Outline of Kashiwa-no-ha Smart City (Focusing on disaster prepared measures)
1. Kashiwa-no-ha Smart City

Transit Oriented Development
25 km from central Tokyo

30 minutes
by Tsukuba Express from Akihabara

Akihabara
Tokyo

Tsukuba Express

New Tokyo International Airport (Narita)

by car
41 min from Haneda
53 min from Narita

Kashiwa-no-ha Campus

2005  Tsukuba Express open
2009  Smart City project start
2011  Great East Japan Earthquake
2014  1st stage of the development completed
2. View of 1st Stage

Developed step by step

2005  Kashiwanoha Campus Station
2006  Shopping mall “LaLaport KASHIWANOHA”
2009  Condominiums “Ichibangai”
2011  Great East Japan Earthquake
2012  Condominiums “Nibangai”
2014  Shop & Office, Hotel & Residence “Gate Square”
2018  Child care generation support type rental apartment “Gate tower west”
3. Kashiwa-no-ha Urban Development Concepts

We work on social design with partners, that is, Developer, Local government, Universities and Citizens

- **Environmental-Symbiosis**: A city that is people and environment-friendly and fully disaster-prepared
- **Health and Longevity**: A city in which people of all ages can enjoy healthy and secure living
- **New Industry Creation**: Fostering growth fields that become sources of new vitality for Japan

Hitachi joined this project first.
4. Kashiwa-no-ha AEMS: Multiple Energy Sources

In Kashiwa-no-ha, systems for “energy creation”, “energy saving” and “storage of energy” have been implemented one by one, according to the step-by-step construction.

### Energy creation

<table>
<thead>
<tr>
<th>Item</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural energy</td>
<td>A,B</td>
</tr>
<tr>
<td>- Solar power generation</td>
<td>B</td>
</tr>
<tr>
<td>A: 500kW</td>
<td></td>
</tr>
<tr>
<td>- Solar water heating</td>
<td>B</td>
</tr>
<tr>
<td>- Use of geothermal heat</td>
<td>B</td>
</tr>
<tr>
<td>- Hot-spring heat</td>
<td>B</td>
</tr>
<tr>
<td>Unutilized energy</td>
<td>B</td>
</tr>
<tr>
<td>- Power generation by raw-garbage biogas</td>
<td></td>
</tr>
<tr>
<td>- Exhaust heat from co-generation</td>
<td>A,B</td>
</tr>
<tr>
<td>Emergency generation</td>
<td></td>
</tr>
<tr>
<td>A: heavy oil 1000kW</td>
<td></td>
</tr>
<tr>
<td>B: city gas/ heavy oil 2000kW</td>
<td></td>
</tr>
</tbody>
</table>

### Energy saving

<table>
<thead>
<tr>
<th>Item</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roof/wall greening</td>
<td>A,B</td>
</tr>
<tr>
<td>Energy monitor</td>
<td>B,C</td>
</tr>
<tr>
<td>Car sharing</td>
<td>B</td>
</tr>
</tbody>
</table>

### Storage of energy

<table>
<thead>
<tr>
<th>Item</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large storage battery</td>
<td>A,B</td>
</tr>
<tr>
<td>A: NAS 12.96MWh</td>
<td></td>
</tr>
<tr>
<td>B: Li-ion 3.8MWh</td>
<td></td>
</tr>
<tr>
<td>Ice-thermal-storage</td>
<td>A</td>
</tr>
<tr>
<td>EV battery</td>
<td>B</td>
</tr>
<tr>
<td>Sharing of EV cars</td>
<td></td>
</tr>
</tbody>
</table>

---

C: Residence

B: Shop & Office, Hotel & Residence “Gate Square”

A: Shopping Mall “Lala-Port”
5. Kashiwa-no-ha AEMS: Overall View

Kashiwa-no-ha Area Energy Management System (AEMS) can efficiently operate, monitor, and control energy across the entire region.

AEMS: Area Energy Management System
BEMS: Building Energy Management System
HEMS: Home Energy Management System
PV: Photovoltaic
6. Features of Kashiwa-no-ha AEMS

- **Maximum use of regional energy**
  - Promoting energy-saving activities of electric power, gas and other energy sources being consumed.
  - Optimizing energy usage by managing energy information.

- **Japan’s first area applying electrical interchange between blocks**
  - Coordinating electric power generated from renewable energy, batteries, and the power company.
  - Cutting peaks of electric power consumption of each block and reducing CO\textsubscript{2} emissions.

- **Continuation of “Blocks” energy functions in case of emergencies**
  - Keeping business and life running in case of emergencies such as natural disasters by emergency generators and renewable energy.
7. Waterfront Space (Retention Basin) “Aqua Terrace” (1)

- A waterfront space created by the large-scale transformation of a flood control reservoir
- With the aim of adding further vigor to the city by creating an interactive space for local citizens and workers

Source: kotobuki home page

Source: Urban Design Center Kashiwa-no-ha
The 2nd report: Japan’s first energy management system (Kashiwa-no-ha AEMS)

Wall greening (Lobby of Mitsui garden hotel at Kashiwa-no-ha)

Energy monitor at an office

WEBURL http://emira-t.jp/special/theme/3376/

Smart Center (Kashiwa-no-ha AEMS)

Signage for Energy monitoring

Li-ion battery
Mitsui Fudousan & UDCK has earned the LEED\textsuperscript{®} Neighborhood Development (LEED-ND) Platinum certification in Nov., 2016

The first Japanese project to receive the LEED-ND Platinum certification

Ranks among the largest LEED Platinum-certified projects in the world (42ha)

Major Merits

\begin{itemize}
  \item Urban development through public-private-academic partnership
  \item Smart location for creating a city that does not depend on automobiles
  \item Innovative initiatives unique to the Kashiwa-no-ha area
  \item Proximity to an ecologically sound park offering a rich natural environment
  \item Guidelines that require new buildings to provide a certain level of environmental performance
\end{itemize}

LEED\textsuperscript{®}—an acronym for Leadership in Energy and Environmental Design™—is a registered trademark of the U.S. Green Building Council\textsuperscript{®}.

UDCK: Urban Design Center Kashiwa-no-ha

Source: Mitsui Fudousan

Future Plan (Certificated Area)
HITACHI
Inspire the Next