Asia Pacific Conference

Sustainable City and Communities: The Singapore Experience

Presented by:

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City Developments Limited

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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

UN Sustainable Development Goals
- 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
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

“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
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


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.
| 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 5\textsuperscript{th} version with stringent requirements |
| Environmental Sustainability Measures for Buildings | **Enhancement w.e.f. Jan 2017:**  
Existing buildings with centralised cooling systems and GFA >5,000m\textsuperscript{2} to achieve minimum 50 Green Mark points and meet pre-requisites when installing and replacing building cooling system. |
| 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)*
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.)
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.

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.

https://sustainabledevelopment.un.org/content/documents/16257Climate_Action_Plan_Publication_Part_1.pdf
Business Integration of SDGs – The CDL Story
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
# CDL’s Sustainability Journey Since 1995


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<tr>
<td>1995 Adopted CSR-Centric Vision &amp; Mission</td>
<td>2010 Global 100 Most Sustainable Corporations in the World; DJSI (World &amp; AP); BCA Green Mark Platinum Champion;</td>
<td>2015 Published dedicated Climate Change Policy; BCA Green Mark Pearl Prestige sole winner; Adopted Integrated approach for Sustainability Reporting</td>
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<tr>
<td>1998 First SG developer to install energy-saving lifts in residential developments</td>
<td>2011 GRI A+ Sustainability Report CNA Green Luminary Award;</td>
<td>2016 NUS-CDL Smart Green Home Lab &amp; T² Lab; 1st SG developer to achieve ISO 14064-1GHG; Aligned to 9 UN SDGs;</td>
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<td>2001 EHS 5-Star Assessment System</td>
<td>2012 First SG landed housing development with individual-unit solar energy, HAUS@SERANGOON</td>
<td>2017 Launched CDL Future Value 2030 Sustainability Blueprint + Digital Quarterly Update</td>
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<td>2003 EHS Policy; ISO 14001 EMS; OHSAS 18001</td>
<td>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</td>
<td>Zero Energy Singapore Sustainability Academy</td>
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<td>2004 CSR report in Annual Report; Let’s Live Green!; Adopted more international sustainability benchmarks</td>
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<td>2005 Signatory to UN Global Compact; Founding member(SG Compact)</td>
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<td>2008 SG’s 1st GRI-checked SR</td>
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<td>2009 BCA Built Env Leadership (BEL) Platinum Award;</td>
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Future proofing 2030 – CDL’s Value Creation Model

SUSTAINABILITY BLUEPRINT:
CDL FUTURE VALUE 2030

OUR VISION:
BUILDING VALUE FOR TOMORROW, TODAY

CONSERVE AS WE CONSTRUCT

Develop

Engage

Manage

Human Capital

Organisational Capital

Manufactured Capital

Financial Capital

Natural Capital

Build Sustainable Profitability while Conserving the Environment

Build Quality, Green and Innovative Spaces

Build a Resilient Organisation and Committed People

Build Partnerships and Bonds with the Community

Social and Relationship Capital
Sustainability Journey Since 1995.

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

SDGs Alignment Since 2016.
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
- To double our commitment to adopt innovations and technology for green buildings
- To double resources devoted to advocacy of sustainability practices, stakeholder engagement and capacity building

SDG 11: Sustainable Cities and Communities
SDG 9: Resilient and Innovative Infrastructure
SDG 17: Partnership for Sustainable Development
## CDL Future Value 2030 Goal 2: Reducing Environmental Impact

<table>
<thead>
<tr>
<th>Goal</th>
<th>SDG</th>
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<tr>
<td>To achieve the science-based target of reducing carbon emissions intensity by 38% from 2007 levels</td>
<td>SDG 13: Urgent Action to Combat Climate Change</td>
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<tr>
<td>To reduce the usage intensity of energy and water by 25% from 2007 levels</td>
<td>SDG 7: Affordable and Clean Energy</td>
</tr>
<tr>
<td>To reduce total waste disposed by 50% from 2016 levels</td>
<td>SDG 12: Responsible Consumption and Production</td>
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<tr>
<td>To ensure 100% of appointed suppliers are certified by recognised environmental standards</td>
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<tr>
<td>To ensure 50% of our construction materials are derived from recycled content, low-carbon sources or certified by recognised environmental organisations</td>
<td>SDG 15: Biodiversity and Resource Conservation</td>
</tr>
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</table>
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 GoldPLUS certified
- 87 GM certified (34 Platinum & 24 GoldPLUS) properties as at end 2016, highest among pte developers

- 7 & 9 Tampines Grande [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%
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**
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**
To celebrate, inspire and empower women to create a financially, environmentally and socially sustainable future.

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

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

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

Engaging the Community to Reduce Energy Use

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<th>Year</th>
<th>2015</th>
<th>2016</th>
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<tr>
<td>Household outreached</td>
<td>63,000</td>
<td>68,000</td>
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<tr>
<td>Household signups</td>
<td>1,800</td>
<td>3,000</td>
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<tr>
<td>Beneficiaries (unique)</td>
<td>116</td>
<td>94</td>
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<tr>
<td>Schools involved</td>
<td>14</td>
<td>18</td>
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- 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
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<tr>
<th>1. The Impact of Climate Change Goes Global</th>
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<td>168 Parties* ratified the Paris Agreement – the first truly global and binding climate change agreement</td>
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<tr>
<th>2. Rising Social Inequality and Disengagement</th>
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<tr>
<td>Migration, inequality and global action on climate change are key issues</td>
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<th>3. Increasing Pressure on Natural Resources &gt;&gt; Price Hikes</th>
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<td>Raw material shortage causes price hike, water scarcity leads to conflicts</td>
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<th>4. The Rise of the City-level State</th>
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<td>Power shift from central sources to cities and communities</td>
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<th>5. Tech-driven Innovation Disrupts Societies and Industries</th>
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<td>Emergence of products to support sustainable lifestyles and infrastructure</td>
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<th>6. Private Sector as the Engine to Deliver on Paris Agreement and SDGs</th>
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<td>Increasing numbers of businesses aligning business strategies to the SDGs</td>
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<th>7. Sustainability Perceived Increasingly as an Opportunity</th>
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<td>Sustainability moves up on the boardroom agenda, circular and sharing economy on the rise</td>
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<th>8. Collaboration is King</th>
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<td>More collaborations emerge across value chains for sustainability</td>
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*As of 12 Oct 2017
Cambridge Institute of Sustainability Leadership, 2017

Source: