



**Here's one we prepared earlier**

Chris Reynolds,  
Guildford Borough Council

## On the river theme .....

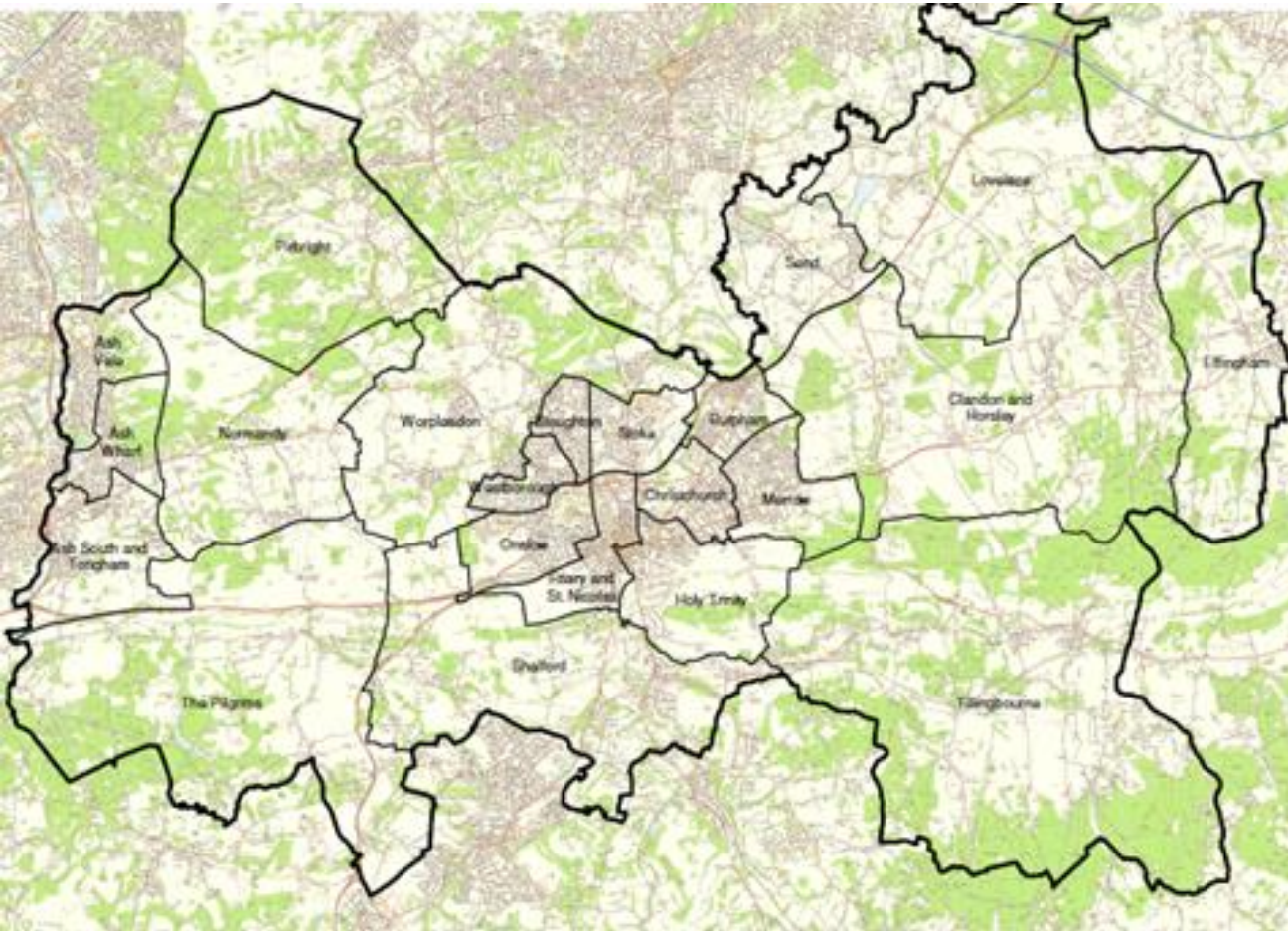


# **Guildford's Hydro scheme and other renewable energy developments.**

14<sup>th</sup> June 2016

**Chris Reynolds**

## Guildford - Background



- 89% greenbelt
- 48% AONB
- Special Protection Area in North e.g. Pirbright, Wisley
- Strong political will
- Heritage assets
- 100% NIMBYism



