Background

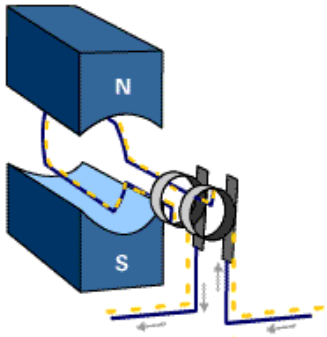
- Energy Policy Act of 2005 (EPACT 2005) requires advanced electric meters at all federal facilities by 1 Oct 12
- Energy Independence and Security Act (EISA) of 2007 requires advanced natural gas, water, and steam meters at all federal facilities by 1 Oct 16
- DOD guidance requires metering all utilities for facilities that have estimated annual utility cost of $35K or greater
- Army criteria for electric metering program:
  - $35K or greater annual energy costs
  - 29,000 square feet or greater
  - reimbursable tenant facilities
- Each MACOM funds their respective facility metering

Roles of Huntsville COE

- Huntsville COE executes contracts for installation and networking of advanced meters and utility monitoring and control systems (UMCS).
- Worldwide Clients include the following:
  - US Army (Medical Command, Army Reserves, Army Natural Guard, Installation Command, and Army Materiel Command)
  - US Army Corps of Engineers Logistics (ULA)
  - Marine Forces Reserves (MFR)
  - Defense Logistics Agency (DLA)
  - Individual active Army garrisons
  - Various Marines camps and Air Force garrisons
- These clients have different criteria than the Army metering program.
- Future of metering programs = UMCS, basewide metering, master metering, integration with smarter gird technology, etc.

Process

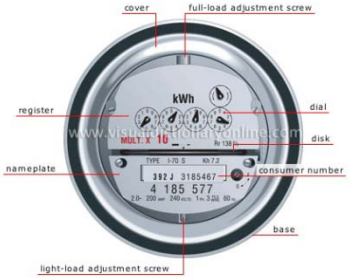
- Phase I:
  - Contractor visit and survey buildings
  - Interview DPW and site engineers
  - Evaluate existing Utility Monitoring and Control System (UMCS)
  - Submit Technical Data Package (TDP) w/ detailed design
  - Provide detailed cost estimate per building



Process (cont.)

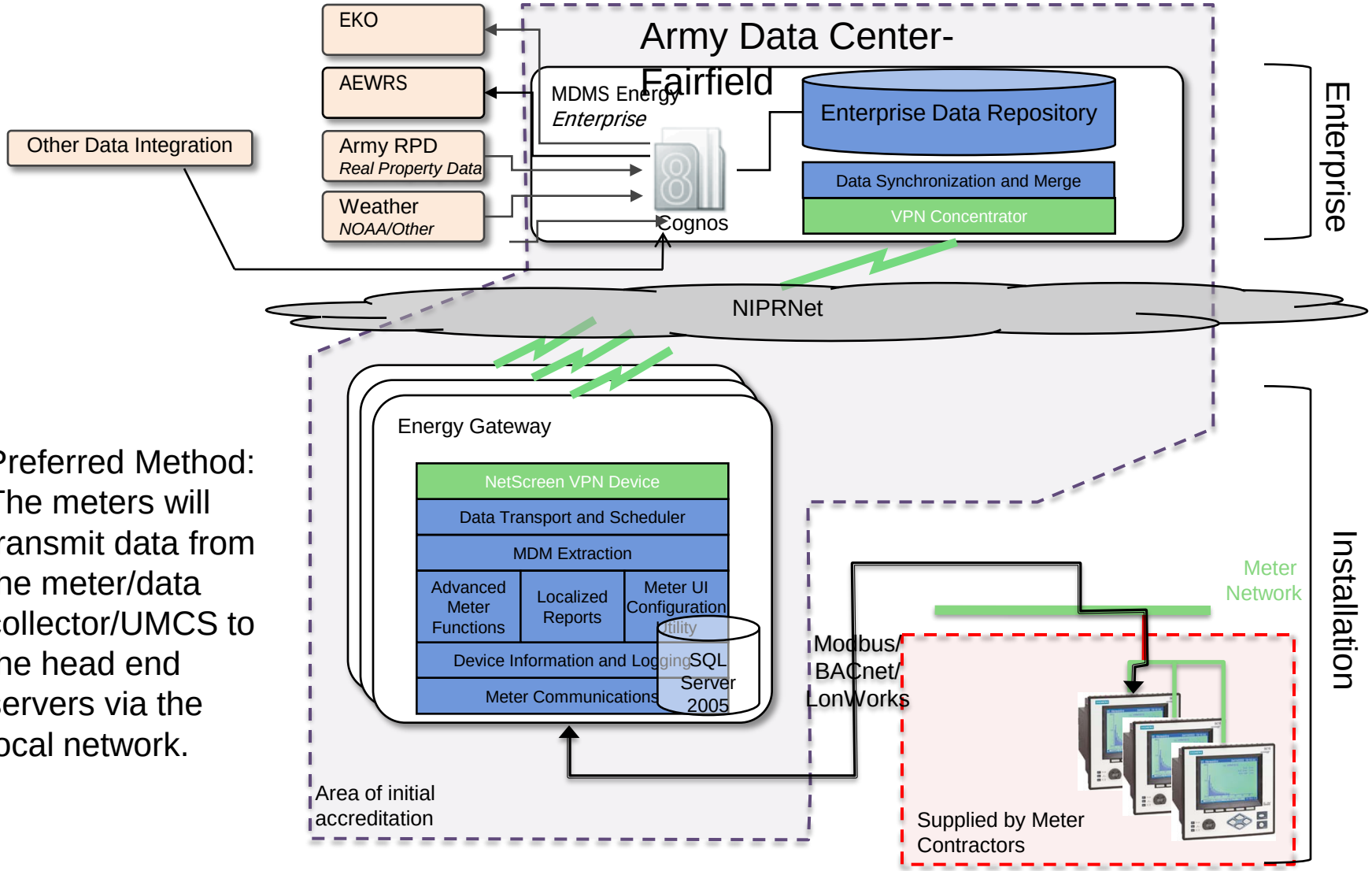
- Phase II:
  - Procure & install Phase I design
  - Awarded as option after firm fixed price negotiated from Phase I
- Metering Data Management System:
  - Meters will be connected to existing UMCS system if available
  - If no UMCS, a meter data management system will be provided with reporting of metering data to a central front end

