

# Sunamp



Social Fuel Poverty Impacts and the role that new  
technology might play

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# Introduction to Sunamp

- Sunamp develop, design and manufacture heat batteries here in Scotland
- We employ 28 staff and are based in East Lothian
- We are the most advanced PCM Heat Battery energy storage company in the world
- We have an office in Zurich to manage enquiries we receive from all over the world
- We have rolled out over 1000 heat batteries, many within the EastHeat fuel poverty reduction project
- The EastHeat project and Sunamp have won numerous awards



**Winner: Solar Power Portal Awards 2016**



**Winner: Regen Renewable Futures & Green Energy Awards 2017**



**Finalist: SHIFT Awards 2016**



**Finalist Ashden Awards 2017**

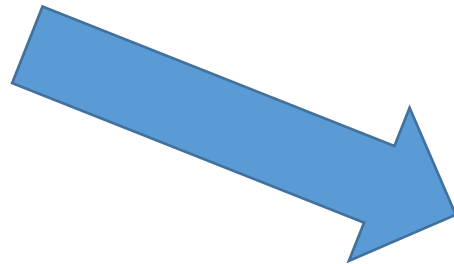
# Sunamp Heat Battery Vision



Disrupt the hot water cylinder market with a better, smaller, more efficient heat store that fits beautifully into small, modern living and working places.

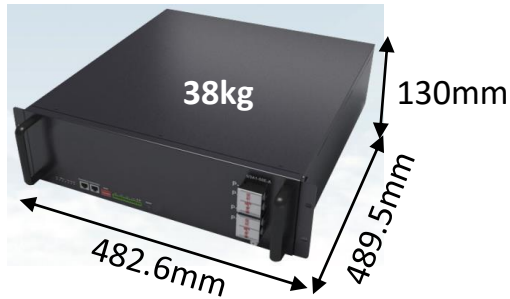
Much more storage in homes that (because of the trend to combi boilers) are becoming “Storage Poor”

Support the transition to renewable energy



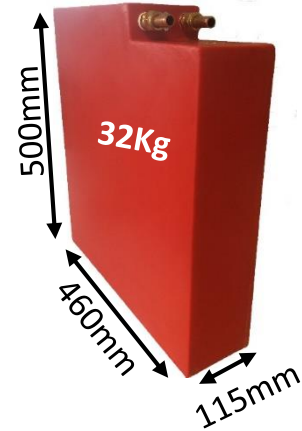
# Sunamp advantages against Lithium batteries

## Lithium Battery



2.5kWh  
 2.5kW  
 30.7dm<sup>3</sup>  
 6,000 cycle life  
 (to 70% capacity)  
 Materials issues

