

GreenPulse

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A BIOPHILIC
DESIGN

YANMAR
HEADQUARTERS-
OSAKA , JAPAN

Bershka

INSIDE

GreenPulse

VOLUME: 2

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4

COVER STORY



A BIOPHILIC
DESIGN

YANMAR
HEADQUARTERS-
OSAKA , JAPAN

08

FACE TO FACE



Andrea
Reimer

Councillor of
Vancouver City

12

SPECIAL REPORT



Herb in
a cup

Gardening
Initiative by
Urban Gardener

14

SPECIAL FEATURE



Conergy
Announces
Its First Solar
Farm In
Vietnam

16

PRODUCTS

19

EVENTS

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ENVIRONMENTAL FEATURES

COLOR

The bright red Color is used on each door as a focal point for wayfinding and in key locations such as the naturally ventilated (Air) eco-cylinder stair and elevator. Inside the building, people are drawn to the water relaxation room, which serves as a transitional space from the noisy urban environment to the much quieter office. Daylight and filtered and direct sunlight are used strategically to support human spirit and performance as well as reduce energy





loads. The Green Façade serves multiple functions from reducing urban heat island effect to filtering direct sunlight, enhancing views and vistas and providing flowering plants which attract the honey bees and butterflies. The Habitat and Ecosystem of the honey bee garden provides a natural setting for enjoying lunch or break-time in the café.

NATURAL SHAPES AND FORMS

SHELLS AND SPIRALS

Shells and Spirals are represented in the gentle Fibonacci-like stair form as well as the actual beehives. Honeycomb shaped café cubicles and lighting tracks reinforce this connection to the living bee habitat. Other tubular forms can be found in circular light fixtures and elliptical exterior shading devices.

SHAPES RESISTING STRAIGHT LINES AND RIGHT ANGLES

Much of the buildings layout—even its very shape Resists Right Angles. The sloping walls of the Water relaxation room facilitate the waterfall effect, but also bring a coziness to the space.

BIOMORPHY

The buildings Biomorphy is inspired by the cherry blossom leaf and the body and wings of the dragonfly. It also resembles the bow of a boat, which is sitting because when Yanmar was a young company, they sold boat motors directly to small-town fisherman.

NATURAL PATTERNS AND PROCESSES

SENSORY VARIABILITY

Sensory Variability occurs in several forms—the eco-cylinder (spiral) “communication” stair is naturally ventilated and day lit from the





top—air movement can be felt and heard in the spring and autumn seasons. Daylight is controlled in several ways, depending on the façade direction, and provides variation in light filtration and color. Bees can be seen and heard buzzing by when visiting the rooftop “showroom”, which overlooks the open air bee garden. And the smell and taste of seasonal food, from all across Japan, provides enjoyment every day to more than half the employees who eat there regularly.

TRANSITIONAL SPACES

The water relaxation room is an excellent example of a Transitional Space (between city and office).

LINKED SERIES AND CHAINS

The eco-cylinder stair, designed to encourage communication between staff, is an example of Linked Series and Chains (enticing mystery and connection) and a form of hierarchically organized ratios and scales with its spiral, Fibonacci form.

LIGHT AND SPACE

FILTERED AND DIFFUSED LIGHT

Filtered and Diffuse Light can be seen near the glazing behind the Green Façade and the exterior shading louvers. The top-lit eco-cylinder stair takes on a Fibonacci form (Space as Shape and Form) when viewed from the top or bottom and provides daylight to the center of the office core. Even the toilet rooms and elevator lobbies (with a glass elevator shaft) are daylit.

LIGHT AS SHAPE AND FORM

Yanmar headquarters is filled with Natural Light. The challenge is to balance daylight with visual and thermal comfort, and energy performance. There are examples of Reflected Light, Light Pools, Light and Shadow and Warm Light in various spaces of the building.

INSIDE-OUTSIDE SPACES

Open to the sky, the 8-meter diameter bee habitat is a great example of an Inside-Outside Space. Another example is the water relaxation room—this space is between the bustling urban street and the calm interior building core.

