



**Warwick Wind Trial**  
**Results to Date**  
David Hailes and Helen Brown

11<sup>th</sup> December 2007

# Agenda

- Objectives of the trial
- Overview of the sites
- Instrumentation and Analysis
- How useful is NOABL and MCS
- How useful are power curves
- Patterns between sites
- Energy consumption
- Conclusions



# Objectives

- To explore the market realities facing this technology
- To understand community and customer reactions
- To see how predictable technical performance is for customers
  
- Typical customer starting points:
  - NOABL
  - No wind monitoring
  - Basic property geometry

Aim to complement and inform academic and industry trials

# Instrumentation

- PEET Kit
  - Meteo Anemometer
  - Novus Logbox DA
  - ME162 Watt meter
  
- BRE Kit
  - NRG Anemometer
  - Pace Scientific XR5-SE
  - ME162 Watt meter

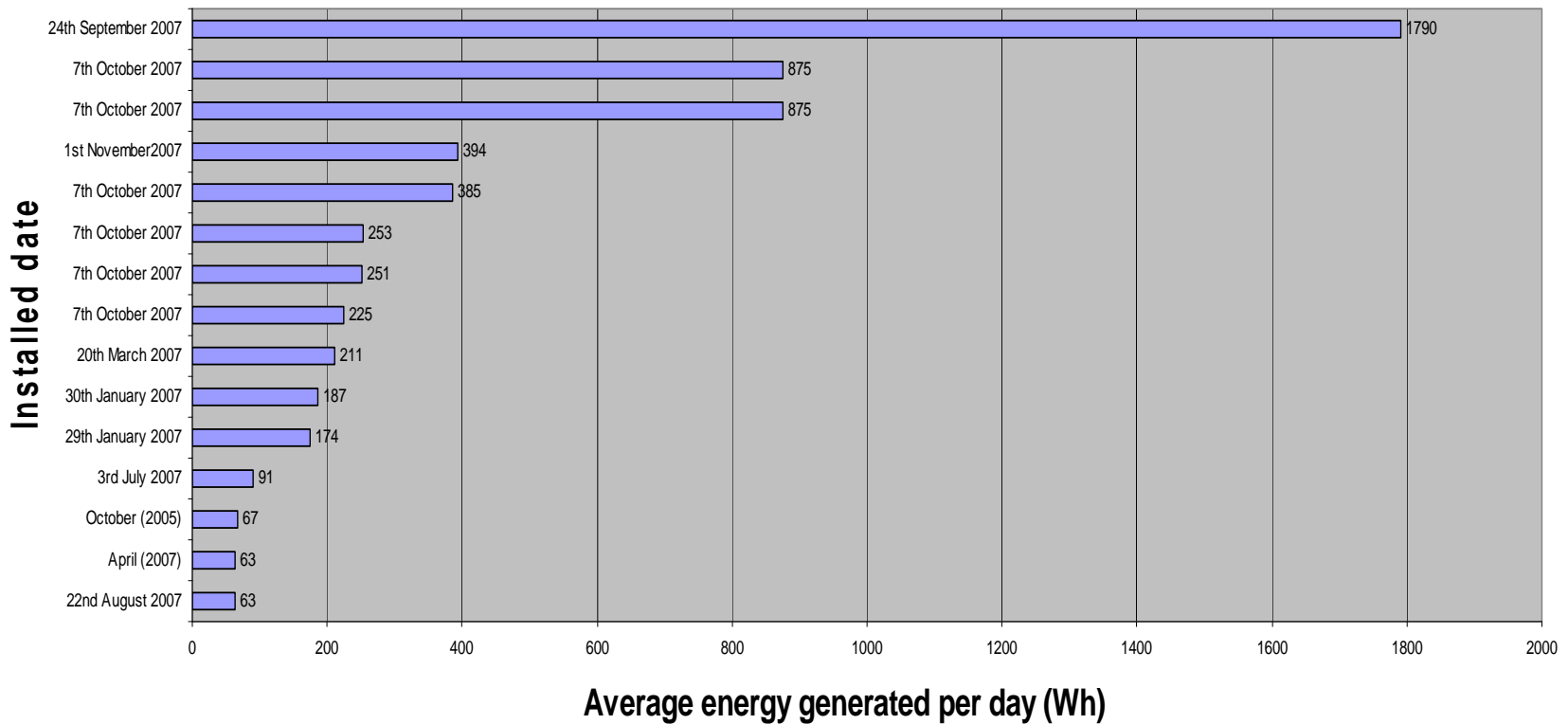


# Sites



# What could you expect to generate?

Average Energy Generated per Day (Wh)



