

InnoGrid2020+

The SmartGrid deployment – interacting stakeholders

Fritz Schwarzländer, SAP, Industry Business Solutions EMEA
25.02.2012, Brussels



Content

SAP in the SmartGrid environment

- engagement in thought leadership
- SAP research: energy and elektromobility

Infrastructure / product scope for the SmartGrid

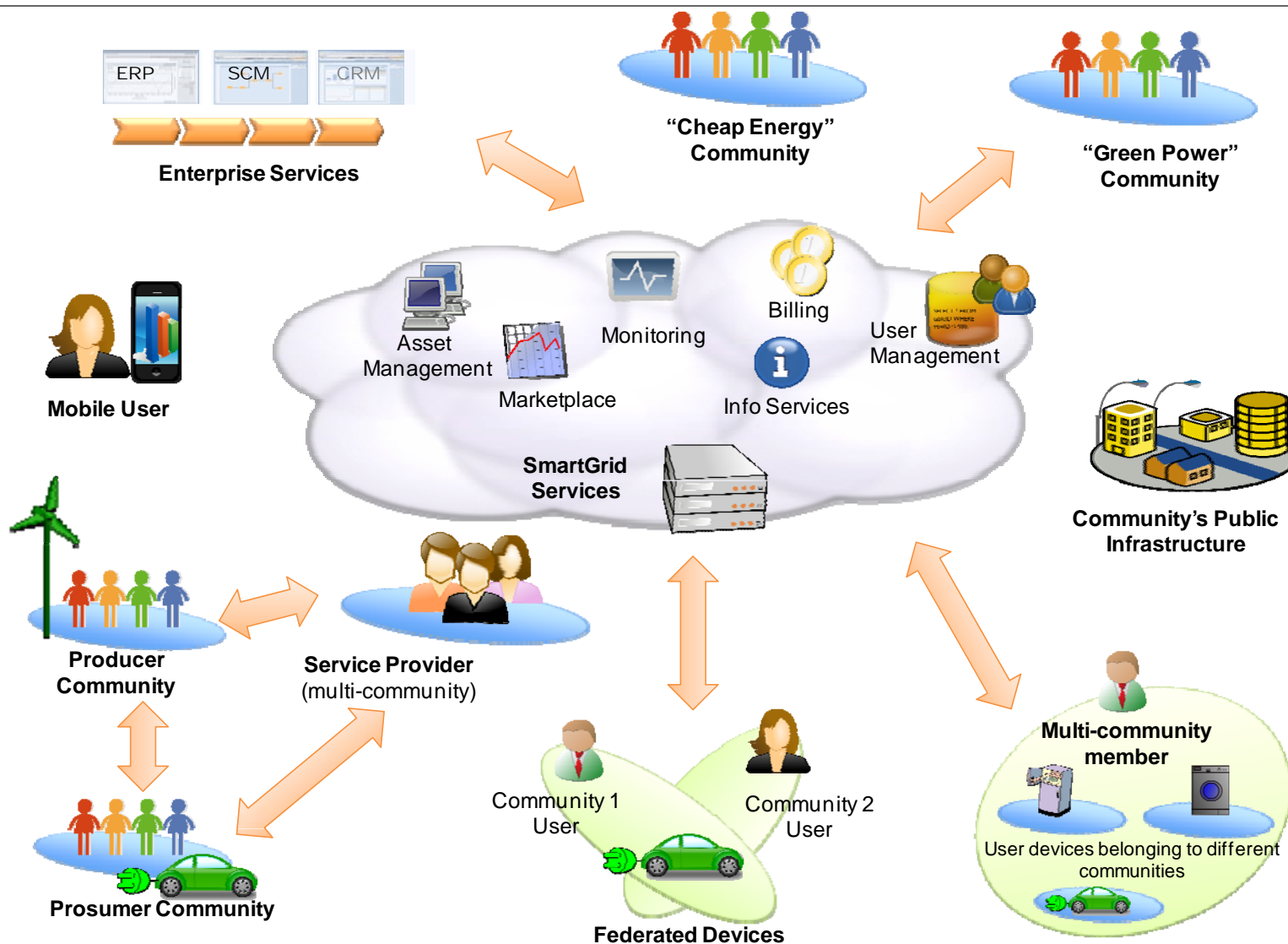
- AMI – infrastructure
- „Big data“ (SM/SG –analytics, event insight)
- DSM, DR, energy efficiency mgt.