PLACE-BASED RELATIONSHIPS

ECOLOGICAL CONNECTION TO PLACE

The Yanmar building design evolved from its Ecological Connection to Place. The idea of building biodiversity through urban ecology stretches from the street, climbing up the Green Façade, all the way into the building in the honey bee habitat.

LANDSCAPE ORIENTATION

The Landscape Orientation—specifically the daylighting, shading and urban wind and prevailing sea breezes captured for natural ventilation.

LANDSCAPE ECOLOGY

The Landscape Ecology of the street trees and plantings, the green façade and the bee habitat were all selected to attract and support urban birds and insects (butterflies and bees)—creating a 3-dimensional urban bio-corridor.

SPIRIT OF PLACE

Japanese designers have a strong sense of Spirit of Place. Nearly all projects include historical references from plantings to gathering places or design elements. Companies always feel the responsibility for long-term stewardship and with Yanmar's 105-year history in this area, they are honoring this commitment through improving the urban biodiversity of Land, Sea and Urban Ecology.

EVOLVED HUMAN NATURE RELATIONSHIPS

PROSPECT AND REFUGE

Refuge is provided in the water relaxation room and relaxation corner on each floor. Prospect is in the purposefully open office areas—with distant red colored accents used for wayfinding.

CURIOSITY AND ENTICEMENT

Curiosity and Enticement and Exploration and Discovery are embodied in the bee garden habitat. Hundreds of elementary students have visited the honey bee habitat each year and learned about the connections between nature-farm and farm-food as part of the honeybee story.

SECURITY AND PROTECTION

The most threatening force of nature in Japan is earthquakes. Japan experiences 3 earthquakes per day, on average, and Security and Protection are essential. Yanmar implemented state-of-the-art seismic isolation and business continuity functions including several days' energy supply, natural ventilation, and water.

REVERENCE AND SPIRITUALITY

Yanmar has a profound reverence for life--their mission: sustainability of people, food, and energy says it all. Yanmar headquarters will transcend generations because of its careful integration of people, place and urban ecology.





Interview with
Councillor

*Andrea
Reimer*

Tell us about your current role as Councillor in the Vancouver City Council.



I was first elected to city council in 2008, and then re-elected in 2011 and 2014. We are elected to serve the whole city of Vancouver so we have the whole city to think about in our work. And we also get portfolios (projects) from the mayor's office if we're in the majority party. So I have quite portfolios but the three that might be most interesting would be – greenest city, renewable energy and energy generally, and economic development and innovation economy (i.e. digital technology, clean technology).

What made you get interested in working on environmental issues?



That's a really long story. The broad thing I would say is that originally I was much more interested in social issues and making sure people, particularly people who lived on low incomes or who didn't have access to the kind of resources that other people

have, had access to housing, education, transportation and jobs.

But the more I worked on those issues, the more that I saw that people living in environments that were impoverished couldn't protect themselves from environmental degradation and that the more there was a divide between the rich and poor, the worse the impacts on the environment and faster the people who were poor had worse and worse outcomes for their families. So I decided it was important for me to think about the people but also about the environment they were in.

Could you tell us more about the greenest city action plan? How is it helping the city of Vancouver?



The greenest city action plan came out of one of 4 big goals we committed to when we were first elected in 2008. At that time the commitment was to be the greenest city in the world by the year 2020. So it was a huge commitment to make. And Vancouver and Canadians generally don't have a culture of making big commitments. So at the time it was a very new kind of concept.

By beginning February 2009 the greenest city action team was established, along with a framework that said that we wanted them to come out with metrics in 10 key areas. It was important for us to be able to see the goals we had to get to for the public to be able to track our progress and for us to be accountable to the goals. So they set 17 metrics in those areas.

From there we went to the public, shared these goals and asked them how we could towards achieving them. We brought in academics, business groups, labour unions, faith communities, youth groups, seniors groups, everybody and anybody who wanted to participate. Because only way it was going to be successful was if people had bought into the 'how' of the plan as they were going to be involved in that.

