



Project Set D Advisors Webcast

**Moderator:
Erfan Ibrahim – Project Set Lead**

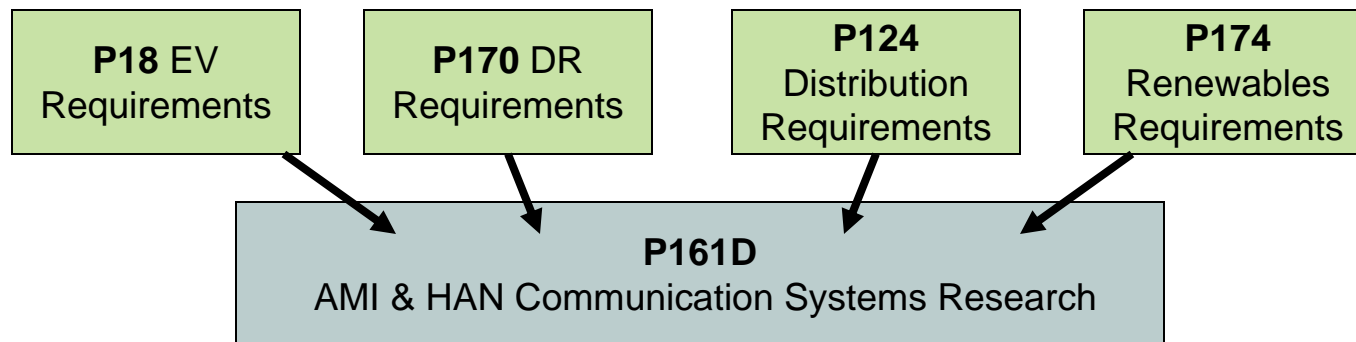
August 2nd 2010

Contributors:

**Brian Seal
Electricite De France
Marty Burns
Joe Hughes
Craig Rodine
Jamal Alrawi
Tim Godfrey**

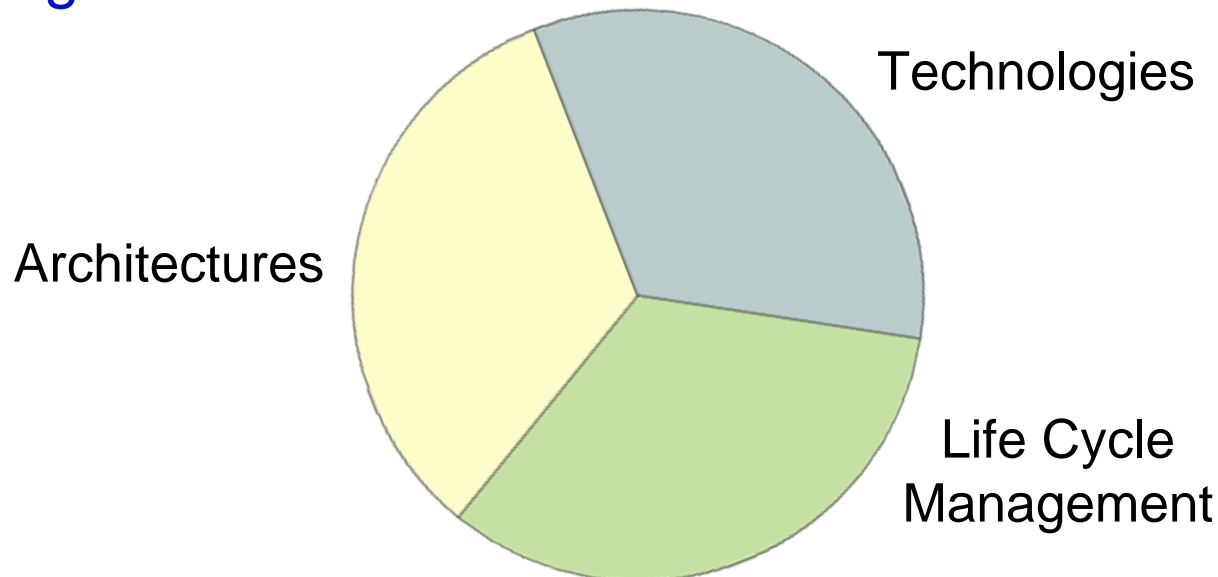
P161D – Place in the Overall Portfolio

- Application requirements are identified in a range of programs, but P161D is the designated place for AMR/AMI communication system research and evaluation.
- P161D is the designated place for all research and evaluation in-premise communication systems.



P161D – Place in the Overall Portfolio

- Scope includes communication architectures, technologies, and protocols
- Covers in-premise residential and commercial networks, AMI networks, and headend software integration
- Ongoing focus areas:



P161D – 2010 Base Project Summary

- **P161.006** Develop a forum to share AMI and HAN lab test results across member utilities
- **P161.007** Characterize a range of common utility communication architectures, with standards and gaps identified at each interface and layer
- **P161.008** Work with HAN communications chip manufacturers to ensure HAN communication reliability with well defined performance metrics

Value

P161.006 Utility Laboratory Testing Coordination

- What are we doing in 2010?
 - Provide an ongoing means by which results of testing being conducted in utility laboratories can be shared and aligned
 - Focused on AMI and HAN
 - No red-tape: Easy to participate, No obligations
- Why is it valuable?
 - Participants will benefit from improved awareness of tests being conducted in utility labs and from the opportunity to share in the learnings from these tests

Utility Laboratory Testing Coordination

Project 161.006

Objectives

- Maximize the industry benefit of ongoing laboratory tests of AMI and HAN technologies.

