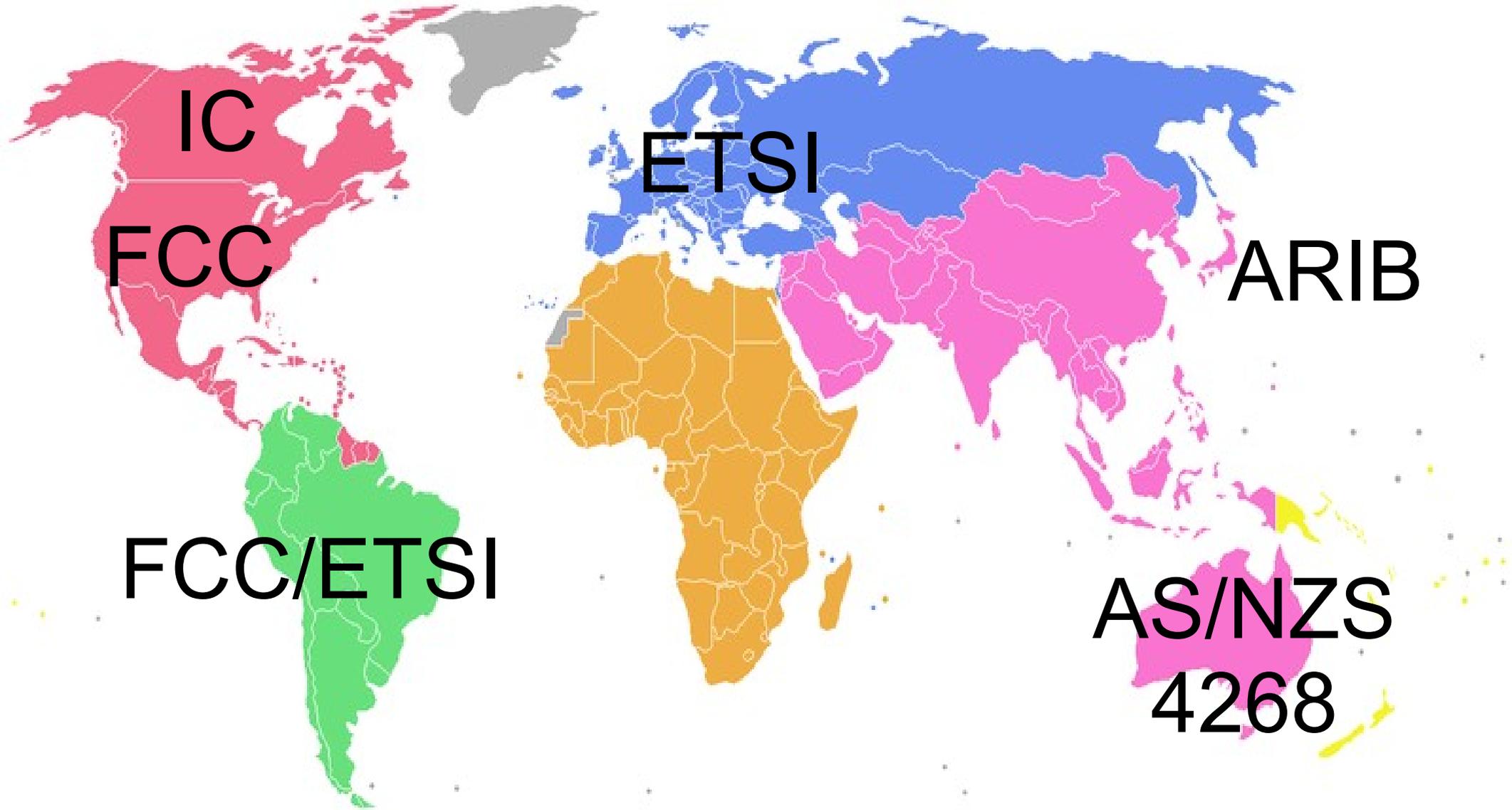




Smart Grid Standards in Europe

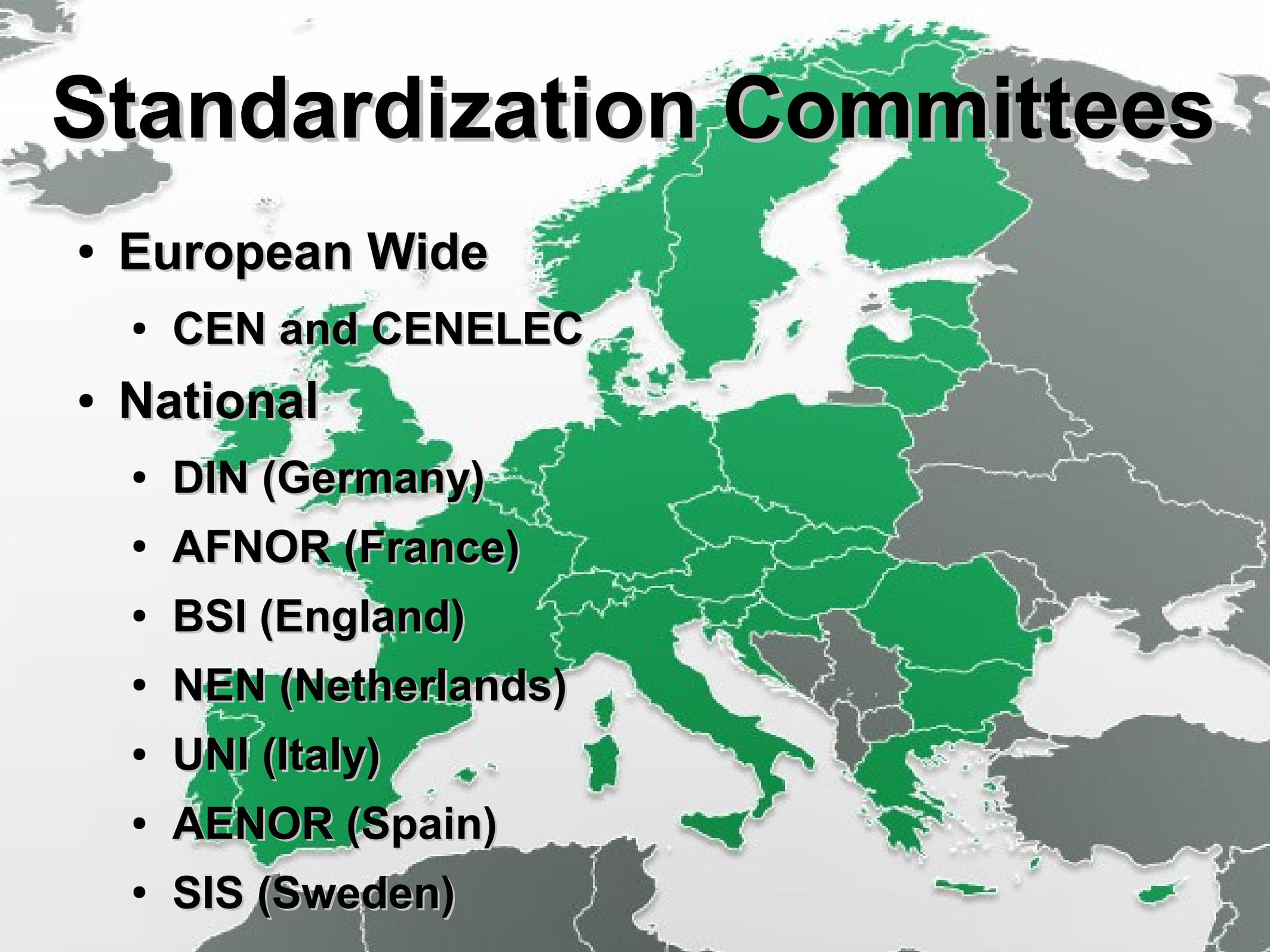
by Ing. Paul Vollebregt MBA
MobiComm Communications

18 Dec. 2012



ETSI Rules in Europe

Standardization Committees

A map of Europe is shown in the background, with the continent highlighted in green. The map includes major landmasses like Europe, Africa, and Asia, with the oceans in grey. The text is overlaid on the left side of the map.

