The Challenges of Solar Energy Development on the Isle of Wight

Solarise Workshop 12 September 2018

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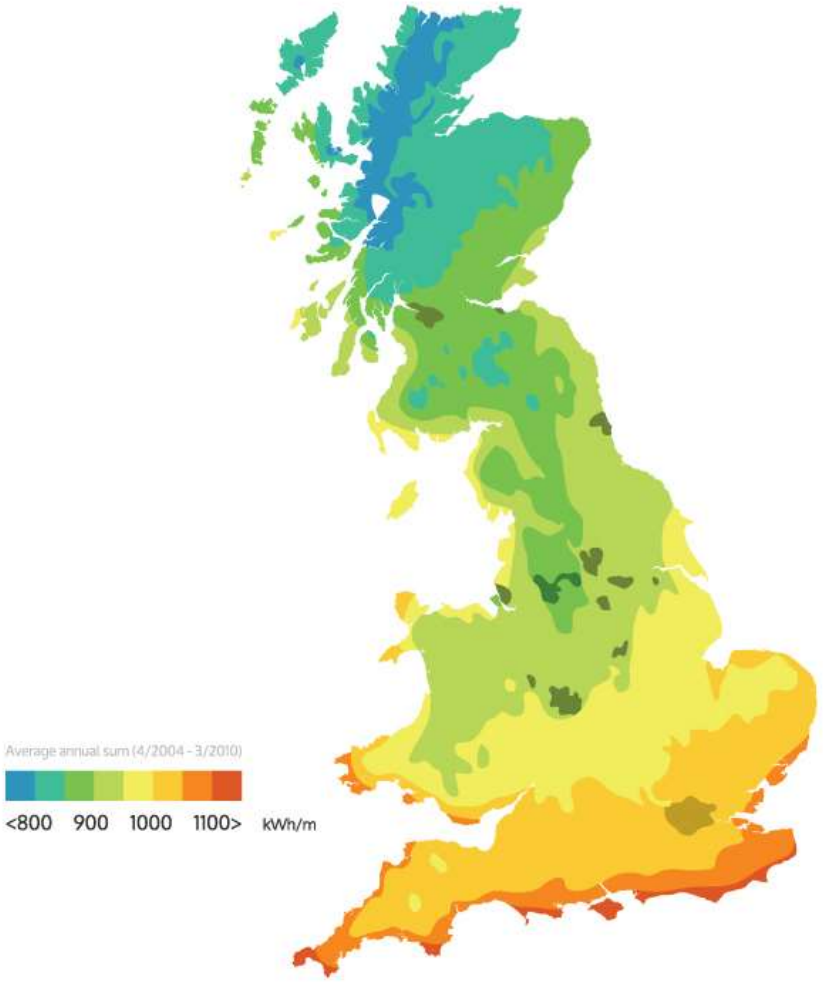
Wight Community Energy