Figure 54: The Town Mill in Guildford showing the single storey Toll House and (right) the 35kW hydro turbine during installation

# Hydro Electric Energy

Hydro electric plant established 2006



35 kW max

Approx. 160 MWh generated /annum

Expected annual income - £20,000



## Millmead Offices

- Biomass used for main heating
- Solar Thermal heats water for showers
- Solar PV – one of 7 sites currently



# Monitoring & Reporting

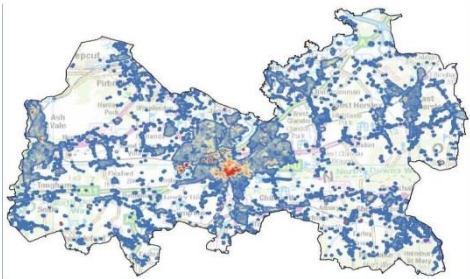
- Buy through Laser framework
- Billing data provided by Laser through Systems Link
- Detailed consumption data (AMR) provided through Stark
- Systems Link (through validation reports) alert us to exceptions, which we investigate
- We use Stark and Systems Link to question the norm.
- Internal quarterly reporting of energy cost, consumption and carbon
- Annual reporting through GHG report and CRC



# Renewables Mapping exercise



**Guildford Borough Council  
Renewable Energy Mapping Study**



Final Version  
January 2015

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## Dual purpose

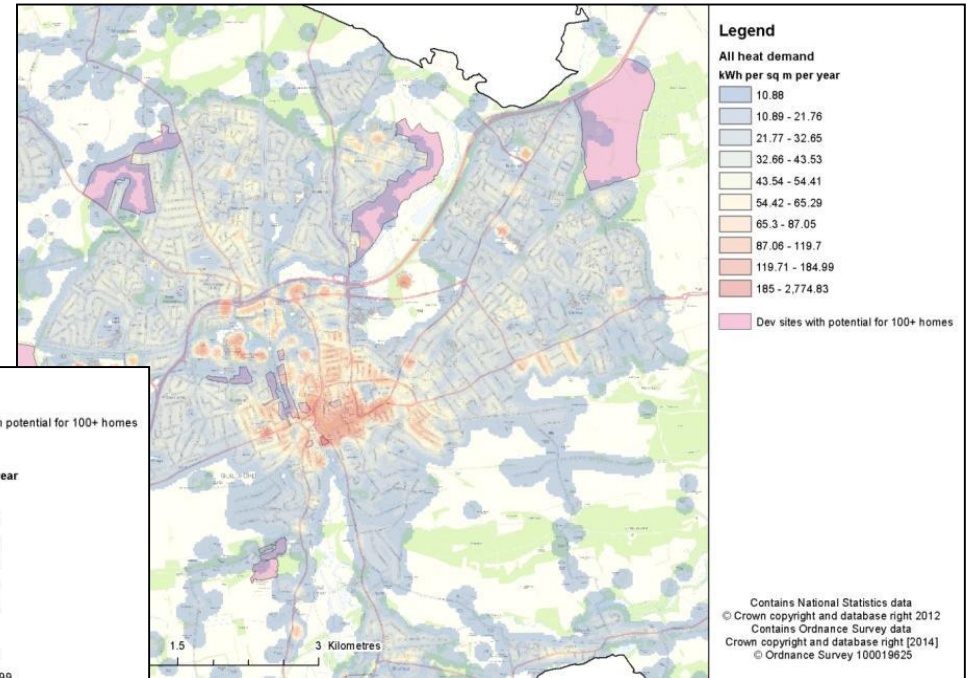
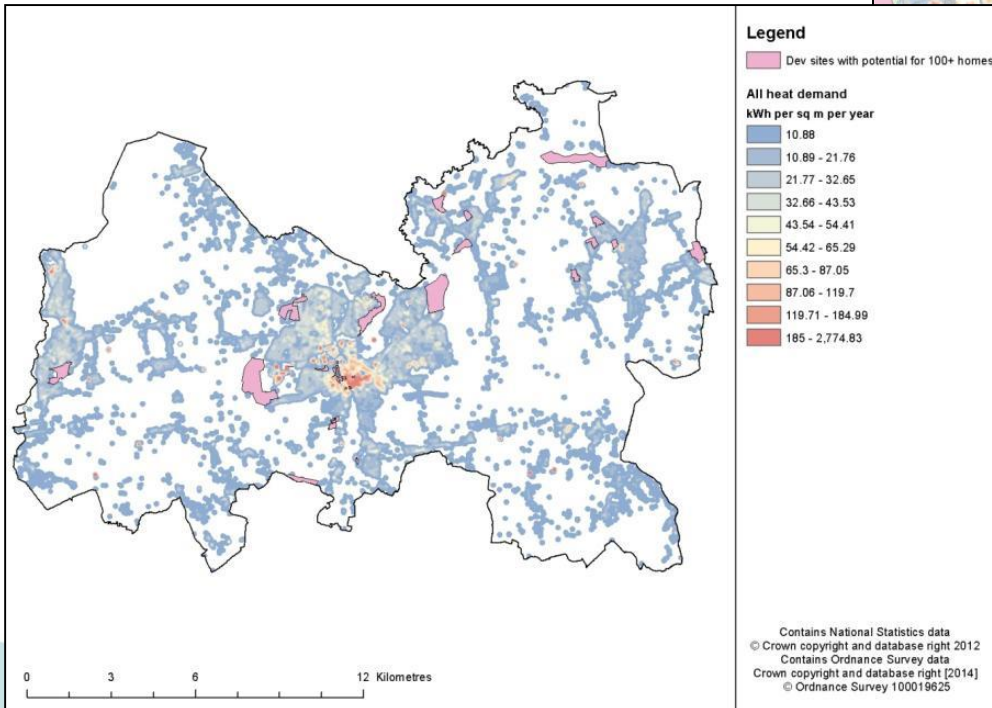
- i. To inform our Local Plan - as part of evidence base
- ii. To inform Climate Change & Energy team on where we should investigate our own municipal energy opportunities

