



Asia Pacific Conference

Sustainable City and Communities: The Singapore Experience

Presented by:

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25 October 2017



**CITY
DEVELOPMENTS
LIMITED**



Global Climate & Sustainable Goals

- National Climate & SDG Actions in Singapore**

Global Goals for Sustainability



Paris Agreement The Paris

- Entered into force on 4 November 2016
- 197 nations attended COP21, Dec 2015

- Global climate agreement to limit global temperature rise to below 2°C
- 168 nations ratified [17 Oct]
- Nations to set targets to reduce GHG emissions

SUSTAINABLE DEVELOPMENT GOALS



UN Sustainable Development Goals

- Adopted at the United Nations Sustainable Development Summit on 25 September 2015.

- 17 SDGs and 169 Targets to stimulate action towards UN 2030 Agenda for Sustainable Development
- Transforming the world – pertaining to humanity, planet, people, peace, prosperity & partnership



World Green Building Council: Net Zero Agenda

- Aim for all new buildings and major renovations to be 'Net Zero' from 2030
- All buildings 'Net Zero' by 2050

National Actions for Climate & Sustainability

Climate Action Plan



- Reduce emissions intensity by **36%** below 2005 levels by 2030
- Stabilise emissions to peak around 2030

Singapore Sustainability Blueprint



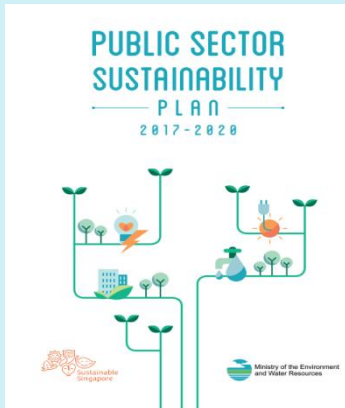
- **S\$1.5 billion** effort for a sustainable Singapore by **2030**
- Focus on developing Singapore as a **Eco-Smart, Zero-waste** and **Car-Lite Nation**.

BCA: Green Building Masterplan



- Strategic goal to green **80%** of Singapore's buildings by **2030**


Public Sector Sustainability Plan



- To reduce electricity by 15% & water consumption by 5%
- All large public sector buildings to achieve at least BCA Green Mark Gold rating
- To set targets for waste reduction and solar adoption
- Green Procurement in Government's contracts e.g. paper products certified by Singapore Environment Council

Actions: Mandatory Energy Management Practices



- **22 April 2013:** National Environment Agency (NEA) launched **Energy Conservation Act (ECA)**
 - Energy intensive companies consuming 54 TJ of energy or more annually are required to appoint an energy manager, monitor and report energy use and greenhouse gas emissions, and submit energy efficiency improvement plans.
- **8 March 2017: Enhancements** to ECA to achieve goals pledged under Paris Agreement e.g. mandatory annual submission of GHG monitoring plan and enhanced emissions report to NEA
- **Energy Efficiency National Partnership** organized by the NEA, Energy Market Authority and the Economic Development Board.
- Aims to support companies in their energy efficiency efforts through learning network activities, provision of energy efficiency-related resources, incentives and recognition.

Actions: Raising Energy Efficiency

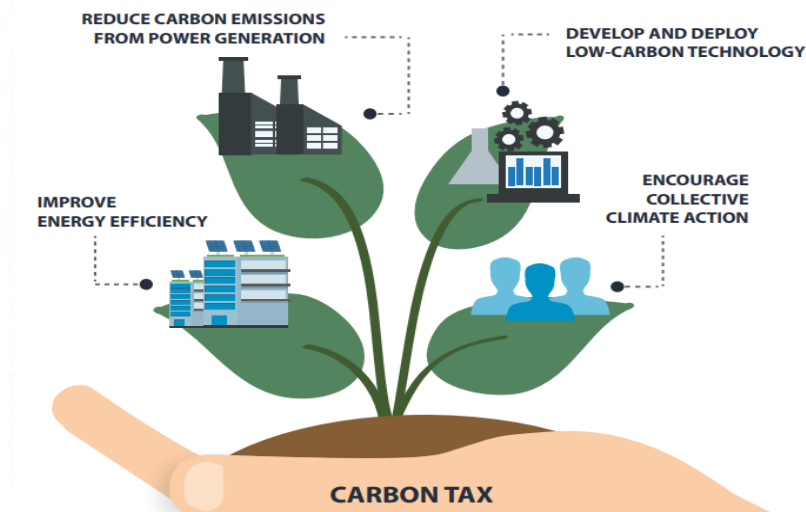
Carbon Tax

- Implement carbon tax by 2019 to cut six targeted GHG emissions:
 - Carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride
- Funds from carbon tax will help to finance measures by industries to reduce emissions
- Funds to provide new opportunities in green growth industries, e.g. clean energy



