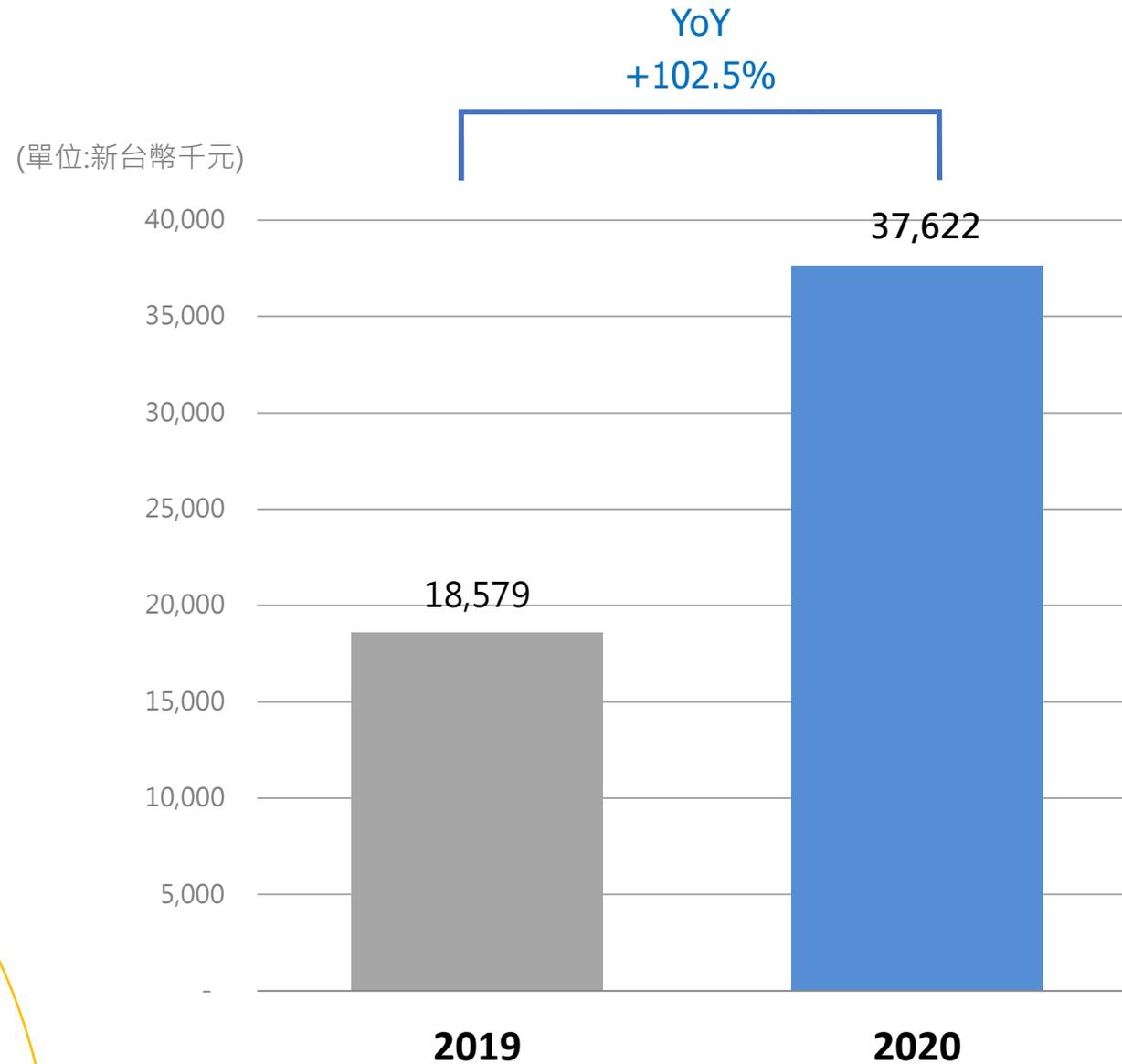
(單位:新台幣千元)



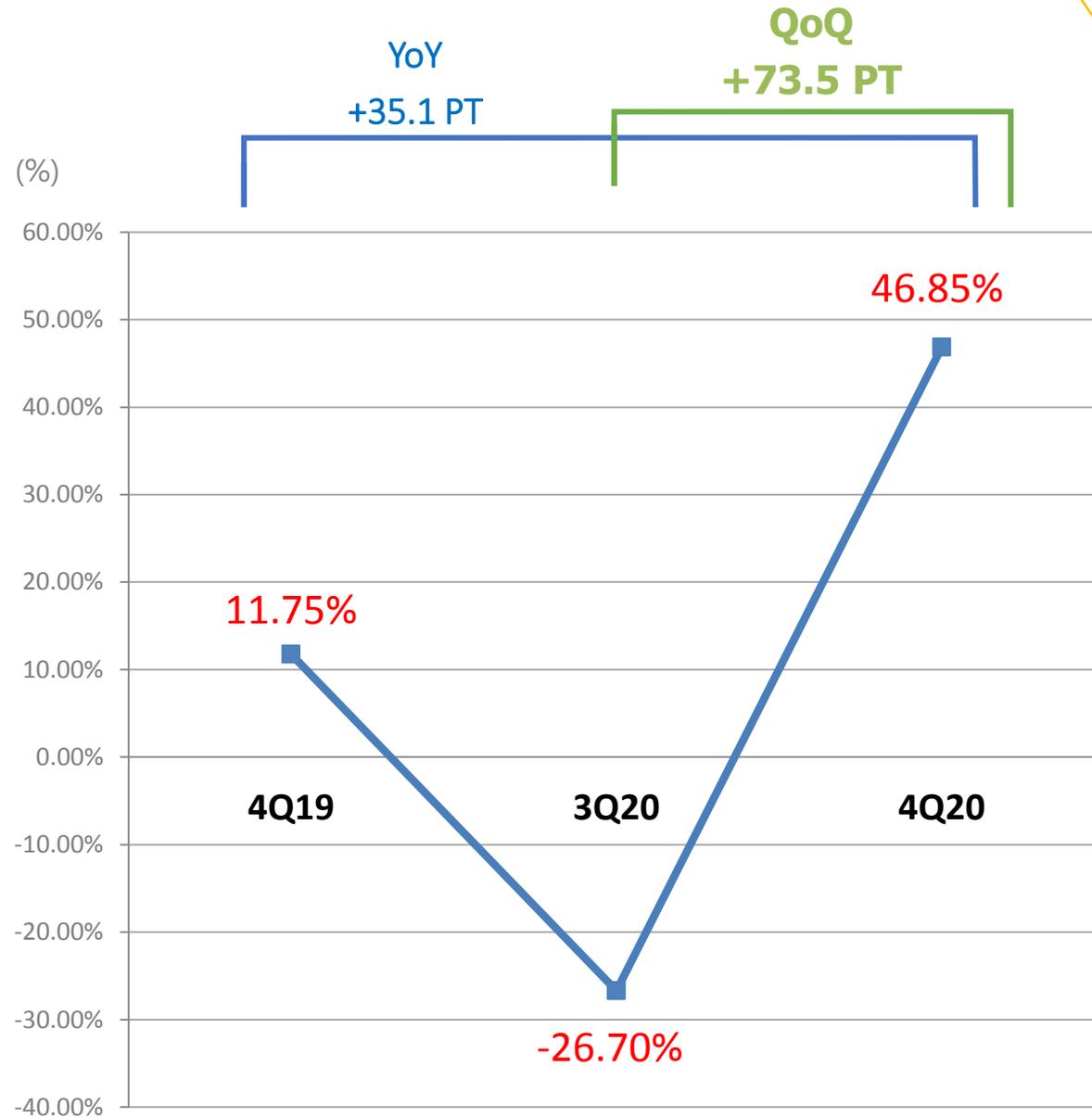
2020年第四季營業利益(損失)