SAP & EEGI, Grid +

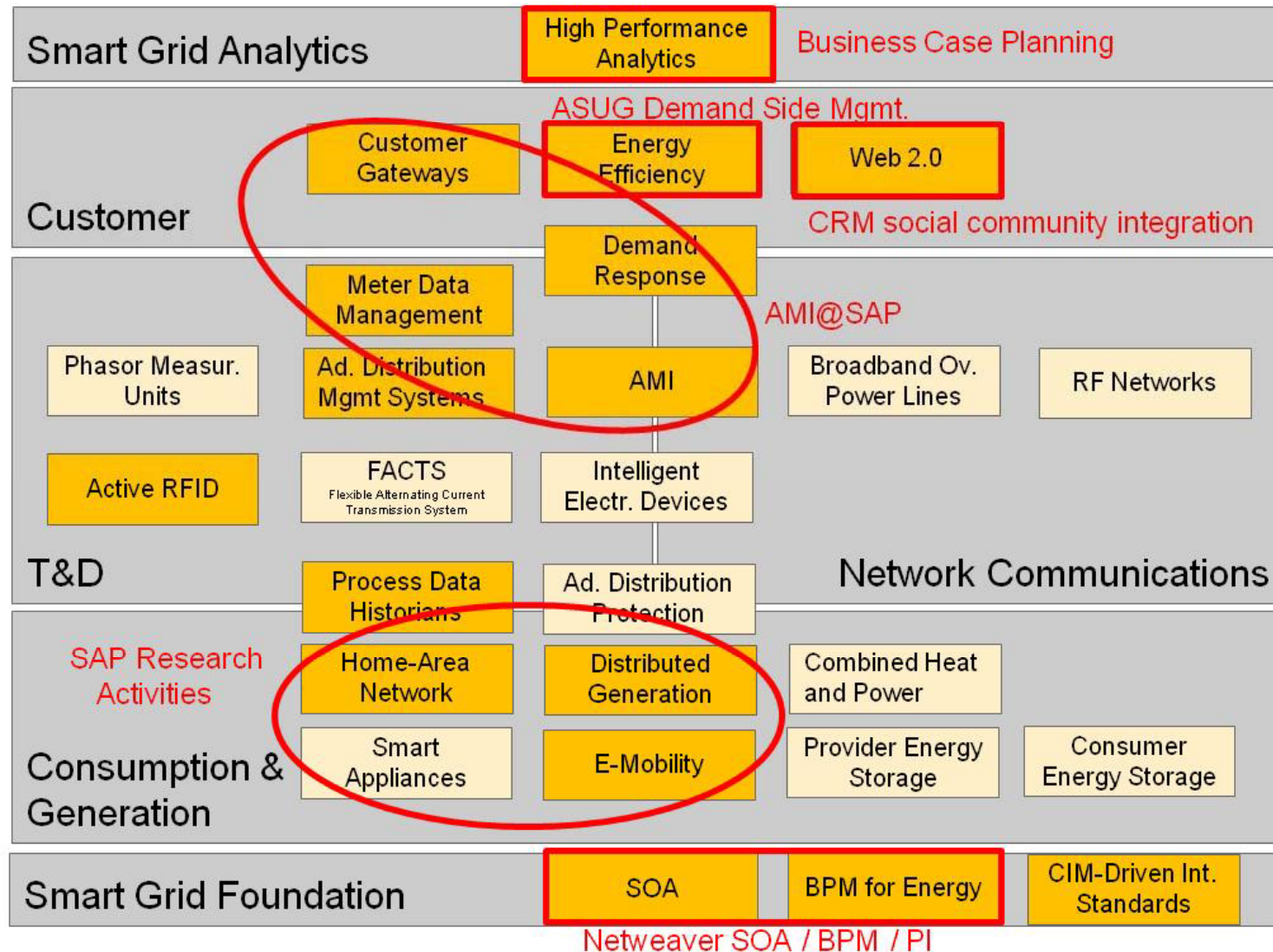
Communityware SmartGrid



www.ict-nobel.eu



SAP and the Smart Grid



Our Thought Leadership in European Energy & SmartGrids



Energy Retailers Perspective on the Deployment of SmartGrids in Europe (07/2010)
ETP SmartGrids Demand & Metering & Retail Group chaired by SAP (M. Chebbo)



European Electricity Grid Initiative (EEGI) white paper (Top 7 TSO & Top 7 DSO)
Member of the Executive Committee (M. Chebbo)



SmartGrids (regulatory) task force (DG-Energy, DG-RTD, ..., 25 associations)



ESMIG - EBSII working group on MDM/ERP System Interoperability (09/2010)
European Smart Metering Industry Group – WG EBSII chaired by SAP (M. Chebbo)



Smart 2020 Germany (12/2009)
BCG co-funded by DTAG, SAP, Siemens, Huawei, GeSI, sponsored by German Ministry



DIGITALEUROPE SmartGrids position paper (06/2010)
DigitalEurope SmartGrids Group chaired by SAP (M. Chebbo)

Adobe, Agilent, Alcatel-Lucent, AMD, Apple, Bang & Olufsen, Bose, Brother, Buffalo, Canon, Cisco, Corning, Dell, EADS, Elcoteq, Epson, Ericsson, Fujitsu, Hitachi, HP, IBM, Infineon, Ingram Micro, Intel, JVC, Kenwood, Kodak, Konica Minolta, Lexmark, LG, Loewe, Micronas, Microsoft, Mitsubishi, Motorola, NEC, Nokia, Nokia Siemens Networks, Nortel, NXP Semiconductors, Océ, Oki, Oracle, Panasonic, Philips, Pioneer, Qualcomm, Research In Motion, Samsung, Sanyo, SAP, Sharp, Siemens, Sony, Sony Ericsson, STMicroelectronics, Sun Microsystems, Texas Instruments, Thales, Toshiba, Xerox.



SAP position paper on SmartGrids (25/01/2011)

