



Empowering Rural Industries

Leading from the Bleeding Edge?

Orkney's Local Energy Opportunities in Adversity

Orkney: Powerhouse

Orkney generates

115%

...of it's electricity needs

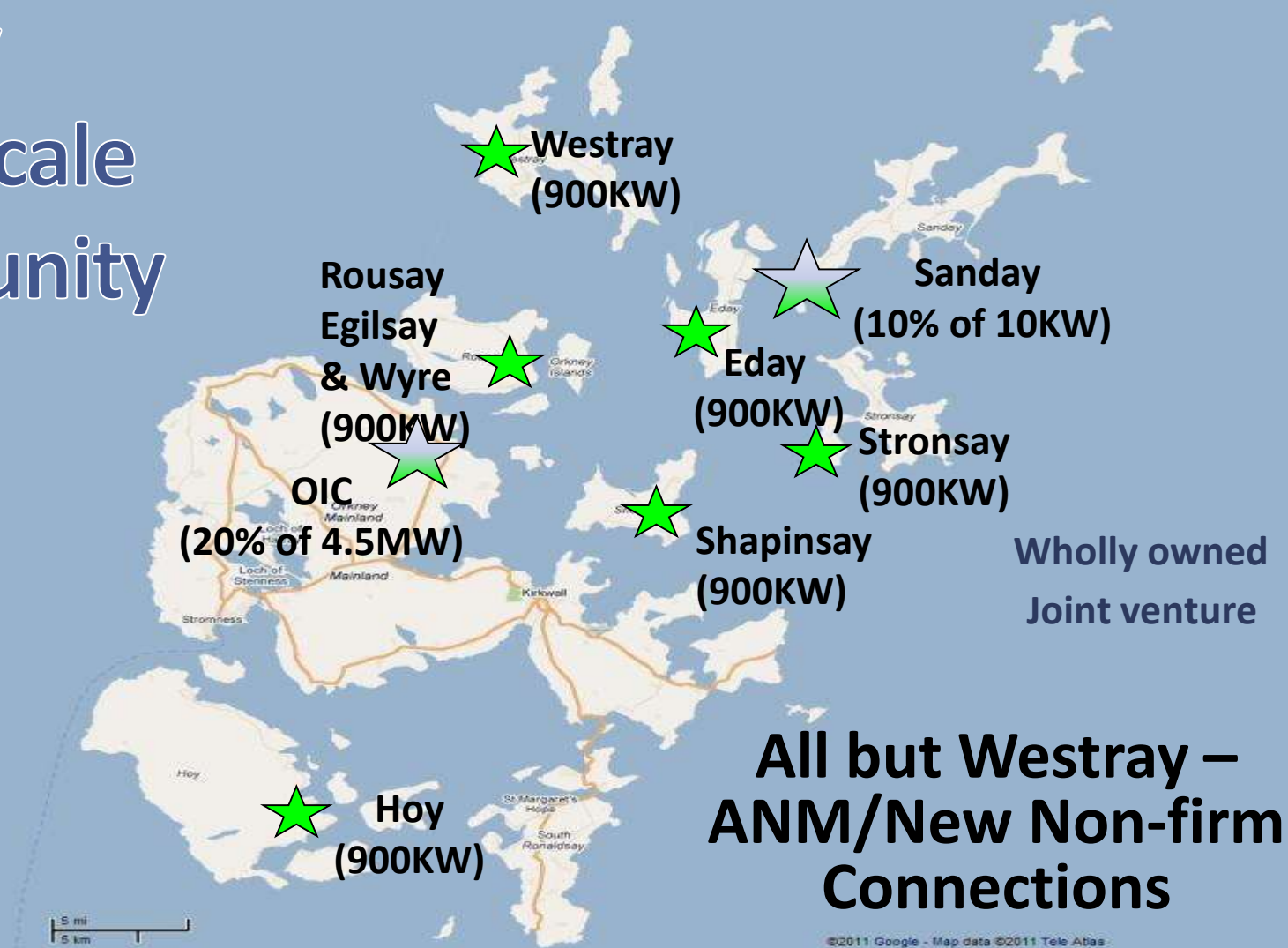
.... or Orkney: Poor House

63% of ALL Homes &

85% of retired homes

...are fuel poor

Orkney Large-scale Community Owned



Wholly owned
Joint venture

**All but Westray –
ANM/New Non-firm
Connections**

Predicted Community Funds

- > £4M per annum revenue
- > £1M per annum after costs
- > £20M over project lifetimes
(in today's value)

A direct result of our local “smart grid”

The challenge of ANM connections

- Curtailment levels in outer zones up to 60%
- Zone 1 losses worth c. £3M p.a. revenue
- Community generators > £1M p.a. in total
- Individual sites £150-350K p.a.
- These levels threaten financial viability