THE STRAITS TIMES

Singapore to impose carbon pricing in move to cut greenhouse emissions



“These plans can help us to move towards a low-carbon society, and also be a Living Laboratory for businesses, agencies, and research institutes to develop new products and services for the global economy.”

- Teo Chee Hean, Singapore's Deputy Prime Minister and Coordinating Minister for National Security

Actions: Raising Energy Efficiency

Solar Adoption in Singapore

Industrial

- Jurong Port completed S\$30 mil installation of solar panels on its warehouse rooftop,
 - Largest port-based solar facility in the world.
- Facility will generate 9.5 megawatts at peak capacity*
- Est. to generate more than 12 mil (kWh)/ year, est 60% of electricity need
- Tengeh Reservoir to host 10 solar panel systems - world's largest solar panel testbed

<http://www.channelnewsasia.com/news/singapore/tengeh-reservoir-to-host-world-s-largest-solar-panel-testbed-7776786>

Residential

- **EDB & HDB Partnership: SolarNova programme:**
 - **Target** to contribute to raise the adoption of solar power to **350 MWp by 2020**.
 - **2010:** Treelodge@Punggol is HDB's **first** eco-precinct
 - Installation of solar panels at HDB blocks under 1st SolarNova tender is expected to commence in Dec 2016 and complete in Dec 2017.



Solar power capacity soars in Singapore



Solar panels on the rooftop of an HDB block in Jurong East. Research is being done to see how Singapore can overcome its space constraints to have more solar panels installed. PHOTO: HDB

<http://www.straitstimes.com/singapore/environment/solar-power-capacity-soars-in-singapore>



First solar PV-integrated public housing

Actions: Green Infrastructure & Buildings



BCA Green Mark Scheme



- **January 2005: Launched as a voluntary initiative** to shape a more environmentally friendly and sustainable built environment.
- **15 Apr 2008: Mandatory Green Mark Certification** for all new developments & existing buildings under major retrofitting
- **Current: the 5th version** with stringent requirements

Environmental Sustainability Measures for Buildings

Enhancement w.e.f. Jan 2017:

Existing buildings with centralised cooling systems and GFA >5,000m² to achieve minimum 50 Green Mark points and meet pre-requisites when installing and replacing building cooling system.

Building and Construction Authority www.bca.gov.sg

Mandatory Tender Requirements

2019 onwards:

Housing & Development Board (HDB) plans to fit all new flats with prefabricated bathroom units, and adopt the concrete PPVC method in 35% of its projects.

Housing Development Board (Sept, 2017)

Actions: Future Proofing Water Provisions



Household Water Bills



- Water price to increase by 30%, wef 1 Jul '17 & 1 Jul '18
- Households using more water, above 40 cubic m, will be charged a higher rate to discourage water wastage
- Price increase will go towards maintaining Singapore's water infrastructure, and more expensive sources of water such as desalination
- NEWater opened 5th plant with capacity to produce 50 mil gallons of water/day, (approx. 92 Olympic-sized pools.)



75% of all households
will see an increase of
less than **\$18**
per month



75% of HDB households
will see an increase of less than
\$12 per month
after additional
U-Save rebates



1- & 2-room HDB
households will not
see an increase on
average after additional
U-Save rebates

Actions: Efficient Waste Management Systems

- Singapore aims to reach an overall **recycling rate of 70% by 2030**
- Currently, about 38% of Singapore's solid waste generation is incinerated at our **4 Waste-to-Energy (WTE) Plants**
- 61% is recycled, while remaining 2% that is non-incinerable is landfilled
- WTE plants help to **reduce waste volume by about 90%**
- Electricity generated by the plants meet **3%** of Singapore's electricity demand
- TuasOne, 5th WTE in SG, aims to be the **largest plant**, to process **3600T of waste/day** and generate **120 MW of energy**, to be **completed in 2019**.



