



ELECTRIC POWER
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Demand Response Trigger System: Decision Support Tool to Connect Retail to Wholesale Electricity Markets

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Overview

- Background
 - Wholesale and retail electricity markets disconnected
 - Financial connection through settlements
- Introduction to “DR Triggers” Project
 - Top-down approach starting with wholesale market systems
 - Specify requirements for triggering DR based on estimated settlements
- Preliminary findings
 - Charge codes relevant to DR
 - Groupings
- Next Steps
 - Specifying tool
 - Proof-of-concept Demonstration

Demand-side Integration: Drivers and Challenges

Drivers



- Peak resource constraints
- Improve economics
- Reliability concerns
- Environmental concerns
- Enhanced innovation

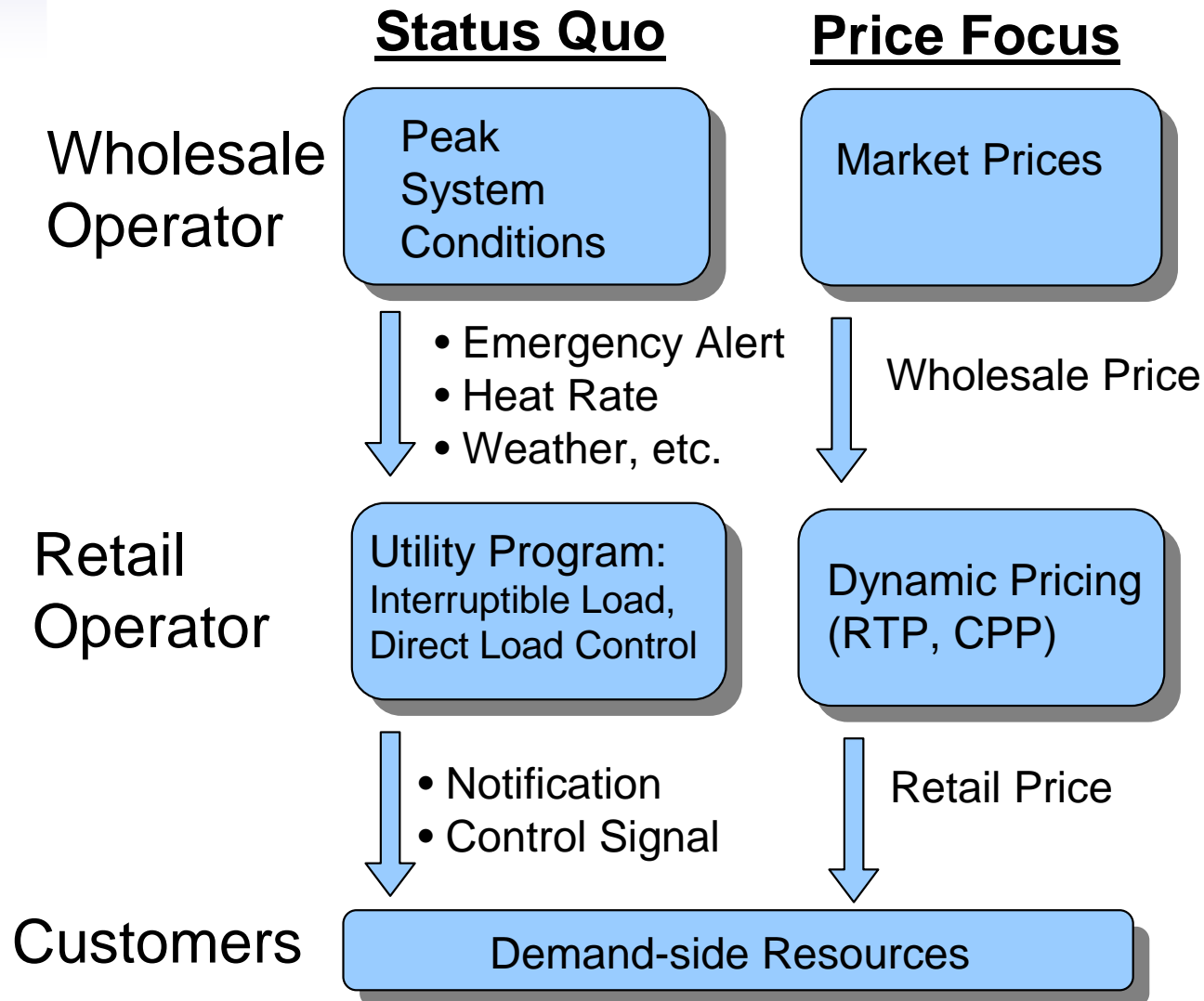
Barriers



- Aggregation
- Automation
- System operator confidence
- Economic justification
- Wholesale market disconnect
- Retail tariffs
- Customer convenience

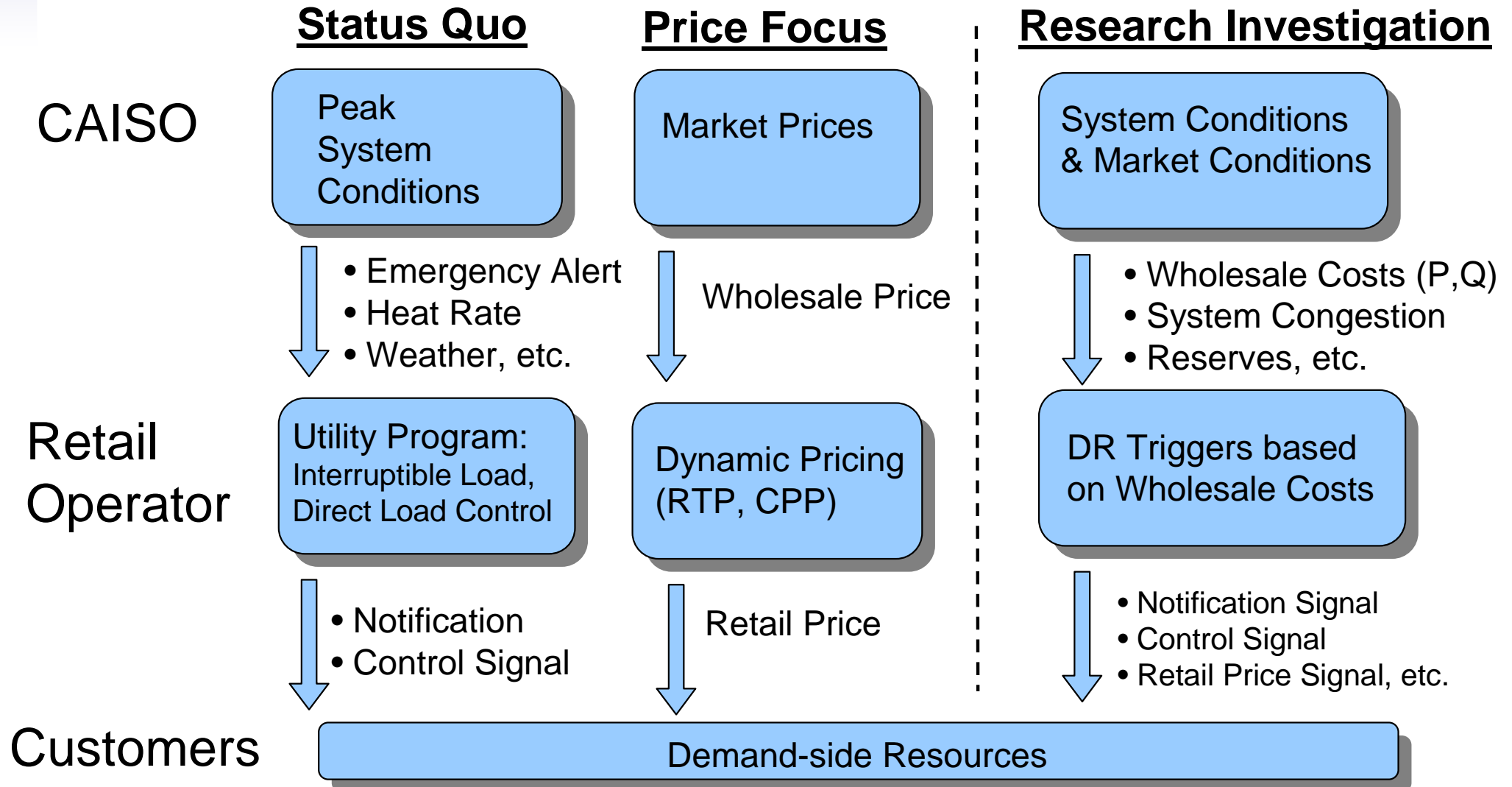
“International Perspectives on Demand-side Integration”, Proceedings of the 19th International Conference on Electricity Distribution (CIRED), Vienna, May 21-24, 2007.

