

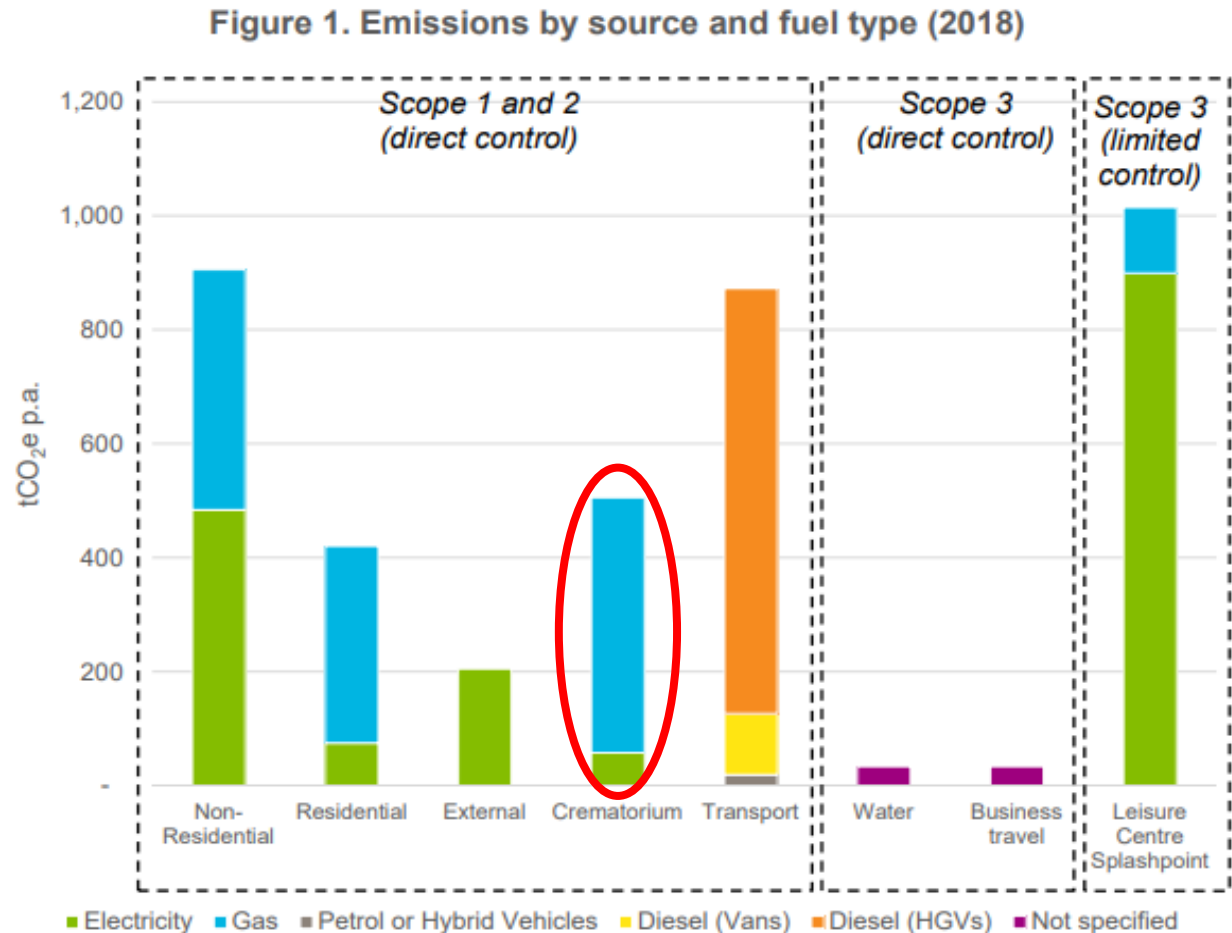
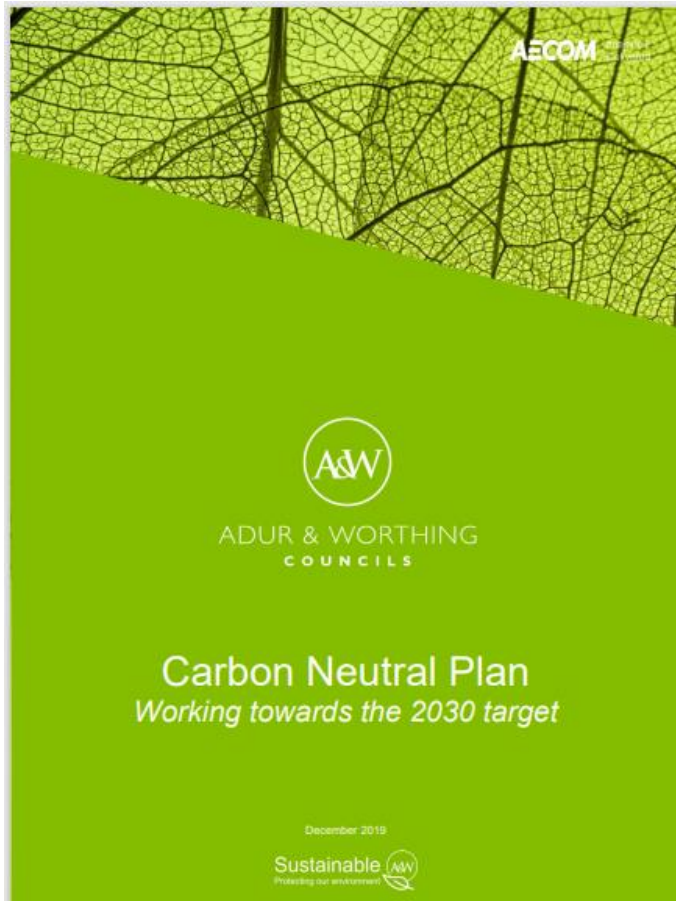