<http://www.guildford.gov.uk/article/14418/Guildford-Renewable-Energy-Mapping-Study>

# Renewables Mapping exercise

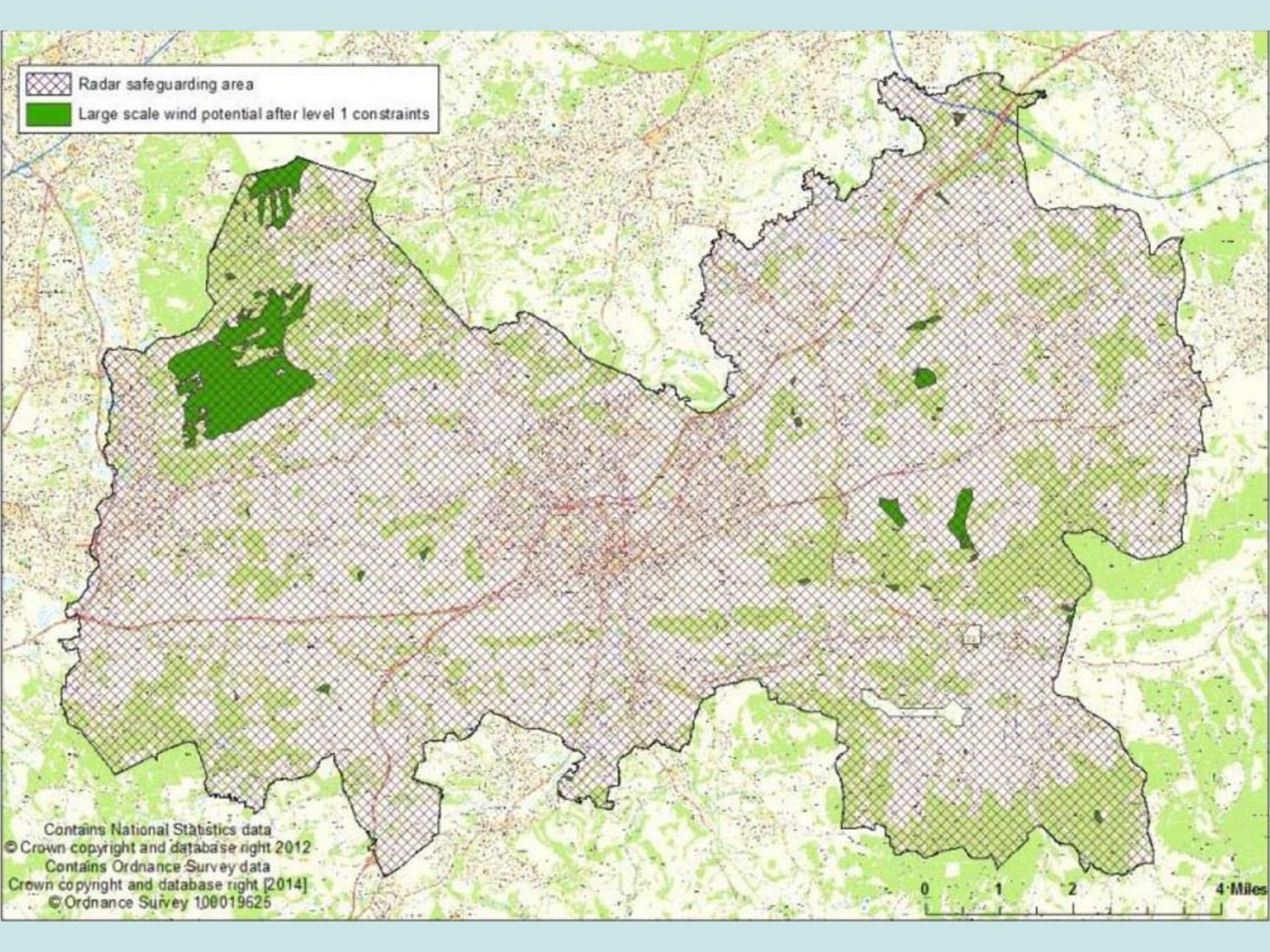
Looked at:-

Wind, Solar, heat demand,  
hydro opportunities,  
constraints.



These maps show heat demand – borough wide and town centre

⊠ Radar safeguarding area  
■ Large scale wind potential after level 1 constraints



Contains National Statistics data  
© Crown copyright and database right 2012  
Contains Ordnance Survey data  
Crown copyright and database right [2014]  
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0 1 2 4 Miles