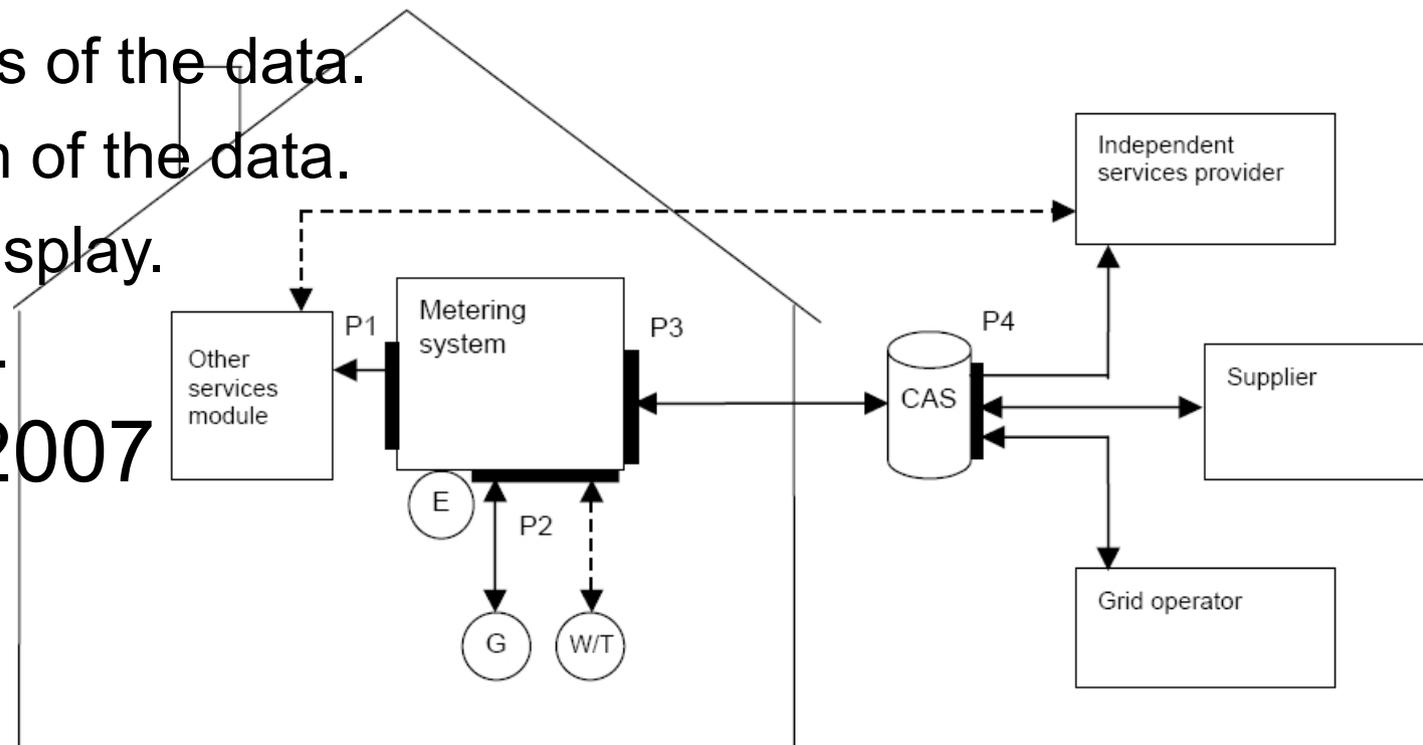
- **European Wide**
 - **CEN and CENELEC**
- **National**
 - **DIN (Germany)**
 - **AFNOR (France)**
 - **BSI (England)**
 - **NEN (Netherlands)**
 - **UNI (Italy)**
 - **AENOR (Spain)**
 - **SIS (Sweden)**

Netherlands – NTA 8130

- Dutch Smart Meter Specification

- Project started on March 2005
- Open public consultations
 - Privacy Worries.
 - Usefulness of the data.
 - Resolution of the data.
 - Inhome Display.
 - Interfaces.

- Completed 2007



Dutch Smart Meter Requirements

- DSMR project started beginning of 2008.
 - Executed under control of Netbeheer Nederlands.
 - Technical leadership DNV KEMA.
- Build on NTA8130
- DSMR Defines:
 - P1, P3 and P4 interface definitions.
 - Encryption mechanism inspired by EN 13757-3.
 - AES128 Fixed Key update through P3.
 - Software update mechanism through P3.
 - M-Bus protocol adaptations (P2).
- Current version is v4.04

European Commission – M/441

- In response of completion NTA8130
- OPEN meter project mandated on March 2009
 - Used parts of NTA8130 as starting point.
 - Executed under control of CEN, CENELEC and ETSI.
 - Technical leadership DNV KEMA.
- OPEN meter project consortium started on July 2009
- Project leadership by spanish Iberdrola electric company.
- Closed and restricted membership, only 19 members.
 - 6 Energy Companies
 - 9 Standardisation and R&D organisations.
 - 4 Metering Companies

Goals

- Open Access Standard for Smart Multi-Metering Services.
- Interoperability between different vendors.
- Allowing EU-industry to take world leadership by being first with a standard.
- Project timeline: 30 Months, Q1 2009 until Q3 2011.

