

GreenPulse

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Nature Inside & Out:

PHIPPS CENTER
FOR SUSTAINABLE
LANDSCAPES

INSIDE

GreenPulse

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4

COVER STORY



NATURE
INSIDE & OUT:

PHIPPS CENTER
FOR SUSTAINABLE
LANDSCAPES

10

FACE TO FACE



Dr. Jeff
Obbard

an Environmental
scientist, Ecologist,
Environmental
Engineer, and
Entrepreneur.

14

SPECIAL REPORT



Creative
Urban
Solutions

by the Studio
Roosegaard

16

SPECIAL FEATURE



An Open
Dialogue
for Climate
Change

20

EVENTS

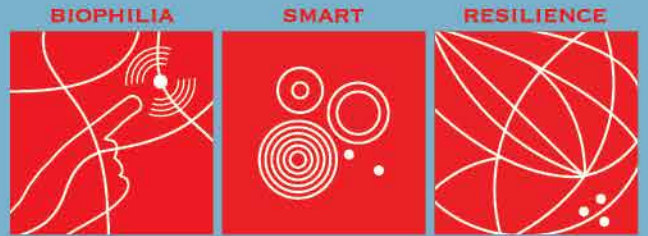
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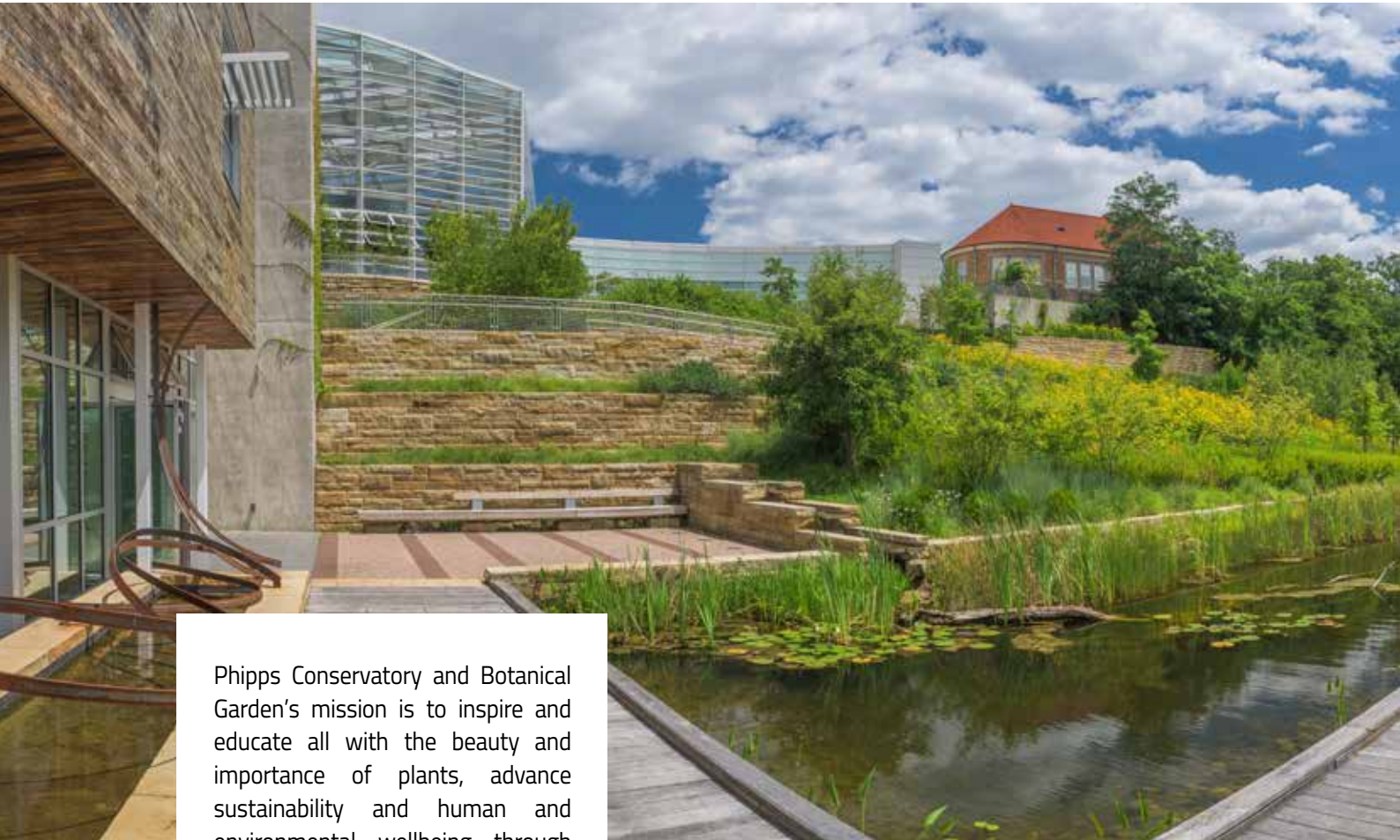
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Nature Inside & Out:

PHIPPS CENTER FOR SUSTAINABLE LANDSCAPES



Phipps Conservatory and Botanical Garden's mission is to inspire and educate all with the beauty and importance of plants, advance sustainability and human and environmental wellbeing through action and research, and to celebrate its historic glass houses. The mission of the organization is evident in the Center for Sustainable Landscapes (CSL). A restored brownfield is now a productive place that takes what it needs from what is available to it, and provides a healthy environment for life to thrive. True to the Phipps mission, the ongoing work at the CSL is based on recognizing vital and positive connections between people, plants, beauty, health, and focuses on awakening children to nature and encouraging sustainable, healthy lifestyles.