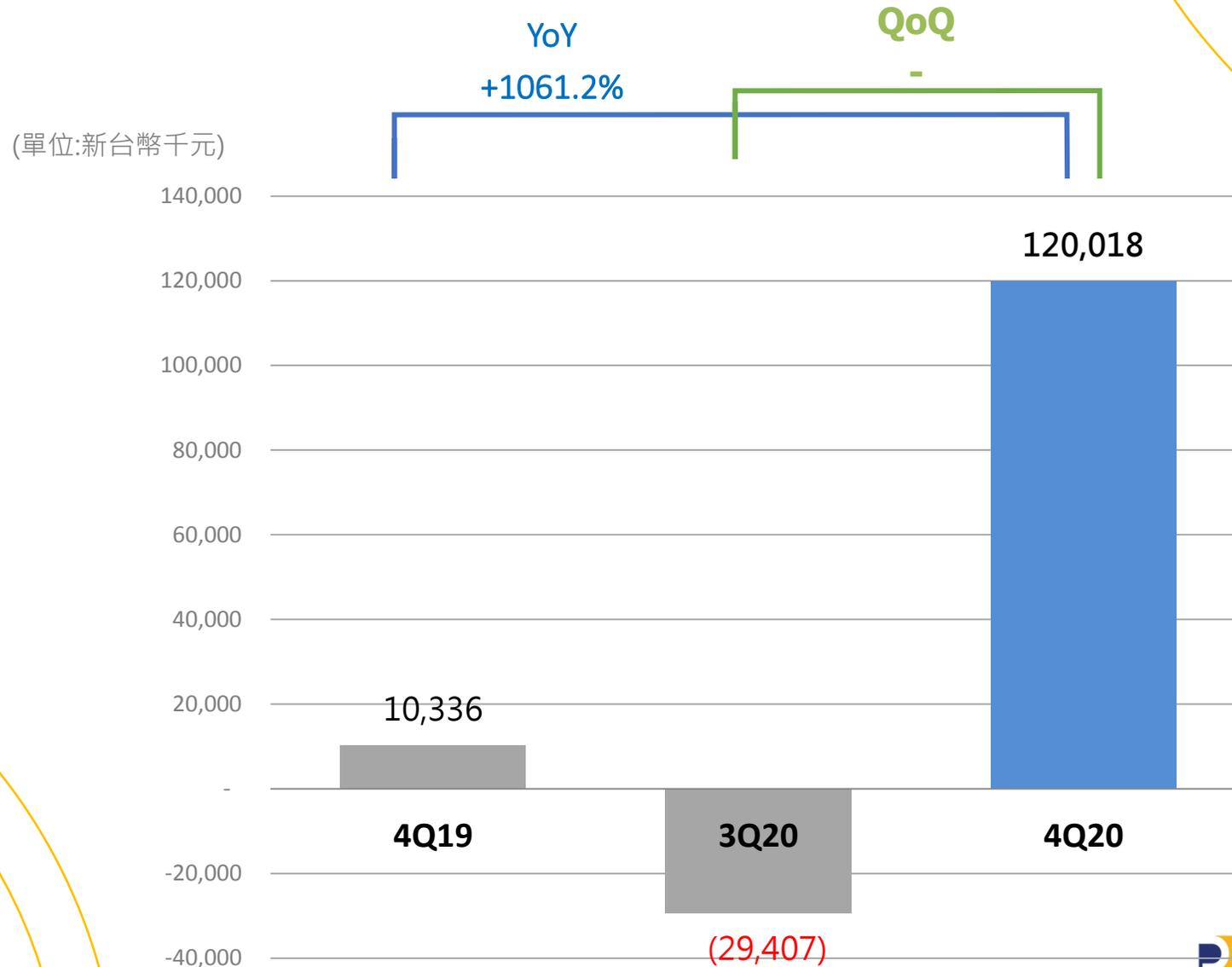
2020年度營業利益



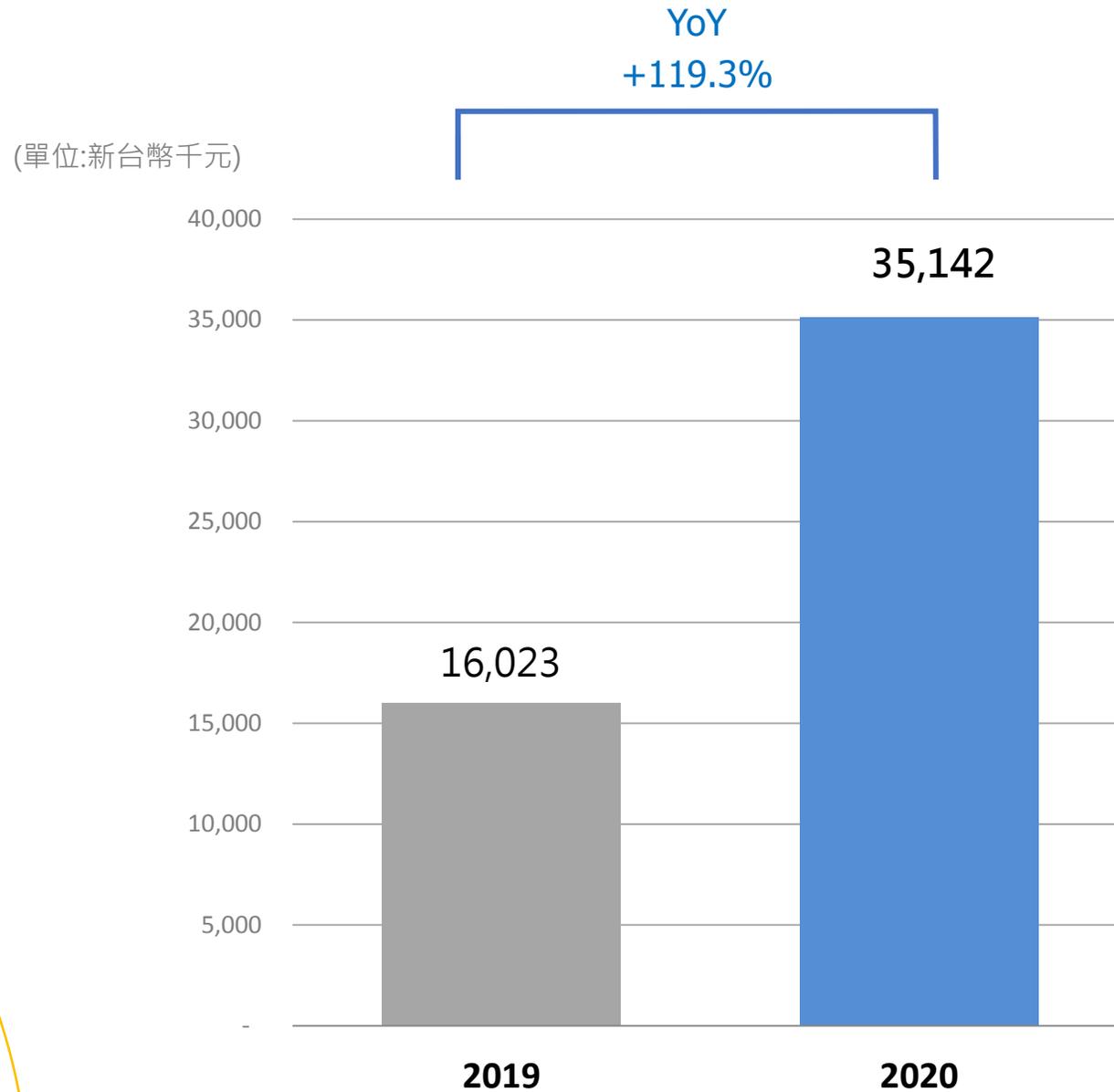
2020年第四季營業利益率



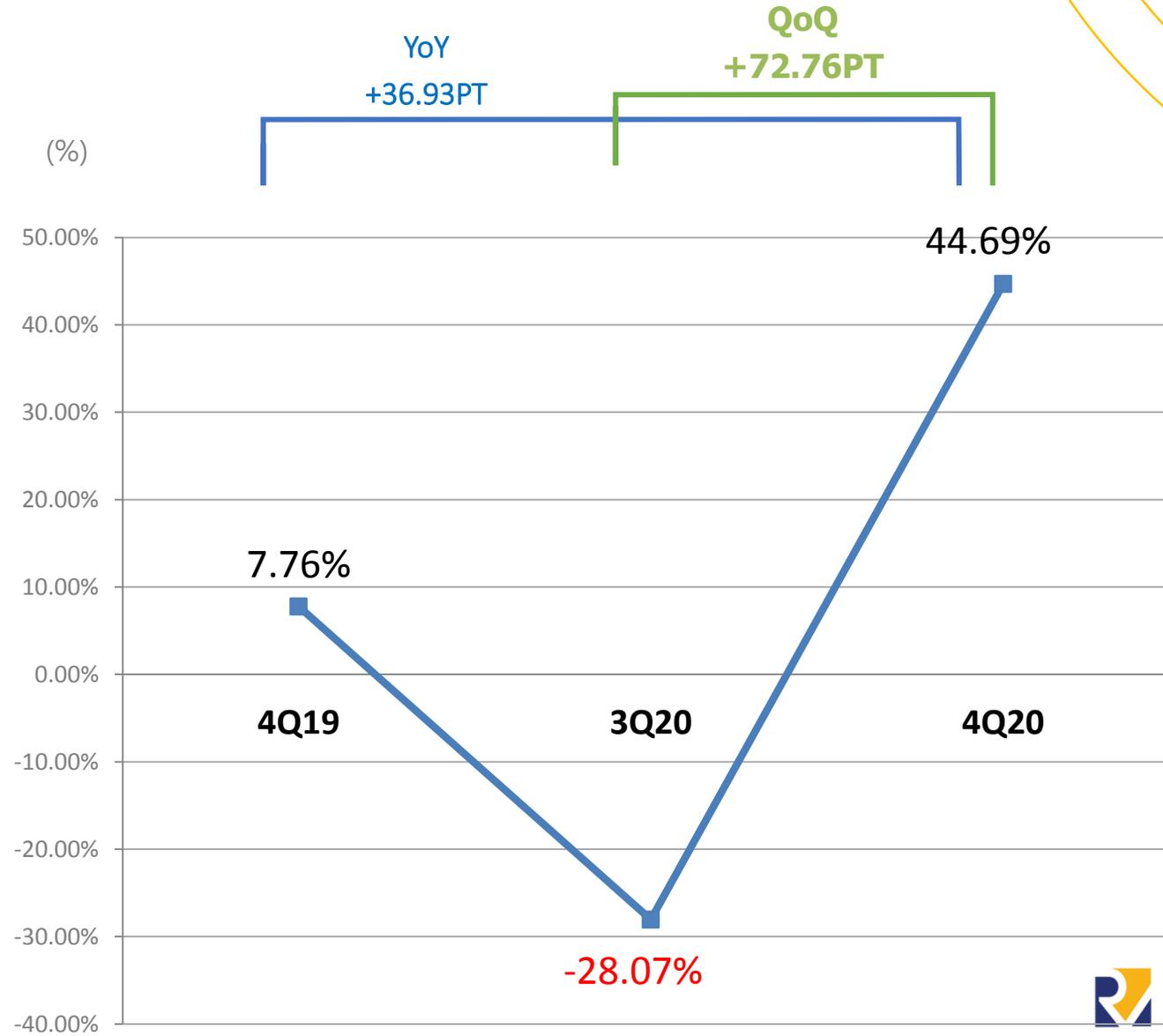
2020年第四季合併淨利(淨損)