Deliverables

- Utility lab testing webcasts, test reports.

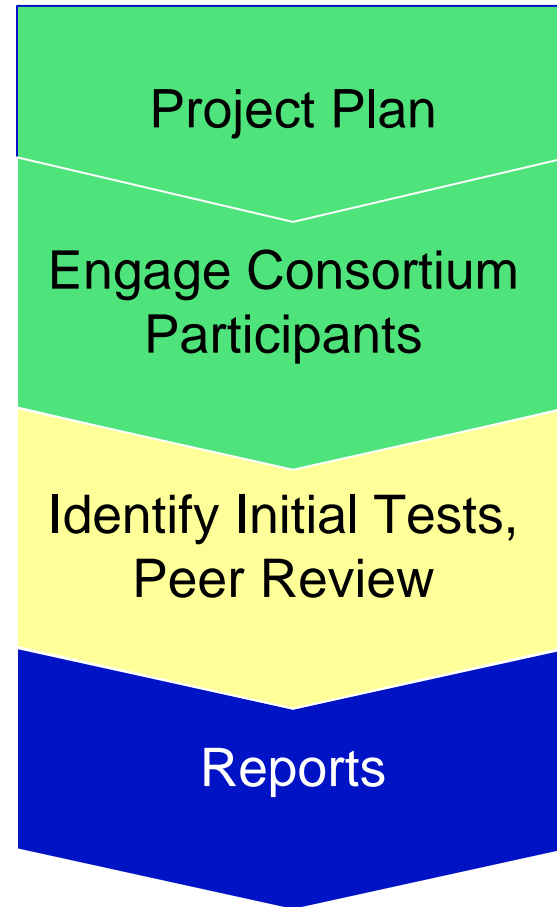
Completion Date

- Ongoing with 2010 deliverables TBD

The Big Picture

- *Utilities have developed laboratories with unique capabilities and are conducting technology evaluations that may be shared with other interested parties.*

Key Tasks and Milestones



The EDF R&D MENOFIS Platform

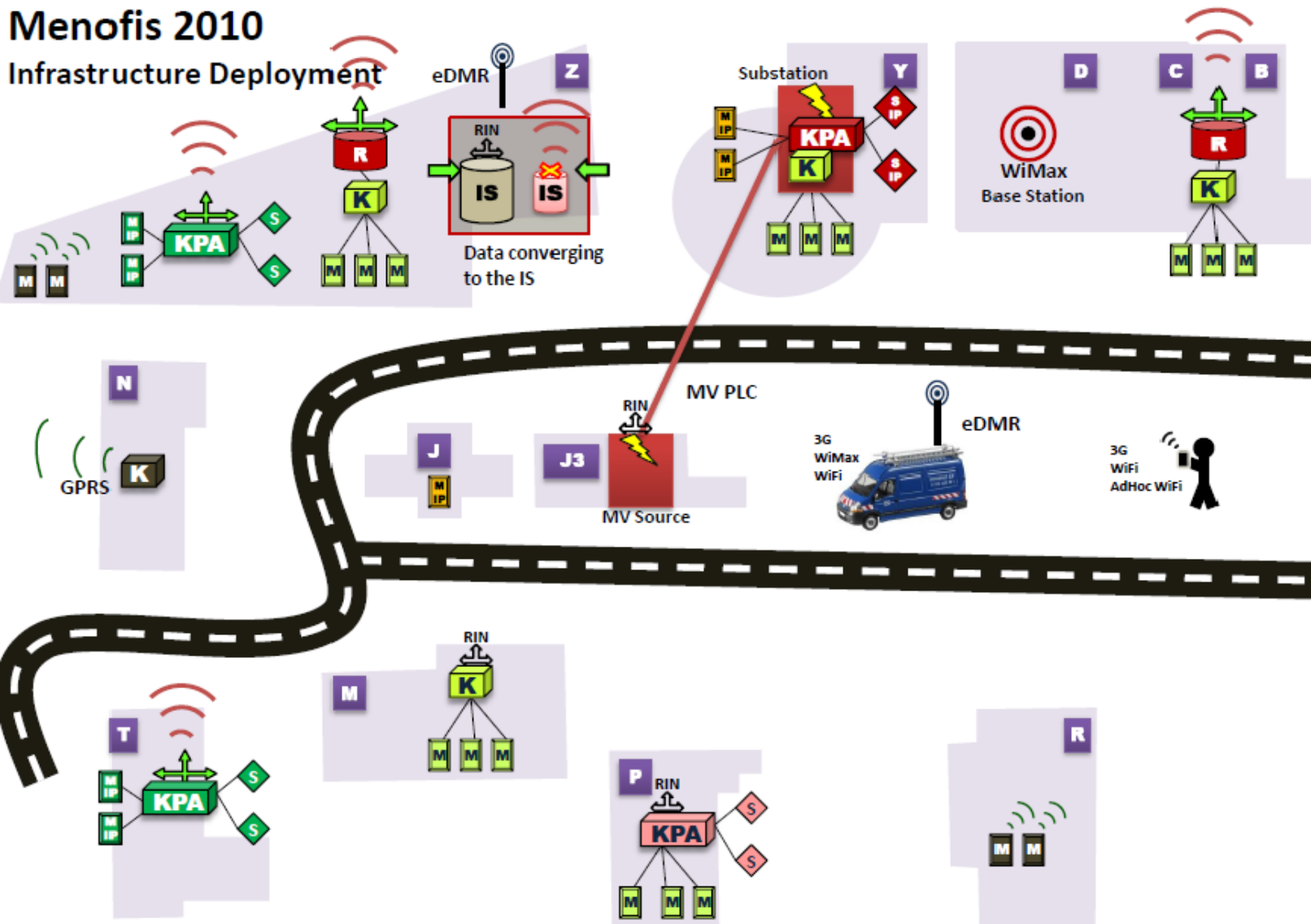
(MEtering, Network and On the Field operations and Information System)

