Turn Insight into Action

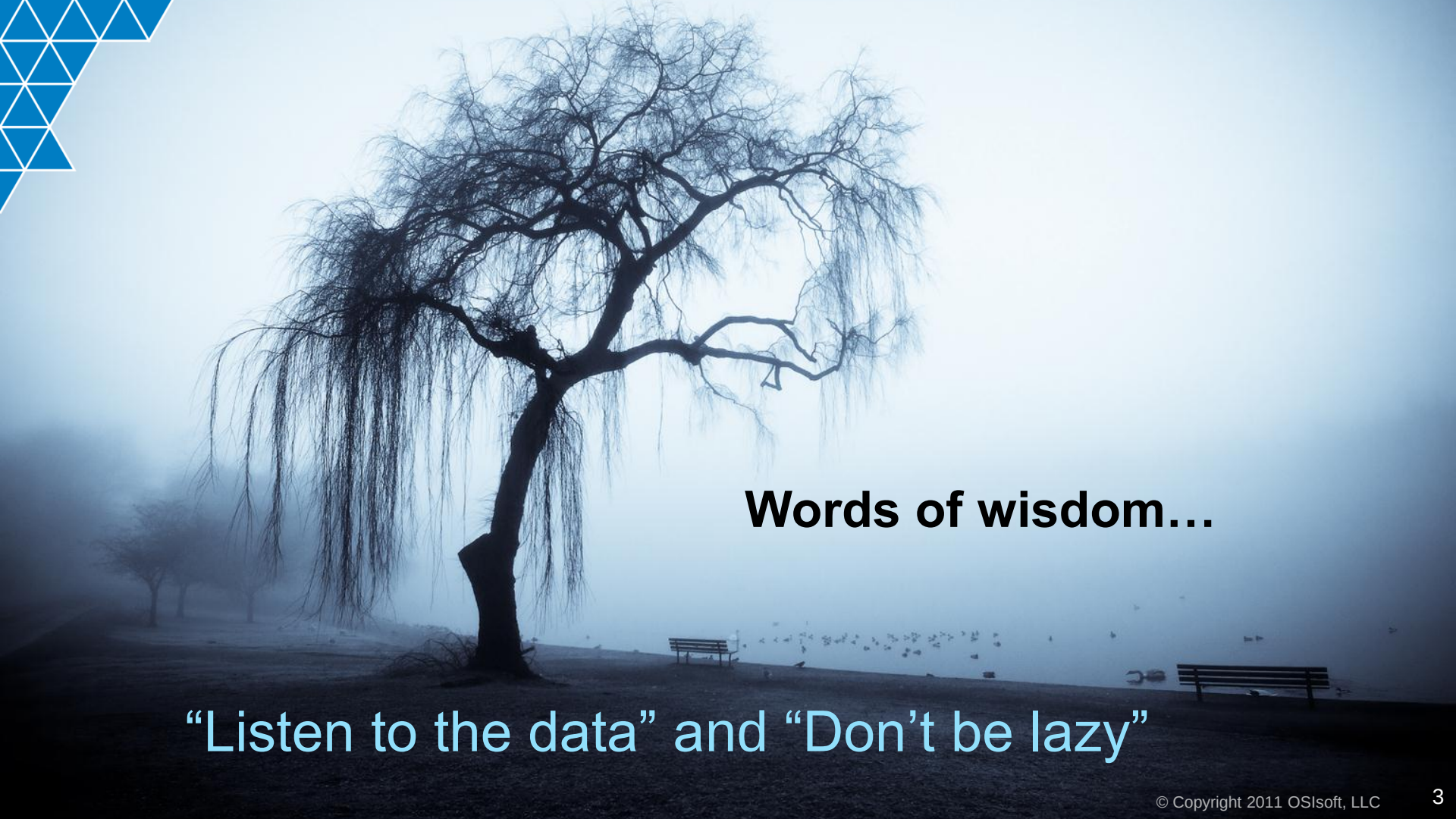
Presented by

Bernard Morneau

OSIsoft

Recap

- Historian to Infrastructure
  - PI Server → PI System → PI System Infrastructure
  - John de Koning – Shell Nederland Chemie B.V
    - “…. so find a justification for the highway between Amsterdam and Paris. I have no clue how to justify it, but everybody knows with common sense that you need that highway to do a good job and it’s the same with the PI System”



Stories told at the 2011 EMEA regional Seminar

- Don Hewitt (1922-2009) - Editor of 60 Minutes
  - "… every piece I view must have a story and not just pretty pictures and comments from people…"

- http://www.cbsnews.com/video/watch/?id=5253157n&tag=mncol;lst;1

Stories we heard in Barcelona

- …
- Discovery
- Efficiency
- Optimization
- Conservation
- Collaboration
- Anticipation
- Improvement
- Sustainable operations
- Simplification of systems
- Trust in the data
- Value chain integration
- Innovation
- …

Value of a PI System

Vital in maintaining Situational Awareness

Cornerstone of Continuous Improvement

Foundational for Sustainability & Innovation

Innovate our way forward

- **Energy & GHG (Air)**
  - Energy demand vs. Demographic growth vs. Human Development
- **Water**
  - Water Stress and Scarcity
    - **Fresh Water 2.5 %**
      - **Glaciers, Ice Cap, etc. 0.65 %**
      - **Underground Aquifers 0.80%**
      - **Permafrost, plants (absorbed) 0.03%**
      - **Accessible 0.006%**
- **Turning Insight into Action to meet the Innovation Challenge**
  - Panel Moderator
    - **Andrew Fanara, Resident Sustainability Expert**

Thank you

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Turning Insight into Action is the Path to Sustainability

