Sustainable Energy Investment Forum Conference
Commercial Value from Energy Efficiency Retrofitting

Tim Mockett
Dublin – 28 September 2017
Impax is a global leader in Environmental Markets investing

- Dedicated to environmental markets since 1998
- Global institutional client base
- Established thought leaders
- Offices in London, Hong Kong, New York, and Portland (OR)
- 30 experienced investment team members

ASSETS UNDER MANAGEMENT AND ADVICE

£6.7bn AUM

£6.2bn Listed Equities
£424m Renewable Energy Infrastructure
£22m Sustainable Property

WINNER OF NUMEROUS AWARDS

2017 UNPRI assessment: A+
Policies, Processes, Practices, and Governance

1As at 30 June 2017. Assets under advice represent ~4% of total AUM.

CLEAR INVESTMENT
A Sustainable Property Fund?

- Meets Manager’s corporate objective and reporting….UNPRI etc

- Fund and asset level benchmarking…. BREEAM, EPC

- Create “alpha” returns from property – City Centre Brown > Green, Buy>Fix>Sell.

- Quantify the “green alpha” created
Separating energy for base building services and tenant activities

For a rating scheme, this enables comparability between different buildings. And it gives building operators and occupants the data they need to take responsibility for the energy uses they are able to control directly.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Base building (actual occupancy)</td>
<td>Base building and occupant ratings</td>
<td>Whole building rating – classic operational rating, as used in DECs</td>
<td>Energy end uses divided between base building and occupant rating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All energy use for the building</td>
<td>Occupant lighting, small power, ICT, etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>All in common parts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lifts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hot water</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Whole building HVAC</td>
</tr>
</tbody>
</table>

Source: Design for Performance: How the commitment to disclose in-use performance can transform energy outcomes for new buildings

CLEAR INVESTMENT
New building energy use in Australia has been halved in 15 years

Source: Design for Performance: How the commitment to disclose in-use performance can transform energy outcomes for new buildings
Energy Efficiency – no ‘green bling’

Repositioning Existing Buildings: Replace inefficiency, fine tune, measure & monitor = typical energy savings of 25%+
5 St Philip’s Place, Birmingham

**Investment Summary**

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition Date</td>
<td>February 2009</td>
</tr>
<tr>
<td>Acquisition Price</td>
<td>£31.5m</td>
</tr>
<tr>
<td>Equity Invested</td>
<td>£16.0m</td>
</tr>
<tr>
<td>Acquisition Yield</td>
<td>7%</td>
</tr>
<tr>
<td>Size (Sq Ft)</td>
<td>80,358</td>
</tr>
<tr>
<td>Disposal Date</td>
<td>June 2014</td>
</tr>
<tr>
<td>Disposal Price</td>
<td>£38.0m</td>
</tr>
<tr>
<td>Disposal Gain</td>
<td>£6.5m</td>
</tr>
<tr>
<td>Gross IRR*</td>
<td>11.6%</td>
</tr>
<tr>
<td>ROE</td>
<td>1.25x</td>
</tr>
</tbody>
</table>

**Initiatives Completed**

- Comprehensive Pre-acquisition Energy analysis…multi-let but part unoccupied by Government departments…very poor Sustainability profile.
- Green Lease completed with Government tenant
- New lighting throughout office floors and common areas, new heating and cooling controls, new electrical sub-station, water flow restrictors, AMR Metering throughout
  £700k capex spent (L&T)
- DEC Energy Ratings: Acquisition G (231), Exit D (98)
- Carbon Reduction - 63% (2009-2013)
- NPV of energy savings **£151,787**

Figures as at 30 June 2017. Gross IRR does not include management fees and carried interest to be borne by investors. Equity multiple (ROE) is calculated as the net proceeds on the sale of the property to the fund (after repayment of 3rd party debt and after disposal costs) divided by the net cost of the property to the Fund (includes acquisition costs and after 3rd party debt)
Making performance visible with display energy certificates

- **5 St Philip’s Place** - High specification but poor DEC - with CO2 emissions 231% of benchmark

**WHY?**
- Annual heating energy use was 95 kWh/m² - 24% better than the DEC benchmark value of 125 kWh/m²

**BUT**
- Annual electricity use was 288 kWh/m² - over three times the DEC benchmark value of 95 kWh/m².
nPower has confirmed the meter error after a site meeting with GOWM and PE on 5 May.

Metering records were corrected. On 12 May 2009, 2008-09 data has now been updated retrospectively.

Significant rebate secured from Utility company.
G to C in less than 4 years
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electricity - kWh/year</strong></td>
<td>2,168,935</td>
<td>1,124,276</td>
<td>899,753</td>
<td>736,716</td>
<td>697,421</td>
<td>-67%</td>
</tr>
<tr>
<td>(as invoiced by the electricity supplier)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Energy - Cost p.a.</strong></td>
<td>£259,174</td>
<td>£144,510</td>
<td>£98,825</td>
<td>£77,957</td>
<td>71,239</td>
<td>-72%</td>
</tr>
<tr>
<td>(for electricity and gas as invoiced and excluding the rebate reimbursed by the electricity supplier in May 2009)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Carbon - tCO2 p.a.</strong></td>
<td>1,305</td>
<td>716</td>
<td>616</td>
<td>483</td>
<td>467</td>
<td>-64%</td>
</tr>
<tr>
<td>(for electricity and gas)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Display Energy Certificate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A-G where A is Zero Carbon)</td>
<td>G</td>
<td>F</td>
<td>E</td>
<td>D</td>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>
The challenge

- How to quantify green alpha…going beyond market Beta.
- Downside risk and seeking upside.
- Controlling for the business cycle and movement in the market
- Multi portfolio analysis or single asset?