Solar energy on the Island



We're in the red zone

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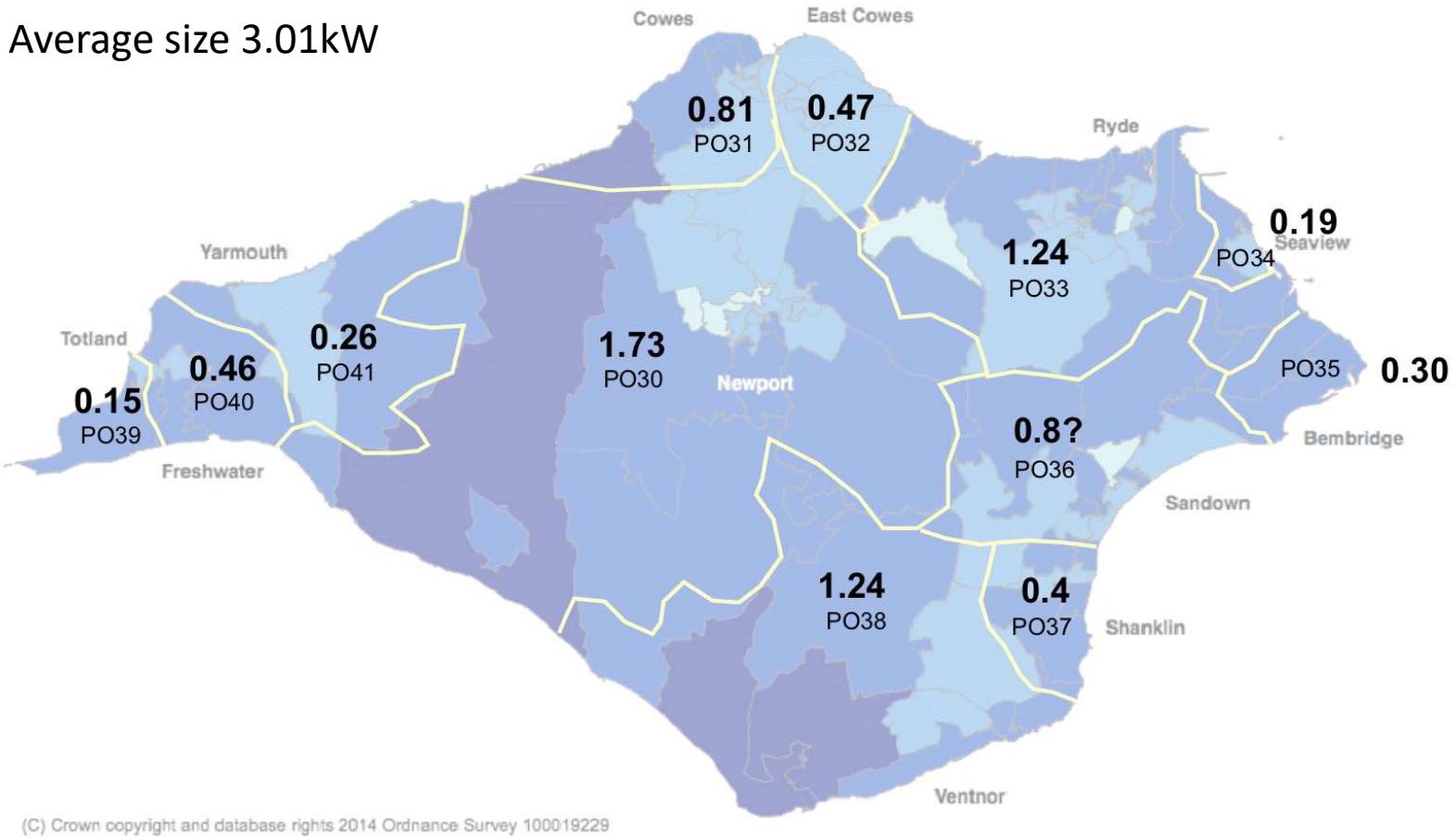
Connected capacity

- 80MW large scale PV
- 7.2MW domestic rooftop PV
- 4.5MW commercial barn/rooftop
- 5MW biomethane

Domestic capacity

Circa 2,500 installations (3%)

Average size 3.01kW



Ambition and progress

- 100% annual electricity = renewable
- Total electricity 563GWh
- Domestic 265GWh
- Total renewable 114GWh
- 43% domestic electricity

2030 scenario

- 15% Evs, 21GWh
- Domestic & Commercial 533GWh

SUPPLY				
Technology	**Capacity MW**	**Capacity factor**	**Output GWh**	
Tidal energy	30	0.30	79	
Domestic solar	36	0.14	43	15% homes
Industrial & ag. rooftop solar	30	0.14	35	
Ground mount solar	260	0.14	307	x 3 increase
Anerobic digestion	12	0.85	89	
Wind energy	-	0.35	-	
Total generation			**554**	**GWh**

2030 scenario – EVs

- EVs as storage
- 10 LEAFs = 1,000 homes (for an hour)
- 15% penetration by 2030
- Total capacity = 500MWh
- Average demand = 64MW
- 20% EV capacity = 1.5hrs (2hrs at min)

What's stopping us?

