

PLANNING FOR ONSHORE WIND

BANKSRenewables
development with care

MARTYN EARLE
and
GAYLE BLACK

BANKS GROUP

BANKS

The Banks Group

- Founded in County Durham in 1977.
- Commenced development of wind farms in 2003.
- Gained consent for first wind farm in 2005.
- Have now gained consent for 6 wind farms in England, 4 more in planning. With programme to submit 7 schemes over the next 12 months.
- Built West Durham Wind Farm (Tow Law). 24 MW. Largest wind consent in NE England (at the time).
- Commence construction on 2 more this year in Barnsley and Doncaster



PRESENTATION OVERVIEW

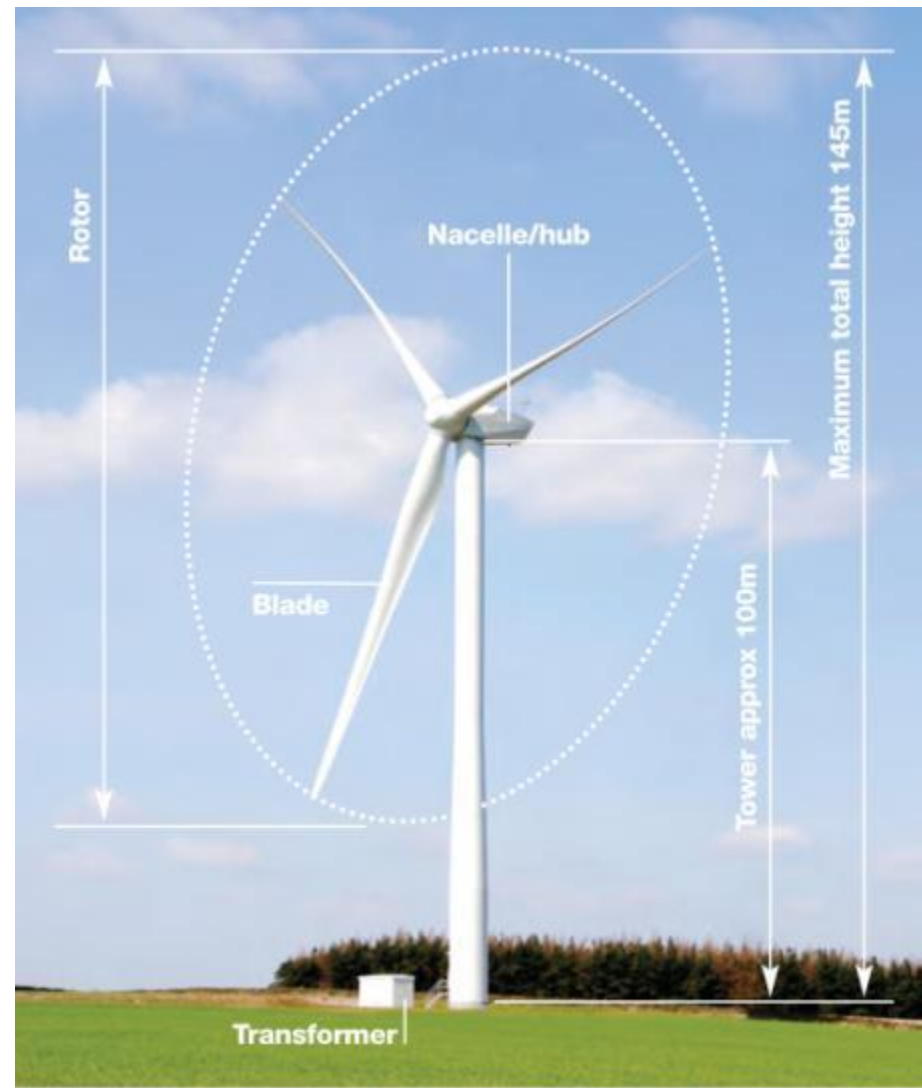
- Wind Farm Specifications
- The Capacity Question
- National Policy
- Wind Energy Constraint Mapping
- Common Issues with Wind Farms
- Planning Balance for Renewable Energy

Current Turbine Specifications

Max height to tip	100m – 145m
Rated output	2MW – 3.4MW 1,100 – 1,900 homes
Output range	26GWh/a – 33GWh/a
Wind speed range	3m/s – 25m/s

Power Outputs

Tip Height	Annual Yield/MWh/An	Percentage Increase from 100m turbine
100m	5,136	-
125m	6,486	26%
132m	9,064	76%
150m	9,823	91%



**Image for illustrative purposes only (100m-to-tip turbine at West Durham Wind Farm)

What is a wind farm ?



Access tracks min. 5m wide

Crane pads and turning areas



Wind monitoring mast/ performance
mast(s) 60m or 80m (hub height of turbine)

Screening and Scoping

What is a wind farm ?



Turbine transformers can be housed internally or externally

Grid connection building size depends on type of connection e.g. 33KV, 66KV, 132KV.



Grid connection underground/over ground.
Most likely wooden poles.
Route dictated by grid operator.

The Capacity Question



Banks operate at approx 30% capacity.
Varies from site to site.

Generally generate for 80% of the time
but not at full rated capacity.

Start generating at wind speeds over 2-
3m/s (5-6mph).

Generate at its full capacity when the
wind speed is 12m/s and greater.

Stop generating at wind speeds in excess
of 25m/s (Gale Force 10)

The Capacity Question



Most efficient coal fired power station operates at around 40% thermal capacity

Gas fired stations generate at 40-50% capacity.

Capacity matters to business and society when you are paying for the resource and when the resource is finite.

A wind turbine could operate at far higher capacities but lower total output. And its generation of renewable energy which we are aiming to achieve.

Capacity is not a relevant measure of the relative merits of on shore wind as we are not paying for the resource.

Context- Where are we now?

- Legally binding target- 15% energy from renewables by 2020 (split into electricity, heat and transport)

CLIMATE CHANGE ACT

- This equates to 30% of total electricity production being sourced from renewables

UK RENEWABLE ENERGY STRATEGY

- Dec 2010- 8.6% of electricity was from renewables

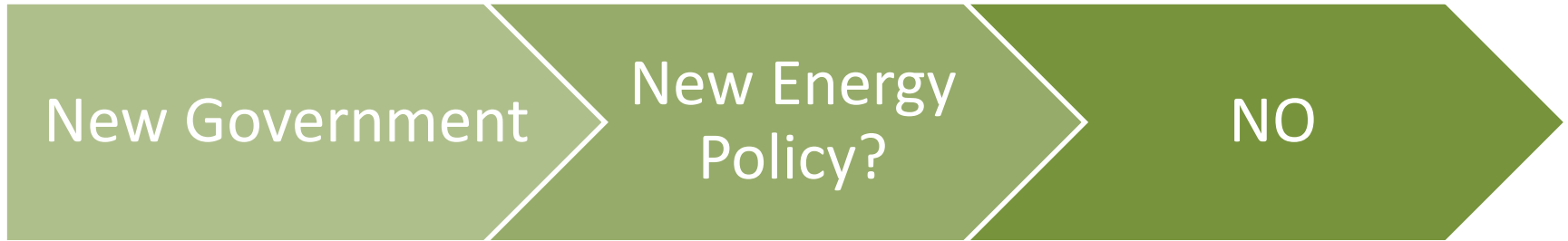
DECC ANNUAL ENERGY REPORTS

- On track to miss 2020 target

- **“Given the urgency and importance of the issue, progress in meeting renewable energy targets has been unacceptably slow over the last decade”**

(Report by Govt Committee of Public Accounts)

Overview of National Policy



- Chris Huhne (Secretary of State for DECC)
Should we increase target of 30% of electricity from renewables by 2020 to 40%?
- Climate Change Committee
Urged Coalition to focus on **MEETING** the targets not raising them!

