Con Edison Demonstration Project DE-OE0000197

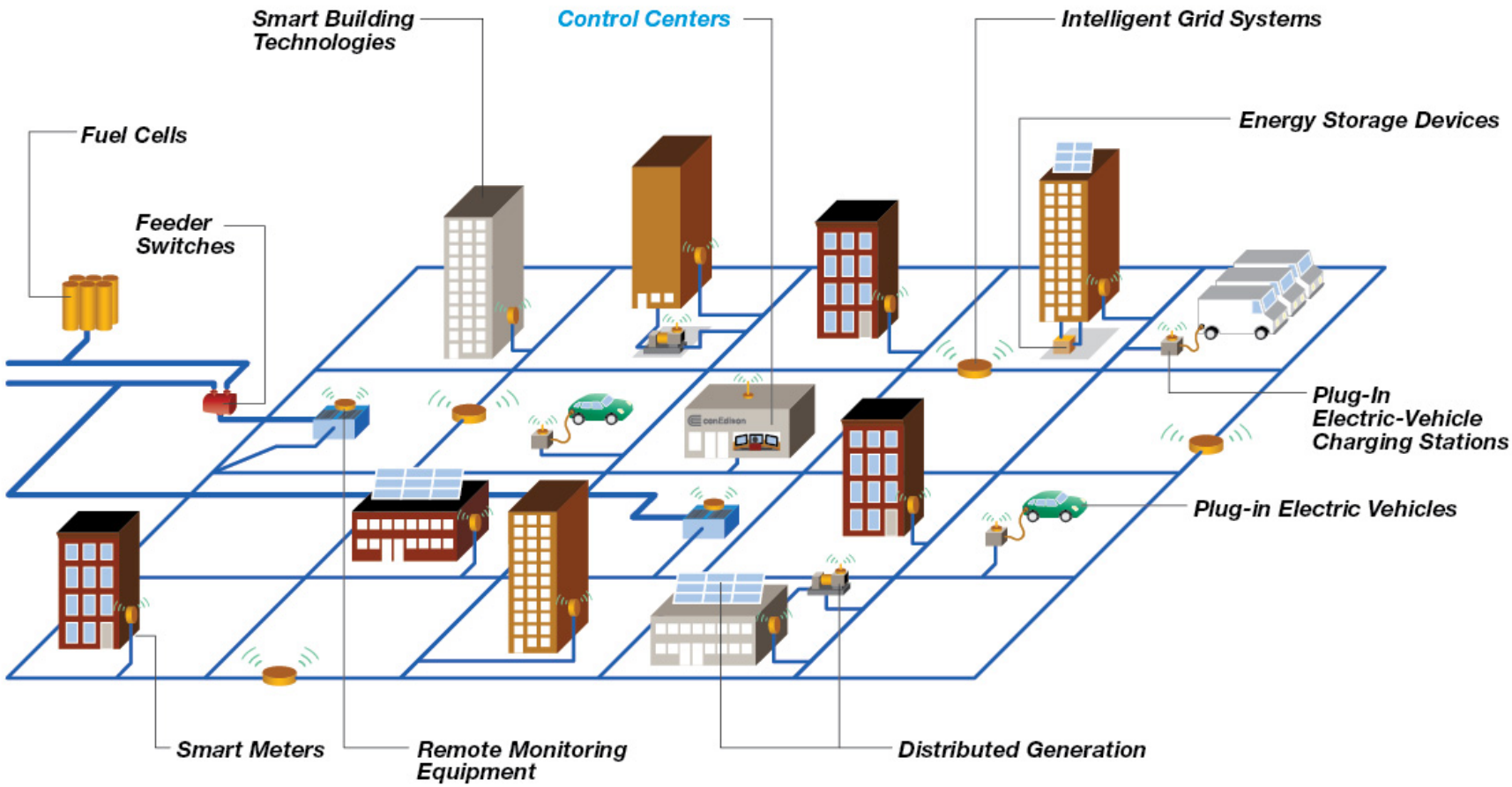
Customer Sited Resource Management Tools

Tom Magee
General Manager
Smart Grid Implementation Group, Con Edison

ADS
National Town Hall Meeting
May 21, 2014

Demonstration Project

Interoperability of Smart Grid Resources



DERMS

- Distributed Energy Resource Management System – Siemens/TIBCO
- DR & DG resources integrated with distributed system
- Near real time status of DR and DG resources
- Control Capability: Demonstrated control of DR Resources via secure messages through NOC or directly to buildings (disabled initially)
- User Group – Distribution Engineering

DRMS

- Demand Response Management System
  - Alstom Grid
- Demand Response Program Management
  - Enroll
  - Event notification
  - CBL performance
  - Reporting
  - Settlement
- Near real time DR performance
- Control Capability: Alstom targeting to implement OpenADR 2.0b by end of 2014 (disabled initially)
- User Group – Energy Efficiency

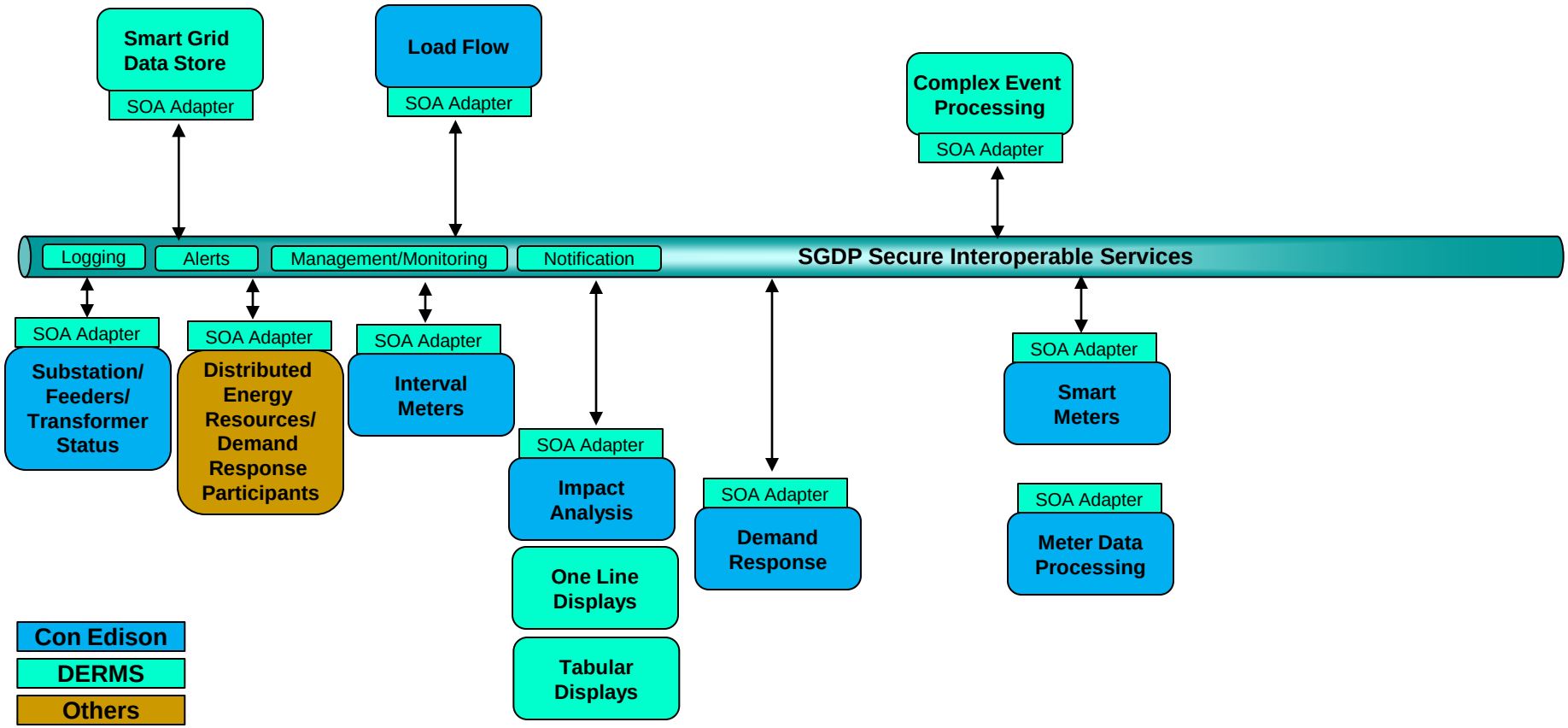
DERMS

DRMS

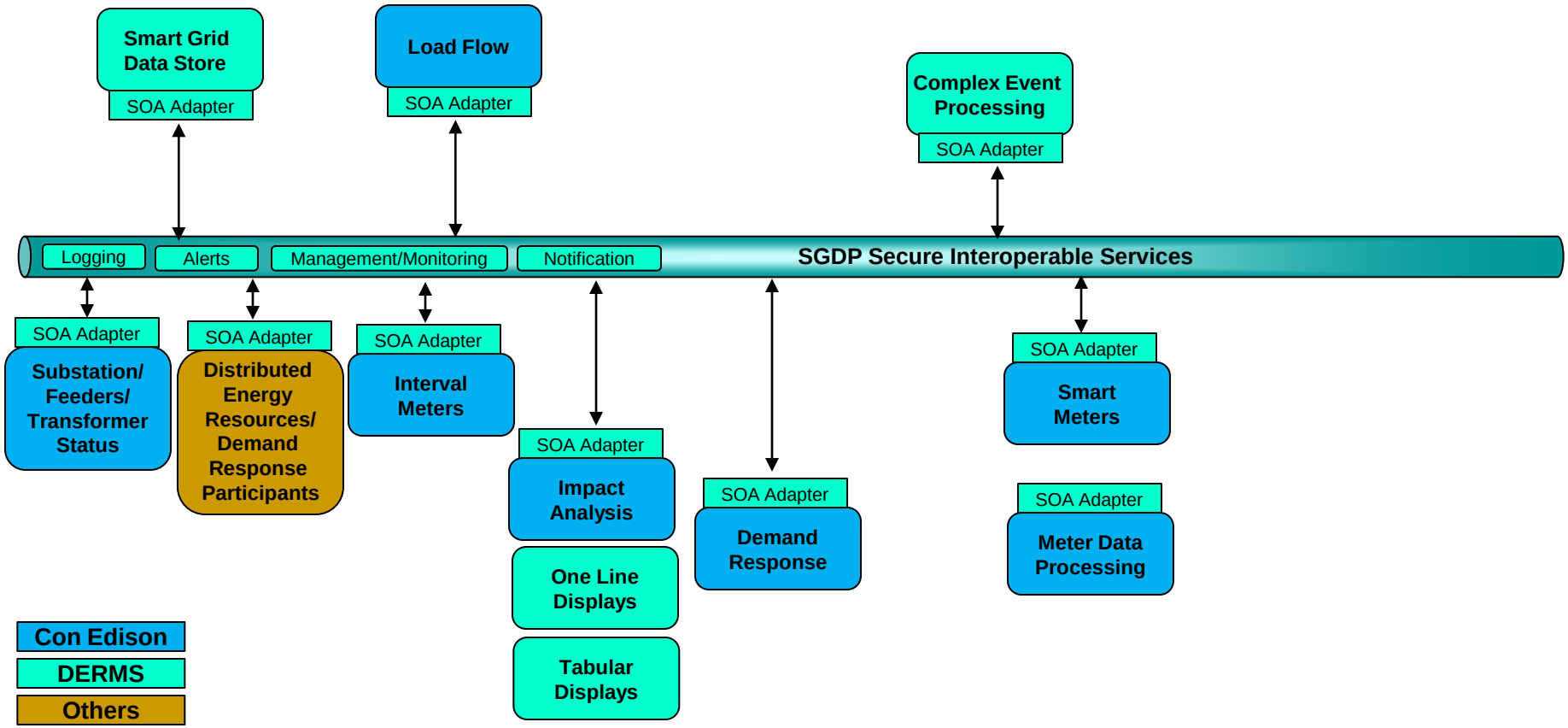
DERMS

DRMS

Distributed Energy Resource Management System (DERMS)

