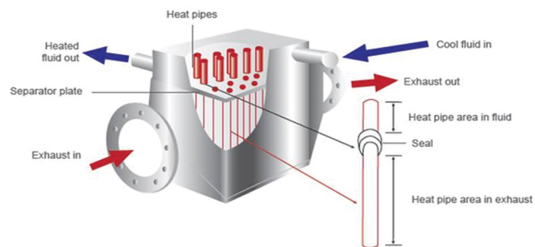




Smartrec

MANAGEMENT OF WASTE HEAT BY A MODULARISED SOLUTION FOR FLEXIBLE AND ADAPTIVE INTEGRATION OF HEAT RECOVERY AND THERMAL STORAGE CAPABILITY



Heat pipe heat exchanger construction

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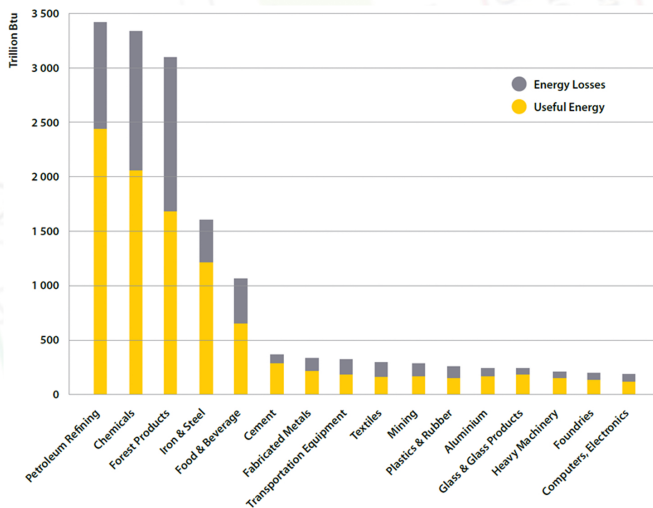
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Waste heat is a problem common to high temperature processing industries as a significantly underused resource.

Energy Losses Within Sectors



Secondary aluminium recycling and ceramic processing were identified as key examples with economically recoverable waste heat



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- 20 - 50% of industrial energy consumption is discharged as heat
- Analysts estimate that EU alone has potential energy recovery of 140TWh each year
- Significant potential for efficient energy utilisation
- Europe 2020 Strategy to make EU a competitive low carbon economy by 2050

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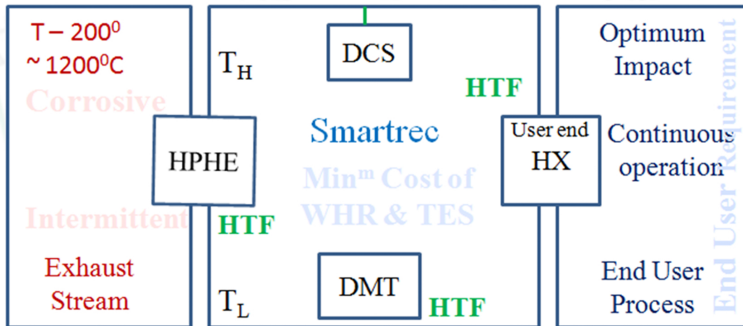




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What is Smartrec?

Smartrec is a modularised standard solution to recover and manage waste heat from corrosive, contaminated and intermittent exhaust streams. Smartrec is categorised based on the maximum operating temperature into 3 system loops: recovery from high, medium and low heat grades.



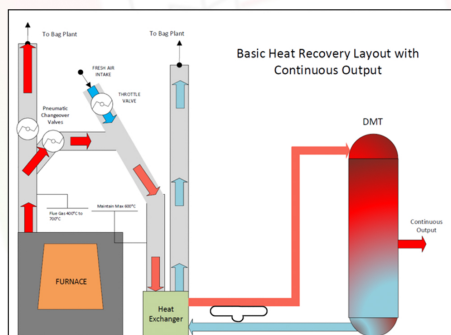
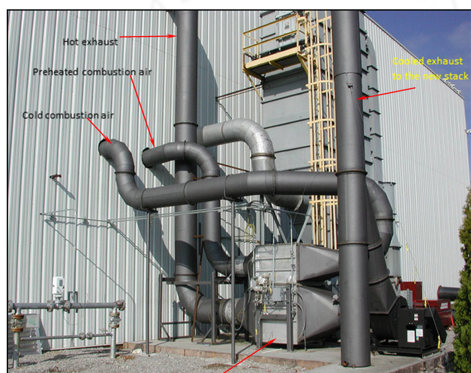
Functional model of Smartrec



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Smartrec will pioneer a new kind of approach, using a unique combination of technologies, processes and heat transfer fluid.

Potential heat recovery opportunities within several industry sectors, such as aluminium, ceramic, cement and glass, will result in significant CO₂ savings, reduction in fuel consumption, improve process efficiencies and provide significant economic benefits.



Full-scale Heat Recovery Unit

- Compact
- Easy to retrofit
- Simple design

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Benefits and Advantages

- Unique system - limited to no other technologies available
- Able to recover 60+% of exhaust stream waste heat
- Able to recover 90+% waste heat from other deployments
- Reduce fossil fuel consumption and carbon emissions
- Significant economic benefits to be obtained

Applications

- Heating air - burner application efficiencies
- Generating electrical energy
- Pre-heating materials and/or scrap
- Heating water for various applications



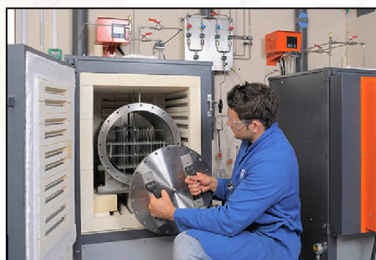
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Where we are to date

1. Installations of two Lab-scale Smartrec Systems now complete
2. Completed design for a full-scale industrial prototype for the heat recovery system is currently in manufacture.
3. End user within secondary aluminium industry secured
4. Knowledge Software Tool developed and now live
5. Testing of materials for chosen heat transfer fluid
6. Dual Media Thermocline model validation on existing data now complete



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