The greenest city action plan has brought about massive positive change. There is positive change on the actions (i.e. Active transportation has increased so now more than half of Vancouver rides, walks, cycles or takes transit everyday). And that has positively impacted the environment – lower GHG, less waste, lower water use

and more food assets. And we also see a positive social impact. People are walking more or they are urban farming, so they end up spending more time with each other, connecting and learning more about each other. Communities are breaking social barriers and becoming closer.

And the other way it has helped the city is by changing our perspective. We now see that we can have this big goal and everyone can work together to achieve this shared aspiration. And that has impacts in not just in greening Vancouver, but other big goals as well.

Vancouver is on its way to being the greenest city in the world. What does being the 'greenest city' mean to you?



Our vision of a greenest city has been translated to the 10 environmental policy areas that we have set. These include climate, buildings, transportation, access to nature, green jobs, availability of local food, clean water and etcetera. We really wanted to make sure a green city was not just about the climate, because the climate definitely important but that's not the only thing.

Tell us something about Vision Vancouver.



In Vancouver we have to run for the entire city because we don't have a smaller wards, so people tend to work together across political parties. The city level political parties are different from political parties that are at the national or state level. In fact its not considered positive to have the same party at all levels because cities have often different interests than the provincial and federal governments and you need to be able to advocate to the provincial/ federal government for your needs without feeling like your hampered by members of your party and people feeling bad about your advocacy.

Vision Vancouver is a local civic political party in Vancouver. All of our members and us are excited about cities and are excited to have Mayor Gregor Robertson, myself and our team, who are very focused on how Vancouver can be a globally significant and competitive city.

What are the lessons other cities can learn from Vancouver?



Look at the actions we have taken – setting up the 10 policy areas, 17 metrics and 100s of initiatives to meet these metrics. Each of those can have different lesson for other cities. Not all of these lessons are transferable because it is a lot about context. So for example, the way we have reduced the number of cars in Vancouver is very specific to our built form and culture. You can't necessarily take those lessons to a city like Houston or Paris because they are such different cities in terms of both the culture and urban planning. However, transferable lessons would be how we got people to go from putting all the waste in one bin to diverting their waste (recycling). Vancouver is now almost at 70% diversion.

The process is the most important lesson to take away. The process has four critical ingredients:

- i. A leader (i.e. Mayor) – to show that they are fully invested in the goal and their success can be judged based on this.
- ii. Having a plan – with clear targets and metrics that the public can hold you accountable to, and for the whole organisation to understand what they are working towards. 'Some is not a number, soon is not a time' – a philosophy that helps any government to ensure they have clear metrics and clear timelines for reaching them.
- iii. Action – be prepared to act even if it means failing because failing is important to demonstrate to yourself that you are pushing the edges on what you are trying to do and to also learn. Many cities have leaders and plans but they don't necessarily have action.
- iv. Partnership – to work together to achieve the goals. We have over 200 institutional partners, thousands of individual partnerships to meet our goals.

Is it difficult to balance economic progress and sustainability in city planning?



Not at all. There has been a huge impact on our economy from our greenest city initiative and all of it has been positive. Despite the rest of Canada's economy slowing down because of its over reliance on non-green industries, particularly oil

and gas, Vancouver's economy is moving at rates that is similar to other countries in the developing world that have very high growth economies and that's all based on green jobs and the concept of a clean green economy.

However, there are still the challenges of transitioning industries within the economy.

For example the people in the waste industry see a shift in job scope. With waste diversion, the industry has become more labour intensive than the previous material recovery. So there some impacts to the system that you have to plan for and we have an economic commission who's jobs is both to plan for that and ensure as much as possible it is a positive transition.

Do you have any advice for industry students and building users?