# HyCrem

Trialling Hydrogen at Worthing Crematorium

# Adur & Worthing Councils

Target to be Carbon Neutral by 2030



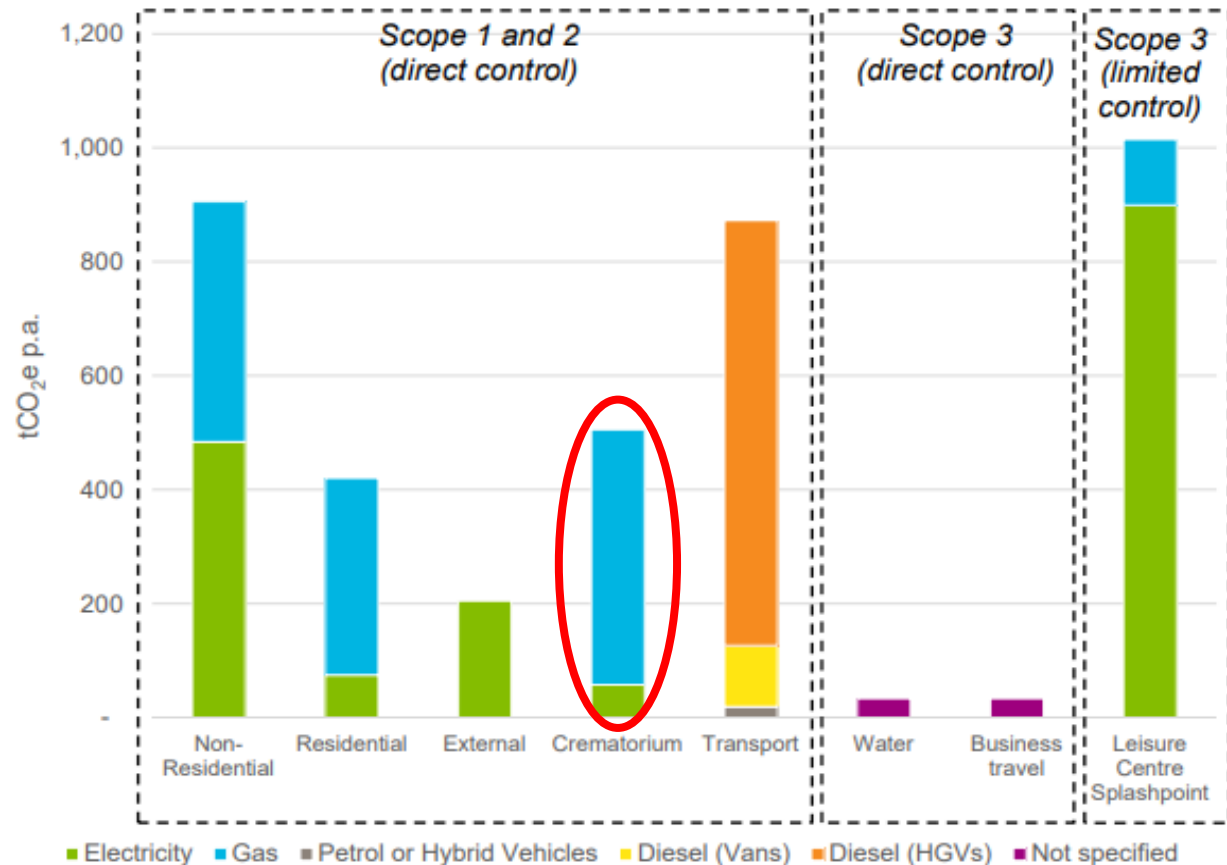
# Adur & Worthing Councils

Target to be Carbon Neutral by 2030

Worthing Crematorium:

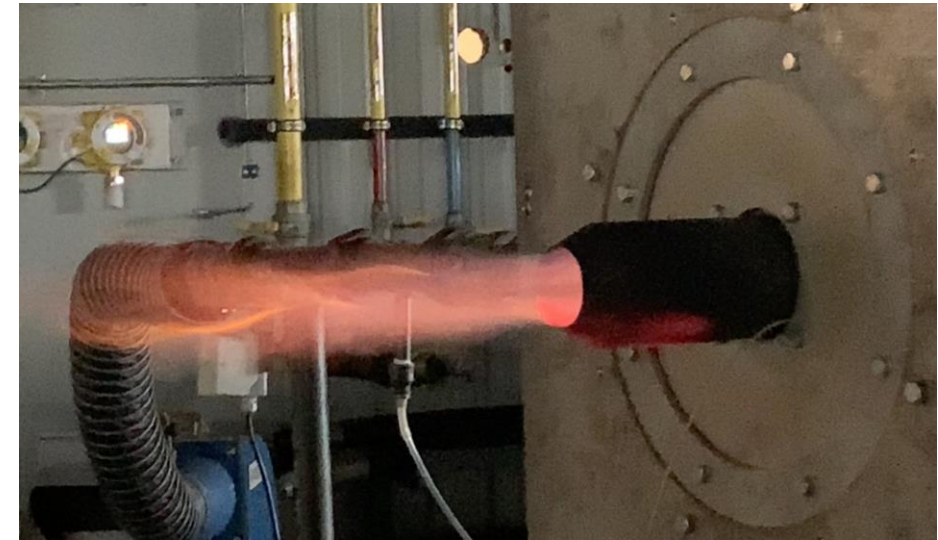
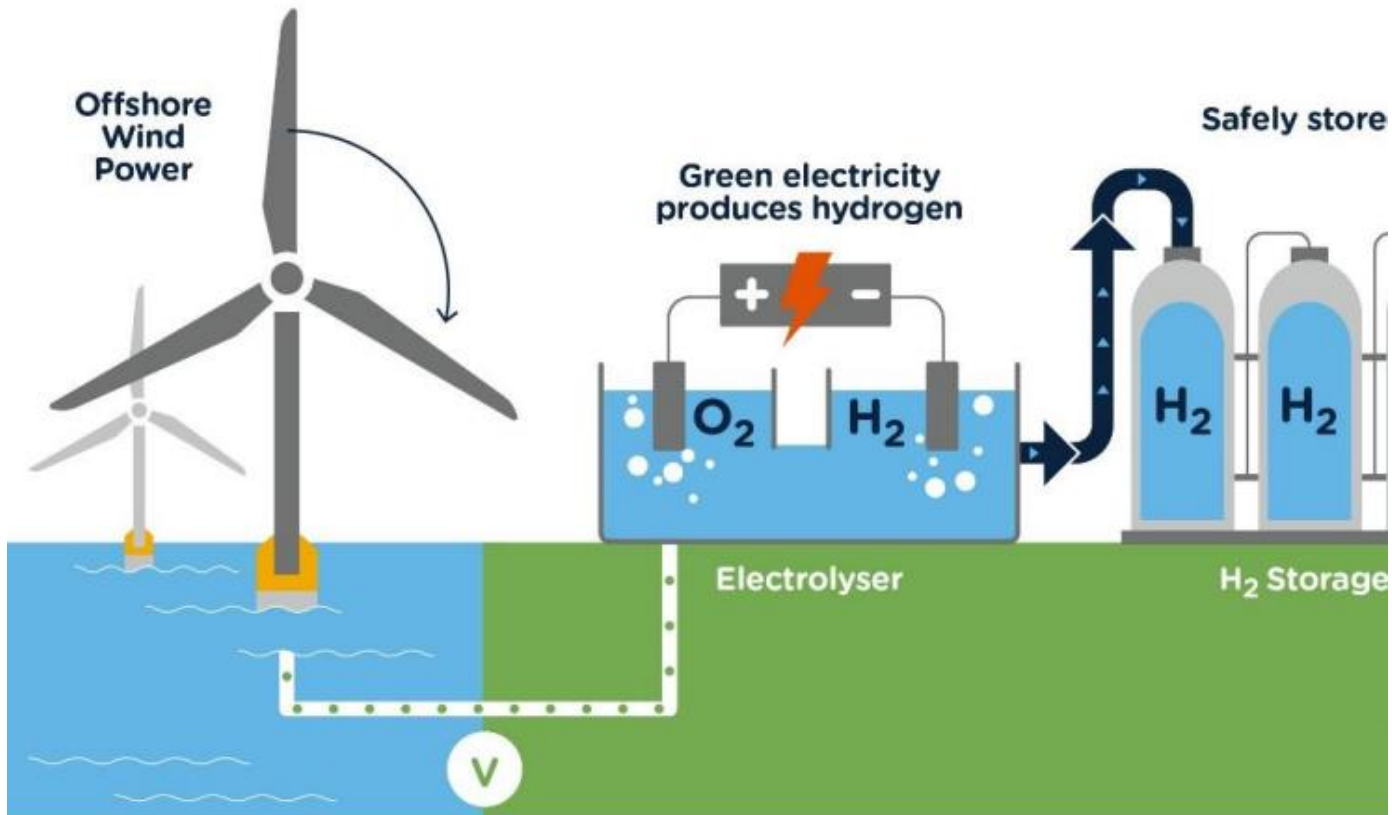
- One of the busiest crematoria in the country
- Three cremators: carries out between 2,500-3,000 cremations / yr
- Largest single source of CO<sub>2</sub> emissions across Adur and Worthing

