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& Crematoria

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Cemeteries
& Crematoria

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TBC

Justin Smith

APSE Conference – January 2019

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Science & Environment

Climate change: Last decade confirmed as warmest on record

By Matt McGrath
Environment correspondent

15 January 2020

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Our Planet Matters



The 10 years to the end of 2019 have been confirmed as the warmest decade on record by three global agencies.

Electric Cremators

- In 2018 on the British Islands there were 481,712 cremations
- Each cremation produces on average 240kg of CO₂ from gas consumption
- = $481,712 \times 240\text{kg} = 115,610,880\text{kg}$ of CO₂
- = 115,610 tonnes of CO₂

Electric Cremators

To offset this carbon would require

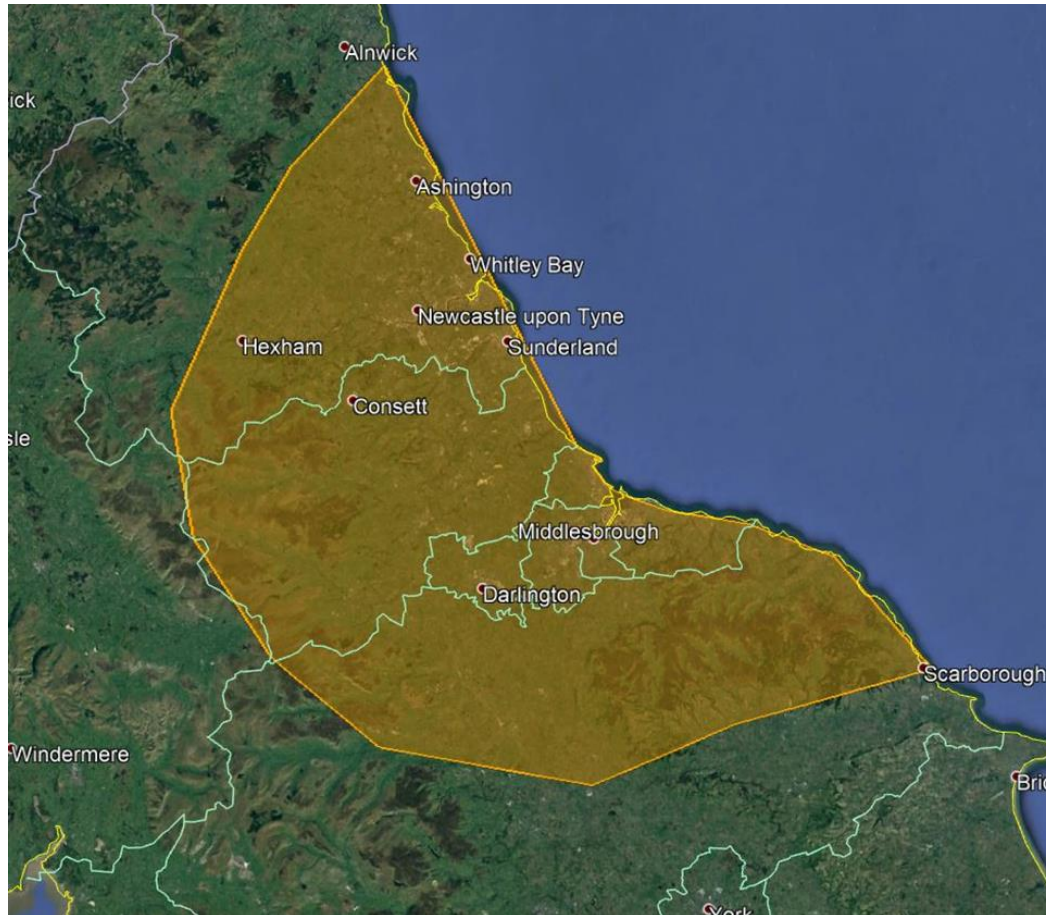
= **150,981 acres** of mature forest*

The average oak tree takes 20-30 years to mature (Oak Tree most common tree in the UK).