Panel moderated by

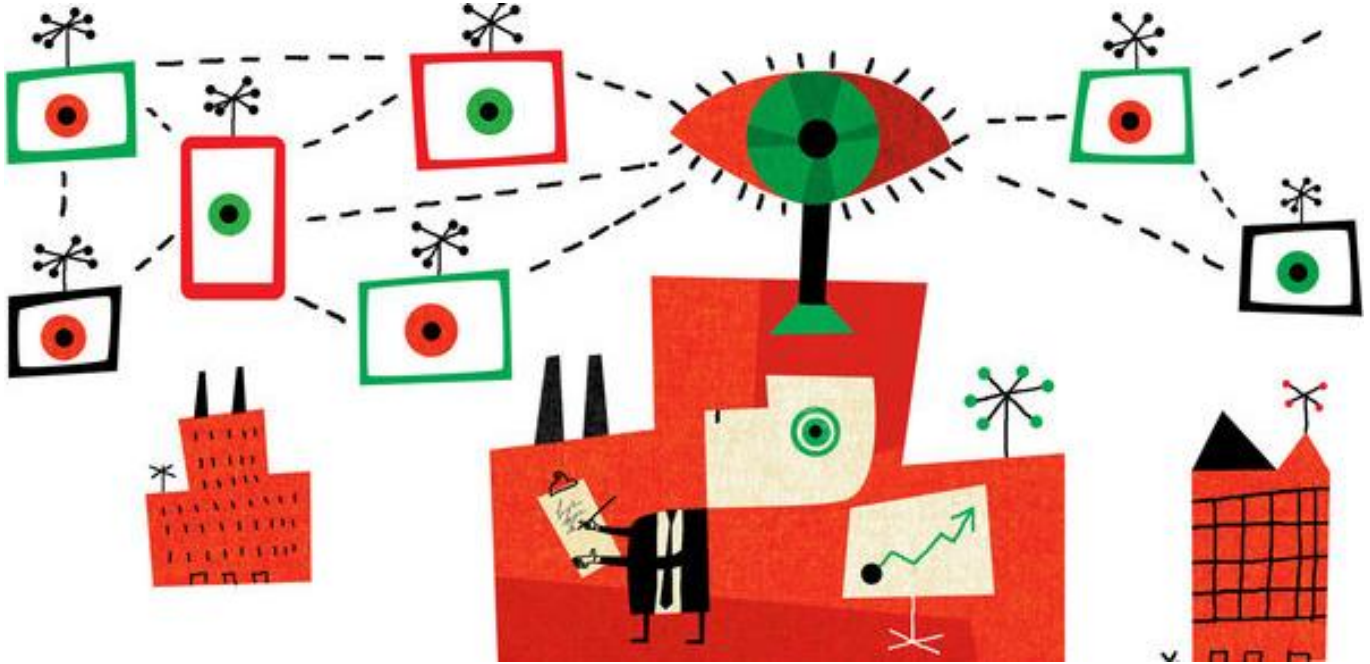
Andrew Fanara

Sustainability Strategist

OSIsoft

The New York Times Published: April 23, 2011

When There's No Such Thing as Too Much Information



James Yang

Cisco ES2020 Sustainability & Network Convergence

Presented by

Juan A. Blanco

Agenda

- Putting Green into Context
- The role of ICT
- Converged Networks and Sustainability
- Cisco on Green

European Commission Recommendations

- Commission is encouraging ICT industry to facilitate the transition to an energy-efficient, low-carbon economy
- EC underlines necessity of investments in smart metering saying “smart metering and smart grids are important means to maximise energy savings in buildings”
- Other examples of the ecological potential of ICTs given by the Commission are promotion of video conferencing (if Europe were to replace only 20% of all business trips by video conferencing this could save more than 22 million tons of CO2 per year) and the roll-out of broadband networks (facilitating an increased use of online public services and applications could save at least 1–2% of total energy use worldwide by 2020).

Source: http://ec.europa.eu/information_society/activities/sustainable_growth/docs/recommendation_d_vista.pdf

SMART 2020: KEY FINDINGS

> ICT is a high-impact sector in the global fight to tackle climate change

> The sector's current contribution of around 2% is set to more than double (0.5 Gt CO_2e to 1.4 Gt)

> ICT could reduce global emissions by a significant amount through enabling reductions in other sectors **(7.8 Gt out of 52 Gt business as usual in 2020, or 15% of total emissions)**

> ICT's pivotal role in monitoring, optimising and managing domestic and industrial energy usage could **save nearly €600 billion in 2020**

THE CLIMATE GROUP

GeSI GLOBAL e-SUSTAINABILITY INITIATIVE

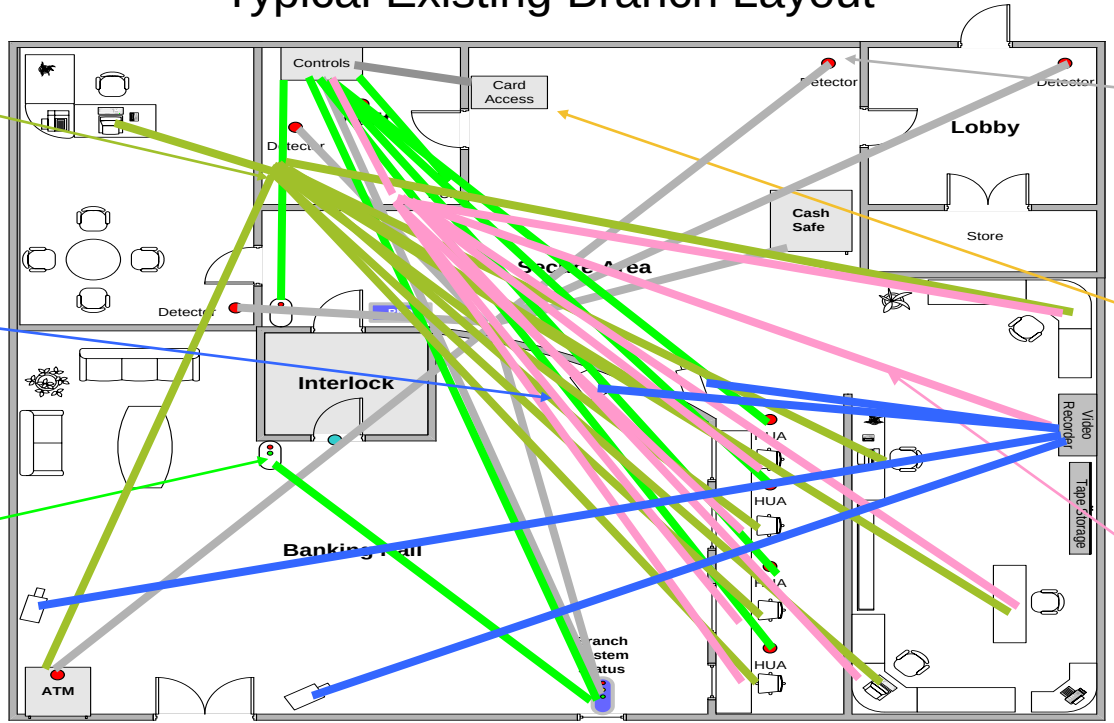
An example of convergence in a branch office

