



Cisco Connected Grid  
**Powering End-to-End  
Communications & Innovation**

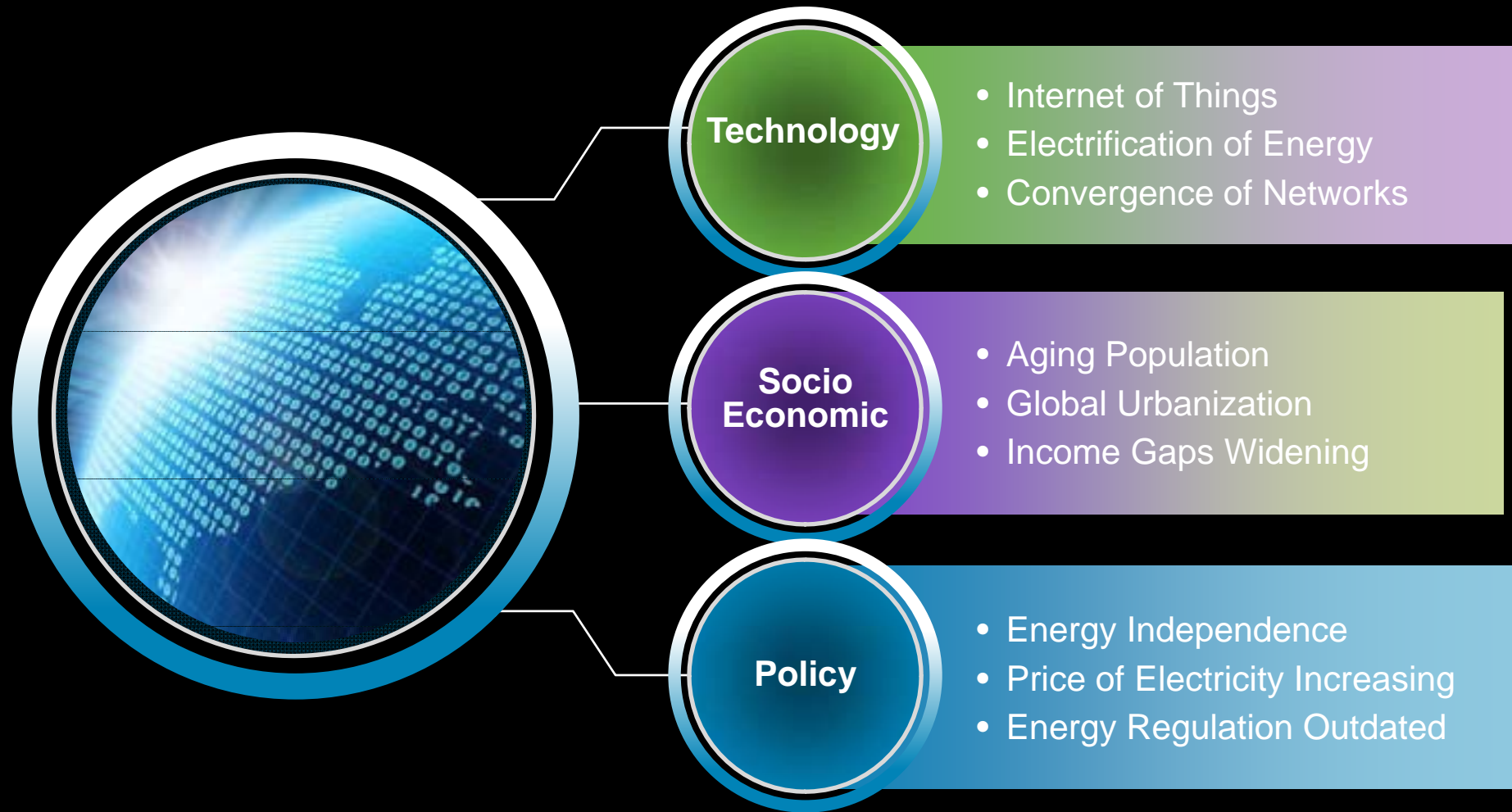
**Stephen Goodman**  
Vertical Solutions Architect

19 October 2011

# Forward-Looking Statements

This presentation contains projections and other forward-looking statements regarding future events or the future financial performance of Cisco, including future operating results. These projections and statements are only predictions. Actual events or results may differ materially from those in the projections or other forward-looking statements. Please see Cisco's filings with the SEC, including its most recent filings on Form 10-K and Form 10-Q, for a discussion of important risk factors that could cause actual events or results to differ materially from those in the projections or other forward-looking statements.

