Universities For The Future:

Decarbonising Scotland

EAUC Topic Support Network

11th September 2019 – Glasgow Caledonian University

Ben Hartfield, Heather Jones & Aisling Crowley

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SFC Workshop

- Vision & Fund Criteria
- What makes a good business case
- Setting the scene - Heat Decarbonisation
- Application supporting documents
- Examples and Next Steps

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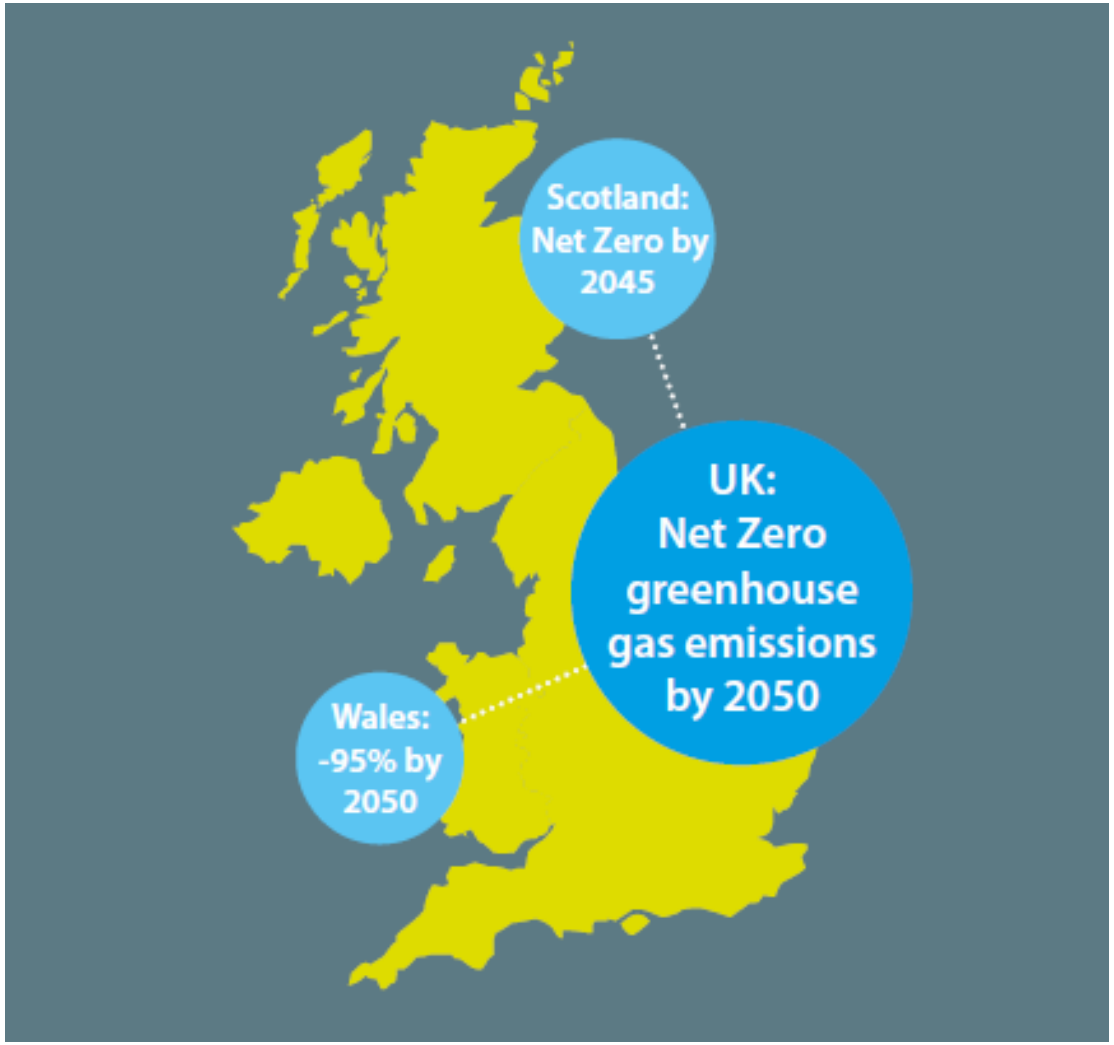
Vision for Decarbonising Scotland