Electric Cremators

- Therefore interim planting prior to tree sequestering maturity requires the planting of 1,900,000 acres of saplings to absorb equivalent annual CO₂e from cremation alone
- *Reference EPA (United States Environmental Protection Agency)

Electric Cremators



2 million acres of UK for
tree planting just for
cremation CO₂ offset

Energy Cost Comparison

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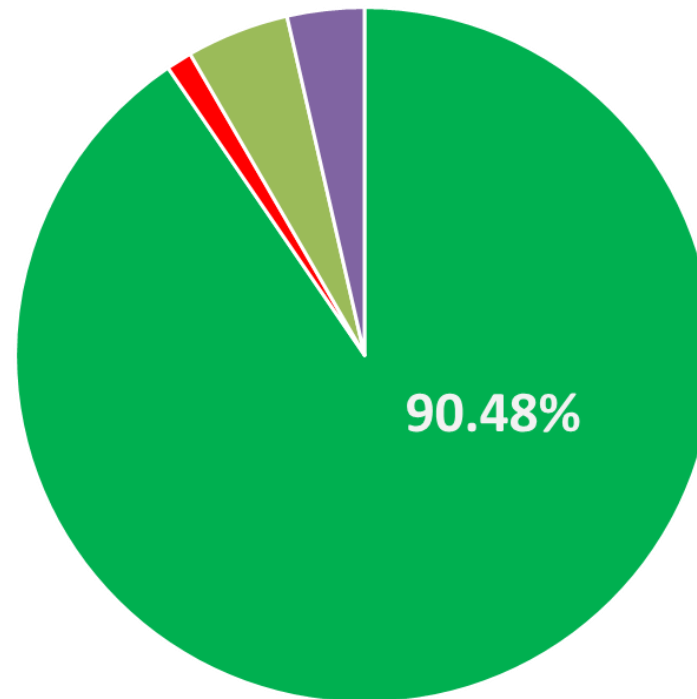
Days cremating per year						250	
Days not cremating per year						115	
							Total
Cremations a year	1,200	Gas		£31,478.40	£772.80		£32,251.20
	1,200	Electric		£6,912.00	£6,624.00		£13,536.00
						Difference	£18,715.20

Public Survey

<https://www.surveymonkey.co.uk/r/R3MS2YX>

Public Survey

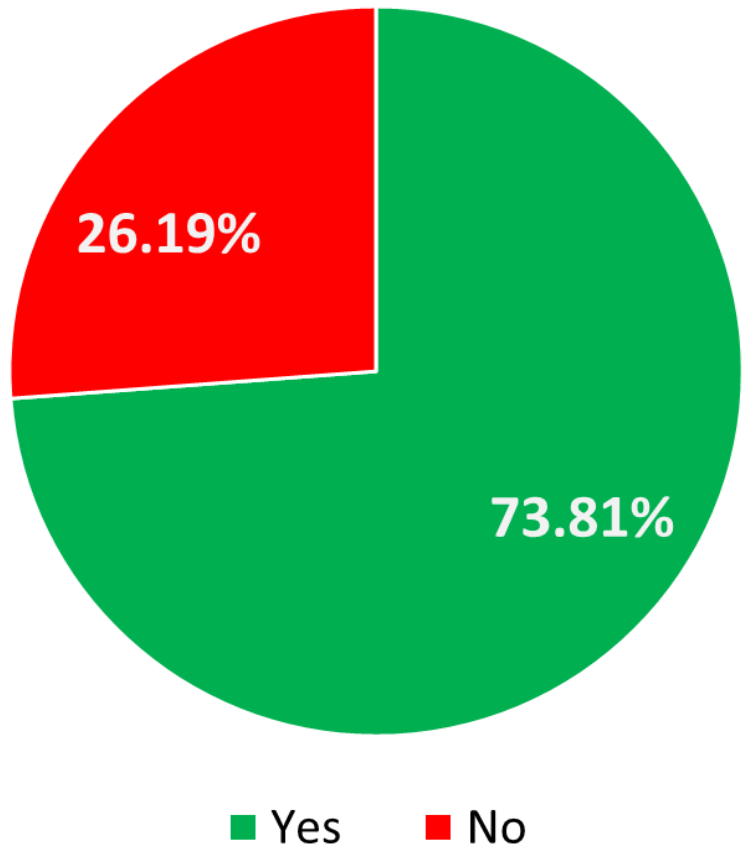
Would you choose a green cremation over a gas cremation, considering the former produces 95% less carbon emissions?