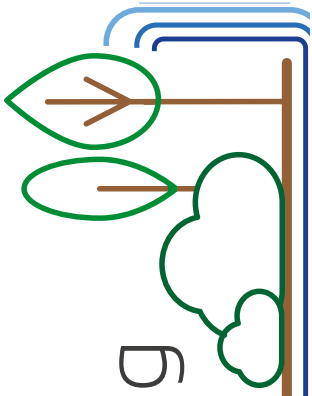
Everything I've said so far. Have leaders leading to be a leader but also demand/ensure the leaders you have are showing leadership positions on issues. Planning is huge but what should be in the plan? Set the boldest goal you can. Think of a goal that is big, bold, exciting and aspirational that you can pull people into. Because once you have that framework, you're actions will be bigger than your expectations. It is more than just wanting to be something better. Doing better is important but being the best is something that humans can rally behind.

In terms of students and building users, you'd be surprised how significant action is. So just act because once you do you'll be amazed at how much you can ripple through the people and institutions around you to create change.



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HERB IN A CUP

GARDENING INITIATIVE BY URBAN GARDENER



Herb in a cup is a learning and educational platform that features and promotes Herb in a cup classes, building commercially edible food forests, earth-worm composting kits, oyster mushroom grow kits, organic fertilizer brews, and other supplies.

The objective of Herb in a cup is to promote and address environmental challenges through the different spheres with the objective of addressing climate change at a local consumer level. This model below demonstrates the workflow of spheres that promote the Herb in a cup sustainability model. This model allows for anyone to adopt and embrace a culture of sustainable, living, and that climate change is within you.

Balan Gopal, fitness trainer and father of two, has more than 200 herbs growing on the corridor of

his HDB floor. His lush herb collection is a labour of love—two years worth of curious adventures and hard work. Social entrepreneur Balan Gopal is passionate about taking on environmental challenges in this ever-changing landscape of life.

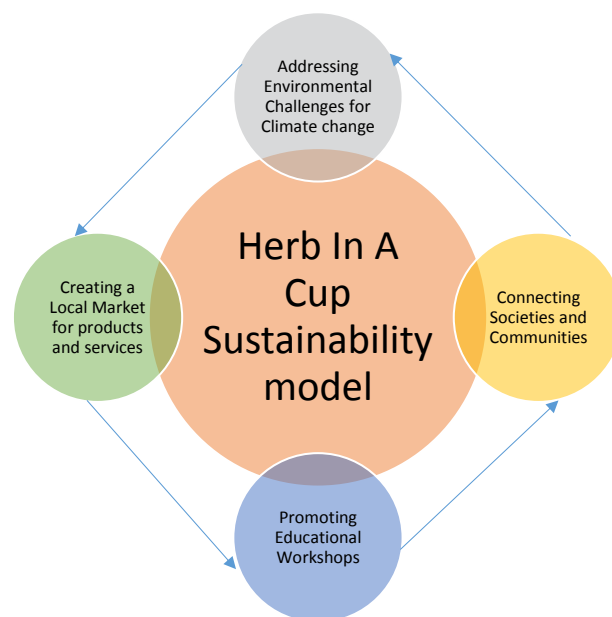
Being self-taught, Balan sees opportunity and possibility where others do not, with an immense passion to learn, apply and teach to quench his thirst of curiosity.

His myriad of interests - from personal fitness and mind training to the effective recycling of organic matter and growing his own food - has encouraged him to pursue social enterprise projects such as building urban aesthetic food forests in confined spaces and providing employment and 'paying-it-forward' meals by recycling used bottles into decorative lamps.

Balan believes that education and the application of eco-projects provide vital solutions to the challenges in today's landscape. His mission statement is to make Singapore a true 'green' food paradise with a focus on healthy and mindful living.

Oyster Mushroom Kits :

Balan recently took part in Green In Future's facebook contest to provide ideas on reducing environmental impact and he won first prize for his idea for



reducing waste and recycling it.

He collected used coffee and sugar cane stems from local stalls and used them as a base to grow oyster mushrooms. Each bag... our landfills. The best part of this...the same time, and what's left in the bag that did not become oyster mushrooms cab be used as a soil enhancer or compost.

