DIT at Grangegorman
Challenges and opportunities of a sustainable urban campus

USE Efficiency
January 2012
DIT across the city

- Bolton St.
- Aungier St.
- Cathal Brugha St.
- Chatham Row
- Kevin St.
- Rathmines
- Mountjoy Sq.
Why Move?

• To provide education that meets DIT’s social, economic, and cultural mission.
  – Via student-centred learning.
  – Using leading-edge technology.
  – With facilities currently lacking.

• Consistently excellent integrated student experience

• Synergies and opportunities

Student Accommodation
Sports
Recreation

Significant costs to upgrade existing premises
Lack of critical mass – clubs and socs

Interdisciplinary activities
New & emerging disciplines
Modularised offerings
Options

Stay put & Refurbish – high costs / little benefits

Move to out-of-town green field site
- Space
- Flexibility
- Difficult to access
- Isolated

City-centre site
- Limited Space
- Compact
- Vibrant
- Well connected
- Good public transport
30 Ha site in the heart of Dublin.
Why Sustainable?

• **Walk the Walk**
  – Sustainability is core to what we teach and research
  – 40%+ of activities directly related
  – Dublin Energy lab
  – Offer examples of best practice to wider community

• **Statutory obligations**
  – Increasing minimum standards
  – Governments 2020 commitments

• **Social obligations & global warming**
  – Aim to reduce our overall carbon footprint
  – Make best use of scare resources

• **Economic arguments**
  – Increasing costs of utilities – power, water, waste
Strategic Objective for Dublin City

Grangegorman designated a Framework Development Area  FDA8

“To create a sustainable urban campus at Grangegorman as a new home for DIT with the capacity to develop strong links with other knowledge sector engines located elsewhere in the inner city”

Dublin City Development Plan
Site

• Remain within the urban centre – sharing the infrastructure of the city
• Integrate with transport network - mobility
• Positive reuse of site and existing listed buildings
• Reintegrating the site into the surrounding streets
• Drive regeneration in north inner city
Network of pedestrian and cycle routes on campus
Multiple entry points
Limited vehicular access
BUS
LUAS & Metro
Maintain current favourable modal split
Well connected

Transport 21:

‘The two Luas tram lines to be joined... Cross-city link... extended to serve Broadstone and the new Dublin Institute of Technology Campus at Grangegorman... connect with the Maynooth rail line... Liffey Junction’
Masterplan Key Principles

- Connections
- Main street from Constitution Hill to Prussia St.
- Courtyards
- Green fingers and serpentine way
- Open space
- Exploit levels

Urban form
- 4-6 storey academic buildings
- 6-9 storey residences
- 10-12 storey science park.

THE GREEN FINGERS LANDSCAPE CONCEPT
Earthworks & landfill

- Sloping site (11m fall)
  - Introduce level changes
- Surface drainage feature
  - HaHa
- Compact site
  - Some major basements

- Reduce
  - Adjust levels to minimise cut
- Reuse
  - Reuse cut as fill where possible
- Recycle
  - Reworking on-site to improve re-use value
  - Reuse demolition materials
  - Keep contaminated materials within site where feasible
Energy

- Minimise thermal energy demand
  - Building envelope
  - Reasonable latitude
  - BER A2
    - PASSIVHAUS?

- Minimise electric energy consumption
  - Lighting
    - Lighting controls and monitoring KNX/DALI
  - ICT
    - Data centre
    - Peripherals and controls
  - HVAC ~ maximise nat vent
  - Equipment *(especially in lab and research environment)*
  - Monitoring
  - User behaviours

- Maximise on-site energy production
  - Efficient
  - Renewable
Optimum layout and orientation

• Maximise use of natural light and ventilation
• All new buildings to be narrow plan
• Designed around a series of SW courtyards
• Limited on-site traffic -> low noise
Central energy plant & site-wide district heating scheme?

• Large scale - justify central plant + distribution
• CHP – good scale and mix of use
  – Hospital, leisure centre, residential
• Fuel type?
• Procurement – ESCo?
• Highly dependent on expected energy demands

• Phased development
• Initial developments not of sufficient scale
• Local solution
  – Temporary /short-term
  – Reasonable /medium term
• Sunk costs – disincentive to develop site-wide solution
• Costs of distribution network
Distribution network

• “Ideal” combined utilidor
  – Significant “up-front” costs

• Reality
  – Phased development
  – Utilise basements
  – Daisy-chain development from building to building
On-site renewables in an urban environment

- Biofuel thermal
- Gas fired CHP
  - Biofuel CHP ?
- Urban wind
  - Planning issues
- Geothermal
  - shallow
  - deep
- Solar thermal
- Photovoltaics
  - Payback?
  - Integrated

Opportunities for innovation
- Actively moving/storing/managing surplus/deficit of energy between building types
- High degrees of monitoring of energy use – how - where – how much
- Make energy usage visible in different formats to inform and influence consumers
- Monitor the impact of information and assess different formats of information
- Deploy innovative technologies in a highly visible way
Protected structures

- Conservation
- Integration
- Reuse

North house
Laundry
RC Church and infirmaries
Clocktower (Annex)
C of I Church
Lower house
A high profile city-centre location with the potential to influence future generations of engineers, architects, planners, scientists

Thank You