Environmental Features

PLANTS

The Center is nestled within a botanical garden, giving it a powerful relationship to the landscape.



Incorporating over 150 native plants grouped into natural communities, these terraced gardens embrace the building, even extending onto it with a green roof. The design creates outdoor rooms that blur the edges between building and landscape. The experience carries over inside the building, where the many windows provide intimate views of the gardens and live plants grace the offices, conference room and lobby.



VIEWS AND VISTAS

To be in the Center is to be simultaneously outside. Every place in the building, including the classroom, conference room, offices, and three levels of the lobby provides distinctive perspectives and views: to the south and west, the expansive vista overlooking Panther Hollow and Junction Hollow; to the east, intimate views of the gardens; and to the north, views of the dramatic topography from which the building itself emerges.

GEOLOGY AND LANDSCAPES

The backdrop for this project is a dramatically sloping hillside. The Center, set into this bluff, becomes part of the geology. The gardens surrounding the building unfold in a series of planted areas that mimic the region's varied landscapes. As visitors approach the building from the upper campus and meander down the path toward

the ground floor, the plantings, building and topography work together to create natural-seeming transitions between the outside and inside. Visitors pass by upland species at the roof level and through oak woodlands on the path, finally reaching wetlands and raingardens at the bottom of the slope.

Natural Patterns And Processes

SENSORY VARIABILITY



This building takes advantage of its immersion in botanical landscape, building on the dynamic variety of colour, texture and shape of the plants to bring an ever-changing visual and auditory experience to occupants. Recognizing the importance of sound to



connect people to nature, Abby Arresty's audial sculpture brings the sounds of Pittsburgh into the atrium space, while interactive and three-dimensional art throughout the building creates texture and visual stimulation. All of this sensory variability invites people to pause, touch, look and listen—to connect with nature, but also with themselves.

INFORMATION RICHNESS

Inside the building, light, art and sound combine to create a multi-layered experience. Art installations inspired by nature enrich the interior and invite staff and visitors alike to pause. Glass sculptures that evoke colourful flowers bloom along one wall. A bronze windbell at the entry to the rooftop garden captures the movement of air in its clear resonant tones. A suspended steel sculpture of curving steel bands draws attention with its contrasts of light and dark, solidity and air. The interplay of light drawn through the light shelves and atrium windows lifts the spirit.

CENTRAL FOCAL POINT

The Center is organized around a central lobby with an atrium, a feature which highlights the dramatic elevation change that characterizes the site. The three-story



atrium anchors the building, serving as a guidepost for people whether they are inside or outside. Visitors who take the meandering path through the gardens can refer to this distinctive feature—the translucent tower with its distinctive pitched roof is the highest point on the building—to stay oriented as they transition from the amphitheater down to the lagoon. Inside, the lobby and atrium orient people within the building and connect them to other spaces.

NET POSITIVE WATER IMPERATIVE

The water needs for the CSL are supplied by captured rainwater, while potable water is drawn from municipal sources per the temporary exception due to local health regulations. Due diligence was performed with all appropriate agencies.

All irrigation, toilet flushing and janitorial and equipment uses are supplied by captured rainwater. Roof runoff from both the CSL and an adjacent, non-project structure, is captured in a 1500-gallon cistern used for landscape irrigation (when necessary). Any overflow is diverted into a roughly 100,000-gallon lagoon. The lagoon serves as a landscape feature, a home to native turtles and fish and is accessible to visitors via a surrounding boardwalk. Wetland plants purify the water, and lagoon overflow is channeled into underground rain tanks with 60,000 gallon capacity. Water can be drawn from this to supply the rest of the campus with water for non-potable uses. All sanitary water is treated on site via constructed wetlands, sand and UV filters, and is used for toilet flushing. Excess water from this system is further treated with a solar-powered distillation unit and used to irrigate plants in an adjacent campus building; due to regulatory restrictions, this water is only used for non-potable purposes.

NET POSITIVE ENERGY IMPERATIVE

Early energy models helped inform the project's design

during its development. Because available space for renewable solar photovoltaic systems was limited, the net zero energy goal presented a significant challenge for the design team. This team managed to overcome this challenge by employing an integrated design approach.