Use waste material, like coffee grounds. Mix them with the compost because it takes a while before it breaks down and blends into the soil to become nutrients for the plants. He uses coffee grounds mixed with discarded sugar cane stems to grow oyster mushrooms.



Conergy Announces Its First Solar Farm In Vietnam



Conergy, Southeast Asia's leading downstream solar specialist, today announced their selection as the EPC contractor for a 30 MWp solar photovoltaic (PV) power project in the south central coastal region of Vietnam, representing the first phase of a 300-MW clean energy pipeline. Local government officials, Conergy executives and investors held a ground-breaking ceremony for 80 guests.

The solar plant, planned for nearly 400,000 square meters, will be located in NinhThuan province and is being built by Conergy on behalf of investment firms from Vietnam and the Philippines.

The project investors include the BIM Group, headquartered in Vietnam and AC Energy from the Philippines.

The BIM Group is a leading diversified corporation in Vietnam, successfully establishing its mark in four main business fields namely: Tourism Development & Real Estate Investment, Agriculture – Food,

Commercial Services and Renewable Energy.

AC Energy is the Ayala Group's business arm in the energy sector, with investments in renewable energy and conventional power plants. AC Energy is one of the fastest growing regional energy platforms with development, operations and retail supply capabilities. Ayala is one of the largest conglomerates in the Philippines with a diverse portfolio of businesses and transforming industries since 1834.

Construction on the plant will commence in April 2018 and is scheduled to be connected to Vietnam's power grid in December of 2018. NinhThuan is Vietnam's most arid province, making it a strategic location for solar farm developments.

Speaking at the ground breaking, Conergy COO Marc Lohoff said, "We are delighted to announce our selection as EPC contractor for yet another large solar project in the ASEAN region, and more importantly, our first project in Vietnam. We would

like to thank and congratulate the Government of Vietnam, the people of the province on NinhThuan, local authorities in NinhThuan province and our clients for the development of this solar farm, which will help to provide some of the energy needed to fuel Vietnam's successful development in the years ahead." BIM Group and AC Energy emphasize that a key pillar of their strategy is the development of clean energy generation from solar sources to balance carbon emissions from fossil fuel based generation while contributing towards energy security of Vietnam.

BIM Group and AC Energy executives chose to partner with Conergy based upon the company's high performance PV solutions, high quality standards and proven track record of building commercially successful solar farms in neighboring countries. AC Energy has already tapped Conergy to build a number of solar farms in the Philippines, and is planning further developments in the ASEAN region in 2018 and beyond.

Mr. Doan Quoc Viet, Chairman of BIM Group, stated that this investment will help Vietnam meet the country's growing needs for energy and simultaneously address the impacts of climate change, which are affecting Vietnam. The project marks a milestone in the drive to grow Vietnam's portfolio of clean and renewable energy generation.

"Our ambition is for this project to represent a springboard to the solar energy era in Vietnam," said Mr. Viet. "This project will help Vietnam to prosper economically without sacrificing the environment. It is one of Vietnam's most sustainable energy projects, and we are very excited to complete the project later this year and start generating clean energy."

The NinhThuan solar farm is one of dozens of similar projects that Conergy has executed in the ASEAN region. AC Energy has partnered with Conergy on solar farms in the Philippines, and executives said they were very encouraged by the policy environment in Vietnam, and the potential for future solar developments. The NinhThuan solar farm is expected to generate 50,464 MWh of clean electricity per year and save approximately 21,629 tons of carbon dioxide (CO²) emissions. But AC Energy executives said this is just the start of what they can achieve in Vietnam.

"AC Energy is very keen to participate in the fast-

growing Vietnam power sector, with pioneering investments in renewable energy. We are delighted to partner with BIM group, which has a significant presence in NinhThuan province, which in turn has among the best solar irradiance in the country", said AC Energy CEO Eric Francia.

Conergy has 20 years of experience in the development, engineering and maintenance of photovoltaic systems and the company has installed over 300 solar plants in Europe, America, Middle East and Asia with a capacity of more than 2 gigawatts. In NinhThuan, Conergy is leading the overall planning, engineering, design as well as the component supply for the power plant and is collaborating with a Vietnamese partner for the PV plant installation.