# Global Megatrends Changing Energy



# Energy Technology Megatrends

Limited Sensing

TO

Deep Situational Awareness

Batch Processing

TO

Real Time Processing

Centralized

TO

Distributed

Limited Security

TO

Pervasive Security

Proprietary

TO

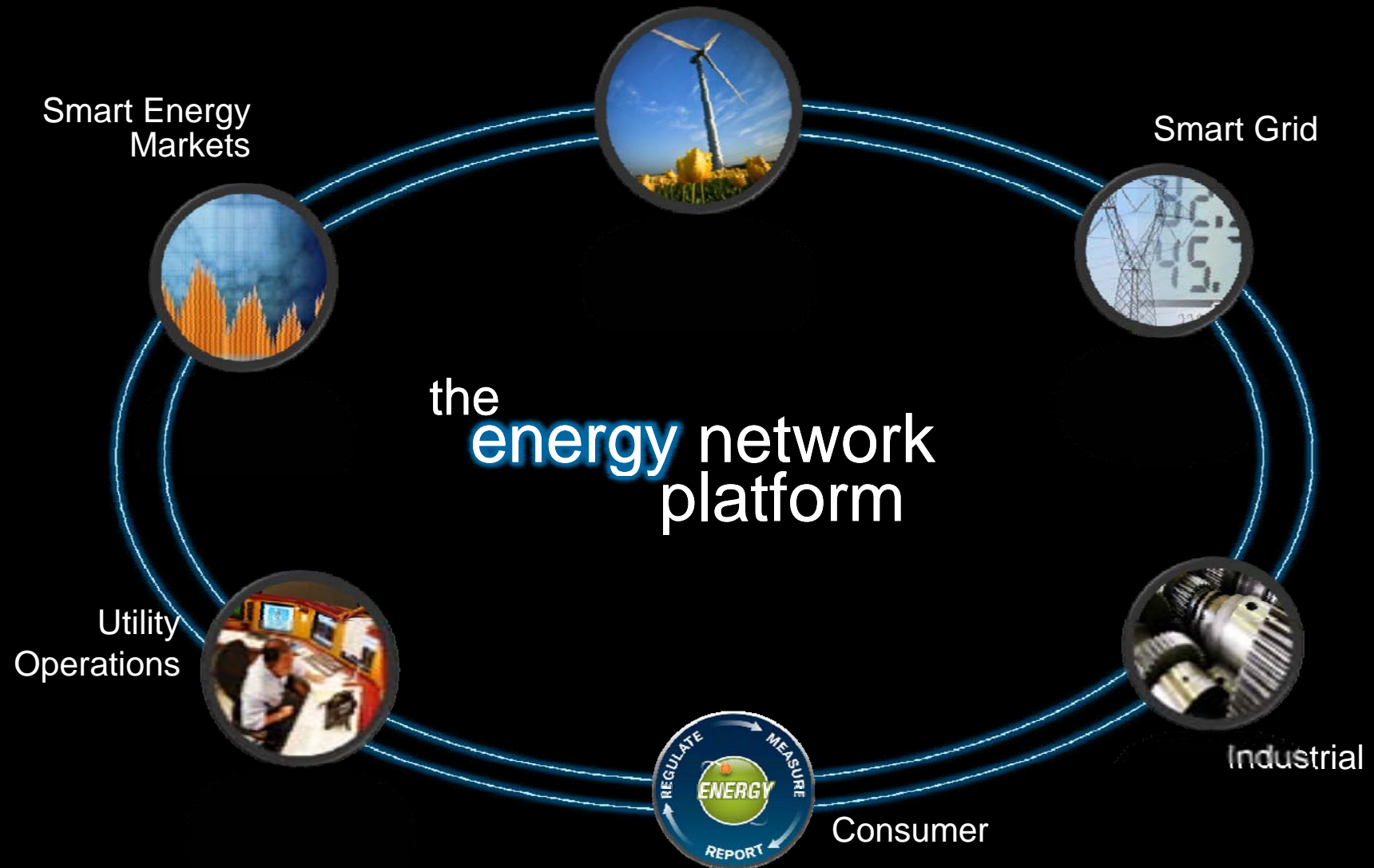
Open Standards

“Transform energy production, distribution and consumption using an end-to-end IP platform to sustainably meet the world’s future energy needs”



Cisco Connected Grid Vision

# The Network as the Platform





# Energy Network Platform

The network and networking technologies will enable the electric grid to become:



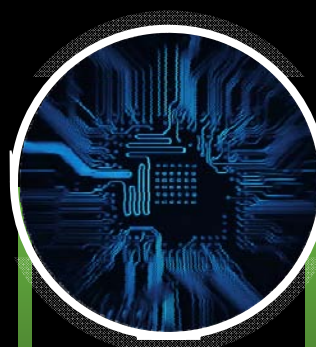
## OBSERVABLE

Deep  
Situational  
Awareness



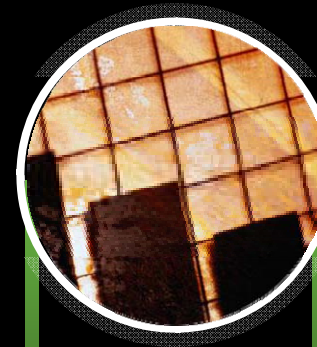
## AUTOMATED

Minimal  
Human  
Supervision



## INTELLIGENT

Distributed  
M2M  
Intelligence



## TRANSACTIVE

Distributed  
Market  
Participation

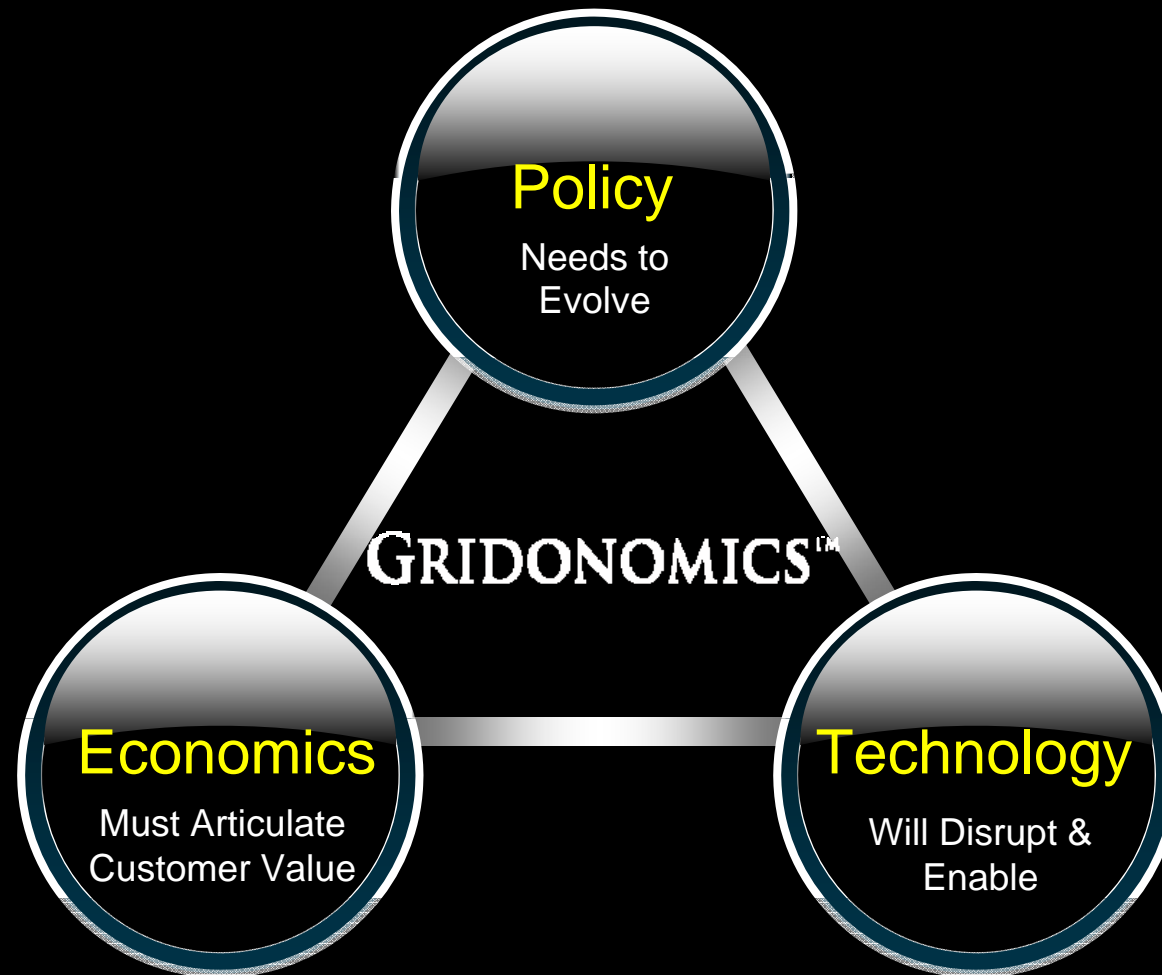
# Empowering Utilities

- Increase grid utilization and reliability
- Optimize operational costs
- Create platform for clean energy policy
- New models of customer engagement
- Enable innovation