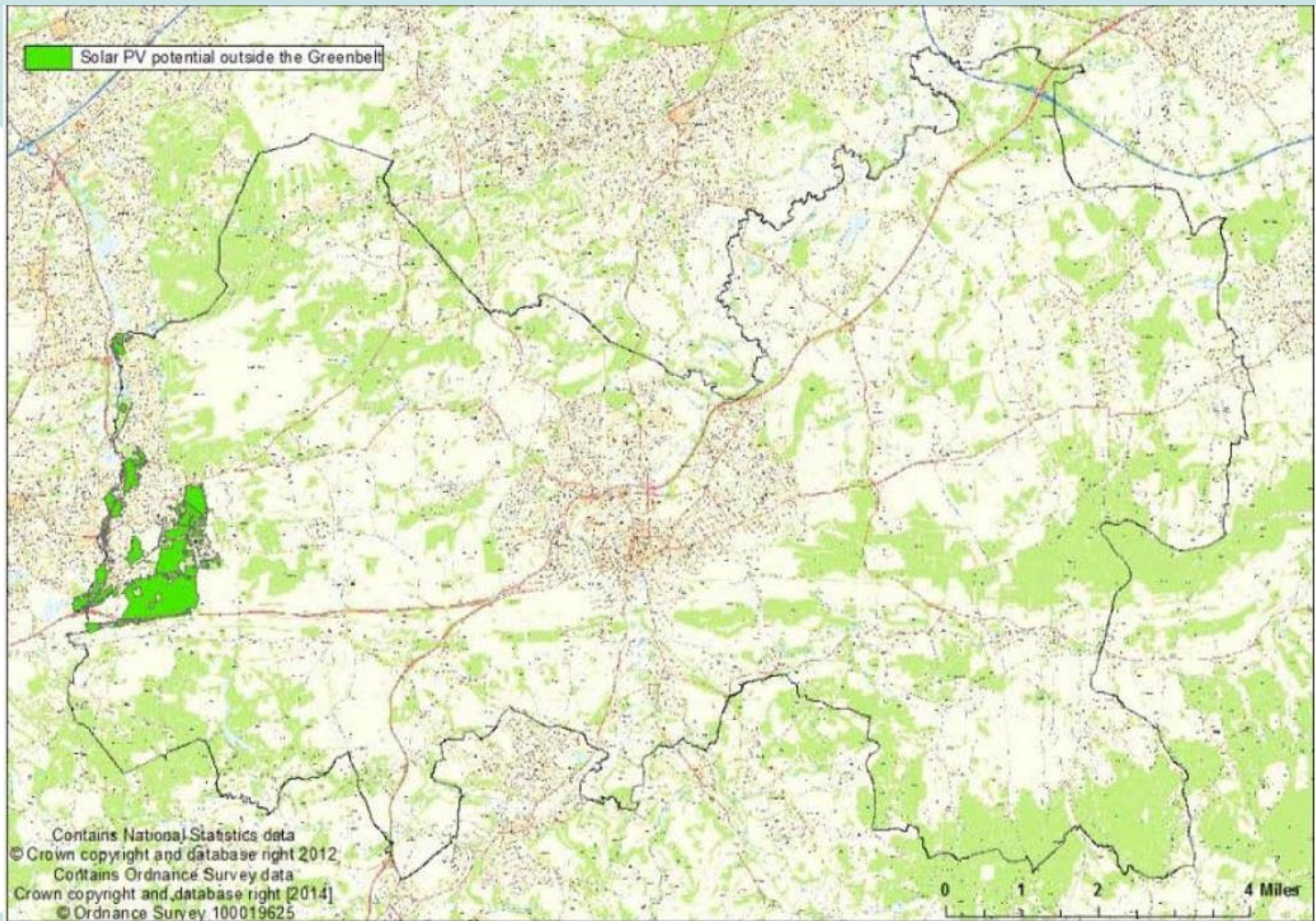