The final concept design energy model showed an EUI of 19 kbtu/sf year with an energy usage for the building at 117,623 kwh per year. A 125.25 kW PV Solar Array was chosen for the project that was estimated to produce 135,655 kWh per year. During the 2013 calendar year, the CSL was net positive on energy by 3,425 kWh, with an actual EUI of 20 kbtu/sf year.

The approach to the Net Positive Energy Imperative was to utilize a passive-first strategy to bring the outdoors inside, connecting its occupants to the natural world—a strategy which has proven beneficial to both occupant comfort and the overall performance of the building. These passive-first strategies were coupled with high-performance and innovative technologies to ensure the active systems are as efficient as possible. The CSL is a long, relatively narrow building on an east-west axis, which allows for maximizing southern exposure. High-performance glazing on the north and south facades permit solar gain in the cold months, while louvers and strategic deciduous tree plantings prevent unwanted heat gain and glare in the warm months. A large atrium, majorly-constructed of concrete acts as a heat sink by helping regulate the temperature throughout the course of the day. Phase change material that lines the atrium walls also passively regulates temperature. In-depth, computational fluid dynamics studies determined



placement for BAS- and occupant-controlled windows to maximize natural ventilation. These passive strategies, which also include operable windows for natural ventilation, permitted a downsized mechanical system (a custom-built rooftop energy recovery unit).

Energy use is monitored by the individual plug, which permits any anomalies to be addressed. Occupants each have electricity meters at their desks that encourage energy-saving behaviours. Energy is produced on-site via a vertical-axis wind turbine and a 125kW photovoltaic array. If generation is greater than campus-wide demand, surplus electricity flows back to the grid.

HEALTHY INTERIOR ENVIRONMENT IMPERATIVE

To ensure clean air, the CSL uses an Aircuity system to monitor temperature, humidity, CO², TVOC, particulates and CO in occupied spaces, which safeguards that the highest quality air is delivered to maintain thermal comfort. In conjunction with this system, a rooftop





energy recovery unit modulates between 19.4% and 100% outside air based on need, which is delivered through under-floor and ceiling distribution systems. Breathing zone air ventilation rates are 55% above ASHRAE Standards 62.1-2004 requirements, and 100% of the total building area is adequately served by natural ventilation for a portion of the year. Solely passive strategies are implemented in the atrium; thermal massing, high-performance operable glazing, solar shading, and phase change material maintain comfortable temperatures.

BIOPHILIC ENVIRONMENT IMPERATIVE

The concept of “biophilia”, as coined by Erich Fromm and popularized by biologist E.O. Wilson, is defined as “the innately emotional affiliation of human beings to other living organisms”. This notion is an integral component of the green building toolkit. In the interest of making its audience truly embrace the idea of green buildings as beautiful and inspiring places in which to live, work and play, Phipps developed the BETA (Biophilia Enhanced Through Art) Project, a new art exhibit staged throughout the building and surrounding landscape. Carefully curated and installed in collaboration with SmithGroupJJR and art experts from MoxBox, the BETA Project brings a new dimension of sensory engagement to the CSL, creating dozens of opportunities for visitors to experience nature’s beauty through the lens of the artist. To reflect a diverse array of voices while reinforcing the CSL’s western Pennsylvania locality, the exhibit features mostly local artists, but also a dynamic mix of international artists such as Dale Chihuly and Hans GodoFräbe.

The Materials Petal Imperatives were among the most difficult for the project team to achieve when pursuing Certification for the Center for Sustainable Landscapes. To achieve the Materials Petal, it requires thoughtful design paired with appropriate, high quality, non-toxic materials; it is necessary to consider materials at the outset of a project. Throughout the process, there were a few instances where the design was revised due to lack of market availability. For example, the architect initially designed a series of shades to minimize summertime glare and heat gain, but when all viable products were found to contain HFRs (Halogenated Flame Retardants), that idea was scrapped from the project. Adapting the design and convincing manufacturers to adapt their products, was necessary to achieve the Petal. During this robust design phase, the team specified many project materials, but the scale of the project rendered much of the specifying incomplete when construction was slated to begin. To minimize the amount of lost time in attempting to specify materials during the construction phase, the general contractor was given an unprecedented 60-day period to concentrate their efforts on the specification process; many manufacturers were reticent to divulge detailed documentation about their products. During the design and specification period the project team realized the value and importance of pushing the market toward a healthy and transparent materials economy. The team decided to extend the Red List Imperative to furniture within the building, even though it isn’t a requirement for Living Building Challenge 1.3 Certification.

EMBODIED CARBON FOOTPRINT IMPERATIVE

The design team's approach to energy efficiency was to use outside-in, passive strategies first. To this end, the atrium was designed to house large amounts of concrete to act as thermal mass, increasing energy efficiency. However, concrete embodies large amounts of carbon relative to other materials due to its manufacturing process. To mitigate some of this carbon, fly ash was used in lieu of Portland cement, one of the most water carbon intensive components. Recycling fly ash, which is a waste product of combustion, also keeps the material out of landfill where it would usually be sent. In calculating the embodied carbon of the CSL, Phipps partnered with faculty and students from a local university to conduct a comprehensive life cycle assessment of its assembly and operations.