Targets are meaningless unless we make progress in meeting them.

Overview of National Policy

- ❑ **PPS 22**- promote and encourage
- ❑ **PPS Climate Change** - opportunities maximised and respond promptly
- ❑ **Energy White Paper** – CO2 savings material consideration
- ❑ **Renewable Energy Strategy** - 2/3 from wind

Constraint Mapping

- Site finding tool used by developers (and local authorities) to identify ‘areas of least constraint’ for wind energy
- Involves layering wind energy constraints on a plan
- Areas that ‘fall through’ the layering exercise are technically and environmentally least constrained for wind energy
- Not about finding ‘the best site’ or ‘the only site’ but helping to find the **optimal sites**

Constraint mapping

Mappable Constraints

Landscape Designations –
National Parks, AONB

Ecology Designations -
SSSI, SPA, SAC, RAMSAR

Residential Standoff

Aviation Radar

Areas of Low Wind Speed

Unmappable Constraints

Electrical grid capacity/availability

Actual wind resource

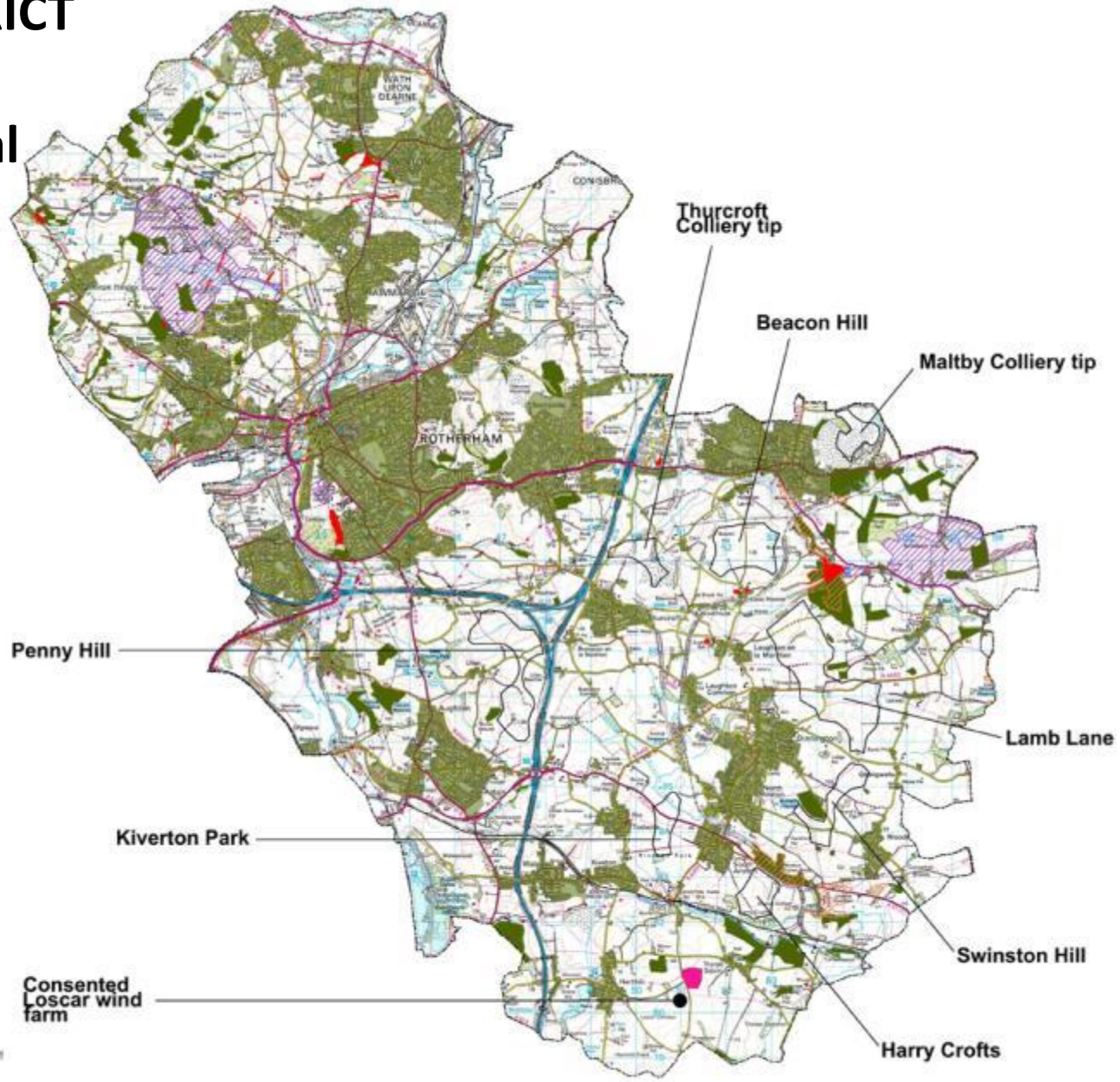
Archaeology on site

Setting of Cult Heritage Assets

Capability of road network

ROTHERHAM DISTRICT

Ecology and Cultural Heritage

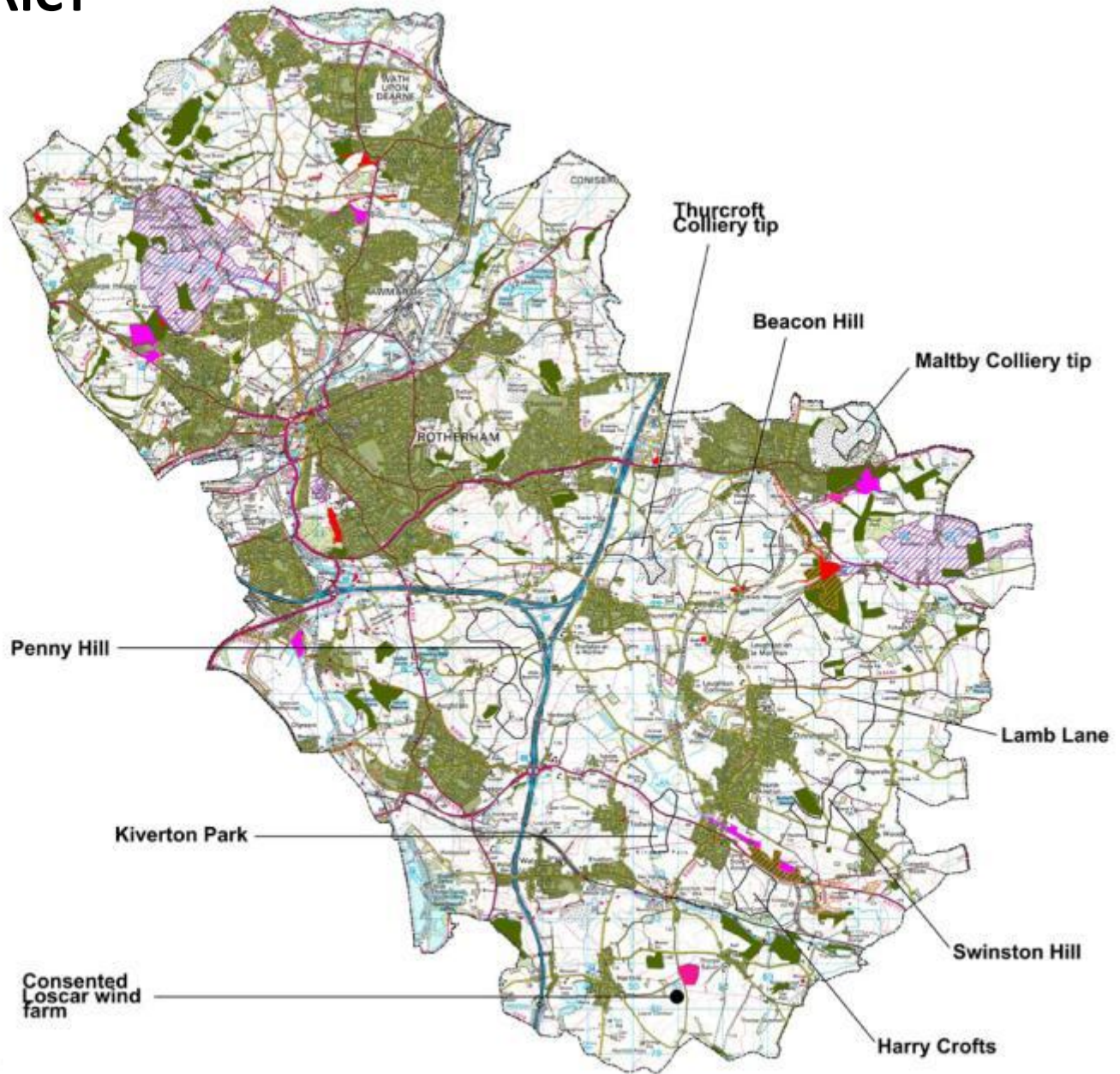


- Rotherham MBC boundary
- Local nature reserve
- Regions of low wind speed
- Registered parks and gardens
- SSSI
- Ancient woodland
- Scheduled ancient monuments
- 500m housing standoff
- Study area
- Robin Hood Airport vectoring area



ROTHERHAM DISTRICT

Local Designations

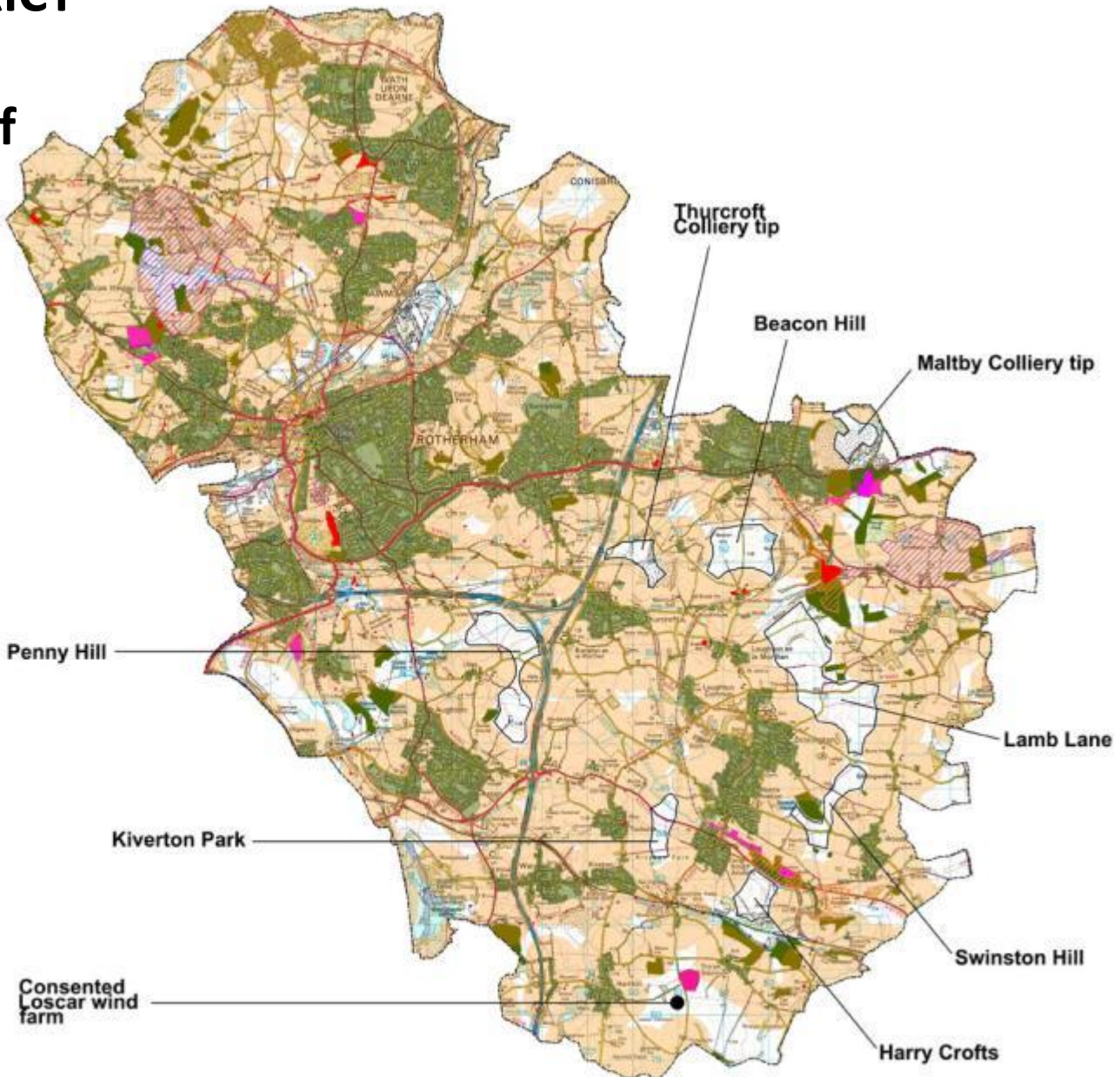


- Rotherham MBC boundary
- Local nature reserve
- Regions of low wind speed
- Registered parks and gardens
- SSSI
- Ancient woodland
- Scheduled ancient monuments
- 500m housing standoff
- Study area
- Robin Hood Airport vectoring area



