

# ESB Networks Perspective on Microgeneration

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# Micro-generation

## Presentation Outline

- EN 50438 – Interface Protection
- Safety
- Process
- What is Micro Generation
- Status of Micro Generation In Ireland
- Network Access for Micro Generation
- Metering and the Energy Market
- ESB Support Initiative for Domestic Micro Generation

# Micro-generation – shapes and sizes

- Micro-CHP units
- Small wind turbines
- PV arrays
- Combinations



# EN 50438

- Annex A houses variations in Interface Protection settings
- Annex E houses variations in scope
- In some European countries, “Inform and Fit” is prohibited by law

# EN50438 scope

In En50438, Micro-generation is defined as a source of electrical energy and all associated equipment, rated up to and including

- 25A at low voltage [230V], when the DSO network connection is single-phase
- 16A at low voltage [230/400V], when the DSO network connection is three-phase,

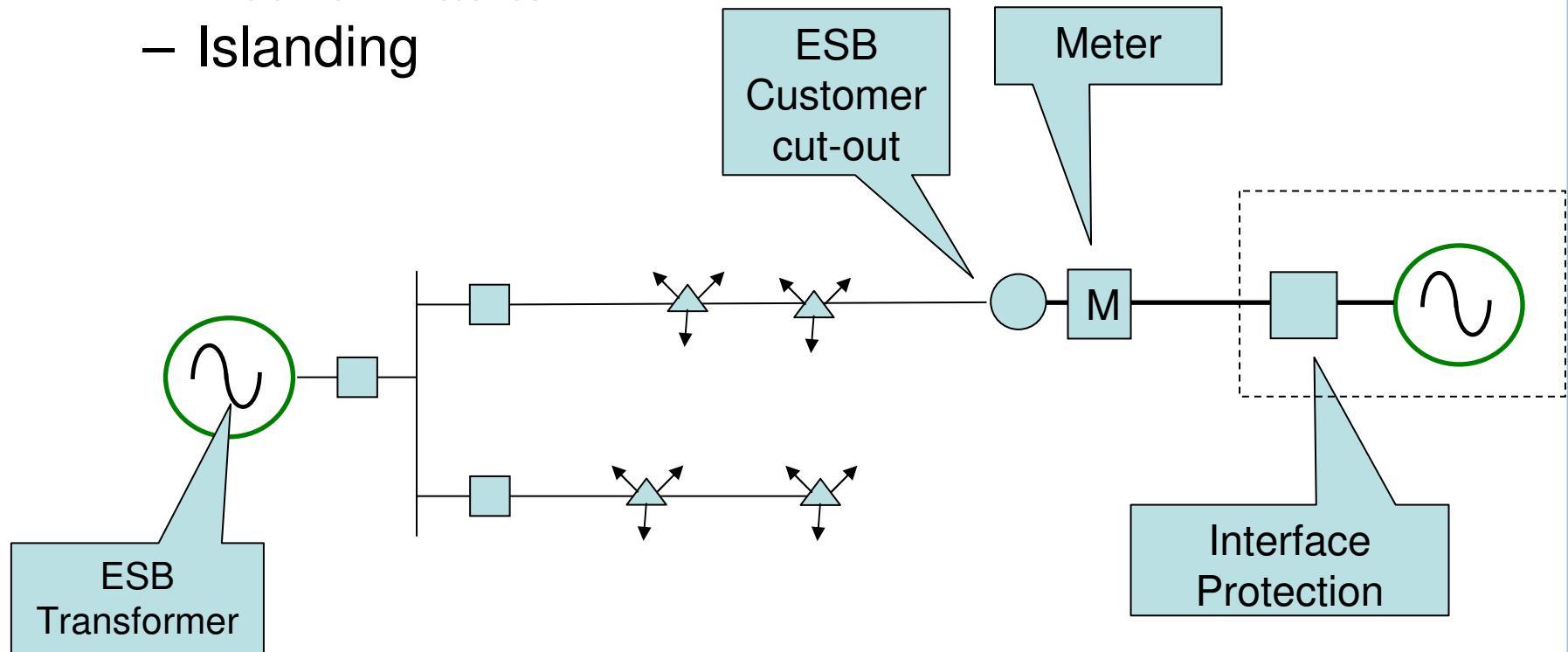
and designed to operate in parallel with the ESB Networks LV system.

