

Japan: Sekisui Harmonate-town Shin-Kamagaya

BIODATA

PV community name:	Sekisui Harmonate-town Shin-Kamagaya
Kind of urban area:	Residential – urban
Main building type in community:	Houses - single houses
New/Retrofit/Added:	New district/community – building integration
Type of project:	Commercial project
Start of operation:	Year 2004
City, state, etc.:	Kamagaya, Chiba
Country:	Japan
Latitude:	N35 46' 32"
Longitude:	E139 59' 49"

PV SYSTEM CHATACTERISTICS

Total PV power:	90 kW
Number of houses/buildings:	29 houses
PV power per unit:	2,0 – 5,6 kW/house (averaged power: 3.1 kW/house)
Energy yield per year:	1 000 kWh/kW/year (calculated)
Main PV system type:	Grid-connected - demand side
Main PV application type:	Flat roof – mounted (13), Inclined roof – mounted (15) & Inclined roof – integrated: PV roof tile (1)
Main PV module type:	Framed regular module (28) & PV roof tile (1)
Main PV cell type:	Crystalline silicon – multi (13), Crystalline silicon – mono (15) & Amorphous silicon (1)
PV module manufacturer/brand:	Sharp corporation (28) & Kaneka corporation (1)
Inverter manufacturer/brand:	Sharp corporation (28) & Omron corporation (1)
Investment for PV systems:	500 000 JPY/kW

OWNERSHIP

Building owner:	Inhabitant
PV owner:	Inhabitant
PV energy user:	Inhabitant



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PV COMMUNITY DESCRIPTION

PV Community Brief

Sekisui Harmonate-town Shin-Kamagaya is located in the west of Chiba prefecture and is 40 minutes from the center of Tokyo. The area is 6 500 m² in total and consists of 29 house compartments. A concept of developing the area was 'A house living with sun & a town living with future' and all houses were equipped with PV systems.

Generally, an approach for symbiosis housing in the suburb is to have a green area in a large site and to build a house in a low building-to-land rate. However, because the site is an existing urban area near city center, to design a large compartment was difficult from an economical viewpoint. Therefore, to develop an urban-type symbiosis housing equipped with facilities for energy conservation and creation was decided. An effective utilization of building roof area was very important and to install PV systems on all houses was decided. The houses achieved the energy conservation standards for houses and were all-electric. Further, electric power lines were laid underground in the area. One of the important factors to realize and succeed the project was to obtain a positive support by the utility company.

Grid issue

There was concern for over-voltage phenomenon caused by a concentrated PV systems in a limited area. In addition, supplying electricity to the area where lots of all-electric houses would be constructed should be the most important issue for a utility company. Therefore, the electricity distribution line in the area, including countermeasures for the concentrated PV systems installation was designed and constructed by the utility company (the Tokyo Electric Power Company).

As a result, one transformer was set for two houses, e.g. two PV systems.

Urban planning and architectural issues

To begin with the project, compartments before building houses were sold with carrying option to build an all-electric house equipped with PV system. Then, each house was designed and built on the compartment according to users' (inhabitants') intention. Two kinds of the roof-type are there; one is inclined-roof and the other is flat-roof. In case of inclined-roof, PV modules were mounted in the angle of inclination of the roof. In case of flat-roof, PV modules were fixed with support structure in the angle of 10 degree because of an effective utilization of roof area. Also, because the electric power lines were laid underground, an open environment was created in the area.

Economic / financial issues

The PV system received a governmental subsidy, available through Japan's residential PV program. After starting operation, a net-metering scheme was applied so that surplus PV is traded between the inhabitant and the utility company, at the same price of the residential electric tariff.

For the all-electric house, electricity tariff structure is different than usual. The daytime rate is higher, while in nighttime the tariff is discounted. This means the value of the PV electricity from inhabitant to the utility company is higher.

Additional significant energy bill reductions resulted from energy conservation measures of high thermal insulation and high efficiency equipment.

Other remarks

In addition to thermal insulation performance satisfying the energy conservation standards, all-electric houses were standardized. Not only PV system but also a high-efficiency electric water heater, called "Eco-Cute", was equipped in all houses. These advanced facilities caused high price of the houses, however the added value of the houses and the community has highly-regarded property value.

As well as each inhabitant's environmental consciousness, it is expected the extensive consciousness and actions for environment as a community will be developed.

COMMUNITY INFORMATION

Project leader company: Sekisui Chemical Co., Ltd.

Other project company: -

Project's www: -

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