Andes Technology Corp.
Investor Conference Report
Safe Harbor Notice

Except for the historical information contained herein, the matters addressed in this presentation are forward-looking statements that involve certain risks and uncertainties that could cause actual results to differ materially, including but not limited to weather, impact of competitive products and pricing, industry-wide shifts in the supply and demand for semiconductor products, rapid technology change, semiconductor industry cycle, and general economic conditions.

Except as required by law, Andes undertake no obligation to update any forward-looking statement, whether as a result of new information, future events or otherwise.
Andes Highlights

• Founded in March 2005 in Hsinchu Science Park, Taiwan, ROC.
• Well-established high technology IPO company
• Over 280 people; 80% are engineers.
• TSMC OIP Award “Partner of the Year” for New IP (2015)
• Founding Premier membership in the RISC-V International Association (RISC-V Foundation) (2020)
• Al Global Media Award “Most Outstanding Embedded Processor IP Supplier” (2020)
• Hsinchu Science Park Innovation Award - AndesCore™ NX27V (2020)
• EE Awards - “Taiwan-Product Award” & ”Asia-Company Award” (2021)

Andes Mission

• Innovate performance-efficient processor solution for low-power SoC

Emerging Opportunities

• Smart and Green electronic devices
• Cloud Computing and Internet of Things and Machine Learning
Business Status Overview

❖ **250+** commercial licensees
  - Geographically distributed in Taiwan, China, Korea, Japan, Europe, and USA
  - **600+** license agreements signed

❖ **AndeSight™ IDE:**
  - **22,000+** installations

❖ **Eco-system:**
  - **500+** partners

❖ **10B+** Accumulative SoC Shipped
1Q22 Revenue Analysis

YoY +39.6%
QoQ -21.6%

(NT$ thousands)

1Q21: 151,126
4Q21: 269,054
1Q22: 211,029
1Q22 Top 10 Customers Analysis by Revenue

Top 10 Customer Contributed 78% Revenue

(NT$ thousands)
1Q22 Royalty Analysis

- YoY: 11.6%
- QoQ: -2.8%

(NT$ thousands)

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Royalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Q21</td>
<td>54,667</td>
</tr>
<tr>
<td>4Q21</td>
<td>62,772</td>
</tr>
<tr>
<td>1Q22</td>
<td>60,988</td>
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</table>
# Royalty Analysis

(NT$ thousands)

<table>
<thead>
<tr>
<th>Year</th>
<th>Royalty</th>
<th>Customer numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>445</td>
<td>1</td>
</tr>
<tr>
<td>2012</td>
<td>660</td>
<td>2</td>
</tr>
<tr>
<td>2013</td>
<td>1,285</td>
<td>5</td>
</tr>
<tr>
<td>2014</td>
<td>10,819</td>
<td>9</td>
</tr>
<tr>
<td>2015</td>
<td>12,232</td>
<td>15</td>
</tr>
<tr>
<td>2016</td>
<td>13,320</td>
<td>15</td>
</tr>
<tr>
<td>2017</td>
<td>38,287</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>74,953</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>106,716</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>158,792</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td>233,676</td>
<td></td>
</tr>
</tbody>
</table>

 cherish the income and user base growth over the years.
1Q22 Top 10 Customers Analysis by Royalty

Top 10 Royalty Customers
Contribution Analysis: 88%

(NT$ thousands)
1Q22 Revenue Analysis by Payment Model

- License Fee: 56%
- Running Royalty: 29%
- Maintenance & Others: 15%
1Q22 Revenue Analysis by Region

- Taiwan: 55%
- Korea: 13%
- China: 13%
- USA: 12%
- Europe: 5%
- Japan: 2%
1Q22 Revenue Analysis by Product
1Q22 Revenue Analysis - RISC-V

V3

RISC-V

1Q21

58,684

39%

92,442

61%

1Q21

79,614

30%

189,439

70%

1Q22

111,644

53%

99,385

47%

(NT$ thousands)
Historical Revenue Analysis

License

Royalty
1Q22 Consolidated Gross Margin

(NT$ thousands)

<table>
<thead>
<tr>
<th></th>
<th>1Q21</th>
<th>4Q21</th>
<th>1Q22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Profit</td>
<td>150,700</td>
<td>268,425</td>
<td>210,700</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>99.72%</td>
<td>99.77%</td>
<td>99.84%</td>
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</table>
1Q22 Consolidated Operating Expenses

YoY +50.6%
QoQ -3.9%

(NT$ thousands)

1Q21
- R&D expenses: 71,529
- Administration expenses: 19,110
- Selling expenses: 46,804

4Q21
- R&D expenses: 110,418
- Administration expenses: 27,478
- Selling expenses: 77,618

1Q22
- R&D expenses: 117,129
- Administration expenses: 22,599
- Selling expenses: 67,302

RISC-V®
1Q22 Consolidated Operating Income

YoY -72.3%
QoQ -93.1%

(NT$ thousands)

1Q21: 13,257
4Q21: 52,911
1Q22: 3,670
1Q22 Consolidated Operating Margin

YoY
-7.3 PT

<table>
<thead>
<tr>
<th>(%)</th>
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</thead>
<tbody>
<tr>
<td>10.00%</td>
<td></td>
</tr>
<tr>
<td>5.00%</td>
<td></td>
</tr>
<tr>
<td>0.00%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 Q1</td>
<td>8.77%</td>
</tr>
<tr>
<td>22 Q1</td>
<td>1.74%</td>
</tr>
</tbody>
</table>
1Q22 Consolidated Net Income