OPEN meter panel of users and stakeholders

- CEN European Committee for Standardization.
- ERA Energy Retail Association (UK).
- ESMIG European Smart Metering Industry Group.
- EUROGAS European Union of the Natural Gas Industry.
- EUTC European Utilities Telecom Council.
- DLMS USER ASSOCIATION.
- DNV KEMA.
- ACTARIS, ELSTER, LANDIS+GYR, STM, USYSCOM ...
- IBERDROLA, RWE, EDF, ENEL, ENDESA...
- UNI OF KARLSRUHE, NETBEHEER NEDERLANDS.

Why OPEN meter?

- **Open**

- based on open standards and non-proprietary solutions, result is a set of open standards

- **Public**

- results will be made freely available to all stakeholders

- **Extended**

- goes beyond utility metering and allows for providing new energy services

- **Network**

- metering devices become nodes of telecom networks

Results

- Can be freely download from: www.openmeter.com.
- Standards as predicted by many refused members.
 - M-Bus, wired and wireless.
 - DLSP/COSEM
 - No real Cyber Security definition.
 - RC4 with 128 Bit key as proposed by KEMA.
 - Fixed Key for all meters in a country or region
 - In Rev. 2 Changed to AES128.
 - One unique Key per meter XOR with Fixed common key.
 - Every 6 months a Fixed key update using old Fixed Key.

Response from industry

- Disappointment from within industry.
- Criticism about primitive security.

NIST SGIP introduces NISTIR 7628

Joint Working Group

- Executed under control of CEN, CENELEC and ETSI.
- JWG on standards for smart grids worked between June 2010 and March 2011 on the production of a report addressing standards for smart grids.

European Commission – M/490

- In response of completion JWG
- Mandated on March 2011
 - "to develop a framework to enable European Standardisation Organisations to perform continuous standard enhancement and development in the field of Smart Grids, while maintaining transverse consistency and promote continuous innovation."
 - Used parts of M/441 and M/468 as starting point.
 - The focal point addressing the ESO's response to M/490 is the CEN-CENELEC-ETSI Smart Grids Coordination Group (SG-CG), built around the membership of the previous JWG.
- Closed and restricted membership

SG-CG Structure

- Smart Grid Coordination Group
 - Working Group Reference Architecture.
 - Using SGIP Architecture as a guidance.
 - Working Group First Set of Standards.
 - Working Group Sustainable Processes.
 - definition of Use Cases
 - technical requirements for Smart Grid applications
 - Working Group Security.
 - Using NISTIR 7628 as a guidance.

Open Metering System ?

- Germany started its own standard after the release of OPENmeter.
- OMS is now followed by Switzerland and Austria more countries can follow.
- European Commission asked the SG-CG to work together with Germany.



Open Metering System

The interoperable communication system
for electricity, gas, heat and water
in metering and submetering
as well as home and building control



OMS Group at a glance

- **OMS = Open Metering System**
- The OMS Group was founded in 2007 for defining
 - interoperable,
 - supplier independent,
 - media independentcommunication standard for automatic data read out.
- The OMS Group has **40** members from 9 countries (by Sept. 2012)
 - Manufacturers of metering devices (electricity meters, gas meters, water meters, heat meters, heat cost allocators)
 - Manufacturers of communication technology,
 - Service providers for telecommunication and submetering,
 - Manufacturers of home and building technology,
 - Utilities.
- The OMS Group is supported by
 - figawa – German association of the companies in the gas and water industry
 - KNX – International association and owner of the Worldwide Standard for Home and Building Control