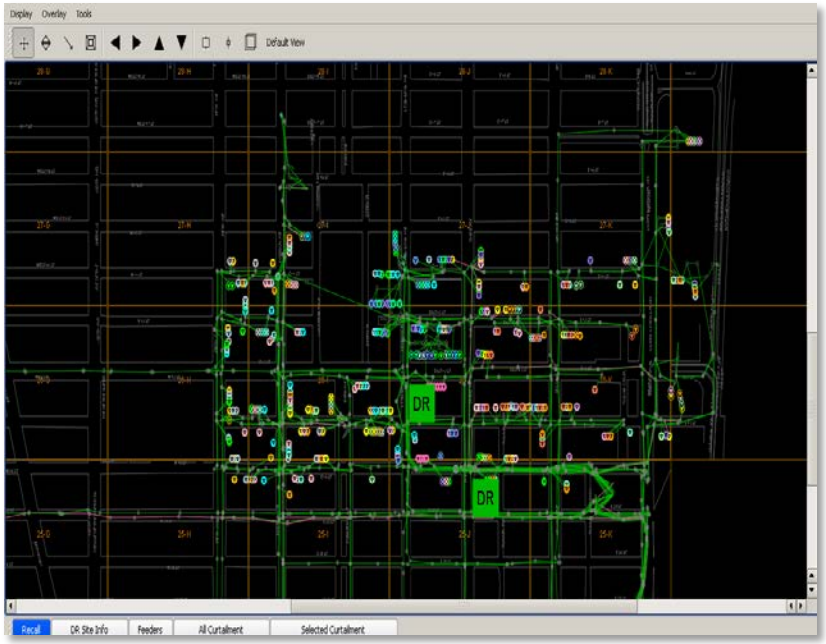


Distributed Energy Resource Management System (DERMS)



Distributed Energy Resource Management System

- Con Edison Distributed System Status integrated with Customer Resources
- Targeted Demand Response from the following:
  - Building Management System (BMS)
  - Controller Connected to Standby Diesel Generator
  - Controller Connected to Electric Vehicle Charger with Standby Battery and PV Generation
  - ThinkEco Modlets

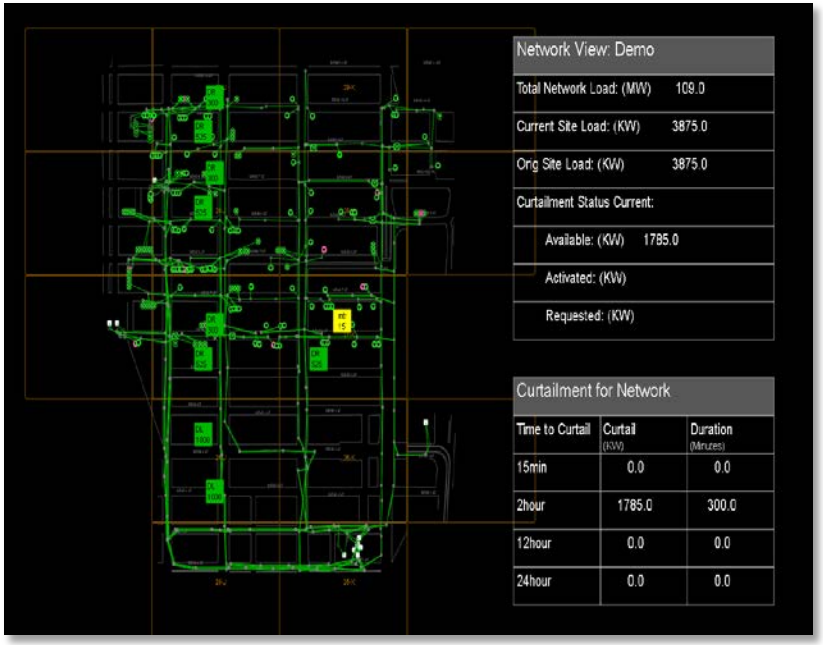


DR resource mapping

DERMS

Current Capabilities and Design Status

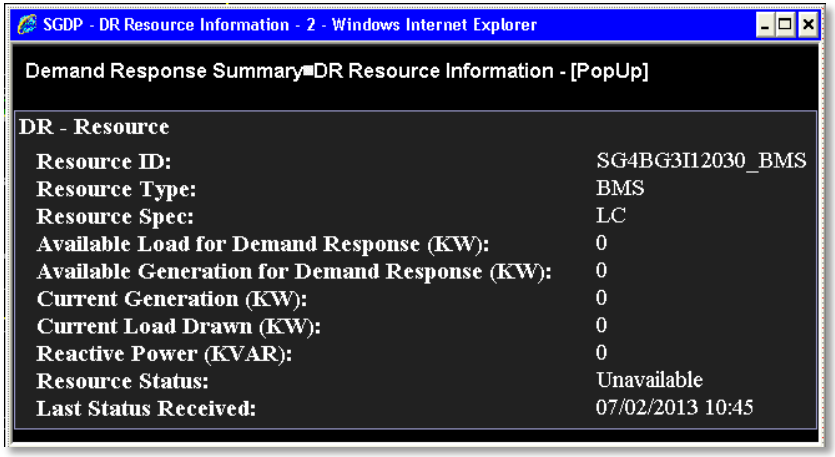
- Activate and track performance of project DR resources
- Utilize PVL Wolf Decision Aid to make recommendations to mitigate overload conditions in the networks
- Area Substation one line display with aggregated DR and DG capability
- Mapped all underground networks
- ~ 800 DLRP resources mapped and integrated into PVL

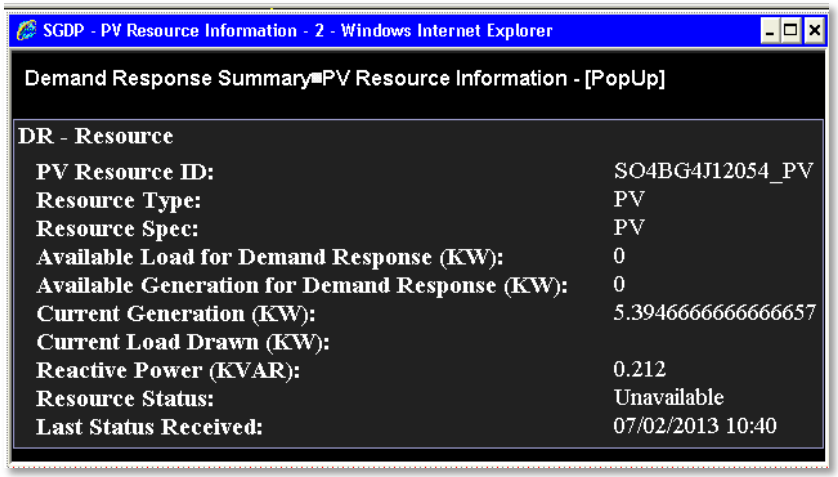


Network Curtailment Capability

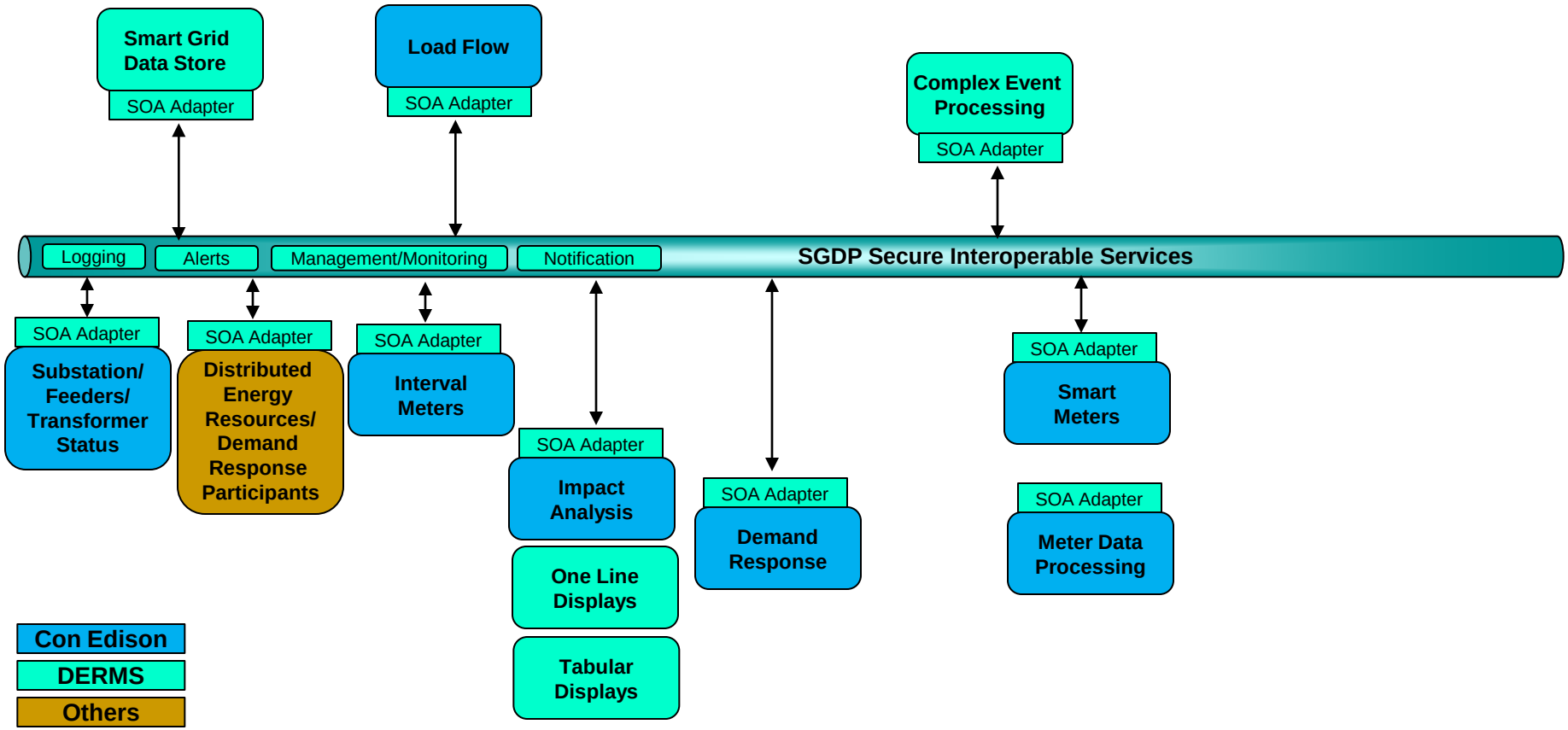
DERMS Resource Information

- Resource type
- Available Demand Response
- Current Generation
- Current Load Drawn
- Date / time of last status