Background: Status Quo



Retail markets (the demand-side) largely disconnected from wholesale markets

Background: Research Investigation



Retail markets aware of the financial impact of wholesale markets in time to trigger DR to mitigate wholesale costs

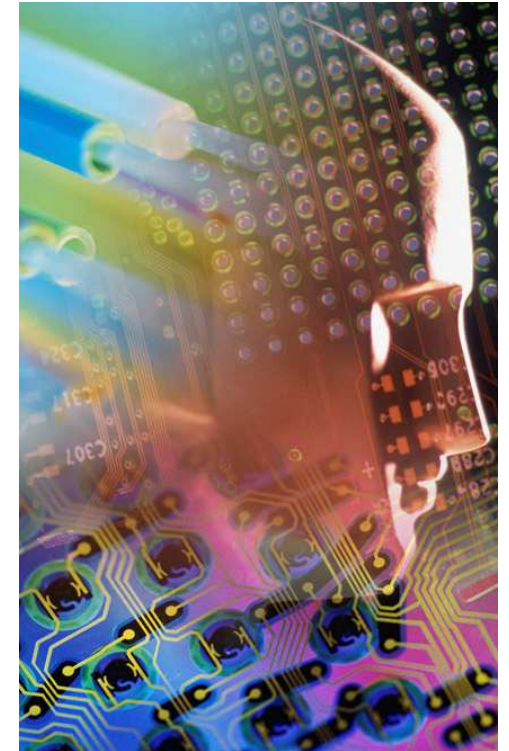
Objective: Prove Feasibility of Concept

Research, develop, and demonstrate an approach and enabling information technology to connect retail with wholesale electricity markets through investigation of:

1. What method for triggering demand response will enable energy retailers to mitigate wholesale market settlement charges?
2. What decision support tool will enable energy retailers to create demand response triggers based on impact to wholesale settlement costs?

Project Tasks

- Trigger Methodology Development
- Information Technology Specification
- Proof-of-Concept Demonstration
- Reporting and Publication



Specify, develop, and demonstrate a method for energy retailers to trigger demand response in a fashion that financially links retail with wholesale electricity markets

Collaborative Team

Project Team:

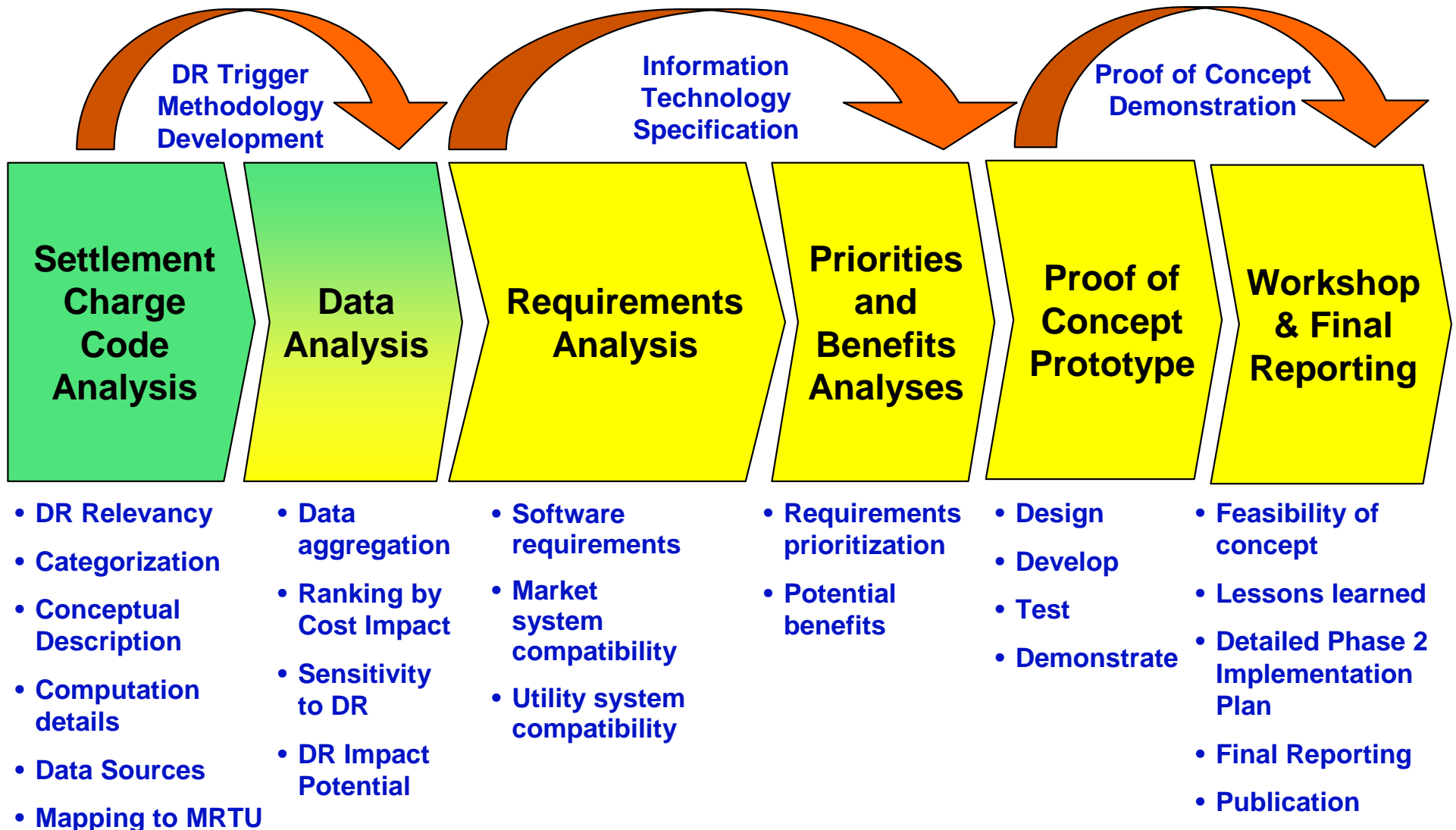


Other Discussants:

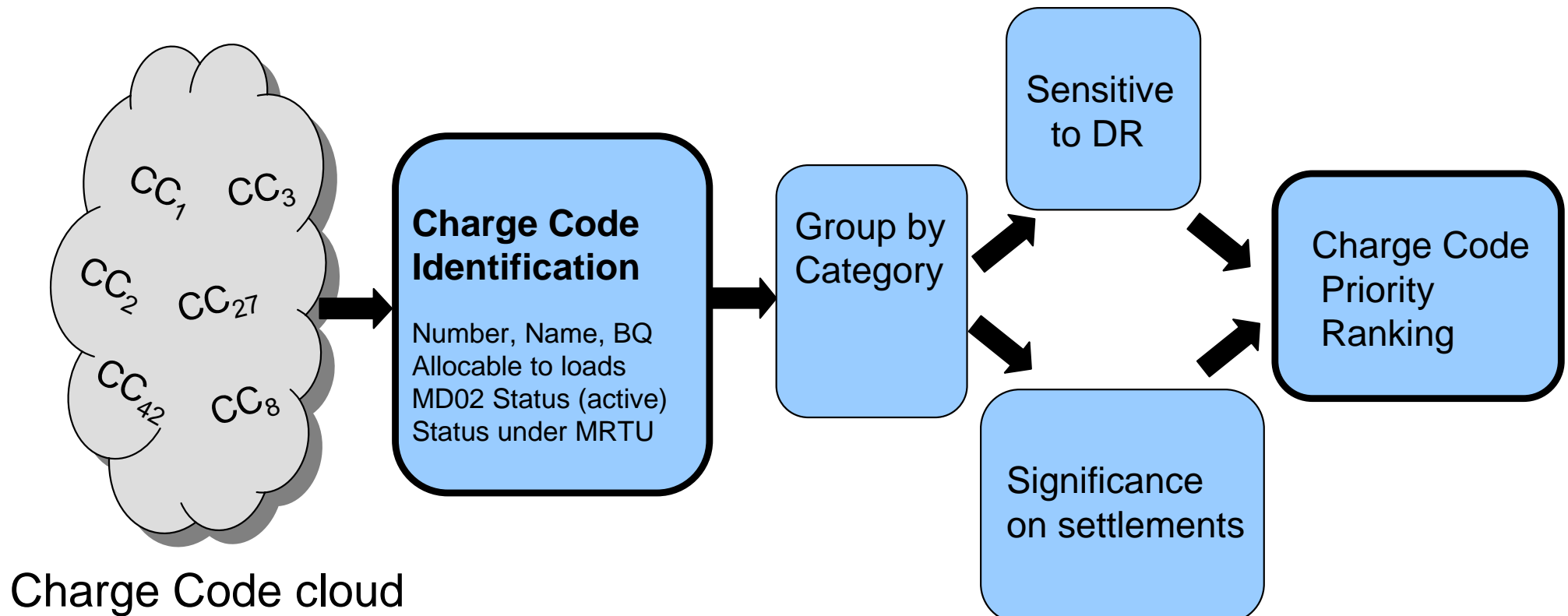


+ Competitive Energy Retailer

RD&D Process



Charge Code and Data Analyses



DR Relevant Resource Types

- Generators
- Pump Storage Gen
- Dispatchable participating load
- Non-participating load
- Import
- Dynamic Import
- Export
- INTER-SC Trade
- Metered Subsystem
- Participating Transmission Owner
- UDC
- FTR/CRR
- Transmission Ownership Rights

70 Charge Codes out of 166 analyzed under MD02 found relevant to DR

Preliminary Findings: Top Charge Code Groups

- AS - Ancillary Service related charges
- IE - Imbalance energy related charges and associated neutrality charge
- GMC - Grid Management Charges
- BCR - Bid Cost Recovery or Unit Cost Recovery related charges
- HVAC - High Voltage Access related charges
- CONG - Transmission Congestion related charges
- FERC - FERC related fees
- Neutrality – Other CAISO charges to remain cash neutral
- Uplift - Market Uplift related charges
- RMR - Reliability Must Run related charges
- DRP - Demand Response Program related charges
- Penalty - Interest and Penalty related charges

Next Steps

- Trigger Methodology
 - Drill down on top priority charge codes
 - For input data not available in operational timeframes, identify alternatives for estimates/inputs required in calculations
- Requirements Analysis
 - Functional requirements specification
 - Requirements prioritization and potential benefits
- Proof-of-Concept System
 - Design and development
 - Demonstrate concept at end-of-project workshop



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