



# GREEN BUILDING: CHALLENGES AND OPPORTUNITIES

---

DR. RAYMOND YAU, GENERAL MANAGER, TECHNICAL SERVICES & SUSTAINABLE DEVELOPMENT

# PERFORMANCE AMONGST TOP SD LEADERS



**1<sup>st</sup>** in Asia  
Rank 8<sup>th</sup> globally



**Top Company**



**Global Sector  
Leader**  
5-star Rating



**'AAA'** rating (2019)<sup>1</sup>

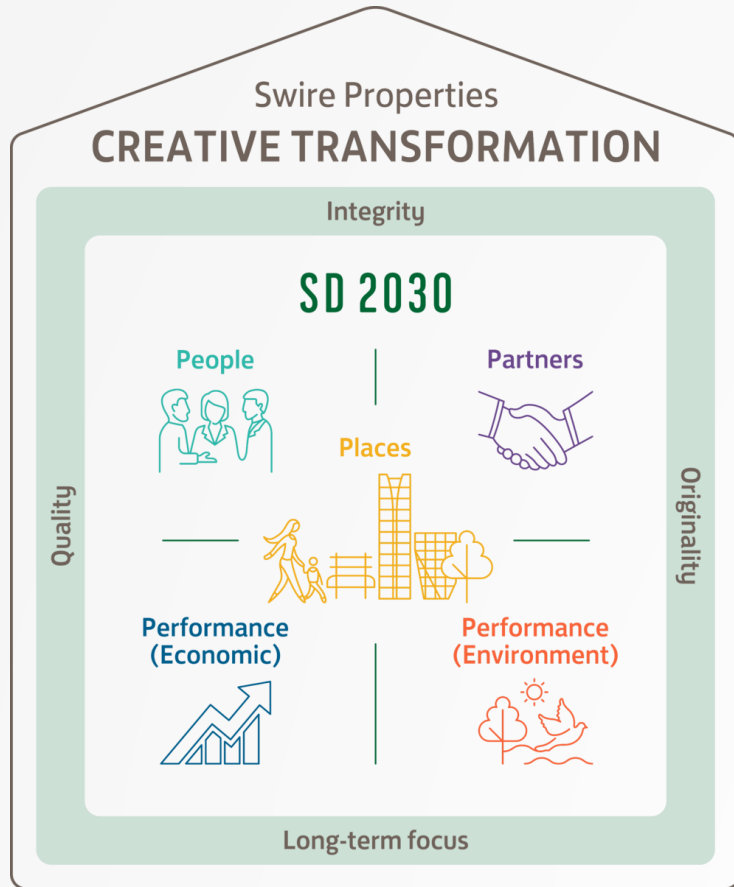


The only HK and Mainland China  
developer listed (2019)



**FTSE4Good**  
(2017, 2018, 2019)

# SUSTAINABLE DEVELOPMENT (SD) 2030 STRATEGY



*SD Vision –  
“To be the leading SD performer in our industry globally by 2030”*

