

SMART CITIES, BIG FUTURES

As it intelligently maps out the future of urban areas, Panasonic is integrating clean and sustainable solutions into entire smart towns

As CO₂ emissions become an increasingly urgent global problem, clean energy solutions are experiencing a boom. Global investment in the clean energy sector in 2010 is estimated at \$250 billion, representing a 630 percent advance since 2003 (excluding R&D spending). But according to the World Economic Forum report "Green Investing 2009," produced in conjunction with Bloomberg New Energy Finance, this is still only 50 percent of the investment needed to limit global warming to acceptable levels by 2020 without compromising economic growth.

Currently, two-thirds of CO₂ emissions emanate from urban areas, home to the majority of the world's population. The idea of new "smart cities," which seek to implement energy management on a citywide scale, is taking root globally. In China alone, plans call for more than 100 such new smart communities, and according to some observers, by 2020 China may lead the pack in terms of having the smartest energy system in the world. (China's growth in renewable energy more than doubled between 2005 and 2010.)

Panasonic's global strategy for smart cities

Panasonic Corp., which will celebrate its centenary in 2018, is an active participant in the clean energy evolution that is sweeping the world. Haruyuki Ishio, Director of Panasonic's Corporate Division for Promoting Energy Solution Business, says that the company is playing a key role in the design and planning of projects in Dalian and the Sino-Singapore Tianjin Eco-city, both taking place in China. Panasonic is also participating in the Punggol project in Singapore, the Indian Delhi-Mumbai Industrial Corridor (DMIC) project, and projects in Japan, such as the Yokohama Smart City and Fujisawa Sustainable Smart Town (SST). The Punggol project is being undertaken in conjunction with three Singaporean government agencies and will provide energy savings for 10,000 households using technology at which Panasonic excels, such as retrofitting older apartment buildings with PV panels and storage battery systems, Panasonic's SEG (Smart Energy Gateway) systems and air-conditioning controls. Singapore eventually intends 900,000 households to be so modernized.

Ishio makes the point that energy storage and energy saving must play their part along with energy creation to implement

true energy management solutions that join appliances, homes and buildings together in a network, resulting in greater efficiency. Panasonic's home-appliance lineup allows full integration of everyday living with energy management systems through networked interfaces. Intelligent energy utility strategies, such as demand response and peak shifting, are possible with this technology, providing a comfortable and economical lifestyle for end users.

Older cities around Europe are also undergoing smart retrofits, making cities more energy-efficient and greener. In Amsterdam, for example, joint investment by municipal authorities, energy companies and other private firms could exceed \$1 billion over the three years ending in 2012, including \$383 million spent on energy monitoring and sensors (a "smart grid" system), and \$255 million spent by local housing cooperatives to improve overall household energy efficiency. Ali Izadi-Najafabadi, of Bloomberg New Energy Finance, rates Amsterdam as one of the "smarter" cities in the world as a result of these moves.

An ambitious planned eco-city in Portugal, PlanIT Valley, is using innovative sensor and software technology (including sensor technology originally developed

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PANASONIC'S SMART CITY SOLUTIONS AROUND THE WORLD



for Formula 1 motor racing) to develop and provide a new range of services and building techniques, for a truly innovative approach to city planning.

Ishio says that something to keep in mind about these new developments is that a single standard approach to creating a smart city does not work for all regions or conditions, unlike, for example, a global standard for TV sets. Differences in infrastructure architecture, climate, geography and governmental attitudes (not to mention those of the end users and general public) all make a unique solution necessary for each country in which a smart city is planned.

The keys to a successful smart city

Increased environmental awareness by consumers is one of the key factors in the growth of smart cities in many countries, and Ronald Stehle of IFA, the world's largest consumer electronics and home appliance show, held in Berlin, confirms this. "Energy efficiency has been on the top of the agenda for many years, and this is still one of the main topics in the home appliance industry," says Stehle. In many markets, ecological friendliness is a major sales point for products, as can be shown by the increased promotion at IFA of energy-saving and -management appliances, which constitute essential ingredients of smart cities, by global manufacturers such as Siemens, Philips and Samsung.

At IFA 2011, Panasonic also displayed its commitment to such consumer preferences by presenting its vision for an eco-friendly future, emphasizing developments such as HEMS (Home Energy Management System) and its Li-ion battery storage technology; PV panels (Panasonic's advanced HIT PV panels are available to U.K. homeowners at an advantageous rate or even free, through

an arrangement with U.K. energy company British Gas); and heat pumps, all demonstrating its commitment to global CO₂ reduction. Also on display were Panasonic's full range of energy-frugal home appliances and devices, and fuel cells—home generators of electricity and heat (hot water). Panasonic plans to introduce its fuel cells to the European market in a few years; in July the company set up a Fuel Cell Development Office for Europe in Langen, Germany.

Another key that leads to the success of smart cities around the world is the attitude of the governments worldwide that are increasingly keen to promote clean energy production and smart energy management. Governmental cooperation can come in the form of both carrots and sticks—subsidies, tax incentives and feed-in tariffs, etc., and emission and consumption caps. The U.S. Department of Energy's National Renewable Energy Lab estimates that 75 percent of PV deployments and 45 percent of wind projects globally have been motivated by feed-in tariffs, which provide stable returns on investment.

