Andes Technology Corporation
1Q18 Investor Conference Report
Driving Innovations™

Stock #: 6533
2018/ 05/ 29
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.
Agenda

- Overview of Andes Technology Corporation
- Operating Results
- Product Application
- New Products and Ecosystems
- Concluding Remarks
Overview of Andes Technology Corporation

Andes Highlights

- Founded in March 2005 in Hsinchu Science Park, Taiwan, ROC.
- Core RD team from AMD, DEC, Intel, MI PS, nVidia, and Sun veterans.
- Just over 150 people; 80% are engineers.
- EETimes' Silicon 60 Hot Startups to Watch (2012)
- TSMC OIP Award “Partner of the Year” for New IP (2015)
- A founding member of RISC-V Foundation (2016)
- IPO on Taiwan Stock Exchange (March 2017)

Andes Mission

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

Emerging Opportunities

- Smart and Green electronic devices
- Cloud Computing, Artificial Intelligence and Internet of Things
Operating Results
>148 commercial licensees
- Geographically distributed in Taiwan, China, Korea, Japan, Europe, and USA.
- >212 license agreements signed

AndeSight™ IDE:
- >13,800 installations

Eco-system:
- >122 partners

2.6B Accumulative SoC Shipped:
- (by the end of 2018 Q1)
Consolidated Revenue

- 1Q18 Revenue: NT$34.68 M
- YoY: down 57.5%
- QoQ: down 39.2%

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Revenue (NT$ thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Q17</td>
<td>81,560</td>
</tr>
<tr>
<td>4Q17</td>
<td>57,034</td>
</tr>
<tr>
<td>1Q18</td>
<td>34,681</td>
</tr>
</tbody>
</table>

YoY: -57.5%
QoQ: -39.2%
Royalty Analysis

**YoY**
+41.8%

**QoQ**
-19.5%

(NT$ thousands)

<table>
<thead>
<tr>
<th></th>
<th>1Q17</th>
<th>4Q17</th>
<th>1Q18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Royalty</td>
<td>6,700</td>
<td>11,805</td>
<td>9,501</td>
</tr>
</tbody>
</table>
Consolidated Gross Margin

(NT$ thousands)

- Gross Profit  
  - 1Q17: 81,386
  - 4Q17: 56,798
  - 1Q18: 34,548

- Gross Margin  
  - 1Q17: 99.8%
  - 4Q17: 99.6%
  - 1Q18: 99.6%
Consolidated Operating Expenses

YoY -25.1%
QoQ +0.1%

(NT$ thousands)

- 80,000
- 70,000
- 60,000
- 50,000
- 40,000
- 30,000
- 20,000
- 10,000
- 0

1Q17 4Q17 1Q18

Selling expenses
Administration expenses
R&D expenses

24,998 21,478 19,123
12,682 15,991 12,644
36,678 18,185 23,933

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Consolidated Operating Margin

YoY: -69.6pt
QoQ: -63.0pt

1Q17: 8.6%
4Q17: 2.0%
1Q18: -61.0%
Consolidated Net Profit (Loss) Margin

YoY
-62.0pt

QoQ
-61.4pt

1.3% 0.7%

1Q17 4Q17 1Q18

-60.7%
Consolidated Earnings Per Share

<table>
<thead>
<tr>
<th></th>
<th>YoY</th>
<th>QoQ</th>
<th>1Q17</th>
<th>4Q17</th>
<th>1Q18</th>
</tr>
</thead>
<tbody>
<tr>
<td>(NT$)</td>
<td>-0.54</td>
<td>-0.54</td>
<td>0.01</td>
<td>0.01</td>
<td>(0.53)</td>
</tr>
</tbody>
</table>
1Q18 Revenue Analysis by Payment Model

- License: 60%
- Royalty: 27%
- Maintenance and others: 13%
1Q18 Revenue Analysis by Region

- Taiwan: 49%
- Europe: 19%
- China: 19%
- Other: 13%
1Q18 Customer Application Analysis

*Based on 2018Q1 agreements number
Product Application
Rich Customers’ Applications

- Touch Screen
- eBook/ eDictionary
- Power management
- Bio-medical device
- CMMB
- MCU
- TCON

- Wireless display
- WiFi, Bluetooth
- GPS, GPON, NFC
- Gateway/ router
- Portable Karaoke
- Sigfox LPWAN
- IoT Cat0 base station
- IoT MCU
- ESL
- Smart Meter
- Smart Lighting

- USB3.0
- SSD, eMMC
- Anti-virus
- Sensor Hub
- mSATA
- Secure SD
- Fingerprint Recognition

- Communication & IoT
- Industrial & Video

- Motor Control
- Wireless Charger
- Surveillance
- Barcode scanner
- ADAS
- VEDR
- 4K2K CODEC
- 8K4K CODEC
- and more.....
IoT Application - 1