**SD Integration into Business**



Business Performance  Corporate Risk Register 

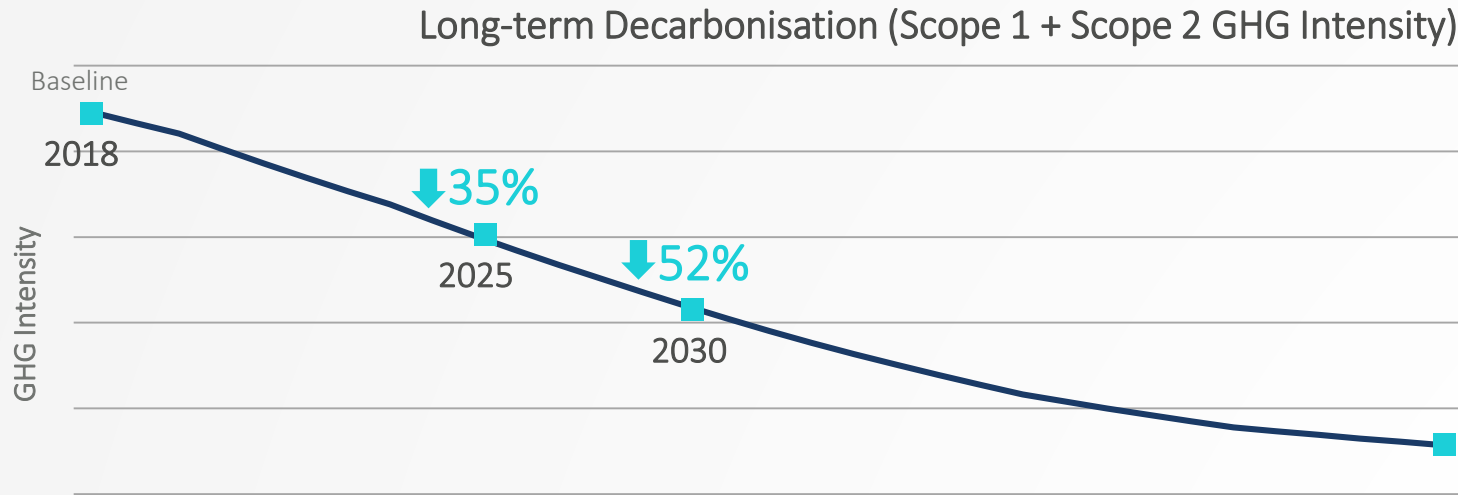
Annual Budget Planning 

Employee Performance Goals Setting  Investment Decisions 



# CARBON PERFORMANCE

## MARKET LEADER IN DECARBONISATION STRATEGY



### GHG Intensity/Decarbonisation – Scope 3 GHG Intensity



**1<sup>st</sup> & Only Developer in HK & Mainland China – approved SBTs**



SCIENCE  
BASED  
TARGETS

#### Scope 1 + Scope 2

Technological Innovation  
On and Off-site Renewable Energy  
Joint Research with Tsinghua University

#### Scope 3 - Upstream

New Projects Development  
embodied carbon reduction target

#### Scope 3 - Downstream

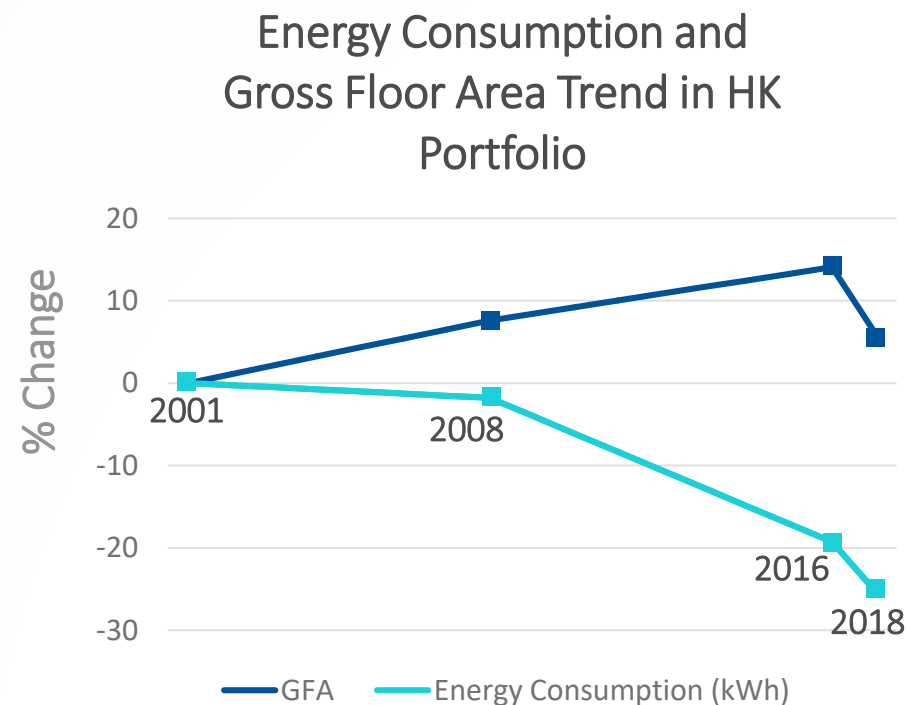
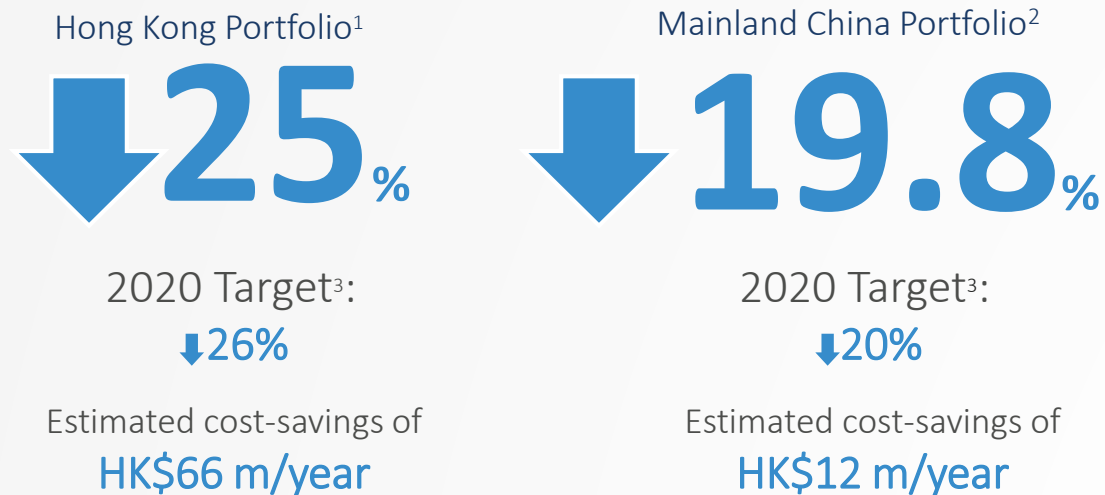
Tenant Engagement  
tenant carbon reduction target

