Energy Services Network Association

OSGP industry group

- Definition of demand response & the demand response vision

- Customer protection

- Offers reflecting actual consumption patterns and interface with the home

- **Central hub and privacy & security**

Mark B M Ossel

Vice President Echelon Energy & Utility

Boardmember ESNA

European Commission Steering board Smart Grid Taskforce

Member ESMIG, ETSI, CLC TC13, 57

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Energy Services Network Association (ESNA)
Smart Meter & Smart Grid Industry Group

- Global, not-for-profit association (under Dutch law) of utilities and solution suppliers & manufacturers promoting the adoption of the **Open Smart Grid Protocol (OSGP)** and **NTA8150 (API)** architecture and infrastructure
- Education, outreach and **standardisation efforts**
- **Ecosystem** of users and companies with value-added applications and devices for secure, reliable and cost-effective smart grid, automatic meter management, Billing, CRM and CIS
- Our purpose is to help our members successfully implement and operate the smart grid and extend the capabilities.
- www.esna.org (ETSI member)
  representation in ESMIG, TC13 / TC57 / TC247 / TC205, TC294, ETSI

  Open standards:
  NTA8150 (API) & Open Smart Grid Protocol (OSGP)

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- Industry/Usergroup, ESNA members securing interest of
  - **Utilities**
    - o.a. Alliander, SEAS, Vattenfall, EoN, Linz, Feldkirch, NRGi, etc.
  - **Software** companies
    - MDM (a.o. Telvent, Ubitronix, Gorlitz, Ferranti, Eaton, Oracle)
  - **Service** providers
    - System Integrators (a.o. Alcatel Lucent, Ubitronix, Accenture, Eltel, Telvent, CIAC)
    - Installers (Eltel)
  - **Hardware/device** providers
    - In-home devices (o.a. Onzo, Ubitronix, Efergy, Geo, Wimet, etc))
    - Meters (a.o. Echelon, ELO, Secure, etc.)
    - Home gateways
- *Share vision, supporting same system, architecture, protocols*

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Open Initiative supported by :

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VATTENFALL

LINZ AG STROM

ENERGIMIDT
nye strømninger

CIAC

netbeheer nederland
energie in beweging

NRGi
Altid til stede

alliander

seas nve

EATON
Powering Business Worldwide

IBM

SECURE
SECURE METERS LIMITED
The Power of Innovation

PRI
measure ▸ inform ▸ empower

GÖRLITZ
Aktiengesellschaft

PMT

FERRANTI
computer systems

ORACLE

DIEHL

EVB ENERGIE

TELVENT

thüga
DIE ENERGIEGRUPPE

ELTEL networks

ZIRODE
MANAGEMENT SERVICES

ubitronix
system solutions gmbh

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NES/OSGP smart meter projects in Europe

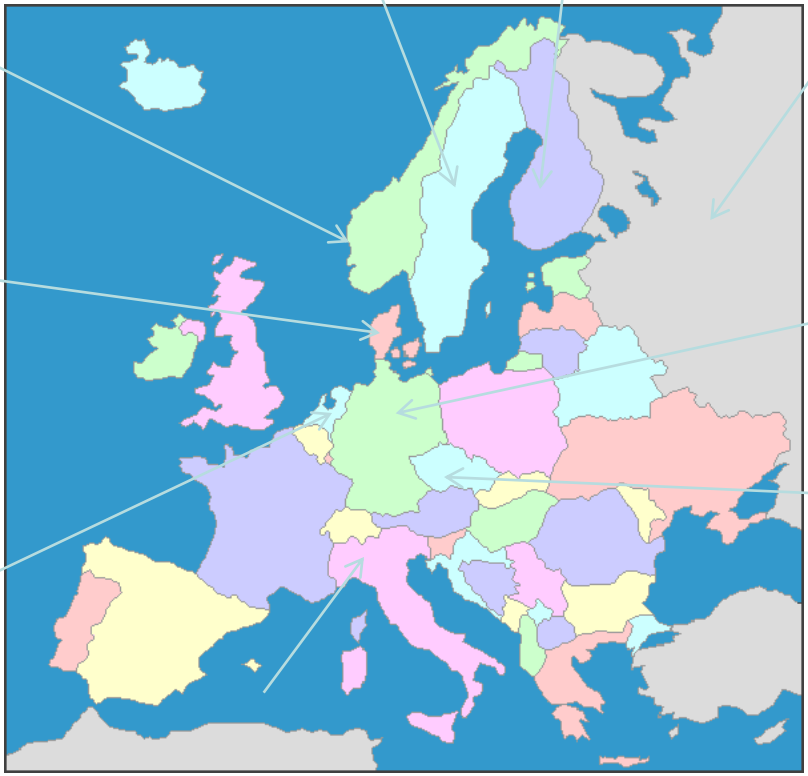
Outside Italy (27M with similar technology) , installed/Under Contract ~ 3 Mil OSGP Smart meters