# How useful is NOABL and the Microgeneration Installation Standard MIS3003?



- Very early days
- NOABL data corrected for the month using a 20 year average taken from International Station Meteorological Climate Summary, Version 4.0
- Above correction corrected again using MIS3003

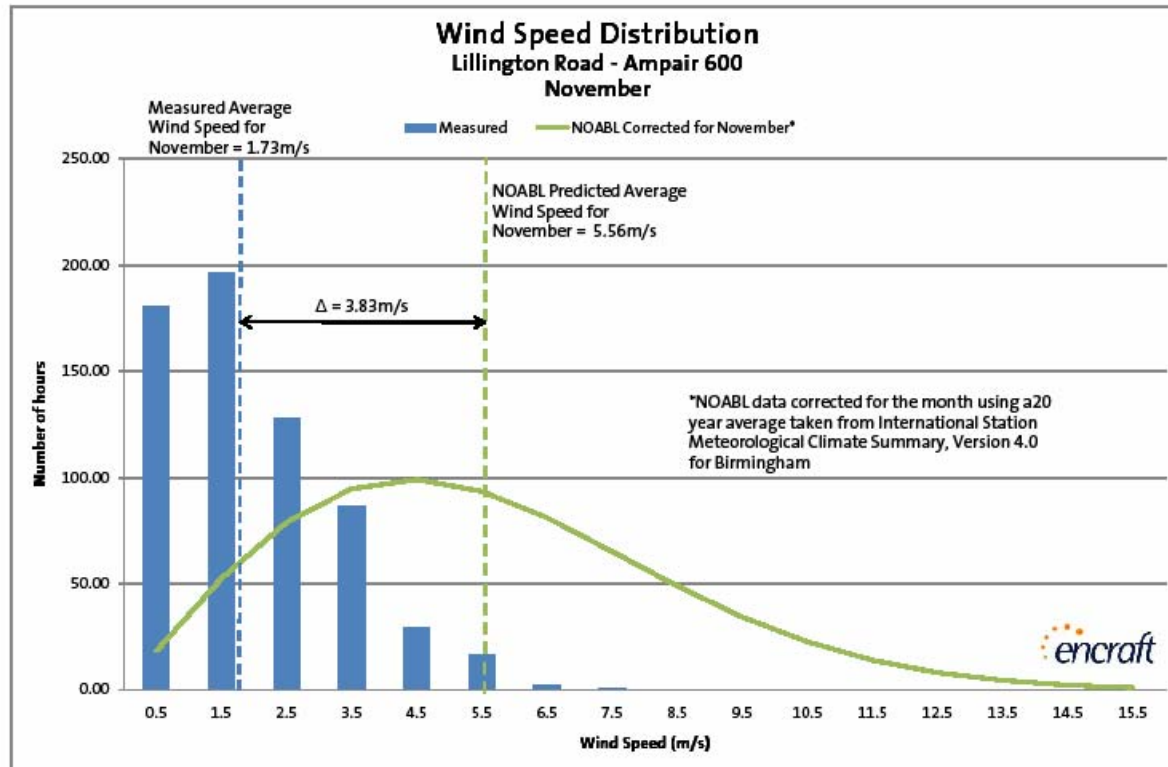