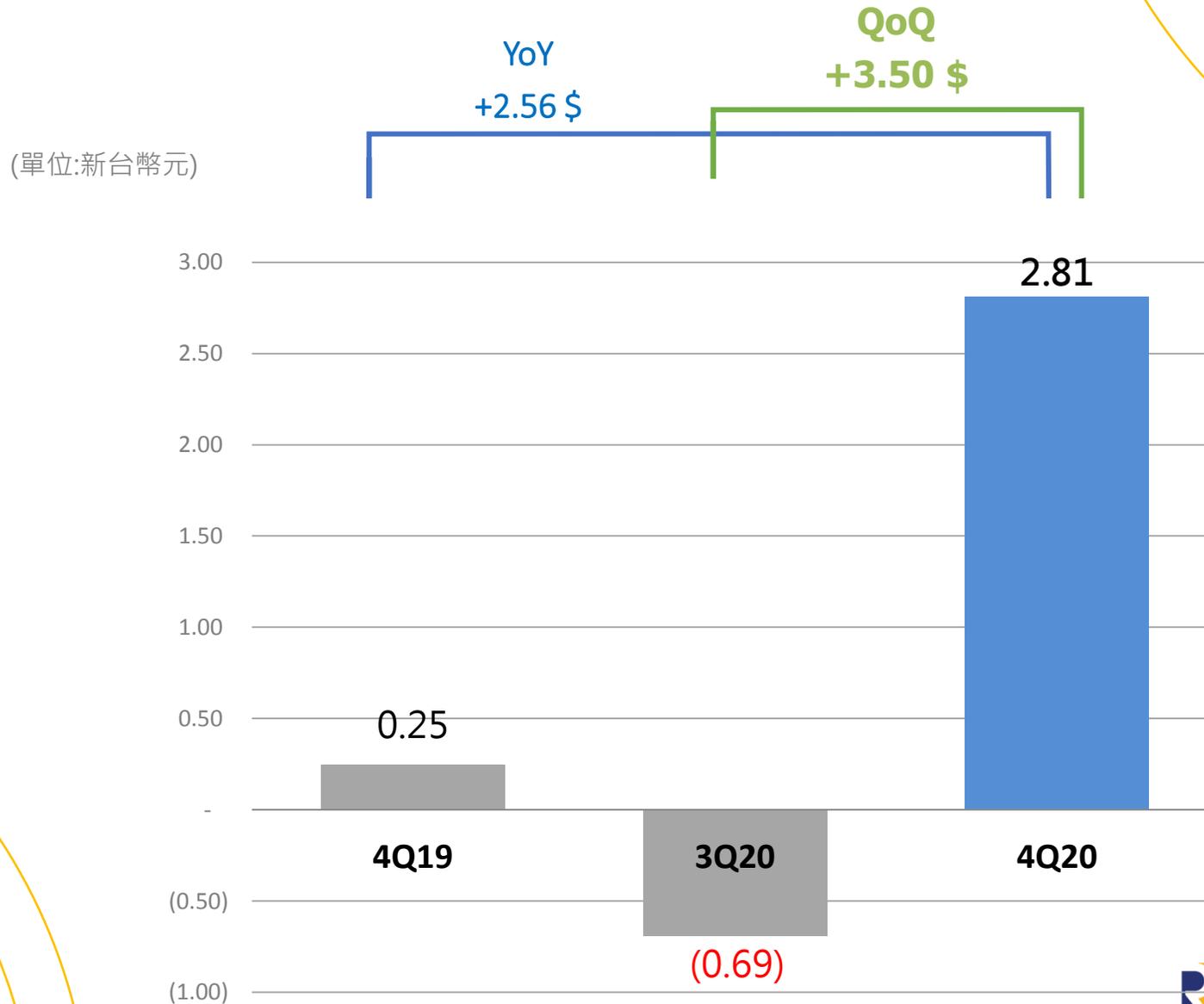
2020年度合併淨利(淨損)



2020年第四季合併淨利率(淨損率)

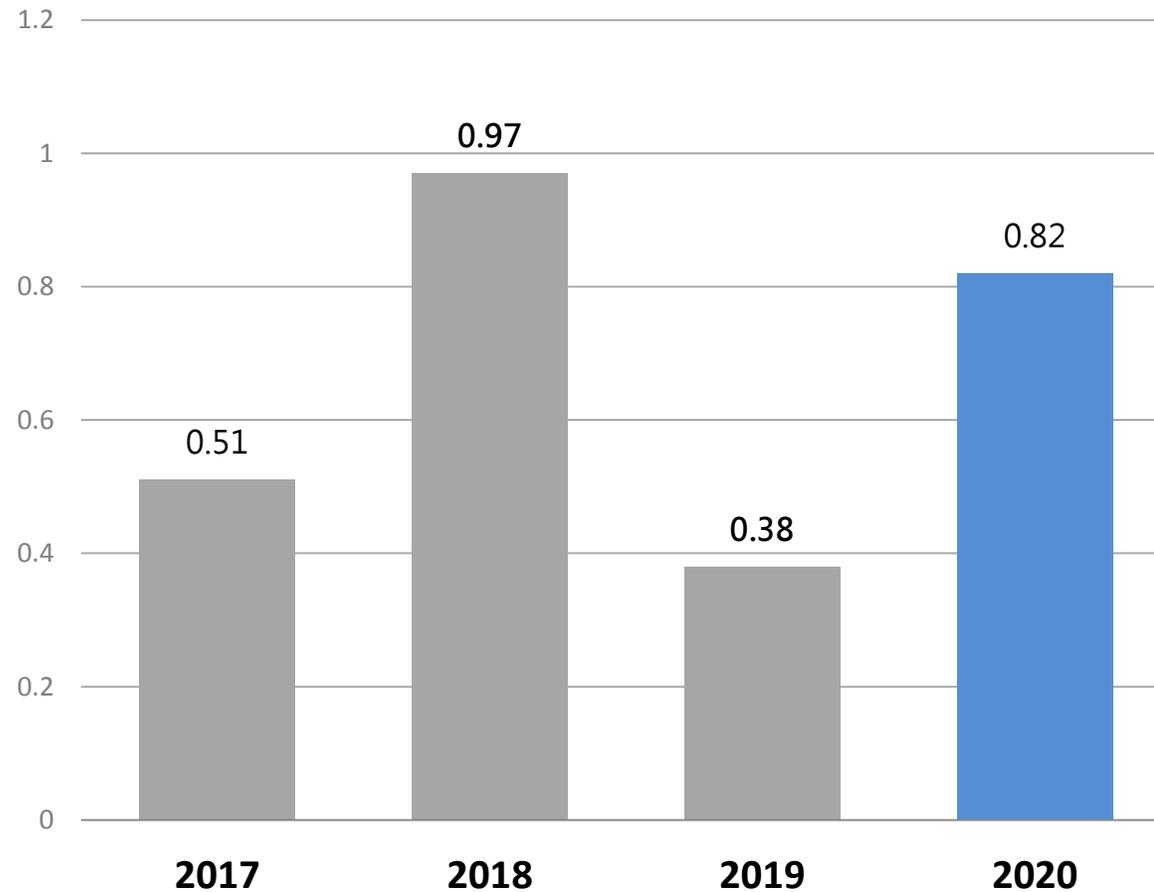


2020年第四季每股盈餘



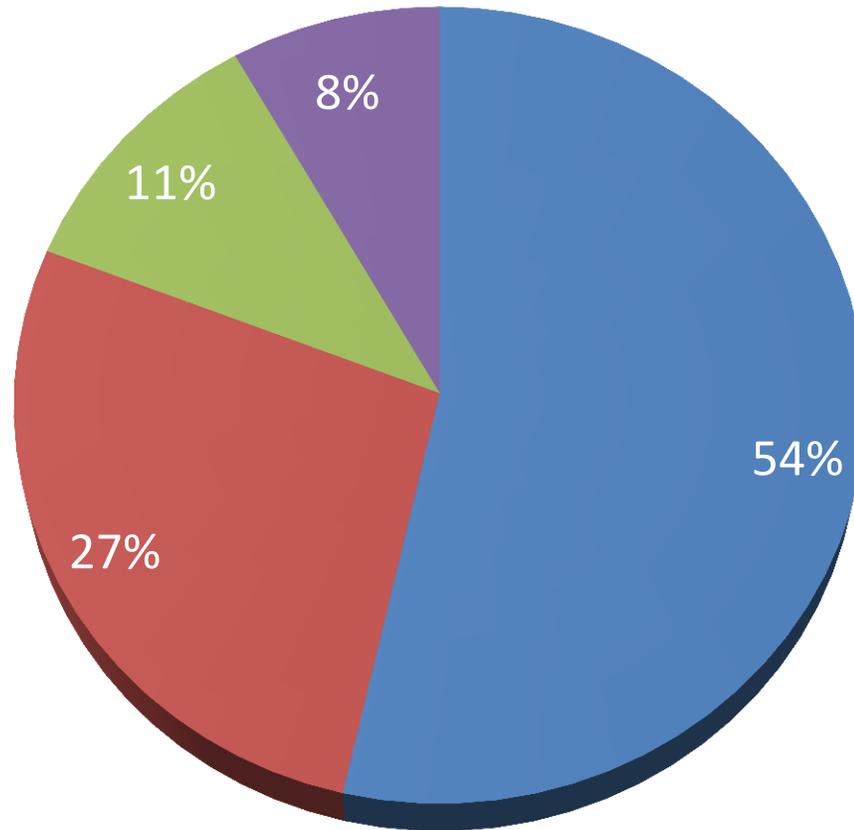
最近四年度每股盈餘

(單位:新台幣元)