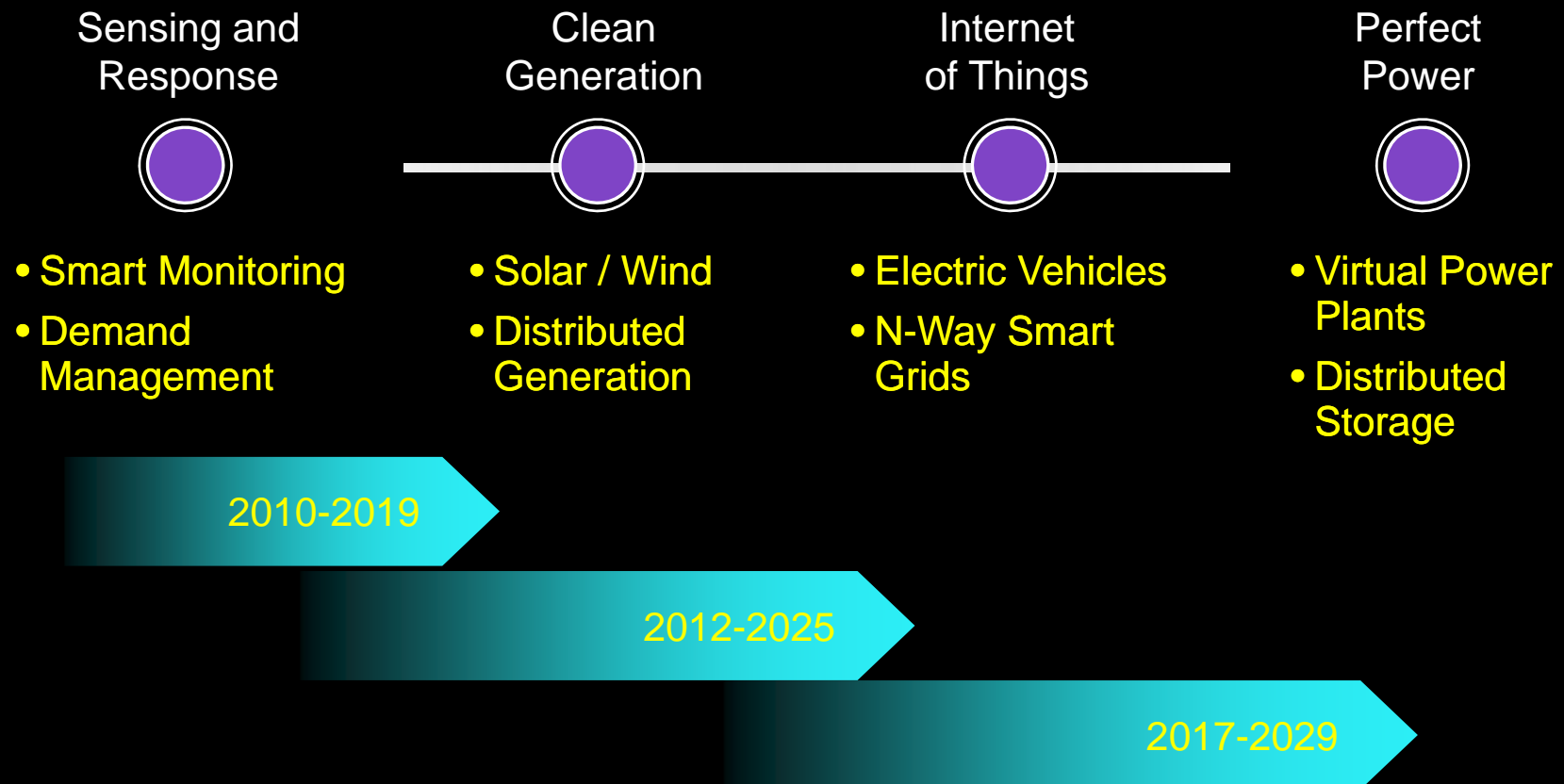
# Transformation of the Grid



# A Future History of the Grid

“The future is already here, it’s just not evenly distributed.”

- William Gibson, Author



# Global Grid Investments



## Canada

\$150 billion in electric infrastructure spend by 2010. Ontario additional \$1B on smart grid by 2015



## Russia

\$15 billion by 2012 to upgrade its utilities using smart grid technology



## Europe

Target 20% renewable production by 2020



## USA

2009 ARRA spurred \$10B for smart grid investment by 2014  
EEl estimates \$1 trillion in grid investment by 2030

## China

Investing over \$600 billion to develop its national smart grid over the next decade