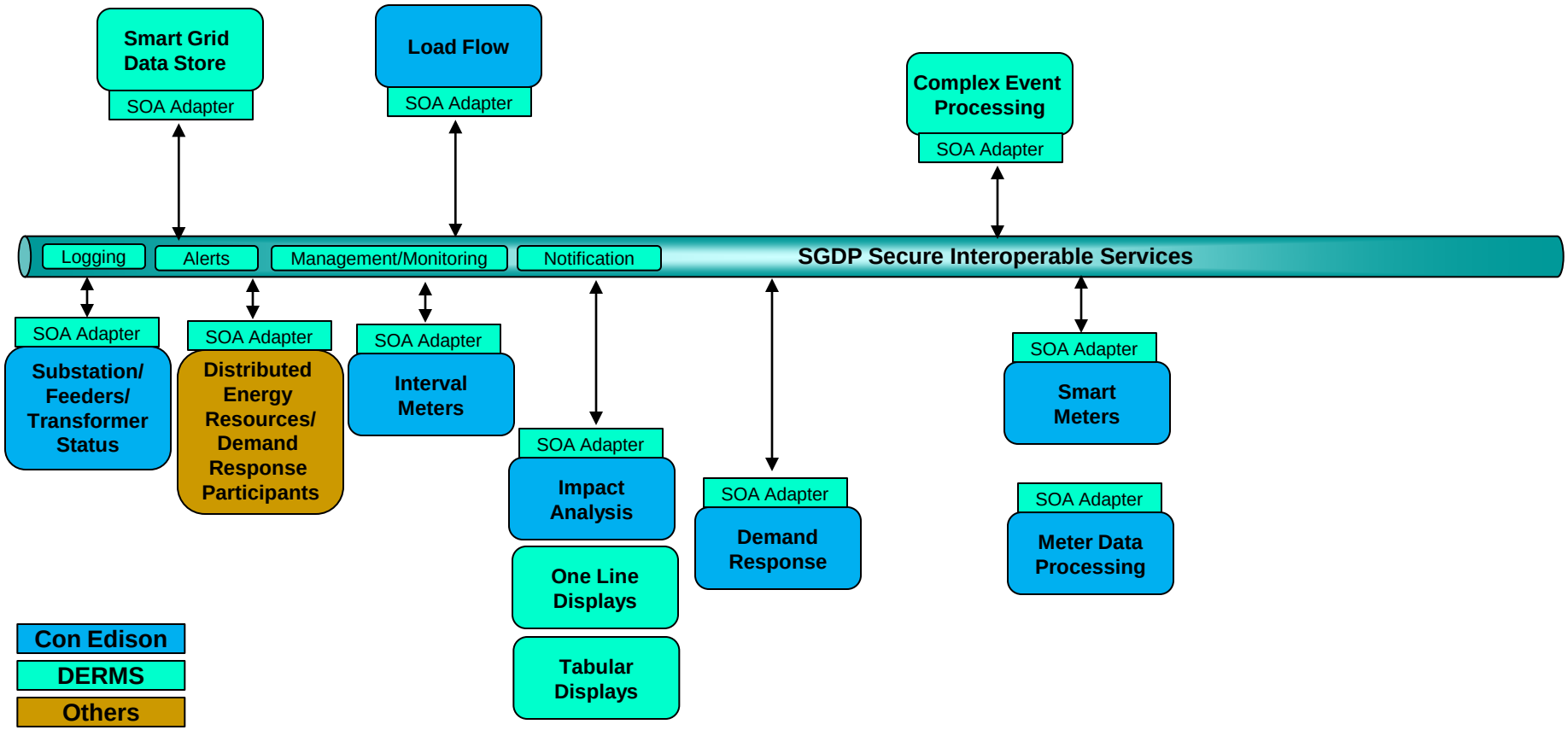




Distributed Energy Resource Management System (DERMS)



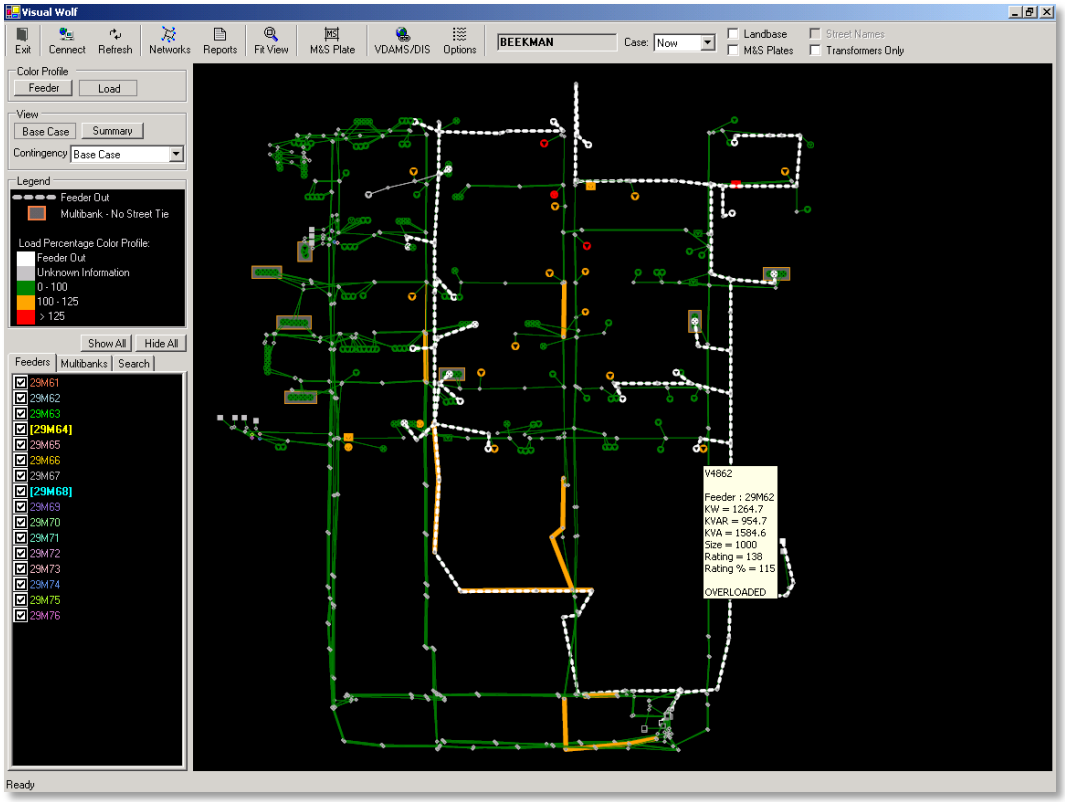
Distributed Energy Resource Management System (DERMS)



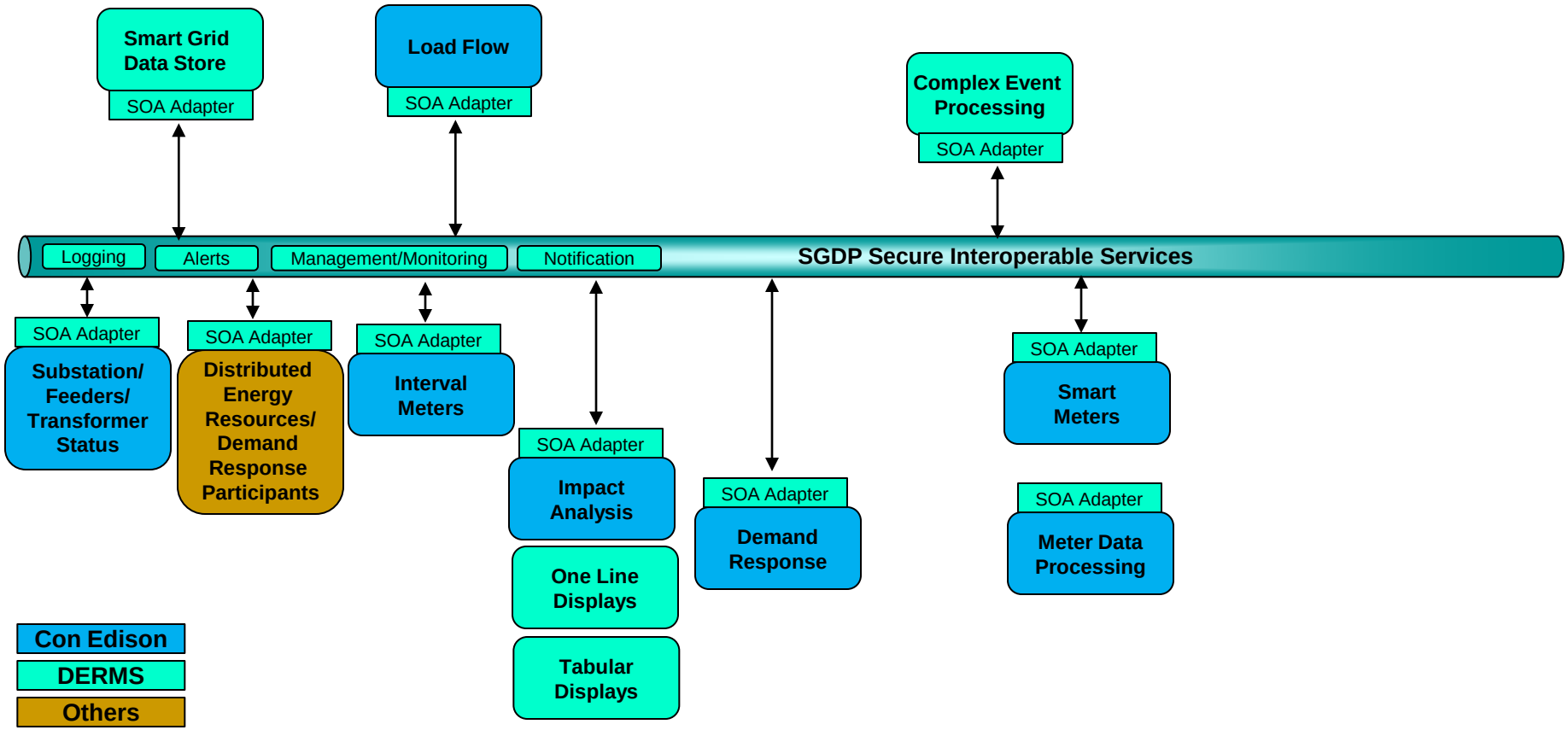
PVL Decision Aid Integration into DERMS

Prioritizes DR resources to alleviate overloaded Feeder Sections or Network Transformers

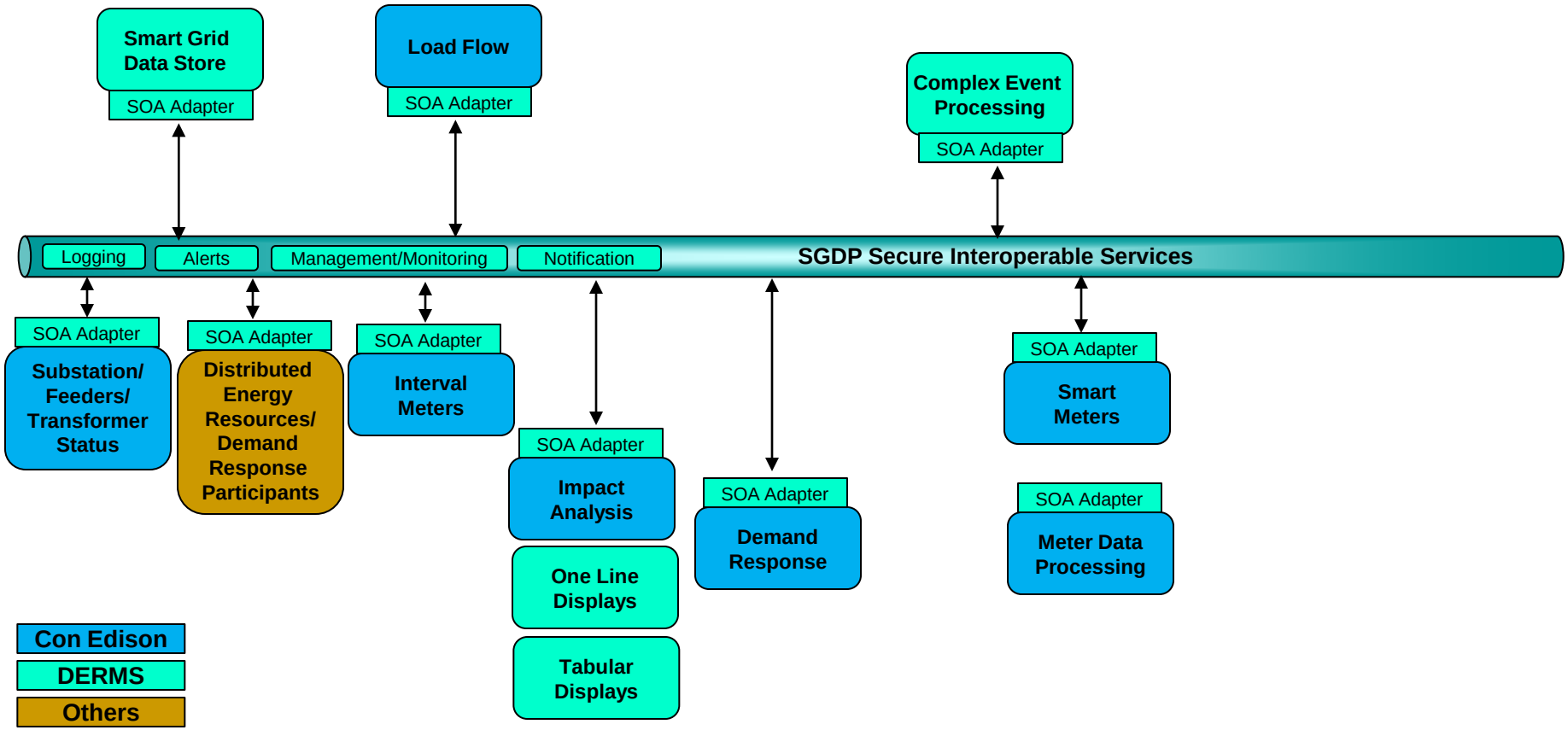
- Enables Targeted curtailment to alleviate overload on feeder or transformer
- Recommends DR resources to alleviate overload condition