- Constrained grid
- Undersea cables (max 200MW)
- Summer solar export peak
- Summer low demand (35MW)
- 140MW Cowes power station (STOR only)
- Old and inefficient

SSEPD's present solution

- 4kW/phase max
- Active Network Management
- Customer pays (Rapanui experience)
- No to storage
- No constraint predictions
- No finance

Actions

- Challenge cable rating
- Understand limit setting rationale
- Future of the power station?
- Time shift demand and export (hydrogen?)
- Encourage EVs
- Generator's forum

inteGRIDy

- EU funded project
- Reports in 2020
- Smart grid and flexibility (storage, DSR etc)
- Grid model for IoW
- Estimates of curtailment
- Promotion of EVs

Smart systems project

Virtual Power Network and flexibility marketplace for closer connection of generation and demand on the Island

Smart systems project

- Flexible heating and storage systems
- EV charging network with flexibility services
- New generation to feed into VPN
- Storage at generation facility
- Data for flexibility (IoT)
- Peer to peer trading
- A new approach to flexible connections

Hot water

- 300litre insulated tank
- 45 to 75 deg = 11kWh (5 showers)
- <£2,000 install
- Avoids inefficient summer water heating

https://mixergy.co.uk - Internet of tanks

Hot water


August 2018
External Temperature
Set Point
Temperature
80°C
70°C
60°C
50°C
40°C
30°C
20°C
10°C
0°C
heat loss = 0.1kWh per hour
6.4kWh
4.9kWh
Aug 01
Aug 08
Aug 15
Aug 22
Aug 29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Community Energy

Coming together to take control of energy consumption and generation energy

Freedom from the grip of the Big 6

In the UK there are over 5,000 community-owned renewable projects and the number is growing all the time

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Community objectives

Support community ownership of energy generation

Work to reduce fuel poverty

Move IoW towards energy self sufficiency

Encourage wider EV ownership

Support development of smart grid solutions

Members

136 members

Total £700k raised

61 Island addresses

£200k locally including

Footprint Trust and Community Action IoW

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Finance

- Project capital of £5.5M was raised from:
  - £3.08m bank loan (now £2.8m)
  - £1.7m IoW Council
  - £700,500 shareholders
- Highly geared
  - 13% equity
  - 85% costs = Opex + debt service
- Payments
  - 7% to members
  - >£1million to community