Where multiple generating sources [of the same or varied technologies] are on the same site and share access to the same ESB Networks connection point, the aggregate rating must not exceed:

- 25A at low voltage, when the DSO network connection is single-phase
- 16A at low voltage, when the DSO network connection is three-phase.

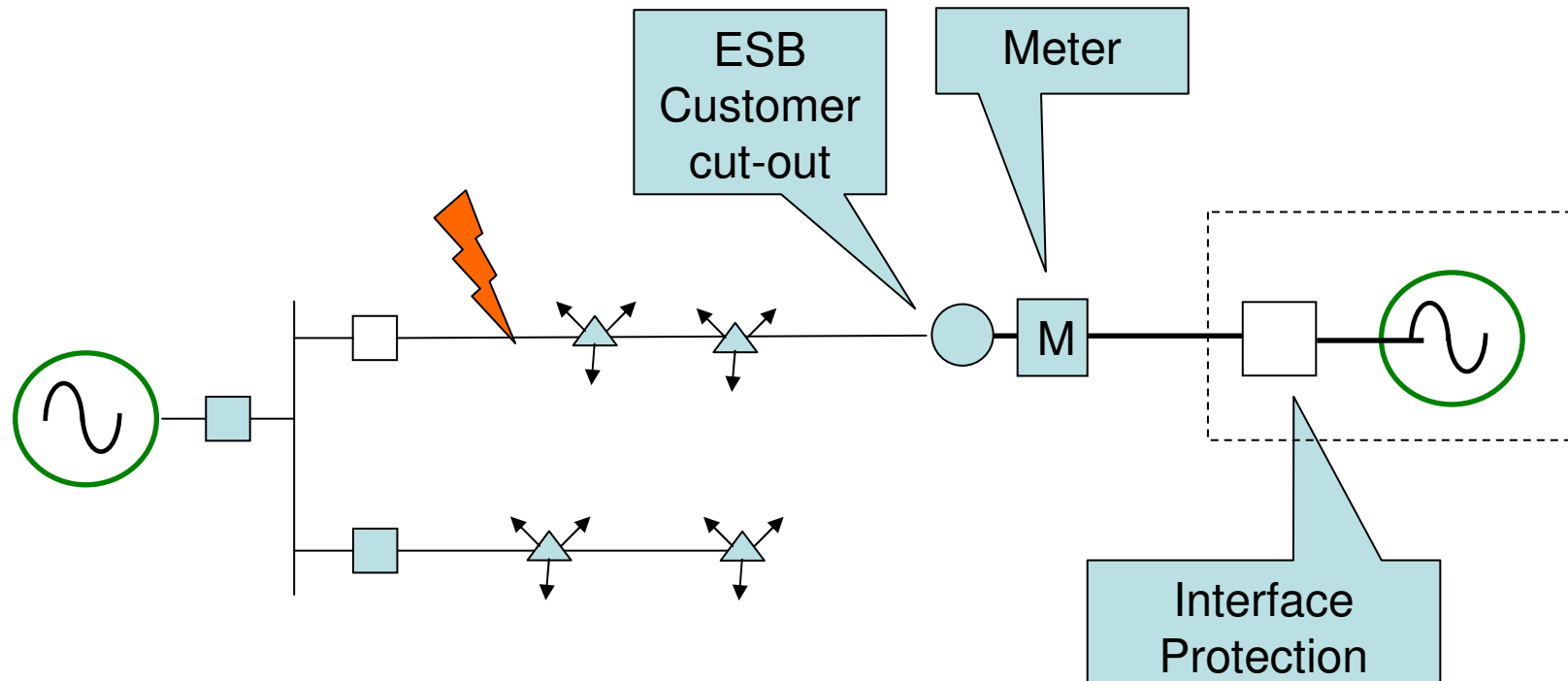
# Technical Aspects – Interface Protection