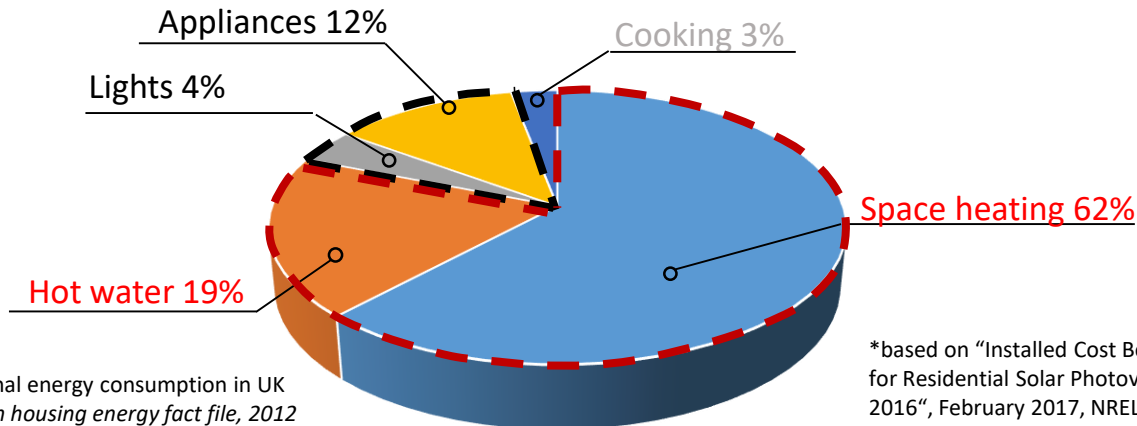
## Sunamp Heat Battery



2.5kWh  
 35kW  
 26.5dm<sup>3</sup>  
 >35,000 cycle life  
 70% lower cost\*

16% of household final energy consumption

81% final energy consumption

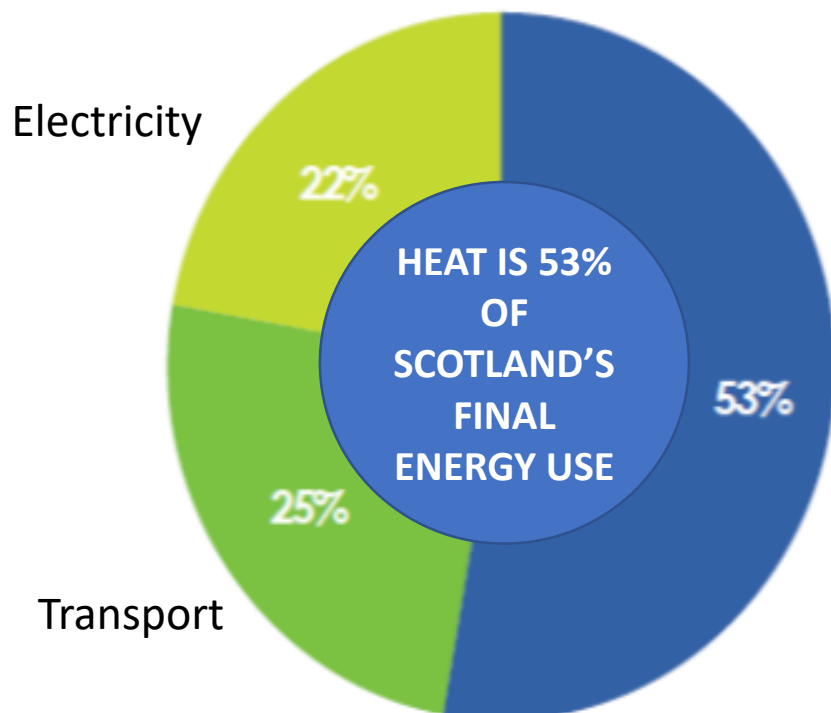


% household final energy consumption in UK  
 United Kingdom housing energy fact file, 2012

\*based on "Installed Cost Benchmarks and Deployment Barriers  
 for Residential Solar Photovoltaics with Energy Storage: Q1  
 2016", February 2017, NREL & Sunamp internal data

## 1. REDUCING EMISSIONS

Heat is 53% of Scotland's final energy use (estimated to be responsible for 47% of Scotland's greenhouse gas emissions)