Figure 1. Emissions by source and fuel type (2018)



# Hydrogen – Energy Carrier for Net Zero

No CO<sub>2</sub> emissions on combustion





# HyCrem Project (2023-2025)

- + DESNZ funded Industrial Fuel Switching Demonstration Project
- + 2 year project to trial using hydrogen in a working crematorium
- + Hydrogen trial scheduled to last 4 weeks (13 May – 7 June 2024)
- + Worthing Crematorium has 3 cremators
  - One will be disconnected from natural gas and will be supplied with hydrogen,
  - Remaining two cremators will continue to operate with natural gas



# DFW Europe: H<sub>2</sub> Burner Development

- 30 years' experience in cremation industry
- In-house expertise in cremator innovation, including developing electric cremator
- Working with Honeywell, who have developed hydrogen ready burners

# Objectives



Demonstrate hydrogen burners in normal operation in one cremator at Worthing Crematorium



Carry out air quality assessment of H<sub>2</sub> cremations compared to NG



Assess economics and refuelling logistics at local and national level to fully switch to hydrogen



# Cremator 3

- + Cremator 3 will be completely disconnected from natural gas (NG) for the duration of the trial
- + The two NG burners in cremator 3 will be replaced by two hydrogen burners.
- + These will be connected up to a low pressure hydrogen pipeline.