# Measured Wind Speeds For a suburban location



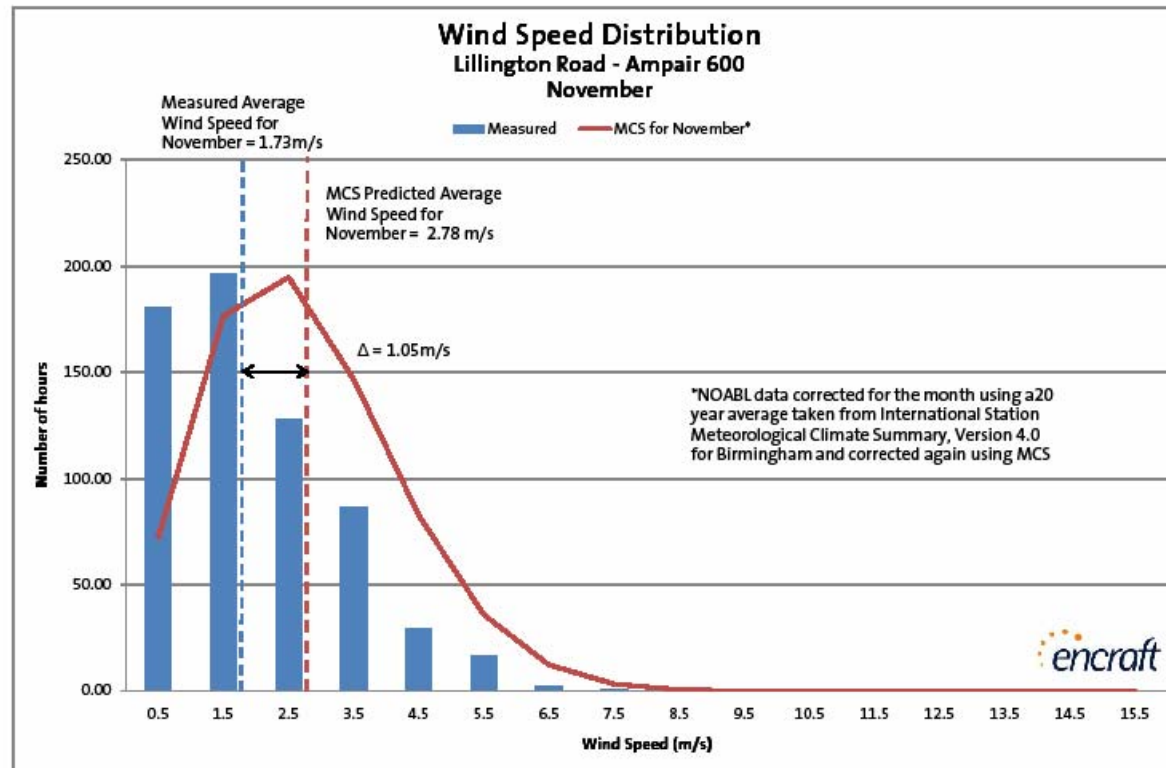


# Measured Wind Speeds vs Corrected NOABL by month For a suburban location



# Measured Wind Speeds vs MIS3003 Corrections

## For a suburban location

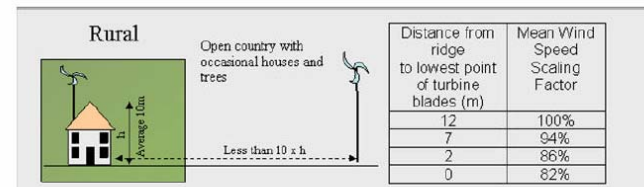
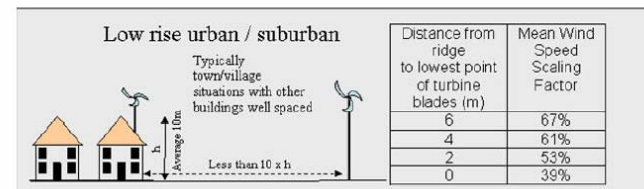
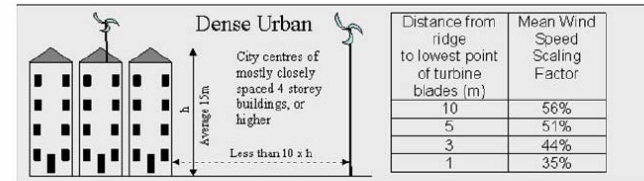