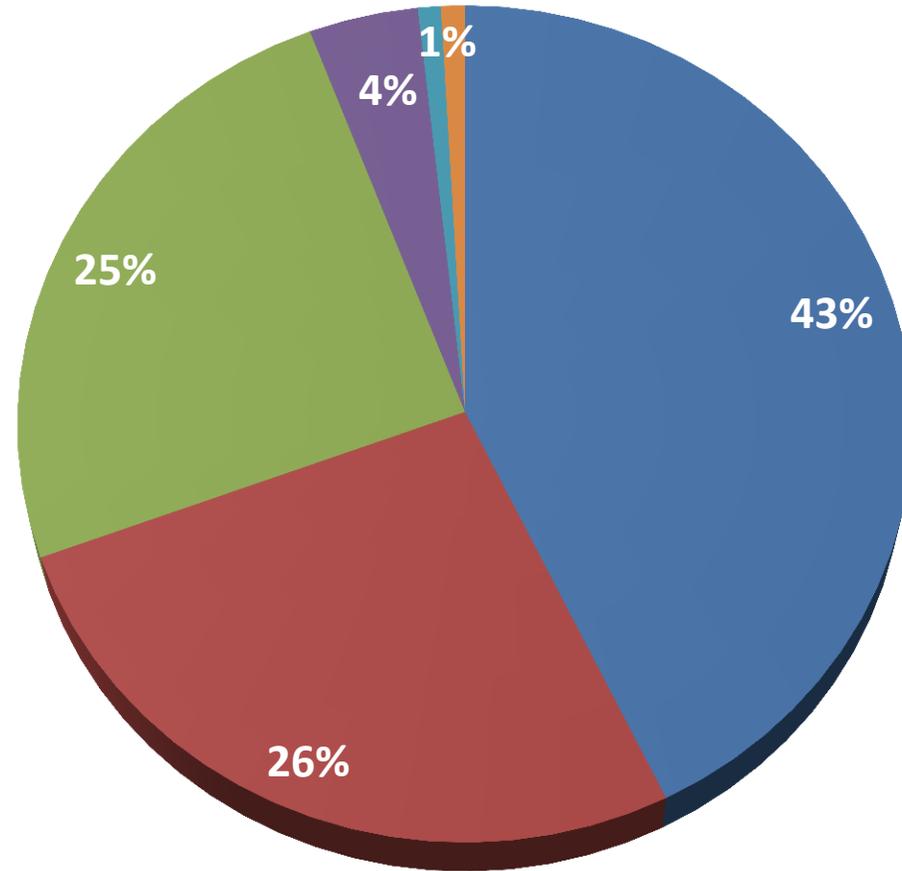
2020年度銷售分析-收入模式

■ 矽智財授權收入 ■ 權利金收入 ■ 技術服務收入 ■ 維護服務收入及其他

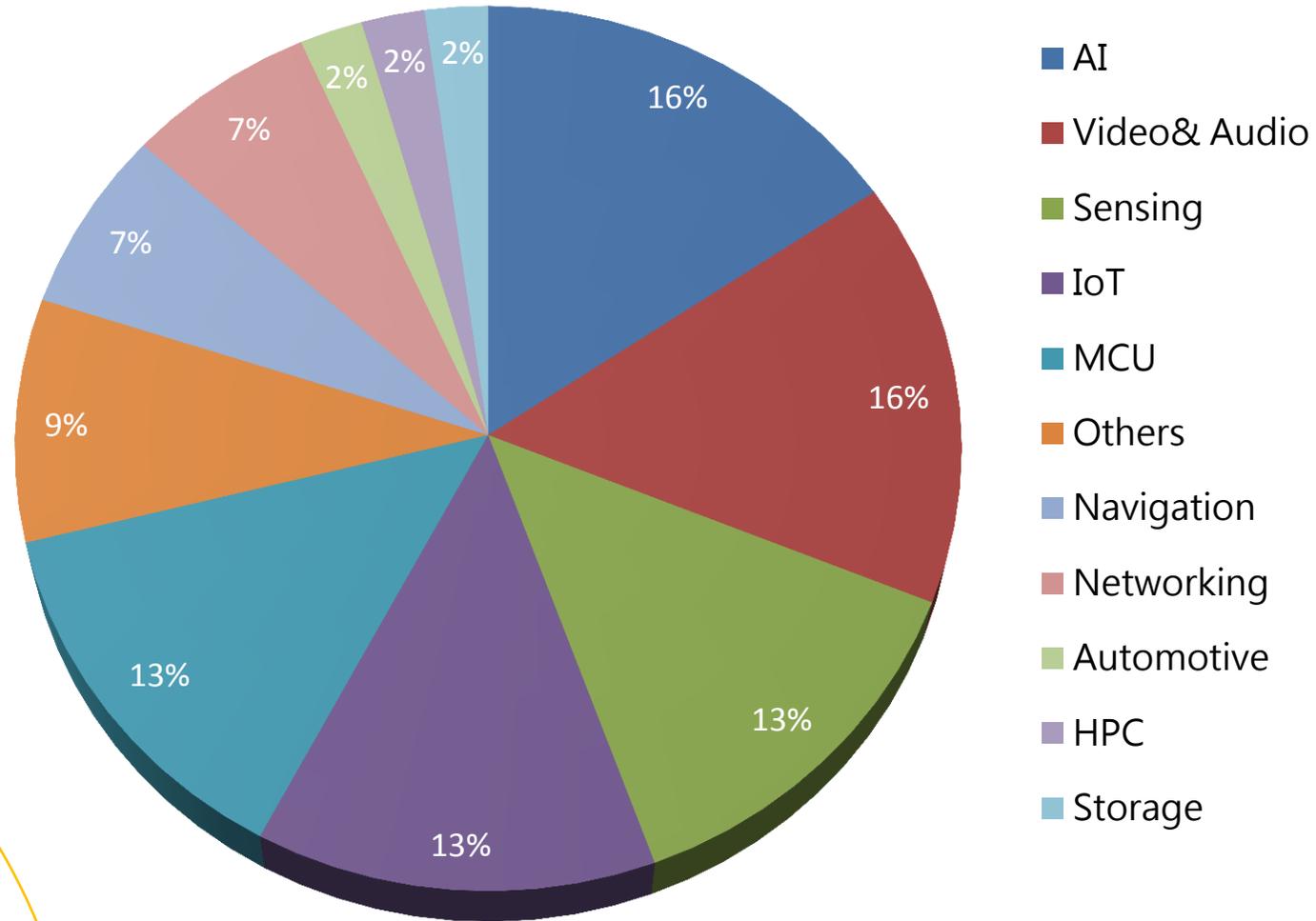


2020年度銷售分析-地區別

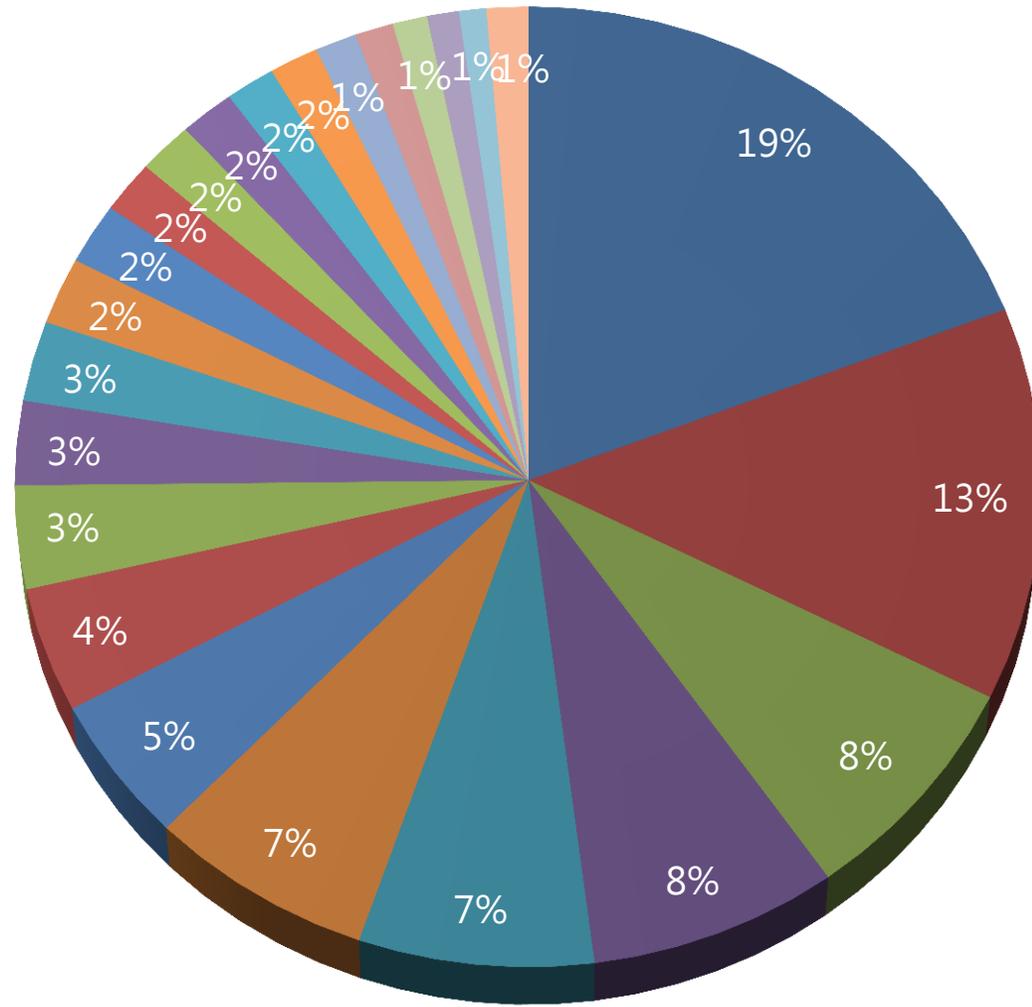
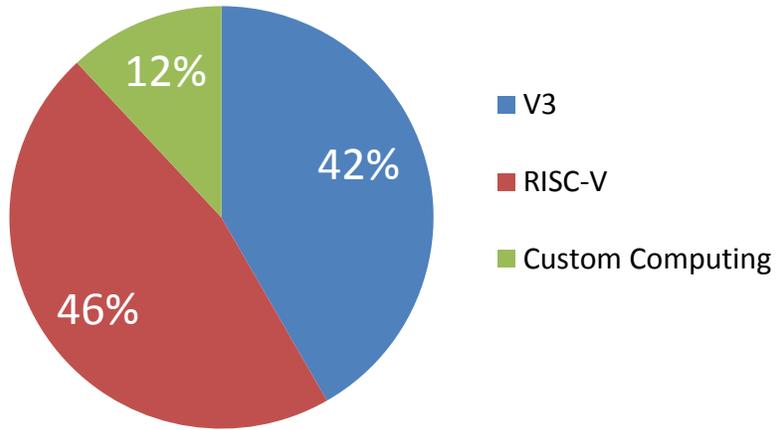
■ Taiwan ■ USA ■ China ■ Korea ■ Europe ■ Japan