Source: JLL Sustainable Investment Analysis – “Green Alpha” Theory and Practice

CLEAR INVESTMENT
Case Study - 5 St Philips Square, Birmingham

Outperformance to IPD (Ungearing Total Return over Hold Period)

Source: JLL Sustainable Investment Analysis – “Green Alpha” Theory and Practice
‘Green Alpha’ methodology
Management quantify how much additional value they add from their energy efficiency initiatives

**Input Data**
- Background to the property and its local market
- Capex in Energy Efficiency Measures
- Calculation of energy savings and paybacks
- Investment Performance Analysis, in terms of Total Return, against comparable transactions
- IPD benchmarking and JLL Forecast comparison

**DCF model**
- Statistical analysis of 20-30 years of historic movements in yield and rental growth
- Monte Carlo probability distribution curves onto JLL forecasts over hold period
- Controlling for inflation by use of real rental growth figures, rather than nominal
- Isolation of outperformance over and above the market that indicate Externalities attribution

**‘Green Alpha’ Total Return Attribution**
- Isolation of outperformance from Monte Carlo analysis
- NPV of energy savings and apportionment to Total Return

Source: JLL Sustainable Investment Analysis – “Green Alpha” Theory and Practice
Monte Carlo analysis isolates the confidence in achieving sales prices given various scenarios adopting actual and forecasted market conditions.

Source: JLL Sustainable Investment Analysis – “Green Alpha” Theory and Practice
Case Study - 5 St Philips Square, Birmingham

*Monte Carlo Simulation Output*

<table>
<thead>
<tr>
<th>Monte Carlo</th>
<th>5 St Philips Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposal Price – Nominal (actual)</td>
<td>£38,000,000</td>
</tr>
<tr>
<td>Disposal Price – Nominal (median)</td>
<td>£36,229,685</td>
</tr>
<tr>
<td>Disposal Price – Nominal (difference)</td>
<td>£1,770,315</td>
</tr>
<tr>
<td>CPI Movement</td>
<td>17.1%</td>
</tr>
<tr>
<td>Market Movement (IPD Birmingham)</td>
<td>7.5%</td>
</tr>
<tr>
<td>Disposal Price – Real (actual)</td>
<td>£29,315,247</td>
</tr>
<tr>
<td>Disposal Price – Real (median)</td>
<td>£27,949,530</td>
</tr>
<tr>
<td>Disposal Price – Real (difference)</td>
<td>£1,365,716</td>
</tr>
<tr>
<td>NPV of energy savings</td>
<td>£151,787</td>
</tr>
<tr>
<td>% of Real difference in Disposal Price</td>
<td>11.1%</td>
</tr>
</tbody>
</table>
Future Trends

• Use this methodology as a predictive tool on future acquisitions

• Not just NPV of Energy Savings but Attribute other factors to green alpha, such as
  - Carbon pricing
  - Flood & other Climate Risk
  - Wellness & overall Occupier Satisfaction
  - Digital and technological resilience
  - Location Connectivity to on site and shared renewables

• The % of “green alpha” will increase as the factors that define a “green building” evolves

• Occupiers and Investors should all be considering all these factors when repositioning assets….look for the Green Alpha.
Any questions?
Disclaimer
This document has been approved by Impax Asset Management Limited and Impax Asset Management (AIFM) Limited ("Impax", authorised and regulated by the Financial Conduct Authority). Both companies are wholly owned subsidiaries of Impax Asset Management Group plc. This document is solely for the use of professionals, defined as Eligible Counterparties or Professional clients. The information and any opinions contained in this document have been compiled in good faith, but no representation or warranty, express or implied, is made to their accuracy, completeness or correctness. Impax, its officers, employees, representatives and agents expressly advise that they shall not be liable in any respect whatsoever for any loss or damage, whether direct, indirect, consequential or otherwise however arising (whether in negligence or otherwise) out of or in connection with the contents of or any omissions from this document.

This document does not constitute an offer to sell, purchase, subscribe for or otherwise invest in units or shares of any fund managed by Impax. It may not be relied upon as constituting any form of investment advice and prospective investors are advised to ensure that they obtain appropriate independent professional advice before making any investment in any such fund. Any offering is made only pursuant to the relevant offering document and the relevant subscription application, all of which must be read in their entirety. Prospective investors should review the offering memorandum, including the risk factors in the offering memorandum, before making a decision to invest. Past performance of a fund or strategy is no guarantee as to its performance in the future. This document is not an advertisement and is not intended for public use or distribution.