# Difficult to categorise in MCS



Issue: Draft 7	MICROGENERATION INSTALLATION STANDARD	MIS 3003
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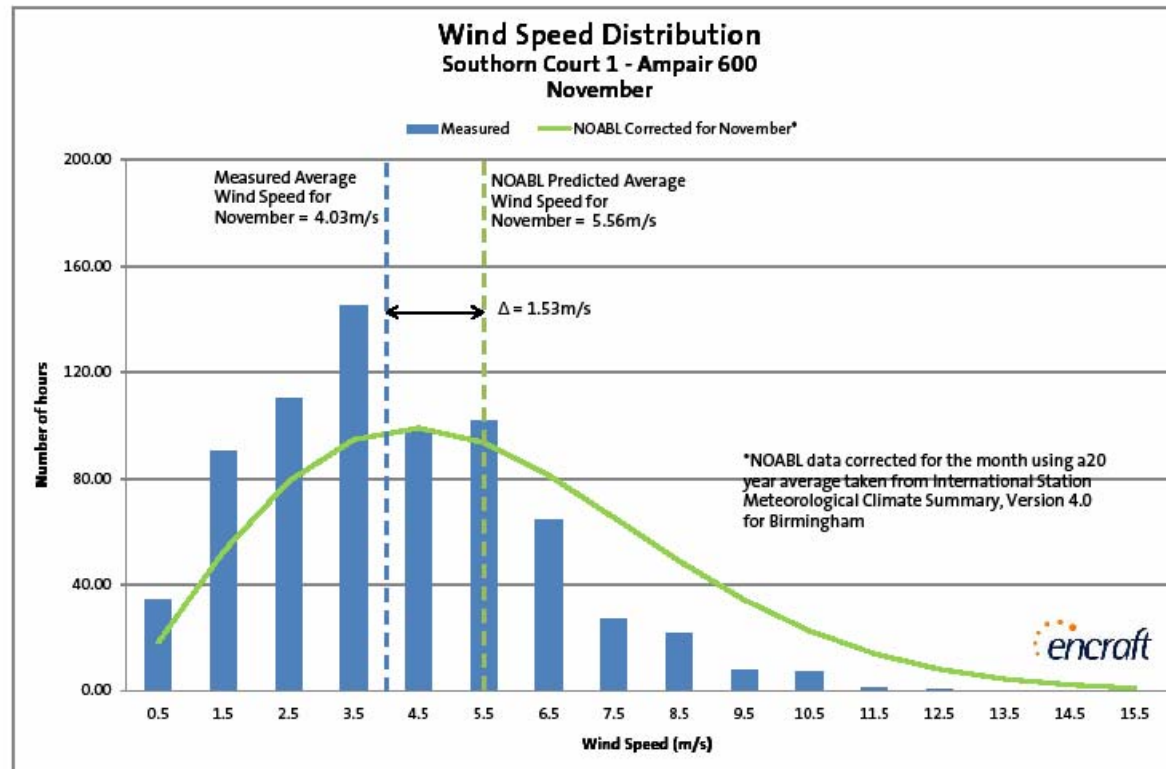
*Please read the notes on the previous page in conjunction with these diagrams*



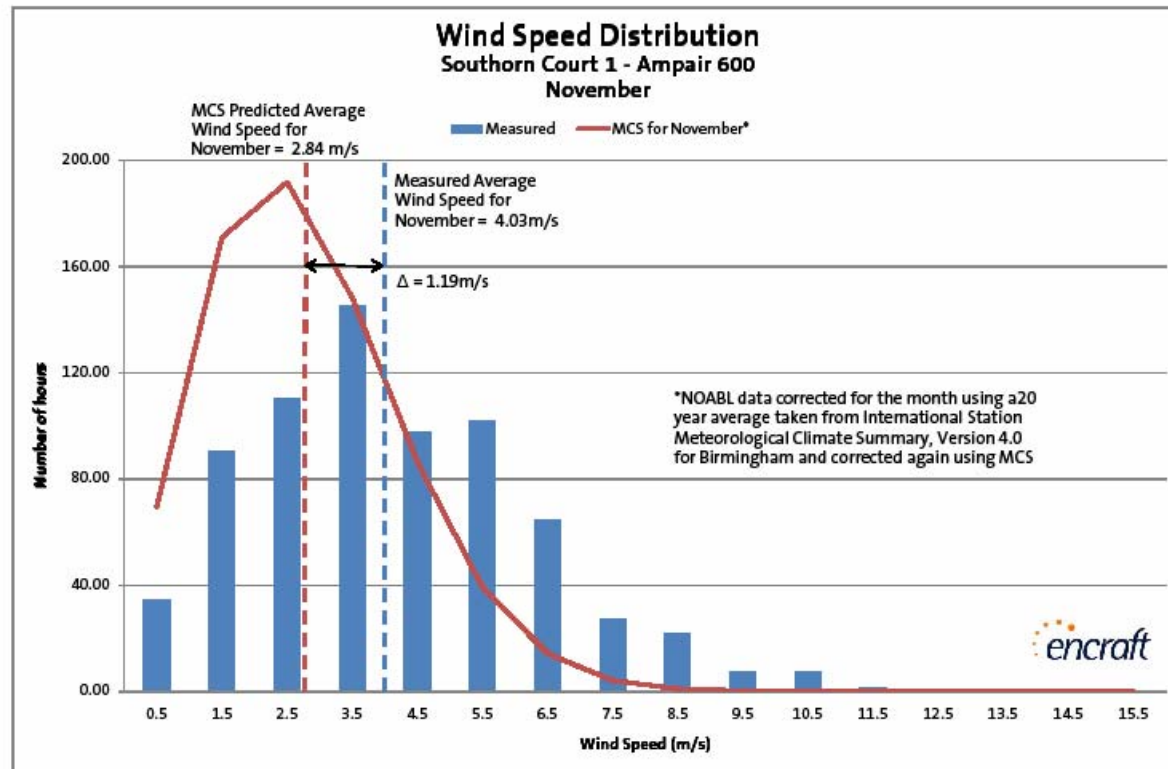
Scaling factors derived from data given in Harris R I & Deaves D M, The structure of strong winds, *Wind engineering in the eighties*, proc. CIRIA conference, 12-13 November 1980, London, 1981.