ROTHERHAM DISTRICT

Residential Standoff

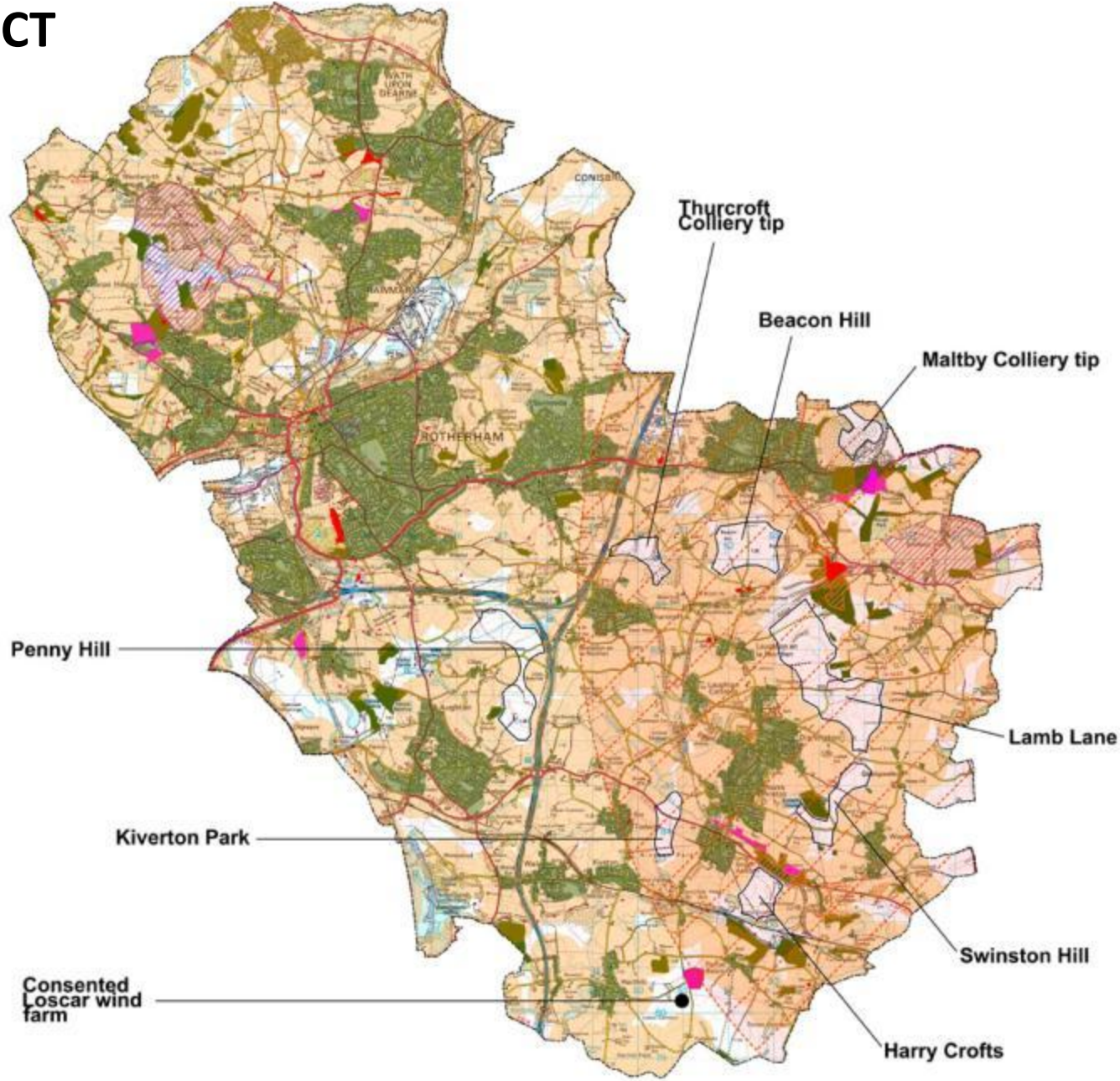


- Rotherham MBC boundary
- Local nature reserve
- Regions of low wind speed
- Registered parks and gardens
- SSSI
- Ancient woodland
- Scheduled ancient monuments
- 500m housing standoff
- Study area
- Robin Hood Airport vectoring area