Distributed Energy Resource Management System (DERMS)



Distributed Energy Resource Management System (DERMS)



SGDP Demand Response Diagram

SGDP Demand Response protocols provide better visibility and real-time dispatch of customer resources

Demand response



Distributed generation

verizon

28 Facilities with 20 MW of DG

Status

Curtailment Action

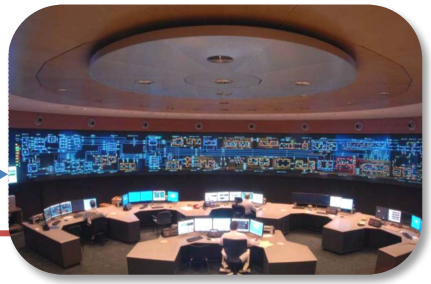
viridityenergy

Software

innoventivepower

Status

Start Curtailment Message

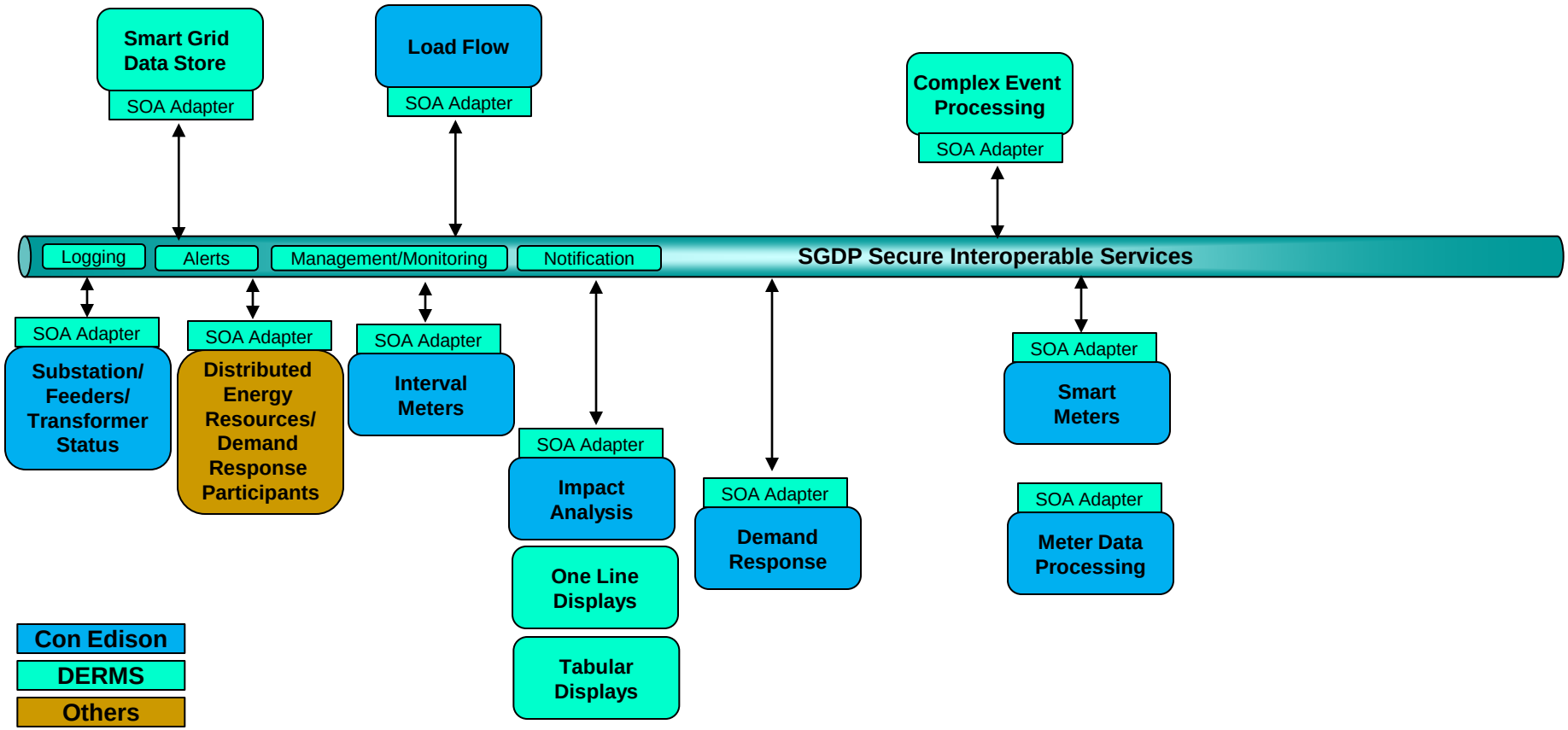


conEdison

Distribution Control Center

TIBCO SIEMENS

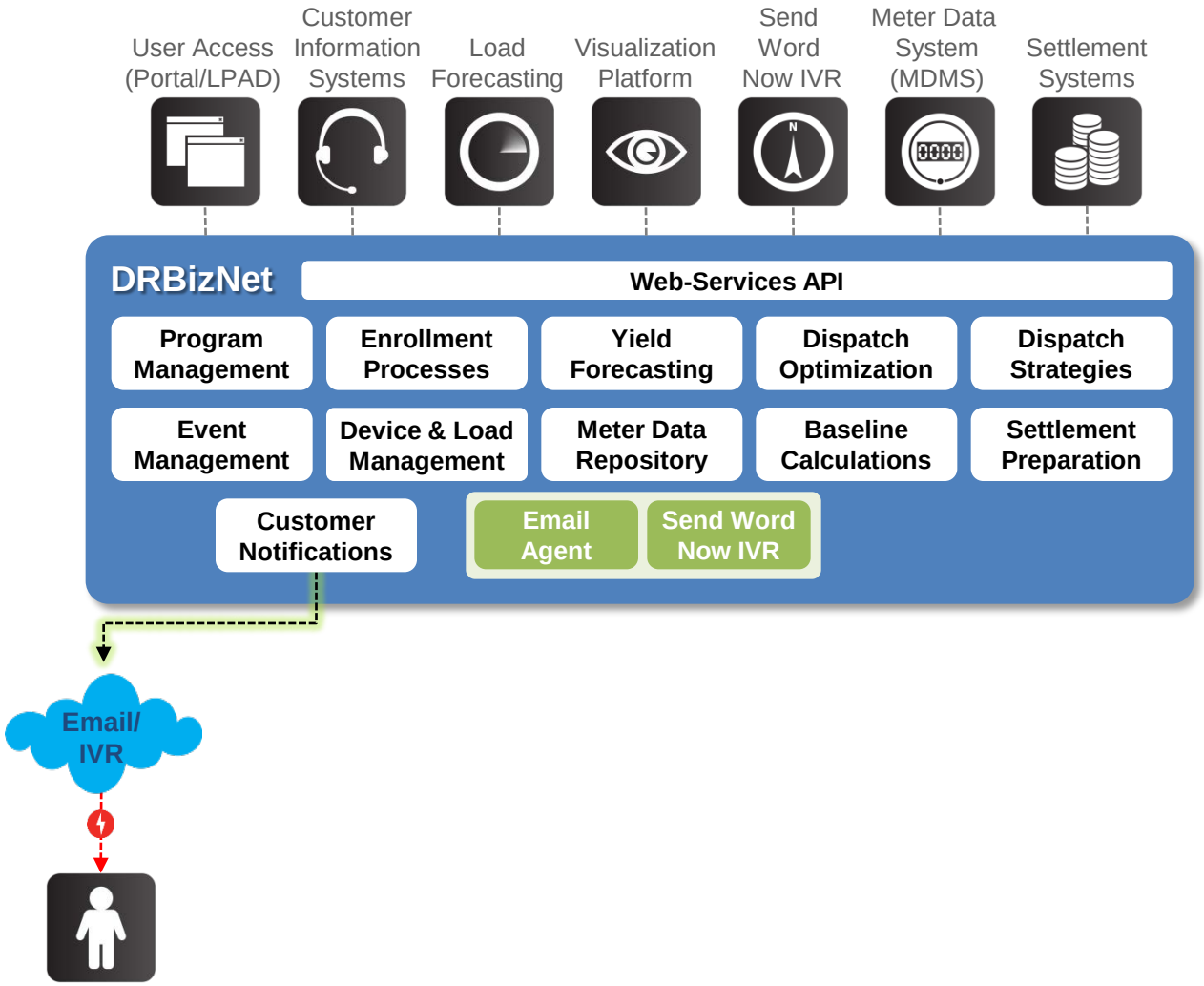
Distributed Energy Resource Management System (DERMS)