2020年度銷售分析-客戶應用

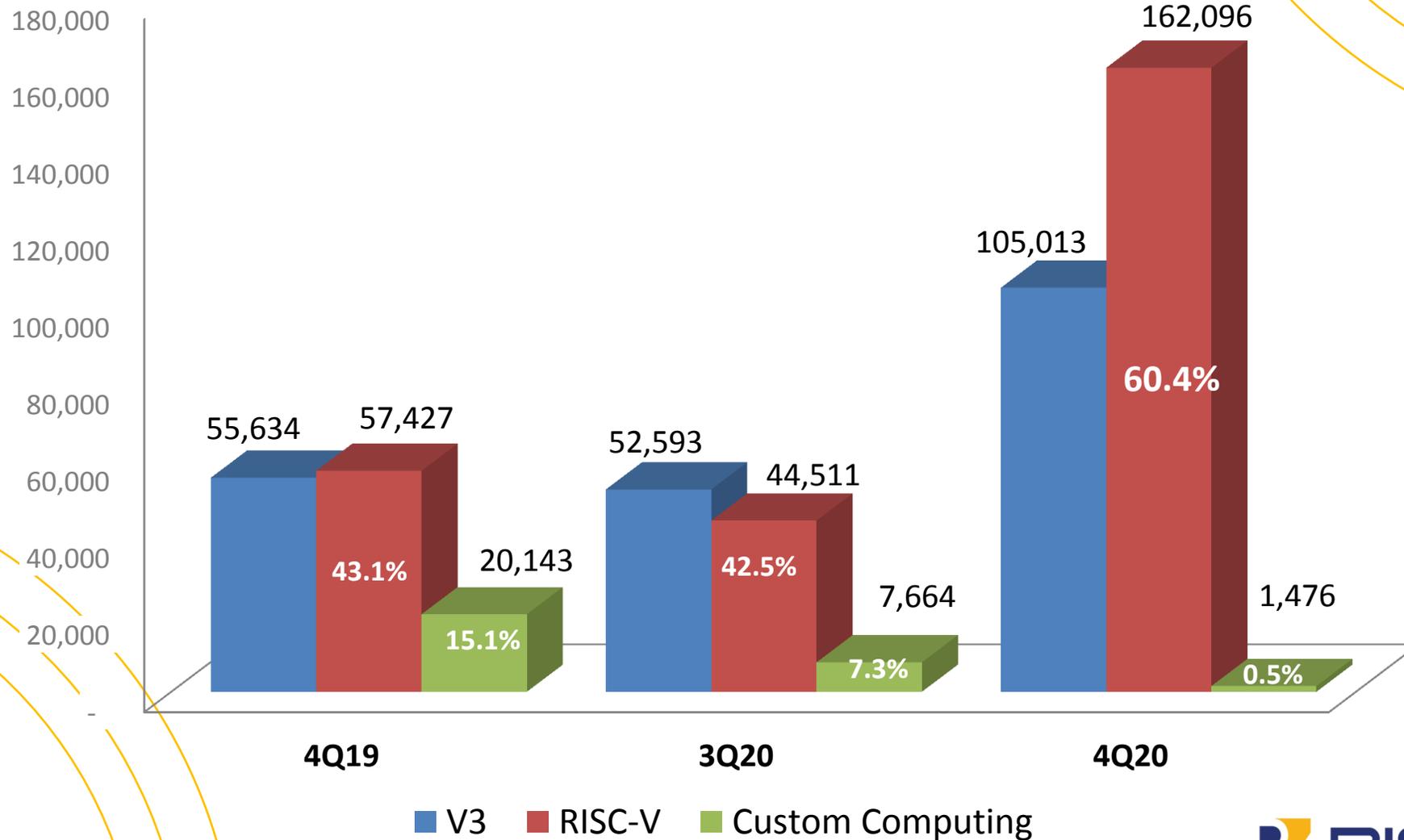


2020年度銷售分析-產品別

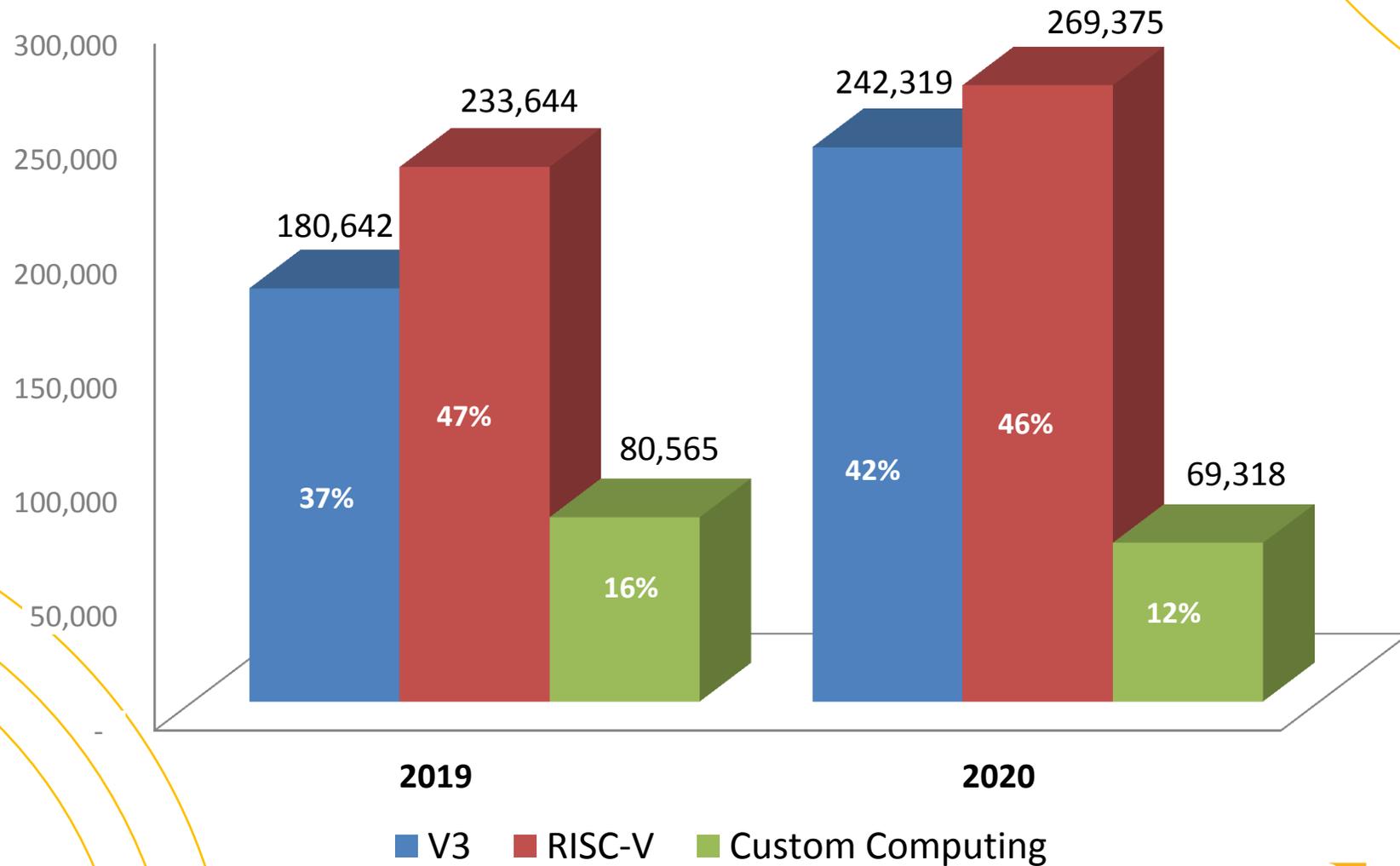


- N8
- N9
- D25
- Customized IP
- N25
- NX27
- D10
- Service
- N45
- ACE
- AX25
- NX25
- A27
- A25
- AX27
- N22
- N10
- N13
- AndeSight
- D45
- NX45
- SYSTEM C
- N7
- OTHER