- Needed for two principle conditions
  - Network faults
  - Islanding



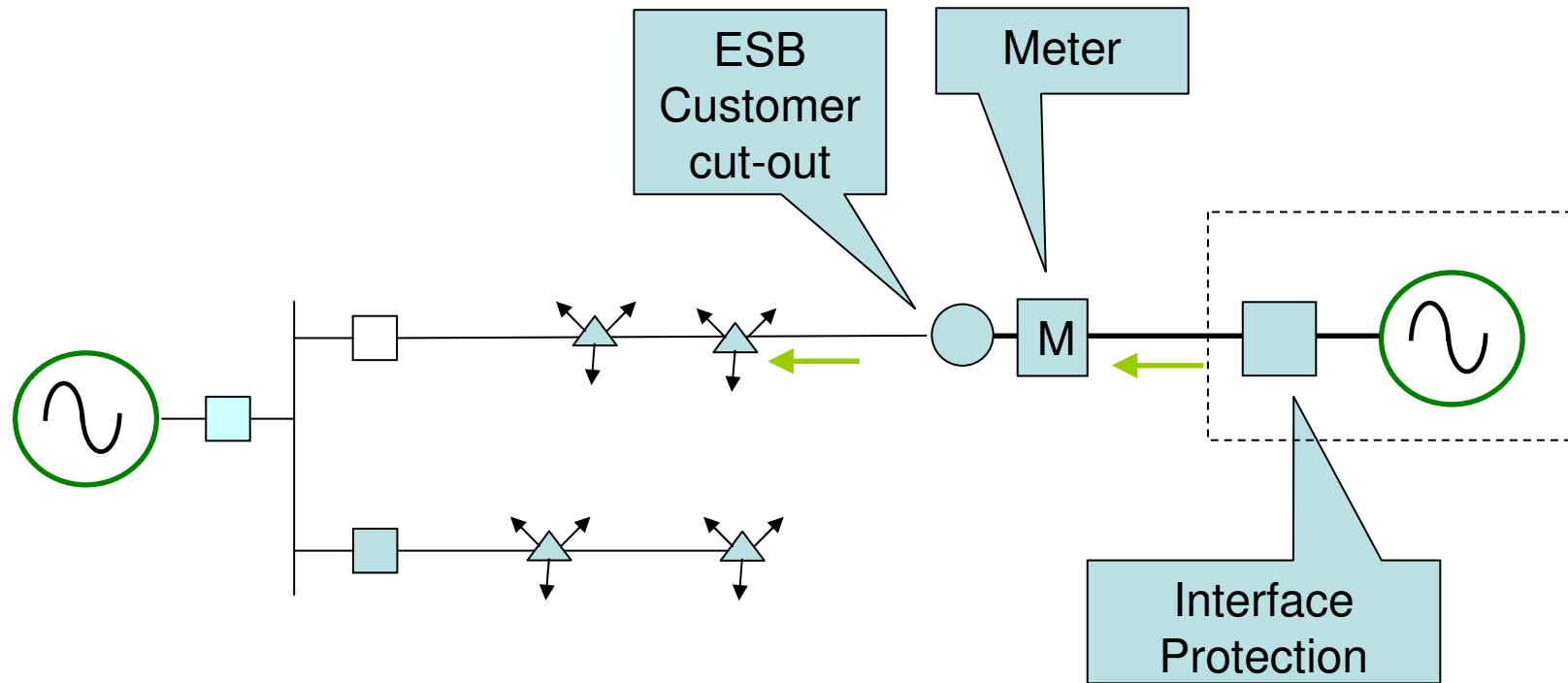
# Technical Aspects – Interface Protection

