Sachin Gupta
Vice President Sales, Asia

Smart Grids – The Foundation for the Future

5th Asia Regional Dialogue Mitigation Action Implementation Network (MAIN-Asia)

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Vice President Sales, Asia
Agenda

• Global and Regional Drivers
• Introduction to Trilliant
• Global Case Studies
• Summary
Global & Regional Drivers
21st Century Energy Challenges

- Safe, Reliable, Affordable Energy
- Aging Infrastructure
- Increasing Demand
- Increasing Peak
- DER/Electric Vehicles
- Renewables
- Supply Shortages
- Non-technical Losses
- Carbon
- Prepay

Trillian
Rapidly Growing Demand in Asia

World Electricity Consumption by Region

Source: OECD/IEA World Energy Outlook 2009 - Reference Scenario
Vietnam: Unique Challenges & Opportunities

90M
World's 14th Most Populous Country, will grow to 100M+ in 2030

6%
2015 GDP Growth Goal of 6.2%*
(Predicted to be 22th largest in 2030)

5-7%
Electricity Losses

8%
Increase in Electricity Demand Annually*

*PWC Study, IFS, Trading Economics, Economist
The Smart Grid’s Role

- **Improve Reliability & Efficiency**
  - Real-time communications for monitoring and control of the grid
  - Minimize technical and non-technical losses
- **Reduce CO2 Emissions**
  - Reducing demand to utilize more efficient generation
  - Facilitate the integration of cleaner energy resources
- **Improve Energy Security, Conserve Energy, Save Cost**
  - Efficiency/Conservation will delay or minimize the need for new generating capacity
  - Manage peak through time-of-use rate structures and demand-side management programs
  - Better consumer engagement and access to tools

Pike Research Recommends:
- Adopting smart meters and an advanced metering infrastructure
- Upgrading T&D systems with distribution and substation automation (DA/SA)
- Developing clean and renewable energy sources
- Creating a comprehensive smart grid structure

“Improvements could cut demand ~15% by 2035, an amount exceeding Thailand’s current demand”
• Smart Metering is often the beginning of the “smart” journey
• A robust communications infrastructure lays the foundation for future smart city and IoT applications
• When planned properly, the asset owner can create significant long term value by leveraging the infrastructure for multiple applications
• New Revenue Streams Can Fundamentally Change the Utility Business Model
Trilliant Introduction
Trilliant: Global Leader in IoT Connectivity

End-to-End Smart Communications Platform for IoT, Smart City, & Smart Grid

Silicon Valley Innovation

• HQ in Silicon Valley
• Operations in the US, Canada, Latin America, Europe and Asia
• Deep Industry Expertise
• Over 35 industry patents

Award Winning IoT Platform

✓ Only true End-to-End wireless platform applicable worldwide
✓ Largest cellular and unlicensed RF mesh deployments globally
✓ Multi-tiered solution supports variety of smart grid and IoT applications

Global Footprint

Global Footprint >100M Consumers

Strong Ecosystem

SIEMENS IBM GE Alcatel-Lucent

OPower OSIsoft Innovari

ORACLE Schneider Electric AutoGrid

ecobee EDMI Itron Landis+Gyr

Apollo
Industry Leadership

Distribution Automation Company of the Year
IoT Innovation Award
CIO Award: Most Promising Energy Technology
Top 50 Utility Vendor
Asia - Technology of the Year
Smart Grid Product of the Year
USA – Technology of the Year
Top 14 in ‘14 Companies to Watch

Recent Client Successes

Asia Utility Week 2016 Awards

Congratulations to EVN!

**Best Digital Transformation**
EVN and Trilliant

**Best Customer Value AMI**
TNB and Trilliant
Trilliant Smart Communications Platform

End-to-End unlicensed wireless communications platform for Smart City and IoT

**5GHz SecureMesh WAN**
- 54Mbps, <10ms latency
- AMI Backhaul, DA/SCADA, Recloser Control, Renewable Integration, Video Surveillance, WiFi

**2.4GHz SecureMesh NAN**
- 2.4Mbps, IPv6
- AMI and Smart City applications (Street Lighting, Traffic Mgmt, Ind Sensors)

**2.4GHz RPMA Canopy**
- AMI and Smart City Applications
- Latency Tolerant Apps, Targeted Deployments, Battery Powered Devices
Client Case Studies
Case Study: Hydro One, Ontario, Canada