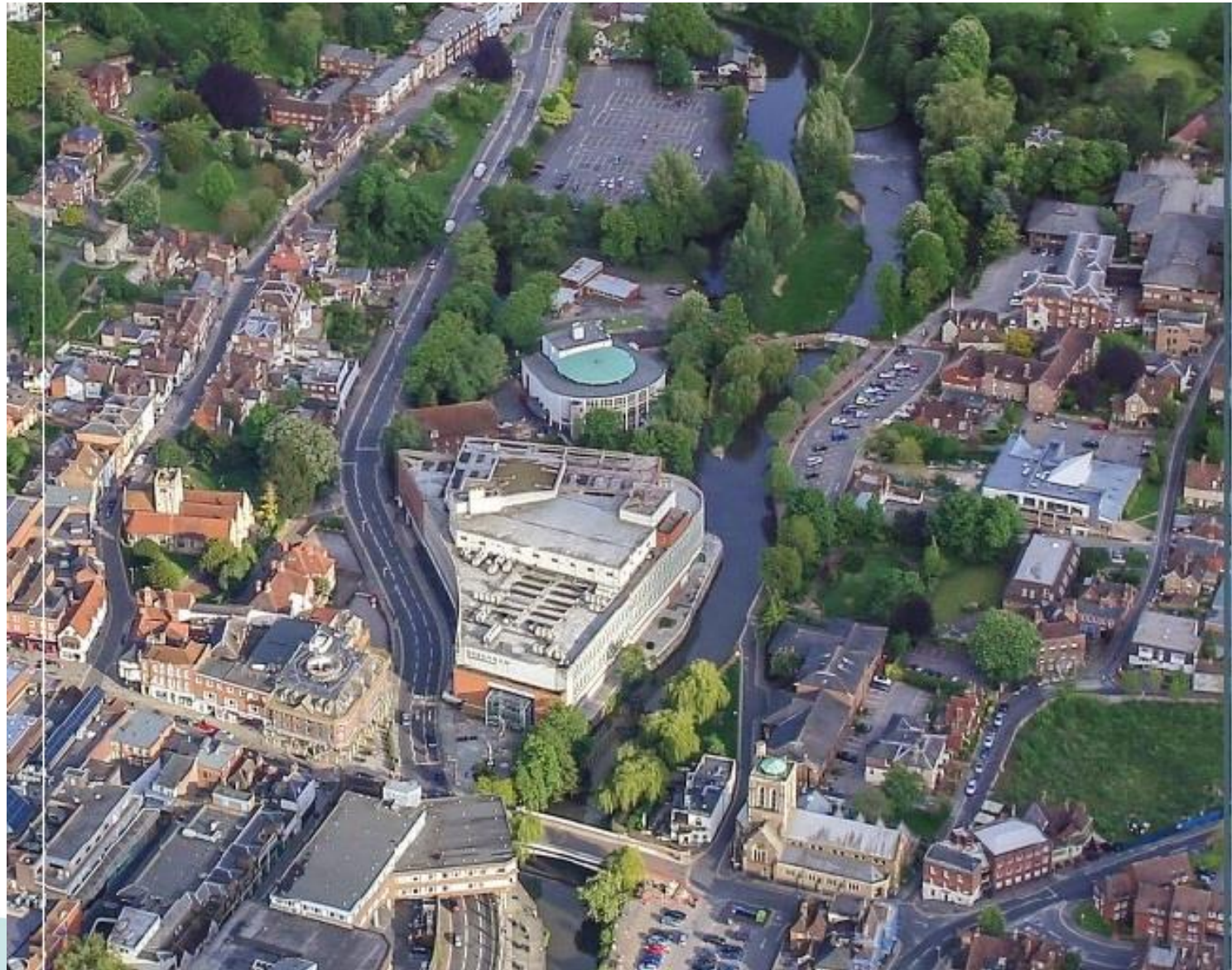


