Overview of Microgrid Research and Development in Korea

Prof. Jaeho Choi
Chungbuk National University
choi@chungbuk.ac.kr

Center for Power IT (CPIT) National Program

Visions, Goals, and Strategies

Introduction of Major Power IT Projects (1)

	Title	Objective
1	Korean Energy Management System (K-EMS)	Development of Korean energy management system
2	IT-based Flexible AC Transmission System	Development of 20MVA BTB STATCOM
3	Intelligent Transmission Network Monitoring & Operation System	Development of real-time transmission network monitoring system management system
4	Advanced Substation Automation System Based on the Digital Control Technology	Total operations management system development for digitalized substations
5	Intelligent Distribution Management System	Development of distribution automation central control system

Introduction of Major Power IT Projects (2)

	Title	Objective
6	Active Telemetrics System for Power Facility Monitoring	Development of sensors, sensor networks, data management system, and user platform for transmission network monitoring
7	Consumer Portal System for IT-based Energy Service Business	Development of consumer portal system and multi-services platform for consumers and electricity providers
8	Broadband Power Line Communication	Development of PLC modem and network system and multi-business services using BPLC
9	Power Semiconductor for Distributed Generation	Development of IGBT devices module integration and package technology
10	Energy Management System and Test Site for Microgrid	Development of EMS for Microgrid and test site for performance evaluation

Korean National Microgrid Project

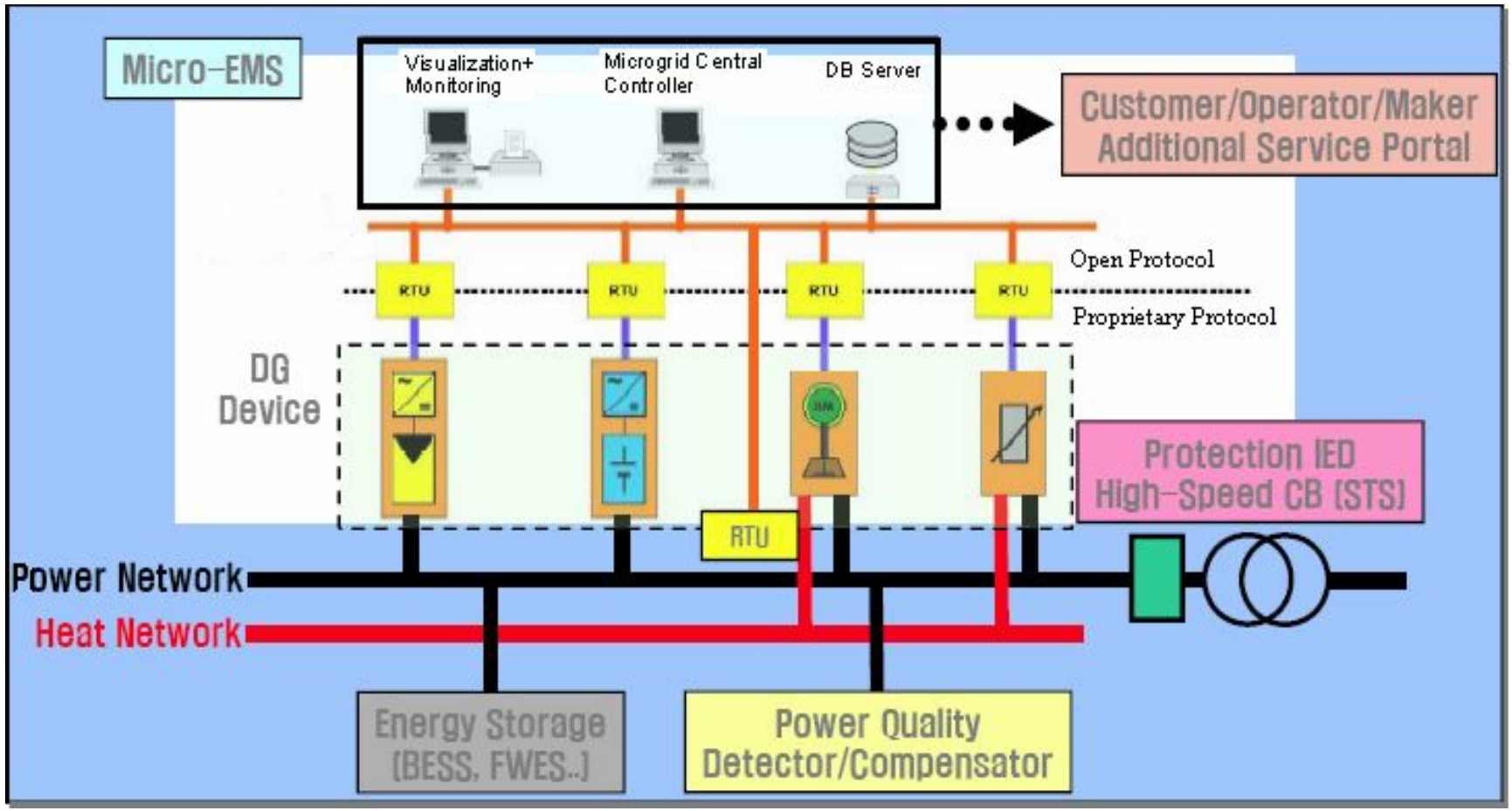
Project Title	Development of Energy Management System and Test Site for Microgrid
Period	Sept. 1, 2007 ~ Aug. 31, 2012(5yrs)
Total Fund	US$ 14.65M(+Microgrid Power Sources)