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# Measured Wind Speeds vs Corrected NOABL by month For a Dense Urban location



# Measured Wind Speeds vs MIS3003 Corrections For a Dense Urban location

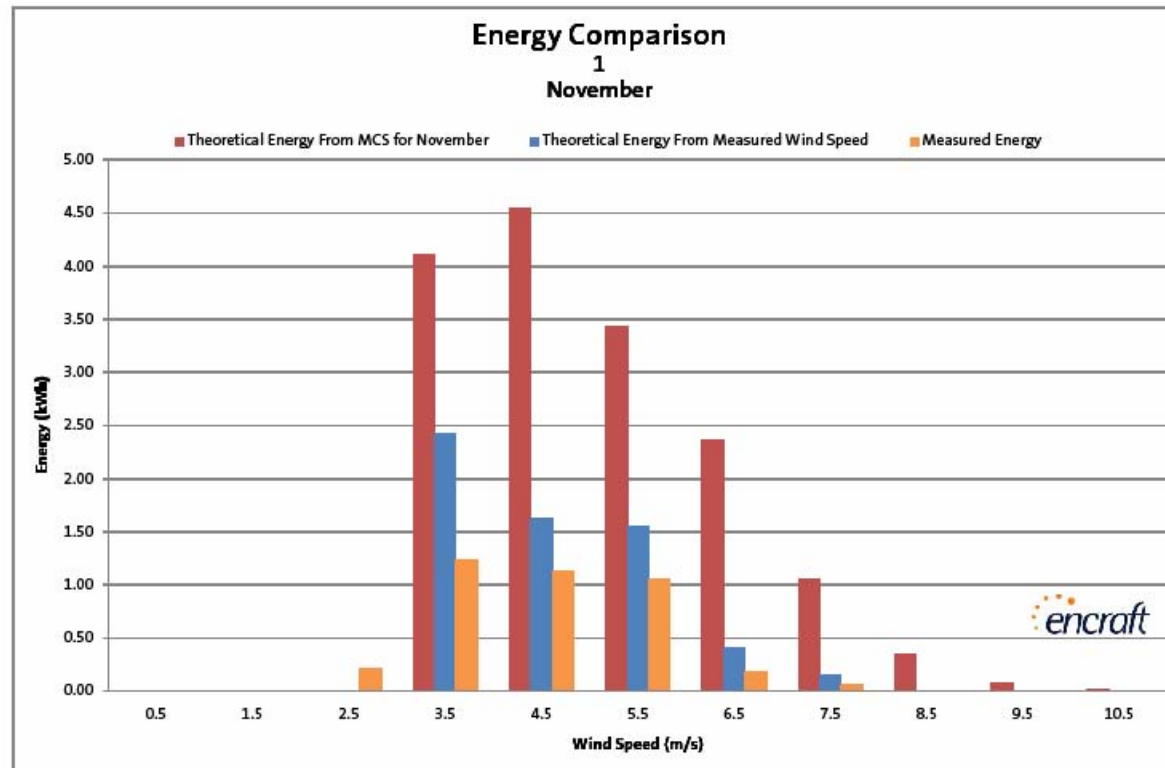


# How useful are Power Curves



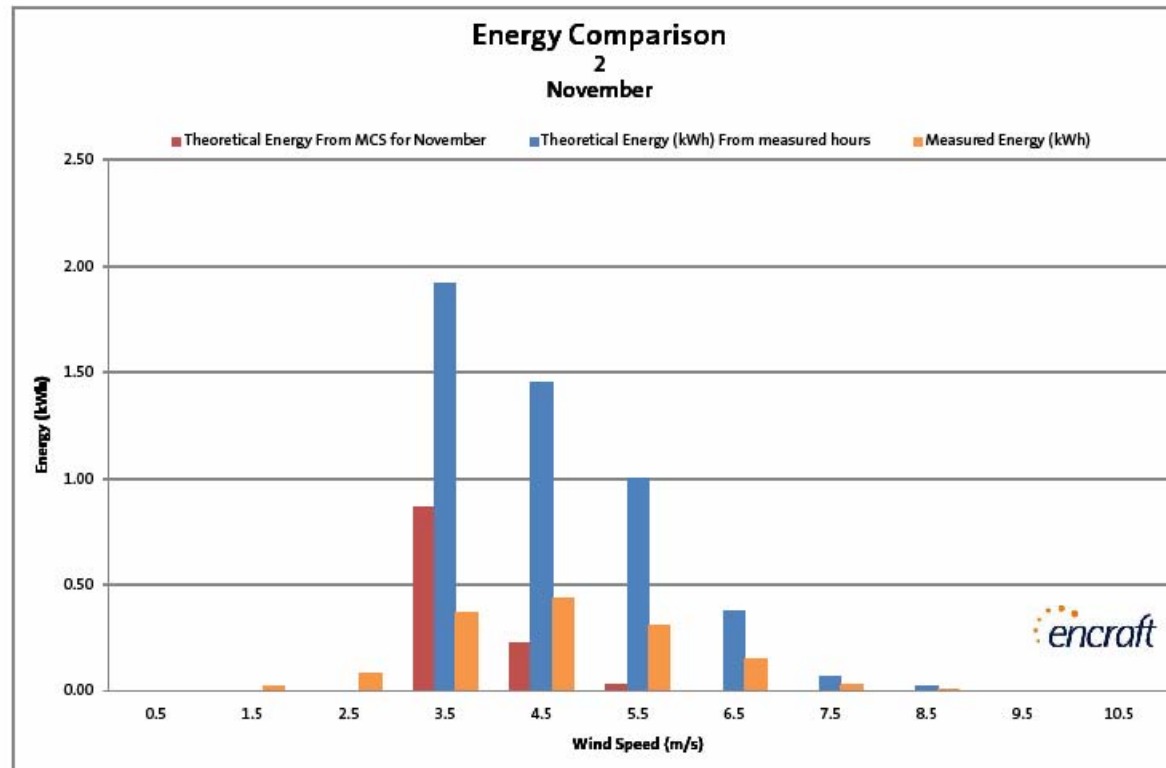
- All power curves are supplied by manufacturer or installer literature.
- Can they be used to predict output?
- Are there variations between manufacturers?