CLIMATE ACTION PLAN

INITIATIVES TO REDUCE WASTE AND INCREASE EFFICIENCY IN THE WASTE SECTOR

The National Recycling Programme was launched by NEA in 2001 to make recycling more convenient for households. All new HDB developments launched from 2014 will be fitted with Centralised Chutes for Recyclables. NEA has also made it mandatory for large hotels and shopping malls to submit waste data and waste reduction plans. In addition, NEA has worked with the industry and non-governmental organisations to get various parties to sign the voluntary Singapore Packaging Agreement that aims to reduce packaging waste, which constitutes about one-third of Singapore's domestic waste. From 2007 to 2015, the signatories cumulatively reduced about 26,000 tonnes of packaging waste, and saved more than \$58 million in material costs.



TuasOne illustration

<http://www.channelnewsasia.com/news/business/hyflux-mitsubishi-consortium-to-build-s-750m-waste-to-energy-pla-8242794>



Business Integration of SDGs – The CDL Story

CDL. A Business Committed to Doing Good, Doing Well

- Singapore's property pioneer since 1963; listed international property and hotel conglomerate with global network across 26 countries
- Group revenue - S\$3.9B (FY 2016); Market Cap - S\$11.58B (13 Oct 2017)
- Over \$3.5 billion (Q1 2017) in Funds Under Management (FUM), set to achieve FUM of \$5 billion by end 2018
- Built over 40,000 homes & owns over 18 million square feet of floor area of office, industrial, retail, residential and hotel space globally
- London-listed subsidiary Millennium & Copthorne Hotels plc (M&C) owns and manages over 130 hotels – one of the largest hotel chains in the world

- 1st SG company to be listed on 4 global sustainability benchmarks: **DJSI, FTSE4Good, Global 100 Most Sustainable Corporations in the World & MSCI (AAA rating)**
- **CDP- Leadership level in the Region & highest scoring SG property firm**
- Only SG company on **Global 100** for 8 consecutive years & ranked top real estate & management company *
- **Asia's Top Property Developer** – Asia Sustainability Ranking since 2014
- **BCA Awards:** Green Mark Pearl Prestige (since 2015) / Green Mark Platinum Champion (2011) / Built Environment Leadership (Platinum) (2009) / Quality Excellence Award – Quality Champion (Platinum) (since 2013) / Quality Star Champion (2017) *2016&17



CDL's Sustainability Journey Since 1995

Raising Performance. Building Leadership. Creating Future Value.

Transformed Business Model to "Conserve as we Construct"

- 1995 Adopted CSR-Centric Vision & Mission
- 1998 First SG developer to install energy-saving lifts in residential developments
- 2001 EHS 5-Star Assessment System
- 2002 Project Eco-Office; 1st Eco Condo; FTSE4Good;
- 2003 EHS Policy; ISO 14001 EMS; OHSAS 18001
- 2004 CSR report in Annual Report; Let's Live Green!; Adopted more international sustainability benchmarks
- 2005 Signatory to UN Global Compact; Founding member(SG Compact)
- 2008 SG's 1st GRI-checked SR
- 2009 BCA Built Env Leadership (BEL) Platinum Award;