Figure 51: Potential areas for solar PV farms in Guildford Borough outside of exclusion zones and Greenbelt

<b>Assumption criteria (not cumulative) with 10% 'competing land use' factor applied</b>	<b>Area of land available outside of exclusion zones (ha)</b>	<b>Potential capacity for PV (MW)</b>	<b>Annual generation potential (MWh)</b>	<b>Potential CO<sub>2</sub> savings (ktonnes/yr)</b>
10% of total area outside of 'exclusion zones'	1,307	436	381,761	172
Within 3 km of 33kV substation	843	281	246,156	111
Excluding AONB	791	264	230,826	104
Excluding SSSI	1,206	402	352,152	158
Excluding AGLV	673	224	196,399	88
Excluding Green belt	32	11	9,286	4
Excluding AONB and SSSI	695	232	203,057	91
Excluding all land designations	20	7	5,869	3

**Table 15: Potential for solar PV farms in Guildford Borough at varying levels of potential constraints**



Number	Name of site	Feature present at site	Potential power output at each site (kW)	Sensitivity
1	Bowers Weir	Weir	157	High
2	Papercourt Weir	Weir	130	High
3	Papercourt Lock	Lock	127	High
4	Millbrook Weir (Toll House)	Weir	118	High
5	Millmead Weir	Weir	111	High
6	Bowers Lock	Lock	103	High
7	Millmead Lock	Lock	94.6	High
8	Stoke Lock	Lock	93.8	High
9	Stoke Mill	Mill	92.9	High
10	Newark Lock	Lock	91.6	High
11	Newark Weir	Weir	79.3	High
12	Broadmead Weir	Weir	77.2	High
13	Stoke Mill House	Mill	76.2	High
14	Walsham Lock	Weir	70.6	High
15	[2 <sup>nd</sup> Weir near Bowers Lock]	Weir	63.6	High
16	St Catherine's Lock	Lock	57.5	High
17	Unstead Lock	Lock	55.8	High