Given Vietnam's economic strength and emergence as a manufacturing hub, the demand for greater power and energy resources is predicted to more than double by 2025. However, while Vietnam still lags behind its neighboring countries in power reliability, the country has excellent conditions for solar PV both environmentally and from a policy standpoint. Vietnam's National Master Plan clearly outlines the need for extra energy capacity and the revised plans also emphasize the importance of renewable energy sources.

"The development of solar energy in the country is very encouraging and it's exciting to consider the potential impact solar investors can make in Vietnam," added Hendrik Bohne, Conergy's VP for EPC - APAC. "AC Energy and the BIM Group are behind what will one day be a showcase project in Vietnam's renewable portfolio. Today's ground-breaking marks only the beginning of many more great days ahead for Vietnam and the environment."

The Vietnamese solar market represents an exciting growth potential (12,000 MW by 2030) and receives technical support for its overall development from the German development cooperation GIZ on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). In the context of the cooperation between Conergy and the BIM Group, GIZ Vietnam supported both parties within the framework of the Project Development Programme (PDP) on behalf of the German Federal Ministry for Economy Affairs and Energy (BMWi) to ensure high quality project implementation.

New fine dust sensor to monitor indoor climate from Siemens Building Technologies

Laser-based monitoring of particle pollution in buildings. New addition to sensor range to ensure healthy indoor climate, increased sensor life and easy module replacement

The Siemens Building Technologies Division introduced a new fine dust sensor for buildings, rounding out its product offering for a healthy indoor climate. The sensor can be used to monitor and visualize particle pollution and is easy to integrate into building management systems.

The picture shows the Symaro fine dust sensor from Siemens.

When the sensor module needs to be replaced, the device alerts users either on the display itself or, on models without a display, through an LED light.

The new fine dust sensor is based on laser technology and measures the particle pollution of the air in two categories: PM 2.5 and PM 10, i.e. particulate matter with a diameter of 0.3 to 2.5 micrometers or 0.3 to 10 micrometers respectively. The new fine dust sensor is targeted for use in office and high-end residential buildings.

During operation, dust particles accumulate on fine dust sensors, reducing their performance over time. The Siemens sensor has a display that is activated only when the presence of people is detected. When no presence is detected in the room, the frequency of particulate matter measurements decreases, significantly improving the service life of the fine dust sensor. When the sensor module needs to be replaced, the device alerts users either on the display itself or, on models without a display, through an LED light. It is not necessary to buy a new device or reconfigure it. Replacing the sensor module is quick and easy and does not require any special skills.



The fine dust sensor has been calibrated to measure PM 2.5 particles and can be set to different air quality index (AQI) levels to meet specific national regulations. Laser light scattering is used to measure the particulate concentration. The user interface of the device can be displayed in German, English, French and Chinese.

The fine dust sensor is the latest addition to Siemens' offering for a healthy indoor climate. Carbon dioxide (CO₂) sensors help reduce the CO₂ concentration of the ambient air and, conversely, increase the oxygen (O₂) concentration in order to improve employee productivity. Effective temperature and humidity control decreases the risk of illnesses such as respiratory tract infections and influenza. Volatile organic compound (VOC) sensors are used to measure the harmful outgassing originating from building materials and items such as carpets and furniture. All sensors have analog signal and Modbus outputs,

allowing them to be connected to Siemens heating, ventilation and air conditioning controls such as Climatix and Desigo Room Automation as well as integrated into building management systems such as Desigo CC. To achieve the desired indoor climate, the system can activate additional filters or increase the ventilation power.

Particulate matter is inhaled through the respiratory tract and can cause lung cancer and cardiovascular diseases. People spend about 90% of their lives in buildings. For this reason, minimizing particle pollution in the ambient air is a crucial factor in protecting the health of employees. Particle pollution is a global issue; countries such as China, India and the Middle East as well as urban centers worldwide are especially at risk.