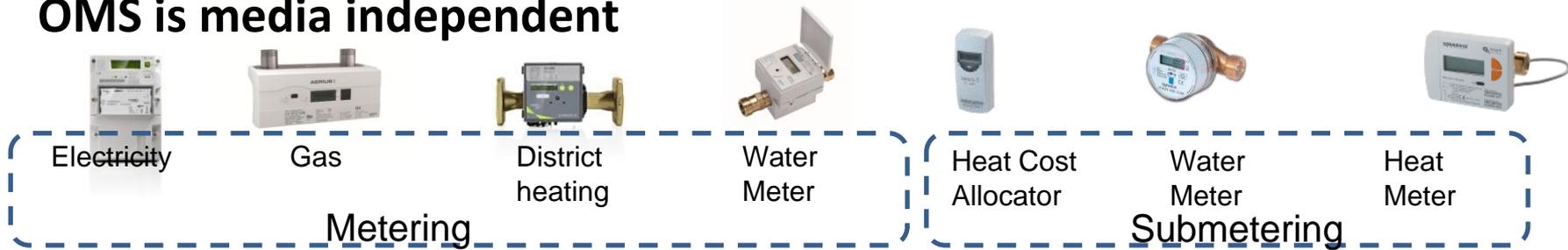
OMS Group members are located in...



-  Country of origin OMS Group
-  Members
-  Area of validity of European Standards

Characteristic and objectives of OMS

- **OMS is media independent**



- **OMS is manufacturer independent**

- OMS specifies rules for certification
- Products and subsystems that have been certified are entitled to carry the OMS Label



Characteristic and objectives of OMS

- OMS includes all metering applications



protocol
definitions

M-Bus
DLMS
SML

OMS Spec Vol. 2
Primary com

- OMS is secure



Authentication and
fragmentation layer

OMS TR 01
Security

- OMS can be used wireless as well as wired

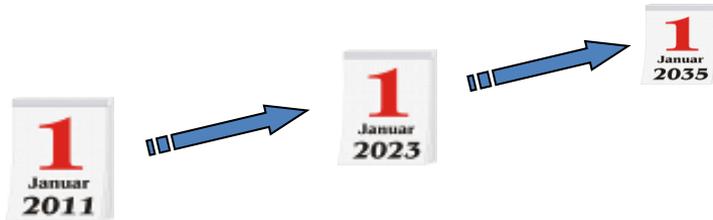


Twisted pair M-Bus
Wireless M-Bus

OMS Spec Vol. 2
Primary com

Characteristic and objectives of OMS

- **OMS is compatible with home and building automation**
OMS and KNX use the same physical and link layer for wireless communication (S-mode)
- **OMS is future proof**
OMS aims at products with an operational lifetime of more than 10 years thus saving investments.



Characteristic and objectives of OMS

- **OMS avoids disturbances**

OMS uses the 868 MHz frequency band, which is reserved for automation, energy metering and home security.