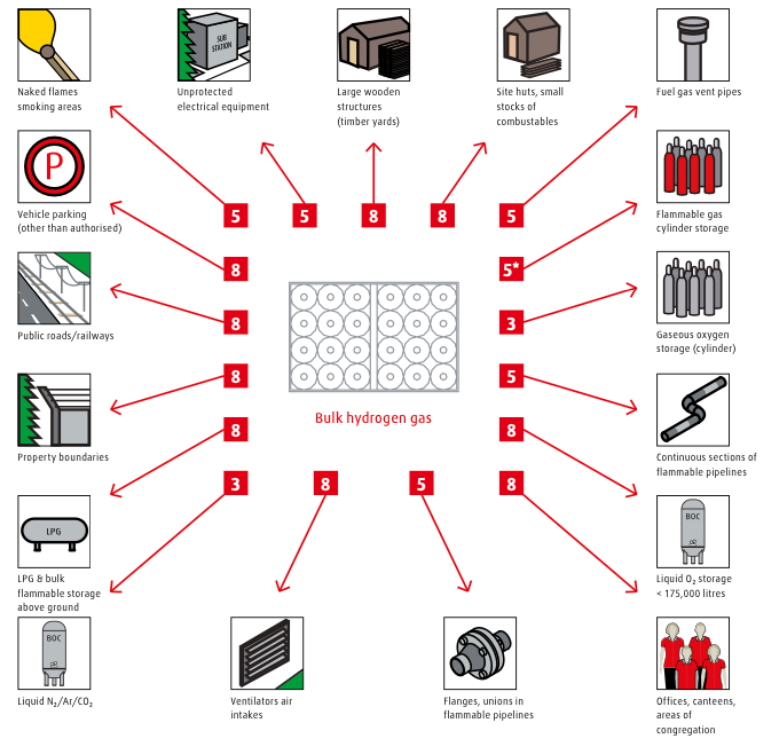




# Hydrogen Delivered to Site



## Safety distances for bulk gaseous hydrogen.



Minimum recommended horizontal distances for hydrogen bulk gas systems (distance in metres).

