



Electrifying industry's heat
for a zero carbon future

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Futraheat – who we are

- High temperature heat pump technology developer established in 2021
- Pre-revenue – seed and grant funded to deliver first market-ready product in 2024
- Small, highly-skilled team across mechanical, electrical, controls, process, and test engineering disciplines
- Value proposition - innovating a highly differentiated technology in a new, yet rapidly growing market essential to net zero goals





Mission

To pioneer and accelerate the disruptive electrification of industry's process heat needs, with the most cost-effective high temperature heat pump technology





Problem

Two thirds of all the energy consumed by industry is for process heat

- High temperatures historically met with fossil fuels
- Manufacturers need alternatives to achieve net-zero
- Techno-economic challenges mean cost effective alternatives not available





Solution

Heat pump products that replace fossil fuel boilers for temperatures up to 200°C

- Addresses 25% of the problem
- Cost effective as (re)uses heat from recovered or renewable sources
- Could reduce global CO₂ emissions by over 3% (more than aviation industry)





Product

GREENSTEAM™ heat pumps













- Beachhead product delivers heat to 150°C (later 200°C)
- Generates steam to retrofit with existing factory infrastructure
- Sized to address the most common process applications
- Uses proprietary technology for cost-performance advantage





Technology

- Heat pumps use compressors to 'concentrate' heat to higher, more useful temperatures
- We use TurboClaw[®]: A novel compressor type with proven advantages

	Positive Displacement	Conventional Dynamic	TurboClaw [®]
			
Oil-free compression			
Low speed			
Low parts count			





Futraheat difference

- Competitor offerings vary considerably in scale, temperature, compressor tech, price point, maturity, ...
- What sets us apart?
 - TurboClaw - probably the only small, oil-free centrifugal compressor designed specifically for HTHPs, in the world
 - Our cost-performance advantage combination of higher temperatures, lower CAPEX, lower OPEX, smaller size
 - We own the compressor technology



SPH Sustainable Process Heat





Progress and next steps

- We are commissioning a full-size, 300kW Greensteam product demonstrator in our Surbiton test facility
- This will be installed at Hepworth brewery in early 2024
- Used to recover waste heat from wort boiling, then raise its temperature to drive process
- Efficiency of >600% will deliver 85% fuel and CO2 reductions
- First pre-production product expected Q4 2024
- Targeting series-A funding by end 2024 to go to market





Thank You

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