Who is Lend Lease?

Lend Lease is one of the leading fully integrated property solutions providers in the world. We can provide investors and clients with one element of the property value chain or an end-to-end solution.
For sustainable living, we must reduce our annual CO2 emissions to 1 ton per capita.

World average (2010): 5 ton CO2 per person

Property Sector – Global Environmental Impacts

Buildings are responsible for 40% of the world’s total greenhouse gas emissions.

Buildings are responsible for 40% of total waste generation globally.

Buildings utilize 1/3 of the world’s resources.

Air quality in buildings typically contains up to 5X more pollutants than outdoor air.

A SHRINKING EARTH?
OVER CONSUMPTION

EARTH OVERSHOOT DAY

<table>
<thead>
<tr>
<th>YEAR</th>
<th>OVERSHOOT DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>19 December</td>
</tr>
<tr>
<td>1990</td>
<td>7 December</td>
</tr>
<tr>
<td>1995</td>
<td>21 November</td>
</tr>
<tr>
<td>2000</td>
<td>1 November</td>
</tr>
<tr>
<td>2005</td>
<td>20 October</td>
</tr>
<tr>
<td>2007</td>
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<td>2008</td>
<td>23 September</td>
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<td>2009</td>
<td>27 September</td>
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<td>2010</td>
<td>21 August</td>
</tr>
<tr>
<td>2011</td>
<td>27 September</td>
</tr>
<tr>
<td>2012</td>
<td>22 August</td>
</tr>
</tbody>
</table>

Source: Global Footprint Network

Lend Lease – Sustainability Philosophy

We believe that every action adds up.
What is a ‘green building’?

Green Buildings

The Organisation of Economic Co-operation and Development (OECD) defines green buildings as those buildings that have minimum adverse impacts on the built and natural environment in terms of the buildings themselves, their immediate surroundings and the broader regional and global setting.

The Gauge – Bourke St, Melbourne
Green Buildings – Key Drivers in the Market

- Investor Demand
- Future Proofing Asset Value
- Tenant Demand
- Competitive Advantage
- Government Leadership
- Green Lease Requirements
- Established Benchmark

Tenant Value – Quality Built Environment

- Building Managers See Higher Tenant Satisfaction After Green Upgrades
- Before Green Upgrade: 53%
- After Green Upgrade: 34%
- Current Satisfaction Level: 91%


Green Building Case Study – Suruhanjaya Tenaga

<table>
<thead>
<tr>
<th>PROJECT DESCRIPTION</th>
<th>RELIABLE CORPORATION OFFICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCATION</td>
<td>Suruhanjaya Tenaga</td>
</tr>
<tr>
<td>RENTED Area</td>
<td>36,000 sq ft</td>
</tr>
<tr>
<td>GROSS REAR AREA (GFA)</td>
<td>36,000 sq ft</td>
</tr>
<tr>
<td>NETT LEASE AREA (GLA)</td>
<td>21,000 sq ft</td>
</tr>
<tr>
<td>NETT LEASE AREA (GFA)</td>
<td>21,000 sq ft</td>
</tr>
<tr>
<td>NETT LEASE AREA (GLA)</td>
<td>21,000 sq ft</td>
</tr>
<tr>
<td>CFM</td>
<td>750 sq ft</td>
</tr>
<tr>
<td>ECS</td>
<td>50/50%</td>
</tr>
<tr>
<td>PROJECT COST</td>
<td>AED 2,350,000</td>
</tr>
</tbody>
</table>

Source: Putra Perdana Construction

Life Cycle Costs of a Building

- 30-year cost of a building
- Design & Construction: 90%
- Maintenance: 5%
- Personal Salaries: 5%

Source: Sustain Energy Industries
Investor Value – Superior Returns

- Equity + Financing
- Rent / Other Incomes
- Opex
- Capex
- Taxation + Other Costs

Incremental Return via Green Value Creation ($y)

- Opex Savings
- Rent Income growth
- Sunk “Green” Capex
- Govt Incentives

Superior Investment Return ($x + $y)

Standard Return

Green Buildings – Key Challenges

- Existing Building Stock
- Strata titled building stock
- Tenants & Consumer Mindset
- Alternate Financial Solutions
- Business as usual
The Various Stages of a Project

- Conceptual/Schematic Design
- Design Development
- Tender/Contract Documentation
- Construction
- Testing & Commissioning
- Handover & Building Occupation

... Which can be simplified into

- Planning
- Pre-Construction
- Construction
- Handover

The Integrated Design Process

Integrated design process emphasizes more upfront investment

Integrated Approach

...Begin with the End in mind...
The Integrated Design Process

The use of an integrated design process can help to achieve project aspirations/goals:

- Establish performance targets
- Ensure that the design team has the range of needed skills
- Establish a reference model
- Hold a stakeholder meeting before any design concepts are developed
- Develop one or more high performance options
- Carry out several simulations during the course of design development
- Make a decision and implement it
Concept – Building Orientation

- Building orientation a big influence
- Sun Path to be considered
- North-South orientation preferred in the tropics
- Sun path study/analysis helps
- Selection and placement of windows dependant on analysis

Menara Public Mutual, Malaysia - Schematic

Building Orientation – Sun Path Videos

Sunny sky.
21 Dec, 1200
View from 3rd floor
Building Orientation – Sun Path Videos

Building Orientation – Daylight Study

No Skylight
Ground Floor, Overcast sky
10,000 Lux

Building Orientation – Daylight Study

With Skylight
VLT=0.5
Ground Floor, Overcast 10,000 CIE

Building Orientation – Daylight Study

Sunny sky,
21 Dec, 1200
View from 3rd floor to entrance
Design Development – Daylight options

Menara Public Mutual, Malaysia
- Design Development

Tender Documentation

Menara Public Mutual, Malaysia
- Construction – Planning
Green Project Management (Const Stage) – Flow and Controls

- Design, procurement and monthly feedback reviews
- Periodic checks and audits on the stages of construction and equipment/materials used
- Verify that materials procured and used are correct
- Compliance audits and inspections
- Review of changes
- Monthly reports on waste, energy, water, etc
- Completed project in line with Green Building Status

Green Precincts

Future – the opportunity
- Sustainable Lifestyle
- Tomorrow
- Sustainable Precincts
- To date
- Sustainable Buildings
The Asia of tomorrow?

How will the next generation of sustainable cities look?

Malaysia Green Building Confederation

A membership-based not-for-profit organization formalized in 2009, aiming to promote sustainable built solutions for everyone.

Membership of > 300 as of Dec 2011 with more than 80 Industry Partners (with a year to year growth of 100%)

Initiated the development of GBI in 2007 and continues to promote the local rating

An emerging member of WGBC, only organization supported by the global body

Membership application forms can be downloaded at www.mgbc.org.my.
greenpagesmalaysia – an information resource directory for green building products and services.

The primary objective – providing info on sustainable building products and services to architects, engineers, developers and others.

A user-friendly, online interface will be consistently updated.
Sustainability: Every Action Adds Up