

# Green Pulse

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## CityTree by Green City Solutions

Clean and Cool Air for the Urban Environment

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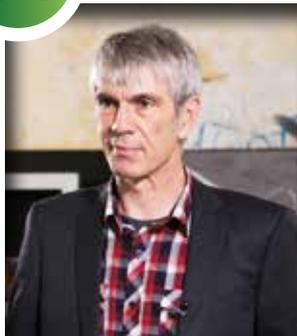
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# CityTree by Green City Solutions

## Clean and Cool Air for the Urban Environment

'CityTree' is a 4 meter-high, 3 meter-wide and 0.6 meter-deep freestanding unit. It combines specific moss cultures with vascular plants that eat particulate matter (PM), nitrogen dioxide and ozone – offsetting 240 tons of Carbon dioxide equivalents per year in total.

The plant filter can be adapted to any environment. The construction contains sensors collecting environmental and climatic data, to regulate and control the unit and ensure that the plants survive. Thus, the CityTree has the same effect as up to 275 urban trees, but requires 99% less space and 5% of the cost. Thanks to solar panels and rain water retention systems, the unit requires only a few hours of maintenance per year.



During the development of the product Green City Solutions focused on using recyclable material to lower the carbon footprint. This has made the product CityTree itself sustainable. The production footprint of 4 tons of Carbon dioxide is compensated by capturing 240 tons of Carbon dioxide equivalents in just one year.

To ensure its profitability, implementation of visual and digital information on the vertical plant display for marketing campaigns is possible. Analogue information can be displayed as simple writing or logos, but also with the help of plants in a variety of different colours. The system enables access to digital content by implementing technologies such as a QR-Codes, Near Field Communication (NFC) or digital screens. This makes it possible to use the CityTree for out of home media advertising as well as mobile commerce purposes.

Integrated benches and the offer of additional services, such as Wi-Fi hotspots or e-bike charging stations extend the functionality of the CityTree.

The vertical plant filter has already been installed in numerous cities worldwide. At the moment, CityTrees are installed in Oslo, Paris, Berlin, Dresden and Hong Kong.

CityTree was developed by an award winning German start-up, Green City Solutions. Green City Solutions is a successful and fast-growing company with a vision to mitigate climate change and fight air pollution through highly smart and profitable "climate infrastructure" for sustainable and liveable cities of tomorrow.

Green City Solutions, in October 2014, was declared as one of the four best CleanTech start-ups in Europe by the EU organization Climate-KIC. In September 2015 Green City Solutions was chosen as one of eight start-up companies from across the globe to participate in the first Infiniti Accelerator driven by Nest. Out of over 3,000 entries, this German start-up was one of six chosen applicants and is among the top three winner's circle. The CityTree was the nationwide winner in the 'Environment' category in the 'Germany – Land of Ideas' initiative and a winner of the 'Go Green' category at European Youth Festival in Graz.



Moreover, Green City Solutions bears the title of 'Cultural and Creative Pilot Germany 2015' and won the first place at the 'Urban Futures Ideas Competition' of Fraunhofer and is now a member of 'Morgenstadt Insights.' Furthermore Dénes Honus (CEO) was honored as one of the 'Social Entrepreneurs' in the first ever '30 Under 30 Europe' list.

The smart plant filter has also been awarded at the Challenge Cup 2016 at Metropolitan Solutions, as a winner of the Plus X Award "Young Innovator" and the Best Bio-Based Business Concept Award. In addition, Green City Solutions was part of the Deutsche Bahn Accelerator Batch 3 "Next Station" and a nominee of the "German Engagement Price". In September 2016, Green City Solutions has been honoured with the "Runner- up" price of the well known Postcode Lottery Green Challenge, the world's largest annual competition for sustainable entrepreneurship.



## Upcoming GREEN Events:

### Global Compact Network Singapore Summit

29-30 August 2017

Suntec Convention Centre, Singapore

- <http://gcnssummit.com/>

### ICSD 2017

5<sup>th</sup> International Conference on  
Sustainable Development

6-7 September 2017

Rome, Italy

- [www.ecsdev.org](http://www.ecsdev.org)



### Bex Asia 2017

12-14 September 2017

Marina Bay Sands, Singapore

- [www.bex-asia.com](http://www.bex-asia.com)

### Mostra Convegno Expocomfort (MCE Asia)

12-14 September 2017

Marina Bay Sands, Singapore

- [www.mcexpocomfort-asia.com](http://www.mcexpocomfort-asia.com)

### APLD 2018 International Landscape Design Conference

13-17 September 2017

Toronto, Canada

- [www.apld.org/events](http://www.apld.org/events)