Sweden
~1 Million smart meters

Finland
550 000 smart meters

Norway
> 100.000 smart meters

Russia
375 000 smart meters



Denmark
~ 1 Million smart meters

Germany
~ 50 000 smart meters

Austria
> 180 000
smart meters

Netherlands
~65 000 smart meters

Swiss
~ 15.000 smart meters

hem
seas nve
e·on
CITIPOWER
VATTENFALL
E/P
Duke Energy
ENERGIMIDT
nye strømninger
Fortum
INTEGRAL energy
The power is in your hands
elro
LINZ AG STROM
NRGi
Altid til stede
NUON
RUHRPOWER
Stadtwerke Schwerte
Powercor
AUSTRALIA
ngc
STADTWERKE FELDKIRCH

Henrik

Expecting simple benefits
Sceptical

Unique

Mette

Very emotional
Creative mindset
Innovation

The critic
24%

The dreamer
20%

the customer

Reality

Dream

The basic
40%

The local
16%

Ib

Traditional
Conservative
Stable electricity supplier

Standard

Kirsten

Environmental issues
Green energy

seasonve

Henrik

Expecting simple benefits

Sceptical

Unique

Mette

Very emotional

Creative mindset

Innovation

No privacy, security infringement

The critic 24%

The dreamer 20%

17.4 % decrease Energy usage

Reality

Dream

The basic 40%

16%

Ib

Traditional

Conservative

Stable electricity supplier

Standard

Kirsten

Environmental issues

Green energy

seasonve

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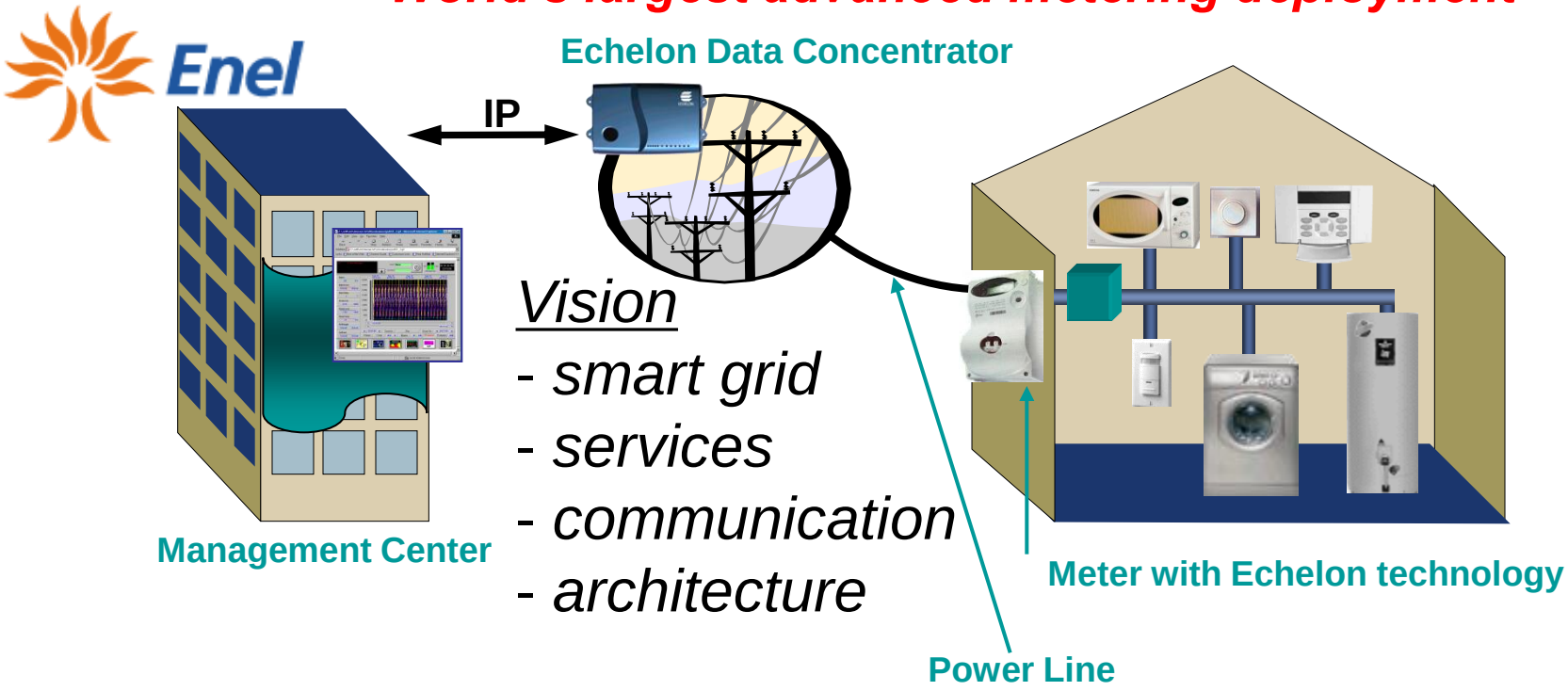
Enel's, Echelon Project In Italy, 2001