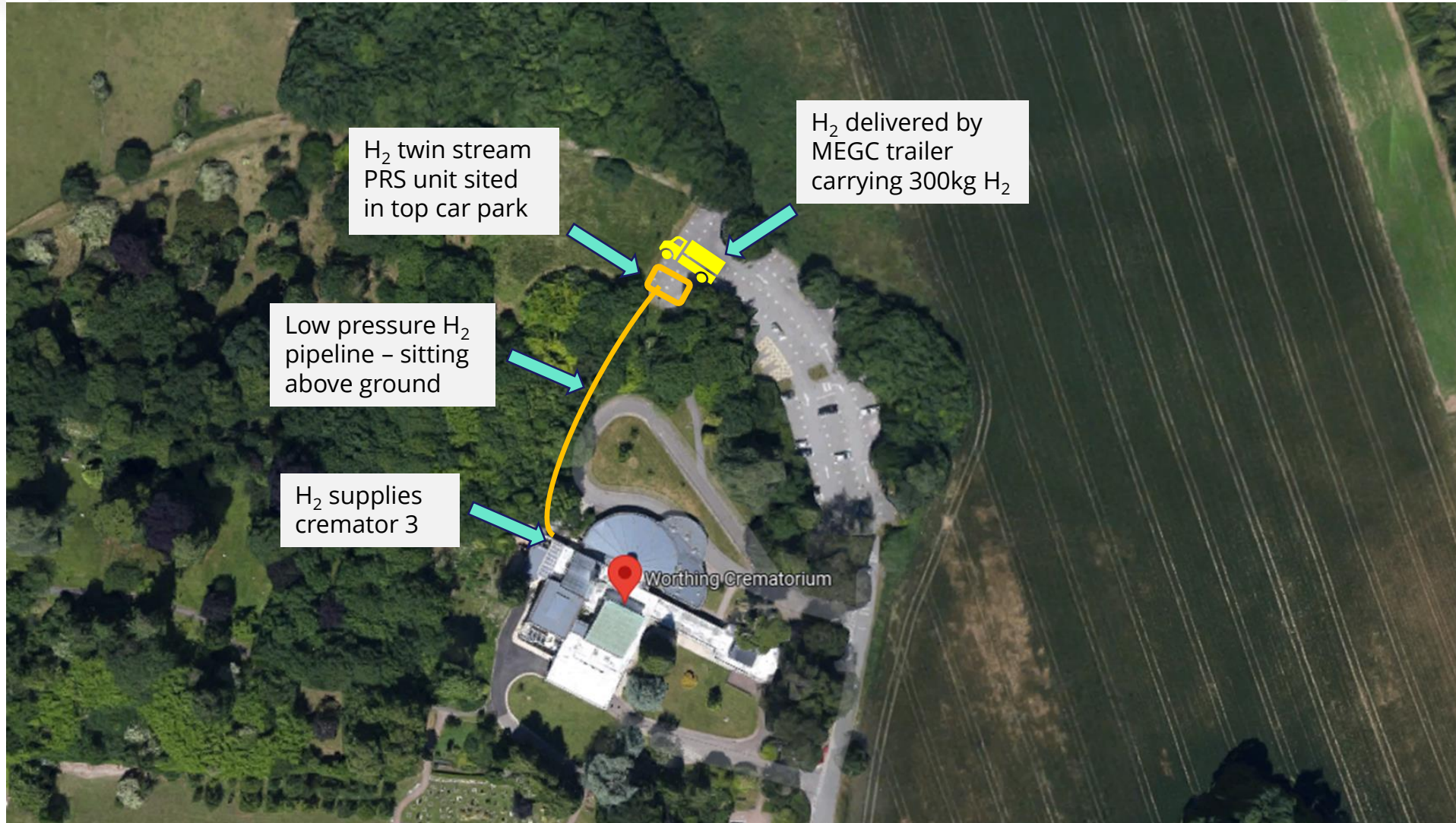


# (Temporary) Pressure Reducing Station





# HyCrem Site Layout





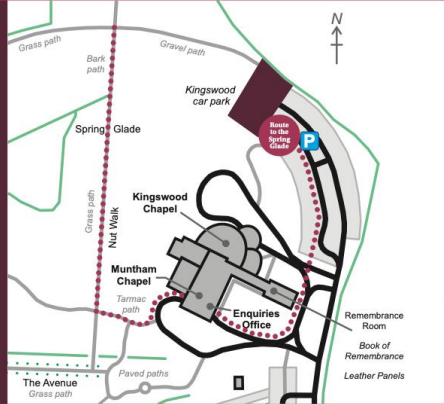
# Hydrogen Safety Onsite





Worthing Crematorium is taking part in a government-funded trial to reduce the carbon emissions linked to cremations.

Access to the Spring Glade will be restricted to the Muntham Chapel driveway that leads through to Nut Walk until Sunday, 22nd June.



We apologise for any inconvenience this may cause.

You can find out more about the HyCrem project and answers to some frequently asked questions by visiting:



# Worthing Crematorium: Pioneering Greener Funerals

(funded by UK Government's Net Zero Innovation Portfolio)

## Making a Difference for the Environment

Worthing Crematorium is proud to be part of a world-first trial using **green hydrogen** for cremations. This innovative project, called HyCrem, aims to significantly reduce our carbon footprint and contribute to a cleaner environment.

## How it Works

During a four-week trial period (May 20th – June 14th, 2024), one of our cremators will be converted to run on 100% green hydrogen, a clean-burning fuel produced without carbon emissions. We'll be closely monitoring air quality and performance throughout the trial.

## Benefits for Our Community

By finding cleaner alternatives to natural gas, we can significantly reduce our environmental impact. This project aligns with the council's goal of becoming carbon neutral by 2030.

## Strong Partnerships

We're collaborating with leading organisations like FT Pipeline Systems, Net Zero Associates, the University of Brighton and DFW Europe to make this project a success.

## What's Next?

Following the trial, we'll carefully evaluate the results to determine if green hydrogen is a viable long-term option for the crematorium.

## Stay Informed

We appreciate your patience and understanding as we participate in this important trial. We'll keep you updated on our progress.

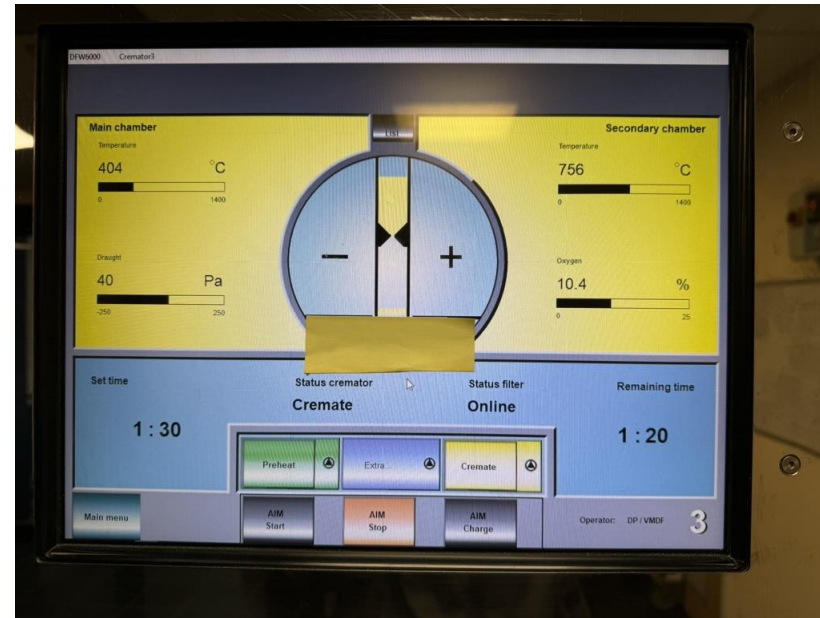
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## Learn More