SAP contribution to EU and US Smart Grid & Energy Efficiency initiatives

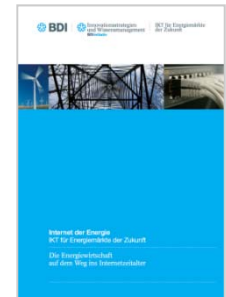


European Commission



Federal Ministry
of Economics
and Technology

German Government
E-Energy Program



BDI The Voice of
German Industry



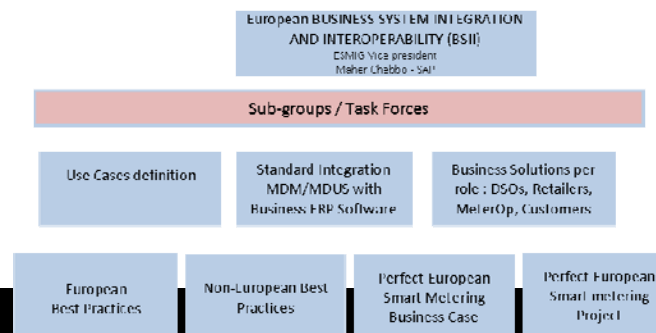
Source: U.S. Department of Energy



ETP (European Technology
Platform) Smart Grids



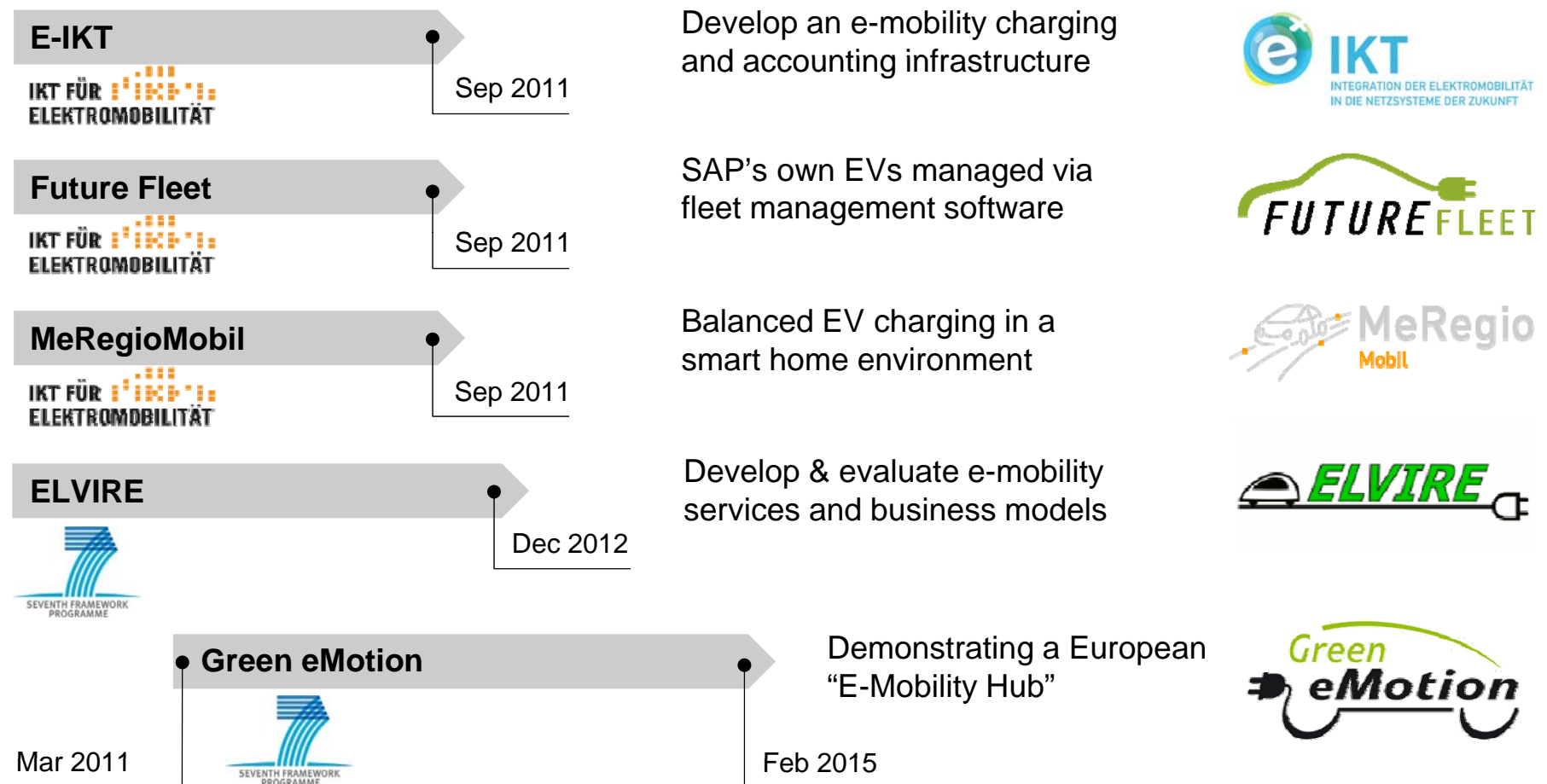
European Smart
Metering Industry
Group



SAP Research – Smart Grid & Energy Efficiency Projects

Project	Project Scope	Partners
MeRegio	Development of an E-Energy marketplace as a coordination tool in decentralized (distribution) networks. Certification of energy efficient regions.	SAP, EnBW, KIT, ABB, IBM, systemplan
SmartHouse/ SmartGrid	SmartHouses' intelligent participation in a dynamic market-driven SmartGrid enhances energy efficiency. Adaptive home appliances and distributed energy sources coordinate operation via ICT.	SAP, ISET, ECN, STITEX, MVV-Energie, PUBLIC POWER CORPORATION S.A.
e-mobility	Billing & Vehicle-to-Grid Functionality. Implement real-world trial in Berlin based on SAP solutions. Test and extend SAP portfolio for electric mobility at scale. Invent vehicle-to-grid services as part of the smart grid.	SAP, VORWEG GEHEN, ef Ruhr, TU, ewald & günter
Green Fleet	Setting up an electrical car fleet infrastructure at SAP's premises. Minimize environmental impact of mobility. Maximize efficiency through optimized asset management and fleet operations. Create a solution for management of electric car fleets.	SAP, MVV-Energie, hochschule mannheim, Öko-Institut e.V., Institut für sozial-ökologische Forschung (ISOE)
MeRegio Mobil	Services for Electric Mobility. Integrate electric vehicles with MEREGIO market place and service platform. Provide secure and privacy-preserving services and applications. Field test for extended integration with smart grids including power re-injection.	SAP, EnBW, BOSCH, KIT, DAIMLER, OPEL
NOBEL	Neighborhood Oriented Brokerage Electricity and monitoring system (NOBEL) will build an energy brokerage system with which individual energy consumers can communicate their energy needs directly with both large-scale and small-scale energy producers, thereby making energy use more efficient.	SAP, GRUPOETRA, SUMINISTROS ESPECIALES ALGINETENSES, Coop. V., SICS, CERTH, UNIVERSITÄT DUISBURG ESSEN
ELVIRE	Electric Vehicle Communication to Infrastructure, Road Services and Electricity Supply – ELVIRE.	Continental, Renault, Better Place, Volkswagen, CEA List, SAP, Motorola, ERPC GmbH, Lindholmen Science Park, ATB, ENDESA, Erasmus University College
MIRACLE	Micro-Request-Based Aggregation, Forecasting and Scheduling of Energy Demand, Supply and Distribution (MIRACLE).	SAP, TU Dresden, University of Aalborg, TNO, INEA, Josef Stefan Institut, Centre for Renewable Energy Sources, EnBW