Unique Needs

Hydro One: Energy Efficiency and Renewable Integration

- Vertically Integrated Utility
  Corporate and government commitment to AMI and Smart Grid
- Tough Environment
  1.2M Customers over 640K sq km, very rural
- Early adopter
  1st large scale wireless mesh AMI rollout in North America
  Full TOU implementation

- Business Drivers
  Consumer Empowerment/Conservation
  Cleaner Generation – RE Integration
  Future Proof grid to accommodate new technologies

- Customer Drivers
  Customer Empowerment – tools to manage cost
Customer Success: Leader in North America

1.2m Meter AMI Deployment Finishes in 2014 – Exceeding all Targets

Project Success:

• 1.2M customers on TOU
• 1,400 MW of Renewable Energy
• Avoided generation with ~150 MW of peak-load
• 26K micro-scale renewable applications in first 2 yrs alone
• Reducing GHG by 11 Megatonnes annually by 2030
• Award-winning project:

“Combining standards-based AMI with the leading wireless and broadband networks...will improve net return on assets, secure investment in the future, and lead to improved consumer satisfaction, distribution productivity, and system reliability.”

—Rick Stevens, Vice President, Customer Service, Hydro One

Partners:

eMeter  Capgemini  Itron
Case Study: Iberdrola, Central Maine Power

Unique Needs

- **CMP: Broad Vision, Reliability and Efficiency**
  - US subsidiary of Global Iberdrola Grp
  - Vertically Integrated, Investor Owned
    - 630K customers
  - Sophisticated, broad Smart Grid vision
    - End-to-end Smart Grid. Operational, societal, and environmental benefits
  - **Business Drivers**
    - Reliability Improvement – storm recovery
    - Operational Efficiency
    - Energy Efficiency
    - Customer Benefits
  - **Customer Drivers**
    - Reliability
    - Tools to manage consumption

Images from Iberdrola
Benefits Today

• Customer value of $20.7M over 5 years
• Operational savings of $7.4M/year
• Reliability impact - over 213K outage hours reduced, 20 min reduction in SAIDI
• Technical loss improvement - 6% reduction
• Enhanced customer benefits — AMI saving 10 minutes on outage notification (vs phone call), reconnect avg 7 minutes
• 99% service orders performed remotely (2K/day)
• 1st in JD Power Customer Satisfaction for 7 years
• Won Edison Electric Institute Storm Recovery awards in 2012 and 2013
• Reduction of more than 1,400 tons of vehicle-based CO₂ emissions annually from reduced miles of avoided field visits

Expansion Plans

• Continuing to add applications to network
• Support generation and demand balancing

“We have ambitious goals to improve our service and deliver value for customers through our Smart Grid network. Trilliant provided the right combination of communication and metering technology to suit our needs.”

— Sara Burns, President and CEO, CMP
Select a communications platform to meet EVN’s business requirements to:

- Support energy efficiency programs that can offset demand growth
- Improve reliability for EVNHCMC customers
- Reduce electricity losses in network
- Provide more information to allow better decisions
- Improve customer satisfaction

Ensure the platform has the capability to support future smart grid and smart city applications over ~15 years

Develop an understanding of the impact to business operational processes that come along with the transformational technology to prepare for large scale deployment

Prove the ability to offer better service to some of Vietnam’s most demanding and critical customers
Project Summary

• Initial application of AMI in Hi Tech Park
• Integrated platform eliminates need for complex integrations of multi-vendor solutions, O&M of multiple platforms, and results in optimal Total Cost of Ownership
• Platform offers flexibility to leverage existing canopy beyond AMI for Distribution Automation, and other smart grid and smart city applications in the future
• 2016 Award Winning Project
Conclusion
Vietnam is Experiencing Tremendous Growth and a Changing Landscape that Present Both Challenges and Opportunities

Smart Grid is Imperative to Help Solve These Challenges

The Smart Grid Forms a Foundation with Significant Potential for New Applications and Even New Revenue Opportunities

Controlling the Foundation Affords Utilities an Opportunity to Lead the Way to the Future
Cảm ơn
(Thank you)

www.trilliantinc.com