



risk management and assessment for business

Developing Brownfield Land

An Engineering Risk Management Perspective

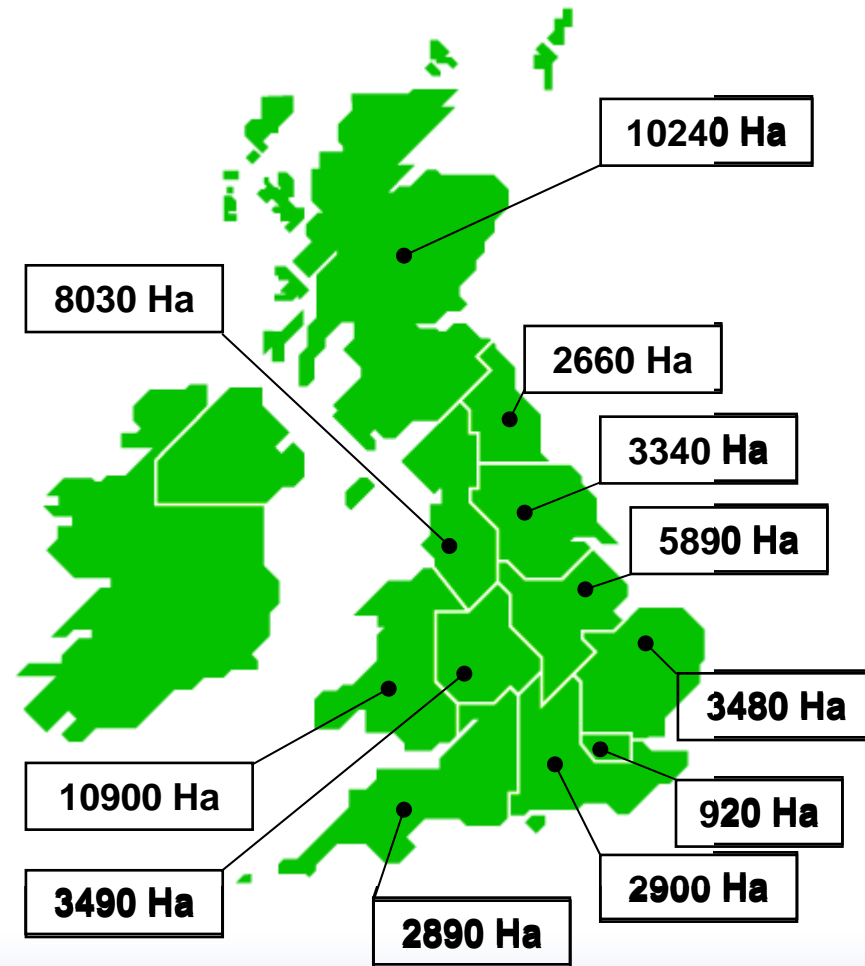


The Challenge of Securing Future Sites

- 2020 Targets require a Step Change in Planning Approvals
- Historical difficulties in obtaining Greenfield Land consent
 - Objections
 - Planning Authority Constraints
- Issues associated with the development of Greenfield locations
 - Infrastructure limitations
 - Grid Access
 - Site Access
 - Challenges of construction in remote locations
 - Logistics

The Brownfield Advantage

- Large availability – circa 70000 hectares^{1,2,3}
- Increased location choice
- Preferential planning status
- Reduced opportunity for objection
- Reduced Environmental Impact
- Potential Infrastructure benefits
 - Grid connection
 - Site Access
 - Logistics
 - Local consumers



¹ Previously-developed land that may be available for Development: England 2007.

² Scottish Vacant and Derelict Land Survey 2007, PLG/2008/1

³ A Statistical Focus on Wales, Chapter 7: Land, agriculture and environment, 1999

Developing a Brownfield Site

- Brownfield sites generally have neighbouring infrastructure



Publicly Available Image courtesy of BP



Publicly Available Image courtesy of Shell

Developing a Brownfield Site

- The Wind Farm must be developed to co-exist safely through:
 - Minimising the increase in risk to adjacent sites
 - Minimising the risk to the Wind Farm from the adjacent site hazards

Risks From the Wind Farm

Blade Throw / Ice Throw

Tower Collapse

Ignition Sources

Critical Communications
Interruption

Navigational Hazards

Risks To The Wind Farm

Vapour Clouds

Explosion

Fire

Missiles / Collision

Development Approach

- Consider existing Adjacent Sites along with any other constraints in developing the initial Wind Farm layout
- Establish early contact with Adjacent Site Operators
- Identify the Adjacent Site Hazards and establish a commensurate Risk Management Strategy
- Involve all Stakeholders in the Risk Management Process to identify and record all Risks.
- Assess the initial Wind Farm layout against the identified Risks and refine to achieve a Tolerable/ALARP Risk profile
- Generate a robust Safety Justification addressing all identified Risks that can be incorporated easily into the Adjacent Operators existing Safety Cases.
- If possible obtain Adjacent Site Operator endorsement of the Safety Justification before formal submission to the Local Planning Authority

Stakeholder Involvement

- Who to involve?
 - Adjacent Operators
 - Operations Representatives
 - Engineering Representatives
 - Health and Safety Representatives
 - Site Owners / Landlords
 - Local Council
 - Affected Official Bodies
 - Port Authorities
 - Local Aviation Authorities
 - Local Telecommunications Operators
 - Statutory Consultees
 - HSE
 - Environment Agency/SEPA

Stakeholder Involvement

- When to involve them?
 - Initial Feasibility Studies
 - Adjacent Operators
 - Site Owners / Landlords
 - Once site has been established as viable and an initial layout has been proposed
 - Affected Local Official Bodies
 - Port Authorities
 - Local Aviation Authorities
 - Local Telecommunications Operators
 - Statutory Consultees
 - » HSE
 - » Environment Agency/SEPA
 - Once all constraints have been established and the layout has been optimised
 - Local Council

Solutions

Planning Applications on Brownfield Sites require:

- A clear understanding of:
 - Site conditions
 - Adjacent Industry Hazards
 - Risk Management Principles
- Adjacent Site Operators involvement in, and endorsement of the Safety Justification
- Presentation of the Safety Justification in a format that is easily incorporated into the existing Adjacent Site Safety Cases
- Demonstration to the Local Planning Authority that a robust Safety Justification has been generated.