- Network faults



# Technical Aspects – Interface Protection

## – Islanding





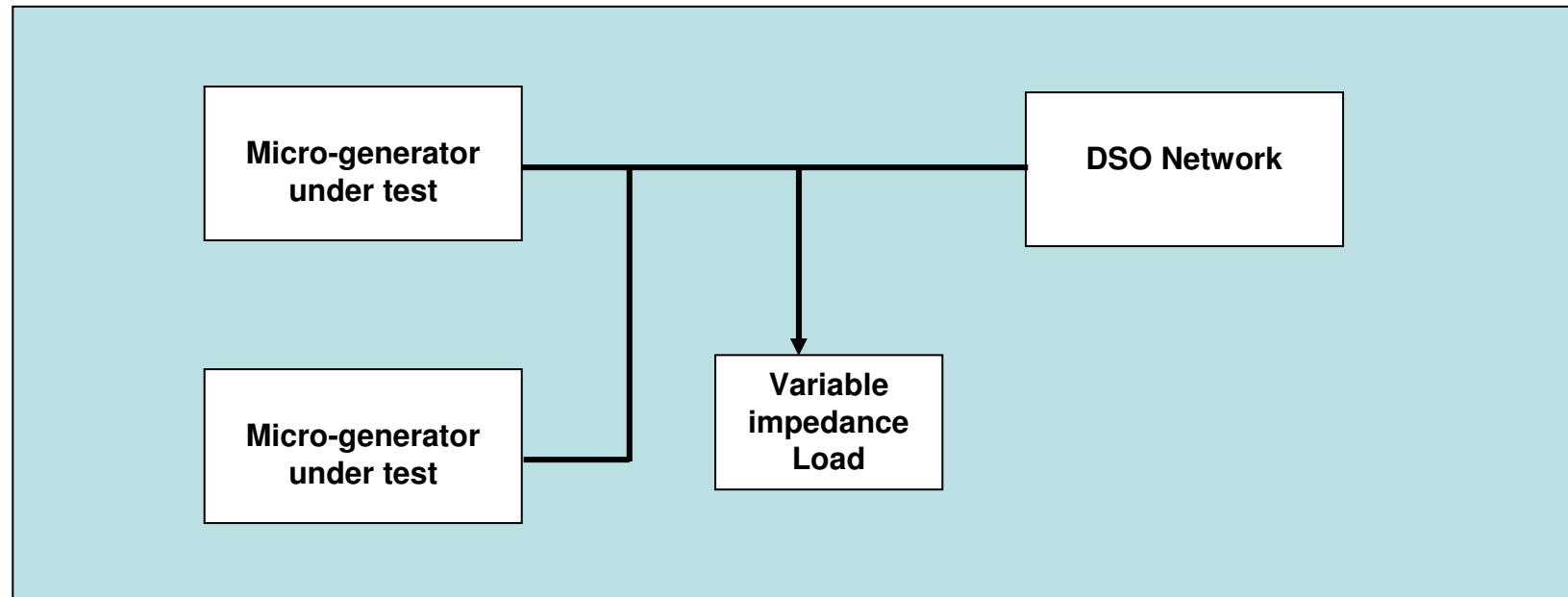
# Interface protection

Parameter	Trip setting	Clearance time
Over voltage	230 V + 10 %	0,5 s
Under voltage	230 V – 10 %	0,5 s
Over frequency	50 Hz + 1 %	0,5 s
Under frequency	50 Hz - 4 %	0,5 s
<p>An explicit Loss of Mains functionality must be included. Established methods such as, but not limited to, Rate of Change of Frequency, Vector Shift or Source Impedance Measurement may be used. Where Source Impedance is measured, this must be achieved by purely passive means. Any implementation which involves the injection of pulses onto the DSO network, shall not be permitted.</p>		
ROCOF [where used]	0,4 Hz/s	0,5 s
Vector Shift [where used]	6 degrees	0,5 s

Type testing - a range of bench tests to verify the following:

- Power Quality parameters
  - Harmonic emissions
  - Voltage Fluctuations and Flicker
  - DC Injection
  - Power Factor
- Interface protection functionality
  - Under/over voltage/frequency
  - Loss of Mains [LoM]

# Loss of Mains Test



- Test takes place at three levels of Output power
- For each, variable impedance load is set to give 75% and 125% load-generation mismatch

# Safety

# Safety

Neither G83 or EN50438 cover the following:

- Safety of DSO personnel.
  - This is the responsibility of ESB Networks
- ESB Networks Safety Rules and procedures need to be robust enough to deal with all situations, including “rogue” installations
- wiring of micro-generation installations.
  - This is the responsibility of ETCI

# Process Issues

# Once-off installations

- Notification of intention to fit is required by ESB Networks
- Simple Form available on ESBN website
- Copy of En50438 type test certification required