SAP Research ElectroMobility projects



SAP Research: ElectroMobility@Future Energy Center



Six Imperatives driving SAP's Utilities Roadmap



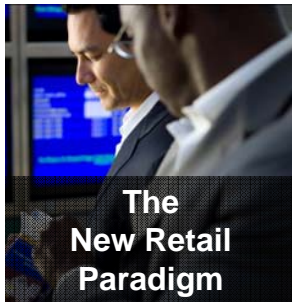
**The New
Era of Power
Production**

**SAP Enterprise
Asset Management**
**SAP Fuel Supply
Chain Management**



**The
Smart Grid
Disruption**

**SAP AMI Integration
for Utilities**
**SAP Enterprise
Asset Management**
**SAP Smart Meter
Rollout**



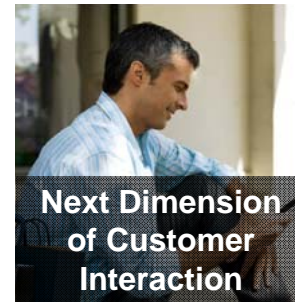
**The
New Retail
Paradigm**

**SAP AMI Integration
for Utilities**
**SAP Customer
Relationship &
Billing for Utilities**
**SAP Customer
Financials
Management for
Utilities**
**SAP Energy
Portfolio
Management**



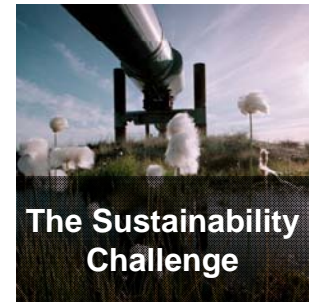
**The In-memory
Revolution**

**SAP HANA and
smart meter
analytics**
NOW AVAILABLE



**Next Dimension
of Customer
Interaction**

**Customer online
service solutions
from SAP**



**The Sustainability
Challenge**

**SAP solutions for
water utilities**
**SAP solutions for
waste & recycling**
**SAP solutions for
sustainability**

Overview Industry Portfolio

Utilities & Environmental Services 2012

Grid Operations & Maintenance

1. Operational Risk Management
2. Asset Visibility and Performance
3. Planning, Building and Commissioning Assets
4. Real Estate Lifecycle Management
5. Service Parts Planning and Logistics
6. Optimized Asset Operations and Maintenance
7. Grid Usage Management and Deregulation Compliance
8. Linear Asset Management

Sustainability

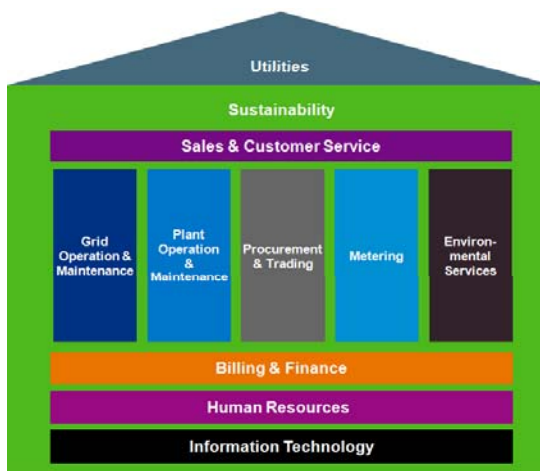
9. Demand Side Management
10. Sustainability Reporting and Analytics
11. Energy and Environmental Resource Management

Sales & Customer Service

12. Integrated Sales Management for Residential Customers
13. Complex Sales Management for Commercial & Industrial Customers
14. Energy Pricing and Costing

Environmental Services

15. Sales of Waste and Cleaning Services
16. Planning and Fulfillment of Waste and Cleaning Services
17. Treatment, Disposal & Incineration
18. Bill to Cash for Waste and Recycling
19. Customer Service for Waste and Recycling



Billing & Finance

20. Manage Financial Performance
21. Manage Enterprise Risk and Compliance
22. Treasury and Financial Risk Management
23. Joint Venture Accounting
24. Bill to Cash
25. From Claim Notification to Claim Closure

Plant Operations & Maintenance

26. Plant: Operational Risk Management
27. Plant: Asset Visibility and Performance
28. Plant: Planning, Building, and Commissioning Assets
29. Plant: Real Estate Lifecycle Management
30. Plant: Service Parts Planning and Logistics
31. Plant Optimized Asset Maintenance
32. Plant Efficient Operations
33. Fuel Supply Chain Management