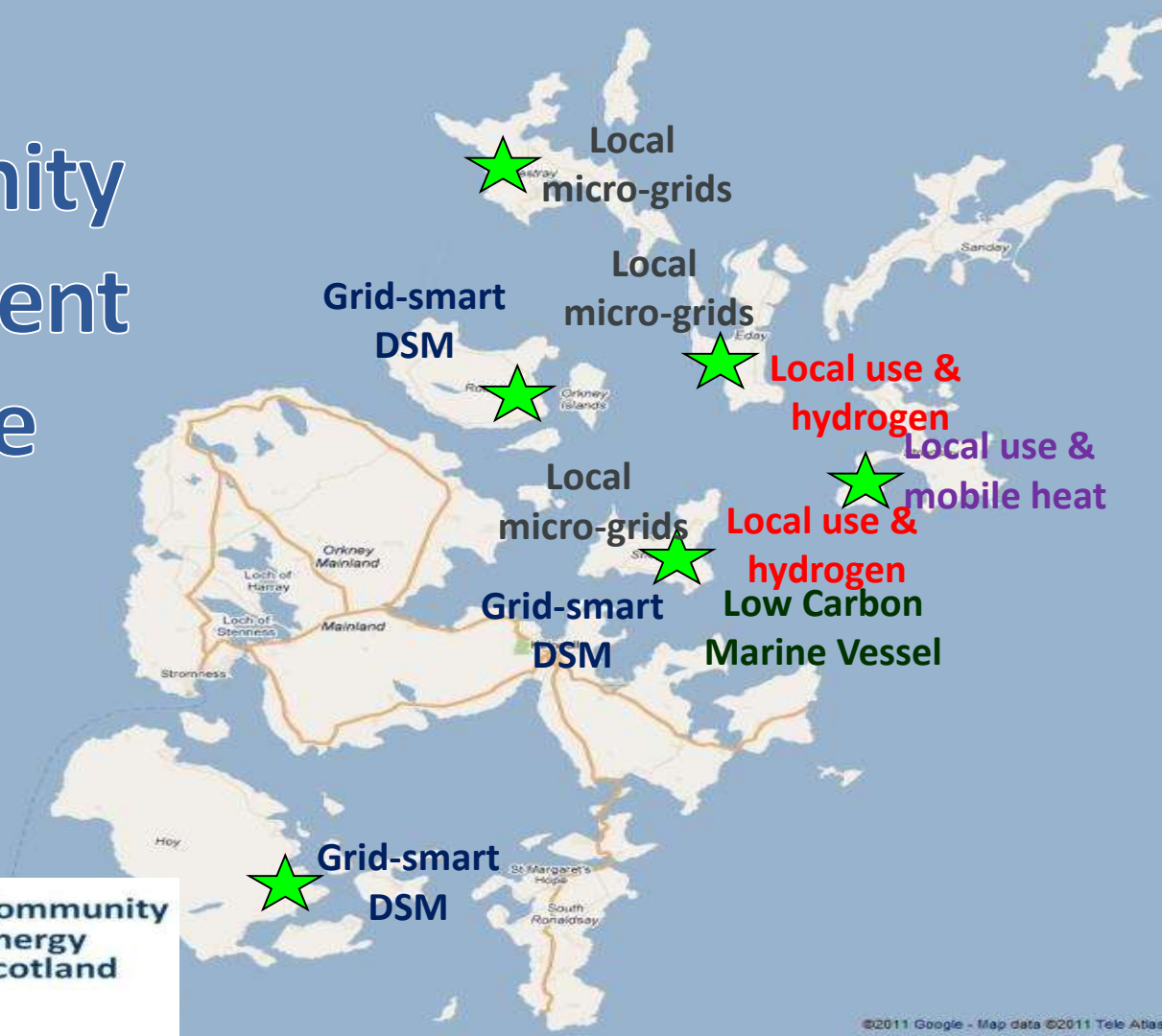
"Eday's Iceberg Graph": A comparison of Generated Output versus Lost Output

■ Generated Output (KWh) ■ Lost output (KWh)