Research Subject and Project Schedule

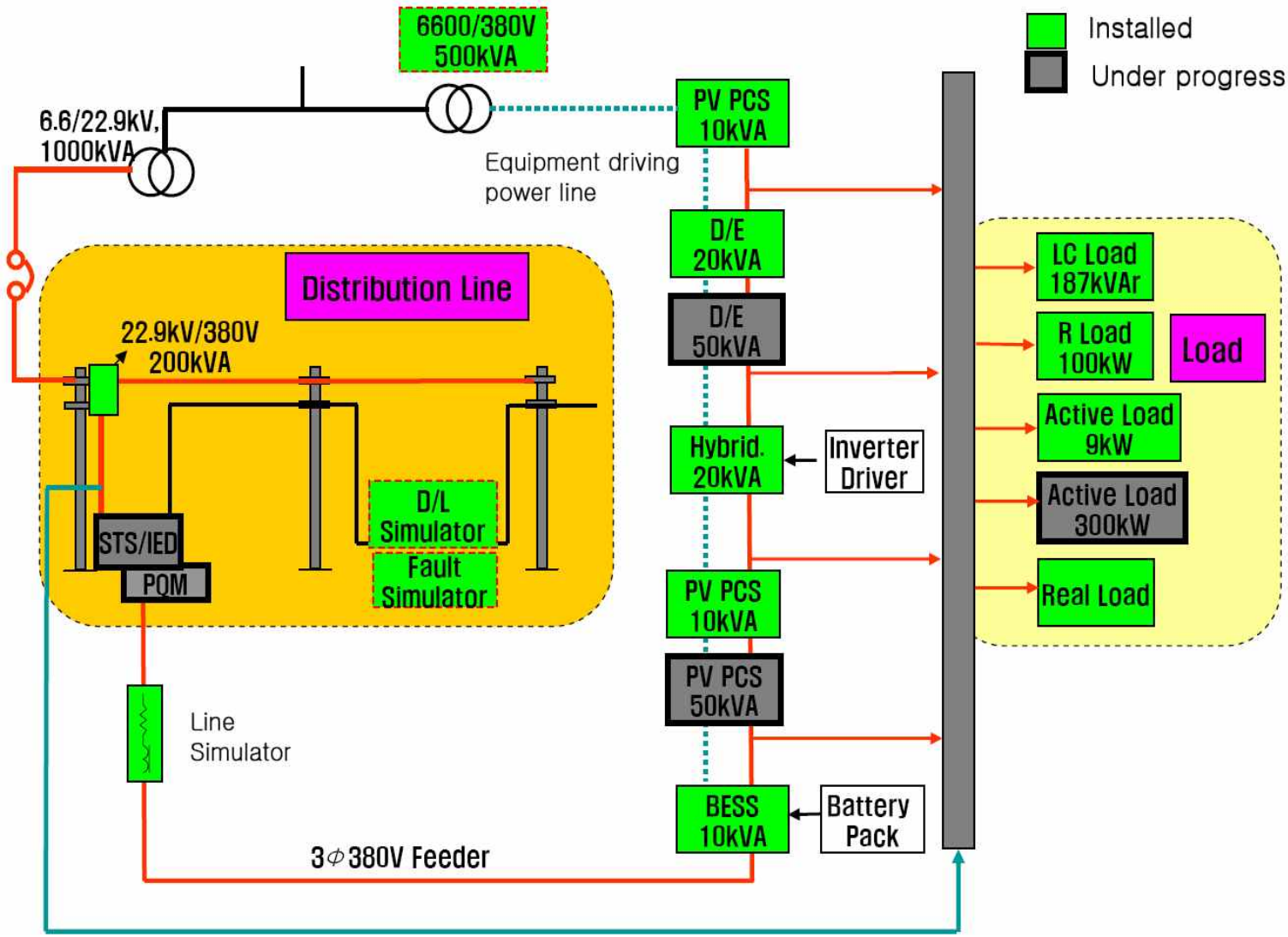
	Technology Development for Commercialization of Key Devices		
	1st Subject	2nd Subject	3rd Subject
	Development of Modular/Std. Device	Development of MG Operating System	Evaluation of Pilot Plant
1st Phase	• Std. Network Gateway • Std. PCS • STS	• Design Package • Engineering Tech. • Prototype Op. System	• 100kW Class Prototype MG • Performance Evaluation
2nd Phase	• Modular/Std. PCS • STS • Control IED • PQ Equipment • BMS	• Integrated Op. System • EMS • Management System • Facility Monitoring System	• MW Class Prototype MG • Performance Evaluation • Standardization