# Planned multiple installations

- Application for connection required in usual manner
- Network studies required
- “Inform and Fit” concept not applicable
- Would arise for example if new housing estate fitted with micro-CHP



# Overview

## *An ESB Networks Perspective*

- What is Micro Generation
- Status of Micro Generation In Ireland
- Network Access for Micro Generation
- Metering and the Energy Market
- ESB Support Initiative for Domestic Micro Generation

# What is Micro Generation

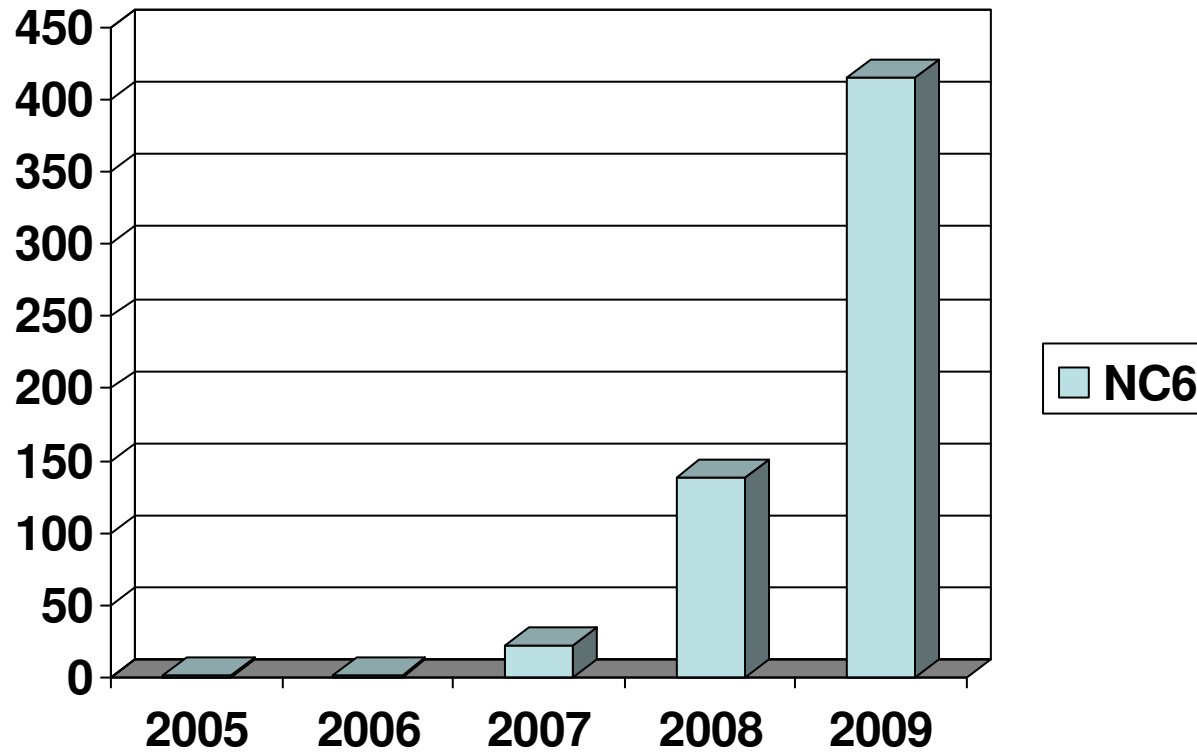
## *An ESB Networks Perspective*

- Electric Grid-tied
- Inform and Fit – 6/11kW
- Domestic – 29kVA single or three phase
- Business - 50kVA