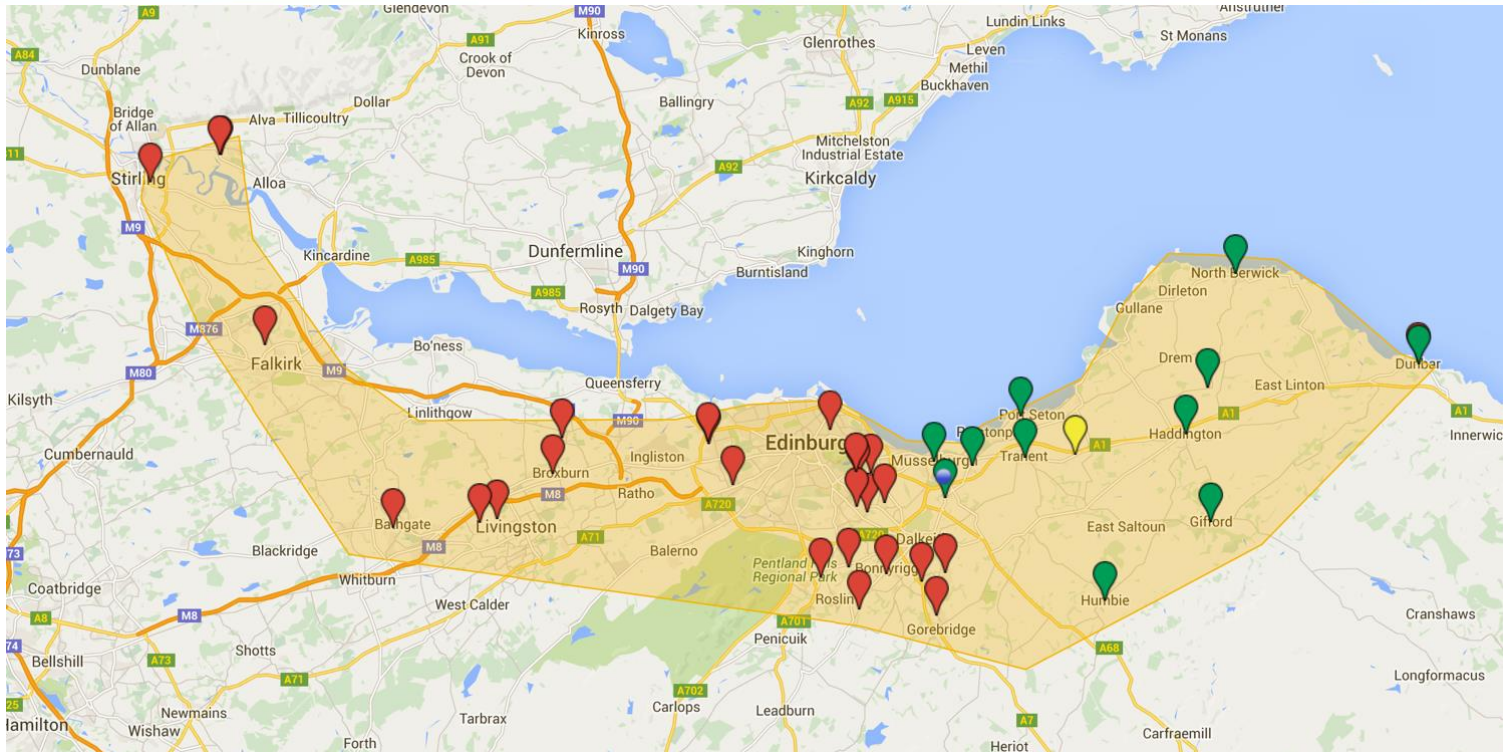


## 2. COSTS & FUNDING

This Heat costs Scotland £26 Billion annually

## 3. FUEL POVERTY

Around 34% of our population are in fuel poverty – mainly driven by Heat need and rising gas & electricity prices



elha.com  
east lothian housing association

CASTLE ROCK EDINVAR  
HOUSING ASSOCIATION



- Over 1000 tenants positively impacted with 10% - 60% utility bill savings
- Core of the project was retrofit installation of Heat Batteries in around 600 homes
- Unlocking renewable energy like solar PV and heat pumps to be genuinely useful to the household
- The UK's largest domestic energy storage project
- Unlocks the potential to use low-cost and low-carbon electricity from an increasingly renewable grid
- Products developed and manufactured in East Lothian and Fife, by Sunamp and our supply chain
- Strong team working between Housing Associations, Local Energy Scotland and Sunamp to deliver

**COMPONENT ONE: Funded PV on the Roof**

- 850 PV rooftops installed
- Two major housing associations (ELHA & CRE)
- £5.6M unlocked from a Chinese investor
- Rural, Semi-Rural and Urban Settings
- Average system size - 2.9 kWp
- **Most PV electricity would not benefit tenants**

**COMPONENT TWO: Thermal Energy Storage in the Home**

- Heat Battery thermal storage linked to PV in 425 homes
- Extra savings targeted by harnessing excess electricity to hot water
- **Targeted tenant saving of 20%**