Typical Existing Branch Layout

Data Network

Analogue CCTV System

Intruder Alarm System

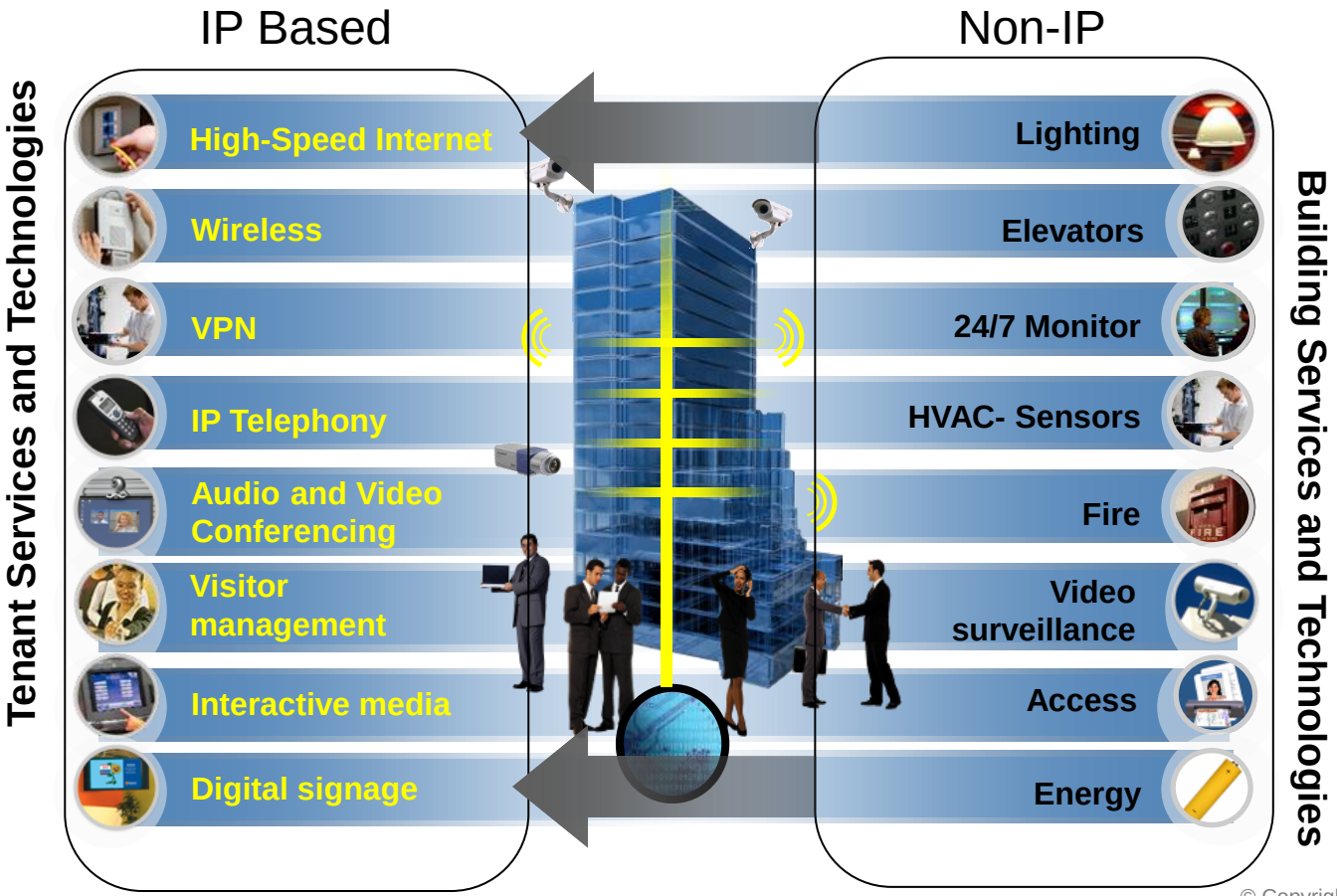


Fire Alarm System

Access Control System

Telephone & Video Conference Network

Disparate Systems Convergence



A world in transition – towards urbanisation

500M people urbanised in the next five years

50% of world population urban by 2008, 60% by 2030

Trillions of dollars in stimulus packages worldwide for infrastructure

Big cities getting bigger; 100 new cities with one million residents by 2025

Source: Connecting Cities: Achieving Sustainability Through Innovation Nicola Villa and Wolfgang Wagener, Cisco IBSG

The Internet of Things: a Key Enabler for Sustainability

Industrialisation of the Internet

300 million connected devices

14 billion connected devices

2001 2002 2003 2004 2005 2006 2007 2008 2009 2010

Everything is connected - cars, buildings, hospitals, schools, government…

Source: Forrester Research

Cisco´s Sustainability Objectives

Four ways to transform environmental impacts

Operations

Impacting the environmental effects of how Cisco operates

Architecture

Providing customer solutions to address green issues

Products

Creating efficiencies and innovations in Cisco products

Culture

Inspiring Cisco employees to get involved and take action

Reducing Operational Energy and Greenhouse Gas Emissions

- Increasing energy efficiency in our labs, data centers and office buildings
- Reducing business air travel
- Using technology to reduce our overall GHG emissions
- Strategic procurement of renewable energy in our operations