Courtesy Andrew Stennett, ERE

Orkney Community Curtailment Response Activity



Key Orkney Community (LECF) Projects Underway





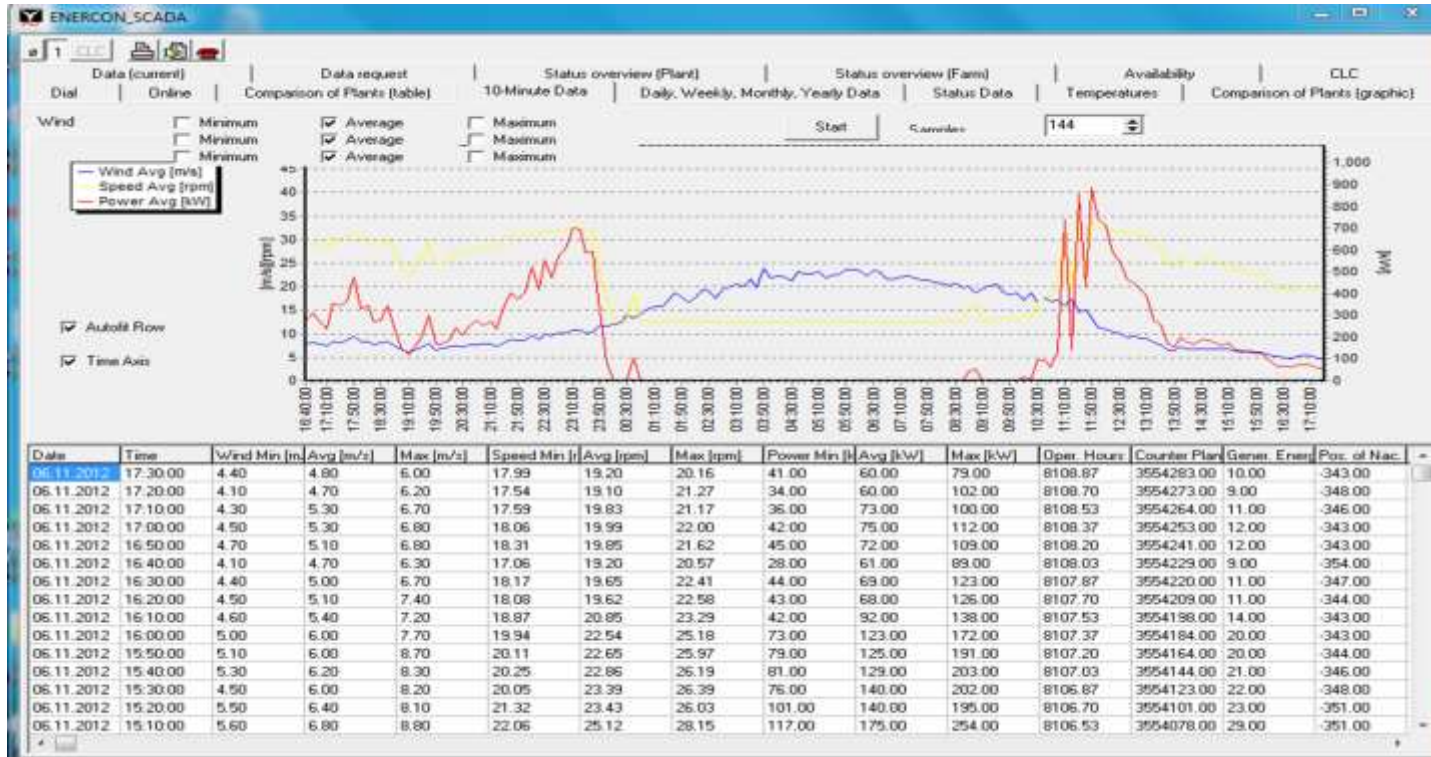
Heat Smart Orkney Ltd

Diverting unused renewable energy into affordable heating

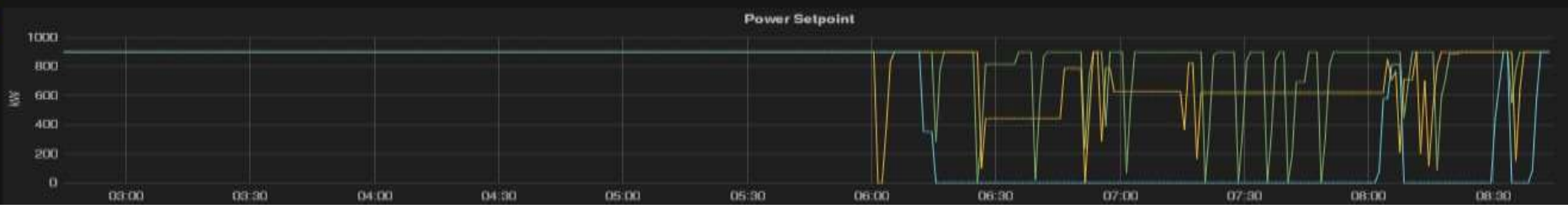
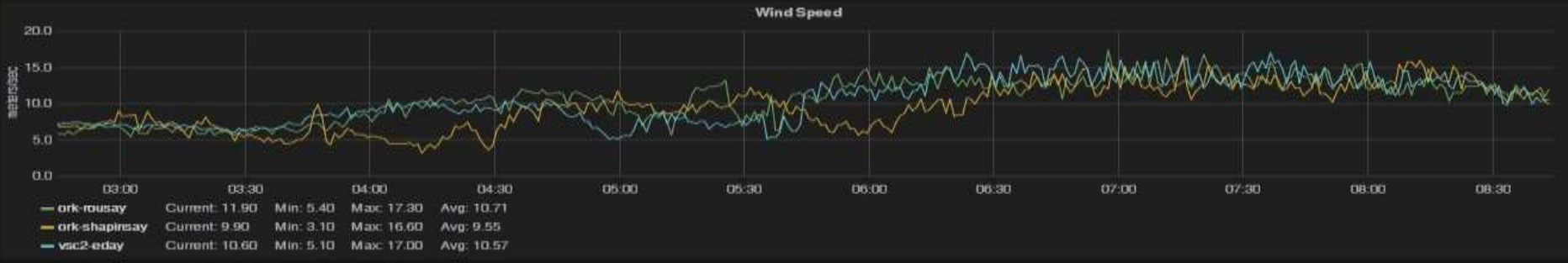
Michelle Koster – REW Development Trust

Mark Hull - Community Energy Scotland

A Curtailment Loss?



Or Curtailment Intelligence?