Procurement & Trading

34. Centralized Sourcing and Contract Management
35. Integrated Sourcing and Procurement
36. Energy Portfolio Management

Metering

37. Smart Meter Data Management and Operations
38. Smart Meter Rollout

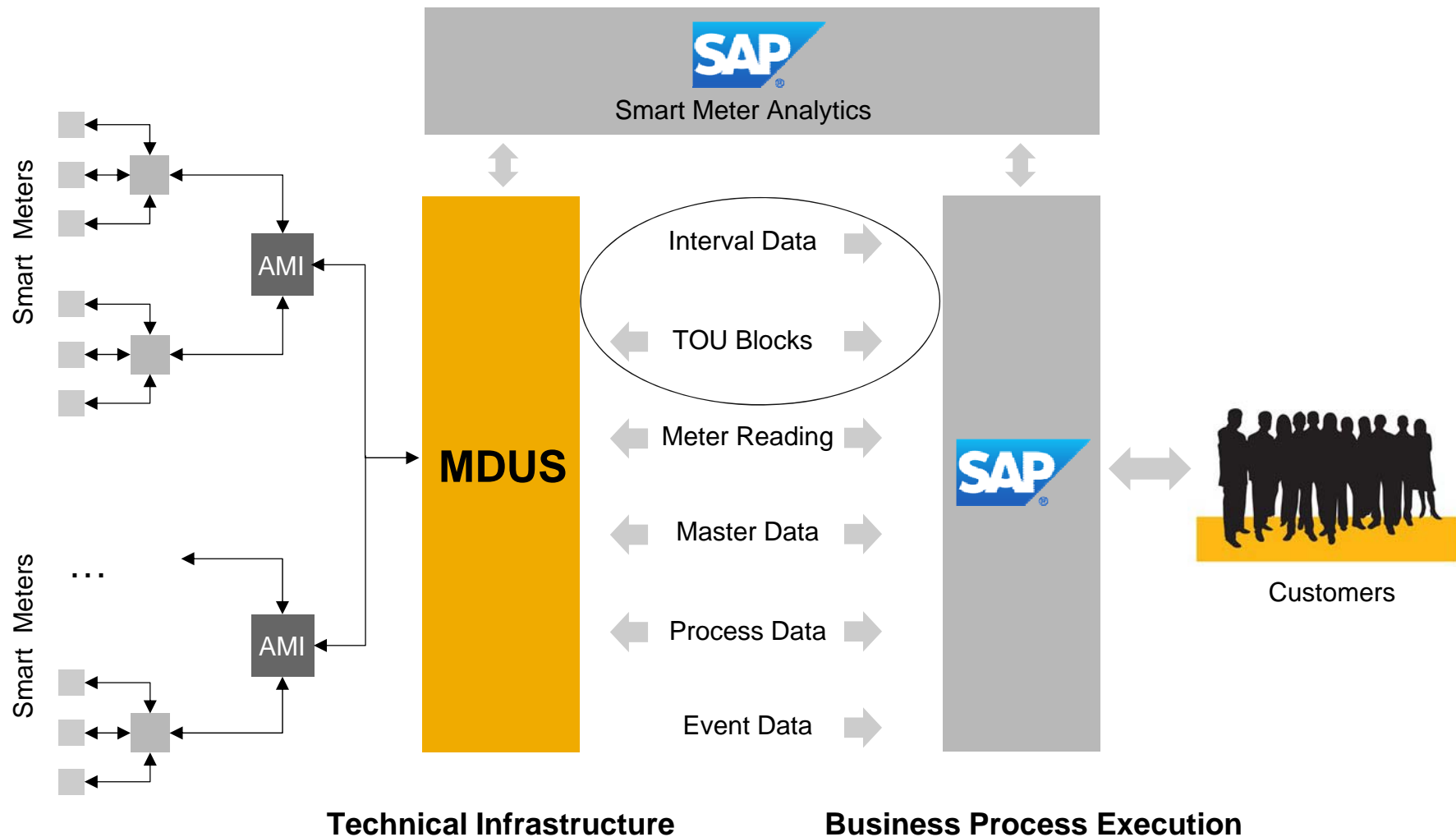
Human Resources

39. Core HR and Payroll
40. Talent Management
41. Workforce Planning and Analytics

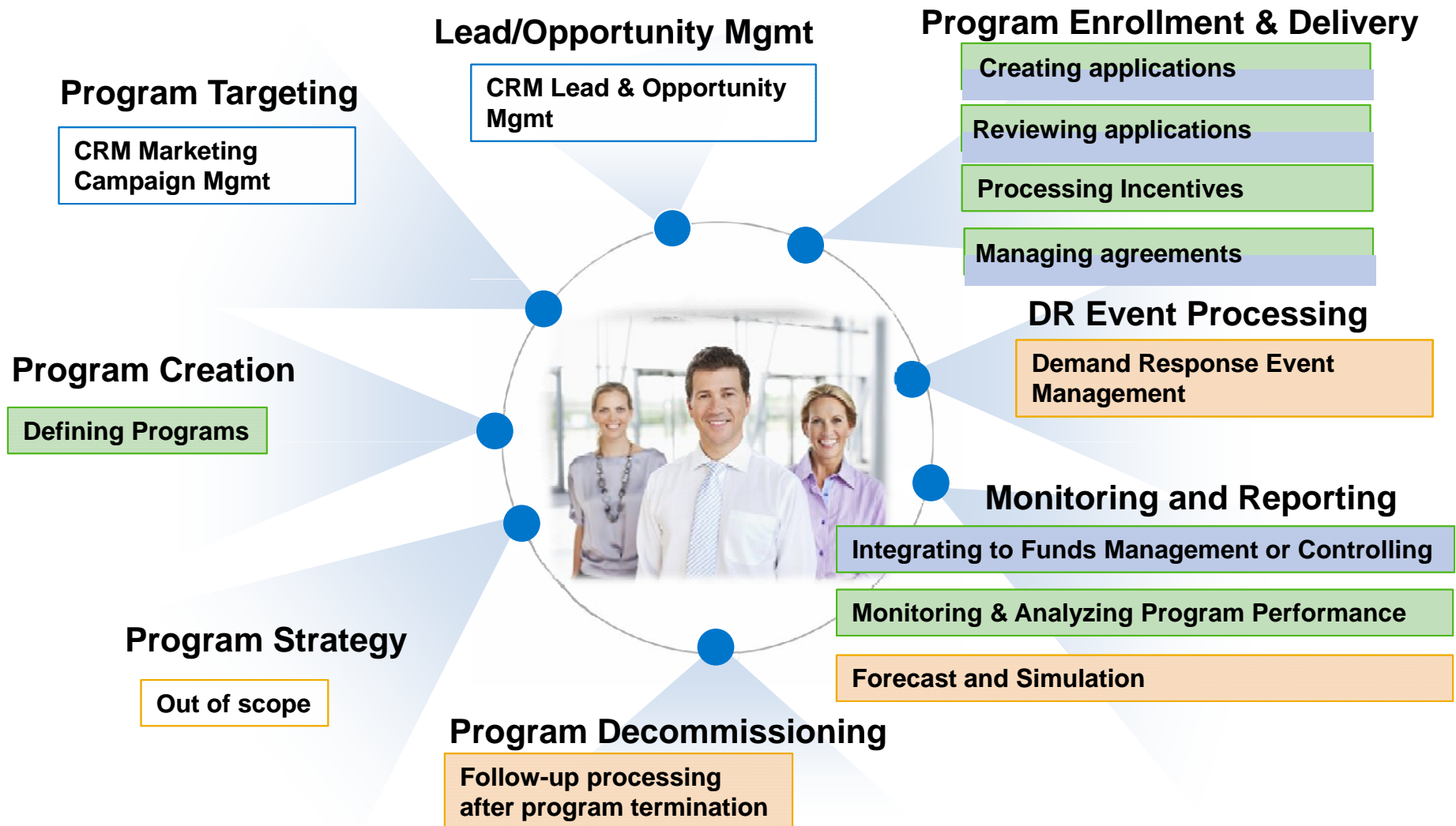
BA & T (Wave 2)