NET POSITIVE WASTE IMPERATIVE

Before site work began and throughout the construction process, the project team made a strong effort to salvage materials for the CSL. For materials that could not be repurposed, the project team partnered with Construction Junction, Pittsburgh's first non-profit building material reuse retailer. Waste handling vendors were screened to identify those most well equipped to handle the complex practices of managing construction waste.

The open office floor with a raised access flooring system allows for flexibility and adaptability for years to come. The overall building systems are plug-and-play and easily upgradeable to accommodate technological advances. A closed-loop, full nutrient cycling management plan aims to realize a zero-waste site; all biomass is recycled in-situ and customized compost tea mixes are applied



to support the various site habitats and maintain biodiversity on the project site over time. An ongoing monitoring plan sustains this performance, informs an adaptive maintenance program, and provides Phipps a pedagogical opportunity to support the institution's educational mission. The CSL project is anticipated to exceed a service life of one hundred years.

SALVAGED MATERIALS

Salvaged materials comprise 10% of those used to build the CSL, including siding made from deconstructed western Pennsylvanian barns, Belgium block, granite, and old Department of Public Works fuel tanks that have been safely converted to store cleaned sanitary water. When performing due diligence when sourcing doors, the design team was unable to find wooden doors that did not contain added formaldehyde. Rather than using glass or metal doors that may have clashed with the aesthetic, the team was able to acquire them from a nearby office building undergoing a renovation.





Face to Face with Environmental Scientist **Dr. Jeff Obbard**

Prof. Dr Jeff Obbard is an environmental scientist, ecologist, environmental engineer, and entrepreneur. He holds a Ph.D. in Environmental Science (Chemistry & Microbiology), and a B.Sc. (Honours) in Ecology (1st Class) from the UK. He spent 17 years at the Faculty of Engineering, National University of Singapore (NUS), and has recently returned from Qatar, where he was Director and Professor at the Environmental Science Centre, Qatar University.

What made you come into the field of environmental science and engineering?



It is basically down to my boyhood fascination with the natural world. As a boy, I was very fortunate that my parents owned a family holiday house next to the ocean on the Isle of Anglesey in North Wales in the UK. I spent long summers there - either in, on or under the ocean and the surrounding hills and forests. I became fascinated with how the natural world functions and this led me to study natural sciences at university for my degree - then later a PhD in terrestrial carbon cycling. The engineering part came later, when I started my professional career as an environmental consultant and joining the Faculty of Engineering at the National University of Singapore. I'm interested in how to work with nature to solve some of the most challenging problems facing humanity today - water, energy and food security, not least climate change.

Recently I have returned from working in Qatar as an academic professor and the Director of the Environmental Science Centre at Qatar University. Before this, I spent 17 years at NUS in the Department of Civil & Environ-

mental Engineering, and as Director of the Sustainable Development & Water Alliance, and as Research Director at the Tropical Marine Science Institute. Whilst at NUS, I was also fortunate to work as Vice President for Science & Technology on a renewable energy venture by Royal Dutch Shell Petroleum in Hawaii, USA. These experiences have strengthened my resolve to use my science and engineering skills to protect the natural environment and help the world to become more sustainable.

Since returning to Singapore from Qatar, I have joined an environmental consultancy company - Tembusu Asia Consulting, as their Executive Director and Consultant for Environment, Sustainability & Climate Change. The company has been established by Er. Tan Seng Chuan, the former Chairman of the Institution of Engineers Singapore. Tembusu Asia aims to be the leading environmental sustainability company in Asia by combining its expertise in environmental science, engineering, finance and management. The company places the Sustainable Development Goals of the United Nations at the heart of its business, and I am looking forward to getting involved in many exciting projects in Singapore and the Asian region.

Could you share about the current research or project you are working on?



Currently, I am very interested in researching how to reduce people's exposure to air pollution in the form of PM 2.5 - these are the tiny particles that are associated with land clearance, fossil-fuel combustion and the haze. At NUS, I set up a spin-off company called AiRazor Technologies to provide affordable, clean air technology to everyone. The World Health Organization is telling us that 9 out of every 10 people on the planet breathe air that exceeds their safety guidelines. I believe that breathing clean air is a human right, and the ability to apply environmental engineering to protect people's health and welfare is what drives me on this research. I have recently returned from China where I have collaborated with partners to bring the technology to the people of China. This is exciting for me as it mixes my interests in science, engineering and entrepreneurship.

I am also working on a technology in Indonesia that is about using the fastest growing plants in the world - tiny microalgae found in the world's oceans to absorb carbon dioxide and turn it into biomass for energy and high-value chemicals. This type of work took me to Hawaii to work on the technology with Shell Petroleum. To me, it is a neat way to use my knowledge of the carbon cycle to mitigate climate change and to produce a sustainable source of energy and non-polluting chemicals. This is exactly what the world needs right now, and it is motivating to be involved in projects like this.

