The Role of University in Smartification of Science City

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Introduction

- Smartification of Permanent Dwelling Condition in Kansai Science City

- The Role of Kyoto University in Smartification of the Kansai Science City

Conclusion
From the beginning, an image of science city imprinted on our consciousness was different from usual image of industrial city we had known.

It was a fascinating, intellectual, eco-friendly, and promising image of future city distinguishing from other common cities developed in the era of industrialization.

**Industrial Landscape**

*by Laurence Lowry, R.A.*

**Sophia Antipolis**

in Valbonne, France

Source: [http://www.christies.com](http://www.christies.com) (2014.11.3)

As a city model, a science city can suggest a future-oriented or near-futuristic urban lifestyle.

A science city is not only an incubator for new technologies but also a test bed for new lifestyles.

It is an ideal place for testing and verifying the outcomes of research on advanced technologies and new social systems to suggest futuristic new lifestyles in cooperation with residents.
Kansai Science City, that is one of four locations around Japan for the Smart Community Project, is a good model.

The project is to identify the optimum form for smart grids and smart cities in Japan.

In the project, Kyoto University plays indispensable roles for smartification of Kansai Science City.

Source: http://www.kri-p.jp (2014.11.3)
Kansai Science City so called “Keihanna Science City” was set up in 1978 as the second oldest science city after Tsukuba Science City in Japan.

In 1987, the city constructions started in the area of the Kansai hills extended to the three prefectures, Kyoto, Osaka and Nara.

Gamut of Kansai Science City

Source: http://keihanna.biz (2014.10.28)
Smartification of Permanent Dwelling Condition in Kansai Science City

The construction of Kansai Science City aims to build a future-oriented model city based on intellect and creativity of humanity not only in science and research but also in culture which includes ways of living.

The Development direction of the facilities and City functions are revealed that it is important to develop the facilities for permanent dwelling including habitats so much as for academic pursuits or promotion of the industries in Kansai Science City as an ordinary city.

The three philosophies of the City’s construction

1. Creating a base for new development in culture, science, and research
2. Contributing to the development of culture, science, and research in Japan and throughout the world, and to the development of the national economy.
3. Foundation of the intellectual and creative city that opens doors for the future.

Development direction of the facilities

1. Facilities for the cultural and academic pursuits
2. Promotion of the industries
3. Habitats
4. City functions
5. Extensive transportations and fundamental facilities for information and communications

City functions

- To be a base of the cultural creations and lead future activities of the academic pursuits and industries
- To announce accomplishments of the activities domestically and to the worlds
- To realize developments of the city where cultures and hospitality are integrated.

Source: http://www.kri-p.jp (2014.11.3)
A large-scale housing development has been proceeding in many districts of the Science Zone of the city. The Seika and Nishikizu district, where the area for operational experiments of the Keihanna Smart Community Project is located, is one of them.

The project is to demonstrate the smart community in actual fields, including not only the transportation sector, but also the residential sector and the commercial sector.

Source: https://www.google.co.jp/maps (2014.11.3)
Making full use of the environment of the city, the Keihanna Smart Community Project seeks to develop the community energy management system (CEMS) that minimizes CO2 emissions without affecting quality of life or convenience for residents, looking towards the construction of a next-generation energy society.

The goal of the Keihanna Smart Community Project is the optimization of energy supply and demand on a global scale. Realization of this goal involves the development of systems including a HEMS to manage energy supply and demand in the home, power demand response for energy management including large-scale DR, a BEMS to manage energy in buildings, an EV charging management system, and V2X.
The promotion organization of the project includes Kyoto prefecture and also involves 24 companies, local governments and universities. There are 7 working groups taking charge of each part in an energy management system and its verification. Among them, Kyoto University is involved in the Leading Verification WG so called ‘i-Energy WG’ as the managing organization leading the verification.
The Role of Kyoto University in Smartification of Kansai Science City

Keihanna Smart Community Project (2010.4-2015.3)
Mitsubishi Heavy Industries, Mitsubishi Electronics, Omron, Fuji Electronics etc.

JST CREST International Cooperation
"Ultimate Team"
JST CREST FS, International Cooperation (2013.8)

IST CREST Project (2012.10-2015.3)

The i-Energy WG endeavors to realize a smart community as a prosumer group, who carries out electricity management autonomously by introducing dispersed power sources, through R&D and demonstration based on industry-university collaboration.

Source: http://jscp.nepc.or.jp (2014.10.28)
In the WG, Kyoto University is in charge of the verification for informizing energy with the member companies. Informizing energy means to integrate a power grid as a social infrastructure in a physical real world with an information grid as a social infrastructure in a cyber network society for building a new super-distributed energy social infrastructure.

Source: http://www.i-energy.jp (2014.10.28)
It is a critical factor to build a new theoretical foundation and train researchers for realizing information-energy integrated network heading towards integration between a physical real world and a cyber network society in the field of energy management system. Kyoto University established the i-Energy Joint Research Chair in April 1, 2013.

Because 3 full-time teachers who participate in the joint research, a program-specific researcher, and 4 joint researchers dispatched from each member company belong to the chair securing an occupied space for itself, it is expected that the joint research can be implemented steadily and speedily with a clear vision of the final applications.
While bringing the initiative for smartification of the whole community into view, Kyoto University is assuming research, development, training areas in the verification field.

At present, when the project has completed the building of the infrastructure, and the acquisition and analysis of the data has commenced, the anticipated future issue to Kyoto University is the analysis and utilization of the large amount of data and experience for creating discipline about smartification. Especially, the efficient processing for building a theoretical foundation of energy informization will be required.

Kyoto University planes to establish a future theoretical hypothesis, verify the ideas of energy informization and simultaneously consider and verify technologies appealing to local users and operator companies during the project period.
Thank You!