- Objectives:
 - This platform is common for different needs
 - Smart Metering,
 - Smart Grid
 - Smart wireless agent on the network
 - This platform will allow to test different technologies and architectures
 - We will try to mutualize the materials in the MV/LV transformers for smart grid and metering needs
 - Next phase, we will try to implement other services using the metering data (i.e demand-response,..) and the network data (i.e LV monitoring, default detection,..)

The R&D MENOFIS Platform

Menofis 2010

Infrastructure Deployment



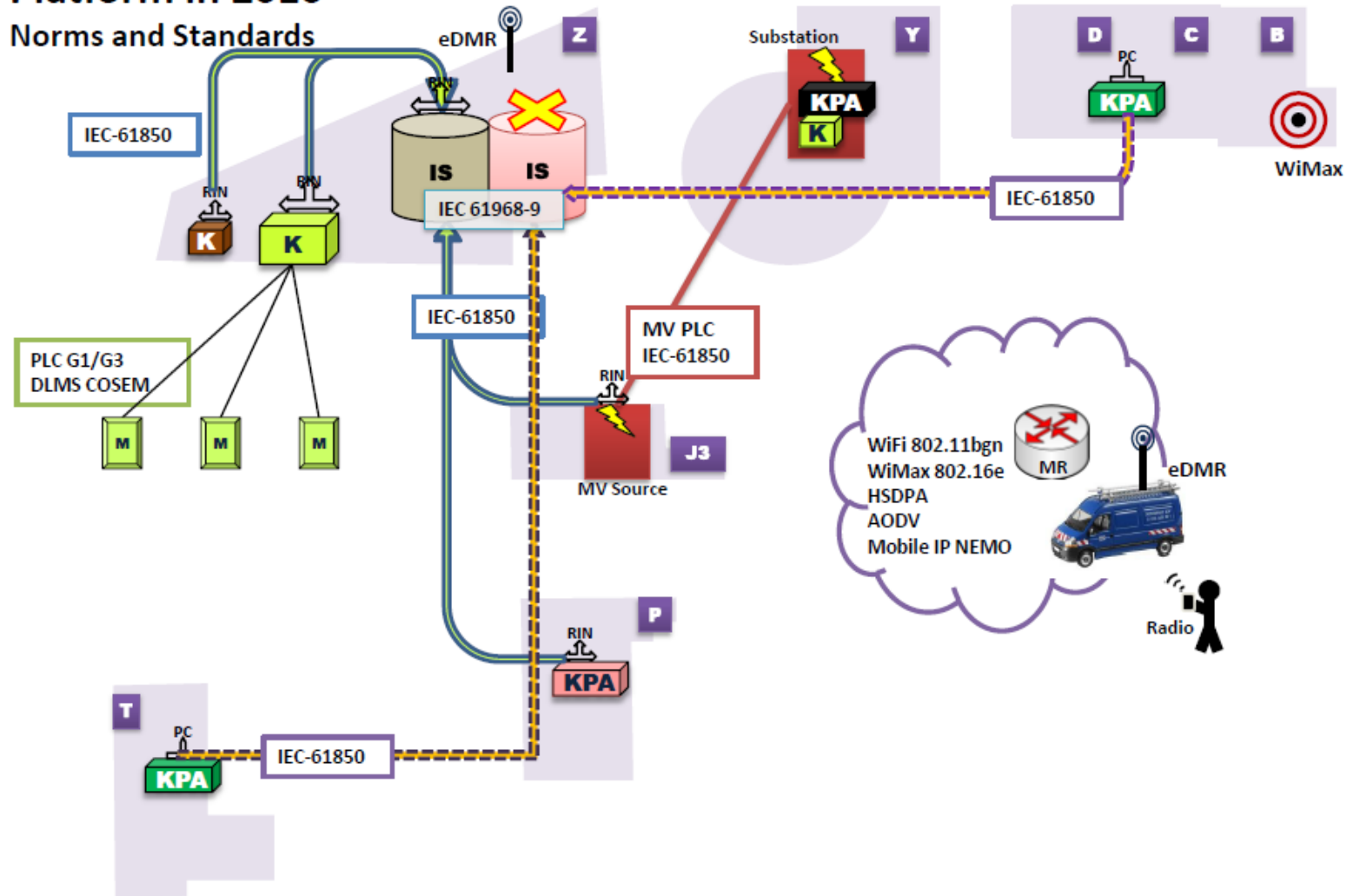
A unique platform for 3 different needs:

- Metering,
- Network operations
- On the field operations

Use of the standards on the MENOFIS platform

Platform in 2010

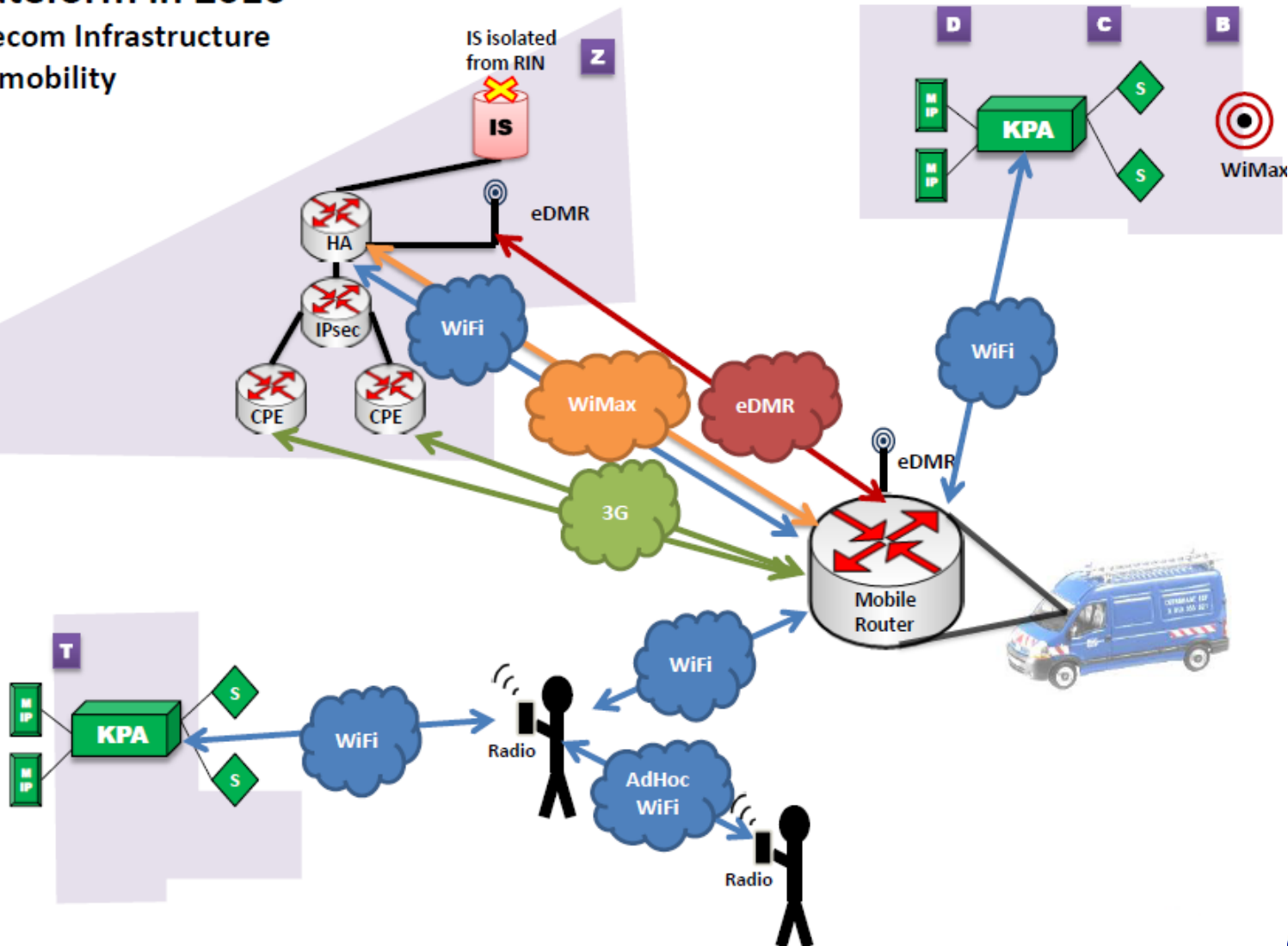
Norms and Standards



The use of wireless communication medias

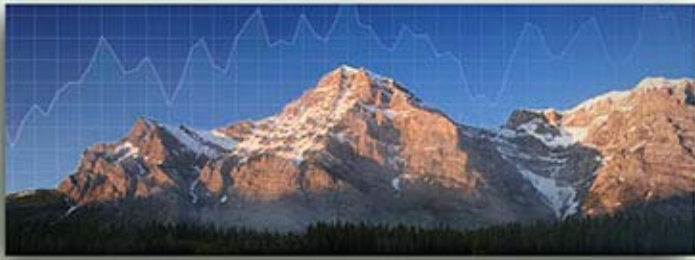
Platform in 2010

Telecom Infrastructure for mobility



EDF Deliverables Deadlines

- The process for delivering the reports is the following:
- Report on the 2010 tests:
 - o Draft version: November 1, 2010
 - o Final version: December 15, 2010
- Report on the 2011 tests:
 - o Draft version: May 1, 2011
 - o Final version: June 15, 2011



Customer Communications Architecture Development: Metrics for Standards and Product Assessment

Marty Burns, Joe Hughes
August 2nd, 2010

Value

P161.007 Customer Communications Architecture

- What are we doing in 2010?
 - Defining the Standards landscape for end to end integration of customer communications
 - Assemble structured dictionary of communications requirements metrics for product and standards assessment
 - Analyze prominent product suites against the metrics
 - Identify gaps and overlaps with existing standards and associated implementations
- Why is it valuable?
 - Participants will benefit from improved awareness of the standards for customer communications and how they could be integrated and what the remaining issues are in developing a full customer communications system

Customer Communications Architecture

Project 161.007

Objectives

- Maximize the potential to integrate standards into a coherent and interoperable infrastructure

Deliverables

- Report on standards integration strategies and issues including graphics of interfaces

Completion Date

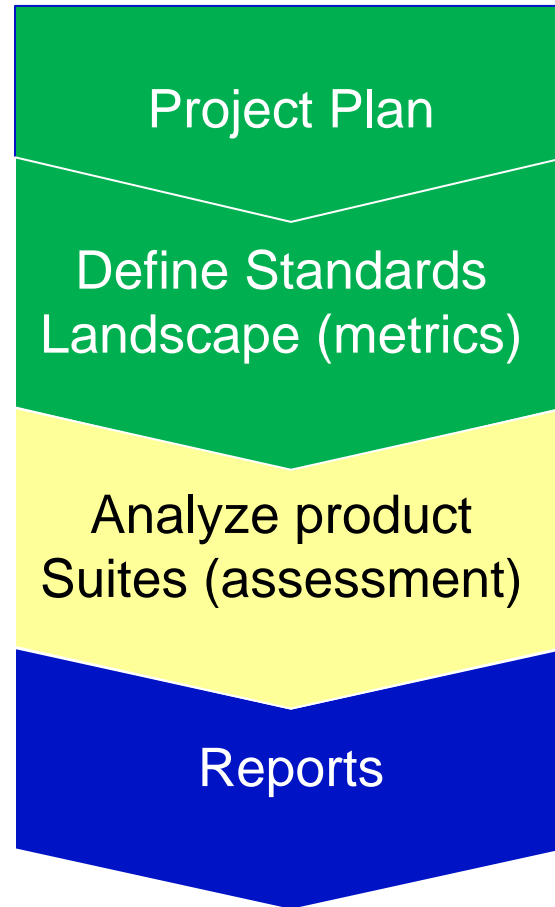
- 7/15/2010 Metrics
9/30/2010 Assessment

The Big Picture

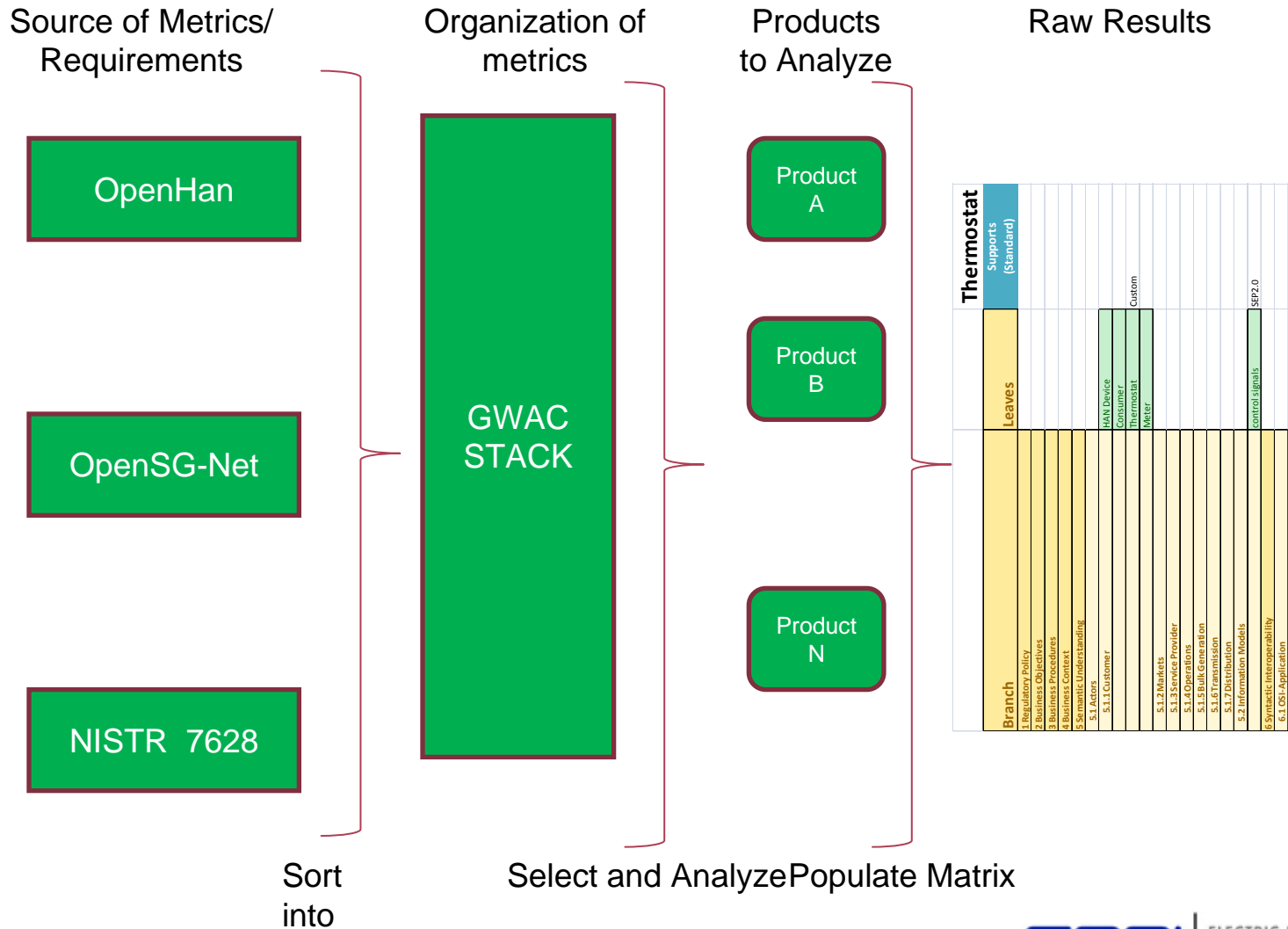
- *A standards based AMI & HAN comms. architecture will accelerate the development of vendor products and value derived from DR & EE.*