## Brazil

Installing 63M smart meters by 2021




## Australia

\$50 billion investment in electric infrastructure and smart grid by 2020

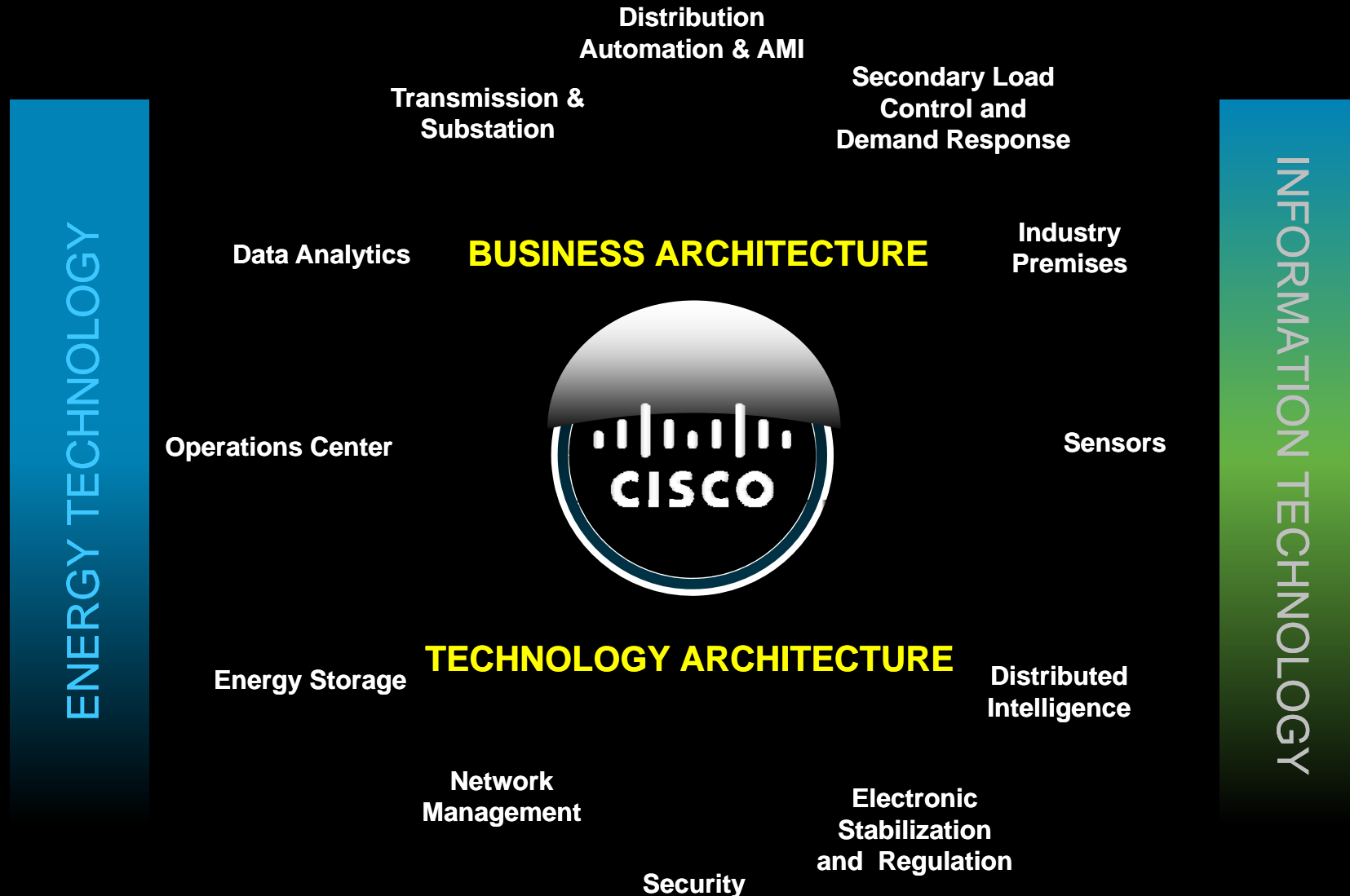
# Over \$4 Trillion Investment in Electric Networks by 2030

# Why Cisco?



The U.S. DOE defines Smart Grid as “an automated, widely distributed **energy delivery network** incorporating the benefits of **distributed computing and communications** to deliver real-time information and enable the near-instantaneous balance of supply and demand.”