World's largest advanced metering deployment



- Over 27 million homes and buildings installed with smart meters
- Projected cost of €2.1 billion
- Projected annual savings of €500 million
- Running

Then: Electricity Was a New Technology

Then

- One-way flow of energy from large plants
- Supply was abundant
- Environmental impact was not understood
- Run to failure design

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Now:
Electricity Is Essential To All We Do

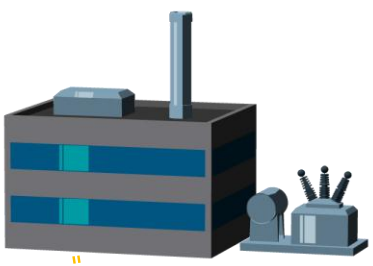
- Reliable supply is an economic and national security concern
- Concerns over $C0_2$
- Move to renewable, intermittent sources of supply
- Distributed generation
- EV

A stable grid

- Meeting these demands requires a smarter grid & change in behavior

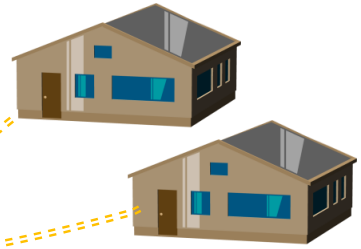
Need to combine information, manage and control, while minimizing datatraffic, communication & storage.

Smart Grid Connects Power Producers and Pro/Con/sumers.
Demand growing faster than capacity..
while we run out of fossil fuels and generate locally

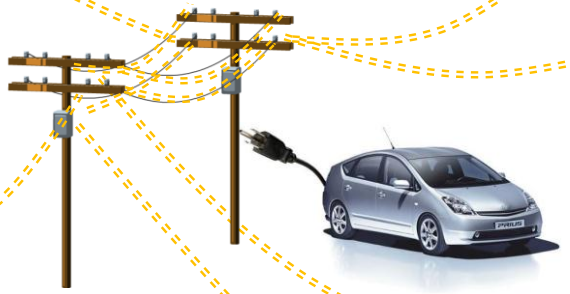


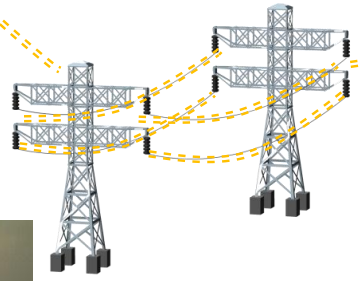
Power Plant

Streetlights



Residential

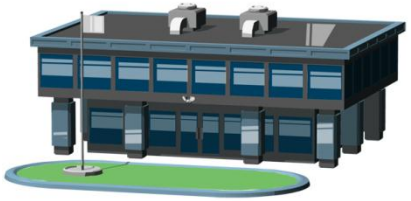




Commercial

Industry

Utility



Light Industrial

LV Substation centric architecture

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Suppliers

Customer Care

Meter Data management

Demand Management

Supplier

Supplier

Supplier

DNO

Distribution Management

Outage Management

Head end for device and communication management

SubStation centric

IP based WAN

measure and control

LV substation ECoS

Key message to regulators

- The future will come with
  - Decentralized intermittent sources of supply
  - Distributed generation (feed-in), EV
- Requirement for local grid management
  - Maintain/ensure service level
  - Eg Voltage regulation
- Smart meters are sensors
  - Allow usage of “Technical data” to ensure service level
- Substation centric architecture required
  - Use data where needed
  - Mix of central and decentralized computing

Any Questions?????

