Estidama – The Vision 2030 Sustainable Foundation

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Abu Dhabi Vision 2030 is about Planning for the Future
(Abu Dhabi Economic Vision 2030 and Plan Abu Dhabi 2030)

The future is unforeseeable without sustainability

Abu Dhabi is at the forefront of responsible sustainable policies
Executive Council Mandate - April 2010

• All New Communities to be:

• All New Buildings and Villas to be:

• All Government Buildings & Villas:
Estidama – Pearl Rating Systems

50% Energy & Water

IDP

NS

LV/LB/LC

SM
Estidama – Pearl Rating Systems – Integrated Development Process

- Establishes collaborative teamwork & iterative design process
- Encourages construction activities that value:
  - workers welfare
  - quality &
  - environmental management
- Prepares for good O&M practices where users play an active role Achieve goals on-time & on-budget
## Estidama – Pearl Rating Systems – Integrated Development Process

### I.D.P vs Conventional Design Process

<table>
<thead>
<tr>
<th>Integrated Development Process</th>
<th>Conventional Design Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involves team members from the outset</td>
<td>Involves team members only when essential</td>
</tr>
<tr>
<td>Front-loaded: time &amp; effort invested early</td>
<td>Less time, effort &amp; collaboration demonstrated in early stages</td>
</tr>
<tr>
<td>Decisions influenced by broad team</td>
<td>Decisions made by few team members</td>
</tr>
<tr>
<td>Iterative process</td>
<td>Linear process</td>
</tr>
<tr>
<td>Whole-systems thinking</td>
<td>Systems often considered in isolation</td>
</tr>
<tr>
<td>Seeks Synergies</td>
<td>Less opportunities for synergies</td>
</tr>
<tr>
<td>Life-cycle Costing</td>
<td>Emphasis on up-front costs</td>
</tr>
<tr>
<td>Process continues after construction</td>
<td>Typically finished upon construction</td>
</tr>
</tbody>
</table>

Source: Adopted from ‘Roadmap for the Integrated Design Process’ by Busby Perkins+Will, Stantec Consulting
Estidama – Pearl Rating Systems – Natural Systems

- Analyse and assess of natural systems onsite
- Conserve existing natural systems through protection or mitigation
- Develop a Natural System Design and Management Strategy
- Encourage the reuse of land
- Enhance ecological value
- Create habitat, restore habitat and provide habitat connections
- Provide shaded walkways
- Promote a more thermally comfortable outdoor space
- Encourage the use of active urban environments

- Provide accessible local amenities
- Encourage the use of alternative modes of transport
- Reduce urban light pollution
- Promote indoor air quality management during construction & operation
- Improve ventilation quality during normal building operation
- Select materials to reduce harmful emissions
- Improve indoor thermal comfort (occupant control)
- Create visually comfortable environments (reduce glare, views etc.)
Reduce indoor & outdoor water demand
Reduce losses – monitoring
Use alternative sources – onsite treatment & grey water
Reduce energy demand through passive design

Improve efficiency (HVAC, lighting, appliances)

Incentivize renewable sources of energy
- Prohibit the use of hazardous materials
- Implement comprehensive waste management (Construction and Operational)
- Reduce materials usage
- Sustainable sourcing of materials
- Promote the use of recycled materials
- Promote recycling industry
- Showcase of cultural and regional design strategies
- Innovative solutions during design or construction
The Estidama Villa Products Database (EVPD) is a database of products that have been determined to be compliant with the Pearl Villa Rating System (PVRS) requirements.

The EVPD covers the following product categories all of which are applicable to the PVRS:

- Water Fixtures & Fittings
- Insulation Products & Systems
- Windows & Glazing
- Air Conditioning Equipment
- Solar Hot Water
The *Pearl Rating System* aims to address the sustainability performance of a development throughout its lifecycle and in relation to the 4 pillars of Estidama.
## Estidama Training Program

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Number of Sessions</th>
<th>Total Attendees (as of 12-Sep-2013)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Rating Training *</td>
<td>337</td>
<td>7,014</td>
</tr>
<tr>
<td>Construction Rating Audit Training</td>
<td>23</td>
<td>464</td>
</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td><strong>360</strong></td>
<td><strong>7,478</strong></td>
</tr>
</tbody>
</table>

### Training Attendees
- **Private Sector**: 16% (75%)
- **Government**: 3% (6%)
- **Student**: 3%
- **Other**: 6%

### Private Sector- Occupation
- **Consultant**: 37%
- **Contractor**: 63%

*Design Rating Training consist of the following sessions:
- Understanding Estidama & the PRS (2 hours)
- Understanding the EVPD for Consultants (1.5 hours)
- PBRS: 1 Pearl Training / Workshop (7 hours)

Source: Estidama Training Attendee Database
Why Estidama – Pearl Rating Systems?