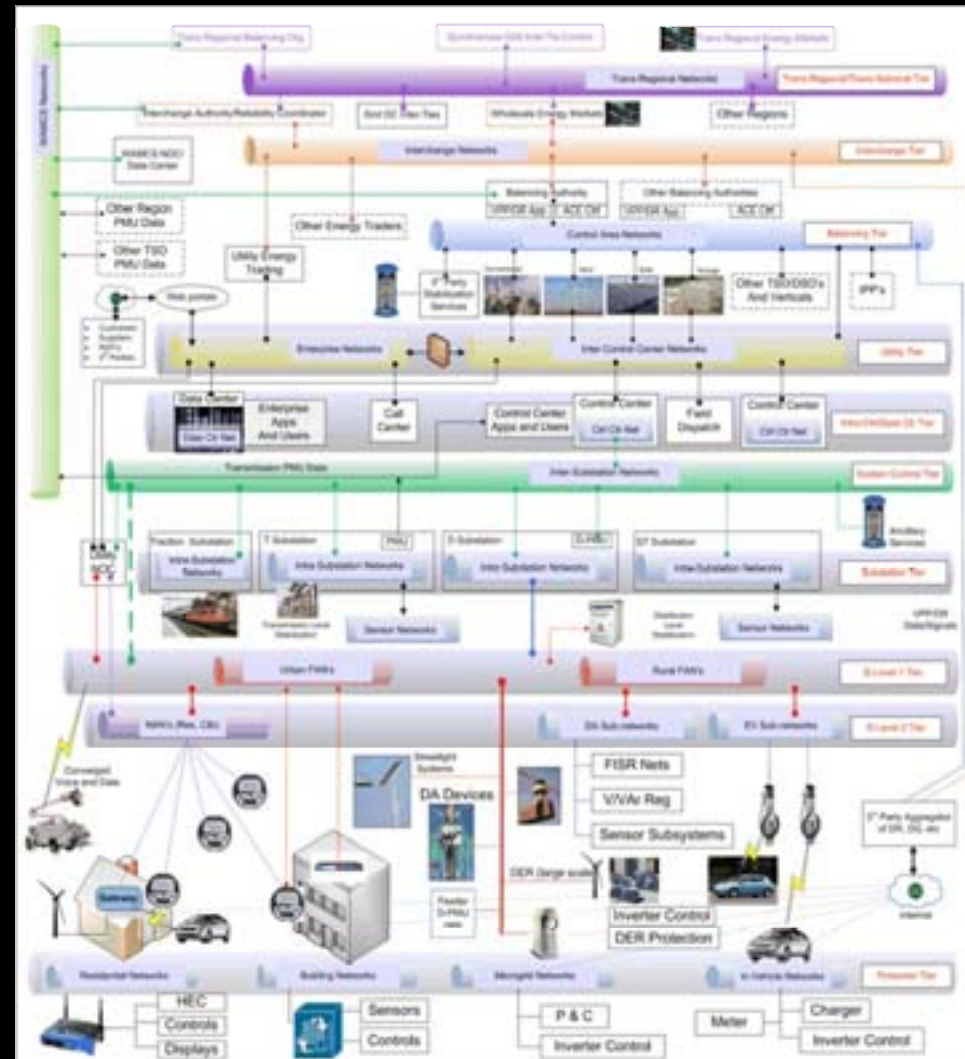
# Utility Systems Convergence





# Cisco Connected Grid Technology Architecture

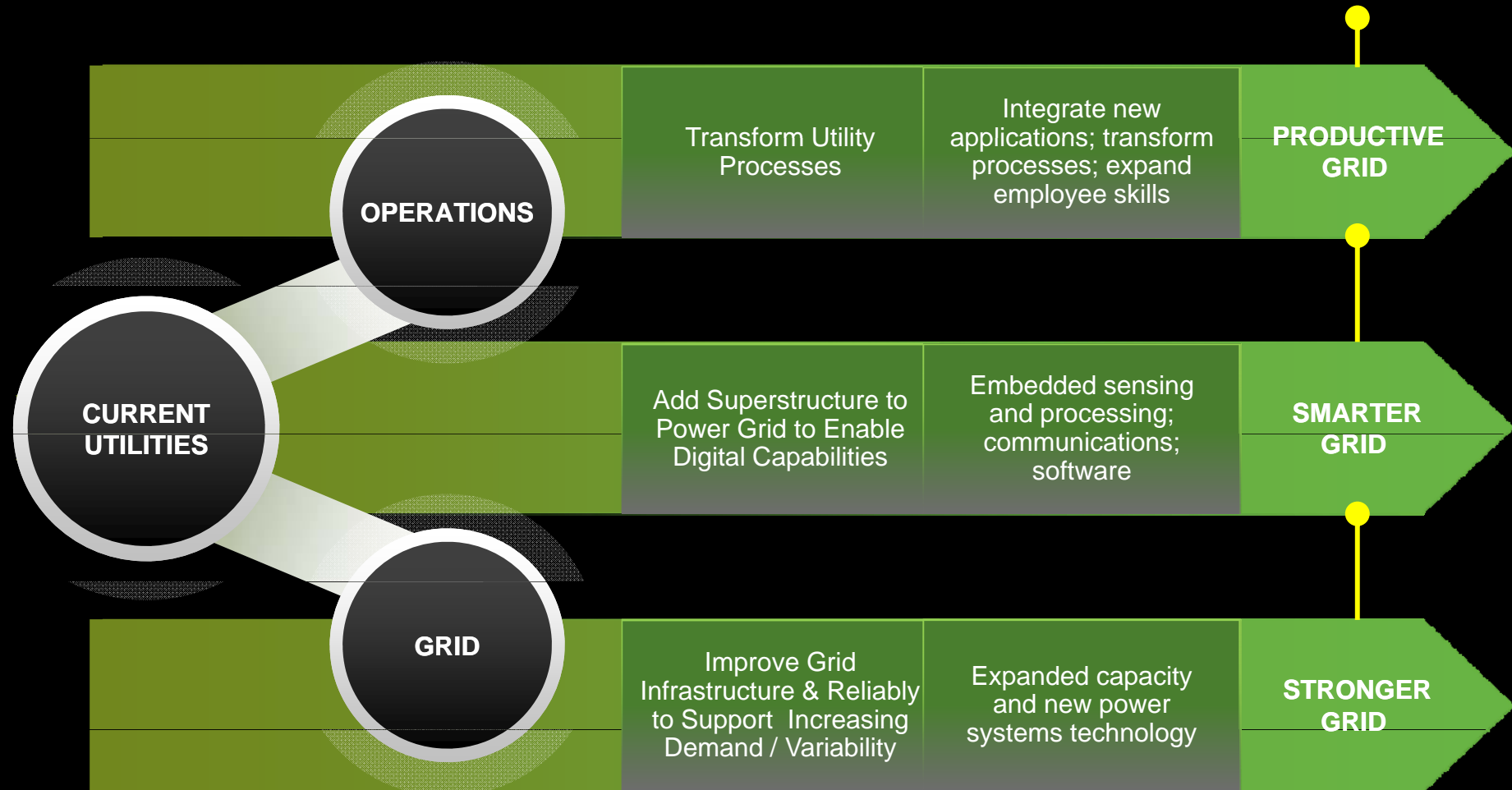
- Not just about new products or devices
- Framework for
  - integrating new ecosystem partners
  - communicating thought leadership
  - using existing products in new ways
- Provides a platform for innovation