### 2017 APRU Sustainable Cities and Landscapes Conference

15-17 September 2017

University of Oregon, Portland, Oregon, USA

### 2017 Taiwan International Air Purification and Sanitation Show

18-20 October 2017

Taipei Nangang Exhibition Center,

Hall 1, Taipei, Taiwan

- [https://www.tiap.com.tw/en\\_US/index.html](https://www.tiap.com.tw/en_US/index.html)

### IGEM 2017

International GreenTech & Eco Products  
Exhibition & Conference Malaysia

11-13 October 2017

KLCC, Malaysia

- [www.igem.my/home](http://www.igem.my/home)

### IFLA World Congress 2017

15-16 October 2017

Montreal, Canada

- <http://iflaonline.org>

### 21<sup>st</sup> National Conference

22-25 October 2017

RACV Royal Pines Resort, Queensland, Australia

- [www.eiseverywhere.com/ehome/234026](http://www.eiseverywhere.com/ehome/234026)

### Singapore International Energy Week (SIEW) 2017

23-27 October 2017

Marina Bay Sands, Singapore

- <https://www.siew.sg/>

### ISOCARP-OAPA/53<sup>rd</sup> ISOCARP Congress

24-27 October 2017

Portland, Oregon, USA

- <http://iflaonline.org/events>

### IFLA Asia Pacific Regional Congress

2-5 November 2017

Bangkok, Thailand

- [www.2017iflaapr.com](http://www.2017iflaapr.com)

### Urban Scape Asia 2017

9 - 11 November 2017

Singapore EXPO Convention and Exhibition Centre

- [www.greenurbanscapeasia.com](http://www.greenurbanscapeasia.com)

### Sustainable Brands'17 Bangkok

29 - 30 November 2017

Bangkok Thailand

### Intersolar India 2017

5-7 December 2017

Mumbai, India

- [www.intersolar.in/en/home.html](http://www.intersolar.in/en/home.html)

# MOVING THE GREEN DIAL

*Around the world, more than half of us live in cities, yet the latter occupy only 3 percent of the earth's land surface. Given their very high urban population growth, cities face many issues, from transportation to treatment of water and waste, and housing.*

*The need to construct a city adapting to the requirements of the present while preserving resources for the future has given rise to smart cities, the aim of which is to: improve the comfort of its inhabitants, provide more efficient transportation, and respect for the environment. Specifically, this covers several aspects of development like constructing more buildings with positive energy coefficients, and insulating buildings during remodeling to increase global energy performance. Smart cities have other attributes as well such as the optimisation of waste management; development of environmentally sound means of transport; public lighting; and digital networks that offer real-time services to connected users.*

*Huge potential for improved efficiency lies in the entire waste management process, from disposal to collection and recovery, with technology increasingly playing an important role to enable cities and businesses to save on both energy and costs. Global positioning systems (GPS), drones, radio frequency identification (RFID), and more straightforward innovations like chippers and balers, are already helping to simplify and expedite operations. In recovery facilities, biological treatments are deployed alongside new technologies to maximise energy extraction from waste materials.*

## Cleaner Waste Streams

Industrial activities have often come under the spotlight as contributors to waste production, prompting businesses to adopt cleaner practices and push towards a more sustainable agenda. Environmentally-friendly solutions that are simultaneously more profitable have since been introduced to improve industrial processes and their attendant waste streams.

At PROXA, for example, liquid waste treatment using eutectic freeze crystallisation (EFC) was developed to optimise processes. EFC involves reducing brine to its lowest possible temperature of solidification, where it crystallises and sinks to the bottom while water freezes and floats to the top, effectively separating salt and water. With the technology, businesses can extract 99.8 percent of brine salts from waste effluents, thus maximising saline waste streams as a resource of valuable by-products that can be reused in construction, detergents and even fertilisers.

Given that many existing water treatment processes generate aqueous waste streams with a high salt content, EFC is among cutting-edge liquid waste management technologies that aim to reduce waste generation while also boosting business performance through enhanced scalability and energy efficiency. Its wide application in industries like petrochemical, power, mining, and food and beverage translates into cleaner liquid waste streams, while improved resource recovery makes industrial processes much greener.

## Reduce and Reuse Energy

Compressed air is used in a wide range of industrial processes and systems, including all kinds of automation and process engineering technologies, drying systems, transport and handling solutions for powdered goods, not to mention power tools, hoists and packing systems. The industrial sector is constantly seeking ways to generate and supply this energy carrier as efficiently as possible.