ROTHERHAM DISTRICT

Aviation

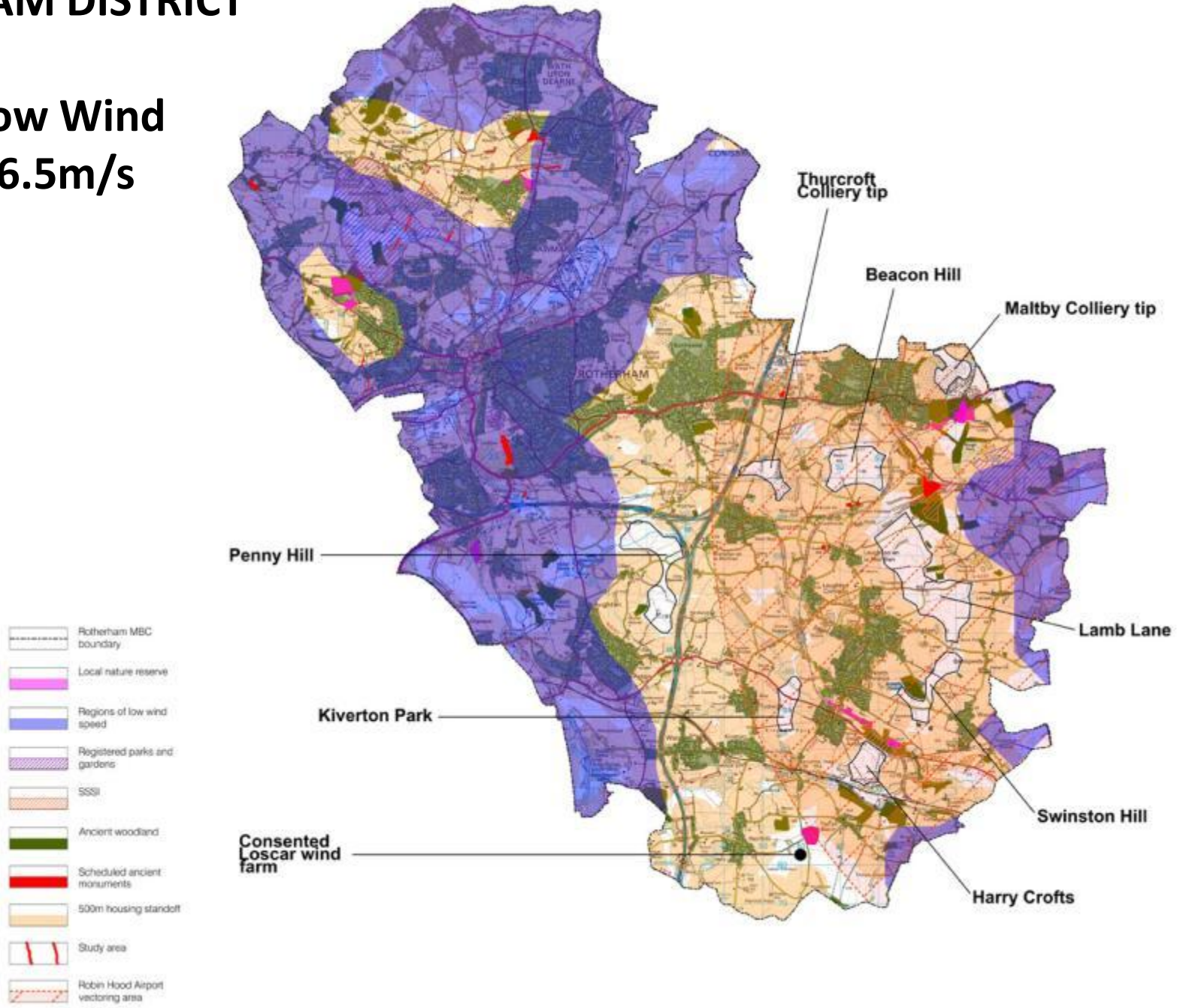


- Rotherham MBC boundary
- Local nature reserve
- Regions of low wind speed
- Registered parks and gardens
- SSSI
- Ancient woodland
- Scheduled ancient monuments
- 500m housing standoff
- Study area
- Robin Hood Airport vectoring area



ROTHERHAM DISTRICT

Areas of Low Wind Speed - < 6.5m/s



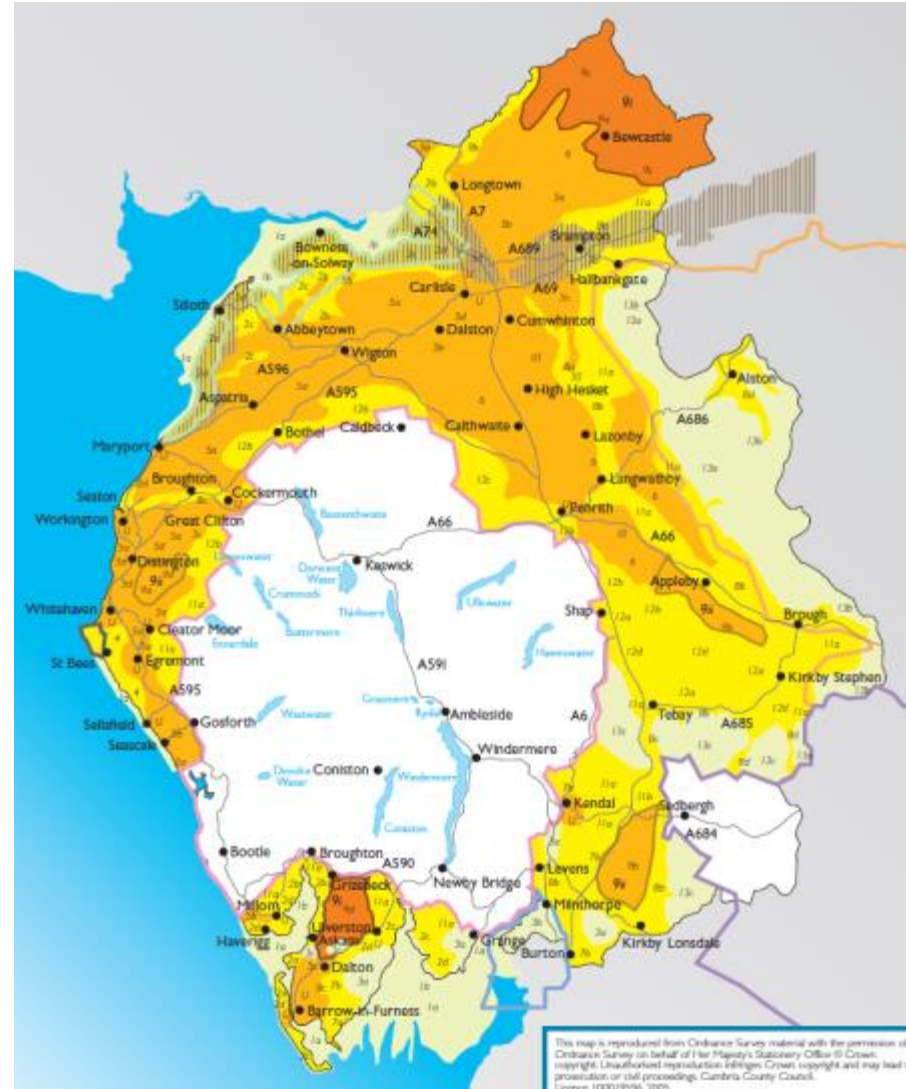
CUMBRIA WIND ENERGY SPD

Key

- Lake District National Park
- Yorkshire Dales National Park
- Solway Coast AONB
- North Pennines AONB
- Arnside and Silverdale AONB
- ▨ Frontiers of the Roman Empire:
Hadrian's Wall - visual envelope
- St Bees Heritage Coastline
- Cumbria County Council Boundary

- ### Landscape Classification Subtype
- Moderate/High Landscape Capacity
 - Moderate Landscape Capacity
 - Low/Moderate Landscape Capacity
 - Low Landscape Capacity

Landscape Character Type	Landscape Capacity	Appropriate scale of development small group - 3-5 turbines, large group - 6-9 turbines small wind farm - 10-15 turbines medium wind farm - 16-25 turbines
1 Estuary and Marsh	Low	All scales generally inappropriate
2 Coastal Margins	Low/moderate	Up to a small group, exceptionally a large group in most extensive parts and where unconstrained by settlement
3 Coastal Limestone	Low	All scales generally inappropriate
4 Coastal Sandstone	Low/moderate	Up to a small group beyond St Bees Head
5 Lowland	Moderate	Up to a small group, exceptionally a large group
6 Intermediate Land	Moderate	Up to a small group, exceptionally a large group
7 Drumlins	Low/moderate	Single turbines or a small group
8 Main Valleys	Low/moderate	Up to a small group, exceptionally a large group, in broader valleys
9i Intermediate Moorland	Moderate/high	Up to a large group, exceptionally up to a medium wind farm on high moorland
9ii Moorland Hill and Low Plateaus	Moderate	Up to a small group
10 Sandstone Ridge	Moderate	Up to a small group, exceptionally a large group
11 Upland Fringes	Low/moderate	Up to a small group, exceptionally a large group, on broader topographic sweeps
12 Higher Limestone	Low/moderate	Up to a small group, exceptionally a large group, in blander parts
13 Fells and Scarps	Low	All scales generally inappropriate
14 Urban Areas and Fringes	Moderate	Up to a small group, exceptionally a large group, in coastal contexts



This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of Her Majesty's Stationary Office © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Cumbria County Council. Licence 10001936, 2005.