2020年第四季銷售分析- RISC-V



2020年度銷售分析- RISC-V





產品應用

<http://www.andestech.com>



晶心概況

- ❖ A 16-year-old public CPU IP company
- ❖ 2B+ Andes-Embedded SoC annually in 2020



- ❖ A founding premier member of the RISC-V International
- ❖ An active role in RISC-V International & its extension task groups
 - RISC-V Board Director
 - Vice Chair of Technical Steering Committee
 - RISC-V Ambassador
 - Chair of P-extension (Packed DSP/SIMD) Task Group
 - Co-chair of Fast Interrupt Task Group
- ❖ A major open source maintainer/contributor



The image shows three screenshots of presentation slides:

- Slide 1: GNU-Based Toolchains**
 - binutils, GCC: May, 2017
 - glibc: February, 2018
 - only supports rv64-based ISAs
 - newlib: August, 2017
 - "Probably not a compiler bug"

Logos: SiFive, bluespec, redhat, ANDES TECHNOLOGY

Label: GNU Toolchains
- Slide 2: RISC-V LLVM Porting Effort**
 - Alex Bradbury is in charge of RISC-V LLVM
 - Talk yesterday afternoon
 - Poster on Tuesday night
 - RV32IM[A]FD support upstream
 - Missing hard-float calling convention
 - Missing 64-bit support
 - Missing compressed support
 - Clang, Go, and OpenJDK have run code
 - Rust port in progress
 - Poster on Tuesday

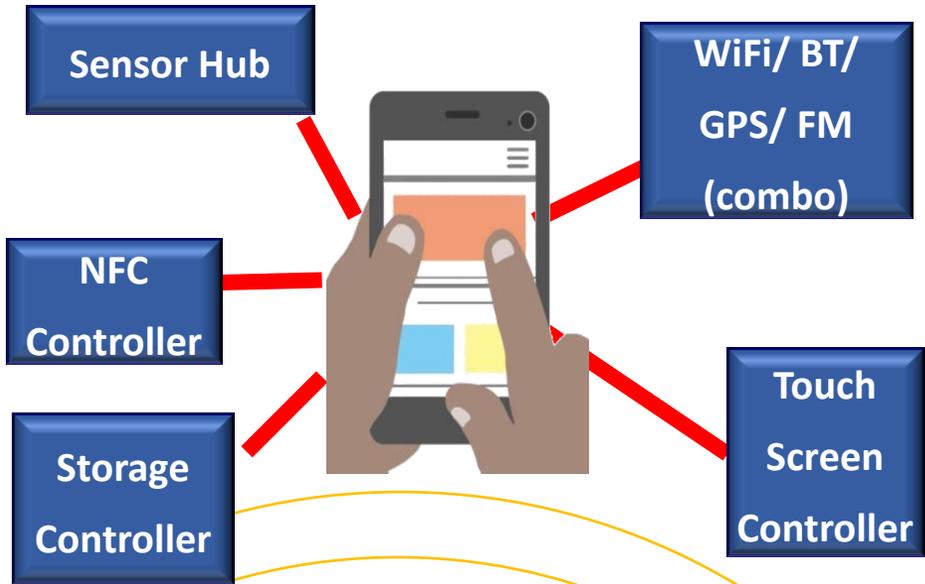
Logos: ANDES TECHNOLOGY, lowRISC, Berkeley

Label: LLVM
- Slide 3: RISC-V Linux Kernel Port**
 - Linux: January, 2018
 - Only RV64-based systems
 - Drivers are tricking in now

Logos: Berkeley, SiFive, ANDES TECHNOLOGY

Label: Linux

晶心嵌入各式各樣新的應用



Andes Embedded in Smart Phones



Smart Speakers:
WiFi IoT



Bike Sharing:
GPS Ctrl



X-Trail:
ADAS Ctrl



Switch:
Game Flash Ctrl



- ❖ In leading **machine learning computers** for datacenter
- ❖ In tier-one **switch routers** for datacenter
- ❖ Recent applications: **5G networking, WiFi 6/7, AI processors** (using Andes Custom Extension, ACE)

晶心RISC-V已應用在邊緣到雲端運算的SoC

❖ Edge to Cloud

- ADAS
- AIoT
- Blockchain
- FPGA
- MCU
- Multimedia
- Security
- Wireless (BT/WiFi)
- Datacenter AI accelerators
- SSD: enterprise (& consumer)
- 5G macro/small cells

❖ 40nm to 5nm

❖ Many in AI



晶心RISC-V核心在SoC中被採用的數目

0 single core

00000
000 2-8 cores

00000000
> 30 cores
00000000

00000000000000000000
00000000000000000000
> 100 cores
00000000000000000000
00000000000000000000

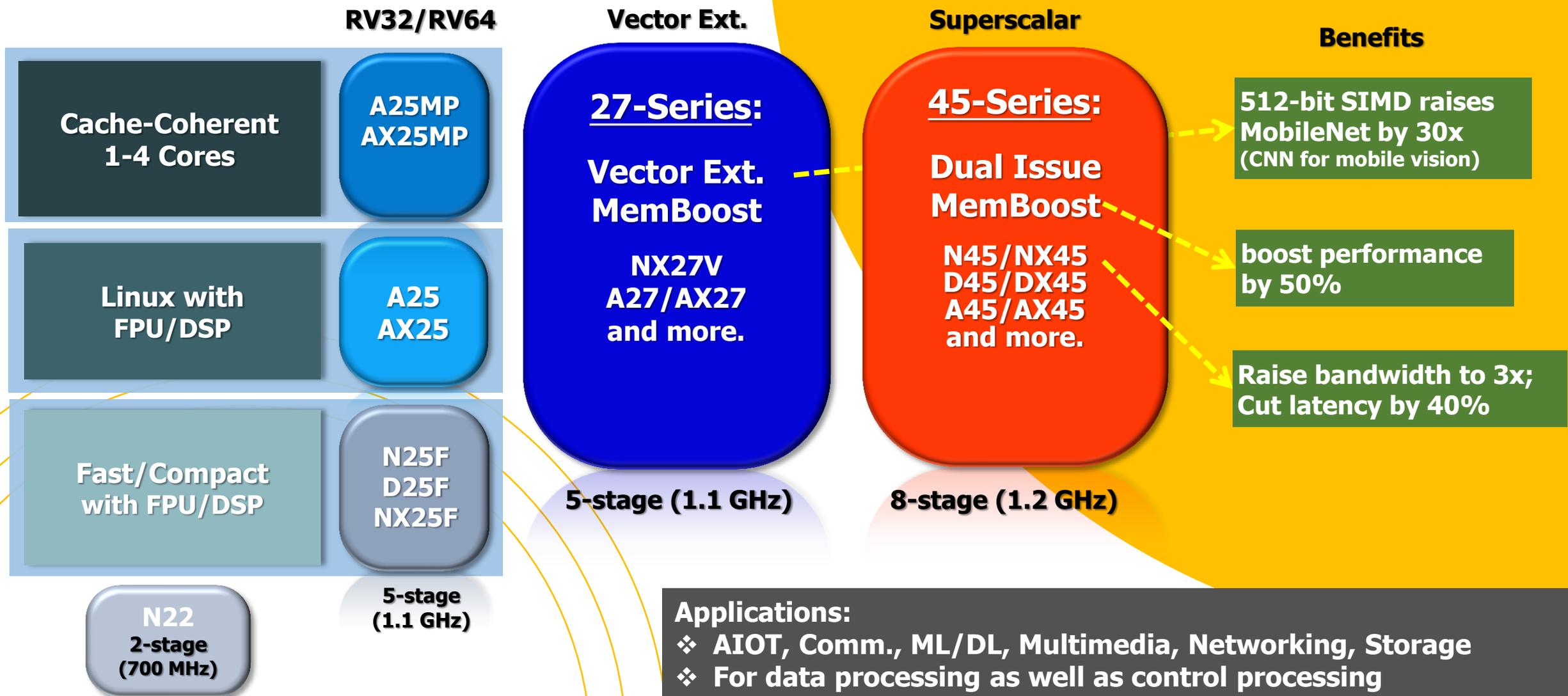
> 1000 cores



新產品及生態系統

<http://www.andestech.com> 

晶心RISC-V產品路線圖



Andes V5適用於廣泛的運算架構

AndeStar™ V5 CPUs



RV32/64



Andes Extension

Conventional Computing Architecture

Leading PPA Embedded Processor

IoT, Sensing, Storage, Audio, GPS

Domain Specific Architecture (DSA)



Define custom instruction to handle time critical codes

N/D-series

N22 N(X)25 D25...