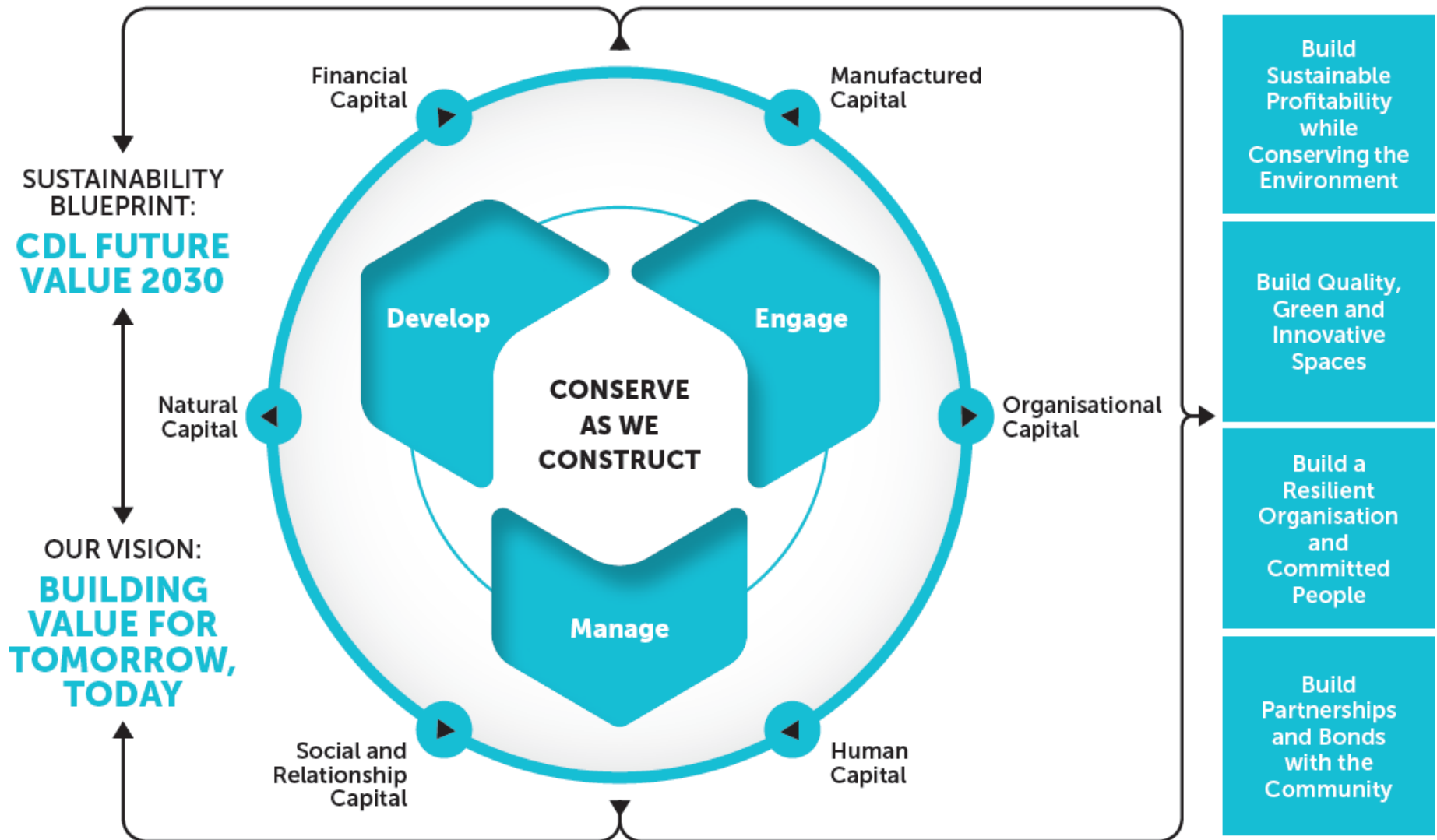
Aligned with Global Best Practices & Standards

- 2010 Global 100 Most Sustainable Corporations in the World; DJSI (World & AP); BCA Green Mark Platinum Champion;
- 2011 GRI A+ Sustainability Report CNA Green Luminary Award;
- 2012 First SG landed housing development with individual-unit solar energy, HAUS@SERANGOON
- 2013 My Tree House – World's 1st Green Library for Kids; Zero Energy CDL Green Gallery @SBG; D'Nest entered SG Book of Records: 'Largest Solar Panels in a Condo'
- 2014 ISO26000 for CSR alignment; Investment properties ISO50001 certified; CDL Green Lease Partnership; Guinness World Record for largest vertical garden (Tree House condo); Asian Sustainability Ranking – Top Asian Developer

Future-proofing Business. CDL Future Value 2030.

- 2015 Published dedicated Climate Change Policy; BCA Green Mark Pearl Prestige sole winner; Adopted Integrated approach for Sustainability Reporting
- 2016 NUS-CDL Smart Green Home Lab & T² Lab; 1st SG developer to achieve ISO 14064-1GHG; Aligned to 9 UN SDGs;
- 2017 Launched CDL Future Value 2030 Sustainability Blueprint + Digital Quarterly Update
- First SG company to adopt New GRI Standards for Sustainability Reporting; Launched S microsite: www.cdlsustainability.com
- Zero Energy Singapore Sustainability Academy

Future proofing 2030 – CDL's Value Creation Model



Sustainability Journey Since 1995.