Leading compressed air systems specialist, BOGE developed Duotherm, a heat recovery system that is capable of boosting the overall efficiency of air compressors. Based on the ratio of usable

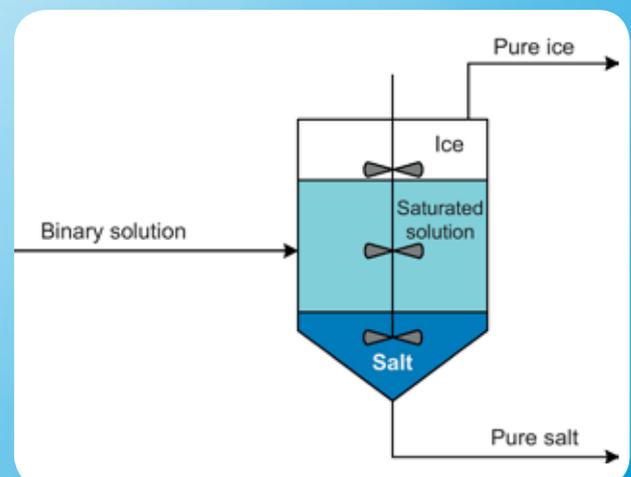


*The increasing pressure on resources makes it clear that waste must be turned into a resource in a circular economy – an economy that only functions optimally if it includes recycling and energy recovery.*

NALIN AMUNUGAMA,  
General Manager of  
BOGE KOMPRESSOREN Asia Pacific.



energy output to primary energy input, up to 94 percent of energy supplied is recoverable for other uses. The heat recovery unit is connected to the compressor's oil system or with the user's water system or process water utility mains, and efficiently transfers the heat from compressed air production to the desired process, without any additional energy input. This free energy is a major plus, especially in factories that use temperature-based processes. But even in settings where process heat is not required, the recovered heat can still be used for space heating and for pre-heating water for showers, washrooms and the likes.





Using data analytics, BOGE also introduced a diagnostics tool that makes remote surveillance of multiple compressed air systems possible. Off-site, round-the-clock monitoring empowers operators to identify and react to system faults, resulting in less frequent maintenance and increased energy savings.

“With access to the latest data through remote surveillance, the integrated system can effectively eliminate less than sustainable processes,” Mr Amunugama reiterates.

### Intelligent Systems

To reduce its environmental footprint, the municipality of Rotterdam in the Netherlands is partnering with Enevo, an innovator in intelligent waste management, to eliminate inefficiencies in infrastructure and processes like waste collection.

Using Enevo’s Internet of Things (IoT) analytics and route planning system, a smaller fleet of

trucks operate in the city through more efficient routes. The technology monitors fill-levels in waste containers via wireless sensors and shares this information with staff through cloud servers, alerting them on when the containers need to be serviced. Through this system, static collection routes are eliminated and resources are channelled to more productive tasks.

“Not only is predictive waste management system an effective way to reduce the cost of waste handling, it can also help to incentivise reuse and recycling, and build the circular economy,” explains Charbel Aoun, Enevo Chief of Sales and Strategy.

With plans to introduce twice the number of monitored waste containers and extend route planning to 40 percent of the underground paper and card waste containers in Rotterdam, Enevo’s tech expertise and software will be a huge boon in helping the city in its push towards a circular economy.

### Sustaining the Future

By 2050, 75 percent of the world’s population will live in cities and their rapid growth is putting enormous pressure on resources, carrying capacities, and quality of life. Cities already produce half of global waste and 60-80 percent of greenhouse gas emissions. Land and buildings are also under-utilised in cities.

Circularity in resource flows is a way of reducing the consumption of resources, such as energy, water, buildings and land in cities. Cities have great catalytic power to develop new economic models that make the most of what they have.

City planners are increasingly being challenged to rethink the way our current urban systems operate, to learn from previous mistakes and implement these lessons in building future systems. Paying attention to resource flows will help to build long-term prosperity, resource self-sufficiency, economic viability and human wellbeing.

## Singapore Green Building Week 2017

Singapore Green Building Week 2017 (SGBW 2017) is organized by the Building and Construction Authority (BCA). The week long event will host various events promoting the green building movement, bringing together experts, policy-makers, academics, practitioners, end-users, students and members of the public. SGBW 2017 aims to congregate ideas, create collaborations and partnerships, and increase learning and awareness to collectively realize the vision of a greener planet.

In its 9<sup>th</sup> installment, SGBW 2017 comprises various events and activities throughout the week. Participants get to network with international players from the public and private sector. SGBW 2016 saw 28,800 participants from 50 countries. Events range from conferences to workshops and competitions.