\* Scope 1 emissions are direct greenhouse gas (“GHG”) emissions from sources that are owned or controlled by Swire Properties, such as emissions from natural gas, diesel and town gas burned onsite.  
Scope 2 emissions are indirect GHG emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by Swire Properties.  
Scope 3 emissions are all indirect emissions that occur in the value chain of the reporting company, including both upstream and downstream emissions.

# ENERGY PERFORMANCE

## DECOUPLING GFA GROWTH AND ENERGY CONSUMPTION

### Energy Reduction



<sup>1</sup> Hong Kong portfolio is our office, retail portfolios and hotels in Hong Kong.

<sup>2</sup> Mainland China portfolio is our office and retail portfolio in Mainland China, excluding hotels.

<sup>3</sup> Energy consumption refers to purchased electricity for the provision of shared services for and in the common parts of our buildings with reference to the BAU baseline level in 2008 for our Hong Kong portfolio, and the BAU baseline level in the first year for which a complete calendar year of data was available for projects in our Mainland China portfolio.

\* All figures are calculated based on 2018 data.

# GREEN BUILDING PERFORMANCE

## SHAPING INDUSTRY STANDARDS FOR OVER 20 YEARS

Achieve the highest environmental building assessment scheme rating for all projects under development

**100%**   
of projects under development<sup>1</sup>  
achieved **highest** green building  
certification ratings

**92%** of all existing buildings<sup>2</sup>  
are **certified green buildings**, of which  
**75%** achieved **highest ratings**

# GREEN BUILDING PERFORMANCE

## SHAPING INDUSTRY STANDARDS FOR OVER 20 YEARS

---

### BEAM Plus (HK)

---



- **37** buildings with BEAM / BEAM Plus certification including **18** buildings with BEAM Plus Existing Building V2.0 Final Platinum

### LEED (HK, Mainland China, US)

---



- **33** buildings with LEED

### WELL

---



- Asia's 1<sup>st</sup> commercial Building – One Taikoo Place achieved **Final Platinum**
- Two Taikoo Place achieved **Pre-certified Platinum**



# ONE TAIKOO PLACE – ADOPTING NEW GREEN BUILDING TECH

---



# ONE TAIKOO PLACE

## FEATURING STATE-OF-THE-ART GREEN BUILDING TECH



HK 1<sup>st</sup> commercial building - Biodiesel tri-generation system



Combined green roof and solar PV system



HK 1<sup>st</sup> AI-enabled smart building

# TECHNOLOGICAL INNOVATION

## INNOVATING TO ENHANCE BUILDING PERFORMANCE



New Ventures



**NEW** Digital Transformation of Technical Services



**NEW** UrbanLab

# RETRO-COMMISSIONING OF HVAC SYSTEMS

## ENHANCING BUILDING ENERGY EFFICIENCY



Partnership with Tsinghua University –  
Monitoring-based  
commissioning of HVAC system



Electronically-commutated  
(EC) plug fan replacement



Variable speed drive chiller  
replacement



Taikoo Place

# BUILDING THE MOMENTUM OF GREEN FINANCE

---

# GREEN FINANCING

## DIVERSIFICATION OF FUNDING SOURCE AND INTEREST COST SAVINGS



### Green Bond Impact Report



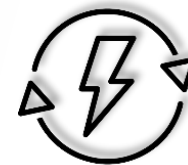
Allocation of funds and environmental impact on:

- Green buildings
- Renewable Energy
- Energy Efficiency
- Sustainable Water and Wastewater Management

### Year-on-Year SD Performance

MEMBER OF  
**Dow Jones Sustainability Indices**  
In collaboration with  a RobecoSAM brand




- Retains listing on the DJSI World Index
- Achieves a target reduction in energy intensity each year for Hong Kong portfolio