2012 GHG Reduction Goal:
25% by 2012

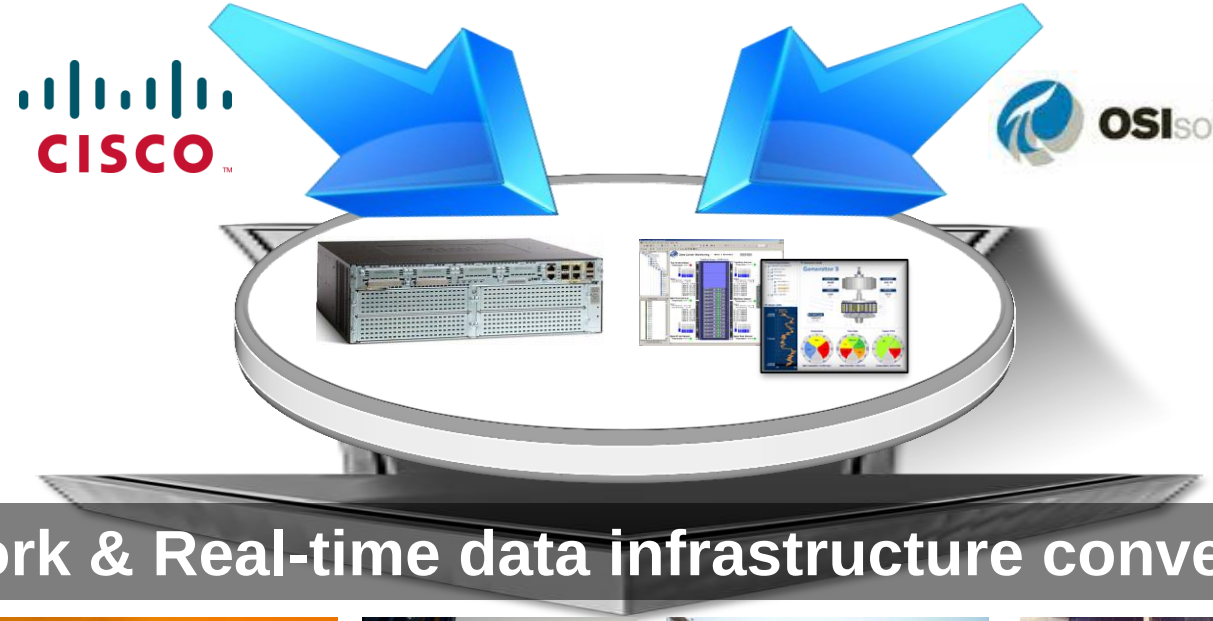
2010 Reduction Results:
12% - scope 1 & 2
45% - scope 3

19.3 M people hours in 868 TelePresence rooms

$1M saved in Cisco labs via automated power control and changing lab temperature setpoints

66,000 metric tonnes in avoided GHG emissions efficiency projects

Disruptive Technologies



Network & Real-time data infrastructure convergence





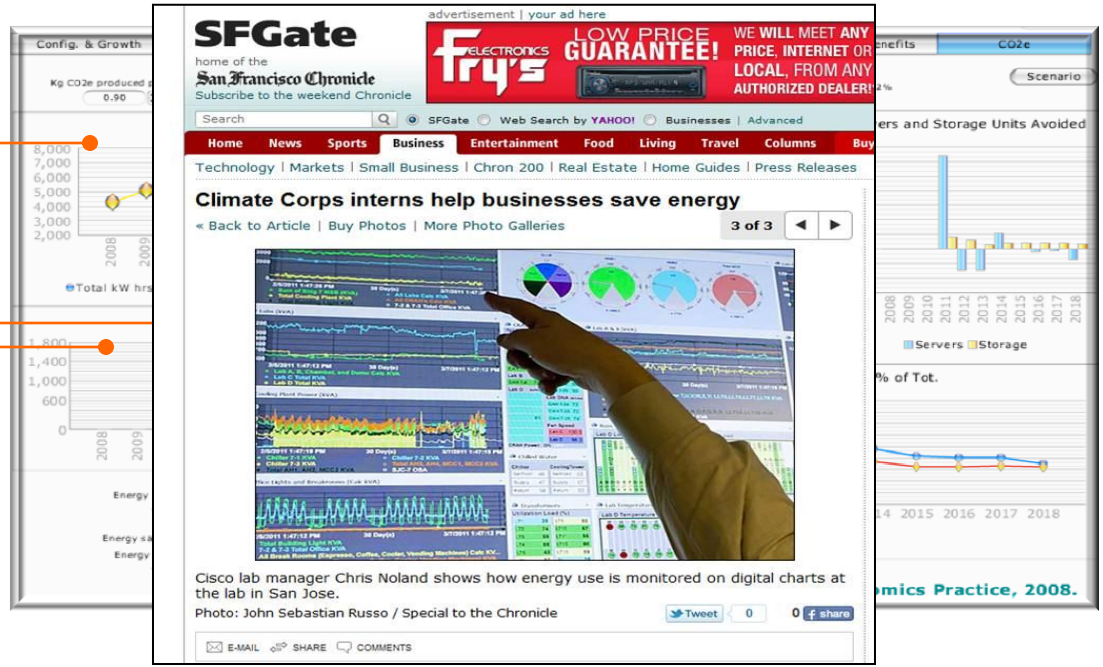
Cisco's GHG Reduction Initiative

July 2008, Publicly Announced 25% Absolute Reduction 2007-2012

- Global, Enterprise Wide Effort across Owned & Leased Properties
  - $150M USD Paid for Energy in FY 2006
  - ~80% Labs & Data Centers

Project Stakeholders

- Workplace Resources
- IT; Labs & Data Center
- Strategic, Corporate



Sustainability is Good for the Business

‘Green’ is not an extra burden to shoulder.
It’s a significant new business opportunity.