Orkney: OUR house

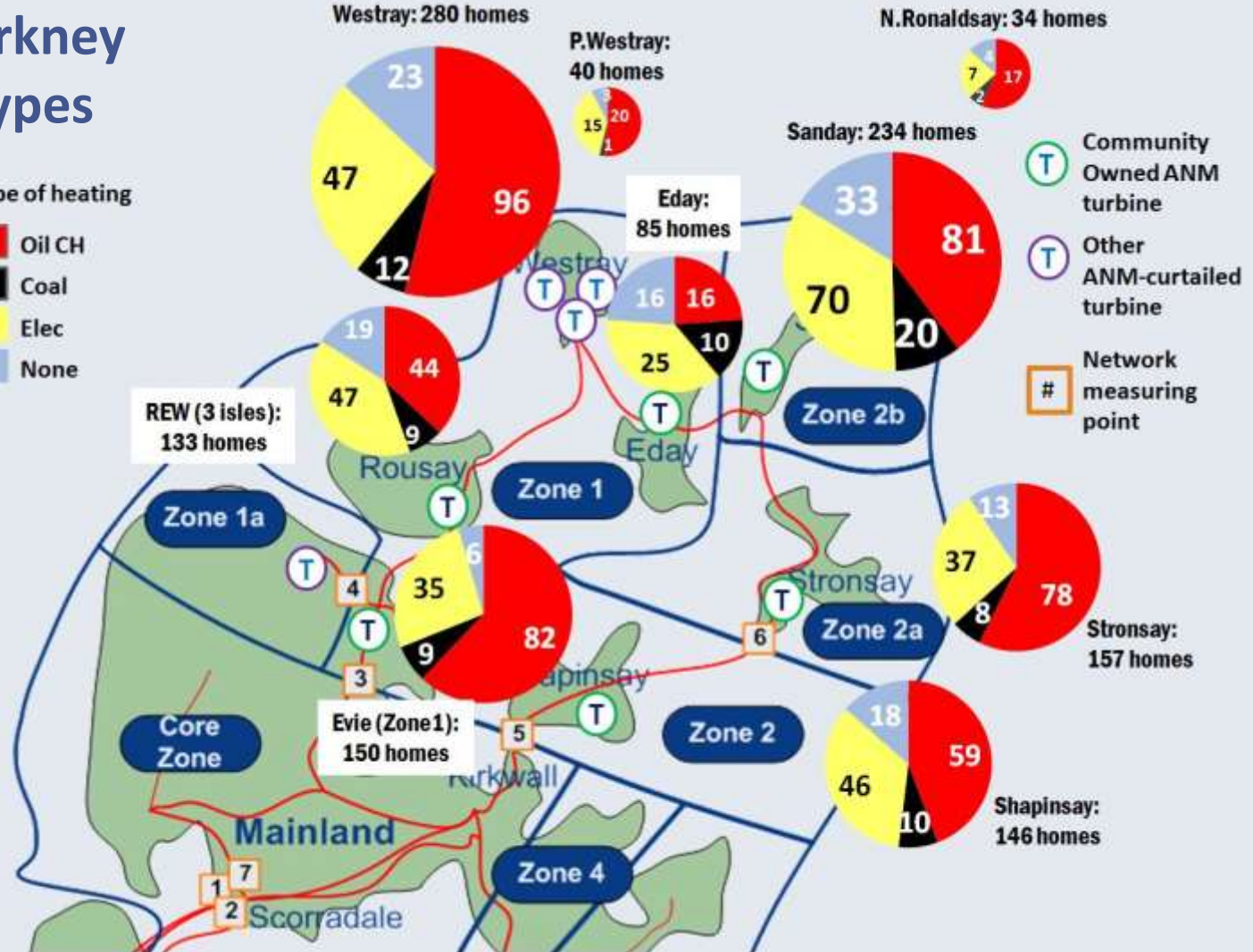
**We can do more if we are
“intelligent”**