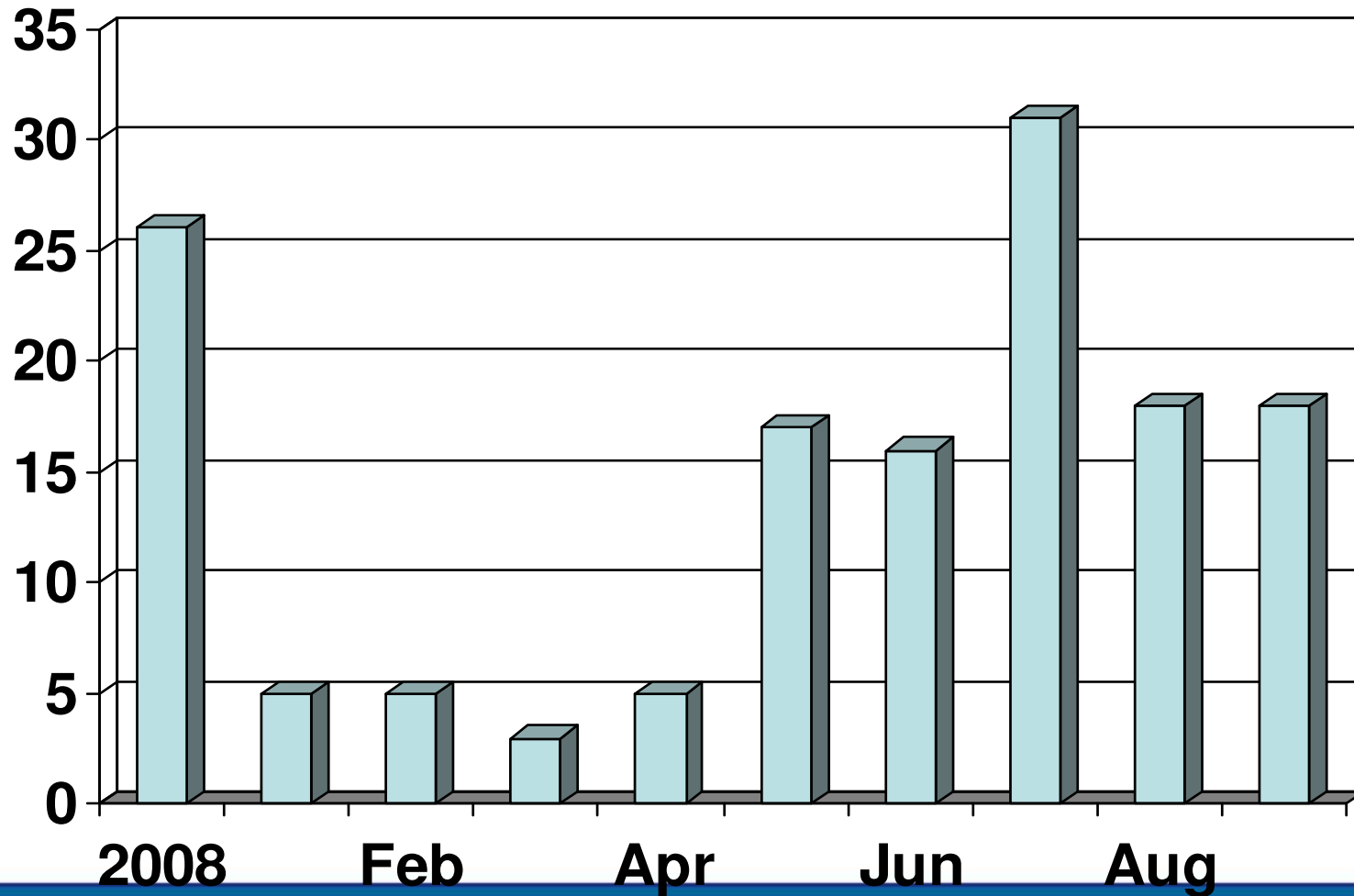
# Current Status of Micro Generation in Ireland