# Energy Calculations Using Power Curve

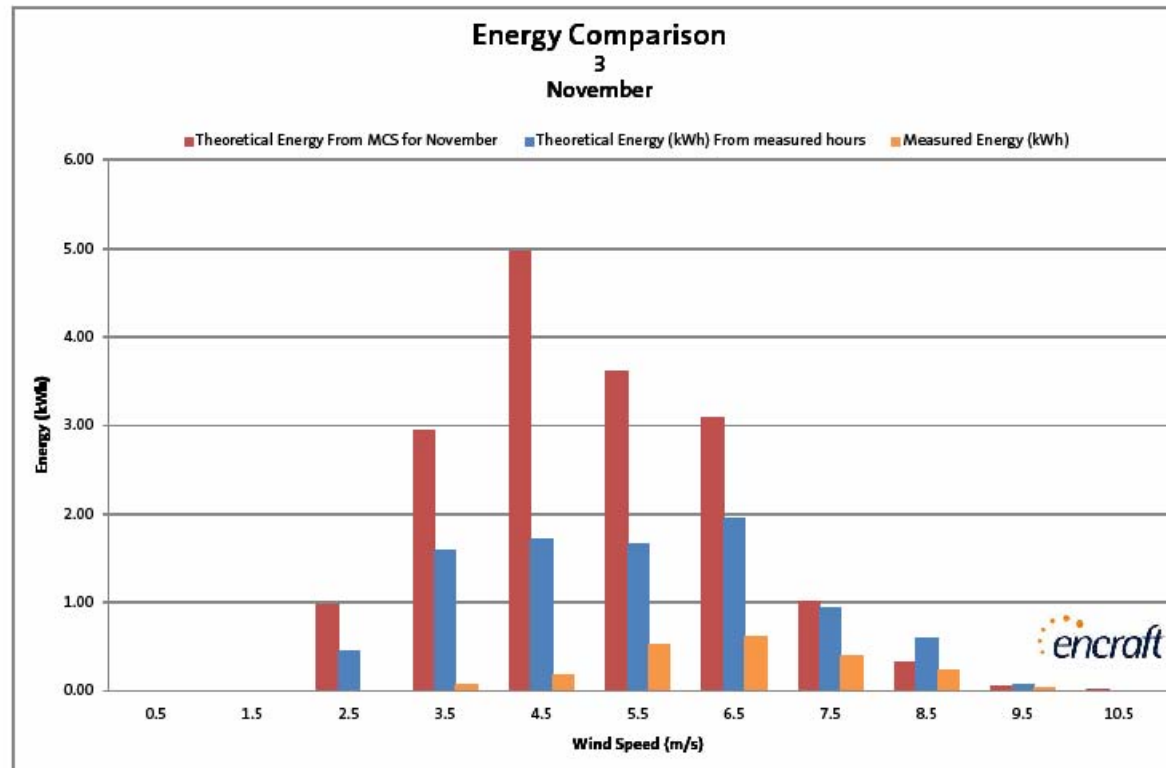




# Energy Calculations Using Power Curve



# Energy Calculations Using Power Curve

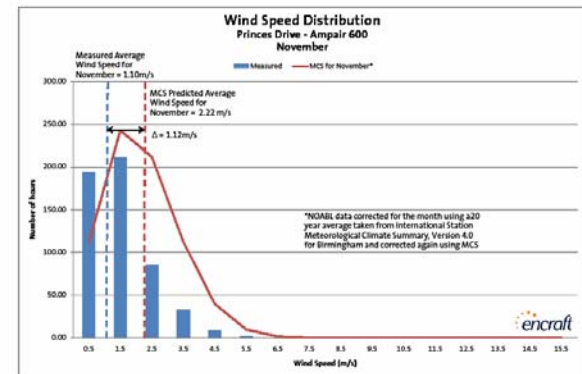