Applications for 2018 Momentum for Change Awards Now Open!

Submit Your Climate Solution and be Celebrated at the UN Climate Change Conference in Katowice, Poland.

Organizations, cities, industries, governments and other key players that are taking the lead on tackling climate change can nominate their game-changing projects for a United Nations award.

The United Nations Climate Change secretariat opened the call for applications for the 2018 Momentum for Change Awards today to showcase action and ambition as national governments work toward implementing the Paris Agreement, the Marrakech Partnership for Global Climate Action, and the Sustainable Development Goals.

Selected initiatives, called 'Lighthouse Activities,' shine a light on innovative, scalable and replicable examples of what people are doing to address climate change, in the hope of inspiring others to act. The winning activities will be recognized and celebrated during a series of special events to showcase global climate action in December at the UN Climate Change Conference in Katowice, Poland (COP 24).

"The Marrakech Partnership for Global Climate Action was launched to highlight climate action already underway around the world, and to spur governments, businesses and other key players to go further, faster together," said Nick Nuttall, UN Climate Change Spokesperson. "The Momentum for Change Lighthouse Activities provide visibility and recognition to this wealth of real-world implementation by governments and business to cities, communities and civil society."

"It is time for the whole world to raise ambition under the Paris Climate Change Agreement and the Sustainable Development Goals—our awards show it is already happening while offering inspiration to others to take the next big steps to a better future," he added.

The 2018 Momentum for Change Lighthouse Activities will recognize climate action that is already achieving real results in four categories:

Women for Results: recognizing the critical leadership and participation of women in addressing climate change, implemented in collaboration with Masdar's WiSER initiative.

Financing for Climate Friendly Investment: recognizing successful financial innovations for adaptation and climate mitigation, implemented in partnership with the World Economic Forum Global Project on Climate Change.

Planetary Health: recognizing novel solutions that balance the need for both human health and a healthy planet, implemented with support by The Rockefeller Foundation.

Climate Neutral Now: recognizing efforts by individuals, companies and governments that are achieving real results in transitioning to climate neutrality, implemented with the secretariat's Climate Neutral Now initiative.

The Momentum for Change Advisory Panel, made up of senior experts from various fields and countries, will select the 2018 Lighthouse Activities. The panel is part of the secretariat's Momentum for Change initiative, which is supported by The Rockefeller Foundation and operates in partnership with Masdar's Women in Sustainability, Environment and Renewable Energy (WiSER) initiative, and the World Economic Forum Global Project on Climate Change.

Applications for the 2018 Momentum for Change Awards are being accepted from 22 February to 30 April 2018 at: <https://momentum.unfccc.int/>

SMU Grow: Urban Farming in the Heart of the City



SMU GROW is a university-wide programme that involves students, staff and faculty in cultivating change through experiential and reflexive learning. The programme joins a global urban farming movement that seeks to (a) create global awareness on environmentalism, food production, consumption and security, (b) promote sustainable urban living, (c) provide for underprivileged members in our community, and (d) enrich our brand of holistic, broad-based education.

The urban farm programme invites people from all walks of life from the community at large, and not just from within SMU, as 'gardeners' and partners in learning. Passerbys and residents are welcome to have a share of the garden's produce. Residents, particularly, from the Central CDC are encouraged to join in the gardening and maintenance of the plants. Planter boxes are also available for adoption. The initiative aims to not just grow a garden of food but build a greener future and better lives for the community eventually.

The overall notion of this initiative includes sharing knowledge on eating and living well, sustainable farming and living, urban eco practices that protect the environment, growing food and feeding people, nurturing and building a caring community, contributing back to society, and making meaningful connections in society.

Integrating technology with nature is another key aspect of SMU Grow. SMUgBUG is a smart device and plant buddy that monitor's plant health. It is an Internet connected (IoT) device that is placed in the field alongside the plants to monitor their health. The device comprises an assortment of simple sensors – a moisture sensor to

check the moisture content of the soil; a humidity sensor to assess the temperature of the air; and a light sensor to determine the amount of sunlight the plants are exposed to. When the plants require water or are under less-than-ideal conditions, the SMUgBUG will send out an email to inform the caretaker.