■ Yes ■ No ■ Does Not Matter to me ■ Other

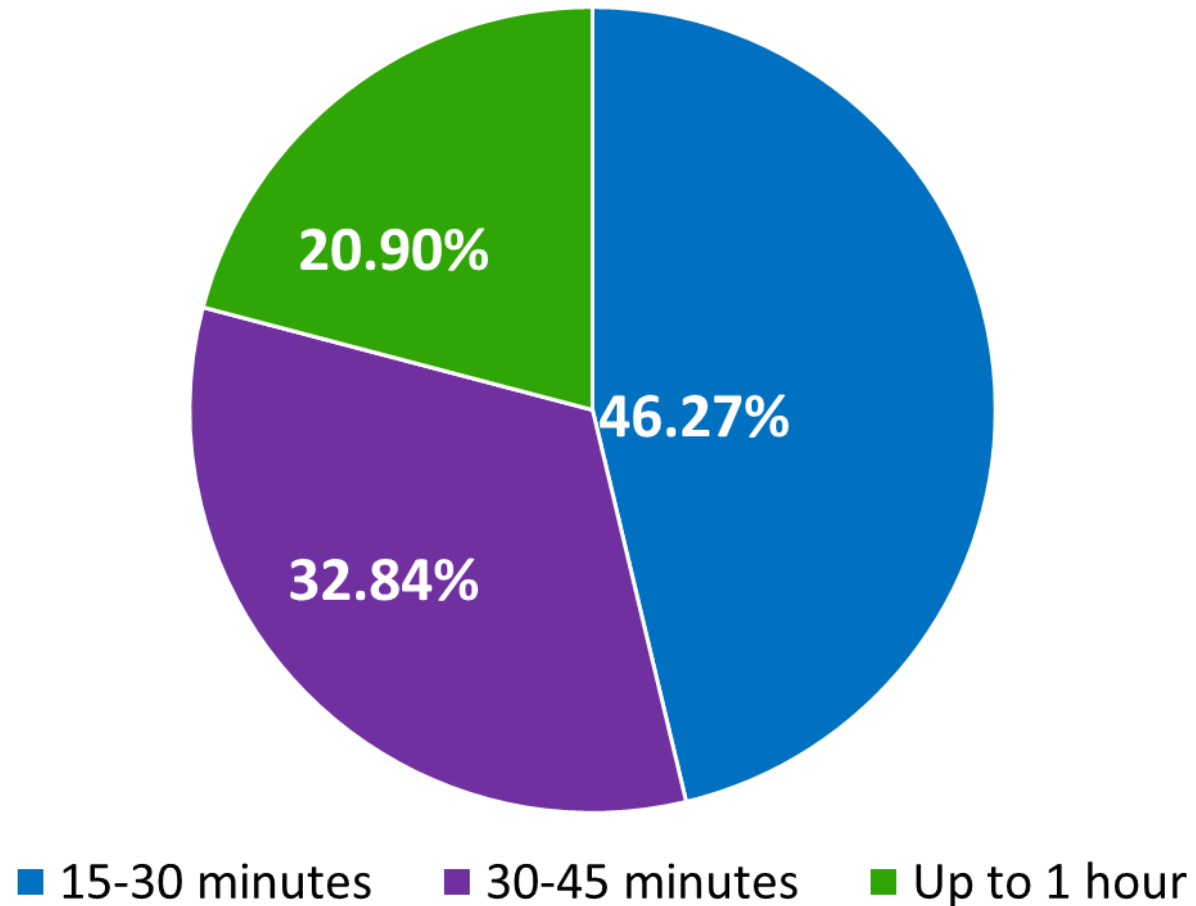
Public Survey

Would you travel further to a crematorium with a green cremator?



Public Survey

If so, how much further would you travel from an existing crematorium for a green cremation?



Public Survey

<https://www.surveymonkey.co.uk/r/R3MS2YX>

Granite Memorials

Discover what's beneath.

- Approximate Total UK Deaths: **527,500** (ONS, 2019)
- Average: 21% burials : 79% cremations
- Approximate 2019 UK Burials – **110,775**
- Memorials supplied for **56%** of burials, equating to **62,034** burials with memorials

Carbon Footprint of Granite Memorials

- On average, a granite memorial weighs **140kg**. (800 mm x 600 mm x 75mm plus base)
- According to Hammonds and Jones (2008), the embodied carbon of imported granite equates to 0.7 kg CO₂/kg.
- Based on these figures, there is approximately **98kg** of embodied carbon per memorial.