SFC Outcomes – UCRF 2017/18

2-3% reduction in Scottish universities total carbon emissions

** calculated using emissions factors published by government for carbon footprinting*

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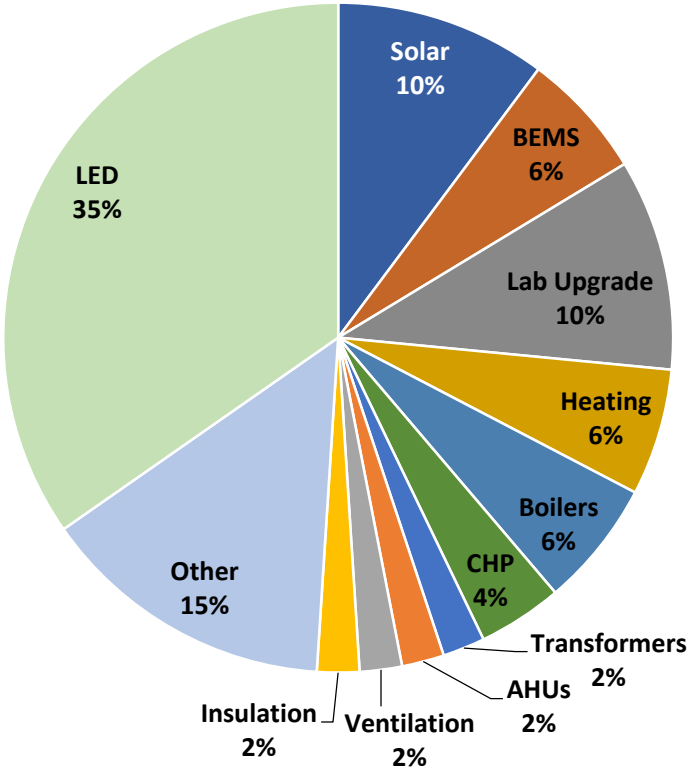
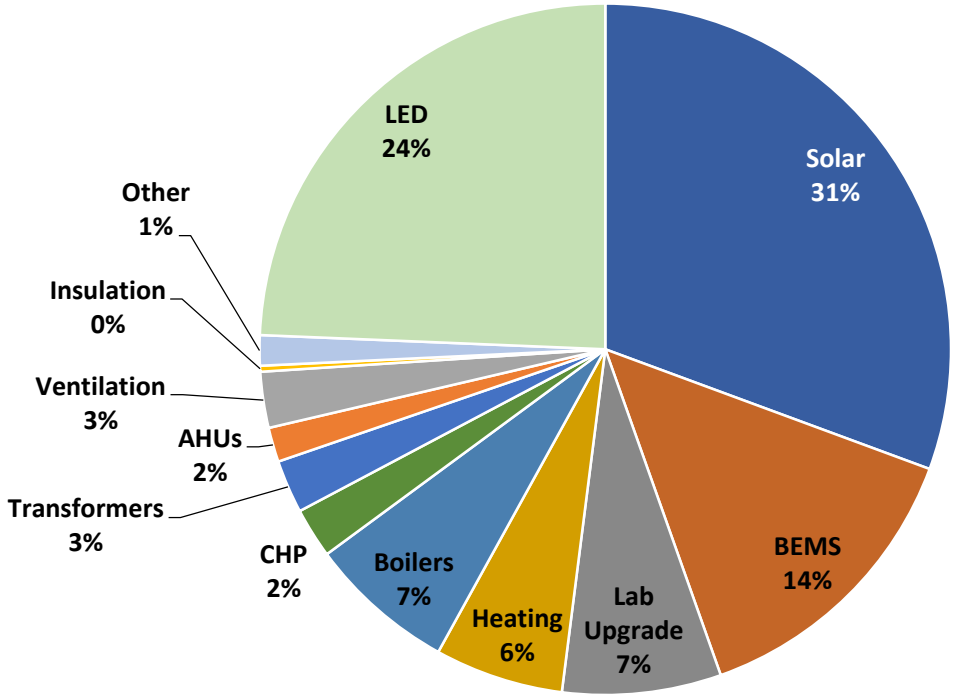
SFC Outcomes – UCRF 2017/18

Percentage of projects by technology



Percentage of project value by technology



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Payback and Carbon Criteria

Compliancy Criteria:	**Standard**	**Fossil Fuel Saving Projects**
Payback	10 years	15 years
£/tCO_2e LT	£400	£600

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SFC Criteria

- The successful applications are likely to achieve 20/45 marks.
  - 1.1 Contribute to reducing Backlog Maintenance through energy efficiency – 10
  - 1.2 Reduction of the University's carbon footprint – 10
  - 1.3 Improving the Student Experience – 10
  - 1.4 Collaboration with other PSB's – 5
  - 1.5 Client Contribution to the Project Cost – 5
  - 1.6 Student Engagement – 5

Business Case Assessments

What makes a good business case

Clear, consistent and thorough level of detail on project

Evidence of costs, consistent with project cost breakdown

Best practice calculations, for example those outlined on carbon trust publications for different technologies. If you have any doubts about your specific project – you can ask us ahead of submission.