Green IT Initiatives

- Contribute to workforce productivity
- Enable agility and innovation
- Control rising energy costs
- Ensure compliance now and in the future
- Improve Op Ex Management
- Motivate the workforce beyond financial considerations

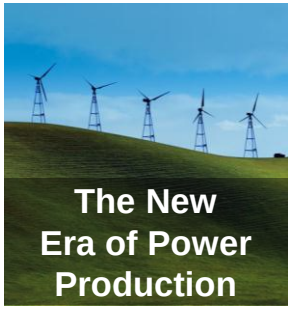
SAP for Utilities – Solutions for an Industry in Transition

Presented by

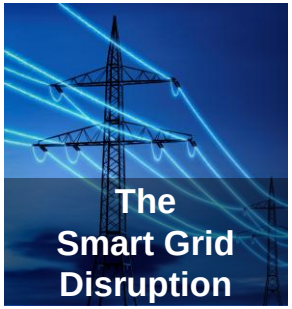
Thomas Wohlert

IBU Utilities

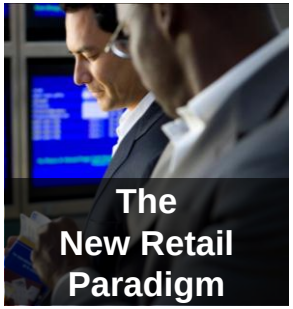
Six Imperatives driving SAP's Utilities Roadmap



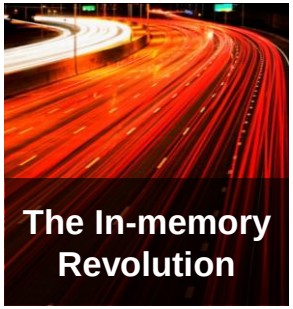
- SAP Enterprise Asset Management
- SAP Fuel Supply Chain Management



- SAP AMI Integration for Utilities
- SAP Enterprise Asset Management
- SAP Smart Meter Rollout



- SAP AMI Integration for Utilities
- SAP Customer Relationship & Billing for Utilities
- SAP Customer Financials Management for Utilities
- SAP Energy Portfolio Management



