

## Japan: Hazama-so

### BIODATA

<b>PV community name:</b>	Hazama-so
<b>Kind of urban area:</b>	Residential – urban
<b>Main building type in community:</b>	Houses - multi-story apartment buildings
<b>New/Retrofit/Added:</b>	Retrofit - old area with new building
<b>Type of project:</b>	Commercial project
<b>Start of operation:</b>	Year 2000
<b>City, state, etc.:</b>	Nagoya, Aichi
<b>Country:</b>	Japan
<b>Latitude:</b>	N35 10' 26"
<b>Longitude:</b>	E136 58' 19"

### PV SYSTEM CHATACTERISTICS

<b>Total PV power:</b>	203 kW
<b>Number of houses/buildings:</b>	8 buildings
<b>PV power per unit:</b>	11 - 34 kW/building
<b>Energy yield per year:</b>	214 996 kWh/year (calculated)
<b>Main PV system type:</b>	Grid-connected - demand side
<b>Main PV application type:</b>	Flat roof – mounted & mechanical fixing
<b>Main PV module type:</b>	Framed regular module
<b>Main PV cell type:</b>	Crystalline silicon - multi
<b>PV module manufacturer/brand:</b>	Mitsubishi Electric corporation
<b>Inverter manufacturer/brand:</b>	Mitsubishi Electric corporation
<b>Investment for PV systems:</b>	-

### OWNERSHIP

<b>Building owner:</b>	Nagoya city government
<b>PV owner:</b>	Nagoya city government
<b>PV energy user:</b>	Nagoya city government



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## PV COMMUNITY DESCRIPTION

### PV Community Brief

Nagoya city is the fourth biggest city in Japan and with over 2 million inhabitants.

The city government is promoting the installation of PV systems on municipal dwelling houses in their environmental action plan. Hazama-so is one of the municipal dwelling houses (apartment buildings). Because the buildings were built in 1955 and 40 years old, it was decided to reconstruct the buildings in the mid- 90's. Afterward, according to their environmental action plan, it was decided to install PV systems onto the new buildings. The work of reconstruction started in 1998 and 8 new buildings, equipped with PV systems on the roof, were completed in 2000. Although a capacity of PV system of each building was different, 203kW of PV was installed in total.

The project to reconstruct the buildings with installing PV systems was approved as a symbiosis housing urban area development model project, which was applied to environmental-conscious housing construction project implemented by local public organizations.

### Grid issue

Wiring from PV systems is connected with a low-voltage circuit of the buildings and the electricity is supplied for common use such as corridor lights, lift, etc. To connect with the low-voltage circuit, 5kW inverters were used. The result was many inverters in a limited site and a maximum of 6 inverters were installed per building. To avoid negative influences against a grid network, an operation test on function of backflow operation was conducted in the presence of a utility company (Chubu Electric Power corporation) and it was recognized there would be no problems on the issue.

When the amount of PV system electricity over the demand of the common loads for the building, reverse power flow to the grid occurs. However, because dwelling units in the building demand electricity, the surplus electricity would be supplied for the dwelling units and not other grid customers. Therefore, an over-voltage phenomenon is not a concern.

Since starting operation, there are no PV system grid-connection problems.

### Urban planning and architectural issues

Since the decision to install PV system was after the development of the buildings' reconstruction plan, the domestic wiring design for the buildings was changed for PV system installation. BOS like inverters were put in a cubicle placed on the roof of the buildings.

PV arrays were mounted and mechanically-fixed to the roof. To maximize PV electric output, the inclination angle of the PV arrays was 20 degrees facing south.

### Economic / financial issues

Because the project was approved as a symbiosis housing urban area development model project, one-third of total project cost including PV systems was subsidized by the national government.

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.

### Other remarks

Besides the Hazama-so project, Nagoya city government is promoting to install PV systems onto other municipal dwelling houses (apartment buildings) and their activities for environmental protection are widely recognized.

Hazama-so is located in Chigusadai area in Nagoya city. A junior high school is there in Chigusadai area, also with a PV system.

## COMMUNITY INFORMATION

**Project leader company:** Nagoya city government

**Other project company:** Mitsubishi Electric corporation

**Project's www:** -

**Contact address:** -