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ESNA

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The Smart Grid Evolution
smart metering as foundation

Today

(AMR/AMI)

Integrate existing services into new grid

Applications

- Meter reading
- Net metering
- Time of use
- Basic outage detection
- Large load demand limiting

Short term

(Smart Grid 1.0)

Transform existing services using advanced communication

Applications

- Pre-paid metering
- In-home displays
- Intelligent disconnect
- Fine-grain load control
- Advanced outage management
- Bi-directional metering (renewables)
- Demand response

Long term

(Smart Grid 2.0)

Enable future services and foster innovation

Applications

- Micro-grids/distributed generation
- Intelligent street lighting
- Vehicle to grid /grid to vehicle
- Storage/distribution of renewables (wind, fuel cells, solar)
- Fault prediction/outage prevention
- Energy asset management
- Automatic demand response
- Other future applications…

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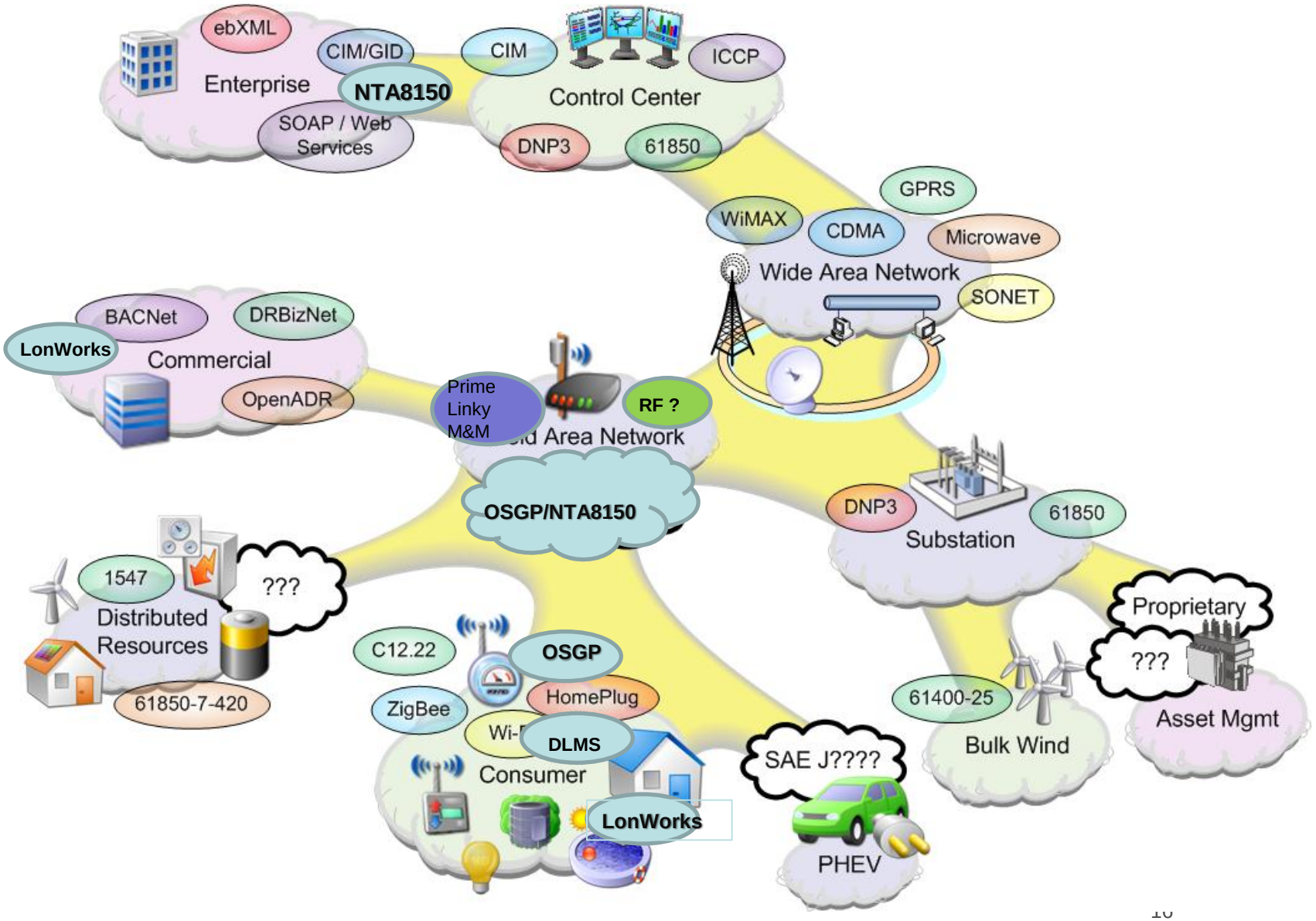
Smart Grid Comm Standards Domains…….. many