**Non utilised local renewable
power for domestic demand
side management**

Current Orkney Heating Types

Type of heating

- Oil CH
- Coal
- Elec
- None



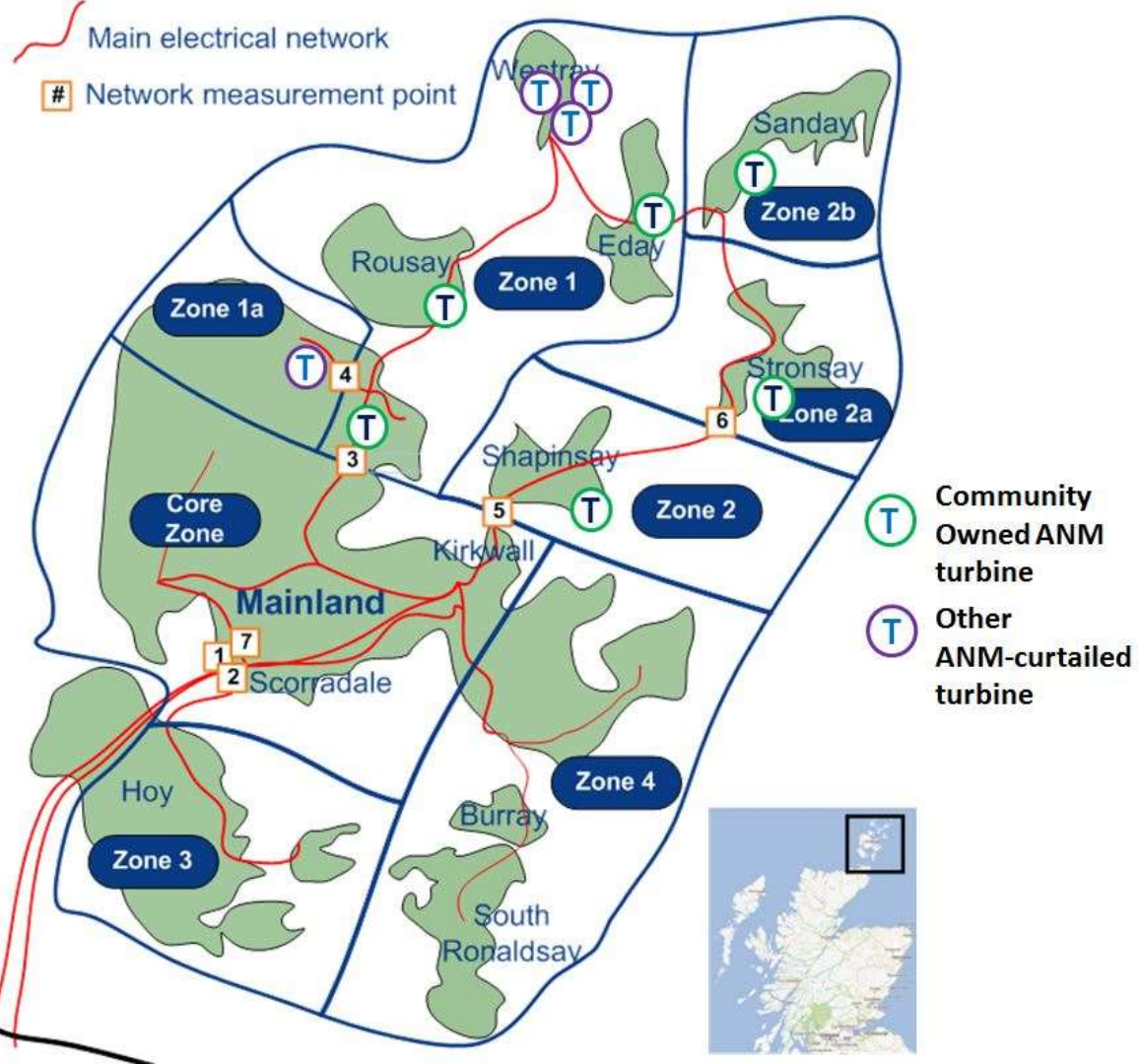
Heat Smart Orkney Homes are here



8 homes underway completing technical & comms. trials

What is driving curtailment?

Orkney ANM Zones 1 & 2



What is driving ANM curtailment?