SDGs Alignment Since 2016.

Future-proofing CDL's Business

- A focal point for our new sustainability blueprint – **CDL Future Value 2030**
- Set long-term ESG goals & targets that will contribute to **9 relevant SDGs**

Integrated Sustainability Reporting

- Connects our ESG impact with business performance
- Benchmark our environmental and social KPIs with SDG targets and indicators



Green Financing

- Tap on like-minded investors to create alternative financing stream to advance CDL's green building efforts
- Raised S\$100 mil with first **Green Bond** in Apr 2017

Sustainable Communities & Collaborative Partnerships

- Leverage CDL's green building expertise and partners network to build 3P collaborations e.g. Singapore Sustainability Academy

Sustainability Blueprint Goals Aligned to SDGs

CDL Future Value 2030 Goal 1: Building Green & Sustainable Infrastructures and Communities

- To achieve Green Mark certification for 80% of CDL owned and/or managed buildings
- To maintain 100% tenant participation in CDL Green Lease Partnership Programme



SDG 11:
**Sustainable Cities
and Communities**

-
- To double our commitment to adopt innovations and technology for green buildings



**SDG 9: Resilient
and Innovative
Infrastructure**

-
- To double resources devoted to advocacy of sustainability practices, stakeholder engagement and capacity building



SDG 17:
**Partnership for
Sustainable
Development**

Sustainability Blueprint Goals Aligned to SDGs

CDL Future Value 2030 Goal 2: Reducing Environmental Impact

- To achieve the science-based target of reducing carbon emissions intensity by 38% from 2007 levels



SDG 13: Urgent Action to Combat Climate Change

- To reduce the usage intensity of energy and water by 25% from 2007 levels



SDG 7: Affordable and Clean Energy

- To reduce total waste disposed by 50% from 2016 levels
- To ensure 100% of appointed suppliers are certified by recognised environmental standards



SDG 12: Responsible Consumption and Production

- To ensure 50% of our construction materials are derived from recycled content, low-carbon sources or certified by recognised environmental organisations



SDG 15: Biodiversity and Resource Conservation

Sustainability Blueprint Goals Aligned to SDGs

CDL Future Value 2030 Goal 3: Ensuring Fair, Safe & Inclusive Workplace

- To maintain Zero corruption and fraud incidents across CDL's core operations



SDG 16: Peace, Justice and Strong Institutions

- To maintain Zero fatality across CDL's operations and direct suppliers in Singapore
- To maintain Zero occupational diseases across CDL's operations and direct suppliers in Singapore
- To maintain Zero AFR at CDL corporate office
- To maintain AFR of one or less for direct suppliers at construction sites and managed properties



SDG 8: Economic Growth, Productive Employment and Decent Work

Connecting Green Building with Green Financing

Green Bond

- Capturing Rising Responsible Investment Funds
- Expanding New Financing Streams
- Raising Green Building Standards



First Green Bond by a Singapore Company

- Issued by CDL Properties Ltd through existing MTN programme
- **Raised S\$100 mil**, 2-year tenor with 1.98% interest rate
- Anchored on **Republic Plaza** [BCA GM Platinum] as a Green asset
- Rewarding Investors – Proceeds used to refinance loan from investors for construction and retrofitting of Republic Plaza
- Based on a creditable Framework from **Sustainalytics**
- Externally assured by **KPMG** & certified by **Climate Bond Initiative**

Rationale and Benefits

- First-mover advantage: place CDL on the radar of international SRI funds and investors looking for green financial products
- Tapping onto a growing green bond market – global green bond issuances expect to reach record **US\$206 billion*** in 2017
- Support **national goal of greening 80% of buildings by 2030** by illustrating positive results from **greening existing buildings**
- Expands financing streams
- Encourage building owners to invest in green building

** Estimate: Moody's Investors Service*

Commitment to Green Building

- Invests 2-5% of construction cost of a new development in green design/features/methods over a decade now
- Operating Cost Savings e.g. over \$16m in utility savings from 2012–16 for 8 CDL-managed office buildings
- Since 2011: set minimum target for all new dev'ts to be GM Gold^{PLUS} certified
- 87 GM certified (34 Platinum & 24 Gold^{PLUS}) properties as at end 2016, highest among pte developers