Demonstrate institutional commitment to reducing carbon emissions. Show how project contributes to long-term holistic plan for decarbonisation of estate.

Arrangements for programme management, delivery including allowance for contingency/slippage & risk mitigation.

Innovative projects

Literature to demonstrate evidence of carbon savings, how technology works and evidence to show how savings should be achieved.

Specific section in application form to outline how project demonstrates innovation – this will boost scoring in SFC criteria

Business Case Assessments

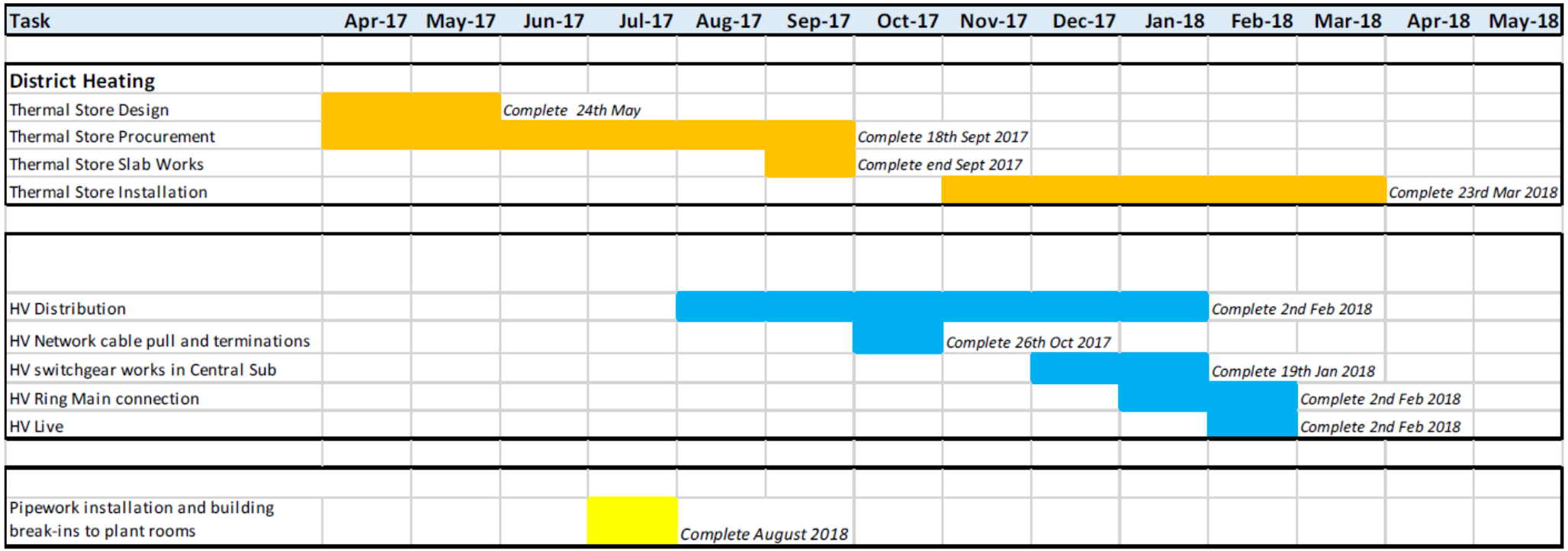
What makes a good business case

Key Project Milestones

Steps taken / to be taken	Process	Start date	End date	Include no. of days Contingency
Project Approval	Estates/finance approval		Complete	
	Board/councillors approval		Complete	
Tender	Project design time		Complete	
	Project out to tender		Complete	
	Contract awarded	15/12/2017	22/12/2017	7
	Cool off period		N/A	
Order	Order Placed	15/12/2017	22/12/2017	7
Delivery	Equipment Delivery	22/12/2017	09/02/2018	14
Project on site	Starting project installation	12/02/2018	01/06/2018	
Project completion	Project complete onsite		01/06/2018	30
	Commissioning	04/06/2018	13/07/2018	14
	Invoicing	13/07/2018	01/09/2018	49
	Send completion certificate to Salix		01/10/2018	60
	Returning loan agreement		01/11/2018	30