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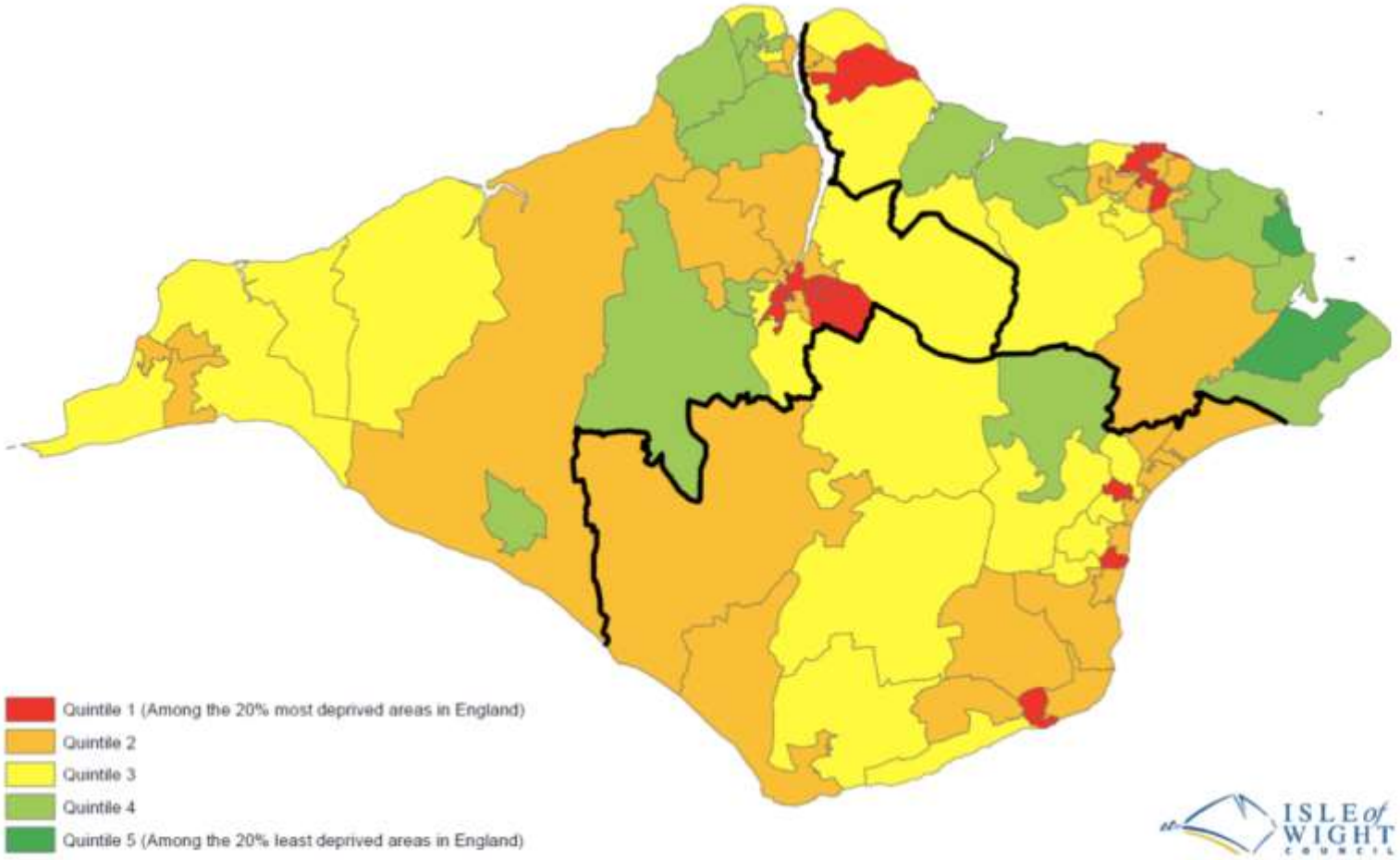
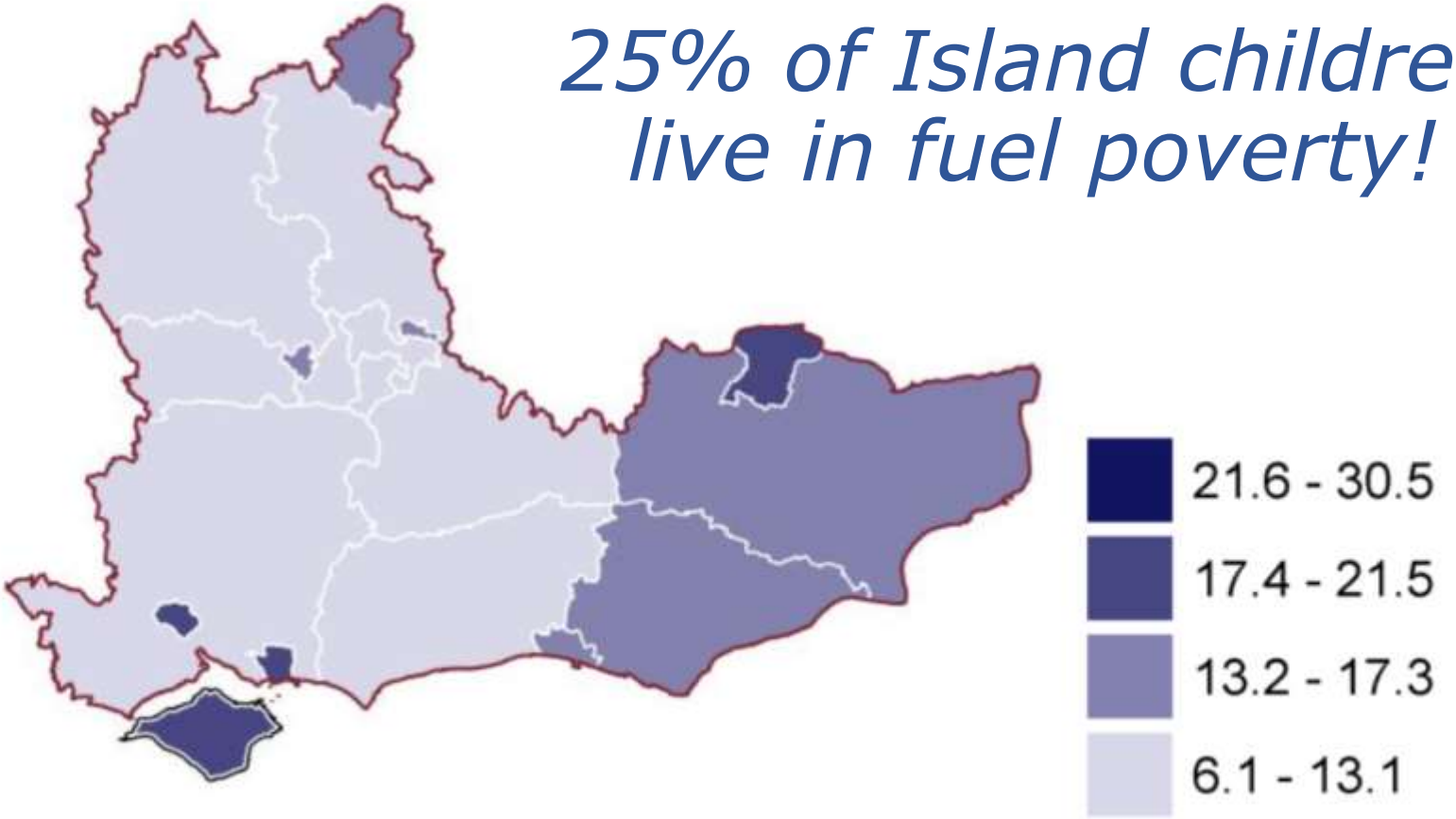
A deprived Island