More locally, In Singapore, since returning from Qatar, I have been involved in projects evaluating the impact of urban development on Singapore's natural resources and also advising the government on the potential impacts of climate change on Singapore - and the opportunities for investment in the world's rapidly growing renewable energy markets. This is very exciting as it allows me to combine my knowledge on climate change with opportunities to mitigate and adapt to its impacts, whilst making financial returns for investors.

Marine plastic is a well-known pollutant of oceans. What is your take on marine plastic?



Back in 2006, when I was Research Director of the Tropical Marine Science Institute I became concerned about the amount of

plastic litter that I was finding around Singapore's coastline. I decided to investigate the occurrence of small plastic items - so called microplastics, in Singapore's marine environment. We found evidence for the presence of microplastics in the beach and mangrove sediments in Singapore. The scientific data that was published turned out to be one of the very first data sets on microplastics in the marine environment in Asia. I also published the first data on marine microplastics in the Arabian Gulf when I was in Qatar.

My take on marine plastics is that it is a growing problem that represent a clear and present danger to marine life in multiple ways at all levels of the food chain. It has also become a human health issue as microplastics (less than 5 mm in size) have now been found throughout the ocean - from the arctic to the antarctic, and from the ocean margins to the deepest ocean trenches. As well as being found in marine food, plastic particles have now been detected in the water we drink (including bottled water) and the air we breathe. As yet, we do not fully understand the ecological or human health implications. There is much more work to do, but the implications do concern me.

In your opinion, do you think we have made progress in terms of meeting the goals set out in the Paris Agreement?



The Paris Agreement was quite remarkable in its political achievement, where every nation on the planet signed up to pledges to reduce carbon emissions to avoid what the United Nations has called 'dangerous anthropogenic (man made) climate change' by avoiding a 2°C rise in average global temperatures compared to pre-industrial times - and to even further by attempting to cap the rise to 1.5°C.

Despite the unfortunate announcement of the USA - the world's 2nd largest carbon emitter (after China) to pull out of the agreement - there is still strong momentum to cut carbon emissions. However, to me as a scientist, the question is whether cuts are deep and fast enough? Unfortunately, my answer to that would have to be 'no'. The United Nations has already warned that the pledges under the Paris Agreement, even before the USA announcement, were not enough to avoid breaching the temperature goals by the year 2100. In other words, not enough is being done.

To stand a reasonable chance of not exceeding the goals, then the world's carbon emissions need to peak imme-

● FACE TO FACE

diately and then be reduced to zero soon after mid-century. Great progress is being made in transforming the world to a low-carbon economy through the very rapid take-up in renewable energy sources (especially wind, solar and hydro) but more is needed in terms of research, development and application of technologies to achieve to goals under the Paris Agreement.

What climate change solutions are you most excited about?



I am amazed and inspired by the world's transition to renewable energy technology. Just in the last few years, wind and solar power generation have become economically competitive with fossil fuel powered generation. According to Bloomberg, investment in 2017 exceeded US\$300 billion. Together with rapid development of smart grids and the electrification of vehicles there is enormous potential to lower carbon emissions. In particular, the world's largest carbon emitter, China, is now racing ahead.

Although there is much more to do, I believe we are now witnessing an energy revolution where the nexus of environment, engineering and finance has come together for the common good. This is how sustainable development should happen, and it is very encouraging.

I am also excited about developments in negative emission technologies - those technologies being developed to actively remove carbon from the atmosphere. Although, as an ecologist, I know the best way to do this is to avoid deforestation and plant more trees, I have been involved in exciting projects that utilize the power of the ocean to remove carbon dioxide from the atmosphere and lock it safely away to slow down global warming. Although the absolute priority must be to cut carbon emissions, the development of advanced engineering solutions will help to solve climate change. Although I am excited, I also know that the world needs to move much more rapidly and invest more in these emerging technologies.

What I'm not excited about is knowing that if we push the climate system too much, then climate change could take on a life of its own. I've been involved in this field for most of my career and it is safe to say the climate change is happening bigger, sooner and faster than expected. Even 5-10 years ago, many expected

that changes would happen gradually over a century or two. That is not the case, and we are already witnessing extreme weather events and temperatures linked to a changing climate right around the world. My biggest concern is that if global warming is allowed to continue then natural carbon reservoirs found in the land and ocean will be triggered and released, raising the prospect of rapid climate change. Like a runaway train, it will become unstoppable, and means that we could be handing the next generation a climate system that is beginning to spin out of control.

I think this is what inspires me to get involved, teach and innovate in environmental science and engineering. I often draw upon my experiences in nature to find the inspiration to move forward.

What are the opportunities in Singapore for people to actively help in the fight against climate change?



Singapore is a small country with a successful and vibrant economy - full of smart, innovative people. It is also highly vulnerable to climate change impacts - both directly as a result of rising temperatures, drought events, intense rainfall and sea level rise as well as indirect effects that impact food, energy and water security.