Visit our website:  
[www.worthingcrem.co.uk/hycrem](http://www.worthingcrem.co.uk/hycrem)

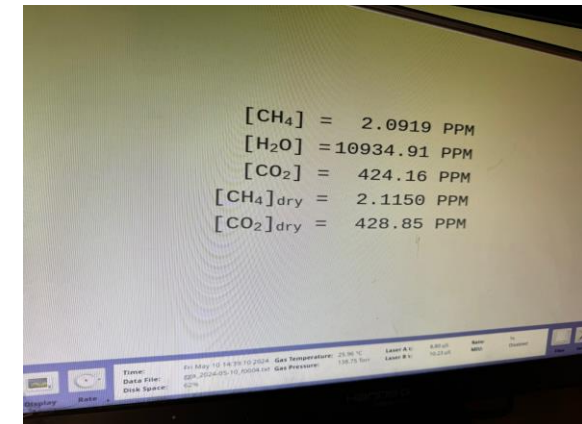
#HyCrem  
#GreenFunerals  
#NetZero







# University of Brighton Emissions Monitoring



# Emerging Findings from the H<sub>2</sub> Trial

- + Hydrogen cremations successful
- + H<sub>2</sub>: broadly similar duration to natural gas cremations

2023-05-31

Location: Worthing 3

HYDROGEN

Cremations: 4

Operator	Crem. nr.	Crem. stone nr.	Crem. start	Crem. end	Crem. time
CO-OP Lancing	11510	0	07:22:26	10:02:42	02:40:16
Chalcraft/DP	11511	0	10:11:52	12:04:57	01:53:05
Dandelion / PC	11512	0	12:13:17	14:20:22	02:07:05
Freeman Bros/D	11513	0	14:29:32	16:29:26	01:59:54

2023-05-30

Location: Worthing 2

NATURAL GAS

Cremations: 4

Operator	Crem. nr.	Crem. stone nr.	Crem. start	Crem. end	Crem. time
C&T Radmall/KP	6329	0	08:00:04	10:06:59	02:06:55
Ian Hart/DP	6330	0	10:13:39	12:03:34	01:49:55
FAH / PC	6331	0	12:10:34	13:55:38	01:45:04
Chalcraft/KP	6332	0	14:04:48	16:04:43	01:59:55



# However if the Crematorium completely switched to Hydrogen:

- + Increased NOx emissions
- + Would need 3 deliveries a week HGV tube trailers to site
- + Would permanently take up 15+ car parking spaces
- + Increased safety risk and H&S requirements
  - storing and using hydrogen onsite
- + Need Hydrogen engineer permanently onsite
- + Massive increase in fuel costs:
  - Gas: 4.7p/kWh
  - H<sub>2</sub>: 50-75p/kWh (2024) expected to reduce to 42-68p/kWh (2030)

# Electric Cremations

- + Currently investigating electric cremators
- + Lambeth Crematorium allowed us access to their data
- + Electric cremations are same duration as natural gas
- + Avoid complex H&S issues with H<sub>2</sub>
- + Much cheaper fuel & more efficient energy use
- + Need to upgrade electrical supply to the site – need new 500 kVA substation
- + DNOs are much more responsive than in previous years – no longer have to wait years for upgrades

2023-06-02

Location: Lambeth [elec]

Cremations: 4

Operator	Crem. nr.	Crem. steen nr.	Crem. start	Crem. einde	Crem. tijd
ANDREW	390	58615	09:34:46	11:14:50	01:40:04
ANDREW	391	58616	12:02:41	13:42:45	01:40:04
ANDREW	392	58617	14:05:56	15:45:50	01:39:54
ANDREW	393	58618	16:14:21	17:54:25	01:40:04



# Conclusion / Future Ambitions

- + Need to decarbonize Worthing Crem by 2030
- + Hydrogen works but is too expensive, and has too many safety issues
- + Currently working on Salix PSDS bid to install 3 electric cremators
- + If you can decarbonize by direct electrification  
– then that's what we should be doing.



**#ElectrifyEverything**