Child Poverty



25% of Island children live in fuel poverty!

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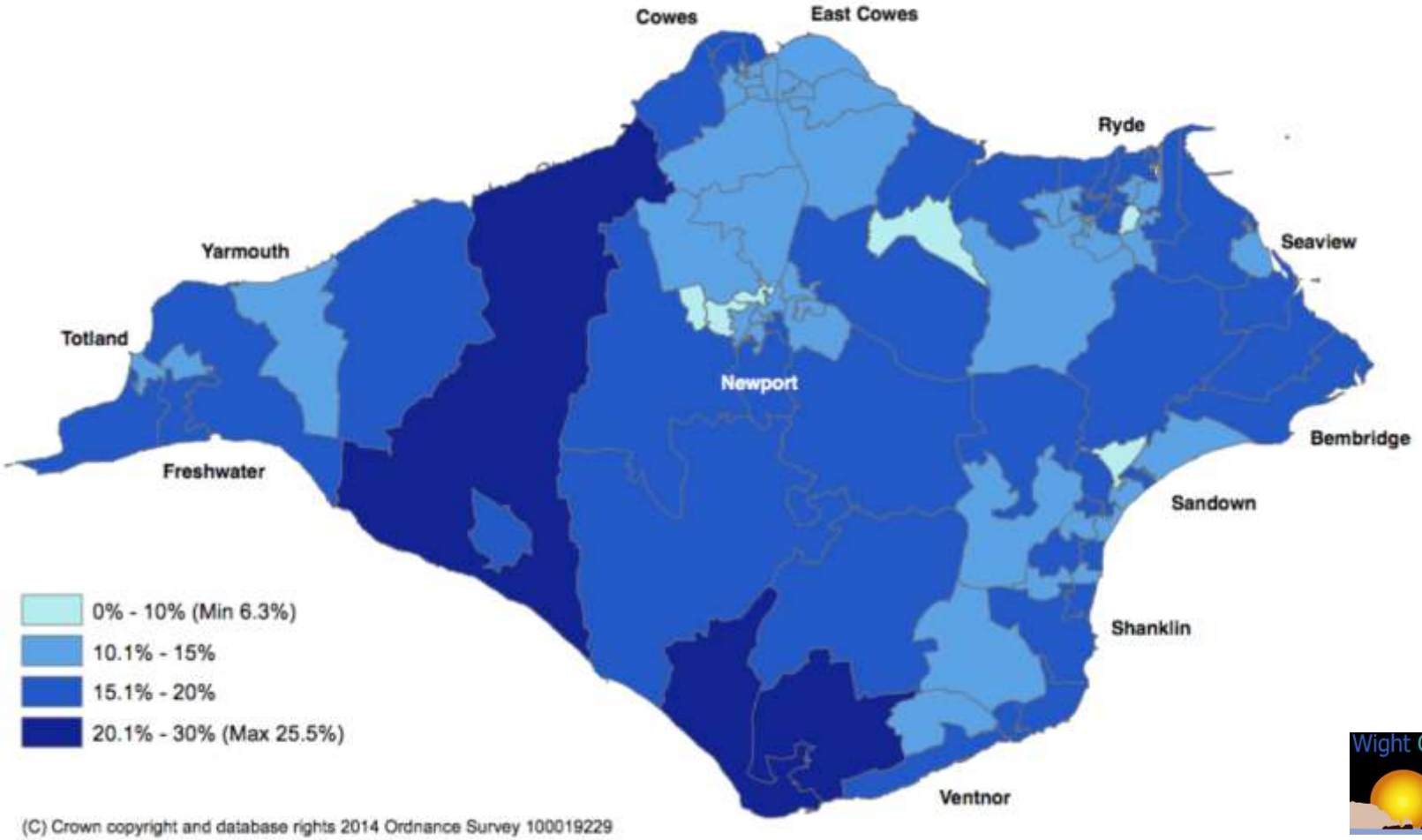
Rural Fuel poverty



