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.
Company Overview

http://www.andestech.com
Founded in March 2005 in Hsinchu Science Park, Taiwan, ROC.
Well-established high technology IPO company
Over 300 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)
AI 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 Highlights

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

Andes Mission

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

Emerging Opportunities
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
Operation Results
2Q22 Revenue Analysis

- YoY: -32.4%
- QoQ: -33.6%

(NT$ thousands)

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2Q21</td>
<td>207,370</td>
</tr>
<tr>
<td>1Q22</td>
<td>211,029</td>
</tr>
<tr>
<td>2Q22</td>
<td>140,138</td>
</tr>
</tbody>
</table>
1H22 Revenue Analysis

YoY -2%

(NT$ thousands)

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue (NT$ thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1H21</td>
<td>358,496</td>
</tr>
<tr>
<td>1H22</td>
<td>351,167</td>
</tr>
</tbody>
</table>
1H22 Top 10 Customers Analysis by Revenue

Top 10 Customer Contributed 72% Revenue

(NT$ thousands)
2Q22 Royalty Analysis

YoY +11.5 %
QoQ -7.6%

(NT$ thousands)

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2Q21</td>
<td>50,569</td>
</tr>
<tr>
<td>1Q22</td>
<td>60,988</td>
</tr>
<tr>
<td>2Q22</td>
<td>56,379</td>
</tr>
</tbody>
</table>
1H22 Royalty Analysis

YoY
+11.5%  

(單位:新台幣千元)

105,236  117,367

1H21  1H22
1H22 Top 10 Royalty Contributors Analysis by Application

(NT$ thousands)

Top 10 Royalty Customers
Contribution Analysis: 87%
1H22 Revenue Analysis by Payment Model

- License Fee: 45%
- Running Royalty: 33%
- Maintenance & Others: 18%
- Custom Computing Service: 4%
1H22 Revenue Analysis by Region

- Taiwan: 50%
- USA: 24%
- China: 12%
- Korea: 9%
- Europe: 4%
- Japan: 1%
1H22 Revenue Analysis by Product

- RISC-V: 49%
- V3: 51%

Other products: D45, AX25, N13, ACE, N8, N25, NX27, E8, AX45, N22, D25, N45, AE250, NX25, IAR, Customized IP, N7, D10, AE350, Other
2Q22 Revenue Analysis - RISC-V

(NT$ thousands)

- 2Q21:
  - V3: 75,776 (37%)
  - RISC-V: 131,594 (63%)

- 1Q22:
  - V3: 111,644 (53%)
  - RISC-V: 99,385 (47%)

- 2Q22:
  - V3: 60,920 (43%)
  - RISC-V: 79,218 (57%)
Product Applications
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
Andes Embedded in Various Applications

- Sensor Hub
- NFC Controller
- Storage Controller
- WiFi/ BT/ GPS/ FM (combo)
- Touch Screen Controller

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

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

**AndesStar™ Architecture V5**
- Best extensions to RISC-V; EDA tools

**AndeSight™ Tools**
- Professional IDE with high code quality

**AndesShape™ Platforms**

**AndesSoft™ Stacks**
- Extensive SW stacks from bare metal, RTOS to Linux; NN lib

**Andes Embedded™**

**Andes RISC-V Product Overview**

AndeSoft™

AndesCore™

AndesStar™

AndeSight™

AndesShape™
### Andes V5 Architecture for All Levels of Computing

<table>
<thead>
<tr>
<th>AndeStar™ V5 CPUs</th>
<th>Conventional Computing Architecture</th>
<th>Domain Specific Architecture (DSA)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N/D-series</strong></td>
<td>Leading PPA Embedded Processor</td>
<td>Define custom instruction to handle time critical codes</td>
</tr>
<tr>
<td>N22 N(X)25 D25...</td>
<td>IoT, Sensing, Storage, Audio, GPS</td>
<td>Andes Custom Extension</td>
</tr>
<tr>
<td><strong>A-series</strong></td>
<td>High Performance and Power Efficient AP</td>
<td>Better approach for accelerator /co-processor to do particular jobs</td>
</tr>
<tr>
<td>A(X)25 A(X)27 A(X)45 Multicore...</td>
<td>5G, AI, Datacenter, Video Surveillance, Networking</td>
<td>Automation Tool for the generation of toolchain, ISS, partial RTL and verification</td>
</tr>
<tr>
<td><strong>Vector</strong></td>
<td>Cray Style, Scalable Vector Processor</td>
<td></td>
</tr>
<tr>
<td>NX27V NX45V...</td>
<td>Datacenter, Server, Deep Learning</td>
<td></td>
</tr>
</tbody>
</table>
Andes RISC-V Product Roadmap

<table>
<thead>
<tr>
<th>RV32/RV64</th>
<th>Vector Ext.</th>
<th>Superscalar</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux with FPU/DSP</td>
<td>A25 AX25</td>
<td>45-Series: Dual Issue MemBoost</td>
<td>boost performance by 50%</td>
</tr>
<tr>
<td>Fast/Compact with FPU/DSP</td>
<td>N25F D25F NX25F</td>
<td>5-stage (1.1 GHz) &gt;3.53 Coremark/MHz</td>
<td>Raise bandwidth to 3x; Cut latency by 40%</td>
</tr>
<tr>
<td>N22 2-stage (700 MHz)</td>
<td>A27/AX27 A27L2/AX27L2 and more.</td>
<td>8-stage (1.2 GHz) &gt;5.50 Coremark/MHz</td>
<td></td>
</tr>
<tr>
<td>5-stage (1.1 GHz) &gt;3.53 Coremark/MHz</td>
<td>45Series: N45/NX45 D45 A45/AX45 A45MP/AX45MP (1-8 Cores) and more.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Leading positions:
❖ The 1st company offering commercial RVP DSP CPU
❖ The 1st company offering the most updated spec of commercial RVV Vector processor
❖ Tools for RISC-V custom extension: 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
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 oppy.

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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