# ESTIMATED ENVIRONMENTAL PERFORMANCE

## ONE TAIKOO PLACE



Category	Highlights of Green Elements	Estimated Environmental Impact
<b>Renewable Energy</b> 	<ul style="list-style-type: none"> <li>Dual-level roof fitted with an integrated solar photovoltaics (PV) system and green roof</li> <li>Bio-diesel tri-generation system to supply heating, cooling and electricity. Used cooking oil from tenants is converted into biodiesel by third-party recyclers to power this system</li> </ul>	<ul style="list-style-type: none"> <li>Total renewable energy generated annually: <b>468,300 kWh</b>, which is equivalent to an annual carbon emissions avoidance<sup>1</sup> of <b>370 tonnes</b> of CO<sub>2</sub>e</li> </ul>
<b>Energy Efficiency<sup>2</sup></b> 	<ul style="list-style-type: none"> <li>Air handling units with electronically commutated (EC) plug fans to enhance efficiency</li> <li>Highly optimized chiller control system with powerful data analytics</li> <li>Energy efficient lighting and control system</li> </ul>	<ul style="list-style-type: none"> <li>Annual energy savings exceeding BEAM Plus<sup>3</sup> and LEED<sup>4</sup> baseline performance by 33% and 28% respectively</li> </ul>
<b>Sustainable Water and Wastewater Management</b> 	<ul style="list-style-type: none"> <li>Harvest rainwater for irrigation and recycle grey water for flushing</li> <li>Low-flow sanitary fittings</li> </ul>	<ul style="list-style-type: none"> <li>Freshwater savings exceeding BEAM Plus baseline performance by &gt;40%</li> </ul>

<sup>1</sup> Calculated by using the 2017 emission factor of Hong Kong Electric

<sup>2</sup> Expenditures relating to energy efficiency element of One Taikoo Place are included in "Green Buildings" Category


<sup>3</sup> Based on Building Energy Code 2012 Edition as baseline

<sup>4</sup> Based on ASHARE 90.1.2007 as baseline (LEED 2009 for Core and Shell Development)

# ESTIMATED ENVIRONMENTAL PERFORMANCE

## ENERGY EFFICIENCY PROJECTS IN HK PORTFOLIO



Category	Highlights of Green Elements	Estimated Environmental Impact																
<b>Energy Efficiency</b> 	<ul style="list-style-type: none"> <li>High efficiency chiller system at Taikoo Place and Pacific Place</li> <li>Energy efficient lighting including LED at Taikoo Place, Pacific Place and Cityplaza</li> <li>Variable speed drive (“VSD”) for condensing water pumps at Taikoo Place and Cityplaza to enhance energy efficiency</li> <li>EC Plug fans in air handling units at Taikoo Place and Pacific Place to enhance energy efficiency<sup>1</sup>. Pilot testing of EC plug fans estimated that the use of fan energy could be reduced by up to 30%</li> </ul>	<ul style="list-style-type: none"> <li>Annual energy saving:               <table border="0"> <tr> <td>Cityplaza:</td> <td>165,900 kWh</td> </tr> <tr> <td>Taikoo Place:</td> <td>3,375,200 kWh</td> </tr> <tr> <td>Pacific Place:</td> <td>2,899,900 kWh</td> </tr> <tr> <td><b>Total:</b></td> <td><b>6,441,000 kWh</b></td> </tr> </table> </li> <li>Annual carbon emissions avoided:               <table border="0"> <tr> <td>Cityplaza:</td> <td>131 tonnes of CO<sub>2</sub>e</td> </tr> <tr> <td>Taikoo Place:</td> <td>2,666 tonnes of CO<sub>2</sub>e</td> </tr> <tr> <td>Pacific Place:</td> <td>2,291 tonnes of CO<sub>2</sub>e</td> </tr> <tr> <td><b>Total:</b></td> <td><b>5,088 tonnes of CO<sub>2</sub>e</b></td> </tr> </table> </li> </ul>	Cityplaza:	165,900 kWh	Taikoo Place:	3,375,200 kWh	Pacific Place:	2,899,900 kWh	<b>Total:</b>	<b>6,441,000 kWh</b>	Cityplaza:	131 tonnes of CO <sub>2</sub> e	Taikoo Place:	2,666 tonnes of CO <sub>2</sub> e	Pacific Place:	2,291 tonnes of CO <sub>2</sub> e	<b>Total:</b>	<b>5,088 tonnes of CO<sub>2</sub>e</b>
Cityplaza:	165,900 kWh																	
Taikoo Place:	3,375,200 kWh																	
Pacific Place:	2,899,900 kWh																	
<b>Total:</b>	<b>6,441,000 kWh</b>																	
Cityplaza:	131 tonnes of CO <sub>2</sub> e																	
Taikoo Place:	2,666 tonnes of CO <sub>2</sub> e																	
Pacific Place:	2,291 tonnes of CO <sub>2</sub> e																	
<b>Total:</b>	<b>5,088 tonnes of CO<sub>2</sub>e</b>																	