Key Tasks and Milestones

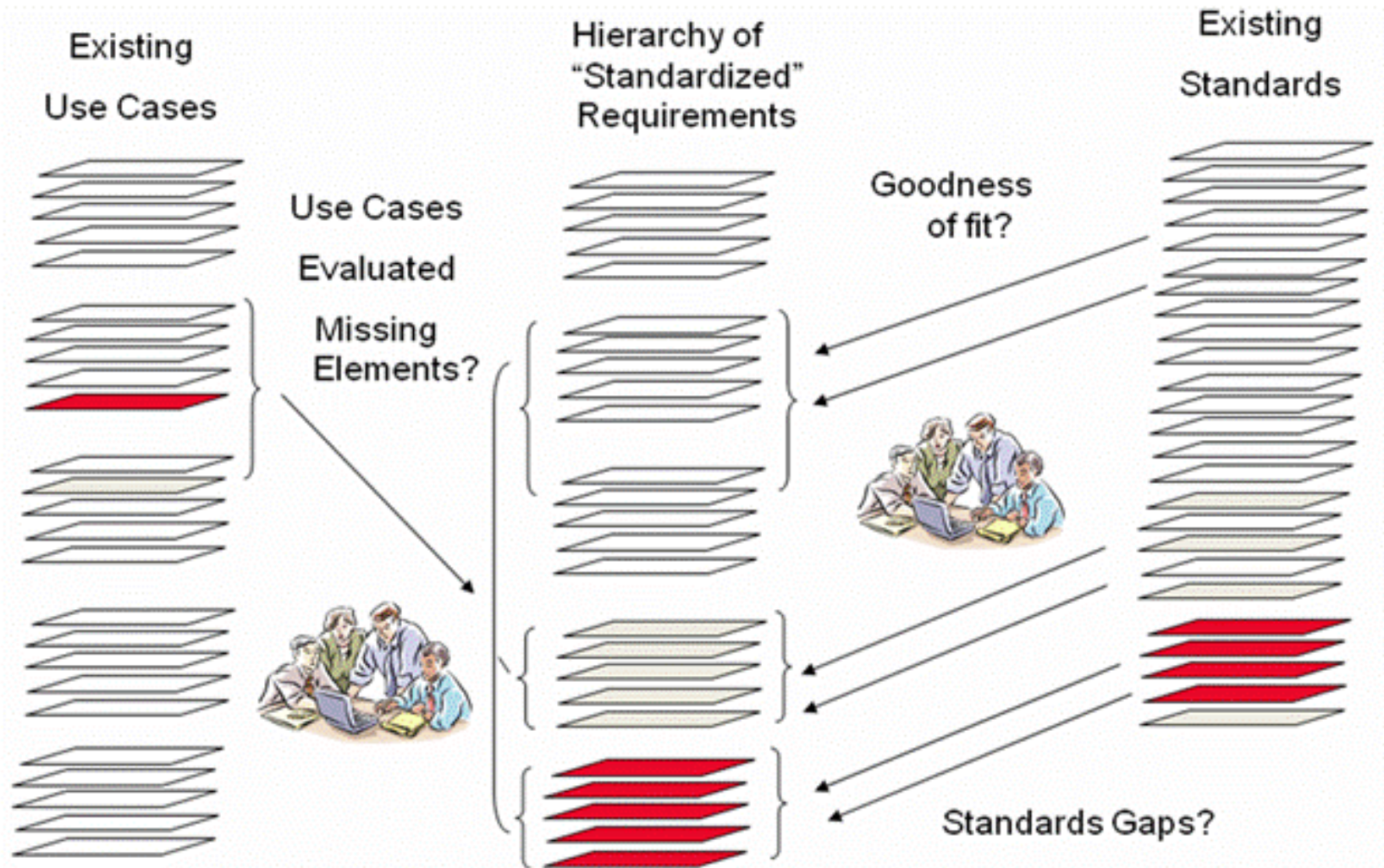
- Completed
- In Process
- Upcoming



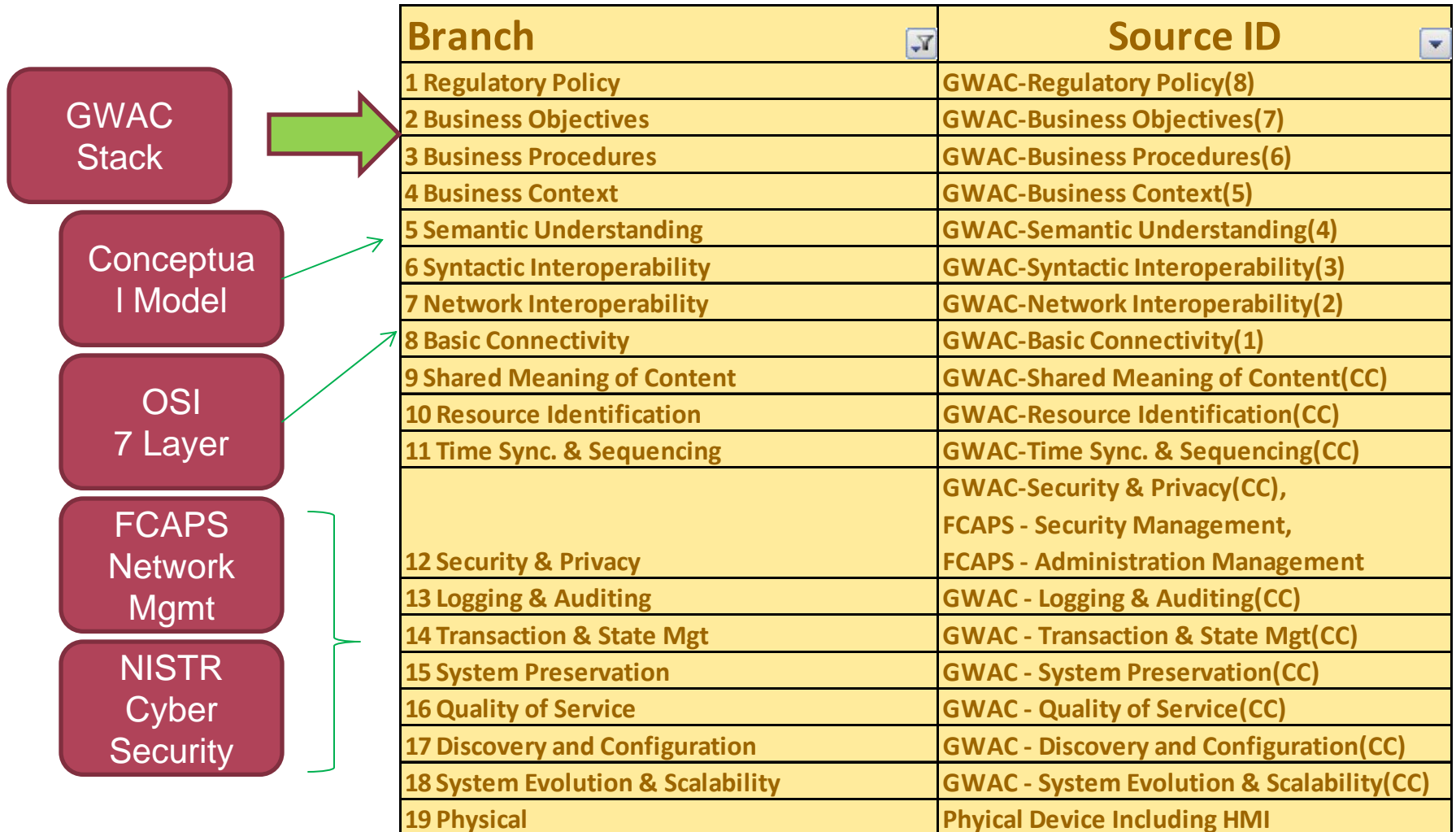
Assembly and analysis of requirements



Uses of “Tree of Requirements Metrics”



Tree of Requirements Metrics: Branches



Tree of Requirements Metrics: Leaves

- 270 individual requirements from OpenHAN (expanded into ~1600 primitive requirements),
- 1000 requirements from OpenSG (expanded into ~12000 primitive requirements)
- 100 requirements from the NISTR 7268
- Resulting in: ~1200 unique primitive requirements

Value

P161.008 Standards and Software for HAN Evaluation

- What are we doing in 2010?
 - Driving standards and platforms for monitoring HAN performance and reliability
 - Including IEEE 802.15.4 (Zigbee), IEEE 802.11 (WiFi), HP-AV/GP and IEEE P1901 (PLC)
 - Involves close collaboration with SDOs, technology alliances, and HAN silicon and appliance vendors
- Why is it valuable?
 - Enables participants to validate HAN communications reliability in support of Retail Energy Services: PH/EV Charging, Demand Response
 - Provides critical infrastructure for utility in-home trials under P161D HAN Supplemental

Standards and Software for HAN Evaluation

Project 161.008 Status

- Power Line Evaluation Tool (PET) A Home Plug AV (HPAV) test tool
 - Accomplishments
 - Local (no networking) and central (remote monitoring) support for PET has been implemented. Both are being tested and evaluated .
 - Beside providing HPAV nodes traffic statistics it also provides SNR and Tone Map graphically as well as the ability to log received HPAV data to file in both the local and the central programs.

