Advanced cross-border collaboration in the field of IT’s SMART:

Intelligent systems and data management for an optimized, controlled and secured gas and electricity grid

Presented by:
Prof Dr. Hans Worthman (RUG)
Dr. Ir Rolf Veldhuys (Hanze UAS/KPN)
Dr. Koos Lok Energy Valley (Prof at the Hanze UAS)
WHAT ARE THE ACTIVITIES IN THE ENERGY VALLEY REGION?
Energy Related Investments
Energy Valley Region

Conventional energy
15.240 billion euro

Energy transition/sustainable energy
6.480 billion euro

Knowledge & Innovation
556 billion euro
Development Energy Academy Europe
Energy Valley North Sea Network

North Sea Energy Alliance
ENSEA

North Sea Energy Vision

EV NL/DL
HEC

Including Belgian network
Energy Transition and System Integration

Need for balancing

Ref: 23-1-2013 Discussion on new Eurec master track on system integration
Energy themes related to Energy System Integration

KP7 Topic ICT-2013.6.1 Smart Energy Grids – Data Management

W.L. Kling. Intelligence in Power Networks (adjusted by author Dr. Koos Lok Eur.Ing MBA Prof. Energy & Management Hanze University Groningen). Inaugural address at Eindhoven University of Technology, the Netherlands (in Dutch), 2002.
Balancing and System Control related to Energy System Integration

Large Scale PV

Central Energy

Large Scale Wind

Data Mngt

Balancing

Data Mngt

Gas Power Plants

De-Central Energy

GRID

Micro level E-Home

Meso Level I-Balance

Macro Level Smart City

Energy Efficiency

Biomass (bijstook)

Storage

CO2

Hydrogen

Methane

Residual Heat

Geo-Thermie

Infrastructure

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Centralized versus de-centralized energy development
Balancing and System Control
Today’s Electrical Grid Operations Paradigm

Normal operations
- Asset underutilization
- Limited market opportunities
- Lead to emergency operations

Emergency operations
- Blackouts and cascading failures

SCADA
~ seconds

Estimation
~ minutes

Contingency Analysis
~ minutes

Operator
Violations

Constrained solutions

Market Operation
~ hours

Ratings & Limits

Off-line Transient/Voltage Stability Analysis
seasonal

Energy for Life Energy for Business
WP 1: Management

Analysis

WP 2: Functional technical requirements

WP 3: EU Scenario analysis

Modelling

WP 4: Telco services and platforms

WP 6: Business Models

Validation

WP 5: Fysical Exp. (Entrance / Clausthal)

WP 8: Simulation Model

WP 9: Dissemination

WP 7: Regulation
Flow schedule project building

1. Detailed scoping
2. Consortium building
3. Application construction
4. Review of proposals
5. Contract negotiations