



Toshima Ecomusee Town



Introduzione

Toshima Ecomusee Town combines regional government offices and high-rise high-density residential storeys. The project is part of a renovation programme of a Toshima city building led by Toshima ward. It is the first case of renovating a public building and achieves “no expense” for the city building construction through highly efficient utilization of the premises. In detail, the city hall functions are gathered in the lower level of the building, and residential storeys at higher levels were sold (partially provided to the former landowners). Income from the residential part was allocated for the city hall area construction. The scheme was proposed by Nihon Sekkei and subsequently adopted. Toshima city building is located near one of the largest terminal stations “Ikebukuro”, so it is very convenient for Toshima residents and users of facilities. For the project Kengo Kuma designed the façade and his image sketch shows the building enveloped by a veil. The veil is both decorative and conveys a green city image. It is named “ECO VEIL”. (Arch. Masao Kuroki, Nihon Sekkei Inc.) PV systems are integrated into the ECO VEIL, the roof and the balconies of the upper residential areas. At the design stage, experience with PV panel installation and results were gathered broadly from within the company and outside the company, before the design was finalized. During the construction stage, after close and frequent meetings with Taisei (General Contractor) and Asahi building-wall (Façade Contractor), the final design and construction method were specified.

Source: [Successful Building Integration of Photovoltaics – A Collection of International Projects](#)

Integrazione estetica

The City hall building is designed as a tree. The ECO VEIL which surrounds the building like leaves has various functions and has adopted a role as a new symbol representing Toshima ward. Panels and modules of the ECO VEIL separate the big building into a human scale and integrates the building into the town. The design of the external appearance responds to various trees along the “Green Road” between Ikebukuro station and the city building and continues the landscape of the town. “EcoMusee” provides a green city landscape with the ECO VEIL and reproduces “Toshima forest” on the roof terrace of the building.

Integrazione energetica

“Environmental city hall leading environmental measure” is symbol for Toshima ward’s goal of “development of an environmental city”. The building creates green-rich space for inhabitants and actively adopts environmental technology including photovoltaics, natural lighting, eco-lighting, water circulation system using rainwater harvesting, and a district heating and cooling system. As a result of these environmental efforts, the CO₂ emission of the city hall area is reduced by more than 30% compared to the former city hall. The total amount of installed PV power from the entire ECO VEIL is 57kWp and is sold through the FIT feed-in-tariff programme. The total installed PV power on the roof and balcony of the upper residential area is 77kWp and is consumed in the residential common area.

Integrazione tecnologica

Together with different kinds of panels (glass panes, wall greening, wooden louvres), the ECO VEIL adopts two type of PV technologies, monocrystalline silicon and amorphous silicon, for appealing diversity and excellent design. The amorphous silicon modules are used in the balcony balustrades as

they transmit light and do not disturb the view from inside.

Processo decisionale

The main reason for adopting BIPV is that the ECO VEIL, which is the main concept of the building, requires BIPV. Appreciation of one of the ECO VEIL functions, which is to publicize the environmental efforts of Toshima ward to its citizens, is another significant reason.

Lessons learnt

One of the challenges of BIPV is the payback time, but the motivation of the project is not the pay-back time but success of the ECO VEIL concept and public information about the city hall effort to inhabitants. A cost reduction evaluation was executed for critical areas and due to the cost estimation, the number of BIPV modules was reduced, but finally the project completed, keeping the original concept.

In this project, BIPV is a component of the ECO VEIL. More design conditions should have been clear. Under the given circumstances, the challenges of installing BIPV were hard to solve. BIPV which is installed close to visitors access to the roof garden, is efficient for advertising the environmental effort and also makes careful installation necessary in detail.