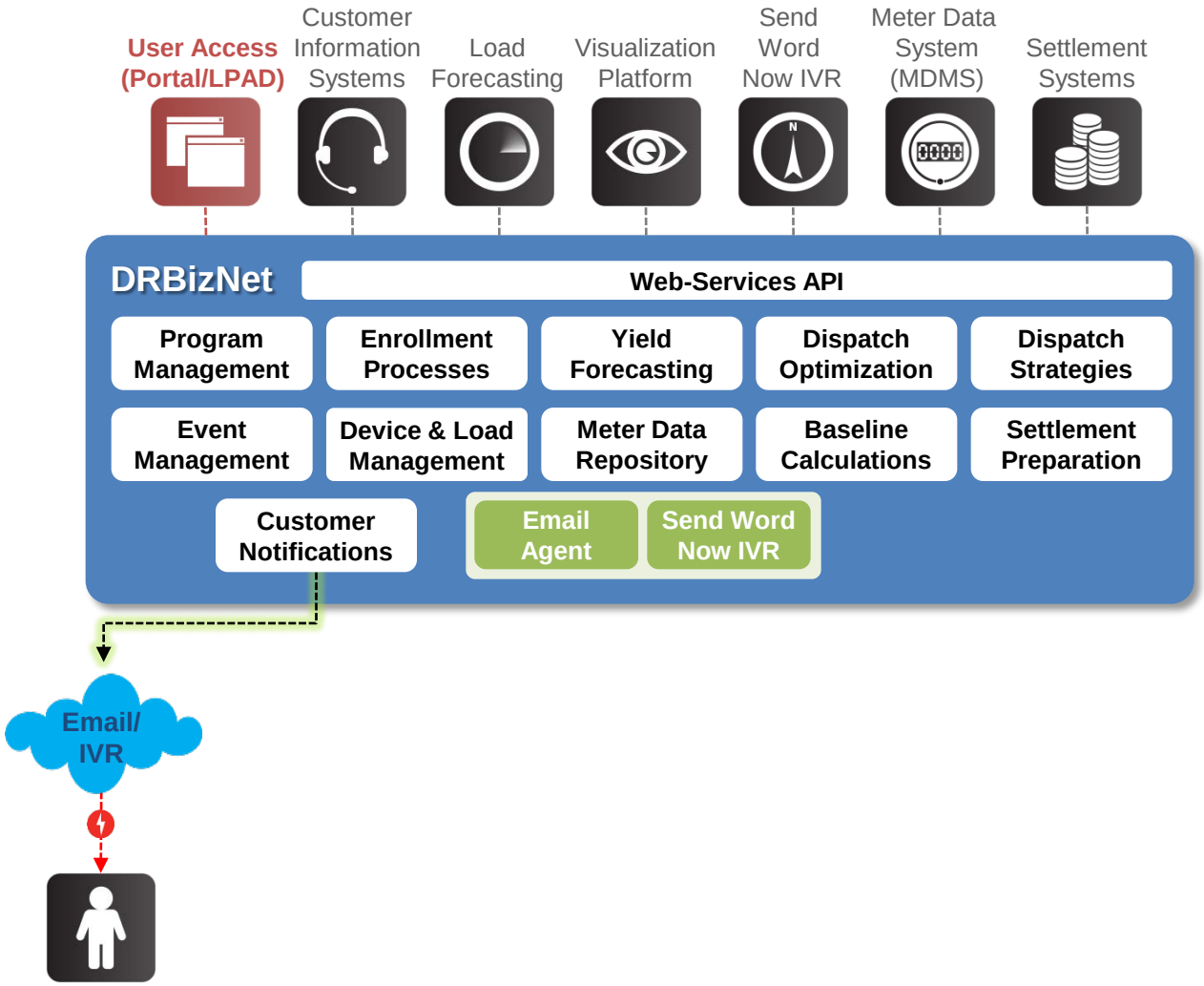
DERMS

DRMS

DRMS Implementation Architecture and Functionality



DRMS Implementation Architecture and Functionality

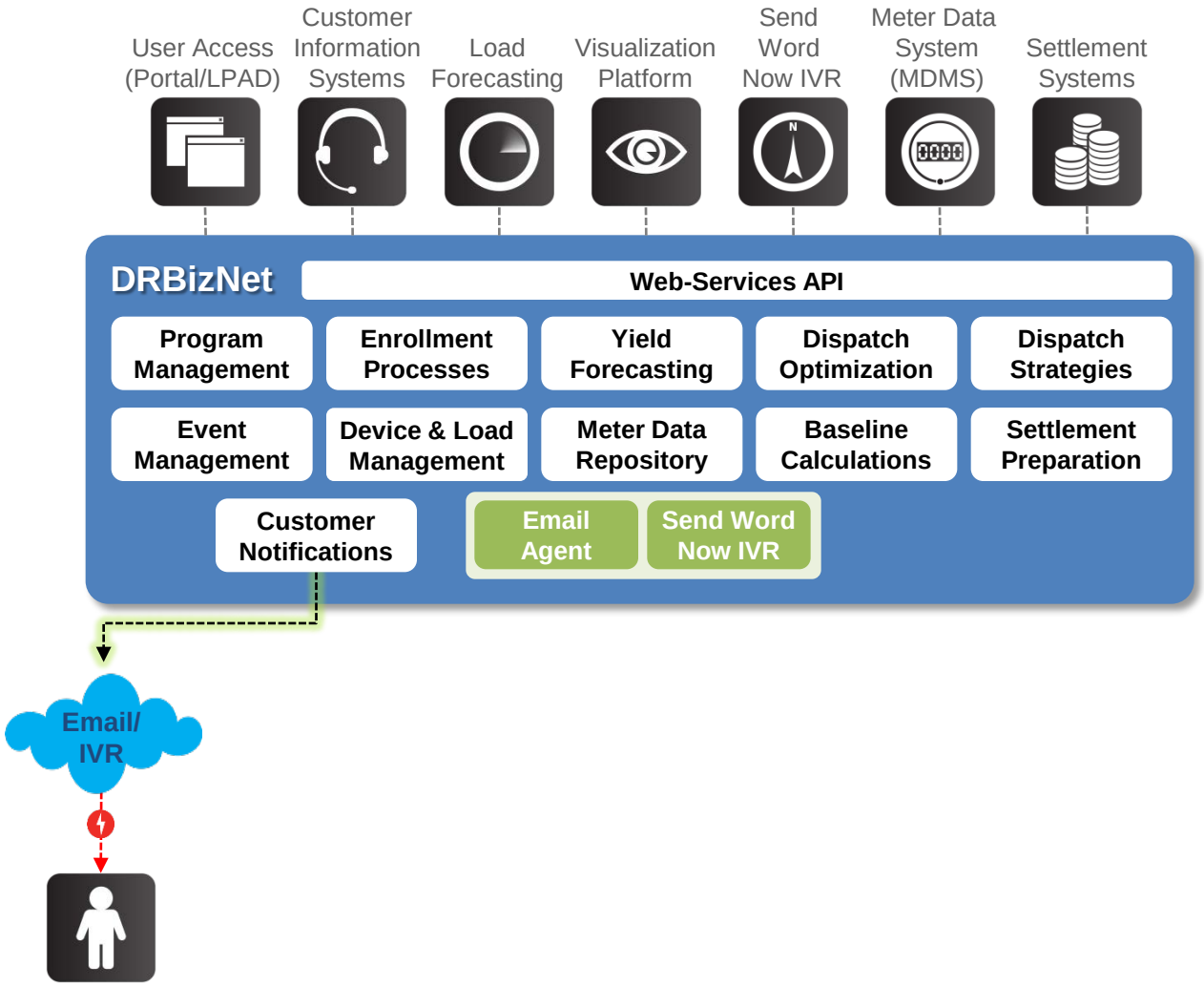


User Access Portal

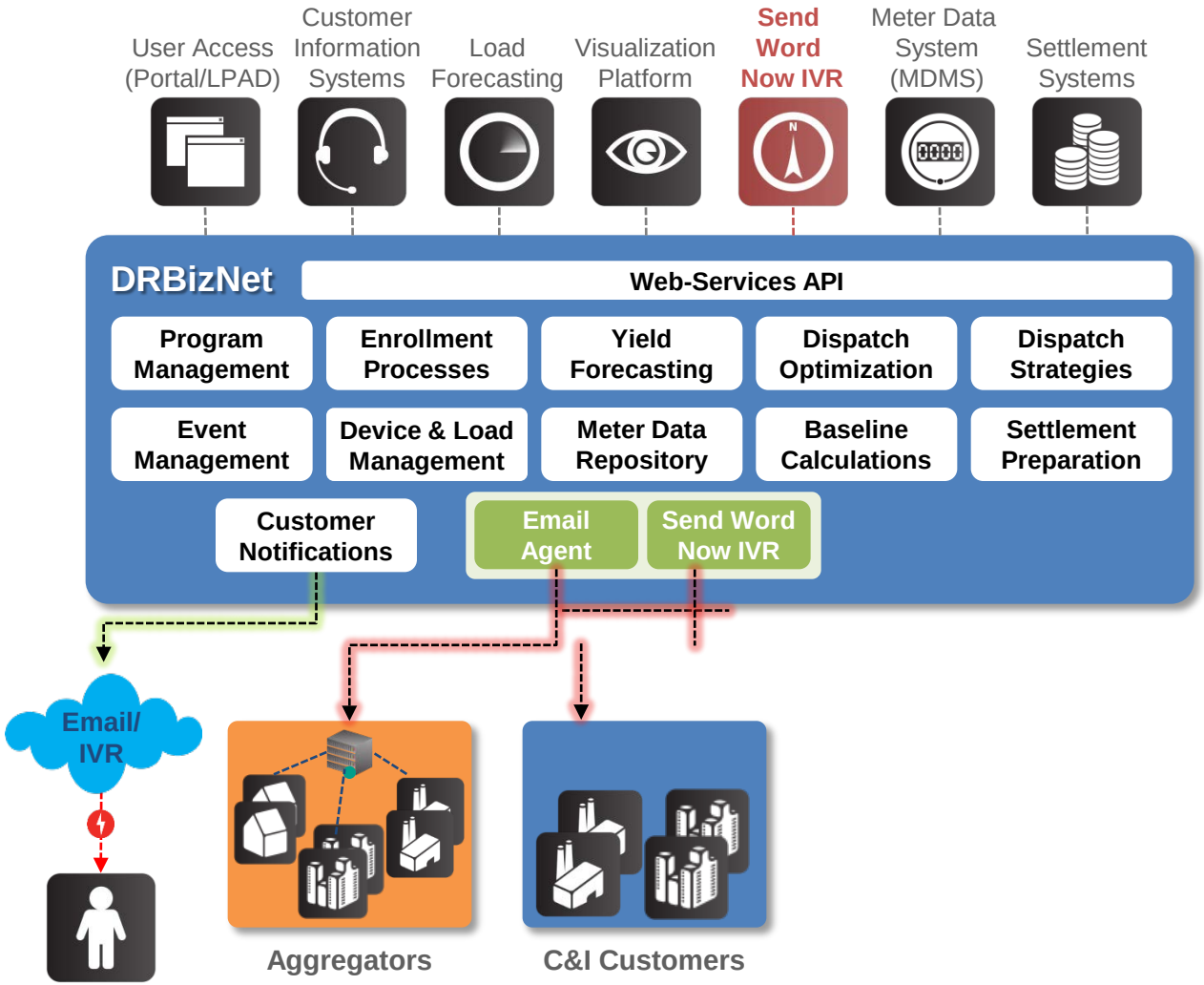
Typical Fields

15 digit Con Edison Account Number	May 2013 Enrollment Start Period	June 2013 Enrollment Start Period	Customer Name (as it appear on bill)	Customer Service Address

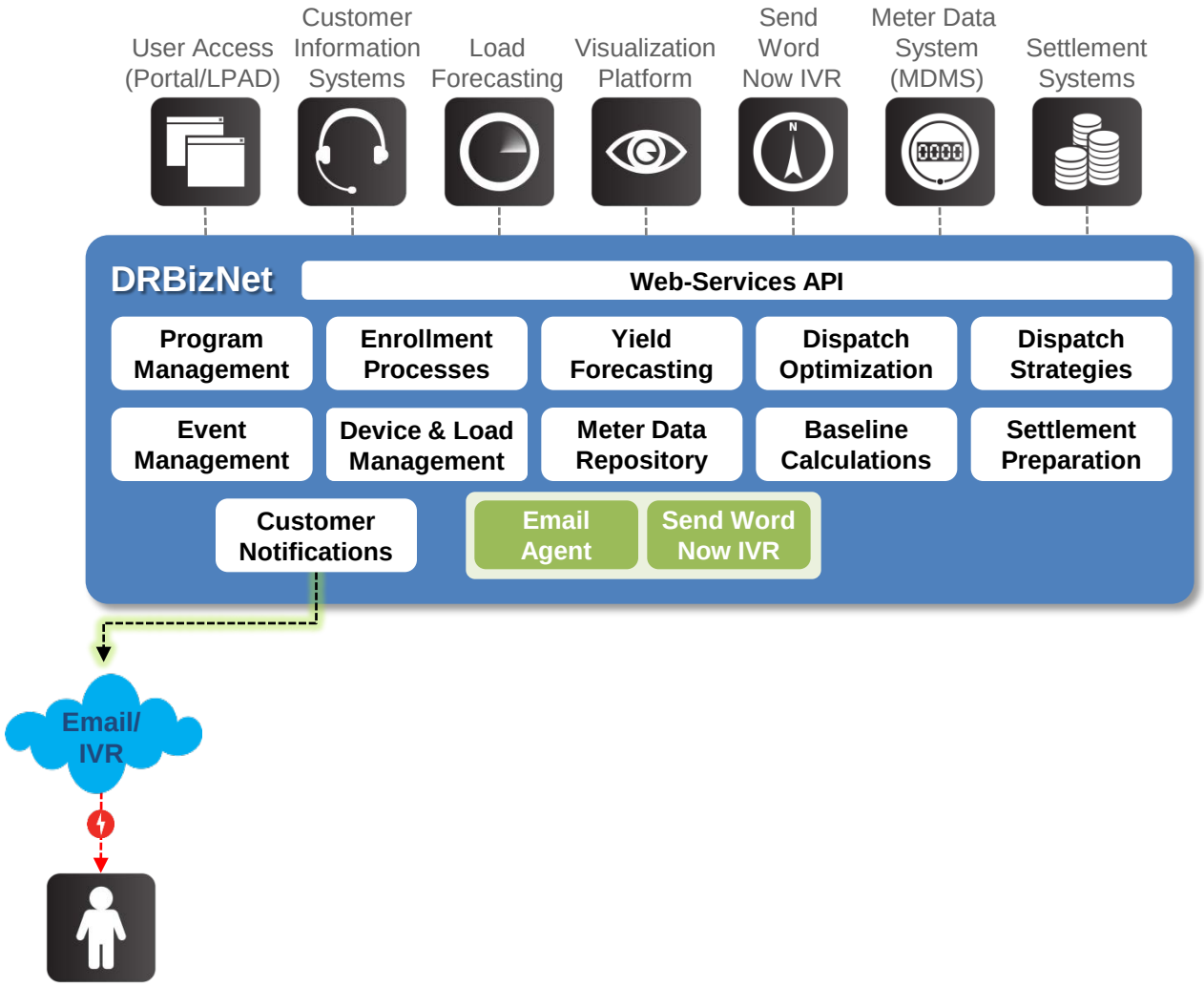
DRMS Implementation Architecture and Functionality