- Bluetooth Speaker
- Sigfox LPWAN
- Healthcare device
- Wearable device
- Electronic price tags
- Sensor Hub

IoT - LPWAN

- Open Data
- Internet of Things
- Smart Agriculture
- Smart Retail
- Smart Home
- Smart Mobility
- Smart Health
- Smart Government
- Smart Energy

IoT Application - 1

- IoT Platform
- Smart City
- Smart Home
- Smart Health
- Smart Government
- Smart Energy

 IoT LPWAN

- N7
- N8

 Electronic price tags

 Wearable device

 Sensor Hub

 Bluetooth Speaker

 Sigfox LPWAN

 Healthcare device

 Confidential

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IoT Application -2

- Wearable devices
- Drone
- Portable Karaoke
- WiFi/ GPS/ FM/ Bluetooth combo
- GPS/ Beido in shared bikes
- Contactless payment (NFC)
Automotive Applications

- N13
  - Calibration of AVM (Around View Monitoring) in NISSAN New X-Trial

- N10
  - CAR Event Recorder
  - ADAS

- D10
  - ADAS
AI Applications

- N9 Dataflow Processing
- D10 Voice Recognition
- D15F Video recognition
- AI companion
- SoC for WiFi in AI Companion

Courtesy: Wave Computing
Emerging Applications

- AI
  - Deep Learning
- Next generation TV
- Network Engine
  - Router
- Drone
- Robot
- ...
- Many new applications are emerging
New Products and Ecosystems
New AndesCore™ Revealed

New Cores Announced/Released in 2017

- Protocol Processing
- Gateway
- Storage

- Sensor
- WiFi

- BT sensor
- ZigBee sensor
- Strong security

- Wearable
- WiFi
- Gateway

- Switch
- Router

- DSP
- FPU

- Protocol Processing
- Gateway
- Storage

- Sensor
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- Gateway

- Switch
- Router

- DSP
- FPU

IoT graphic source: Wilgengebroed on Flickr

The Internet of Things

CONNECT THE WORLD

Driving Innovations™
Product Lines

♦ New Core released in Andes Embedded Forum 2018

ANDES
V5 AndesCore™ Processors

N25/NX25
N25F/NX25F
A25/AX25
AndeStar™ V5: New Generation of ISA Kernel

V1 → V2 → V3

V3m → V5

V5m

Baseline

RI SC-V Kernel

Custom Ext. DSP/FP Ext. Security Ext.

CoDense™ StackSafe™ PowerBrake

Compiler Opt. >200 DSP Libraries COPILLOT tools Secure RTOS

RV32/ 64I MAC+Andes Ext.

V5m+ more Andes Ext.
AndesCore™ V5 families

Ultra Performance

- Next Generation V5 (V5m with adv. features)
  - CoDense™
  - StackSafe™
  - PowerBrake

Enhanced Features

- Enhanced Features
  - N25(F)*
    - V5m, 32-bit
    - 5-stage, 1GHz
    - PMP, FPU, ACE...
  - NX25(F)*
    - V5m, 64-bit
    - 5-stage, 1GHz
    - PMP, FPU, ACE...

Modern Architecture

- Modern Architecture
  - N25
    - V5m, 32-bit
    - 5-stage, 1GHz
    - Compact
  - NX25
    - V5m, 64-bit, 5-stage, 1GHz
    - Compact

- 28HPC RVT, SS, 0.81V, 0C, with I/O constraints. * Available H1 2018
Fast-n-small cores for control tasks in storage, networking, AI, and more.

- N25: 32-bit, NX25: 64-bit
  - From scratch for the best PPA
- AndeStar V5m ISA
  - Superset of RV-IMAC
- 5-stage pipeline
- Configurable multiplier
  - Sequential or parallel
- Optional branch prediction
- Flexible memory subsystem
  - I/D Local Memory (LM): to 16MB
  - I/D caches: to 64KB
  - Optional parity or ECC
- Bus interface
- JTAG debug module

N25 sample config. @ 28HPC:
- Small: 37K gates, 1GHz (worst)
- Large: 159K gates, 1.15GHz (worst)
New V5 AndesCores Coming this Summer

- **4 New 25-series**: maintain the frequency
  - **N25F/ NX25F**: N25/NX25 + FP support
  - **A25/ AX25**: N25F/NX25F + MMU + S-mode

- **High-performance FP support**:  
  - IEEE754-compliant single/double precisions  
  - Multiply, add/sub, multiply-accumulate:  
    - 1-cycle issue rate, 4-cycle latency  
  - Divide/sqrt: 15 cycles for SP, 29 cycles for DP  
    - Run in the background  
  - **Half-precision** load/store for machine learning