Turbine 1

Turbine 2

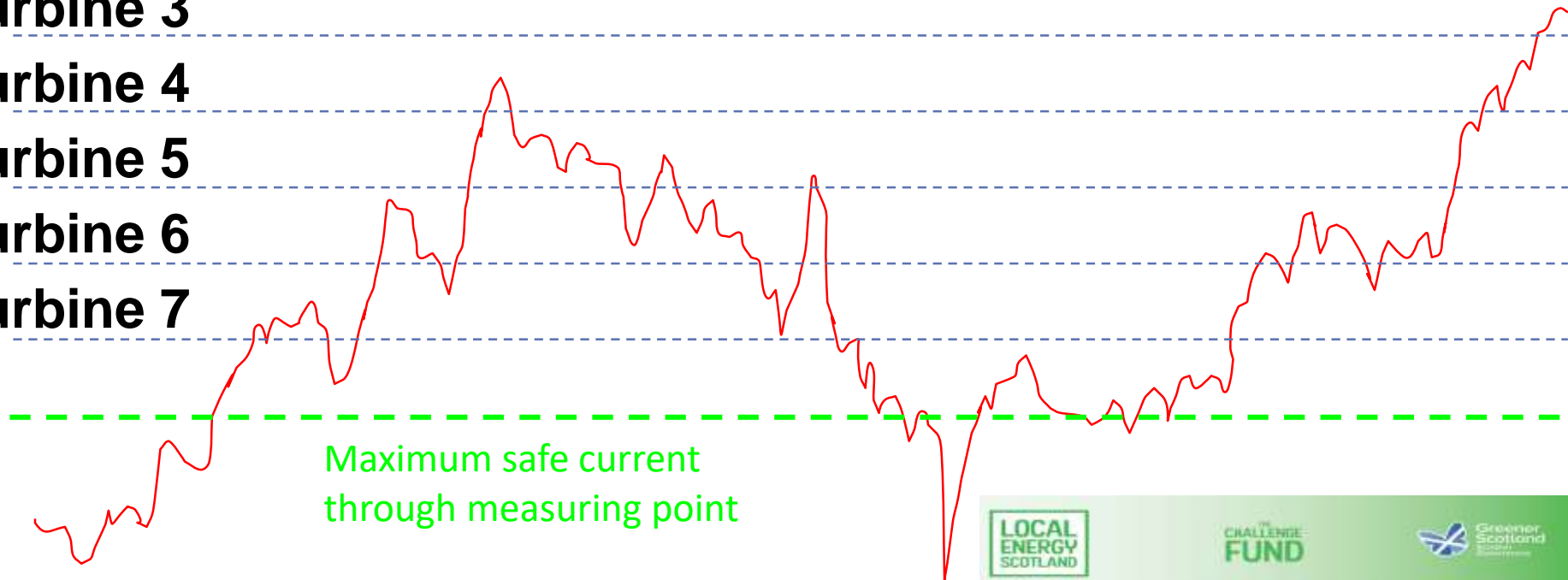
Turbine 3

Turbine 4

Turbine 5

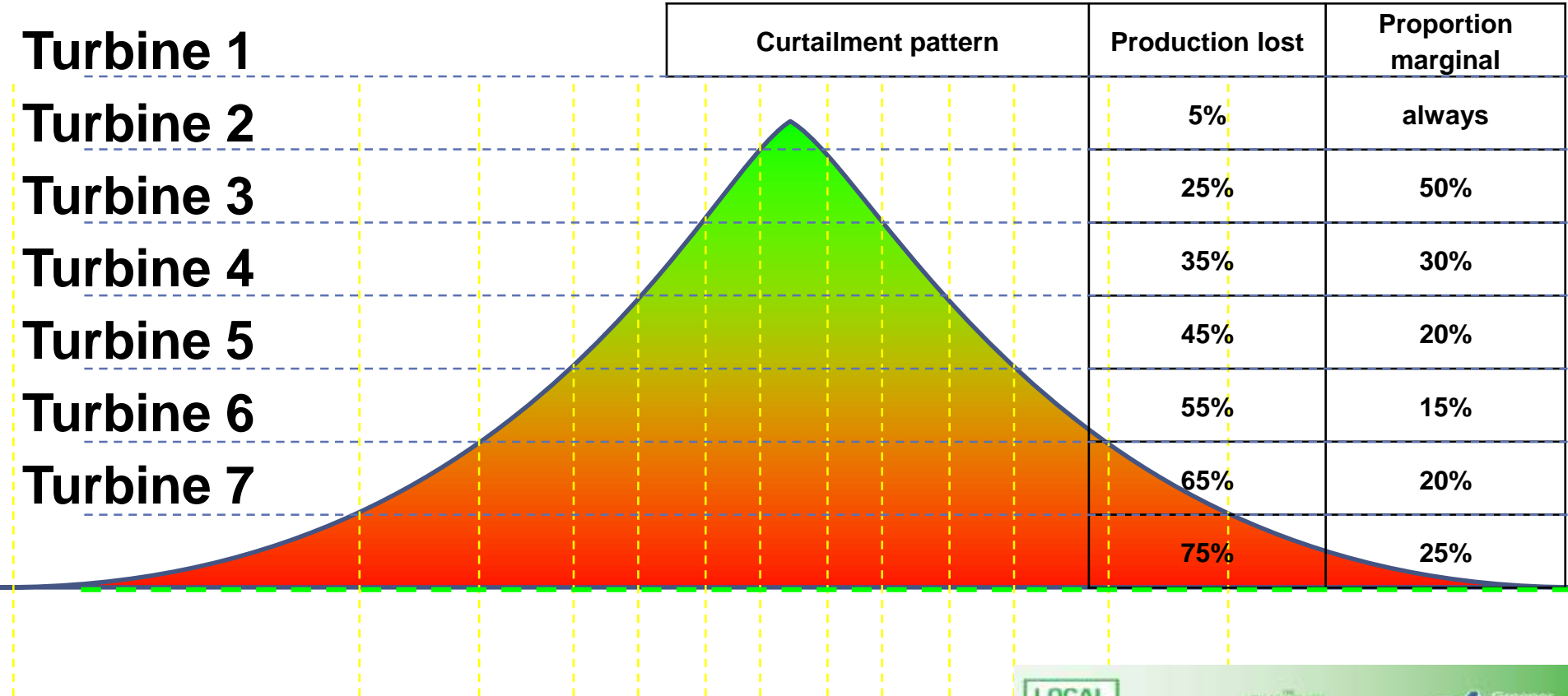
Turbine 6

Turbine 7



Maximum safe current
through measuring point

The ANM stack and marginality





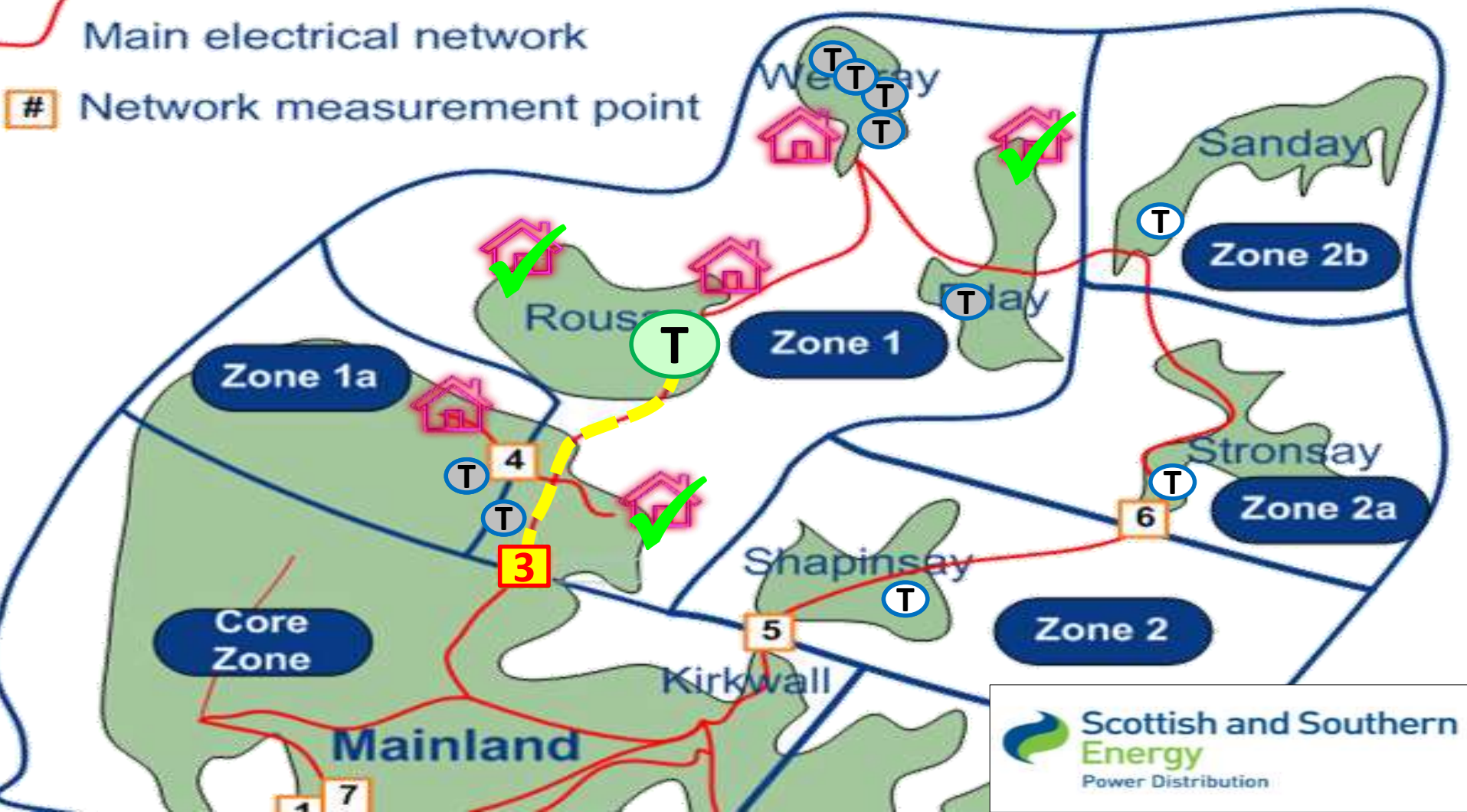
CURTAILMENT

**CORRELATED
LOAD**

Control load

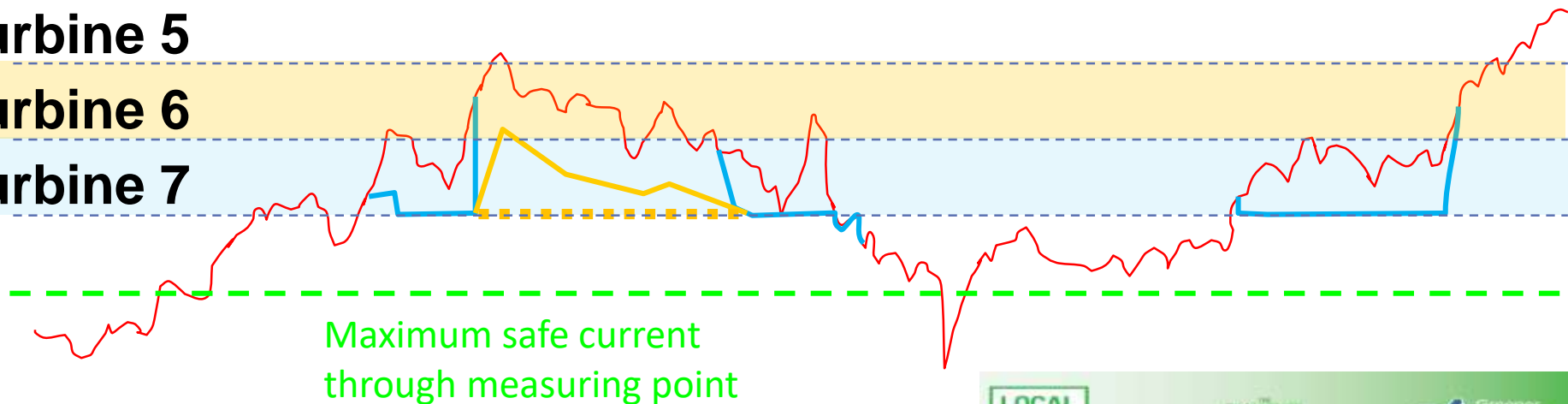
Main electrical network

Network measurement point



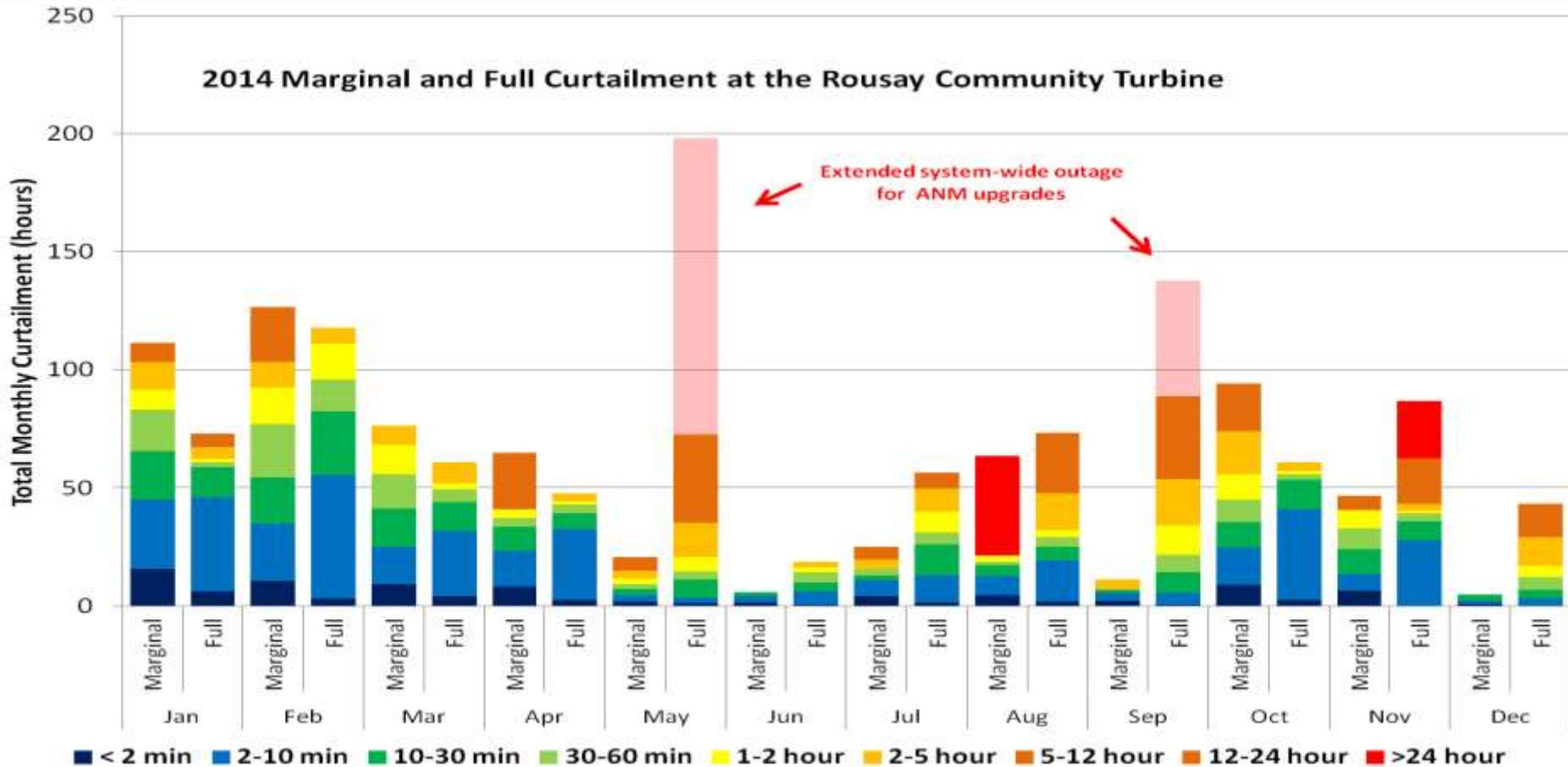
Efficacy coefficient

- Turbine 1
- Turbine 2
- Turbine 3
- Turbine 4
- Turbine 5
- Turbine 6
- Turbine 7



Prevalence of marginality in reality

2014 Marginal and Full Curtailment at the Rousay Community Turbine



Calculating lost production



Partial Community Ownership and Real Community Enablement

- Proposed final HSO will be a wholly community owned social enterprise
- Initially REWDT but multi-community for actual trading
- Self sustaining after keystone LECF support