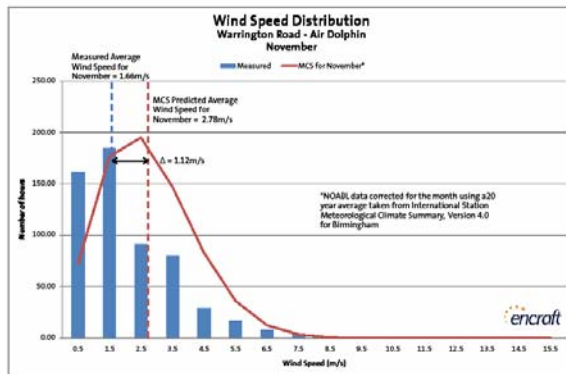
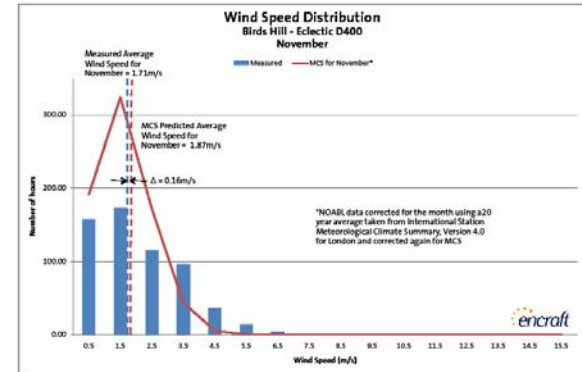
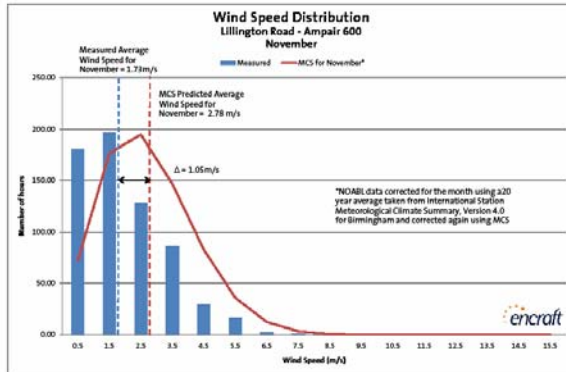


# Wind Speed Distribution

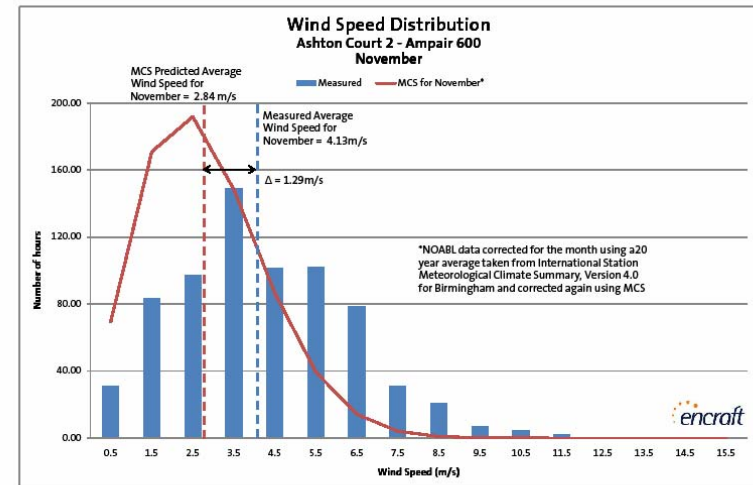
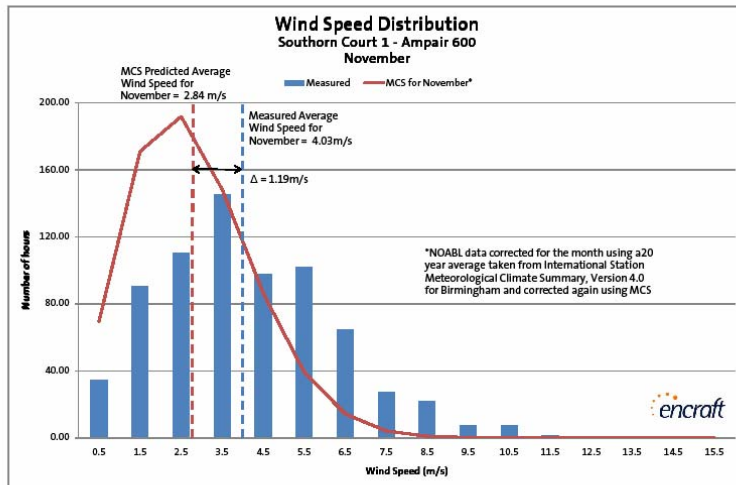