Carbon Footprint of Granite Memorials

- Using this, it is calculated that there is **6,079 tonnes** of embodied carbon through the use of granite memorials for burial annually*.
- To sequester this amount of carbon, requires **4,600** acres of mature trees.
- Or approximately **99,000** acres of saplings

Carbon Footprint of Granite Memorials

*This does not include granite used in cremation memorials

Alternatives: Domestic Stone

Discover what's beneath.

- The largest contributor to CO₂ emissions for imported granite is the transportation; with imported stone from China/India increasing the overall carbon footprint by 90-550% (Chishna *et al.* 2010).
- There are currently 24 operating granite quarries in UK.



Alternatives: Domestic Stone

Discover what's beneath.

- The map indicates that the majority of the UK has access to not only granite, but to a large range of other decorative stones also.
- The simple alternative is to use local stone within the region to reduce the transportation costs as much as possible.

Limestone



Granite



Sandstone



Slate



Photovoltaic Panels in Cemetery Design

Discover what's beneath.

Light after Death.

Santa Coloma de Gramanet, Barcelona. PV's will keep about 62 tonnes of carbon dioxide out of the atmosphere every year



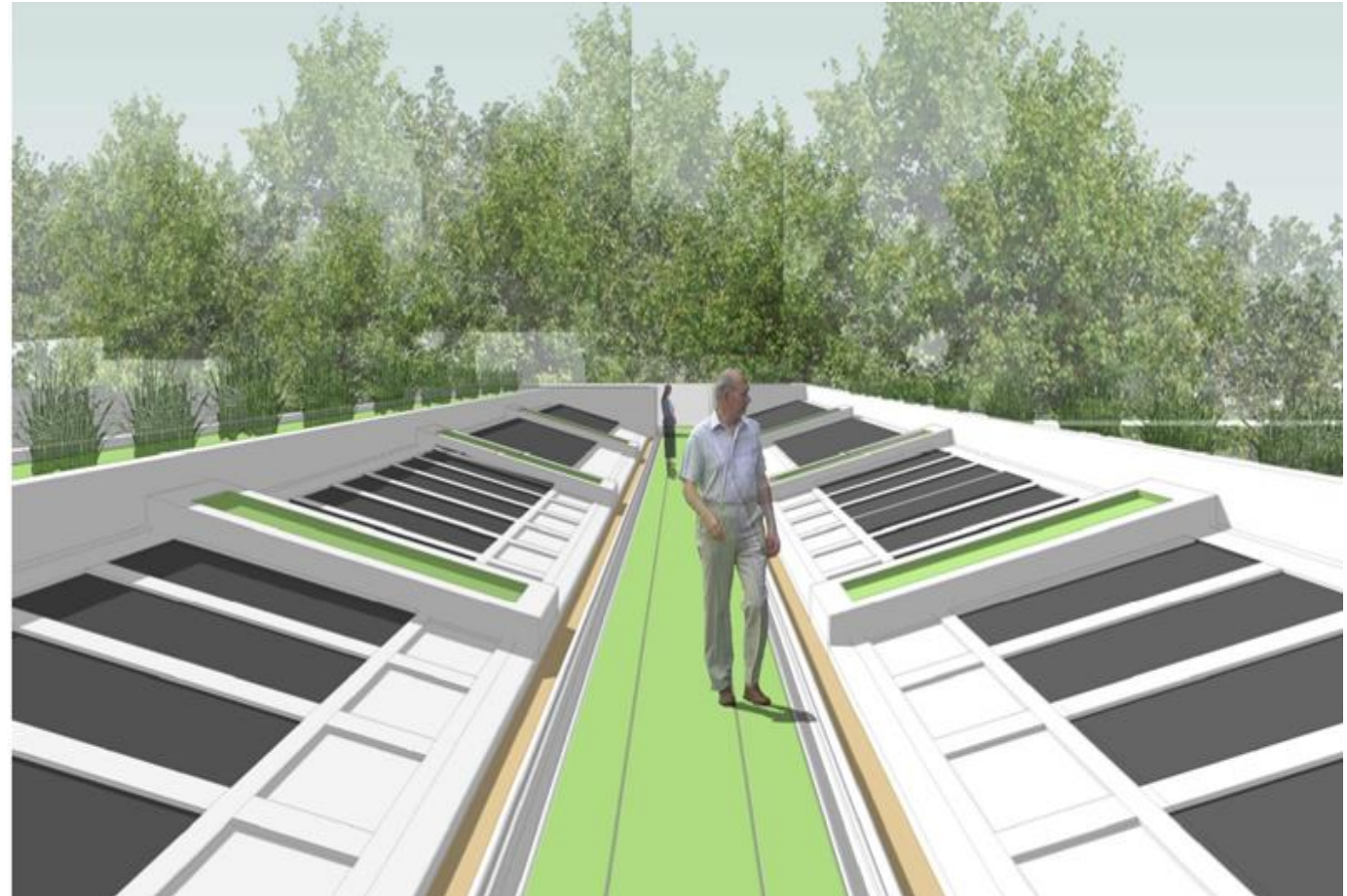
Photovoltaic Panels in Cemetery Design

Discover what's beneath.

Light after Death!

CDS are designing fully integrated PV's with bio-soil burials.

Power used for electric maintenance equipment and residual electricity returns to grid. Surplus funds go to environmental charities

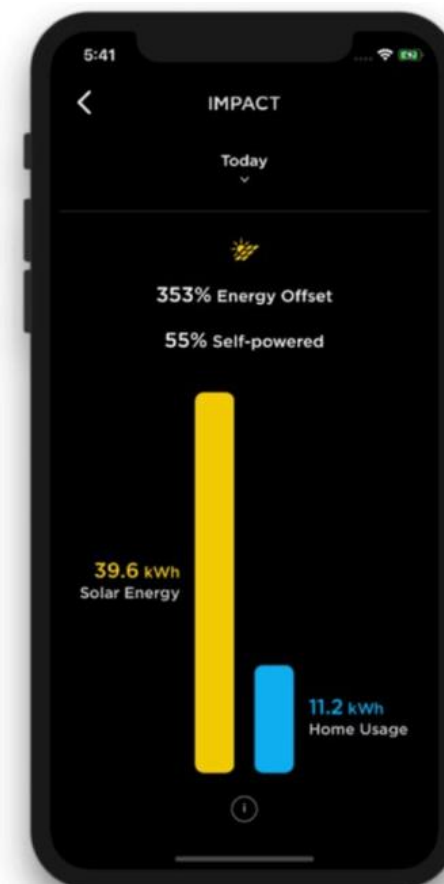
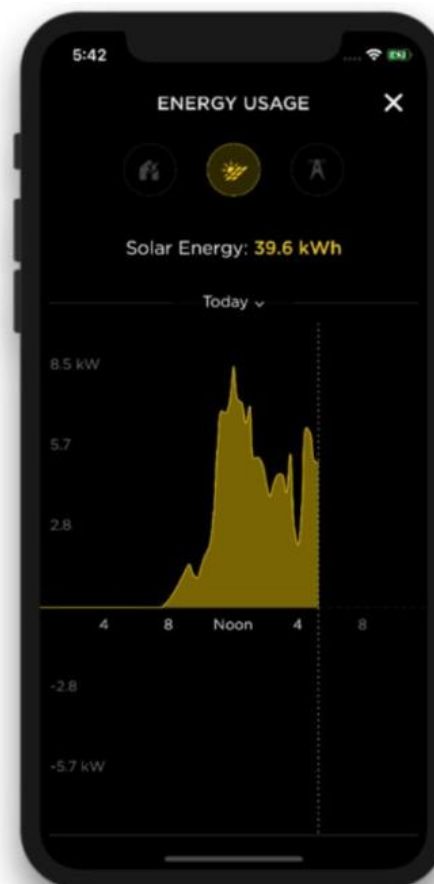


Photovoltaic Panels in Cemetery Design

Discover what's beneath.

Light after Death!

See how much energy generated from relatives grave!



Conclusions

- Electric Cremators are more efficient, sustainable and are cheaper in the long-term compared to gas cremators.
- The carbon footprint of granite memorials is considerable and unmanaged; action needs to be taken!
- There are opportunities for the use of solar panels to be used in cemetery design and could be utilised more effectively.

Conclusions

“The only thing you take with you when you're gone is what you leave behind, let that be a healthy planet”.

Justin Smith CDS