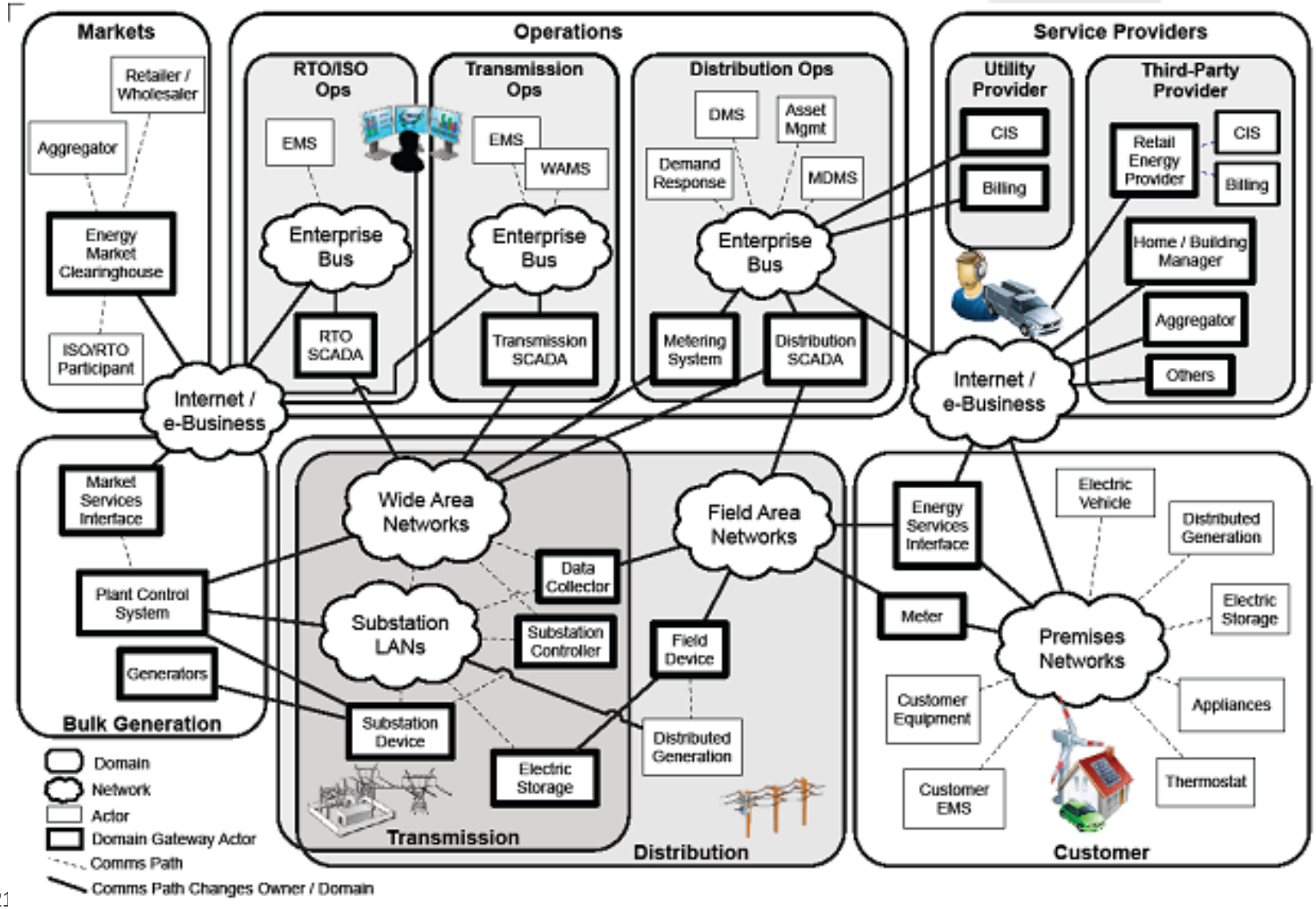


Figure 2.1 Information sharing components of the Smart Grid[7]

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Smart Grid Components & Targeted Benefits

"Intelligent" Communication Infrastructure

Substation Automation	Distribution Automation	Smart Metering / AMI	Behind the Meter Applications
•Improved reliability •Remote breaker operation •Improved Voltage Regulation •Automated Emergency load reduction •Improved asset management	•Improved reliability •Improved PQ •Improved system efficiency (Volt / Var Management) •Emergency load reduction •Reduced equipment inspections •Self Healing capability •Improved asset management •Reduction of technical losses due to better modeling	•Remote meter reading •Remote connect / disconnect •Prepaid metering •More billing options (weekly, bi-monthly or monthly) •Auto On site outage reporting •Meter accuracy improvement •Reduced energy theft •Improved public safety	•Energy Efficiency •Peak Load Mgmt •Demand Response Rates •CO2 Offset from peak reduction

WEBSERVICES