High Performance and Power Efficient AP

5G, AI, Datacenter, Video Surveillance, Networking

Andes Custom Extension

Better approach for accelerator /co-processor to do particular jobs

Vector

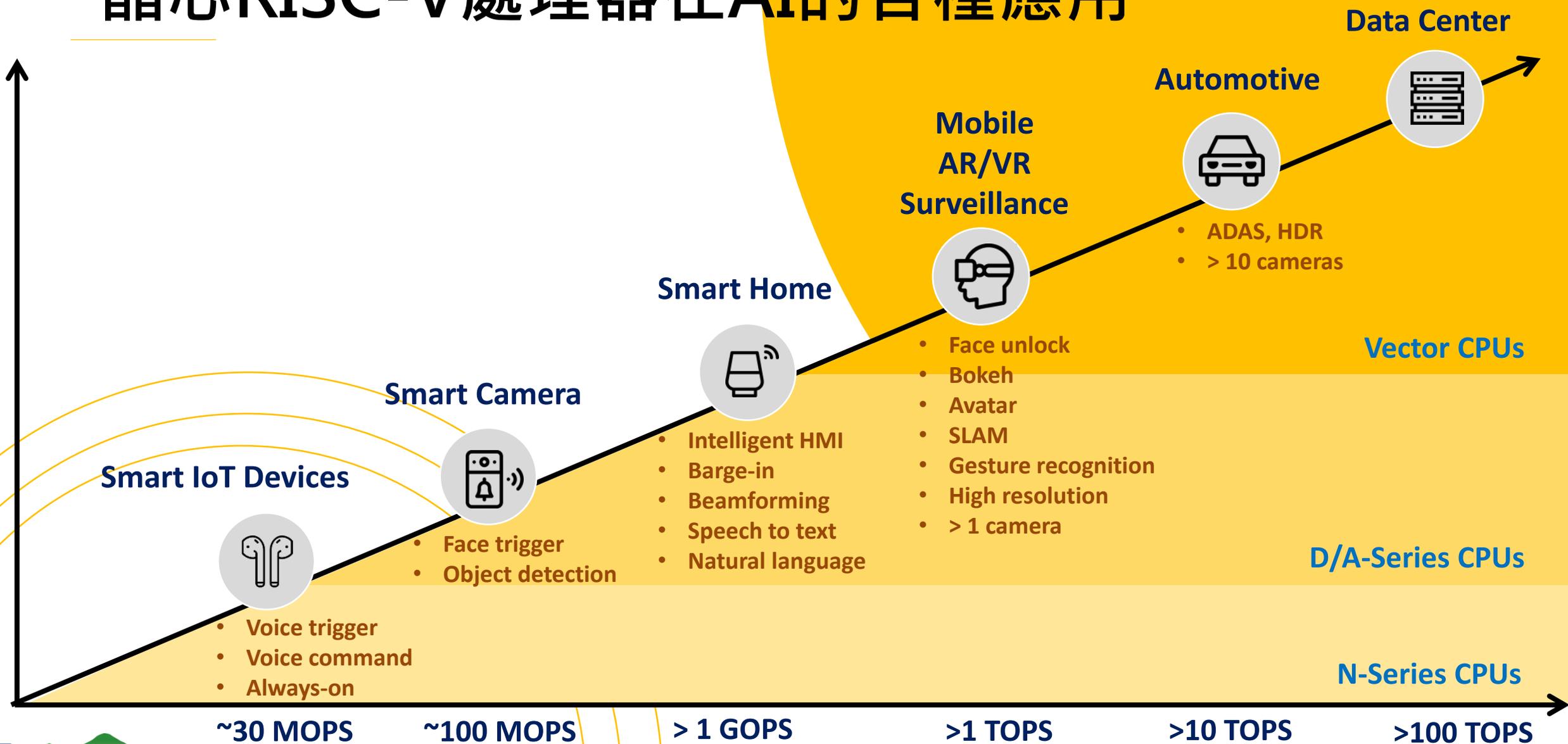
NX27V, NX45V...

Cray Style, Scalable Vector Processor

Datacenter, Server, Deep Learning

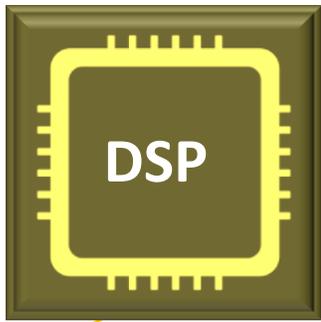
Automation Tool for the generation of toolchain, ISS, partial RTL and verification

晶心RISC-V處理器在AI的各種應用

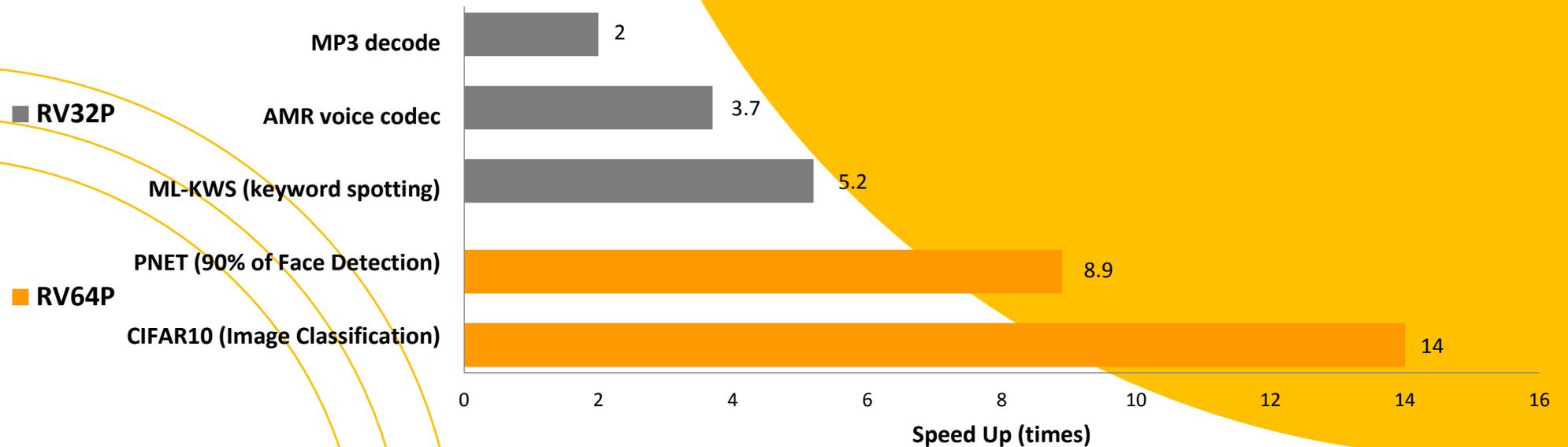


RISC-V DSP Extension

- Andes contributed market-proven DSP(SIMD) as P-Extension
- Designed to accelerate slow video, audio/voice and low data rate DSP workloads