Technical Specs



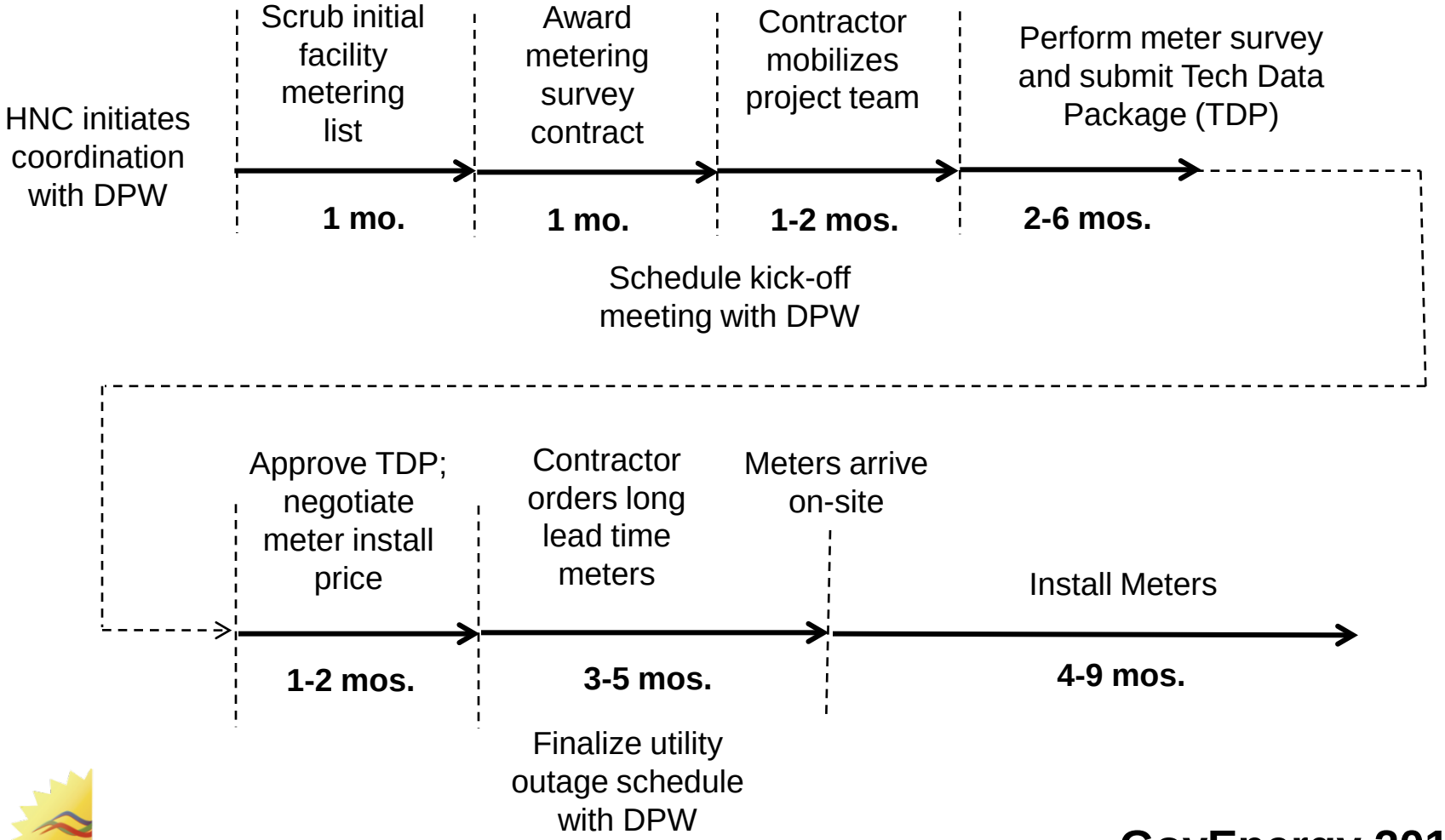
- Typical Bldg
  - ANSI C12.20 0.5% Accuracy Class Meter
  - 0.6% CTs and PTs
- Reimbursable Bldg
  - ANSI C12.20 0.2% Accuracy Class Meter
  - 0.3% CTs and PTs
- Capturing kWh (energy), kW (power), and average kW over 15 minute interval (demand)
- 30 days Data Storage
- 2 Auxiliary Inputs for Other Utility Meters
- Modbus RTU or LonWorks Communications