Standards and Software for HAN Evaluation

Project 161.008 Status-continued

- Wireless Evaluation tool (IEEE 802.15.4) ZigBee
- Accomplishments
 - Local (no networking) and Central (remote monitoring) versions have been implemented and are being tested.
 - Beside providing latency, RSSI and ED monitoring and logging, it also supports Proposed IEEE 802.15.4 statistics and all 802.15.4 ED channels measurements.

Standards and Software for HAN Evaluation

Project 161.008

Objectives

- Establish standard metrics and methods for HAN performance and reliability monitoring.

Deliverables

- Standards, prototype software, vendor and utility support.

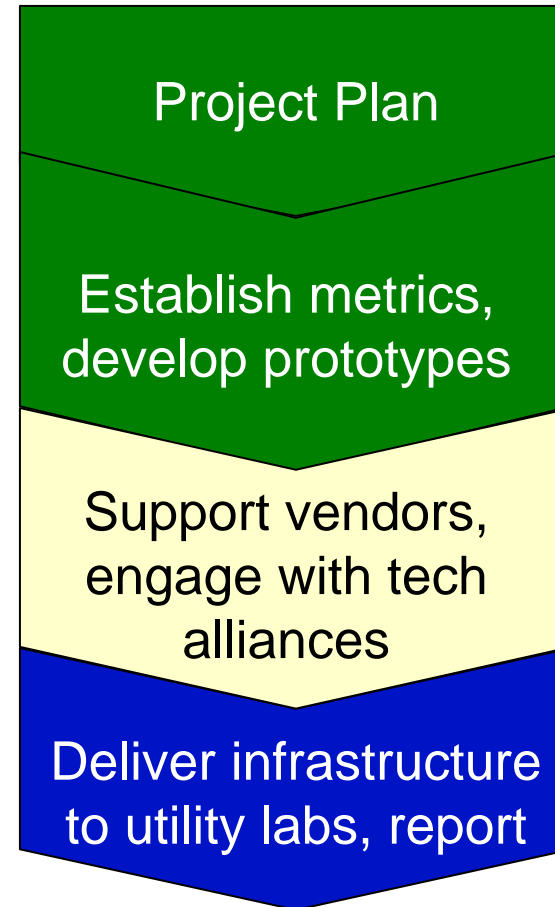
Completion Date

- 12/31/2010

The Big Picture

- *Utilities need to determine whether they can rely on HAN technologies for Retail Energy Services. We are delivering that capability with a set of SDO standards, network monitoring prototypes, and HAN technology/device vendor engagements and support.*

Key Tasks and Milestones



Standards and Software for HAN Evaluation

Project 161.008 Status-continued

- Central HAN Metrics Remote Monitoring Tool
- Accomplishments
 - Remote monitoring via two way Internet communication has been established and is being evaluated for reliability. Internet communication via Mobile (CELL) data communication has been established.
 - Central program is able to support WET and PET simultaneously..
 - Logging and logging processor has been implemented.

Home Area Network Supplemental Project

Problem Statement: Some technologies proposed for home area networks are new and it is unknown how well they will work in a diverse range of homes. These systems need to work reliably with no customer hassle, yet there are attenuation and interference concerns.

Project Plan: This project will leverage the standard metrics from P161.008, and will work with vendors and participating utilities to get a wide range of products installed in a wide range of scenarios and monitored continuously for connectivity.

Technologies to be evaluated are HomePlug, Wi-Fi, and Zigbee. EPRI-provided software on a local laptop computer will capture results.

Goal is 10-50 homes per utility, 10 utilities.

Home Area Network Supplemental Project Status

- Tools for HAN local and remote monitoring are in the advance stages of testing and evolution.
- Will be soliciting participating Utilities to evaluate HAN test tools and provide their feed back.
- Will Indentify vendors whom are willing to provide HAN metrics software supporting application within their utilities targeted products. (Utilities guidance and assistance will be needed)
- . **Help 161.008 Project in defining its architecture and requirements to ensure its suitability to support this project.**

161D Outreach Efforts To Members & Industry at Large

- 4 Quarterly Webcasts (Feb 23rd , May 13th, August 2nd, November)
- 2 face to face meetings (March 2nd @ AEP & September in Florida)
- Direct E-mail Updates for Project Set Advisors, Site Visits and Conference calls to Project Set Advisors
- Utility & Vendor Collaboration
- Contact Info:
 - Erfan Ibrahim – eibrahim@epri.com
 - Joe Hughes – jhughes@epri.com
 - Craig Rodine – crodine@epri.com
 - Brian Seal – bseal@epri.com

Together...Shaping the Future of Electricity