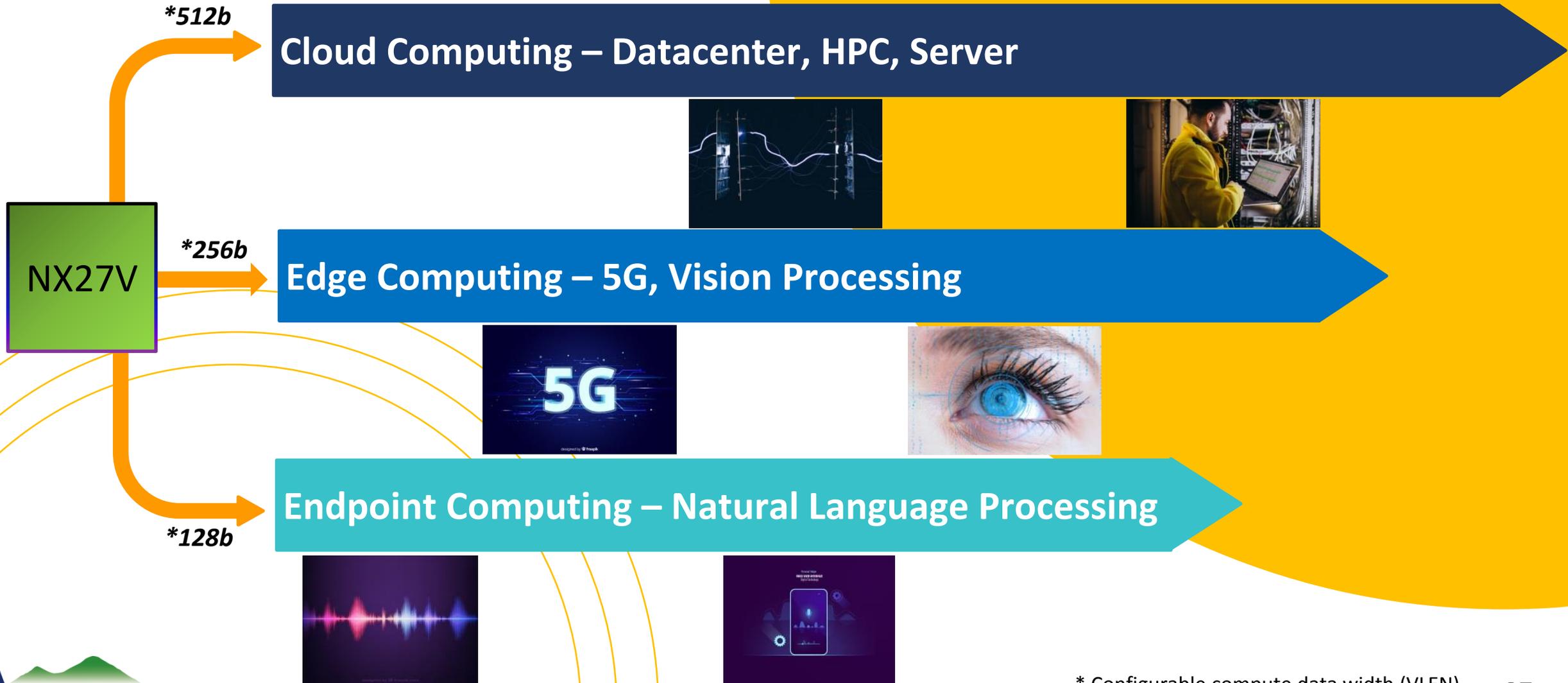


Real world speedup using P-Extension



❖ Increase power efficiency to your DSP applications

晶心向量處理器(NX27V) - One for All Implementations



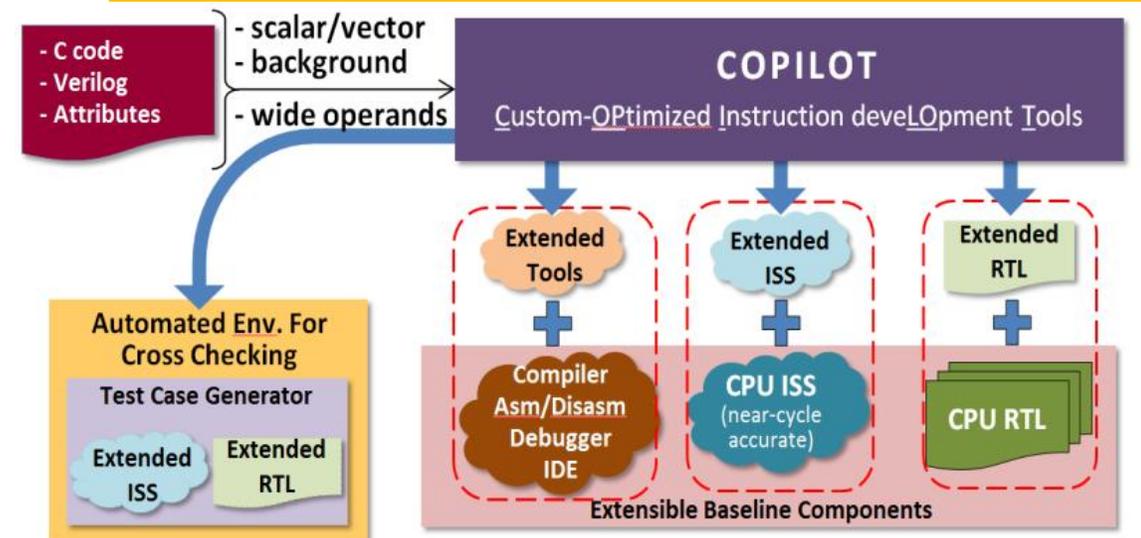
Andes 客製化指令集延伸



- ❖ ACE unlocks RISC-V's Potential of DSA
 - Define ACE instruction to handle time critical codes
 - Another approach to co-processor or accelerators

❖ All-in-one **COPILOT** development environment

- Automation tool and ease of use
- Extensions are easy to re-use, can be used as a library



Taking RISC-V Cores to Next Level

❖ Andes is the world-leading supplier shipping the commercial RISC-V cores to market with the support of

P-Extension

- D25, D45, A(X)25(MP), A(X)27(L2), A(X)45(MP)

V-Extension

- NX27V, NX45V

Custom-Extension

(w/ ACE* support)

- Entire 25, 27, 45 series

晶心RISC-V產品的優勢

Performance & Extensibility

- Leading PPA and code size
- Rich data processing in P, V, and ACE

Configurability

- Flexible configurations for rich features

Maturity

- Compiler optimizations, and SW stacks
- Comprehensive features in AndeSight IDE

積極參與RISC-V社群活動

Foundation Task Groups (partial list)



- ❖ Contributing hardware architecture extensions
 - Chair of the P-extension (Packed SIMD/DSP) Task Group
 - Co-chair of Fast Interrupts Task Group
 - Closely reviewing activities of other Task Groups

晶心協助強化RISC-V生態系統

- ❖ More choices for customers are good
- ❖ Andes works closely with partners to grow RISC-V ecosystem



晶心在 RISC-V 上的定位



Complete product portfolio

Reliable RISC-V core IP vendor

Extreme low power consumption, high computing efficiency

World's leading P-, V- and Custom-Ext. Capable RISC-V cores

Professional custom computing service

生態系統: Andes 與 Knect.me



ANDES
TECHNOLOGY

knectme™



ANDES
TECHNOLOGY

FreeStart Program

❖ FreeStart Evaluation Program (FSEP)

- For all RISC-V enthusiasts and educator/researcher
- Fixed-Configuration N22 RTL
- Sign simple evaluation agreement directly on website

❖ FreeStart Mass-production Program (FSMP)

- For industrial and academy mass production
- Full-configuration N22 RTL
- License fee: \$0; only running royalty is required when mass production

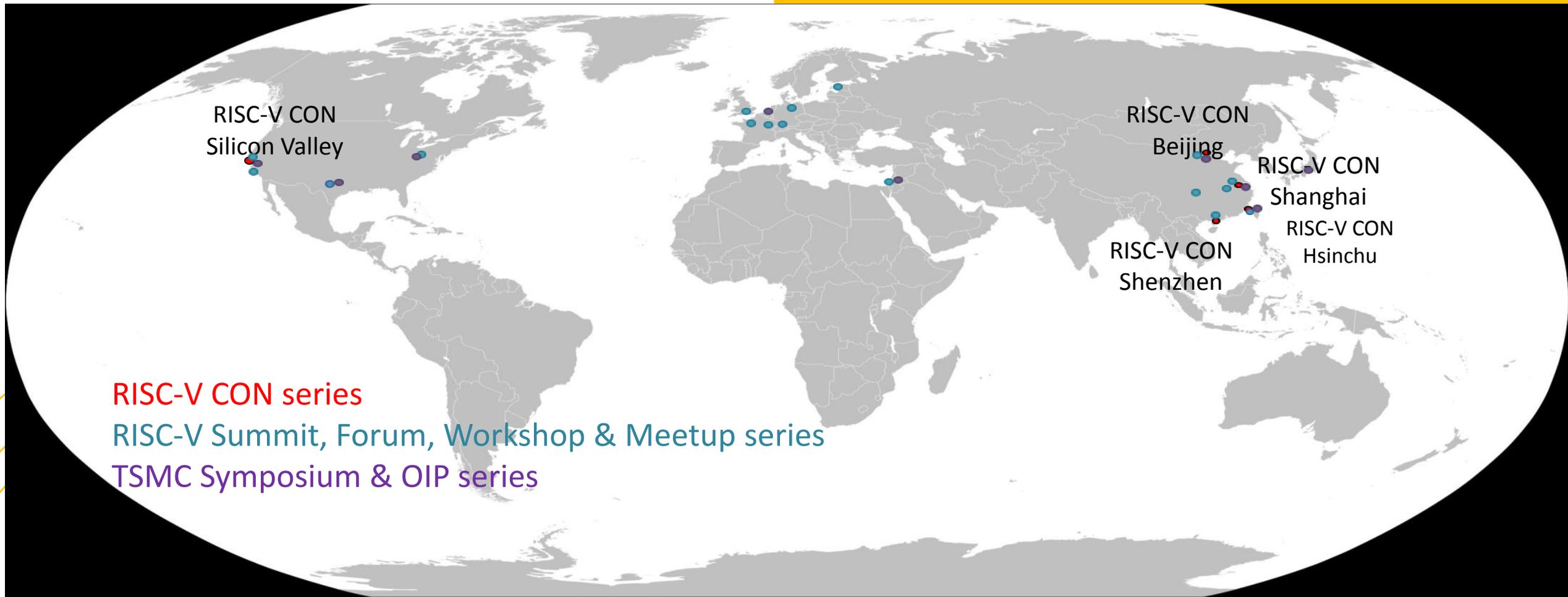
❖ Support Package (FSPP)

- For all
- \$20K for 1st year, including
 - 1 year e-service
 - FreeStart AE250 RTL
 - Corvette F1 FPGA board



For more info., please visit
www.andestech.com

Event Promotion



RISC-V CON
Silicon Valley

RISC-V CON
Beijing

RISC-V CON
Shanghai

RISC-V CON
Hsinchu

RISC-V CON
Shenzhen

RISC-V CON series

RISC-V Summit, Forum, Workshop & Meetup series

TSMC Symposium & OIP series

RISC-V Summit in San Jose
2020: Diamond Sponsor



總結

<http://www.andestech.com> 

A Trusted Computing Expert

Andes Technology

Successfully rolled out new series of RISC-V cores (w/ leading P-, V- and Custom-Ext.), custom computing service and FreeStart program to extend more oppty.

Aggressively involved in RISC-V International new technology development, contributing and leveraging RISC-V eco-system.

Becoming a technology contributor, market promoter, and sales leader in the RISC-V industry

Thank You

<http://www.andestech.com>

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