**Table 17: The size and sensitivity of potential 50-500 kW hydro sites in Guildford Borough**



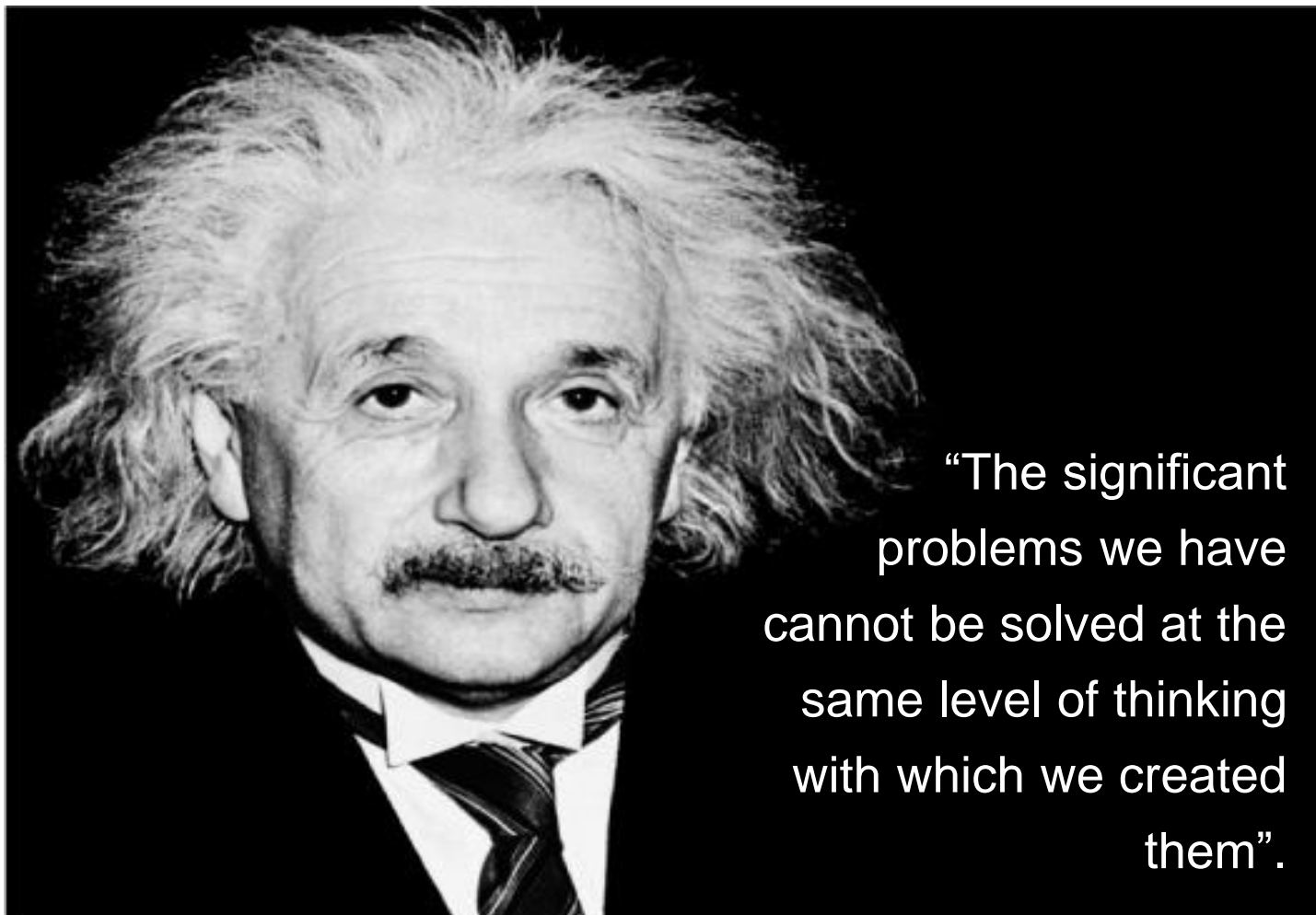
Figure 56: Locations of potential hydro sites in Guildford Borough



# Water Source Heat Pump investigation



- Old generating station.
- Now a Theatre.
- Technical feasibility proven.
- Using original cooling pipes to extract river water.
- Max 116kW heat required
- 2 x 60kW water to water heat pumps proposed.



# **Thank You**

**Chris Reynolds**

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