7 & 9 Tampines Grande [2009]



LEED Gold Cert & Most Extensive Solar Panels in a Comm Dev't (2009)

11 Tampines Concourse [2009]



Asia Pac's 1st CarbonNeutral® Dev't (2009)

City Square Mall [2009]



Singapore's 1st Eco-mall

Savannah CondoPark [2002]



Singapore's 1st Eco-condo
Solar Energy to Power its Club House

Tree House [2014]



Guinness Record: Largest Vertical Garden
(Apr '14 – Jun '15)

D'Nest [TOP 2018]

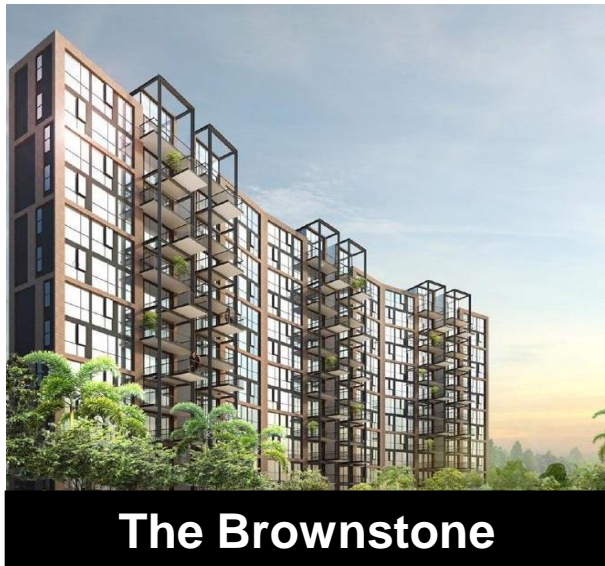


Singapore Book of Records: Largest Solar Panel [1,520 sq m; 219,000 kWh/yr]

Game Changing Technologies and Innovation



- **80-metre long Microclimatic Canopy** engineered and designed to provide naturally ventilated shelter, encouraging airflow and filtering out radiant heat
- **219,000 kwh/year from 1,800 sq m of PV panels** – energy stored lights up canopy & façade at night
- Raises energy efficiency by over **30%**
- **3,400 m² of Sky gardens:** act as ‘green lungs’
- **Rainwater harvest:** irrigate extensive landscape
- **Incorporates** 4 conserved buildings with modern structure
- **Savings:** Est. 17 million KWh of energy and 174,000 m³ of water annually



World's largest PPVC application for

- **Residential development involving some 4,600 638-unitsmodules**
- 1st Mover Advantage – building knowledge, capacity & experience
- Launched 2015, est. TOP Jan '19 - Setting industry benchmark, ahead of Gov. regulations (w.e.f. 2019)*
- Sustainable building method with better EHS & Quality
- Saved 55,000 Man Days & raise Productivity by some 40%

National Platforms to Promote Sustainability



CDL Green Gallery @ Singapore Botanic Gardens, a UNESCO World Heritage Site



- Features **botanical or greening-related exhibits**, renewed every few months
- **4.5 million Singapore Botanic Garden visitors**, overseas and local, annually

Extensive Green Features

- Singapore's **first zero energy Green Gallery**, featuring solar photovoltaic cladded roof panels (approx. 200 sq ft, 105 panels)
- 31,000 kWh solar energy generated vs 30,000 kWh usage annually
- Constructed using **Hempcrete, an eco-friendly biomaterial**, adopted for the first time in Singapore
- **Passive architectural design** taking into account the site's natural attributes
- **Prefabricated construction method** that minimizes environmental impact
- **Green roof** with drought-resistant plant species
- **Green walls** with butterfly-attracting plant species
- Awarded **BCA Green Mark Platinum**



Nurturing Green Generations of Tomorrow



My Tree House – World's 1st Green Library for Kids

- **Tri-Sector Collaboration** - National Library Board, CDL & 11 design and building industry partners
- Collection of 70,000+ book titles, comprising some 30% with green focus
- Target audience: **children aged 4-12**
- **Over 1 mil visitors/year** since launch in May 2013