DATI EDIFICIO

Tipologia progetto	Nuova costruzione
Destinazione d'uso	Multifunzionale
Indirizzo edificio	2-45, Minami-Ikebukuro, Toshima-ku, Tokyo, Giappone

Sistemi BIPV

DATI SISTEMA BIPV

Sistema architettonico	facciata ventilata
Anno integrazione BIPV	2015
Active material	silicio monocristallino e amorfo
Trasparenza modulo	Semi-trasparente
Tecnologia modulo	Strati di vetro, FV riconoscibile, modulo customizzato
Potenza sistema [kWp]	133
Dimensioni modulo [mm]	varie
Orientamento moduli	sud, est, ovest
Inclinazione moduli [°]	varie

COSTI SISTEMA BIPV

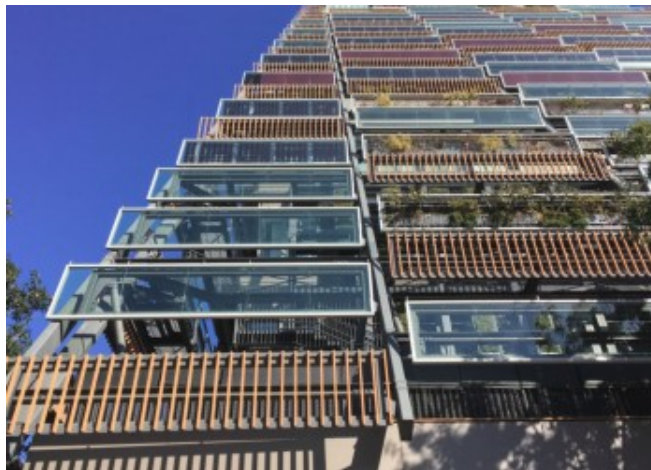
Stakeholders

Progettista principale

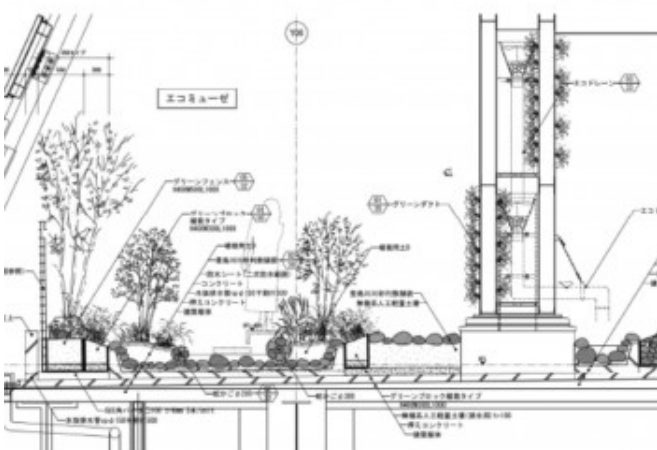
Arch. Kengo Kuma



BIPV on residential façade



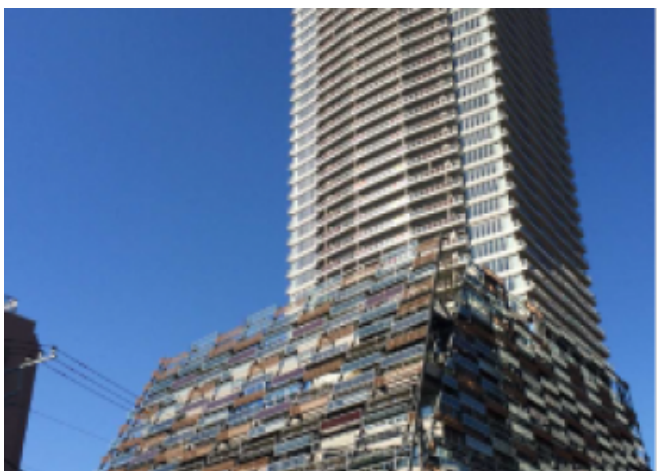
Variety of elements in the façade



Section of the building façade



Inside view of the BIPV balustrades



Autore caso studio:

Hisashi Ishii