Benefits of Constraint Mapping

- Answering the “why here ?” question.
- Satisfies a legislative requirement of Environmental Impact Assessment (planning) process.
- Local authority administrative boundaries- basis of local policy making
- Local authorities are now carrying out this exercise themselves to help inform their planning policies

Shortcomings of Constraint Mapping

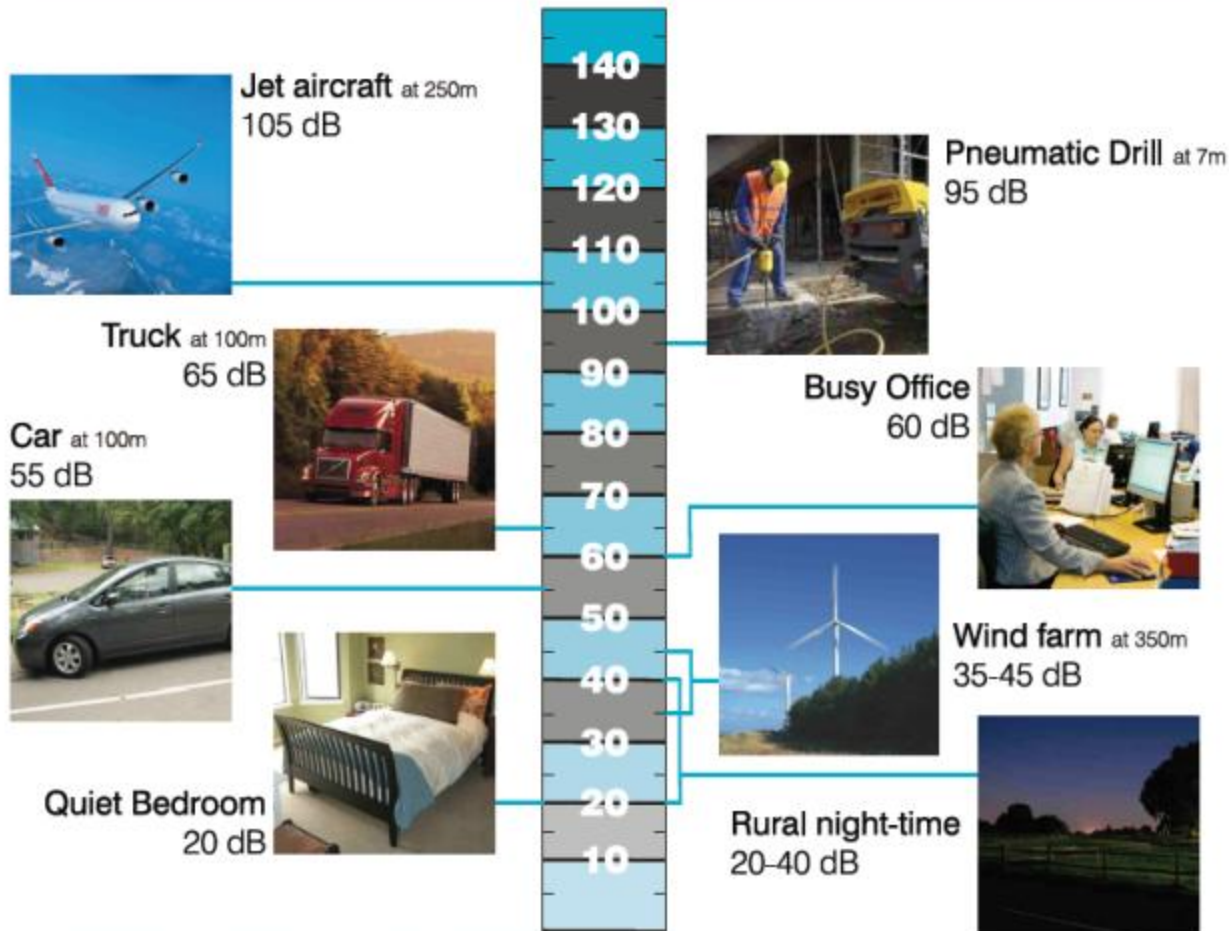
- ❑ Not the complete answer (can only take you so far)
- ❑ Needs to know its limitations :
 - Quality of mappable data
 - Unsound assumptions
- ❑ Makes a case for/leads to clustering of wind farms – conflict with policies on cumulative impacts.
- ❑ Doesn't mean you can only pick one. Eg Tow Law- RSS stated capacity for 25 turbines, 24 turbines installed through 5 planning app's over 10 years

Assessment of Noise from Turbines

ETSU – R -97 Report

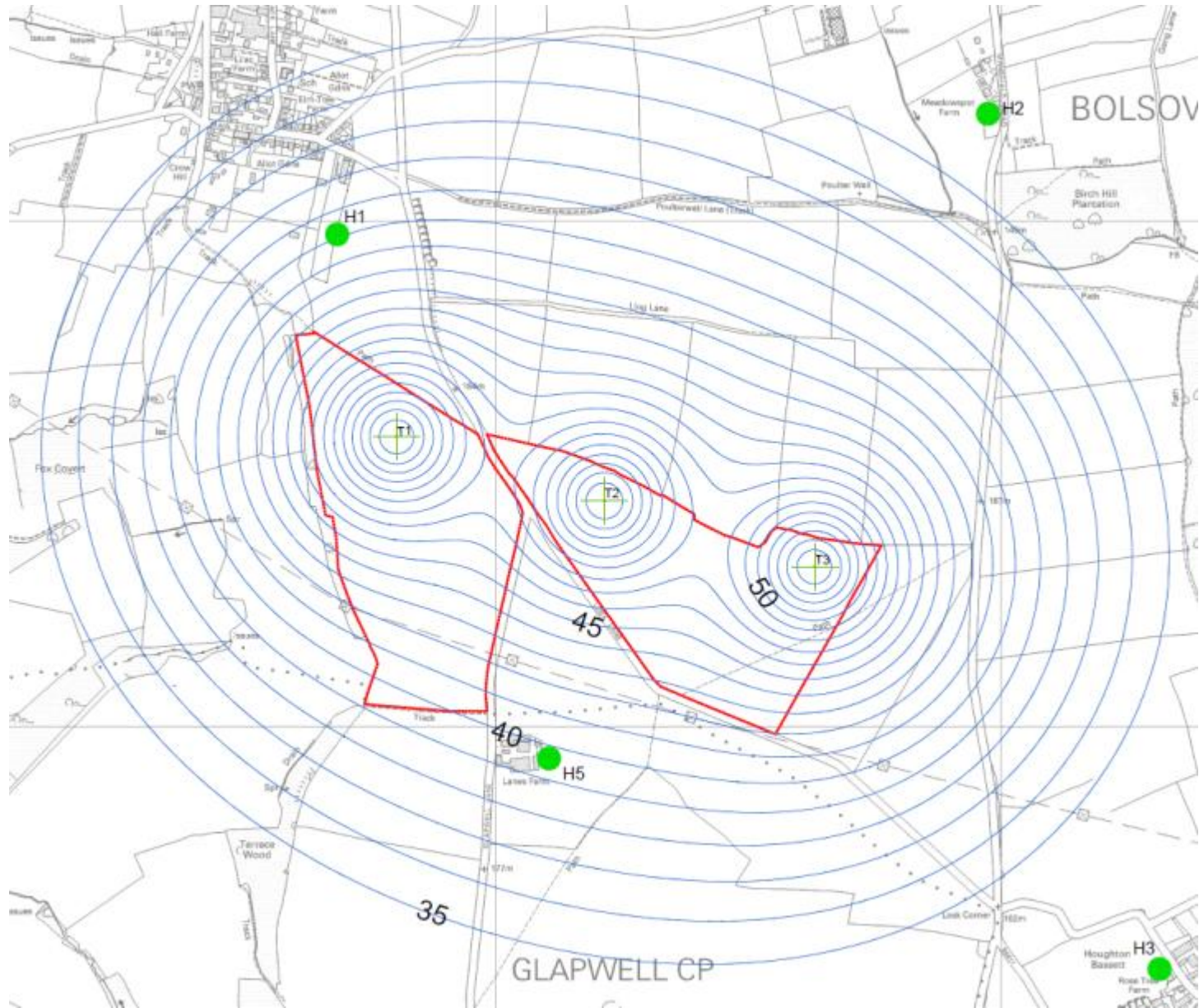
Decibel scale

The scale below puts wind farm noise into context by comparing noise sources and activities (dB)