In line with its sustainable objective is the 'Save the Ugliers Market', an initiative to reduce food waste. This project was aimed at educating and rallying the community to reduce food waste by buying quality produce rejected by retail outlets due to aesthetic reasons. Through the 'Save the Ugliers Market', local businesses were able to recover costs of aesthetically displeasing products that would be thrown away, consumers purchase quality produce at a much cheaper price and sales proceeds are geared toward organising more events that promote green practices. 'Save the Ugliers Market' takes place every Friday at SMU's B3 café.

Moving into the future, SMU Grow is set to part of the global movement for farming. In its initial 3 years, SMU GROW concentrated on setting up a viable foundation – in terms of infrastructure, know-how, organisational culture – mostly internal building. Largely through networking and recommendations, SMU GROW is starting to connect with farmers, educators, organisations (such as IRRI, the International Rice Research Institute), practitioners and advocates.

By inviting renowned practitioners (such as zero waste guru, Bea Johnson) and participating in competitions that are judged by global experts (such as the Cities of Love Award), many opportunities are created for best practices sharing, collaboration and learning across countries. As a city university, SMU is well-placed to be the hub for research and discourse, and more importantly, the test bed for sustainable solutions in the real world. Many of the issues we face in farming and sustainability are universal. By first striving to nurture on campus, an eco-universe in the heart of the city, SMU aspires to be the point of reference for urban farms and city planning.

The SMU Grow garden below the School of Accountancy is open to public. So if you are in the area, head over to check out urban farming right in the heart of the city.

Upcoming GREEN Events:

The 2018 National Sustainability in Business Conference

8 - 9 March 2018

Grand Chancellor, Brisbane, Australia

▪ <https://conference.sustainability.asn.au>

Solar Power Asia

19-22 March 2018

Singapore

▪ www.solar-powerconference.com

Windpower Asia

19-22 March 2018

Singapore

▪ www.wind-powerconference.com

Future Cities Show 2018

9 - 11 April 2018

Abu Dhabi, United Arab Emirates

▪ www.futurecitiesshow.com/aboutus.html

Middle East Smart Landscape Summit '18

7 - 8 May 2018

Sofitel Dubai The Palm Resort & Spa,
Dubai, United Arab Emirates

▪ www.landscapesummit.com

World Cities Summit

8-12 July 2018

Marina Bay Sands, Singapore

▪ www.worldcityssummit.com.sg

IFLA World Congress 2018

16-17 July 2018

Sands Expo and Convention Centre

Marina Bay Sands, Singapore

▪ www.ifla2018.com

Bex Asia 2018

5-7 September 2018

Marina Bay Sands, Singapore

▪ www.bex-asia.com

Singapore International Energy Week

29 October - 2 November 2018

Marina Bay Sands, Singapore

▪ www.siew.sg/#

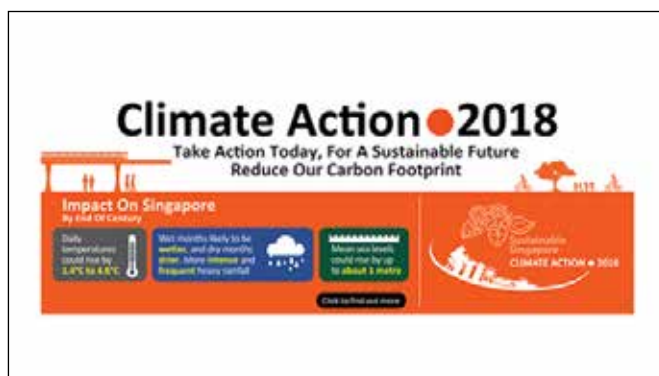
Intersolar India 2018

11-13 December 2018

Bangalore International Exhibition Centre

Bangalore, India

▪ www.intersolar.in



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