Proposed Enterprise Solution



Preferred Method: The meters will transmit data from the meter/data collector/UMCS to the head end servers via the local network.

Timeline



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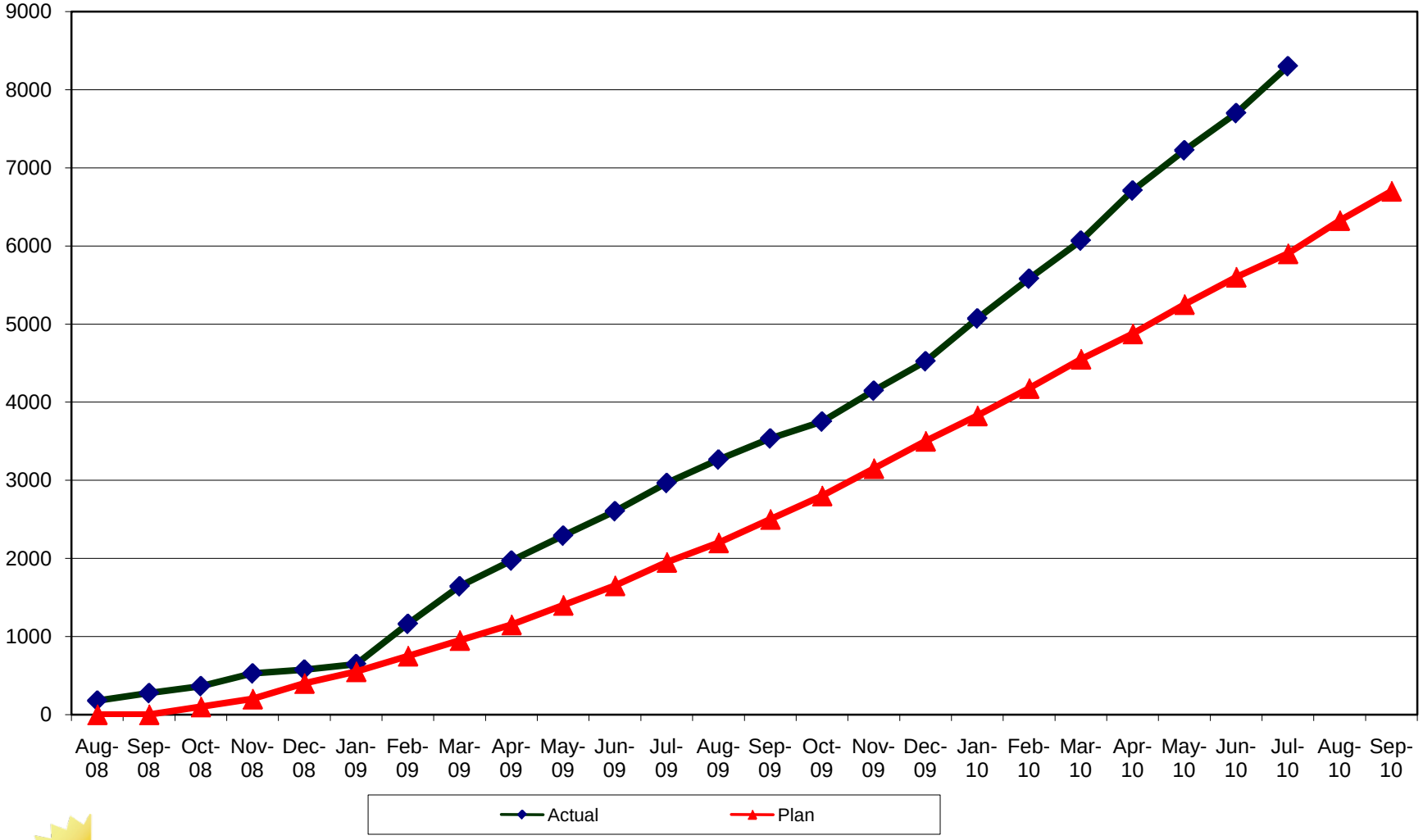
Total Funded Meter Installs