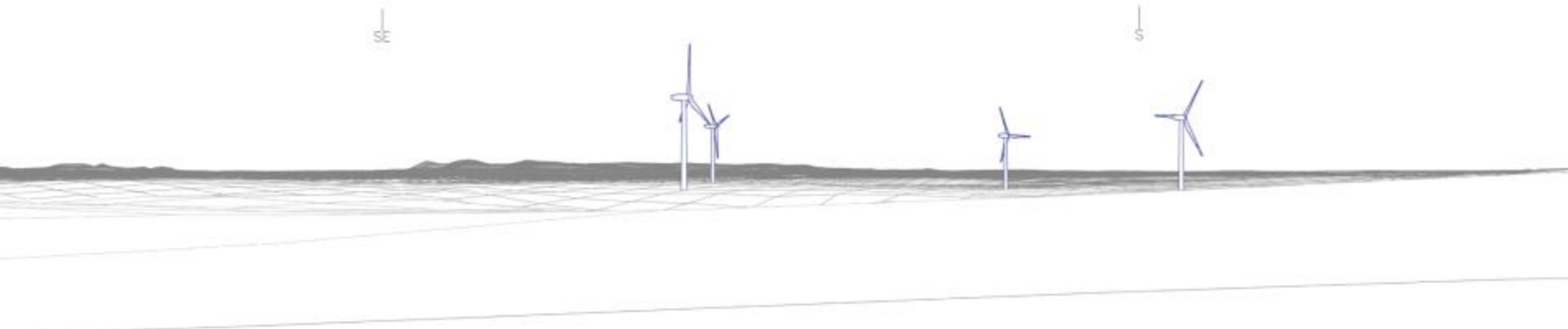
- Guidance on noise is strict, specific and robust
- Methodology assumes worst case scenario
- Planning conditions dictate noise limit to which the wind farm must operate
- Enforcement condition
- Modern turbines are getting quieter.

Noise contour plan



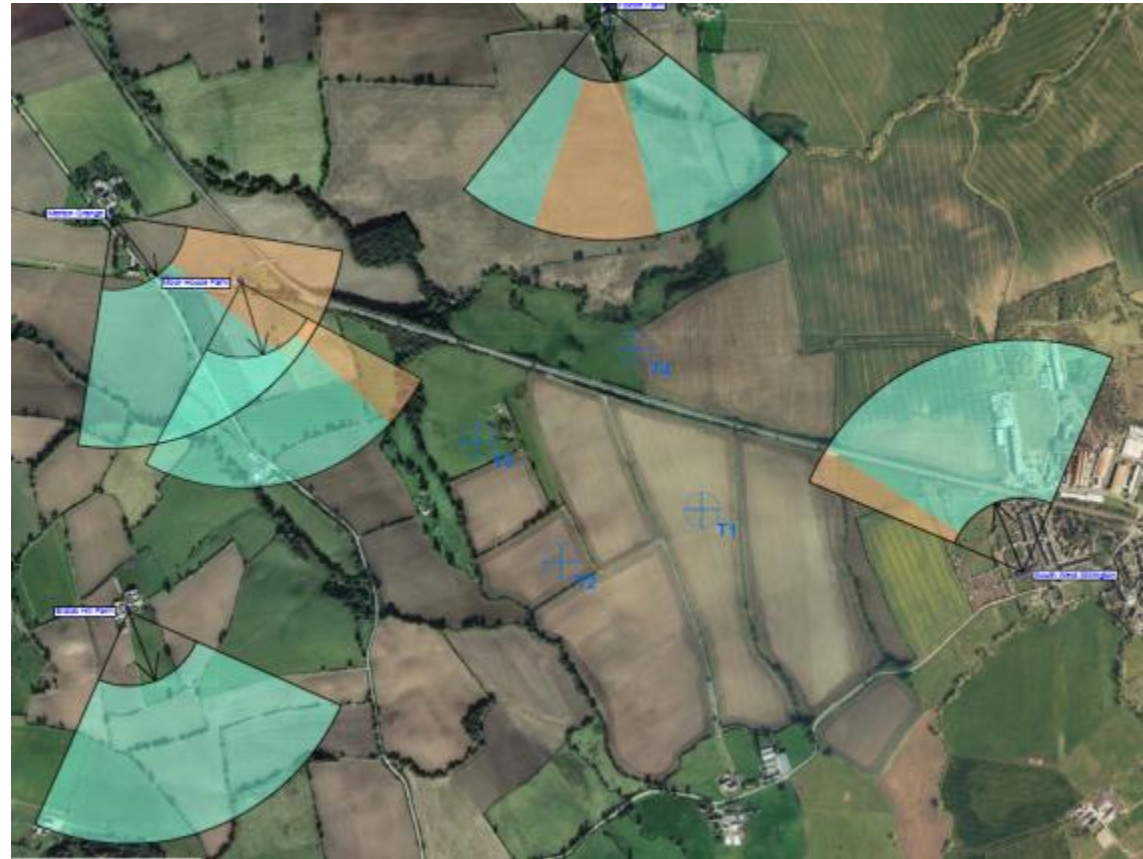
Landscape and Visual Impact Assessment

- Assesses impact of wind farm on
 - Designated landscapes inc NP's, AONB's,
 - Landscape character
 - Key corridors inc national trails, transport routes
- Visual aids include – photomontages, wirelines, Zones of Theoretical Visibility



Residential Amenity Assessment

- Visual Impact, Noise and Shadow Flicker
- Impact likely within 1 km
- View from windows
- Dominance or overbearing effect?
- Appeal decisions vary
- Can use variety of visual aids- detailed ZTVs, viewing angle plans