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Project performance

The SSE problems

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Outages

2016

11.2% lost production

2017

13.4% lost production, £67,210 of income

2018

Nothing so far…

2016 Outages

- 11.2% lost production
- Two primary causes:
  - **Grid outages**
  - **SSE Active Network Management (ANM)**
- Met operating costs and service debt service.
- Unable to pay members' interest or community fund

2017 Outages

SSE letter - 43% loss predicted

Lobbied and negotiated with SSE

Multi -level relationship (30+)
Moved from ANM to inter-trip
Solar consortium deal with RWE (cost to participate)

Actual loss - 13.4%

Full story at:

http://iowcommunityenergy.org/investors-and-charities-set-to-miss-out-due-to-isle-of-wight-solar-switch-off/

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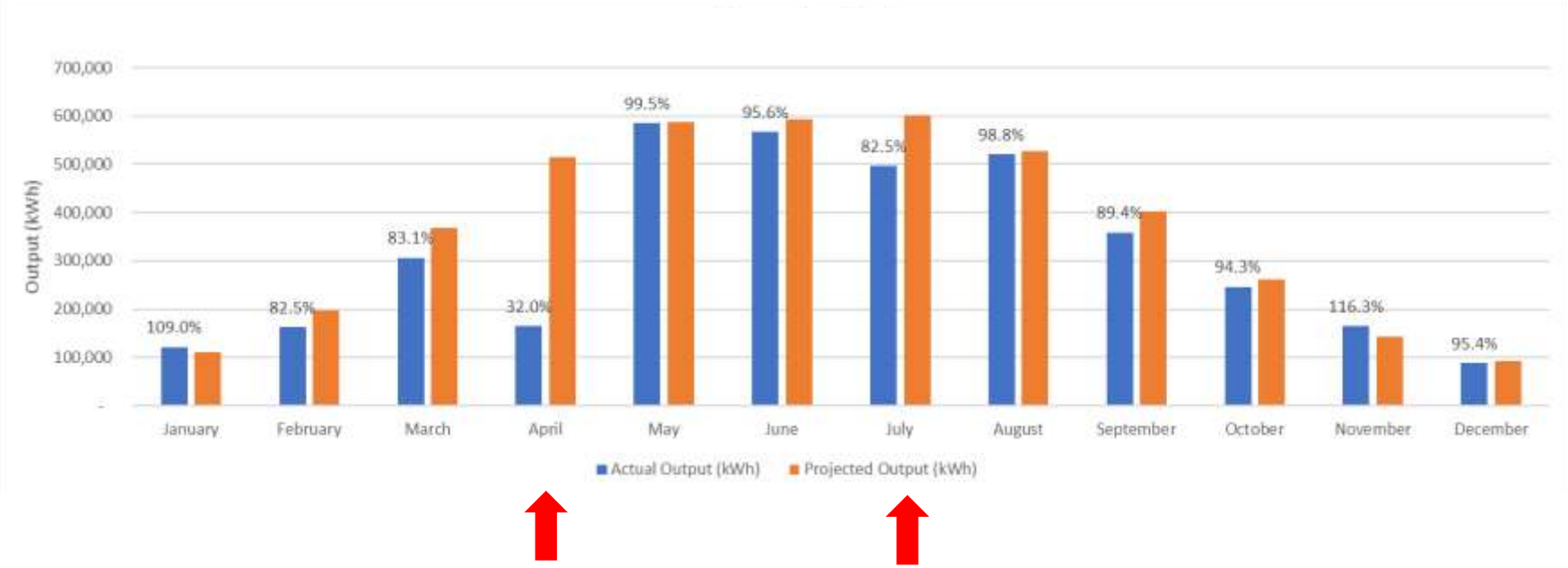
Performance 2017