- Tailored to Abu Dhabi’s unique climate, culture and transformational ambitions
- Government Mandate
- Reinforces Plan 2030 and local codes
- Recognizes traditional design and cultural practices
- Emphasizes integrated design from project inception
Estidama Developments - Stages

Estidama Rated Buildings and Villas

460 Developments

10,667,646m² In programme

5,325,857m² Under Construction

961,272m² Completed

Source: Estidama Project Log (27th October 2013)
Estidama – Development Summary

Project Pearls

Pearl GFAm^2

Buildings Numbers by Rating

Villa Numbers by Rating

Source: Estidama Project Log (27th October 2013)
How Do We Ensure Savings Are Achieved

Reducing the Performance Gap by Stage Monitoring

- Poor
- Good
- Optimum

<table>
<thead>
<tr>
<th>Stage</th>
<th>Pre-Concept Rating</th>
<th>Design Rating</th>
<th>Construction Rating</th>
<th>Operational Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>
## Estidama – Building Case Study

### Al Ain General Facts
- **Rating**: 2 Pearl
- **Date of opening**: Oct 2011
- **Total GFA**: 5,855m²
- **Landscape Area**: 286m²
- **Cooling Source**: Chillers
- **Glazing Percentage**: 29%
- **Fenestration**: Double
- **Walls**: Insulated
- **Skylight**: Double
- **Renewables**: Hot Water
- **Construction Cost**: 50m AED

### Abu Dhabi General Facts
- **Rating**: None
- **Date of opening**: June 2006
- **Total GFA**: 5,950m²
- **Landscape Area**: 392m²
- **Cooling Source**: District Cooling
- **Glazing Percentage**: 27%
- **Fenestration**: Single
- **Walls**: Block
- **Skylight**: Single
- **Renewables**: None

Source/ Basis: ICLDC/ Estidama Project Log
Estidama – Building Case- Al Ain Study

Source/Basis: Abu Dhabi Distribution Company Meters/ Imperial College London Diabetes College (ICLDC)/ Tabreed/ Estidama Project Log
Green Building Taking Global Trend:

<table>
<thead>
<tr>
<th>Country</th>
<th>2012</th>
<th>2015</th>
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<tbody>
<tr>
<td>US</td>
<td>40%</td>
<td>53%</td>
</tr>
<tr>
<td>Australia</td>
<td>28%</td>
<td>47%</td>
</tr>
<tr>
<td>UK</td>
<td>45%</td>
<td>68%</td>
</tr>
<tr>
<td>Norway</td>
<td>23%</td>
<td>49%</td>
</tr>
<tr>
<td>Germany</td>
<td>17%</td>
<td>36%</td>
</tr>
<tr>
<td>Singapore</td>
<td>64%</td>
<td>89%</td>
</tr>
<tr>
<td>UAE</td>
<td>48%</td>
<td>74%</td>
</tr>
<tr>
<td>Brazil</td>
<td>24%</td>
<td>50%</td>
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</table>

## Level of Green Building Activity:

<table>
<thead>
<tr>
<th>Country</th>
<th>Green</th>
<th>Non Green</th>
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<tbody>
<tr>
<td>US</td>
<td>48%</td>
<td>52%</td>
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<tr>
<td>Australia</td>
<td>39%</td>
<td>61%</td>
</tr>
<tr>
<td>UK</td>
<td>52%</td>
<td>48%</td>
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<tr>
<td>Norway</td>
<td>32%</td>
<td>68%</td>
</tr>
<tr>
<td>Germany</td>
<td>28%</td>
<td>72%</td>
</tr>
<tr>
<td>Singapore</td>
<td>66%</td>
<td>34%</td>
</tr>
<tr>
<td>UAE</td>
<td>51%</td>
<td>49%</td>
</tr>
<tr>
<td>Brazil</td>
<td>39%</td>
<td>61%</td>
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</table>

## Triggers for Driving Green Buildings:

<table>
<thead>
<tr>
<th>1st Reason</th>
<th>US</th>
<th>Australia</th>
<th>Europe</th>
<th>Singapore</th>
<th>Brazil</th>
<th>South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client Demand</td>
<td>41%</td>
<td>37%</td>
<td>39%</td>
<td>41%</td>
<td>52%</td>
<td>44%</td>
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<tr>
<td>Market Demand</td>
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<tr>
<td>Regulations</td>
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<td>55%</td>
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<tr>
<td>2nd Reason</td>
<td>CSR</td>
<td>Client Demand</td>
<td>Market Demand</td>
<td>Client Demand</td>
<td>CSR</td>
<td>CSR</td>
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<tr>
<td>CSR</td>
<td>32%</td>
<td>35%</td>
<td>37%</td>
<td>50%</td>
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<tr>
<td>Client Demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Operating Costs</td>
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<tr>
<td>Market Demand</td>
<td></td>
<td></td>
<td></td>
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<td>35%</td>
<td>26%</td>
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</table>

## Most Important Reason:

<table>
<thead>
<tr>
<th>Reason</th>
<th>US</th>
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<th>Singapore</th>
<th>Brazil</th>
<th>South Africa</th>
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<tbody>
<tr>
<td>Energy Reduction</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<td>Water Reduction</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>3</td>
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<tr>
<td>Improved IAQ</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
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<td>5</td>
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<tr>
<td>Protect Natural Resource</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Lower Greenhouse Gases</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
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Green Buildings - Better Places - Healthier People