Overview about verification test project of “Next-generation energy Social System” on Keihanna Eco-city in Kyoto

November 3rd 2010
Verification Test Promotion Committee

Keihannna Science City
Our Goal and Policy about “Keihana Verification Test Project“

Goal

- Ultimately accomplish energy saving CO2 reduction
- Realization of Environmental Future city “Keihana Eco-City model” and new industry accumulation
- Packaging of Exportation of “Keihana Eco-city model” and international development

Feature & advantage of Keihanna

- Research and Development Center based on government project
- Cumulated by Japan’s leading research institutions and universities, integrated companies (Especially environment and energy-related companies)
- Residents’ understanding of and interest in high-tech technology
- Few one of the population growing regions in Japan

Policy of Initiative

Developing the community EMS to realize minimization of CO2 emissions, with the leverage of Keihanna’s Characteristic & advantage and combination of industrial - academic - governmental-Residents wisdom
Keihanna Eco-City Implementation Plan Overview (December 2009)

Keihanna Eco-City Implementation Plan
Make eco activities to culture in Keihanna

Revolution of lifestyle
Eco Platform
Area-wide Environmental conservation activities
Eco learning
Delivery Class by Scholar

Low -carbon
EV Charger Network
variety of EV Verification Test
• EV
• e-Bus
• Micro EV
• e-motorcycle
• Electrical assistant cycle
• Car Sharing
• Community Cycle

CO₂ reduction⇒Incentive
Shopping, railway bus ticket, movies, car sharing community cycle Voucher

Development of Eco-Conscious Residence & City infrastructure
Energy Consumption's Visualization and Optimization
Model residential area
Implementation of PV (300 houses)
- Seikadai
- Doushisya yamanote
- Harmony city Kizu

Smart house
Energy Consumption’s Visualization and Optimization
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Smart buildings ZEB
Solar generation rooftop Greening
LED Lighting
Battery

Keihanna Plaza
Data Center
Control Center

Smart School
Doushisya Uni.

Smart Laboratory

Smart store
Rapid Charger

Eco solar street
LED solar light

Wind turbine

Mega-Solar
Underdeveloped place cluster

International Development
Intercommunion project, developing the sustainable city model’s oversea, aiming at marketing to China and other East Asia Country

Smart Meter

Advanced Eco-house
super-insulated Design

SOFC, Battery

DC Power Feeding

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Smart School
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Creation of new industry of “Environment and Energy” with using Keihana CEMS

National Grid
Substation
Rechargeable battery

CEMS
Community EMS

Next generation energy park

Keihanna Eco-City Implementation Plan Overview (December 2009)
Feature of Keihanna verification Test Project
—Renewable energy’s large-scale implement, verification test delivered with integration of Industrial, academic public and residential players

【Keihanna Science city】
an unincorporated city located in the Keihanna Hills, a border region between Kyoto, Osaka, and Nara Prefectures of Japan. Including 8 cities, More than 100 companies and organizations have already established facilities for researching, educational (university), cultural purposes

Main locations for verification test:
- Kyo tanabe city, Kizugawa city, Seika
- area: about 1,537ha
- population: about 171 thousand

Eco-conscious house (smart house) development Project

Targeting area
(900 units = 300 units X 3 areas)
- Doshisha yamata area (FY2010)
- Seika nishikizu area (FY2012)
- Kizu area (Harmony City kizu) (FY2013)

Implement solar power to block all houses
Area-wide Environmental conservation activities based with Kyoto eco-point operation

ZEB system (Smart building) Project

Keihanna plaza
Doshisha univ.
Implementation Framework of "Keihana Verification Test Project" about Community energy management system
Overall schedule of Verification Test

**CEMS**

- **Energy Visualization**
- **HEMS**
- **BEMS**
- **V2H**
- **EV-Charge Network**
- **ITS & Smart parking**
- **Advancement Technology**
- **Revolution of life style (Eco-point)**
- **Renewable Energy, incl. biomass energy**
- **International development**

**SCADA**

- SCADA (CEMS development)

**Energy Visualization and verification of energy saving activities**

- deliver monitoring existed housing (100 units)
- Differences in consumption patterns

**Verification with 100 units**

- deliver pilot with new housing (10 units)
- Difference in hardware

**BEMS**

- (kehanna Plaza + Doshisha Univ.)

**Development of V2H**

**Development of e-Parking, ITS**

- Community Verification test by EV Taxi and others (establishment of energy management)

**In Mansion room**

- Eco homes combine forces Kyoto (for evaluation and verification of building)

**interlock implementation with incentive sys.**

- Expand into Doshisha yamate aera」「Kizugawa area」「Seika area

- Development in Doshisha yamate aera」「Kizugawa area」「Seika area

**Proposal to over sea city’s implement**

**organization of committee**

- Extract and organize requirements

**SCADA**

- (monitoring application)

- mutual complement with system (local battery)

**scale expansion 300 Units**

**Application for verification test**

- Continuous operation as the system demand

**Explanatory notes**

- initiatives by research institutes and universities, initiatives (Development, verification, implement): innovational approach by WG and options exchanging with verification operation

1. SCADA: Supervisory Control And Data Acquisition

Conducted quarterly
Feature of Keihanna Verification Test
—Local utility proactively participate and utilizing local battery interfacing to grid—

1. We can deal with total management of electricity and heat, challenging both all-electric house and gas smart house that need different energy management due to equipment characteristics respectively since regional utility companies such as Power corps and Gas corps proactively participate in the test.

2. We execute verification test of energy management in linkage with grid, utilizing local battery installed on grid side.
1. The power demands of EV in the region and the quantity supplied of the charge equipments are managed with using advanced ITS.
2. The demand side management is done according to the demand-and-supply balance.
With using “SMART-TAP”, the power consumption is monitored real timely and visualized historically by each home electric appliance.

- Consumption will be optimized through analyzing life-pattern backing up by Energy Saving Concierge Service
- In future, each home electric appliance will be operated as “demand side management” with using “SMART-TAP”

On advanced stage, the power supply of the electricity used with the home electric appliance can be arbitrarily chosen with using advanced-Smart tap, based on “virtualized power routing technology”

- Energy conservation in house internal area, will be realized In selecting renewable energy by priority

![Diagram showing power flow and energy sources including Grid, PV, SOFC, Li-ion Battery, EV, Power router, and Advanced Smart-tap.]

**Feature of Verification test / Advanced development**

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**Power management with using “SMART-TAP”**

- TV
  - Power consumption
    - At a moment: 12.0w
    - Daily total: 0.1kwh
    - 125(JPY)
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Thank you for your attention