Singapore has signed up to the Paris Agreement and is introducing the carbon tax next year in an attempt to reduce carbon emissions. As a nation, it already has an efficient public transportation system. This is all of the good, but we can go much further - and we should not only for environmental reasons, but also because it will unleash technology development that will add to the economy.

In terms of what individuals can do, there are also many positive things. Although the climate change problem seems so big and overwhelming on a personal level it comes down to lifestyle. For example, using public transport or a bicycle instead of a car or taxi can cut one's carbon footprint. Reducing air travel for business by using conference calls is another good example. Even changing your diet to consume less meat cuts the carbon emissions associated with rearing livestock and transporting meat products around the world. There is a lot to be said for using local farm produce, wherever possible. Other

things like cutting plastic waste, which after all is made from fossil fuels, will also help. Getting involved in conservation projects and even planting a tree can help to rub out your carbon footprint.

These days we're hearing more campaigns about reducing food waste, reducing the amount of plastic products we use and to use more public transportation. Do you think it is possible for people, especially in developed societies like Singapore and the US, to actually become more sustainable?



Absolutely, yes. In all of the ways, and more, that I've mentioned above. Actually I think Singapore as a whole should set a target to become carbon neutral. This does not seem as crazy as it sounds - other countries, such as Norway, have this goal already. This doesn't mean actually cutting all of Singapore's carbon emissions to zero - nigh impossible, but it does mean investing in carbon capture and negative emission technologies and projects either at home or elsewhere. For example, by investing to plant a forest in another country, or putting out a peat bog fire in Indonesia, carbon emissions to the atmosphere are cut and this offsets carbon emissions at home. As there is only one atmosphere, then it does not matter where the carbon emissions - or cuts - are coming from, and the net results is that Singapore becomes a leader in carbon sustainability. Singapore strives to punch above its weight and be a leader in so many areas, so why not climate change mitigation. Personally, I think leadership like this would really spur research, de-

velopment and green economic growth for Singapore!

As for the US - what it needs most is intelligent, coordinated, scientifically informed leadership. I don't see that right now, and it is disturbing. Climate change obeys physical and natural laws, not political agendas and to see science being marginalized because of narrow, vested interests in the US is not in the interests of the American people - or the rest of us. Fortunately, having worked in the US, I know that there are many enlightened and determined people, at all levels, who are determined that the USA should also lead on the fight against climate change. American ingenuity, innovation and investment are key - and over time I think this will prevail.

What is your take on the recent carbon tax imposition by the Singapore government?



Overall, it is a good move as it will encourage large carbon emitters to become more energy efficient and cut their carbon emissions. However, as I mentioned above Singapore has a lot at stake from a changing climate and it, together, with the rest of the world, needs to do more to combat the growing threat of climate change. I think it is great that Singapore is beginning to view climate change not only as a strategic threat to the nation, but also as an opportunity to lead and prosper. For me, it is great to be part of this dynamic and now that I am back in Singapore I look forward to doing my part to create a cooler, smarter and more sustainable world for all.



Creative Urban Solutions

by the Studio Roosegaarde



1 VAN GOGH PATH is part of the SMART HIGHWAY, which are interactive and sustainable roads of tomorrow made possible by Daan and Heijmans Infrastructure. Its goal is to make smart roads by using light, energy and information that interact with the traffic situation. The bike path connects innovation with cultural heritage in the town of Nuenen NL, where Van Gogh lived in 1883. By charging at day-time via the sun, the path glows at night up to eight hours, allowing for efficient use of solar energy.



2 Daan and his team of experts created the world's first smog vacuum cleaner. The 7-meter SMOG FREE TOWER uses positive ionisation technology to produce smog free air in public spaces, allowing people to breathe and experience clean air for free. Equipped with environment-friendly technology, it cleans 30 m³ per hour using very little green electricity. The effect of the SMOG FREE TOWER has been validated by the results compiled by the Eindhoven University of Technology. SMOG FREE PROJECT (including TOWER, BIKE and RING) is a series of urban innovations led by Daan Roosegaarde to reduce pollution and provide an inspirational experience of a clean future. The project has recently been launched in China, the Netherlands and Poland.



3 WINDVOGEL are energy generating kites which have the potential to create up to 100 kW and can supply up to 200 households with green energy. Floating in the air, the smart kites move around and are connected with a cable to a ground station. This push and pull of the cable transforms into electricity, like the dynamo of a bicycle. Whilst flying, the installation also creates a visual symphony of dancing lines, celebrating the beauty of green energy.



4 GATES OF LIGHT, the new futuristic entrance of the Afsluitdijk, brings the 60 monumental floodgates originally designed by Dirk Roosenburg in 1932 back to their glory. Every day 20.000 cars pass by. The structures, augmented with a retro-reflective layer, can now be illuminated by the headlamps of passing cars (light reflected through small prisms) in the dark. If there are no cars on the road, the structures will not be illuminated. This way of using light requires zero energy and does not contribute to light pollution.