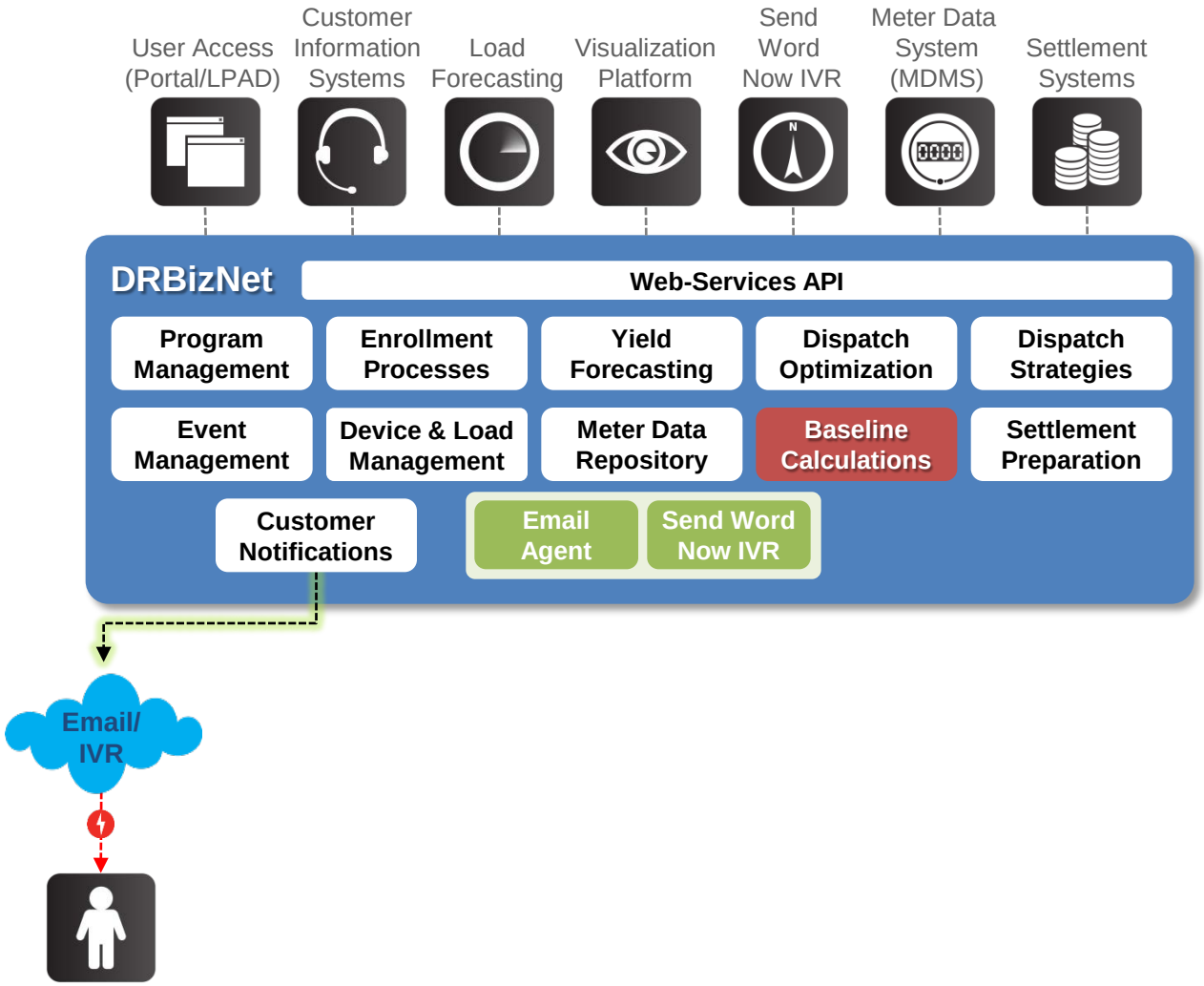
DRMS Implementation Architecture and Functionality



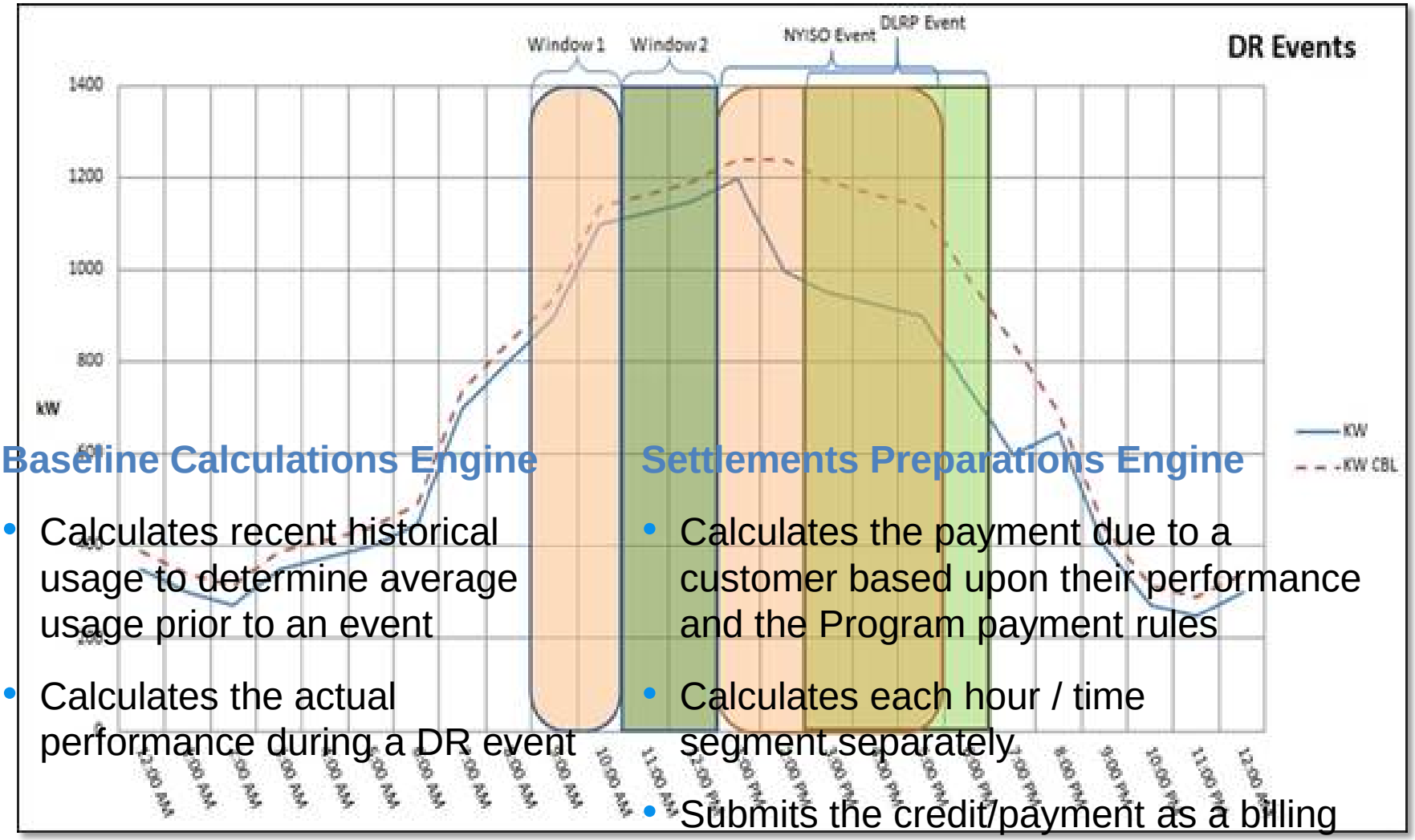
DRMS Implementation Architecture and Functionality



DRMS Implementation Architecture and Functionality



Baseline Calculations



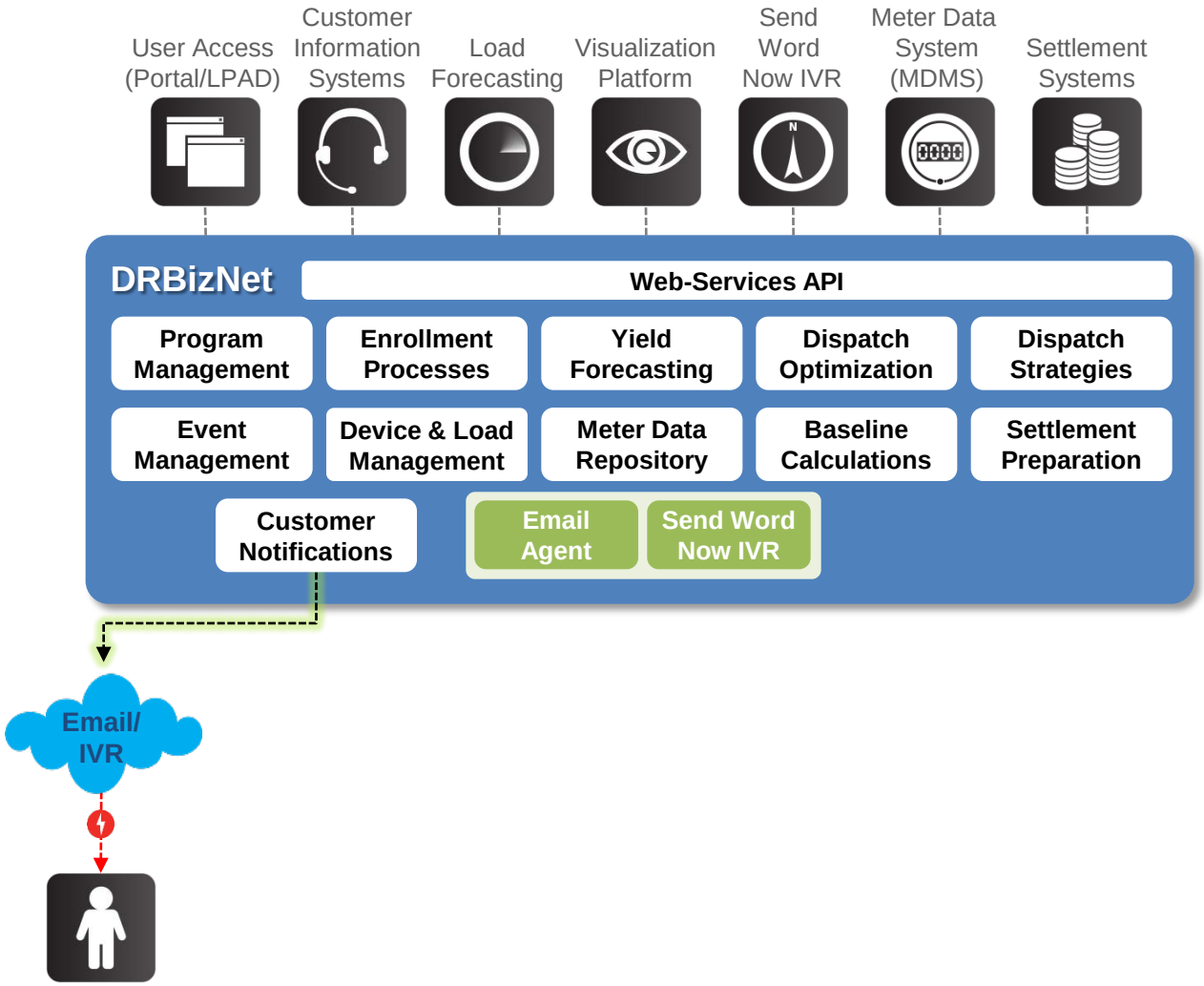
Baseline Calculations Engine

- Calculates recent historical usage to determine average usage prior to an event
- Calculates the actual performance during a DR event