Residential Standoff

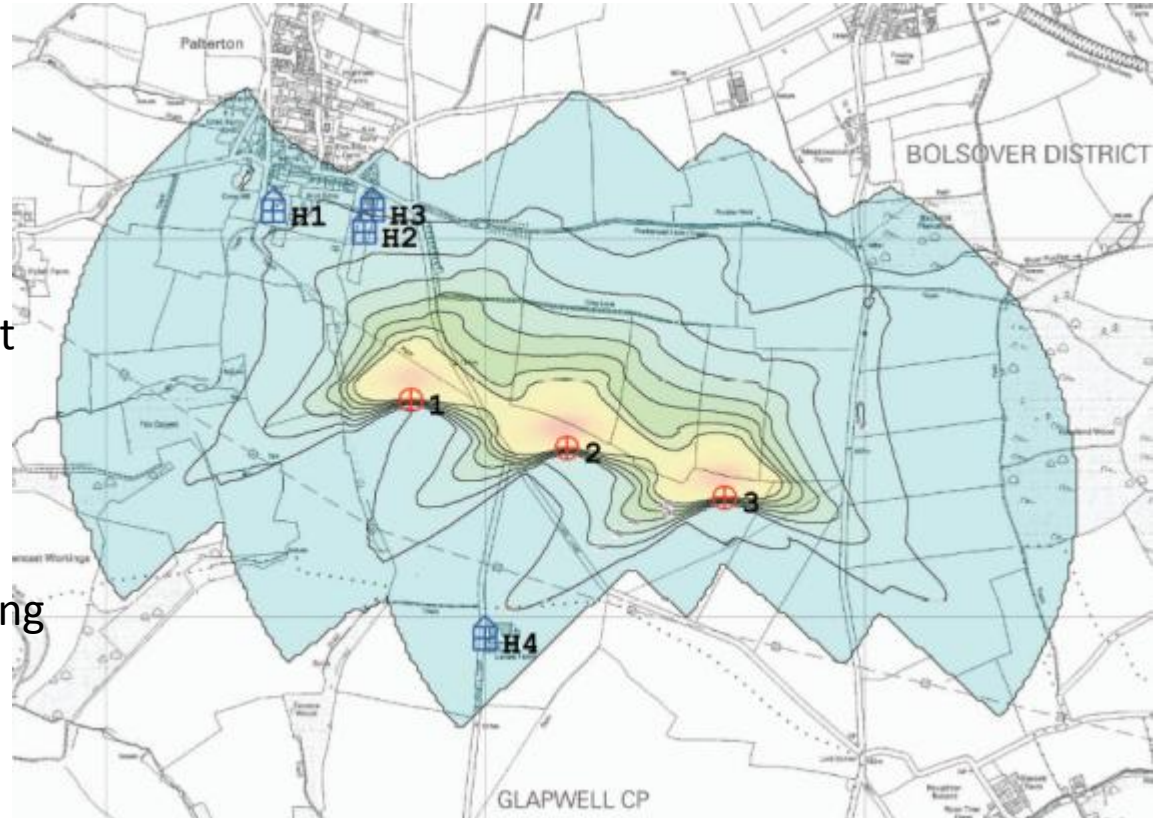
- Key concern of residents
- Developers use around 500m as an initial site finding tool
- No statutory standoff in England

Consider the following scenario

- A property which is located 350m from a turbine but situated next to a motorway (high background noise) and has a shelter belt between it and the wind farm obstructing views
- A property which is located 650m from a turbine but has low background noise levels and clear views from primary windows towards wind farm
- Does the wind farm meet ETSU noise limits?
- Do the turbines dominate or are they overbearing?
- **Not about picking an arbitrary standoff distance but about scrutinising the impact in order to determine acceptability**

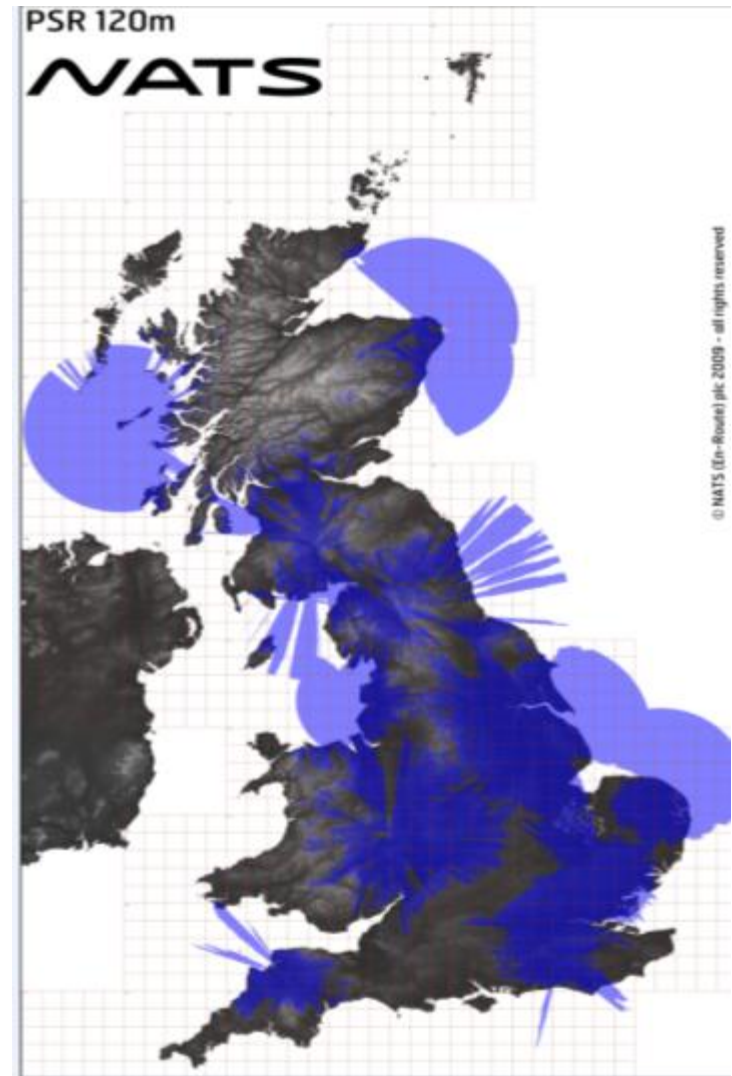
Shadow Flicker

- Occurs when the sun is low and behind the turbines
- Receptors up to 10x blade diameter away
- Dependent on:
 - Time of day, time of year, height
 - Position, size, orientation of windows or gardens
 - Topography, screening
- Effects assessed through modelling in software
- Easily mitigated by condition
- Turbines can be programmed to shut down when shadow flicker occurs



Aviation- A very technical issue

- Not suited to consideration in the planning/public forum
- Aviation bodies include - CAA, MoD, NATS En Route, Airports, Local aerodromes
- Developers should include aviation assessment in ES
- 3 forms of objections
 - Approach surfaces
 - Visibility on radar
 - Clutter resulting from cumulative impact
- Not a safety issue – A capacity one for air traffic controllers.
- Hook Moor



Planning Balance for Renewable Energy



- Very different to the 'normal' balance
- **'significant adverse effects'**
- Policy wording – proposals which have adverse effects will not be permitted
- Therefore wind farms can form a departure from the development plan – clearly this is not in keeping with spirit of climate change and renewable energy policy
- **A LOCAL LEVEL CRITERIA BASED POLICY IS ESSENTIAL FOR ASSESSING PROPOSALS AGAINST**

ANY QUESTIONS ?