42. Smart Meter Analytics
43. Mobile and RDS

System architecture – example regulated market



Energy Demand Side Management Development Roadmap



Typical examples of DSM reports

Using the DSM data in BW, users can create reports and dashboards to monitor their DSM programs and program performance

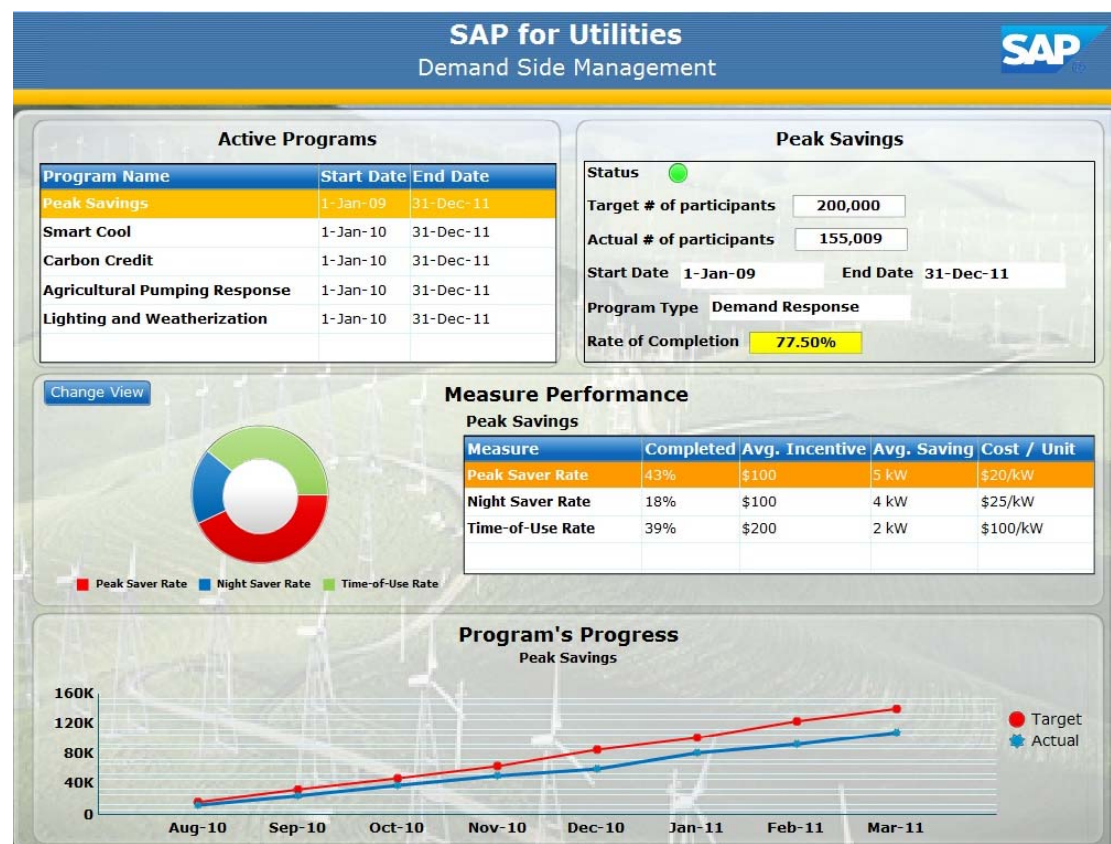
Typical examples are:

Program enrollment performance

Number of applications and agreements by program ID, status over time

Program goal performance actual and pipeline

Sum of goal contribution per program goal. By measure / product, looking at DSM applications and DSM agreements of different posting dates



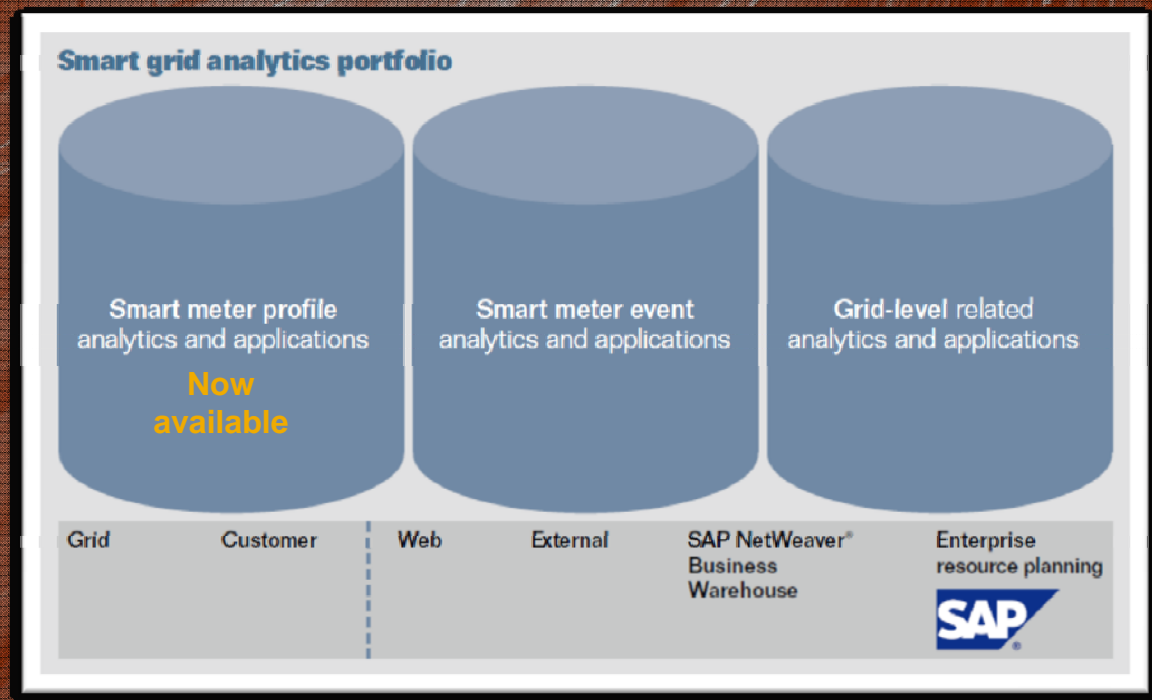
Example of a program performance dashboard

Leveraging the In Memory Revolution

SAP Smart Grid Analytics

Current systems are not capable of applying data mining, analytical techniques to large amounts of combined data in a cost effective, responsive, business relevant manner.

SAP In-Memory Appliance (SAP HANA) provides a technology that allows the processing of **massive quantities of real time data** in the main memory of the server to provide **immediate results** from analyses and transactions.



NEW: SAP Smart Meter Analytics

Powered by SAP HANA

Powerful Customer Insights & Segmentation



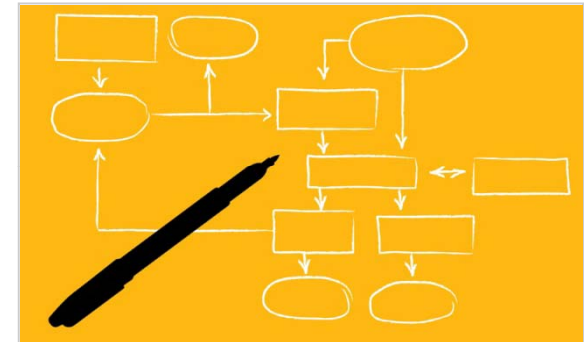
Instant analysis of customers' energy consumption and advanced segmentation based on smart meter data

Energy Efficiency Benchmarking



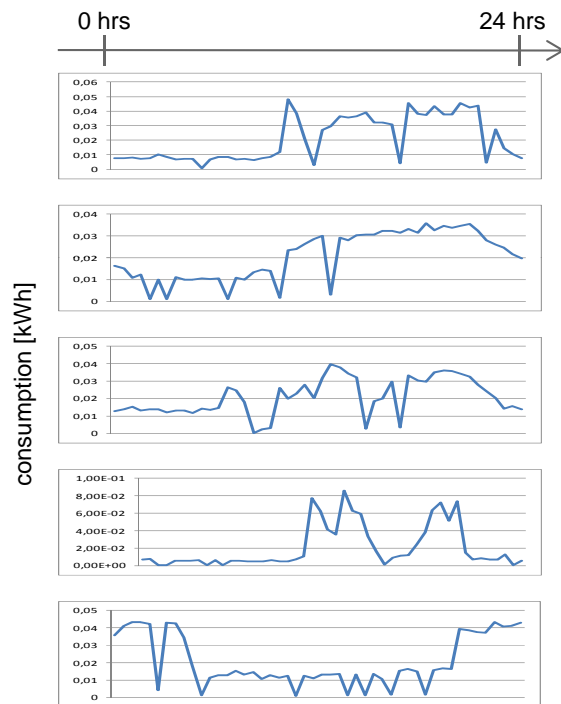
Energy efficiency benchmarking based on statistical analysis of consumption data and root cause analysis

Platform for Consumption-driven Processes



Pre-packaged, web service-enabled In-memory platform to enable consumption-driven business processes throughout the company

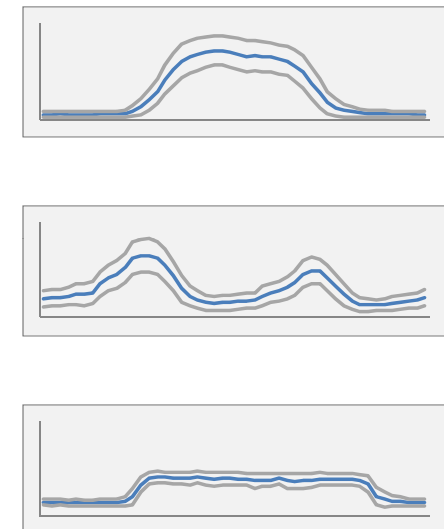
Pattern Profiles – Understanding Customer Usage



1 typical size: millions of daily profiles

Millions of daily consumption profiles contain valuable information about customer behavior for a better energy management