- Can we spot any patterns?

# Can we spot any patterns? Suburban

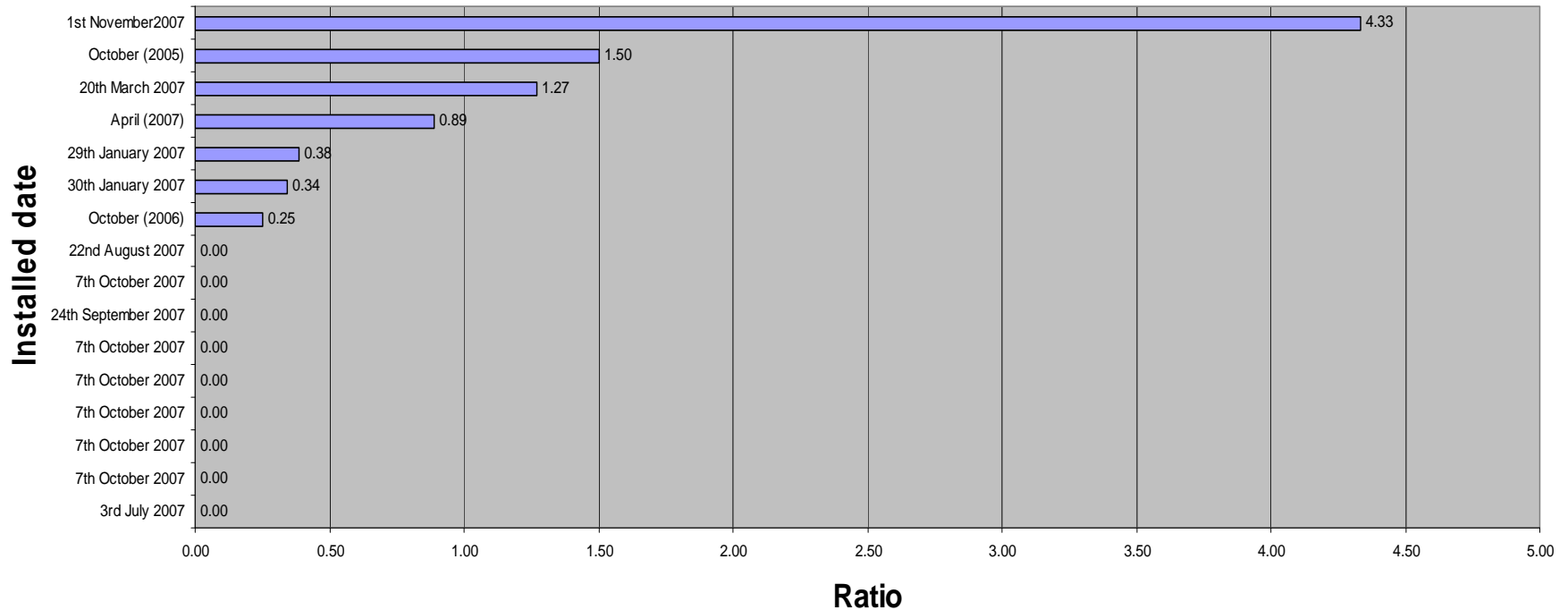


# Can we spot any patterns? High Rise



# How much energy do they consume?

Imported energy as proportion of exported energy



# Conclusions

- MIS3003 offers a helpful insight on low sites
- Quality of power curves vary by manufacturer
- There are patterns emerging
- More data required to build up a more complete picture
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