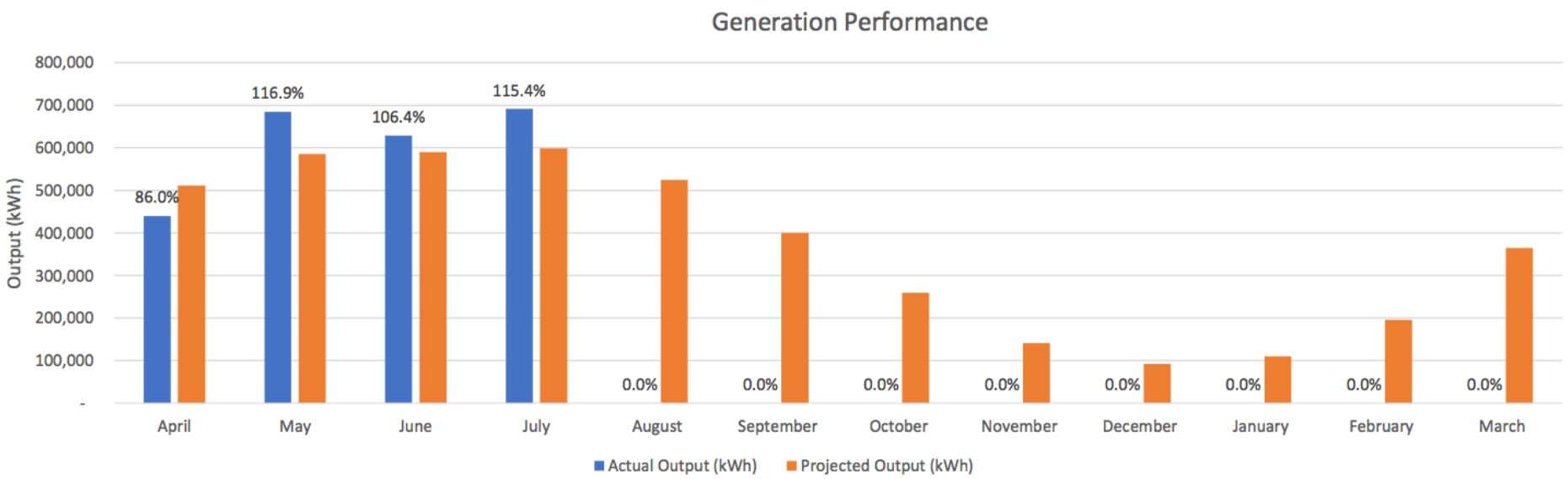
3.78GWh - power for 1,200 homes

86% target: (mainly outages)



January to July 2018

107% target



Summary

- 100% renewable electricity aspiration
- 43% domestic achieved
- Network limits further expansion
- Carrot and stick with SSEPD
- Fuel poverty high (rural)
- Community energy solutions