- Communities working together and taking responsibility to provide their own solutions
- Communities working with their strengths to be able to help and supply solutions to the private sector.
- A model for wider challenges faced in Orkney, across Scotland and all remote and rural grid supplied areas.



Heat Smart Orkney Ltd

Diverting unused renewable energy into affordable heating

Details of Progress

 ***Set up the new community rebate company!***

 ***Commissioned SSE grid studies and defined the area of search***

 ***Created recruitment materials and agreements***

 ***Advertised and started household visits and technical surveys in Rousay, Egilsay & Wyre***

 ***First widened the area to include other N Isles and just expanded to all of Zone 1***

 ***Procured the installation and technical contractors***

 ***Built a bespoke participant CRM database***



Heat Smart Orkney Ltd

Diverting unused renewable energy into affordable heating

Details of Progress

129 Households contacted by the HSO Team since we launched in September 2016

- 52** Households have been interviewed by our Project Officer on Rousay, Egilsay and Wyre, with more to interview
- 29** Properties have been approved by our Technical Assessor on Rousay, Egilsay and Wyre for equipment installation
- 20** Households from Westray have expressed interest in participating (plus 1 in Papay!)
- 5** Households from Eday have expressed an interest and **22** from West Mainland so far.
- 10** Households have declined the project, with **2** households deemed unable to participate by our Technical Assessor

We are now also recruiting across the North of West Mainland. We advertise in the local paper, radio, community newsletters, on the REWDT website, and Facebook, and have drop in events in the parishes.

Thank You





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