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Successes

- Huntsville COE, Army garrisons, and our Contractors have installed approximately 8,299 advanced utility meters (as of June 2010), including 5,746 advanced electric meters.
- Huntsville COE has awarded meter task orders in Hawaii, Puerto Rico, Guam, Saipan, Belgium, Netherlands, Germany, Italy, Japan, and eventually Korea.

Challenges

- Funding availability
- Phased contracting – separate Phase I and Phase II contractors, Phase II awarded as follow-on work to Phase I contractor, FFP Phase I and Phase II combined
- Faulty local real property inventory data
- Garrison building and power outage schedules
- Utility Privatization Projects/Contractors
- Local concerns to reprogram funding for non-program requirements

CASE STUDIES

Direct Connect IP

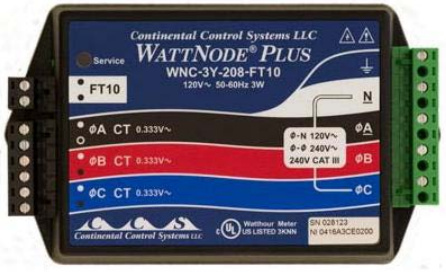
- Case Study #1
  - Direct LAN Modbus TCP Meters
  - Basic Local MDMS for Remote Configuration
  - SQL Database Exchange to Energy Management Software

Direct Connect IP (cont)

- Case Study #2
  - Direct LAN XML Meters
  - Integration to Metasys Server/Local MDMS
  - Separate Gas Meter Pulse Accumulator

Building Automation System

- Case Study #3 – Multiple Flat LON Installations
  - LonWorks® Meters
  - Modbus Meters thru Modbus/LON Gateway
- Case Study #4 – BACnet Installations
  - Very Few BACnet Meters Available
- Case Study #5 – Legacy BAS Installations
  - Very Few Meters with Proprietary BAS Protocols



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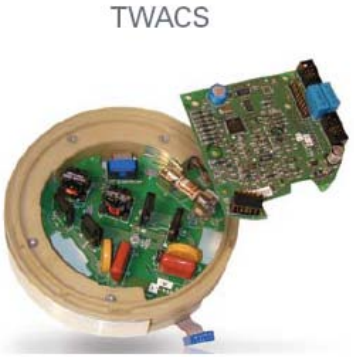
Modem & Power Line Carrier

- Modem - Case Study #6
  - Combined Meter with Modem Communication Board
  - Meter Manufacture's Monitoring Software
- PLC – Case Study #7
  - Privatized Contractor
  - Existing Utility Infrastructure



Challenges

- DIACAP/CON
  - Largest Hurdle on Meter Installations (~8000 Meters Installed, <50% Communicating)
  - Currently Undergoing a CON Process at an Army Metering Site
  - Army Metering Program Investigating Program Wide Approach
  - Small Number of Approved, Available Certificates of Networthiness (CON)
  - Delays Project Closeout and Final Acceptance of Installation

Challenges (cont)

- Privatized Utility Contracts
  - Potential Delays in Installation
  - Potential Cost Additions
  - Difficult to Manage Additional Specifications
  - Contractual Issues

Challenges (cont)

- Future Regional/Agency MDMS Connections
  - Each Meter Installation Could be Different
  - Various Protocols even if Standard Web Protocols Specified
  - Different Contractors with Different End Goals

Challenges (cont)

- Building Power Shutdowns
- Lack of Network System at Buildings Requiring Metering
- Different Wattages and Frequencies across the World