5 DUNE is the public interactive landscape that interacts with human behaviour. This hybrid of nature and technology is composed of hundreds of fibres that brighten according to the sounds and motions of passing visitors. DUNE, which seeks to enhance social interactions in the public spaces, was commissioned by Rotterdam City of Architecture so that Rotterdam citizens enjoy their walk at night.



Daan Roosegaarde

Dutch Artist and Innovator
Founder of Studio Roosegaarde

Daan is a Dutch artist, creative thinker and maker of social designs which explore the relation between people, technology and space. His works, including a bike path illuminated by thousands twinkling stones (running on solar energy) to mirror 'Starry Night', the world's largest smog vacuum cleaner (air purifier) which uses no more electricity than a water boiler, are responses to the urban environment.

Professional Qualifications and Achievements: Roosegaarde graduated from The Berlage Institute with a Master in Architecture. He founded Studio Roosegaarde in 2007, where he works with his team of designers and engineers towards a better future. Together they develop 'Landscapes of the Future' building smart sustainable prototypes for the cities of tomorrow.

Notable Awards: Roosegaarde is a Young Global Leader at the World Economic Forum and named Artist of the Year 2016 in The Netherlands.

Roosegaarde has won the London Design Innovation Medal, the INDEX Design Award, the World Technology Award, two Dutch Design Awards, the Charlotte Köhler Award, and China's Most Successful Design Award. He exhibited at the Design Museum in London, Stedelijk Museum Amsterdam, Rijksmuseum Amsterdam, Tate Modern, Tokyo National Museum, Le Musée des Arts Décoratifs Paris, Victoria & Albert Museum and various public spaces in Europe and Asia. Selected by Forbes and Good 100 as a creative change maker, Daan Roosegaarde shares his visionary ideas frequently at conferences across the world such as TED and Design Indaba.

Daan Roosegaarde will be a speaker at the upcoming IFLA World Congress 2018, 18 to 21 July 2018, Sands Expo and Convention Centre, Singapore. To find out more, log on to <http://www.ifla2018.com/>.

An Open Dialogue for Climate Change: The Talanoa spirit for an enhanced and transparent framework

By Jovin Hurry



Photo by IISD/ENB | Kiara Worth

The United Nations Climate Change Conference COP23 came and left. Plenty of negotiations carried on in full swing in Germany last November 2017, amidst the continuing rise of a global average temperature that has meanwhile contributed to triggering a health crisis in New Delhi. One wonders what all these meetings are for. Progress, albeit slow, is certainly happening and for the first time in the history of the UN climate talks, governments and non-state actors engaged in an 'Open Dialogue' as part of a Grand Coalition concept.

It is worth reminding ourselves as we prepare for more climate talks, that the first-ever open dialogue to bring together parties and non-state actors at a COP was launched by the COP23 President, Mr. Frank Bainimarama and the UNFCCC Executive Secretary, Ms. Patricia Espinosa and was chaired by the COP23 Climate Ambassador, Mr. Deo Saran.

"This is the first open dialogue between parties and non-parties in the history of the COP process. It's not a side event. It has been mandated by the parties and is designed to bring state actors and non-state actors together. I am delighted as COP23 President that we have been able to connect in this manner. Because it goes to the heart of the Grand Coalition concept that Fiji has been promoting all year," said Mr. Frank Bainimarama in his opening remarks.

The Non-State Actors and Observers: Who They Are

Non-state actors at the dialogue represented a diverse mix, including environmental organisations, business and private sector, trade unions and workers, youth, women, indigenous peoples, local governments and research institutions.

Non-state stakeholders would not normally be part of the formal aspect of a COP. They have only been indirectly involved in review processes under the UNFCCC thus far.

"We understand that the formal negotiations are governed by the idea of a party driven process. But we also understand that the rich variety of non-state actors represented in this room have a great deal to contribute to that process. In fact, without the non-state actors, we will fall short of



Photo by IISD/ENB | Kiara Worth

the objectives set by the Parties,” highlighted the COP23 President.

These ‘Non-Parties’, by definition, do not sign up to the Paris Agreement or to any pledges. However it was recognised at COP21 that, as well as Government action, it is vital that as many people and bodies as possible do everything they can to avert Climate Change. Hence, the Agreement reached in Paris in Dec 2016 introduced the concept of ‘non party stakeholders’ and also of ‘observers’.

The Agreement listed some non-party stakeholders: “Welcomes the efforts of all non-Party stakeholders to address and respond to climate change, including those of civil society, the private sector, financial institutions, cities and other subnational authorities”; and expanded on groups of vulnerable people and their rights: “climate change is a common concern of humankind..... their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity.”

The UNFCCC explains observers as: “The United Nations and its specialized agencies and the International Atomic Energy Agency, as well as any State member thereof or observers thereto not party to the Convention, may be represented at sessions of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement as observers. Any body or agency, whether national or international, governmental or non-governmental, which is qualified in matters covered by this Agreement and which has informed the secretariat of its wish to be represented at a session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement as an observer, may be so admitted unless at least one third of the Parties present object.”