Some of the events held during the week will

include Build Eco Xpo (BEX) Asia 2017, Mostra Convegno Expocomfort (MCE) Asia 2017, C40 Private Building Efficiency Network Workshop 2017 and EarthCheck Inner Circle Asia Pacific. Each event caters to a specific area of the green building industry.

The main highlight of SGBW 2017 is the International Green Building Conference 2017 (IGBC). Themed "Build Green: Be The Change", it aims to signify the steps needed to further the green building agenda to develop deeper and bolder impacts on behavioural changes. The conference is set to have better participant engagement, focused workshops on R&D topics and sharing on global green building trends.

SGBW 2017 will be held from 11<sup>th</sup> – 15<sup>th</sup> September 2017. The table below gives a synopsis of the programme. More information can be found at <https://www.bca.gov.sg/events/sgbw/>.

## Singapore International Energy Week



The Singapore International Energy Week (SIEW) is an annual platform for energy professionals, policymakers and commentators to discuss and share best practices and solutions within the global energy space. Participants can look forward to hearing views from energy thought-leaders on the theme, "Rethinking Energy; Navigating Change", and participate in discussions on opportunities and challenges in the evolving energy sector.

Starting a week of high-level discussions, Mr Teo Chee Hean, Singapore's Deputy Prime Minister and Coordinating Minister for National Security, will give the Singapore Energy Lecture and

Mr S. Iswaran, Singapore's Minister for Trade and Industry (Industry) will deliver opening remarks. The Singapore Energy Summit will facilitate energy discussions, focusing on (i) Rethinking Energy; (ii) Slow Road to Recovery? The Outlook for Oil & Gas; and (iii) Integrating Renewables.

The 10th edition of SIEW will host the inaugural Singapore-IEA Forum, focusing on energy infrastructure investments in Asia. Dr Fatih Birol, Executive Director of International Energy Agency (IEA) will also launch the IEA Southeast Asia Energy Outlook 2017 at the Forum.

Don't miss the 2017 Singapore International Energy Week from 23-27 October at Marina Bay Sands. More information can be found at <https://www.siew.sg/>.

Dr Digby Whyte's career has involved leadership and professional roles spanning international, national, state, regional and city parks and recreation organisations based in Australia, New Zealand, USA, Canada and Iceland; and governance roles with international, national, and local non-profit park and recreation organisations.

Currently he is the CEO of World Urban Parks and in recent years was the Director of Park Operations, with responsibility for 4.7 million hectares of national parks and reserves, for the Parks and Wildlife Service of the Northern Territory Government in Australia and the Group Manager of Manukau City Parks a city serving 365,000 citizens in New Zealand. Dr Whyte has served on the boards of Parks Forum and the New Zealand Recreation Association. He holds Doctoral and Directors degrees in Recreation and Park Administration from Indiana University, and a Master of Public Policy from Massey University.



**Dr Digby Whyte** CEO of World Urban Parks

### Tell us briefly about your current role?



The World Urban Parks CEO provides some of the public face of the organisation as well as leadership and support to the board, membership and partners.

### What made you so interested in urban parks and spaces?



To do something about people's quality of life. I like the idea of cities designed with their natural environment, particularly for their contribution to livability and access to nature. Most of my experience and education has been in New Zealand, Australia and USA, but over the last four years, wonderfully international!

### Which is your favourite green space or park in the world?



There are too many, but I was brought up in a house inside a 10,000 hectare regional park on the edge of Auckland City in New Zealand – a park with mountain ranges, wild surf on black iron sand beaches and thick green bush.

### What does World Urban Parks strive to achieve?



To be a united voice for the parks, open space and recreation sector and related partners. To champion the health, livability and sustainability benefits of city open space and to share knowledge and best practice.

## Could you share some strategies used by World Urban Parks to encourage the use of green spaces?



Side Events at the UN Habitat III, international congresses with declarations, strengthening national associations in the industry, connecting open space providers and managers across the sector to solve common issues.

## Why do you think parks and green spaces are undervalued?



Within a city environment space is utilized for housing, commerce, and transport. Depending on how advanced city planning is, these uses can compete. They can be seen as essential priorities but increasingly it is being realized that natural systems and cities integrated with open space make the city more liveable, resilient, healthy and economic.

## In recent years, many developed cities have taken an active approach to creating green space. Do you think these efforts are sustainable?



A number of cities are starting to restore and reconnect the natural systems within their cities. Some of this is more advanced planning, some in response to competition (e.g. the European Commission Green Capital Awards), some in response to citizens,

some in relation to climate change and etcetera. The future test will be how the city responds to ever increasing population. In Singapore green space is now being integrated into high-rise buildings. Green space systems have been recognized as contributing to city climate change resilience (including cooling effects, cleaner air) and they also support non-vehicular circulation systems (in conjunction with public transport like trams) that are safer and more enjoyable than congested road systems.