Research Objective

- ✓ **Technology development for highly reliable/efficiency power grid**
- ✓ **Key device development and pilot plant for urban and rural system**



Pilot Plant (1st Phase)



Distributed Energy Resources and Infra-Structure for Test

▲ PV(9kW)

▲ Fuel Cell(1kW)

▲ DG(20kW)

Distributed Energy Resources

▲ WG(3kW)

▲ WG Simulator(20kW)

Test Site

▲ Line Simulator

▲ Electronic Load

▲ Protection Panel

Test Infra-Structure

▲ Grid Connection Tester

Distributed Energy Resources and Infra-Structure for Test

▲ Transformer for MG

▲ RTDS/Power Amp

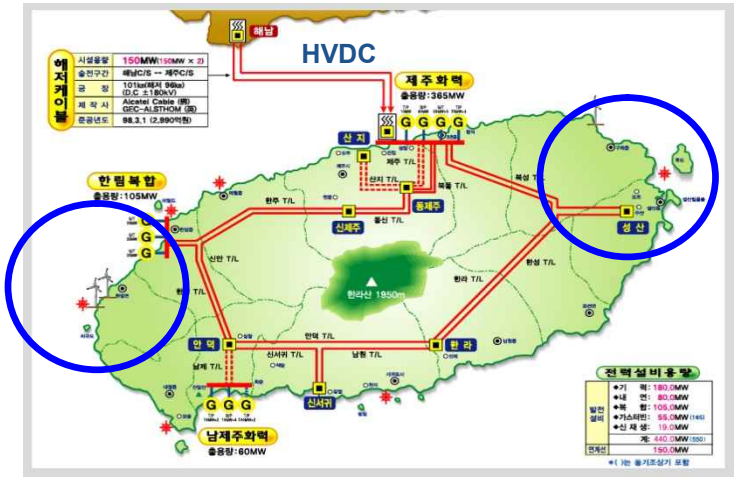
▲ Weather Observation

▲ Hybrid, BESS

▲ Passive Load

Candidates for Microgrid Test Site

- Changwon City (2012-2015)
- Yeosu EXPO 2012
- Jeju Island
  - Smart Grid Test Site (2009-2012)
- Isolated Microgrid for Islands (2009-2012)
- Campus Green Energy Project (2010-2013)



Thank you for your attention!

choi@chungbuk.ac.kr