A final ingredient for success is noted by Ishio, who points out that developing a smart city is about more than just energy management. He adds that such a community must provide what he describes as a "comfortable lifestyle" for its residents, offer compelling reasons to live there and develop along a "positive feedback" path, whereby industry and business are encouraged to come to the area. The latter attracts more residents, which attracts more business, and so on. Such communities are fully sustainable, as demonstrated by Panasonic's plans for the Fujisawa Sustainable Smart Town (SST) project in Japan, announced in May of this year, and highlighted below.

Fujisawa SST

Panasonic has already started to break ground on this project. In conjunction with eight other major commercial partners and the Fujisawa City government, Panasonic is transforming an abandoned factory site into an SST. The town is planned to open before March 2014, and will cover an area of approximately 19 hectares (47 acres), with about 1,000 households. Commercial and public facilities will be provided for the approximately 3,000 inhabitants, with the community planned to reach completion in 2018.

Panasonic believes it is important to provide the residents of smart cities with solutions that allow comfortable lifestyles and incorporate sustainability and harmony with nature. Panasonic's Teruhisa Noro, Director, Corporate Division for Promoting Systems & Equipment Business, points out that Panasonic is more than just a manufacturer—the company is also a provider of services to the residents, and the creator of the sustainable smart town concept. Noro feels that these additional facets are important ones for Panasonic. The eco-friendly sustainable town plan maximizes the use of sunlight and wind to produce a green environment in harmony with nature, making for a desirable domicile, and integrates an advanced "Ecology Network" to create a comfortable lifestyle for its residents that can be maintained over several generations. The town can be described as "smart" in the sense that it decentralizes the energy system (photovoltaic panels and storage batteries in each home—a world first), and provides additional services such as mobility, security, health care, full community platforms and portals for the residents. As such, it acts as a showcase for the concept of "next-generation smart living."



Teruhisa Noro, Director,
Panasonic Corporate
Division for Promoting
Systems and Equipment
Business

Noro expresses his pride in the potential offered by Panasonic's uniquely wide product range, including ICT equipment and home appliances that can be integrated with the company's energy management products in Panasonic's "smart houses." This creates a total energy management solutions system, not only for the houses, but extending to the entire town, allowing smart-city residents to create, store and save energy safely and with peace of mind.

Comprehensive solutions for the whole town

By integrating solar power and storage battery systems, the goal of the Fujisawa SST is to reduce CO₂ emissions by 70 percent from 1990 levels (individual houses aim to be completely carbon-neutral), and water consumption by 30 percent. Panasonic's comprehensive solutions for an entire house, entire housing complex and entire facilities (stores and public facilities) will be applied to the entire Fujisawa SST, combining Panasonic's energy creation, storage and saving technologies to create a total energy management system. Energy and information networks are integrated in the project from the start, thereby providing optimal control.

Each dwelling in the Fujisawa SST will be designed to include Panasonic's SEG (Smart Energy Gateway) systems. This networked home system provides a total energy management solution, with display devices that allow residents to monitor and control the energy saved by the energy-efficient devices installed in the house, the energy created by PV panels and fuel cells, and the energy stored by the batteries, according to the changing needs of the household. Each SEG system also communicates through a decentralized cloud system with other dwellings' SEG systems.

From Fujisawa to the world

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Beyond Singapore, Tianjin and Dalian, Panasonic is already involved in other projects globally that can use this expertise and know-how. Noro feels confident that Panasonic's comprehensive solutions will find more applications in similar projects worldwide as the need for sustainable smart cities and towns on the Fujisawa model continues to grow. —Hugh Ashton

For more information,
http://news.panasonic.net/archives/2011/0526_5407.html
http://panasonic.net/green_innovation/



Sustainable Smart Town
Fujisawa SST



A computer rendering shows what the Fujisawa SST might look like.

FUJISAWA SUSTAINABLE SMART TOWN CONCEPT

<p>SMART TOWN Realization of Green Life Innovation: Creating a town that conveys next-generation smart living to the whole world</p> <p>Energy The world's first decentralized smart town that has photovoltaic panels and storage batteries in each home</p> <p>Mobility Next-generation car-sharing systems for the entire town, contributing to the achievement of a low-carbon community</p> <p>Security An environmentally friendly and safe town being unobtrusively monitored</p>	<p>SUSTAINABLE TOWN Over the coming decades, Panasonic will create sustainable towns that offer "leading-edge ecological innovations" and "comfortable lifestyles"</p> <p>Smart Landscapes Integration of equipment and devices to produce landscapes at one with nature</p> <p>Networking Creating a community linked by an "Ecology Network"</p> <p>Town Brand Creating an ecologically friendly and comfortable town maintaining high real estate values</p>
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ENVIRONMENTAL TARGETS EMPHASIZING CO₂ REDUCTIONS

- Global warming prevention:** Reducing CO₂ emissions by 70%
- Water conservation:** Reducing household water consumption by 30%
- Biodiversity promotion:** Creating wind and green networks