*Bedrooms:*

	1	2	3	4	--	Total
Flat	165	18		1	24	<b>208</b>
Bungalow - Mid-terrace	12	19				<b>31</b>
Bungalow - End-terrace	9	8	1		1	<b>19</b>
Bungalow - Semi-detached		24	3	1		<b>28</b>
Bungalow - Detached		3	2		1	<b>6</b>
House					99	<b>99</b>
House - Mid-terrace		13	43	6	4	<b>66</b>
House - End-terrace		13	28	1	2	<b>44</b>
House - Semi-detached		16	47	6	17	<b>86</b>
House - Detached	1				1	<b>2</b>
--		1			8	<b>9</b>
<b>Total</b>	<b>187</b>	<b>115</b>	<b>124</b>	<b>15</b>	<b>157</b>	<b>598</b>

*KWh/day saved on hot water:*

Bedroom	1	2	3	4	--	Total
Flat	1.5	2.6			1.9	<b>1.8</b>
Bungalow - Mid-terrace	1.0	1.1				<b>1.0</b>
Bungalow - End-terrace	0.5	1.2			1.8	<b>1.1</b>
Bungalow - Semi-detached		2.1	6.2			<b>2.5</b>
Bungalow - Detached		1.5	1.1			<b>1.4</b>
House					2.0	<b>2.0</b>
House - Mid-terrace		0.5	1.9	1.9	3.6	<b>2.0</b>
House - End-terrace		2.6	3.0		3.2	<b>2.9</b>
House - Semi-detached		2.3	1.4	3.4	3.8	<b>2.2</b>
House - Detached	1.8					<b>1.8</b>
--					1.2	<b>1.2</b>
<b>Total</b>	<b>1.5</b>	<b>2.2</b>	<b>2.0</b>	<b>2.5</b>	<b>2.2</b>	<b>1.9</b>

- Excellent statistical sample covering all housing types, sizes, fuel types and plot locations
- Average hot water energy saving: 1.9 kWh per house per day
- PV alone gives ~£100 bill saving to the household electricity bill
- Adding a heat battery doubles this to ~£200 (by avoiding £100/year of bought-in electricity for hot water)
- We have been monitoring these homes for 18 months+
- A further 18 months of monitoring after which all systems will be left in place to benefit tenants
- Helped Housing Associations meet EESSH targets

## **The Lynne Family**

*"Our hot water is plentiful, comes out of the taps quickly and is an excellent temperature"*

## **Alec & Joan**

*"In comparison to the old system, the new system performs to a much higher standard, providing a larger quantity of hot water for a much cheaper price."*

## **John and Jayne**

*"It gets a bit to getting used to, switching on the hot tap normally you would hear the sound of the gas boiler that doesn't happen any more"*

- New factory in East Lothian
- Working with national housebuilders to help them meet SAP targets in new Scottish building standards
- Working with other Housing Associations and Local Authorities (under LCITP, NEA and others) to develop, deliver and prove better HEATING systems:
  - Electrically heated properties, adding Heat Battery and better controls to flow electric boiler – comfort up, cost neutral
  - Night Storage heated properties, converted to Heat Pump plus Heat Battery storage – comfort up 31%, cost-down 41%
    - Real world savings of £50 per month on electricity bill
  - Gas heated village halls, converted to solar PV, Heat Pump and Heat Battery – comfort and utility up, cost-down 80%

# Scotland and Sunamp's Challenge

Eradicating Fuel Poverty, Improving Efficiency, Cutting Emissions

## 1. REDUCING EMISSIONS

Decarbonisation – Sunamp Heat Batteries allow more renewables on homes and from grid

## 2. COSTS & FUNDING

£Billions of savings possible

## 3. FUEL POVERTY

Proven ability to deliver up to 80% reduction in bills and higher comfort – now need deployment at scale

Scottish Enterprise has estimated that Scotland will need to spend £100 billion pounds over the next 40 years upgrading heating systems

### What should it be spent on?

Advanced Heat Storage saves money in homes, meets energy efficiency needs and helps the grid accommodate more renewable energy.