Observer organizations include intergovernmental organizations (IGOs), such as the OECD and International Energy Agency (IEA), along with non-governmental organizations (NGOs).

As the decision adopting the Paris Agreement clearly states that the mentioned inputs for the global stocktake are not exhaustive (no inputs are specifically mentioned or excluded for the



facilitative dialogue), other inputs from non-state actors could be welcomed. This could include reports by credible and reliable non-state actors, including international organizations such as the United Nations Environment Programme, which publishes the very policy-relevant annual Emissions Gap Reports.

Non-State Actors Enhance The Dialogue Process

The Presidency’s Open Dialogue offered a unique opportunity for parties and NGO constituencies to directly interact with each other on concrete issues in the UNFCCC negotiation process.

Working on the Chatham House Rules, these stakeholders met to discuss the improvement of their respective climate goals, known as Nationally Determined Contributions (NDCs); and how can the UN climate process can better integrate the experience and expertise of non-state actors, in light of the urgent need to show real progress on the ground in implementing the Paris Agreement. The process was designed to foster more understanding, and greater transparency and inclusivity, to make it ultimately a more effective process to help achieve the Paris Agreement’s climate goals.

In the first facilitated session on NDC enhancement and implementation, the participants agreed that non-party stakeholders can play a key role in supporting effective implementation, strengthening domestic enabling environments and providing analytical inputs to identify new opportunities for mitigation and adaptation action.

Non-state actors can play a key role in such review processes. In many areas of international relations, including climate change, they have helped monitor compliance with states’ obligations and pledges, provided relevant information and expertise, “named and shamed” laggards, and



worked to identify and overcome key barriers to implementation, such as gaps in capacity, funding, or technical knowledge.

The session had a particular focus on the Facilitative Dialogue in 2018, and discussed how the stakeholders can contribute to the efforts of increasing ambition with the aim to build momentum, provide confidence and exchange good practice on effective cooperation amongst stakeholders at all levels.

During the second facilitated process on enhancing admitted observer access to and participation in formal meetings, the participants extensively discussed and continuously enhanced observer engagement in the UNFCCC process. They built on the conclusions of the Subsidiary Body for Implementation and discussed specific steps towards their implementation as well as enabling conditions for further enhancement, in view of previous discussions and conclusions.

It was shared that following existing review processes, the transparency framework will have two elements: a technical review of national reports by a team of experts, and a multilateral consideration of the report by other Parties. Both elements can benefit from including non-state actors.

It was mentioned that while existing multilateral elements of the international assessment and review, and the international consultations and

analysis, do not provide clear roles for non-state actors, the enhanced transparency framework under the Paris Agreement could strengthen their role. This could be achieved by making the proceedings accessible to the public (e.g. via webcasting the multilateral consideration), making all relevant documentation available (which is by and large common practice under existing technical review processes), and allowing submissions from non-state actors to submit written and/or oral questions.

A Dialogue Process With The Talanoa Spirit

As the participants engaged in rich discussions on how to effectively collaborate and on outcomes for consideration under the UNFCCC process, they were encouraged to share stories and ideas in the true spirit of Talanoa - a Pacific cultural concept of storytelling.





Photo by IISD/ENB | Kiara Worth

The COP23 President framed the dialogue at the onset, leading by example. “Today, we will not be negotiating. We will be talking to each other. And we will be listening. This is the perfect setting for adopting the Talanoa Spirit that is so much a part of what Fiji brings to the Presidency. Together, we should learn how to engage all levels of government, civil society, the private sector and billions of ordinary citizens in the formation of the national plans for climate action.”

“There will be good experiences to share and frankly, it’s the only way forward. But we must also be honest about what is not working. Because the Talanoa Spirit isn’t just about being nice to everyone - although respect is essential. It is about contributing to a solution that requires a degree of straight talking. And whoever you represent today, I encourage you to embrace that spirit - honest, constructive dialogue for the common good,” he continued.

It is to be noted, as the Subsidiary Body for Implementation conclusion stated, that “any outcomes of such a dialogue should have persuasive value only.” It is hoped that the Parties and non-party stakeholders will have a deeper understanding of

actions required on the topics discussed that day, i.e. on NDC enhancement and implementation and enhanced observer access to and participation in UNFCCC negotiation and sessions, and would have identified more ways to achieve the goals.

Certainly, both the facilitative dialogue and the global stocktake would benefit from assessing the crescendo of climate-related efforts that cities, companies, and other non-party actors are making individually, with one another, and alongside states and international organizations

By the end of several hours of sharing that included examples of success when the NDC process is supported by non-state actors, the participants agreed that non-state actors can in particular make significant contributions by helping to address issues that transcend national boundaries. They finally expressed strong support for the Open Dialogue at future climate talks.

Hence, as one moves on to future climate talks, it will help to champion the Talanoa spirit movement that got ignited last year, for an all-inclusive approach with non-state actors for the full benefits of everyone.



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