III’s solutions for energy efficiency
– EMS and AMI systems

Smart Network System Institute
Institute for Information Industry
SNSI Technologies Focus

Broadband Wireless

- Mobile Multimedia
  - Audio/Video, Streaming, DVB-H, VoIP/SIP
  - 3D Graphic, IPTV, TV-Widget, Widget-based TV UI/Payment/DRM
  - MID, Android Phone

- Next generation wireless
  - WiMAX, IMT-Advanced, FemtoCell
  - Communication protocol software
  - Communication standards
  - Testing services (RCT/PCT/IOT)

Intelligent Living Environment

- Wireless Sensor Networks
  - Home Energy Saving and Management System
  - Energy Information and Communication Architecture (AMI)
  - Location Base Service applications
  - Green Building Technologies

- Network security
  - Network vulnerability scanning
  - Web Application Protection Tool
  - Security Information & Event Mgt.
  - Security Sandbox
  - Cloud computing security

Ubiquitous Network Environment

Networking

Designed for Users

Integration across Domains

Core Technology & Market Strategy

Innovation, Compassion, Effectiveness
IOT – System Architecture

Sensing Layer: of wonders

Transmission Layer: of everywhere

Application Layer: of omnipotent

Sensor Network Services
- Logistics, SCM
- Structural health monitoring
- Agricultural control
- Disaster Surveillance
- Military Field
- U-Health care

SN Applications
- SN Middleware
- NGN, Internet, etc.
- Access Network
- Access Gateway
- Sensor Networks
- Mobile RFID Reader

Innovation, Compassion, Effectiveness
Application example 1. Taipei Port container terminal

Wireless Sensor Network technology was applied to Taipei Port Container Terminal (TPCT)
-- Develop and deploy a wireless sensor network based container terminal management system.
-- System Architecture: Terminal operation System (TOS), Truck Dispatching System (TDS), Yard Wireless Sensor Network (TWSN) etc.
-- Deployed 100 Container Car Access Points for positioning in Yard Sector, and 500 ZigBee LBS Tags.
Private Sector: Taipei Port Container Terminal Corp
Evergreen Marine Corp, Wan Hai Lines, and Yangming Marine Transport Corp.

Public Sector involvements:
-- An expressway connecting the Port of Taipei to Freeway and the Greater Taipei area was opened to the public. Construction costs for the expressway topped US$ 1 billion level.

-- Funding support from Ministry of Economic Affairs for related Wireless Sensor Network technology development

Results:
-- Min. 20 % efficiency raise of cargo container load/unload
The 1st Metropolitan Smart & Green Building in Taiwan

Fu-an Memorial Building

Automated window control

Super-low carbon temperature hydro-control

User friendly UI

Domain know how building thermal and lighting simulation

Environment quality analysis tool
Application example 3. Taipei National Palace Museum

Sensors with Temperature and Humidity, Router Coordinator, Gateways are deployed. Interactive and multimedia guidance systems are provided.

Private Sector:
- Innova Tech & Management Consultant, Inc., Bright Ideas Design Co., Ltd., etc.

Public Sector: National Palace Museum

Tour guide and education

Humidity & temperature monitor and control

Innovation, Compassion, Effectiveness

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Application example 4: LED light & control in parking lots

- **Public Sector**
  - Ministry of Economic Affairs, Sanchong City government

- **Private Sector**
  - LiteOn Technology Corporation
  - Peng-Pei Co. Ltd

**Results:**
- Power saving
- Better safety
Today’s focus -- III’s Solution
EMS (Energy Management System)

In-Snergy
• R&D 100 Awards identify the 100 most significant, newly introduced research and development advances in multiple disciplines.
• Winning one of the R&D 100 Awards provides a mark of excellence known to industry, government, and academia as proof that the product is one of the most innovative ideas of the year, nationally and internationally. In-Snergy thanks the Ministry of Economic Affairs for funding both technology development program and innovative technology application program to support this project.

2011 R&D 100 Award Winners

<table>
<thead>
<tr>
<th>Primary Developer</th>
<th>2011 R&amp;D 100 Winning Technology (Category)</th>
<th>Co-developers/Contributors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institute for Information Industry (III), Taiwan</td>
<td>In-Snergy Technology: Cloud-based Intelligent Energy Management Technology (Energy Devices)</td>
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</tr>
<tr>
<td>Intel, USA</td>
<td>The 2010 Intel Core Processor Family (Information Technologies)</td>
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<tr>
<td>Lawrence Berkeley National Laboratory, USA</td>
<td>Nanostructured Antifogging Coatings (Materials Sciences)</td>
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<tr>
<td>Lawrence Livermore National Laboratory, USA</td>
<td>Serrated Light Illumination for Deflection-Encoded Recording (SLIDER) (Imaging Technologies)</td>
<td></td>
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</tbody>
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In-Snergy Supported Applications

- Energy Management
  - Convenience Chain Store
  - Hotel Building
  - Factory / Office
  - School / Dormitory
- Environment Monitoring
- Street Lighting Management
- Renewable Energy Generation Monitor

Diagram:
- Energy Management
- Solar Energy Generation Monitor
- Environment Monitor
- Demand Response
- IntellGreen
- Street Lighting Management
- Renewable Energy Generation Monitor
Remote maintenance and Management

Street Lighting On/Off/Dimming Control
Today’s focus -- III’s Solution
EMS (Energy Management System)

Polar Bear
About AMI -- definition

- AMI Definition from Federal Energy Regulatory Commission (FERC) Staff
  - A metering system that records customer consumption hourly or more frequently and that provides for daily or more frequent transmittal of measurements over a communication network to a central collection point …
What can we expect from AMI

- AMI can provide large operational cost savings to a utility
- Customers can reduce system resource costs by reducing demand, especially at times of high system demand
  - time-varying pricing and demand response programs
    - CPP (Critical Peak Pricing)
    - TOU (Time of Use)
AMI provides operational cost savings to a utility

- Remote meter reading
- Remote disconnection/reconnection (electric only)
- Identification of outage locations
- Improved tamper detection
- Improved capacity utilization
- Grid voltage and phase monitoring
- Better load data for planning purposes
System functions

- Customer info.
- System config.
- Meter management
- Real time info.
- Group
- Event analysis
- Meter data analysis
Thanks for your attention!