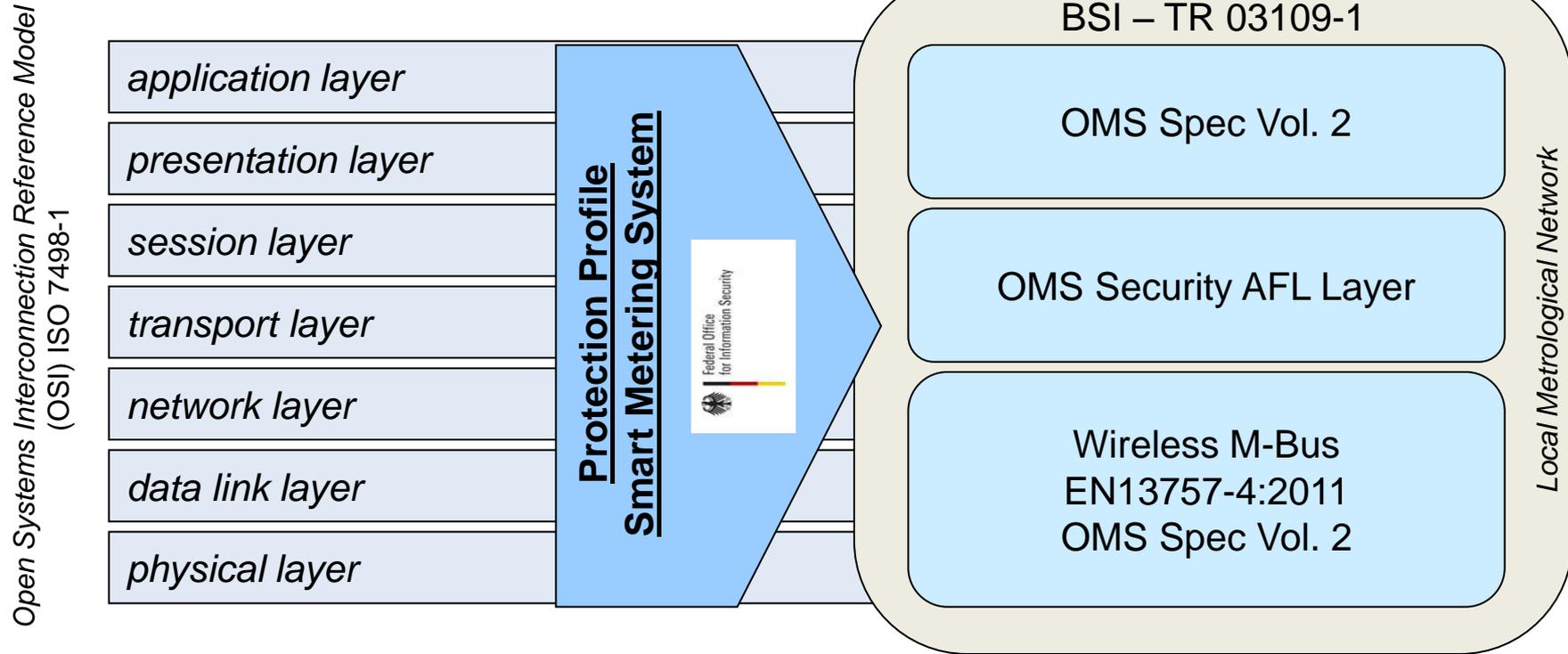
- **OMS guaranties long ranges**

Due to the use of a Sub-GHz band the attenuation is moderate also within buildings



Characteristic and objectives of OMS

- OMS is part of the protection profile for smart metering



OMS certification

OMS-Conformance-Test-Specification
http://www.oms-group.org/de_downloads.html



OMS member: 3.000 €
non member: 6.000 €



Selftest



Publications

- Internet: <http://www.oms-group.org/>
- Documents: http://www.oms-group.org/de_downloads.html
 - OMS-Specification
 - OMS-Conformance
 - OMS-Technical Reports
 - The articles of association of the OMS Group
 - Membership Application Form
 - Test Tool Order Form

Work in process: OMS Specification release 4



Finalizing
TR-03109 for
protection profile
smart metering

Including the requirements
of TR-03109
in OMS Specification (release 4)

Adopting the OMS
Spec (rel.4) into the
OMS-Conformance-
Test-Specification

Ready to
certify
OMS
systems
and
Components
for German (incl.
BSI-TR03109)

2012

2013

OMS in Europe



European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

CEN/TC 294

"Communication systems for meters and remote reading of meters"

prEN 13757-1 → CEN Enquiry

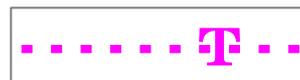
prEN 13757-3 → Formal Vote

prEN 13757-4 → CEN Enquiry

prEN 13757-5 → TC Draft



OMS Members



ESNA

- Energy Services Network Association.
- Based on NES standards
 - Open Smart Grid Protocol (OSGP)
- Claimed to have 3.5 million OSGP compliant meters installed mainly in Italy since 2002.
- Only one Technology provider: Echelon.
- non-profit organisation with no government involvement based in The Netherlands.

Drawbacks of OSGP

- Technology mainly from the 1980's.
 - 64 Bit Key based RC4 (old installations)
 - 128 Bit Key based AES128 new proposed standard.
 - Uses BPSK Narrow Band Power Line.
- Not Compatible with OPENmeter or any other European standard in making or defined.

Which direction are we going ?

OSGP

DSMR

SG-CG

OPENmeter

OMS

SGIP

M/490

ESNA

Will Europe find the way out ?

- **Energy companies and network operators are in waiting mode.**
 - **Want one clear standard before they invest.**
- **Weak points in the European Smart Grid.**
 - **Different proposed standards all with pros and cons.**
 - **Selection process not based on technical grounds but on political correctness.**
 - **Weak Cyber Security protection.**
- **Only way out is to work closer with SGIP and form ONE unified standard for Smart Grid.**



Merry Christmas
Feliz Navidad
Shinnen omedeto. Kurisumasu
Omedeto
Feliz Natal
Sheng Dan Kuai Le
Pozdrevlyayu s prazdnikom
Rozhdestva is Novim Godom
Vrolijk Kerstfeest en een Gelukkig
Nieuwjaar!