- YoY +349.8%
- QoQ +314.7%

(NT$ thousands)

1Q22: 124,425
4Q21: 30,002
1Q21: 27,665
1Q22 Consolidated Net Profit Margin

YoY
+ 40.65 PT

(%)
1Q22 Consolidated EPS

YoY +1.81 $  QoQ +1.92 $
Andes Updates

- A 17-year-old public CPU IP company
- **3B+** Andes-Embedded SoC annually in 2021

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

- A major open source maintainer/contributor

*GNU-Based Toolchains*
- binutils, GCC: May, 2017
- glibc: February, 2018
  - only supports r64i-based i5As
- newlib: August, 2017
  - "Probably not a compiler bug"

*LLVM*
- Alex Bradbury is in charge of RISC-V LLVM
- Talk yesterday afternoon
- Poster on Tuesday night
- RV32IM[AFD] 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

*Linux*
- Berkeley
- SiFive
- lowRISC
Andes Embedded in Various Applications

- 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)
V5 Adoptions: From MCU to Datacenters

- **Edge to Cloud**
  - ADAS
  - AIoT
  - Blockchain
  - FPGA
  - MCU
  - Multimedia
  - Security
  - Wireless (BT/WiFi)

- **40nm to 5nm**
- **Many in AI**

- Datacenter AI accelerators
- SSD: enterprise (& consumer)
- 5G macro/small cells

- **Cloud**

- **Personal**

- **IOT Edge**

- **5G Macro**
Andes RISC-V Cores Adopted in SoC

- Single core
- 2-8 cores
- > 30 cores
- > 100 cores
- > 1000 cores
New Products and Ecosystems

http://www.andestech.com
Andes RISC-V Product Overview

**AndeStar™ Architecture V5**

**AndesCore™ Processors**
- Highly optimized design with leading PPA
- Handy peripheral IPs to speed up SoC construction

**AndeShape™ Platforms**

**AndeSight™ Tools**
- Professional IDE with high code quality
- Extensive SW stacks from bare metal, RTOS to Linux

**AndesSoft™ Stacks**
- Best extensions to RISC-V

**Andes RISC-V Product Overview**
- Professional IDE with high code quality
- Extensive SW stacks from bare metal, RTOS to Linux
- Best extensions to RISC-V
## Andes V5 Architecture for All Levels of Computing

### AndesStar™ V5 CPUs
- **N/D-series**
  - N22 N(X)25 D25...

### Conventional Computing Architecture
- **Leading PPA Embedded Processor**
  - IoT, Sensing, Storage, Audio, GPS

### Domain Specific Architecture (DSA)
- Define custom instruction to handle time critical codes
- Better approach for accelerator /co-processor to do particular jobs
- Automation Tool for the generation of toolchain, ISS, partial RTL and verification

### Andes Custom Extension

### A-series
- A(X)25 A(X)27 A(X)45 Multicore...

### High Performance and Power Efficient AP
- 5G, AI, Datacenter, Video Surveillance, Networking

### Vector
- NX27V NX45V...

### Cray Style, Scalable Vector Processor
- Datacenter, Server, Deep Learning
Andes RISC-V Product Roadmap

**RV32/RV64**
- Cache-Coherent 1-4 Cores
- Linux with FPU/DSP
- Fast/Compact with FPU/DSP
- 2-stage (700 MHz)
- N22

**Vector Ext.**
- 27-Series:
  - Vector Ext. MemBoost
  - NX27V
  - A27/AX27
  - A27L2/AX27L2
  - and more.
- A25
- AX25
- A25MP
- AX25MP

**Superscalar**
- 45-Series:
  - Dual Issue MemBoost
  - N45/NX45
  - D45
  - A45/AX45
  - A45MP/AX45MP
  - (1-8 Cores)
- N45/NX45
- D45
- A45/AX45
- A45MP/AX45MP

**Benefits**
- 512-bit SIMD raises MobileNet by 66x (CNN for mobile vision)
- boost performance by 50%
- Raise bandwidth to 3x; Cut latency by 40%

**Leading positions:**
- The first company offering commercial RVP DSP CPU
- The first company offering the most updated spec of commercial RVV Vector processor
- Tools for RISC-V custom extension expansion: ACE
AndeCore™ 45-Series

32-bit AndesCore™ N45/D45/A45/A45MP
64-bit AndesCore™ NX45/AX45/AX45MP
AndesCore™ 45-Series Overview

- 8-stage In-Order Dual-Issue
- AndeStar™ V5 ISA:
  - RV*GCN (S/D FPU): All Series
  - RV*P-ext (DSP/SIMD): D45/A(X)45
  - MMU for Linux Applications: A(X)45
- MemBoost memory subsystem
- Low power dynamic branch prediction
- Unaligned data accesses
- Fast or small multiplier
- StackSafe™ (Andes Ext.)
- CoDense™ (Andes Ext.)
- Multi-core support: A(X)45MP
  - Up to 8 cores
AX45 Can Do More (vs. 64bit A-series)

- A53
  - 8-stage In-Order Dual Issue
  - Widely adopted by industries in many applications

- AX45
  - 8-stage In-Order Dual Issue
  - Performance is better!
    - Coremark/MHz: 1.32x
    - Dhrystone/MHz: 1.37x
Target Applications for 27 & 45-Series

- AI/Deep Learning
- AR/VR
- 5G
- Networking
- Storage

- Video Surveillance
- ADAS
- V2X (Vehicle to Everything)
- IVI (In-Vehicle-Infotainment)

Metaverse and more...
Bring Andes Strength to RISC-V Cores

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
Concluding Remarks
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

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