# The Smarter Part

## The Grey to Green Evolution

### UTILITIES OF THE FUTURE



# Cisco's Innovation Model



# Cisco Connected Grid Solutions

## End to End

### ARCHITECTURE + SECURITY + CONNECTED GRID INTELLIGENCE

Enterprise  
Operations &  
Data Center

Grid Ops & Inter-  
Utility Network

Transmission  
& Substation  
Network

Field Area  
Network (FAN)

Neighborhood  
Area Network  
(NAN)

Premise Area  
(HAN/BAN)



- Storage & Analytics
- Network Management
- **Protection & Security**
- Regulatory Compliance

- **Situational Awareness & Control**
- Data Analytics
- National/Regional Connectivity
- High Availability/Low Latency

- Grid Sensing & Observability
- **Adaptive Teleprotection**
- Ultra-low Latency
- Cyber/Physical Security

- Advanced Distribution Automation
- **Distributed Intelligence**
- Low Latency & High Bandwidth
- Policy Based Mgmt & Robust Security

- Scalability & Interoperability
- Grid Sensing & Asset Monitoring
- High Availability & Robust Security
- **Full IPv6 & Open Standards-based**

- **Distributed Generation**
- Visibility to Optimize Energy Usage
- Enable Demand Response
- Policy Based Management

# Smart Grid Security Lifecycle





# Cisco Security Architecture

Implemented Through Systems and Solutions

## DEFEND

Defend Grid Operations



Threat Defense

## EXTEND

Secure Utility Connectivity



Secure Mobile Workforce

## PREVENT

Prevent Loss of Critical Assets



Physical and Data Loss Prevention

## COMPLY

Achieve Regulatory Compliance



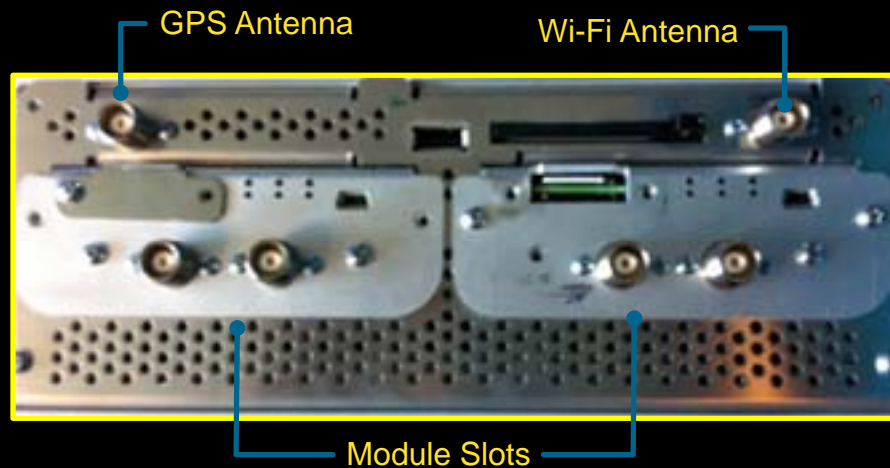
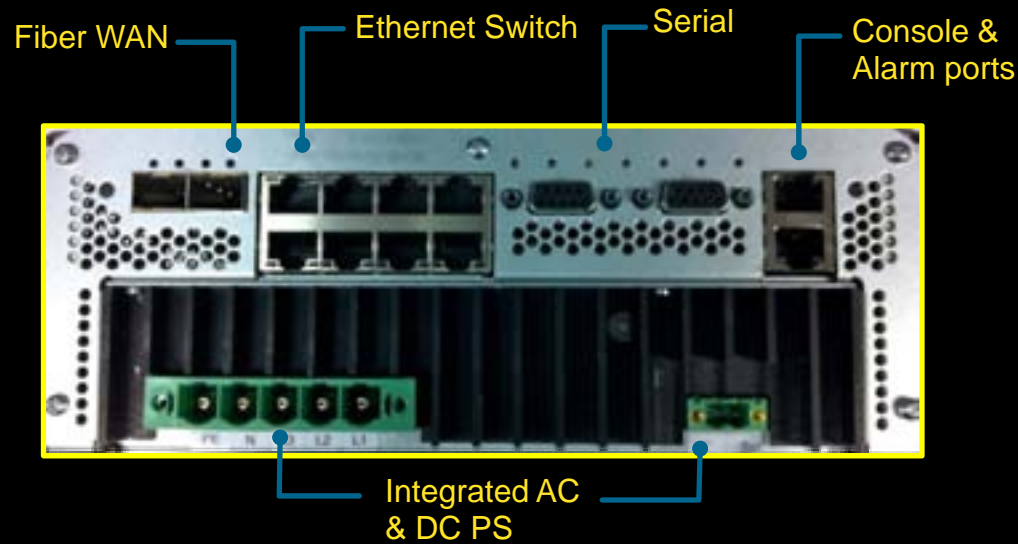
Governance, Risk and Compliance

## Securing the End-to-End Electric Power Supply Chain

# products

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# Cisco 1000 Connected Grid Router Indoor Model (din-rail mounted)