Extensive Green Features and Focus

- **Green Design/Construction:** Use of eco-friendly building & decorative materials e.g. energy-efficient LED lighting, refurbished bookshelves, carpets with green properties.
- Centre piece constructed with **3,000 recyclable plastic bottles** collected from the public, schools and City Square Mall
- **Green programming:** Over 400 eco-programmes since 2013
- Awarded **BCA Green Mark Platinum**



Extensive 3P, Cross Sectoral Partnership

Positive Energy Singapore Sustainability Academy

- **First major 3P ground-up initiative** between CDL & the Sustainable Energy Association of Singapore (NGO), supported by **6 government agencies and 15 founding industry & NGO partners**
- To **promote a low-carbon economy, resource efficiency, and sustainable practices** among businesses and the community, in particular, youths
- A hub for building capacity, education and training, knowledge and resource sharing, collaboration, advocacy & stakeholder engagement for a cleaner, greener and more sustainable future
- 3,200 sq ft of photovoltaic panels – 60,000 kwh/year vs est. use of 50,000 kwh usage/year; positive energy since opening
- First in Singapore to have its construction materials, **Cross Laminated Timber and Glued Laminated Timber** verified by the Nature's Barcode™ system
- Awarded **BCA Green Mark Platinum**



Opened by DPM Teo Chee Hean and Minister Masagos Zulkifli on 5 June 2017, World Environment Day

Extensive Outreach Programmes In Support Of SDGs



Women4GREEN

To celebrate, inspire and empower women to create a financially, environmentally and socially sustainable future.



CDL E-GENERATION CHALLENGE 2017



Young Eco-Champion will join The International Antarctic Expedition led by renowned explorer Robert Swan



Open Category Winner



Student Category Winner



Sustainability Studio @SSA

In partnership with



Video series featuring inspiring green solutions in support of SDGs via broadcast & digital media

Promoting Low Carbon and Zero Waste Practices

Active Stakeholder Engagement



EcoBank – Zero Waste community



- Encouraging 3R while raising more than \$35,000 in total for disadvantaged children
- 2017: Collected 10+ tons of donated items, waste reduction and saving some 2,700 tonnes of carbon emissions going to the land field
- Eco education, awareness and outreach to hundreds of thousands via online and social media platforms

Tenant Engagement - BPfP



- Inaugural tenant outreach session by a landlord to promote Better Places for People (BPfP), co-organised with World Green Building Council (WGBC) and Singapore Green Building Council; supported by BCA
- BPfP Initiative rolled out by WGBC in 2016 to promote awareness of green buildings as healthier & more productive places for workers

Building an Active and Gracious Green Community



Reduce @ North West

Engaging the Community to Reduce Energy Use



Year	2015	2016
Household outreached	63,000	68,000
Household signups	1,800	3,000
Beneficiaries (unique)	116	94
Schools involved	14	18

- Educating & encouraging residents to reduce energy consumption
- Engaged 200 students & 3,700 residents from low income families since 2015

Learning Space @ Limbang

Building a Smart and Caring Community



- Outreach initiative between CDL and North West Community Development Council
- This designated learning space, created and designed by CDL, targets to empower over 200 children and youths residing at Limbang to enjoy quality time after school.
- National Library Board donated books for kids' reading corner; Nanyang Technological University students provide free tuition for youths

8 Global Sustainability Trends Driving Businesses in 2017 and Beyond

1. The Impact of Climate Change Goes Global

168 Parties* ratified the Paris Agreement – the first truly global and binding climate change agreement

2. Rising Social Inequality and Disengagement

Migration, inequality and global action on climate change are key issues

3. Increasing Pressure on Natural Resources >> Price Hikes

Raw material shortage causes price hike, water scarcity leads to conflicts

4. The Rise of the City-level State

Power shift from central sources to cities and communities

5. Tech-driven Innovation Disrupts Societies and Industries

Emergence of products to support sustainable lifestyles and infrastructure

6. Private Sector as the Engine to Deliver on Paris Agreement and SDGs

Increasing numbers of businesses aligning business strategies to the SDGs

7. Sustainability Perceived Increasingly as an Opportunity

Sustainability moves up on the boardroom agenda, circular and sharing economy on the rise

8. Collaboration is King

More collaborations emerge across value chains for sustainability



CDL FUTURE VALUE 2030



CITY DEVELOPMENTS LIMITED

Thank you!

www.cdlsustainability.com