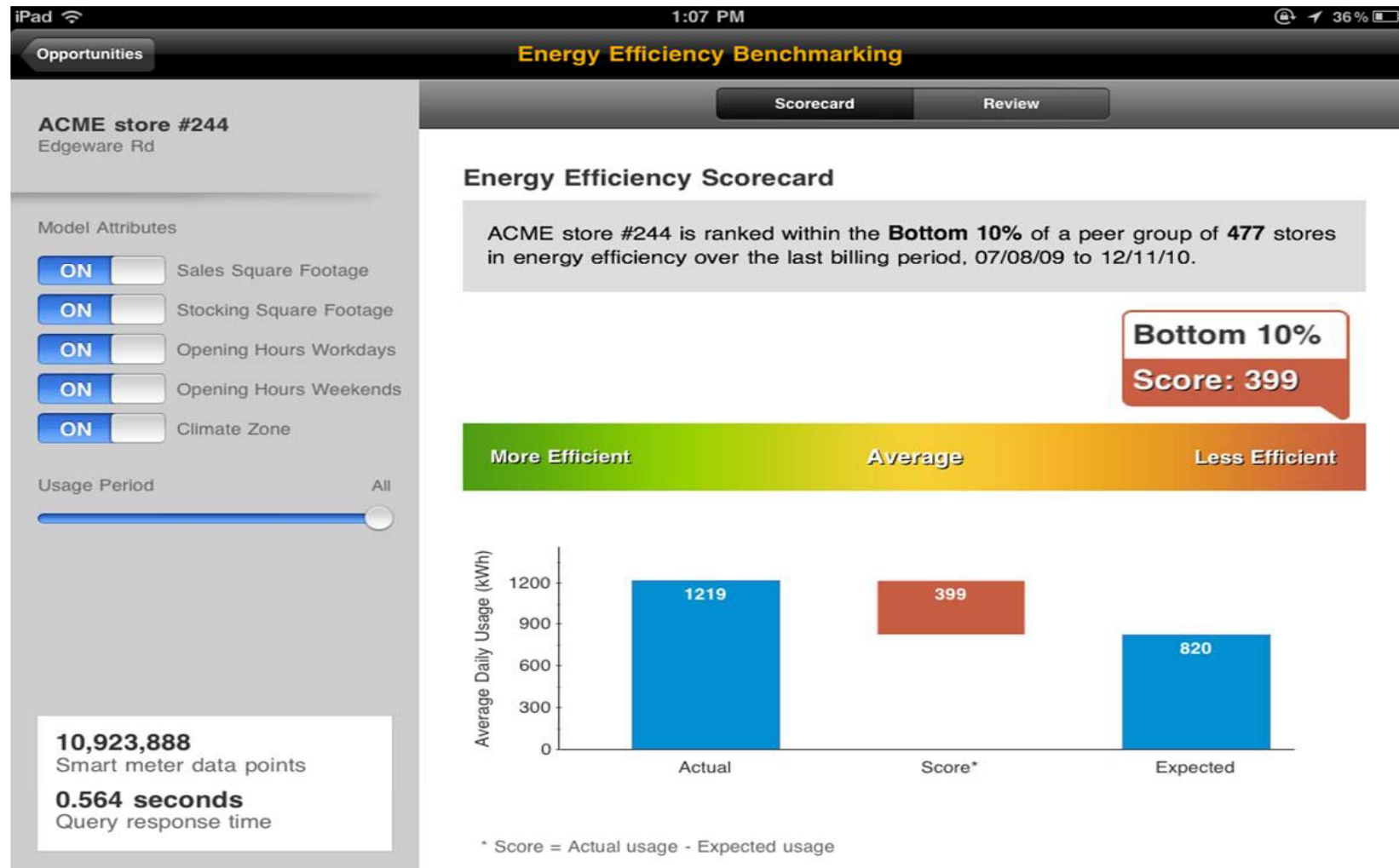
2 In-memory pattern recognition algorithm crunches typical load profiles out of those huge amount of data to “summarize” those data and categorize user behavior.



3 Instead of exploring millions of individual profiles it is sufficient to take a look at the typical pattern in the data to understand user behavior. Those pattern are the basis for other follow-up processes

Flexible and dynamic scorecard reporting

A benchmarking example



Compute benchmark for peer group and identify outliers

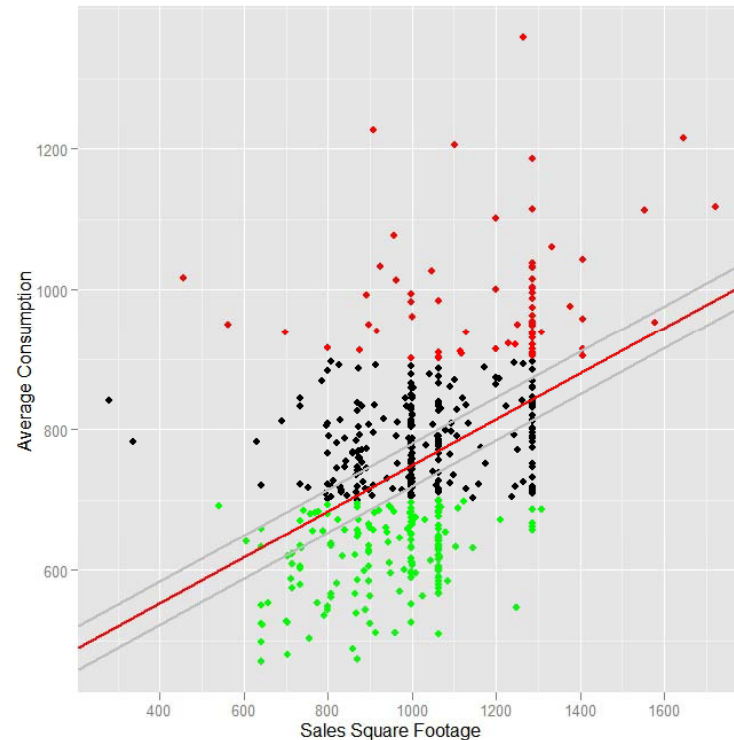
A benchmarking example

Business Objective

- From a retailer chain with ~ 500 stores find those stores which are least energy efficient and would profit from energy management services.

Available Data:

- Half hourly Smart Meter Data
- Climatic region
- Sales square footage
- Number of opening hours
- ...



Energy Benchmarking:

Compute a regression model from the data of all stores, which estimates the dependency of consumption on facility configuration.

Relative Store-level Energy Efficiency

Any surplus consumption which cannot be justified from what we know about the store is an energy services opportunity.

Main Areas for Smart Grid Analytics

Outage Management:

- Real time outage information missing ingredient for efficient outage response

Fraud Monitoring:

- Meter tempering

Grid Monitoring:

- Monitor real-time sensor activity in grid

Customer Service:

- Direct interactions with customer for outage notifications

Service Management:

- Dispatch field resources to address outages

Asset Optimization:

- Analyzing asset history for optimal O&M
- Increase utilization and performance of the assets
- Support strategic decisions (mid-term and long-term) about asset replacements and new investments
- Optimize the use of the field resources to provide services and maintain the assets

SAP & EEGI, Grid +

EEGI = Platform / testbed(s) for ICT-developments / Infrastructure approval and validation; input for future developments

Input to EEGI, Grid+

- from EMEA, APJ (Korea SG testbed), US (esp. DSM,DR)
- from thought leadership engagements, e.g. Interoperability (SEESGEN-ICT), ESMIG usecases, EU taskforce SG participation; market experience e.g. clearinghouses ...

Expectations: Standardization, Harmonization, usecases, businessmodels

Grid+ = mandatory in that complex project environment; compare e-energy: accompanying consolidating research



Thank You!

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