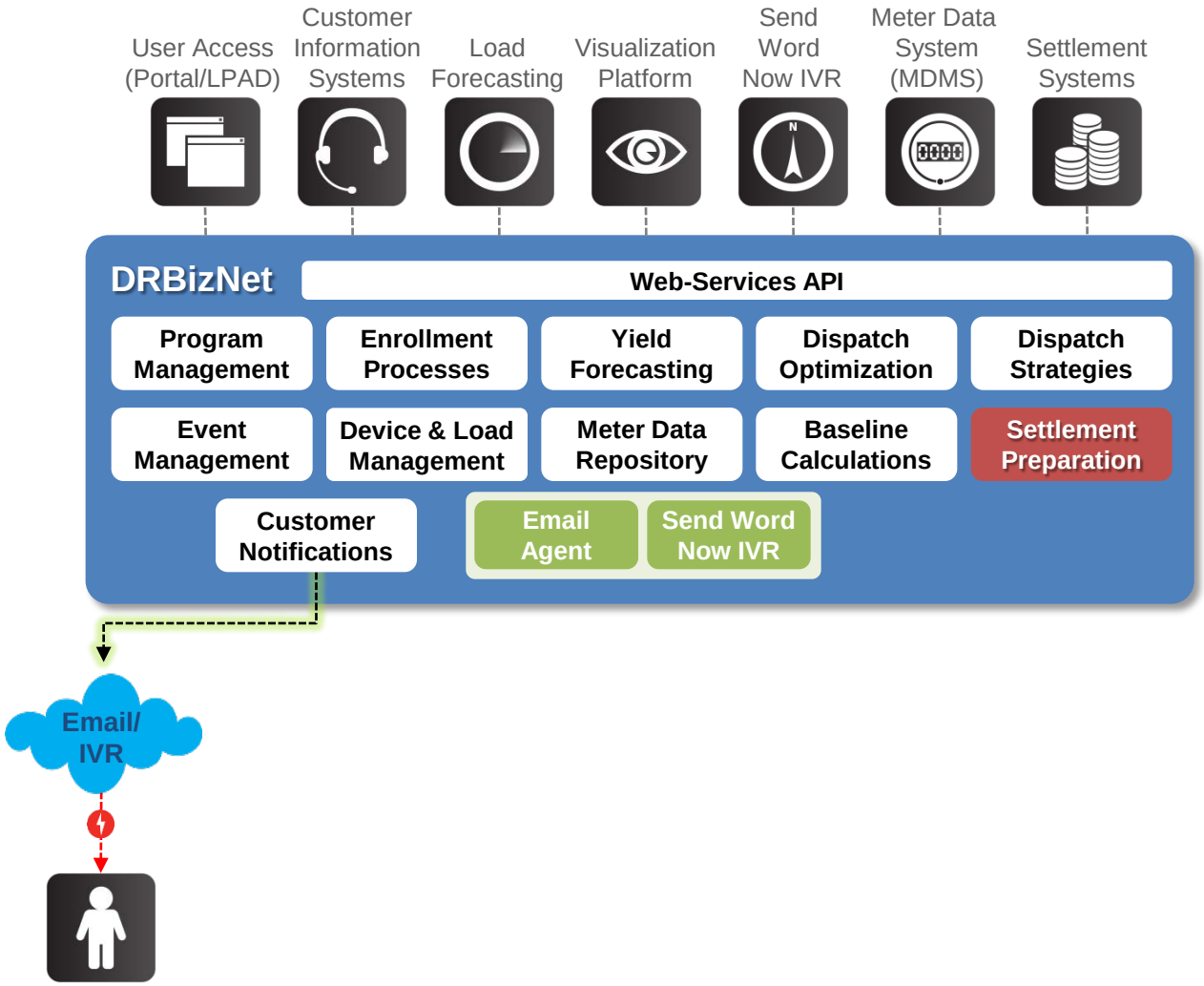
Settlements Preparations Engine

- Calculates the payment due to a customer based upon their performance and the Program payment rules
- Calculates each hour / time segment separately
- Submits the credit/payment as a billing determinant to the Billing system

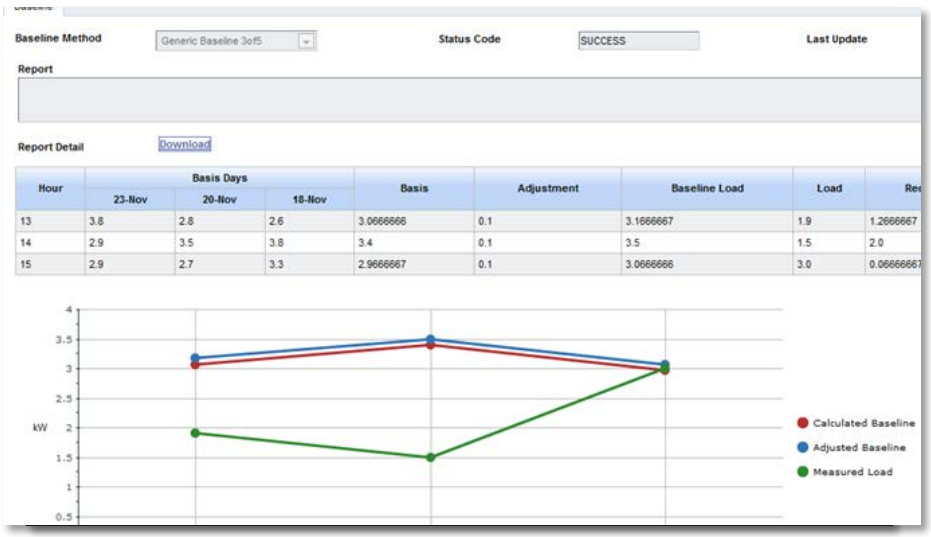
DRMS Implementation Architecture and Functionality



DRMS Implementation Architecture and Functionality



Baseline Calculations and Preparations



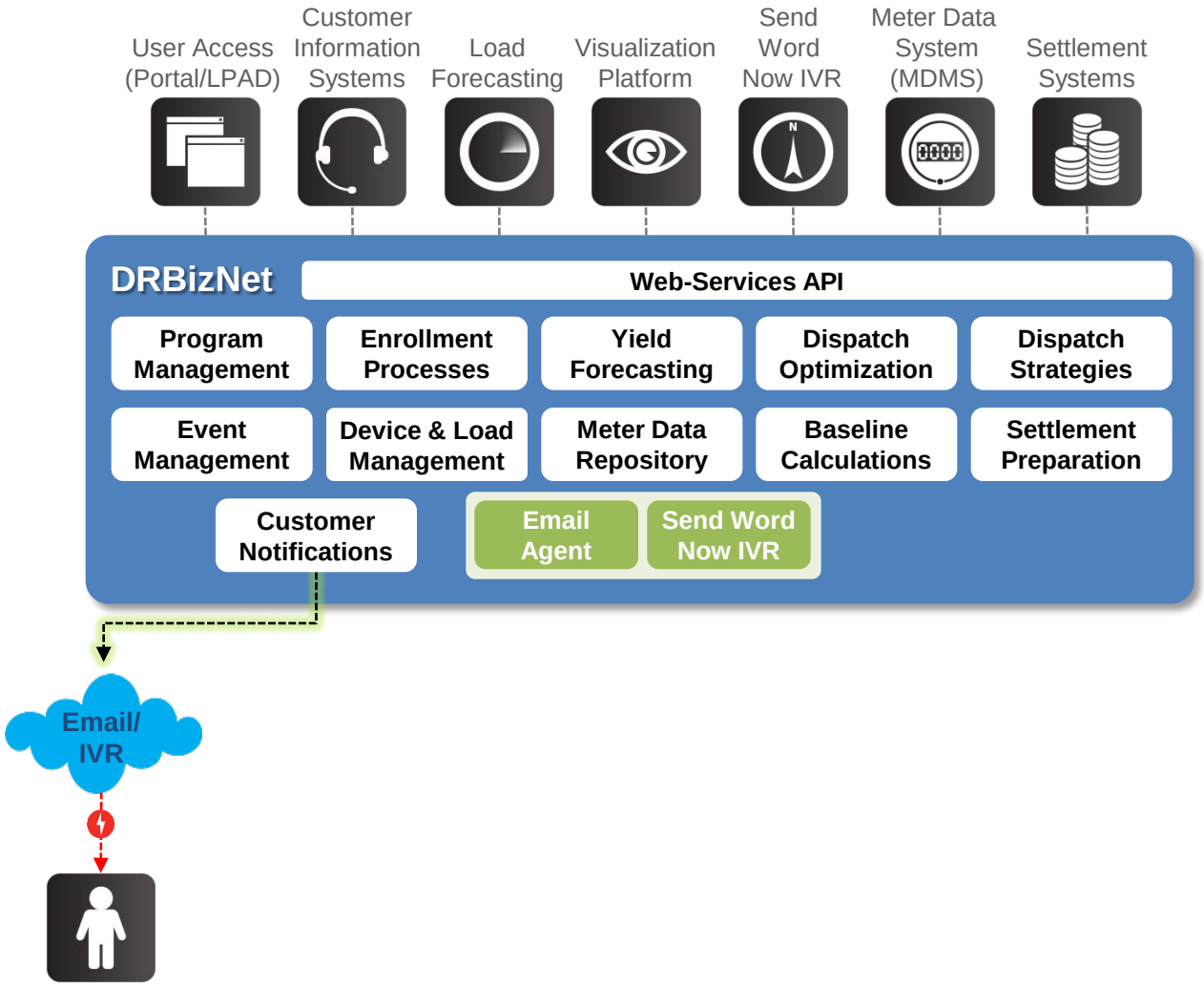
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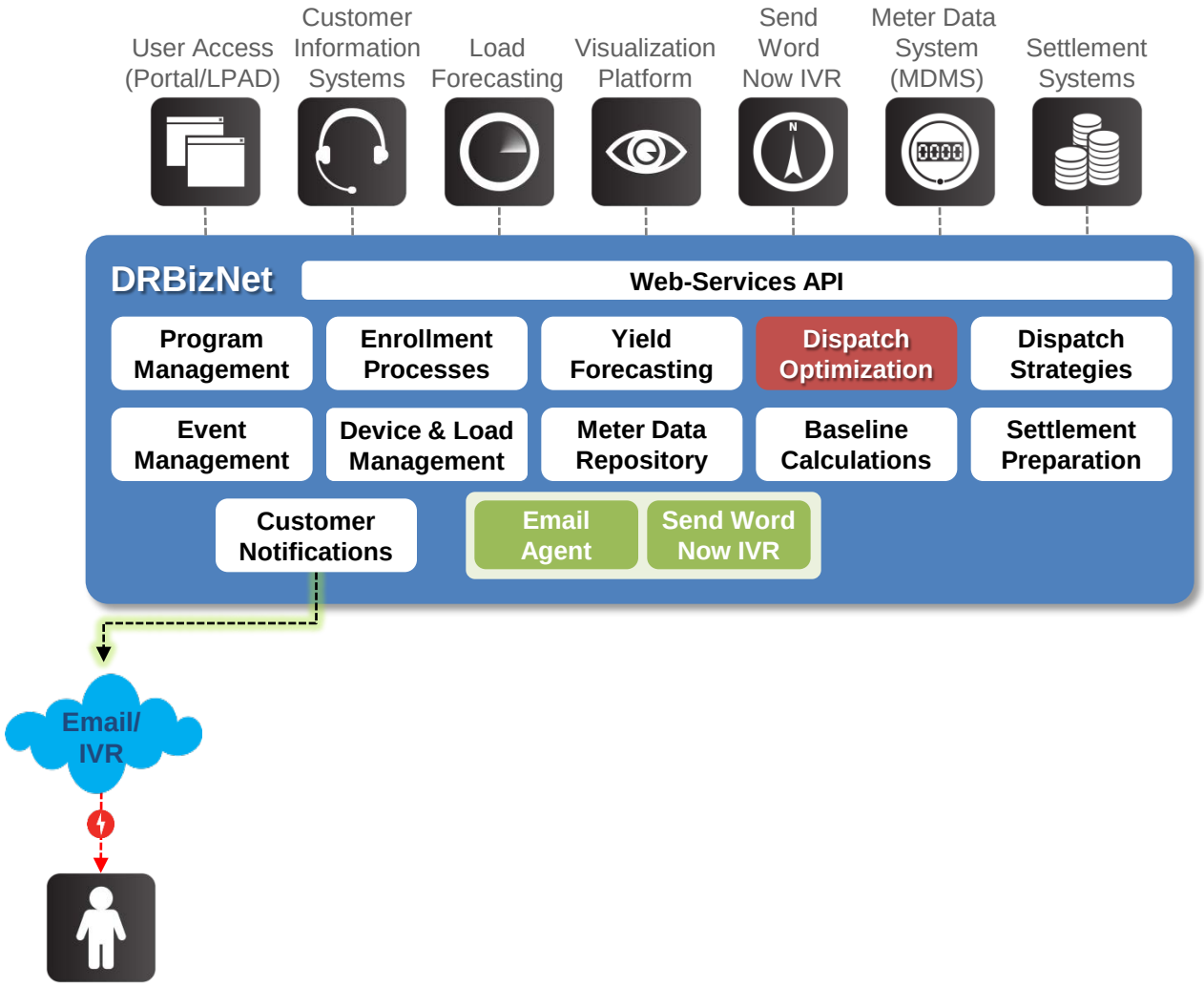
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DRMS Implementation Architecture and Functionality