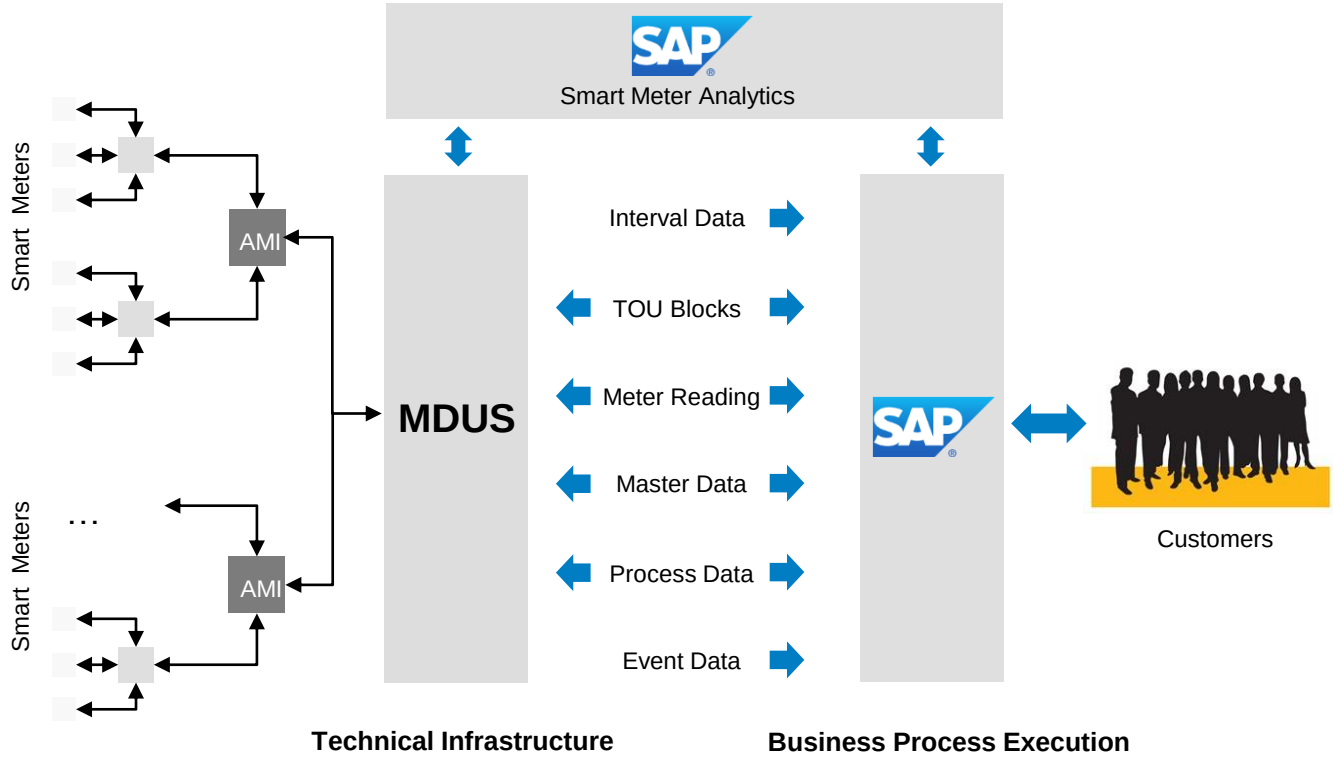
- SAP HANA and smart grid analytics

- Customer online service solutions from SAP

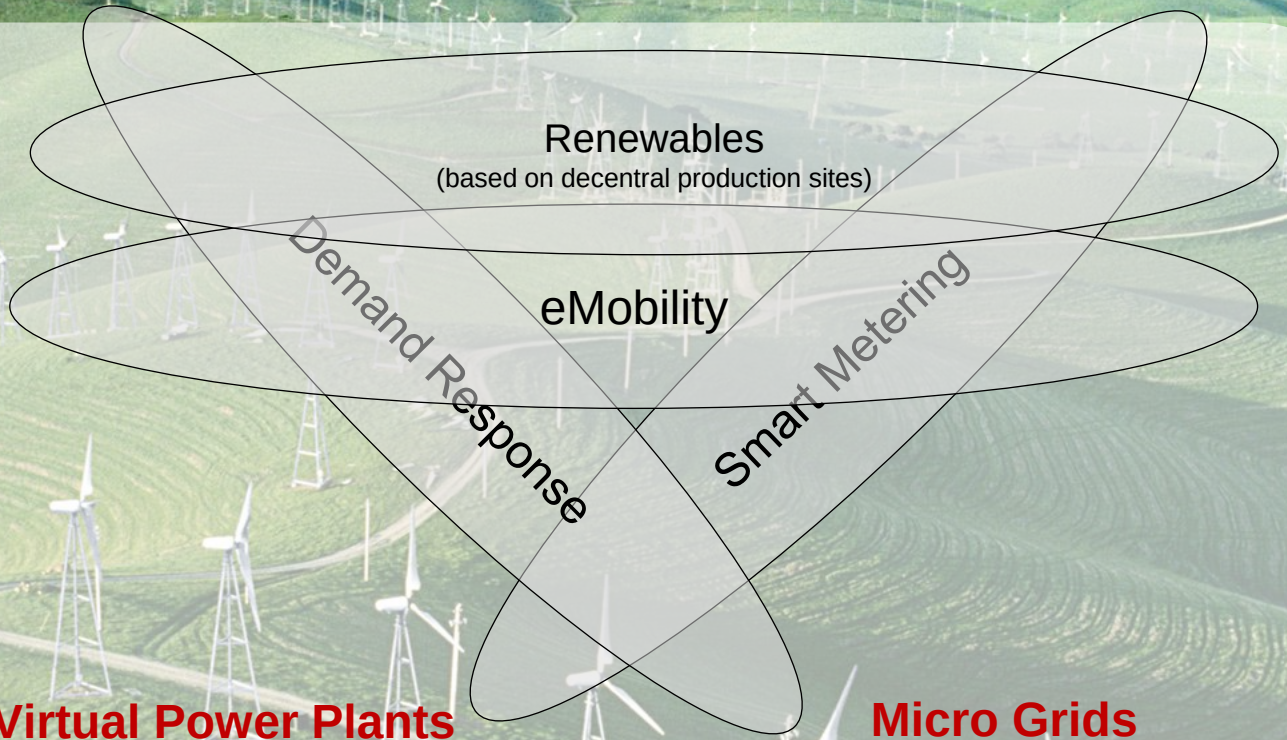
- SAP solutions for water utilities
- SAP solutions for waste & recycling
- SAP solutions for sustainability

SAP AMI Integration for Utilities

The Core of the Smart Grid Business Platform from SAP



Current Activities



Virtual Power Plants

Micro Grids

Facing the Data Tsunami

Classic Meter

Smart Meter

Example: Utility with 1.2 Mio. customers in Germany

- 1000 Byte per reading
- 1 reading per customer/**year**

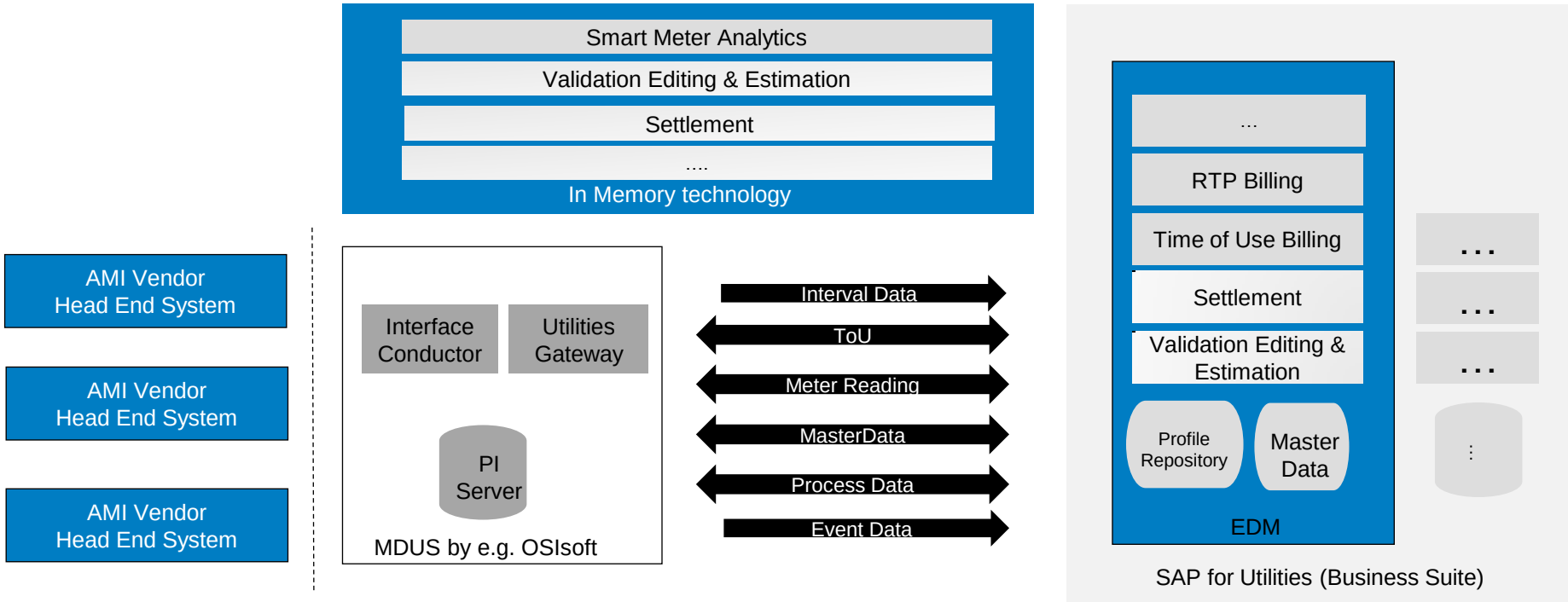
= ~ 1 GB raw data per year

- 15-min (96 values) per customer/**day**
- 5760 Byte per customer/**day**

= 6.44 GB raw data per day → 2.3 TB per year

= ~ 750 GB per year compressed

Smart Grid Platform based on In-Memory Technology



At a Glance:
Roadmap for Smart Grid Business Platform from SAP

2009
Smart Grid Foundation

- MDUS Integration
- Master Data synchronization
- On-Demand Read
- Smart Grid Project Planning
- Smart Grid Operation