## In your opinion, how do urban parks and open spaces contribute to improving social interaction in cities?



Public parks are social levelers, whether sitting on the beach or playing soccer, it does not matter who is who. Good park design and use management or facilitation caters for social situations, such as events, supporting club use, playgrounds with social places for parents, outdoor aerobics or dance, cafes, etcetera.

## What does your ideal urban park look like?



There is no such thing, but it should respond to the local culture and natural environment. They may be in broad categories with an emphasis on natural systems, such as coastline and streams; sport or community; play or bikeways; or outstanding geography or cultural heritage. In general, the integrity of natural and cultural resources, circulation and information systems, compatible uses, reduction of risks, and basic conveniences should feature.



# International Greenery Parks and Recreation Infrastructure, Parks Conference and World Urban Parks Asia Pacific Region Conference 2017



The conference and Masterclass was jointly organised by Singapore's IPRS, and World Urban Parks and, Parks and Leisure Australia. It was held on from 17-20 July 2017 in Marina Bay Sands, Singapore.

This conference shared the experiences and information on "GREENERY, BUILDINGS, RECREATION, INFRASTRUCTURE

& PARKS" with the main theme on 3Ps (Public, Private and Community Participation). Sub themes covered include governmental policies and projects.

### Green in Future – Official Media Partner for IGRIP 2017

Urban parks are the core infrastructure that make cities livable. They provide the green framework that cools and enhances the urban landscape, nurturing and protecting our natural habitats. Urban parks also create the spaces and places that allow residents to play, be active, socialize and stay physically and

mentally healthy. A city's parks are also an important foundation of the local economy, supporting a broad range of economic activity and driving local, regional and international tourism.

However designing an effective urban park is not easy. The day long masterclass covered a range of international perspectives on planning for parks in higher density urbanized cities. Insights were shared by practioners from Australia, Asia, and North America.

The conference was well received by more than 200 participants consisting of Town Planners; Architects; Landscape Architects; Mechanical, Electrical, Hydrological, Civil & Structural Engineers; Energy Consultants; Project Managers; Quantity Surveyors; Interior Designers; Arborists, Ecologists; Contract Managers & Administrators; Legal & Policy Advisors; Construction Lawyers; Arbitrators; Contractors;



Sub-Contractors; Builders; Cost Planners; Facilities Managers; Marketing Managers; Building Materials Manufacturers & Suppliers; Developers; Town Councils; Academics; Energy Managers and Sociologists.

Ms. Maria Boey, President of IPRS gave the welcome address. It was followed by the Masterclass led by Dr. Digby Whyte, CEO of World Urban Parks; Mr. Martin Lambert, President Parks & Leisure Australia; Mr. Mark Band, CEO Parks & Leisure Australia; and Eric Moraczewski, Arch River Foundation (USA).



*IPRS-WUP Asia Pacific Congress in Singapore representing 10 countries*

## WORKSHOP PRESENTERS



**MARTIN LAMBERT**

President Parks & Leisure Australia



**KEITH ANDERSON**

Washington DC Parks (USA)



**MARK BAND**

CEO Parks & Leisure Australia



**DIGBY WHYTE**  
CEO World Urban Parks



**ERIC MORACZEWSKI**  
Arch River Foundation (USA)



**PLUS:**  
Local Singapore Experts

Other notable presentations include:

- Mr. Tai Lee Siang, Chairman, World Green Building Council
- Dr. Ken Yang, Leading Eco Architect
- Elisabeth Fournier, Vice Chair Alliances, World Urban Park, Secretary General, Hortis
- Mr. Wayne Van Balen, President of the Australian Institute of Horticulture Inc
- Manfred Koehler, Professor, Landscape Architect Head of Dept Landscape Ecology, University of Applied Sciences Neubrandenburg

The conference also witnessed the MOU signing for the first ever Cert Parks & Leisure professional accreditation with World Urban Parks and Parks and Leisure Australia.



*MOU signing off World Urban Parks WUP and Parks and Leisure Australia PLA*



Open Asia Pacific Region Meeting – with World Urban Parks



Mr. Ken Yeang, Eco Architect Principal TR Hamzah and Yeang



IGRIP 2017-3 Day Conference Delegates and Masterclass Attendees



Over 200 Conference delegates and Masterclass participants made the event a BIG success



Mr. Digby White, CEO World Urban Parks on benchmarking parks



Mr. Ken Yeang with Green in Future team, Dr. Paru and Anchana