*An ESB Networks Perspective*

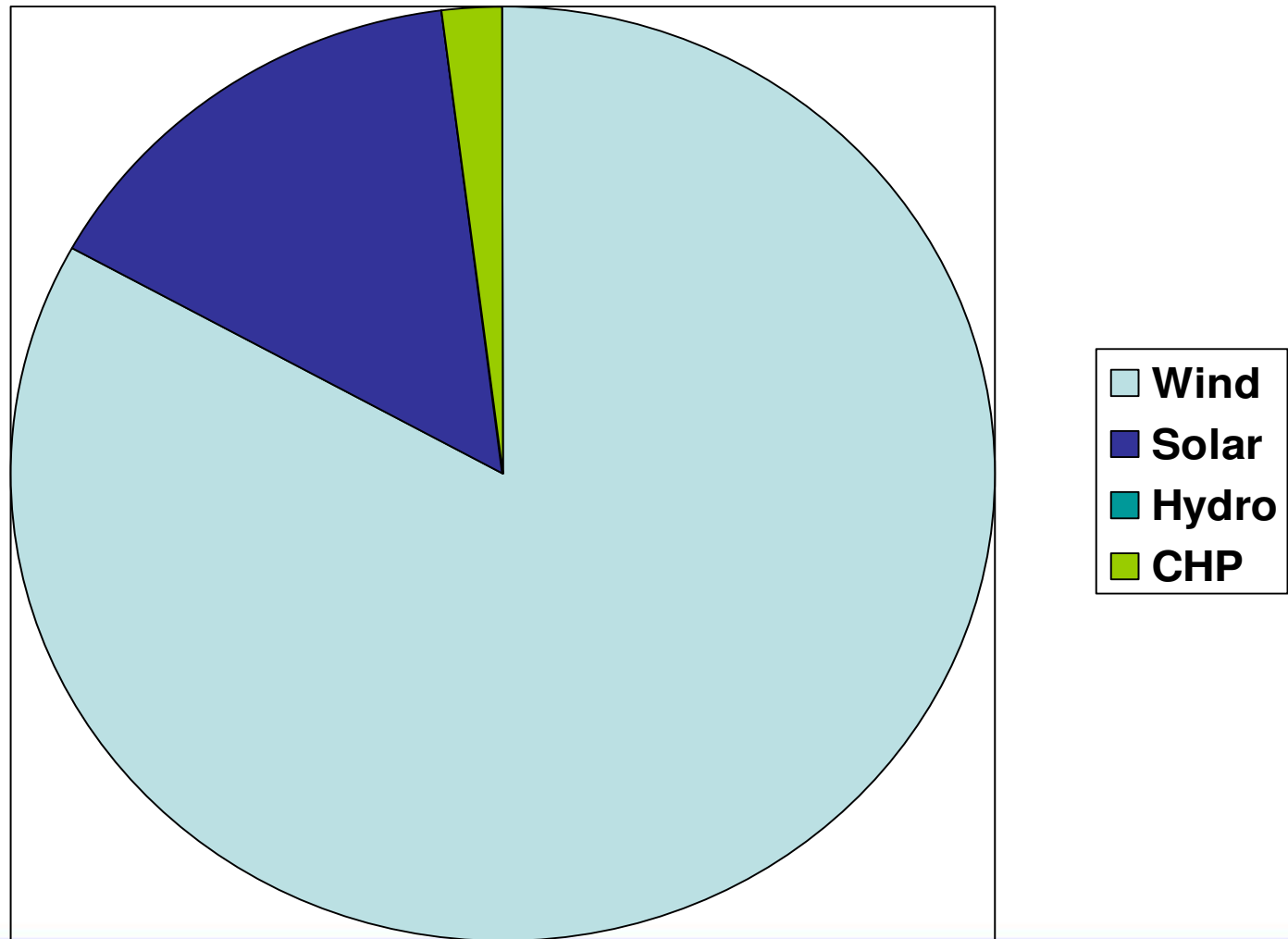
# Customer Notifications



## Meters Installed



## Types of Micro Generation



Cork 94	Cavan 11
Dublin 57	Monaghan 9
Galway 50	Roscommon 9
Tipperary 43	Carlow 8
Donegal 30	Kilkenny 8
Wexford 28	Longford 6
Wicklow 24	Laois 5
Westmeath 20	Leitrim 2

# Network Access for Micro Generation

- Inform and Fit – EN50438
- Domestic up to 29kVA – Under Review
- Commercial up to 50kVA – Under Review



# Metering and The Energy Market

- Micro generation currently outside Market Settlement System
- ESB Supply currently only Supplier with Tariff
- Interval Metering is remotely polled
- Smart Metering

# ESB Support Initiative for Domestic Micro Generation

*An ESB Networks Perspective*

- Free Metering
- 10c Top Up for first 3000 kWh  
For first 4000 customers

Thank You for your attention

Questions?