2010
Smart Grid Enhanced Processes

- Remote Disconnection / Reconnection
- Billing Determinants Calculation
- Non-Energy Event Management
- On-Demand Status Request
- Linear Asset Management

2011
Smart Meter Analytics & Renewable Power Production

- In-memory based profile segmentation and benchmarking
- Renewable Power Production
- Customer Online Services
- GIS-Integration

2012
Grid Analytics & Demand Side Management

- Energy Efficiency Programs
- Sales and churn analysis
- In-memory based grid operation analysis
- Consumption Visibility (COS)

2013
e-Mobility & Demand Response

- Roaming consumers / Charging
- Demand Response Management
- In-memory based Forecasting
- Energy and Emissions Management

Note: All dates are planning dates only and might be changed without further notice

California ISO

Shaping a Renewed Future

California ISO Preparing California for a Greener and Smarter Grid

Presented by

Jim McIntosh

Director – Operations Executive Advisor

California ISO

California ISO Control Room (Folsom, CA)

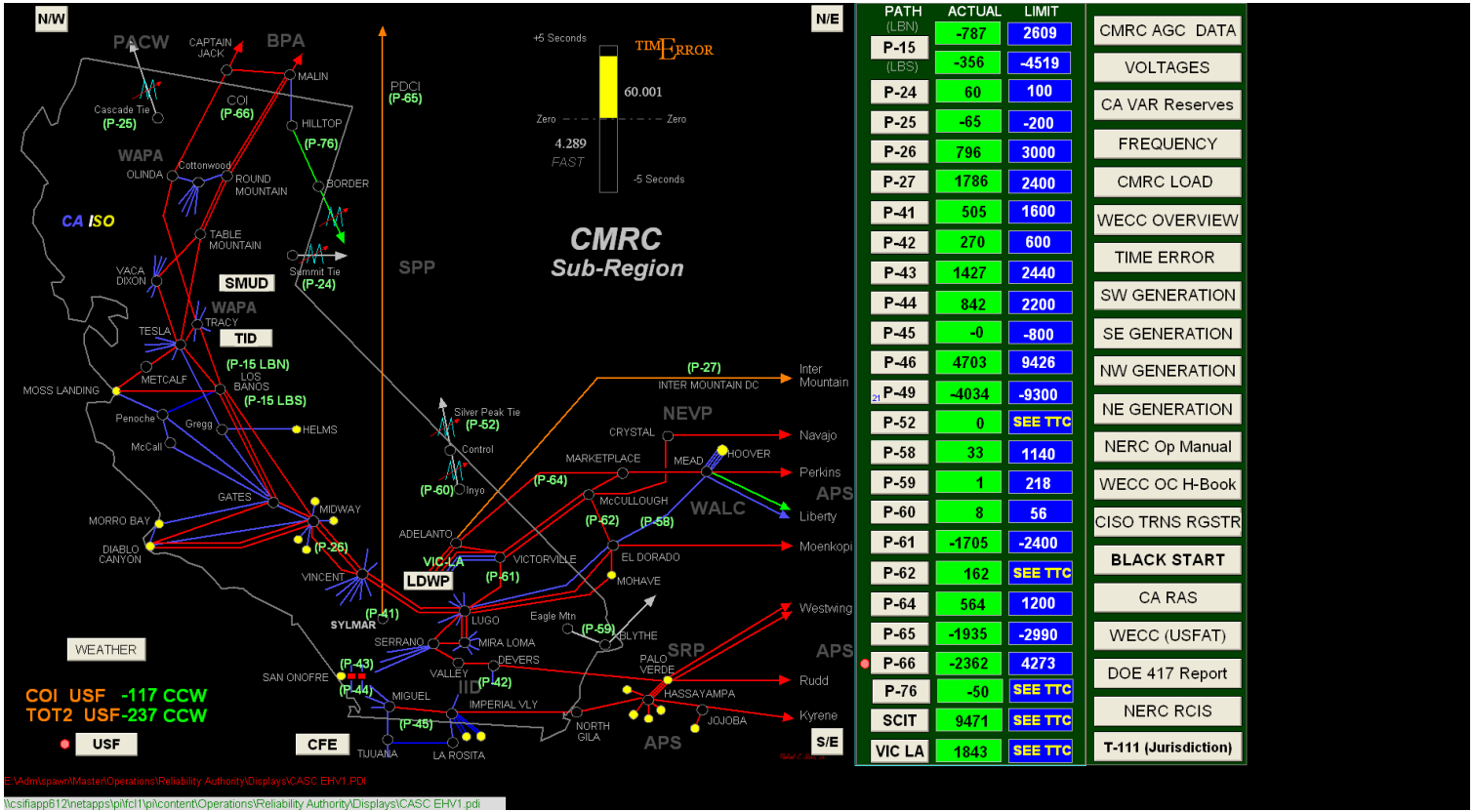
The ISO grid control room faces significant short- and long-term challenges

- Uncertainty of grid infrastructure development
- Ramping requirements significantly increased
- Continued development of control room tools
- Load and wind forecasting accuracy
- Rapid changes in grid generation fleet, especially wind and solar technologies

1. Wind and solar variability will be a significant issue by 2012-2013.

2. Synchrophasors are the most significant advancement in control center technology in the last 30 years.

CAISO PI System Display – Reliability WECC-Western Electricity Coordinating Council Transmission Path Overview



PATH (LBN)	ACTUAL	LIMIT
P-15 (LBS)	-787 / -356	2609 / -4519
P-24	60	100
P-25	-65	-200
P-26	796	3000
P-27	1786	2400
P-41	505	1600
P-42	270	600
P-43	1427	2440
P-44	842	2200
P-45	-0	-800
P-46	4703	9426
P-49	-4034	-9300
P-52	0	SEE TTC
P-58	33	1140
P-59	1	218
P-60	8	56
P-61	-1705	-2400
P-62	162	SEE TTC
P-64	564	1200
P-65	-1935	-2990
P-66	-2362	4273
P-76	-50	SEE TTC
SCIT	9471	SEE TTC
VIC LA	1843	SEE TTC