- **MMU support**:  
  - Supporting SV{32, 39, 48}  
  - Page size: {Kilo, Mega, Giga, Tera} page  
  - 4- or 8-entry microTLBs (ITLB,DTLB)  
  - 4-way 32~128-entry Shared-TLB (STLB)
Andes Position in RISC-V

- Complete product portfolio
- Reliable RISC-V core IP business partner
- RISC-V core that runs Linux*
- Extreme low power consumption, high computing efficiency
- World’s only Customer-Extension Capable RISC-V Core

* Linux ported on core design, to release in Q3’18
YTD RISC-V Design Win

- NX25: Enterprise SSD (Taiwan)
- N25, AX25: FPGA (US)
- Three design service joint promotion licenses: US, Korea, China
<table>
<thead>
<tr>
<th>AndesCore™</th>
<th>AndesCore/ Competitor Power Efficiency¹ (DMI PS/ mW)</th>
<th>Competitors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N7</strong></td>
<td>+42%</td>
<td>Cortex-M0+</td>
</tr>
<tr>
<td><strong>N8</strong></td>
<td>+43%</td>
<td>Cortex-M3</td>
</tr>
<tr>
<td><strong>N9</strong></td>
<td>+43%</td>
<td>Cortex-M3</td>
</tr>
<tr>
<td><strong>D10</strong></td>
<td>+48%</td>
<td>Cortex-M4</td>
</tr>
<tr>
<td><strong>N13</strong></td>
<td>+185%</td>
<td>Cortex-A5</td>
</tr>
<tr>
<td><strong>N13</strong></td>
<td>+45%</td>
<td>Cortex-R4</td>
</tr>
<tr>
<td><strong>D15F</strong></td>
<td>+121%</td>
<td>Cortex-M7</td>
</tr>
</tbody>
</table>

1. Power Efficiency is DMI PS/ MHz divided by power consumption (mW/ MHz) when running Dhrystone.
64 Bit Infrastructure and Eco-System

Processor IP's
AndesCore™
NX25

Processor Architecture
AndeStar™
V5, V5m

Development Tools
AndeSight™

Development Platforms
AndeShape™

SW Stacks
AndeSoft™

Andes Embedded™

AndesCore uCore

ITLB
MMU MPU

Instr LM Intf
Data LM Intf

DMA Engine
Bus Interface Unit

Standby & VIC

EDM
COP Intf

Instr Cache
Data Cache

Standby & VIC

EDM
COP Intf

Instr Cache
Data Cache

EDM
COP Intf

Instr Cache
Data Cache

EDM
COP Intf

Instr Cache
Data Cache

LMBRG Bus Matrix

DMA Engine
Bus Interface Unit

LMBRG Bus Matrix

DMA Engine
Bus Interface Unit

LMBRG Bus Matrix

DMA Engine
Bus Interface Unit

LMBRG Bus Matrix

DMA Engine
Bus Interface Unit

LMBRG Bus Matrix

DMA Engine
Bus Interface Unit
Two Ecosystems: Andes and Knect.me
Built up Ecosystem **knect.me** to help IoT Developing
- to **knect** solutions - Silicon IP’s, SW stacks, tools, applications, systems and products

Includes:
- SoC IP Platforms
- Software Stack
- Development Boards
- Development Tools

To Form a IoT League
- to **knect** chip vendors, partners, application developers, system vendors
Added A.I. to Knect.me Ecosystem

What is “IoT League”? We invite Andes’ customers to provide products information which contains AndesCore. IoT League can enhance exposure and reputation in IoT domain. Various applications can help Andes’ customers to attract more and more users to adopt their IoT products.

Companies in alphabetical order
Andes Awarded
Leader of the Emerging Technology

“2018 Top25 emerging tech solutions provider”
— CIO Advisor Magazine

Andes Technology Corporation

For exhibiting excellence in delivering Emerging Tech solutions for the Asia-Pacific region.

Selena James
Managing Editor
Concluding Remarks
Andes: Even Better Value in Future

- Andes Embedded Forums were held in Hsinchu, Shenzhen and Shanghai in May. Its topic focused on RISC-V and got a lot of responses. For example, Andes invited Sifive to joint forces promoting RISC-V.

- Andes aggressively involved in RISC-V Foundation new technology and clusters development, contributing and leveraging RISC-V eco-system. During recent RISC-V Workshop in Barcelona, Andes donated its DSP instruction set to RISC-V Foundation. Andes' CTO and other staffs are also served as key persons in several committees in RISC-V Foundation.

- Andes has successively signed contracts with design houses to authorize N25/ NX25. Those contracts will create a win-win situation for Andes, the design houses and the end customers.
Thank You!

www.andestech.com
Q&A