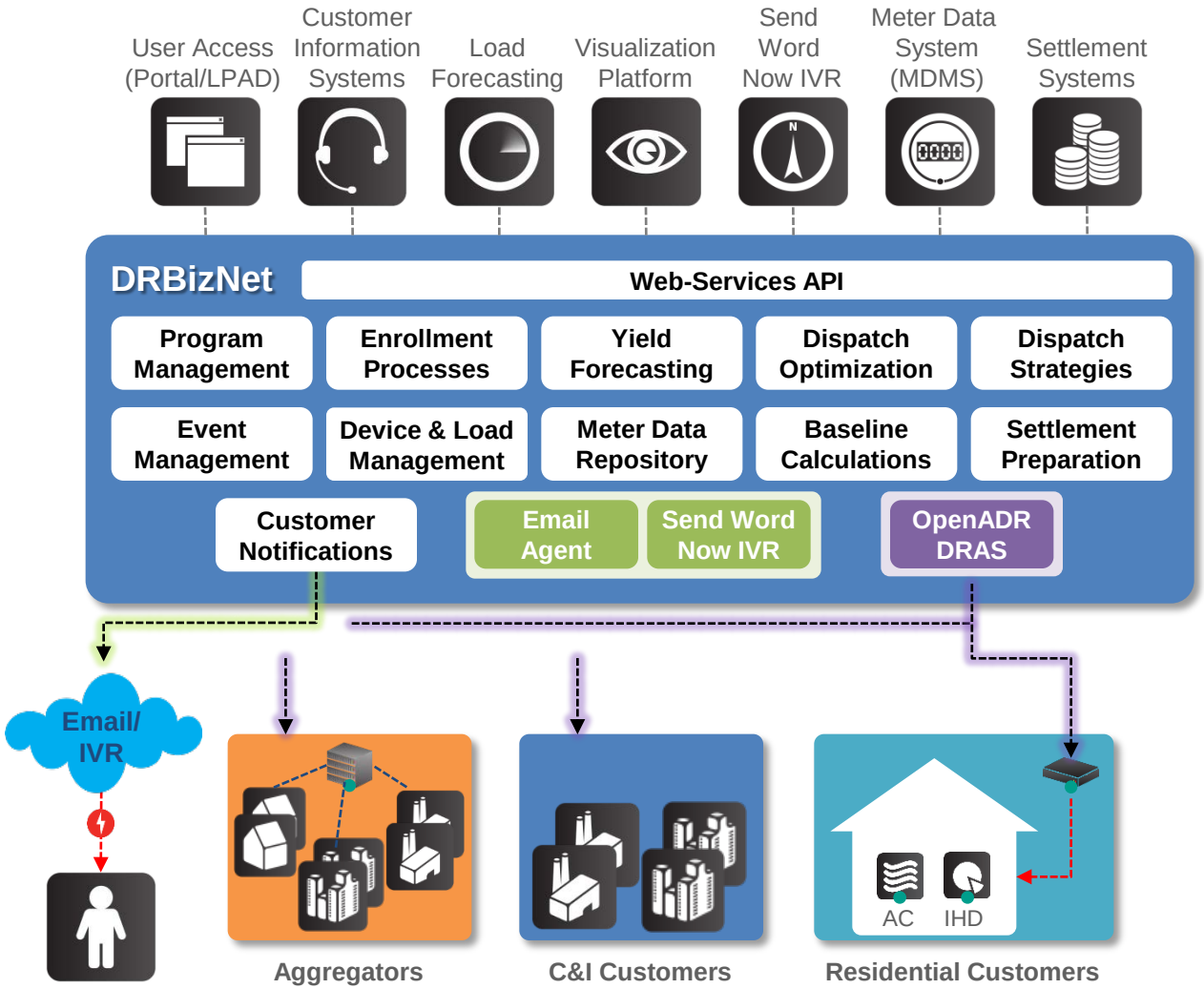
DRMS Implementation Architecture and Functionality



Optimization Module Modeling Dispatch Options

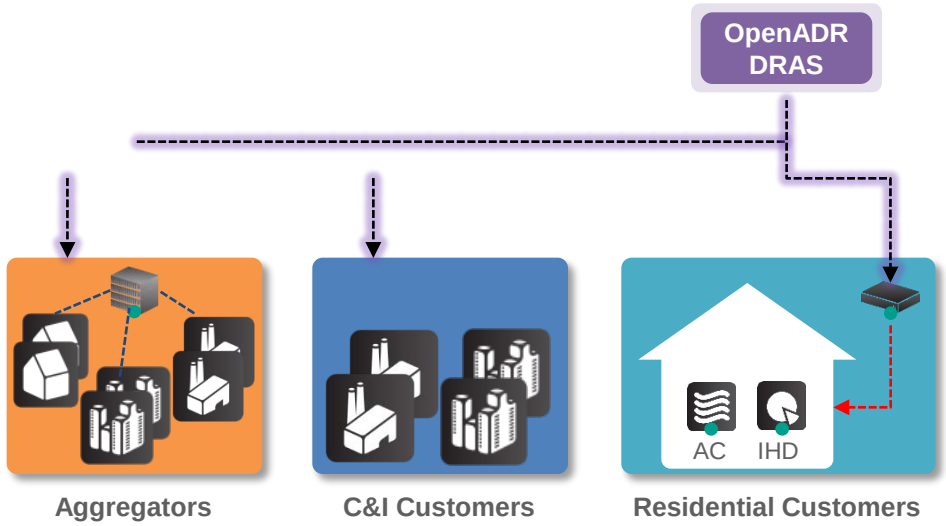
- Targeted DR Reduction
- Peak Load Shifting
- Economic Pricing/Profit

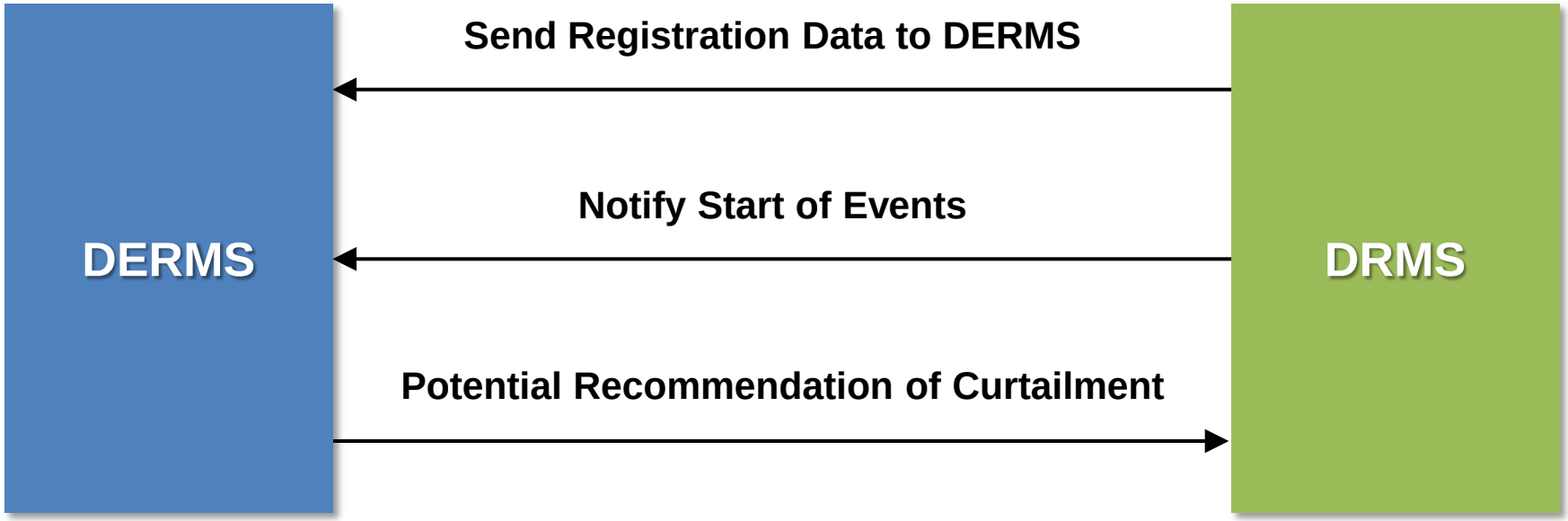
DRMS Implementation Architecture and Functionality



Alstom Open ADR Capability

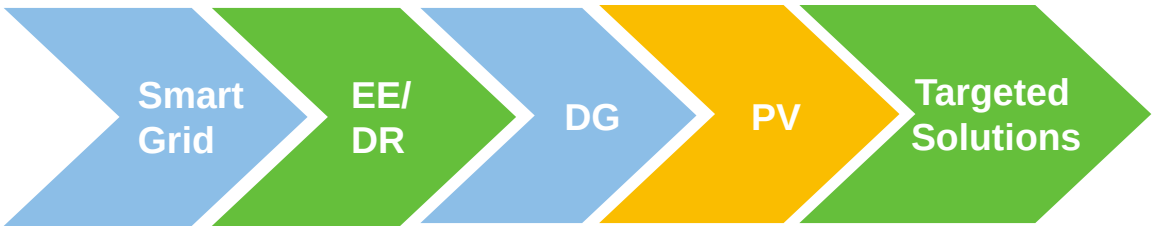
- Utilizes Open ADR 1.0 for direct control of end devices in one Utility
- Target to have capability to offer Open ADR 2.0b by end of 2014




DERMS
Send Registration Data to DERMS
Notify Start of Events
Potential Recommendation of Curtailment
DRMS

Challenges & Opportunities
Utility of Future

Current Evolution



Opportunity for a Comprehensive Review



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