## Substation Hardened

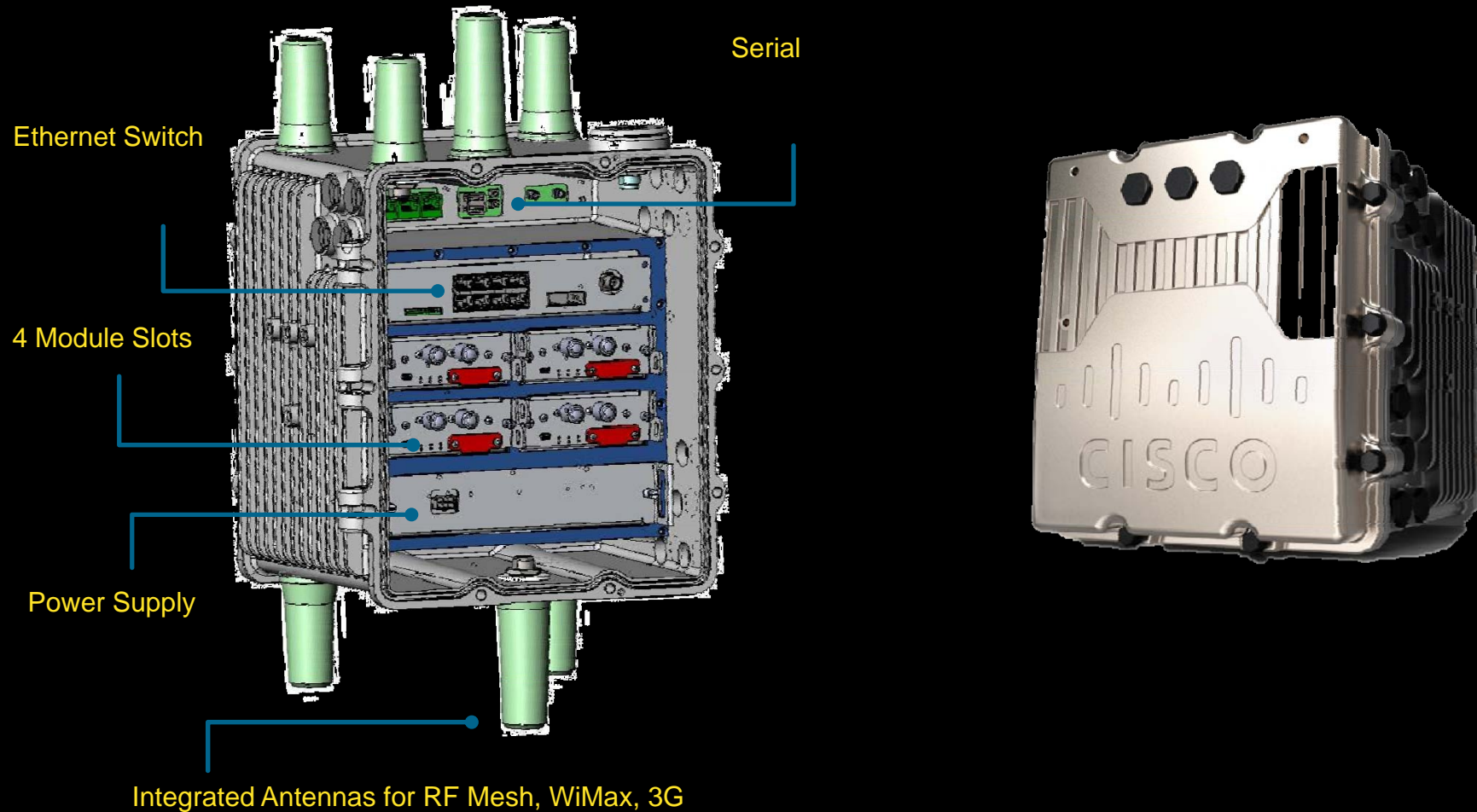
- Substation Compliant - IEC61850-3 and IEEE1613
- Fixed Memory

## Convection Cooled

- No fans and/or moving parts
- Increased Operating Temp

- Estimated Dimensions: **8.9 cm (H) x 22.9 cm (W) x 20 cm (D)** = 3.5" (H) x 9.0" (W) x 7.8" (D)

# Cisco 1000 Connected Grid Router Outdoor Model (pole-top mounted)



- Estimated Dimensions: **30.5 cm (H) x 20.3 cm (W) x 19 cm (D)** = 12" (H) x 8.0" (W) x 7.5" (D)
- Antennas shown above are optional; can be deployed with external antennas

# Cisco Connected Solutions

## Energy Automation

- Integrated cyber security solution
- Traffic prioritization & network segmentation
- Condition-based maintenance programs
- Fault isolation & location, restoration support
- Interoperability across vendors
- E2E manageability & diagnostics



Cisco CGR 2010  
Connected Grid Router  
Cisco CGS 2520  
Connected Grid Switch



"Networking technology will serve as the platform of a smart, more secure energy grid for the 21st century. Cisco is uniquely positioned to provide a converged Smart Grid communications fabric and to assist our utility customers with the kind of business transformation that will enable the efficient, effective transmission of energy and deliver entirely new, environmentally-friendly services to consumers."

**John Chambers,**  
Chairman and CEO, Cisco





**CISCO**