CMRC AGC DATA
VOLTAGES
CA VAR Reserves
FREQUENCY
CMRC LOAD
WECC OVERVIEW
TIME ERROR
SW GENERATION
SE GENERATION
NW GENERATION
NE GENERATION
NERC Op Manual
WECC OC H-Book
CISO TRNS RGSTR
BLACK START
CA RAS
WECC (USFAT)
DOE 417 Report
NERC RCIS
T-111 (Jurisdiction)

Smart Homes: The Challenge with Data

Presented by

Robin Crowther

British Gas

British Gas –
We are the UK's leading energy services company

6m Electricity
10m Gas
1m Business

4.5m Central Heating Service
1.7m Plumbing & Drains Service
1.4m Home Electrical Service
0.4m Kitchen Appliance Service
0.1m Central Heating Installs

25m Customer Accounts

12m Customer Households

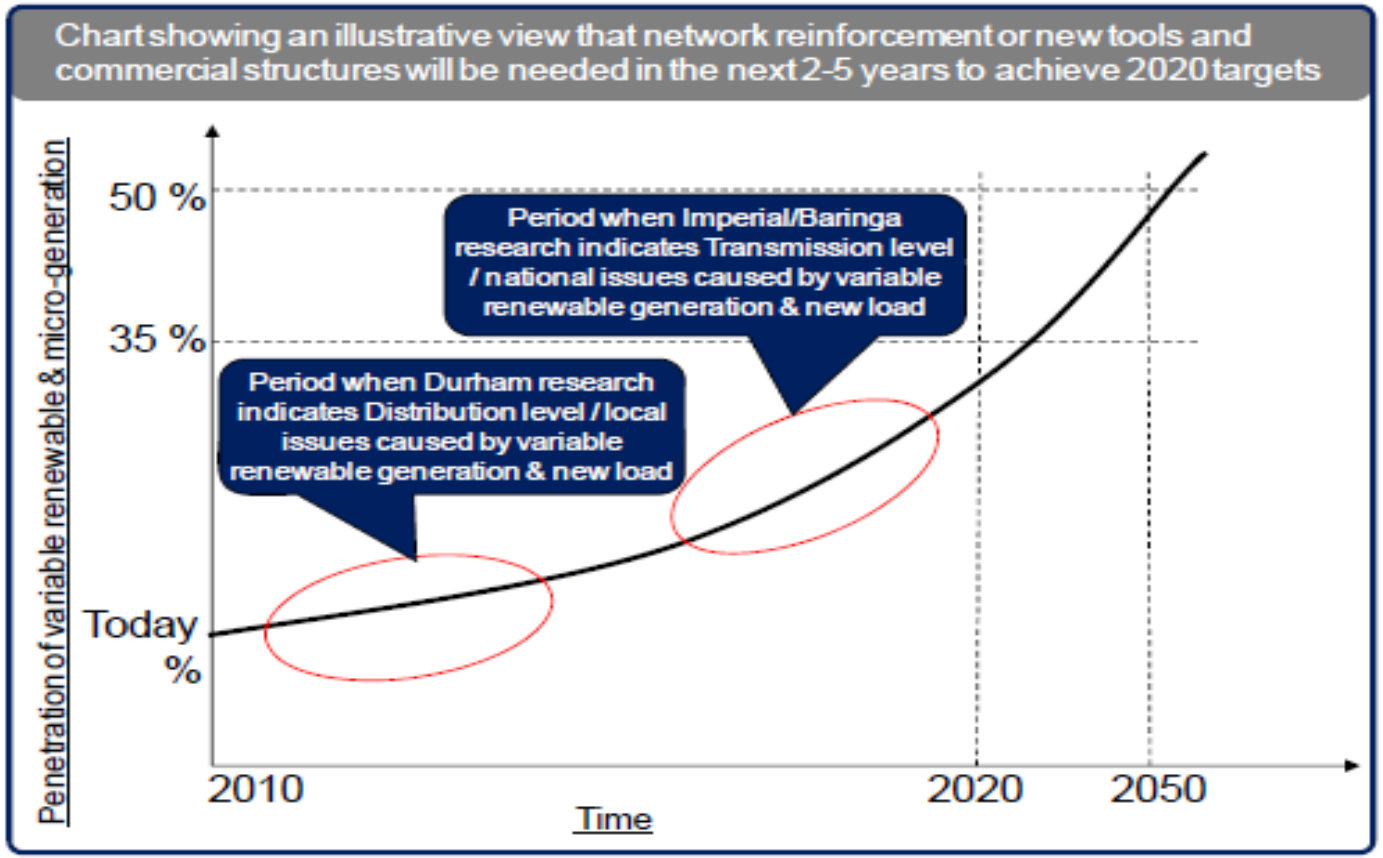
10k engineering service staff

>300k smart meters

British Gas “Smart Homes” making the home smarter

The Impact of Micro Generation

British Gas



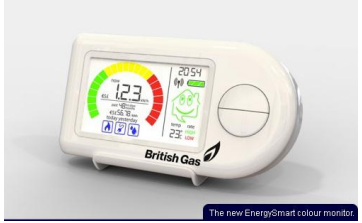
Paradigm Shift

- Decision Making Process:
  - 1-way to 2-way
  - Customer Consume or Sell
  - Sell or Store

- Consumers' Attitude Towards Information
  - From 'Don't know' to 'Don't Need to Know'
  - From 'Over-caring' to 'Handle with Care'

To transform our relationship with customers,
Transforming their relationship with energy

The Data Challenge



- 12m homes with between 3-10 devices/home
- Large amounts of data will need to be collected
  - Half hourly to sub second
- We will have to store and process this data
- **Some** of this processing will have to be "**Near Real-time**"

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Thank you