Business Case Assessments

What makes a good business case



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Heat Decarbonisation

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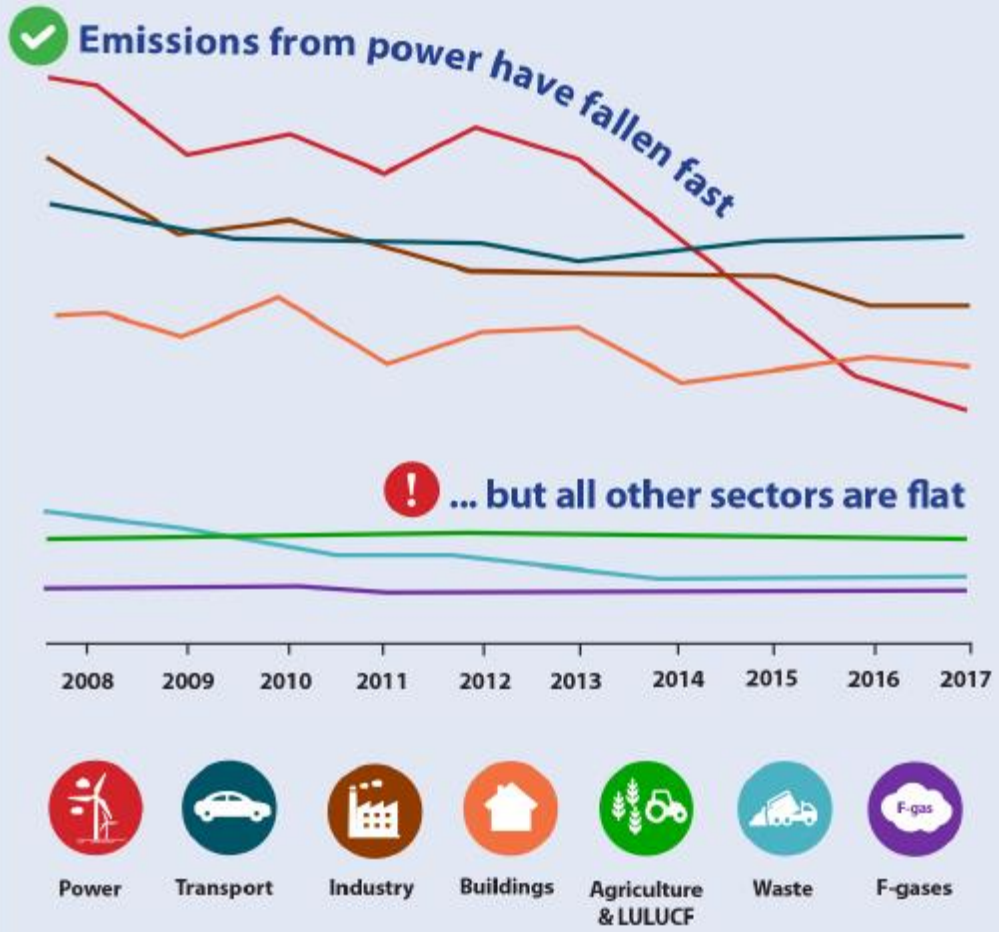
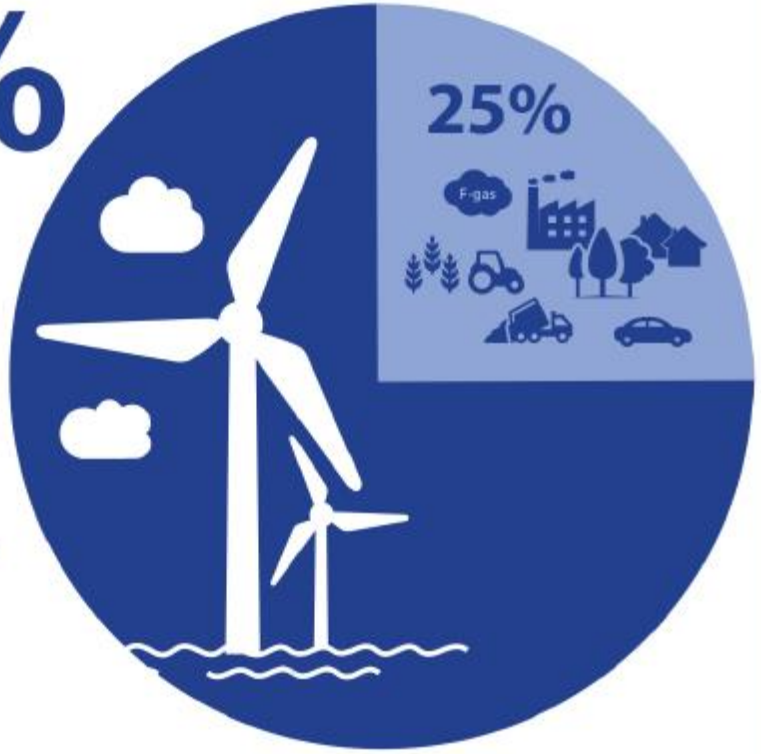
Excellent progress in reducing emissions from electricity generation masks failure in other sectors

The UK's greenhouse gas emissions have reduced by 43% compared to 1990 levels, on the way to a target of at least an 80% reduction by 2050.

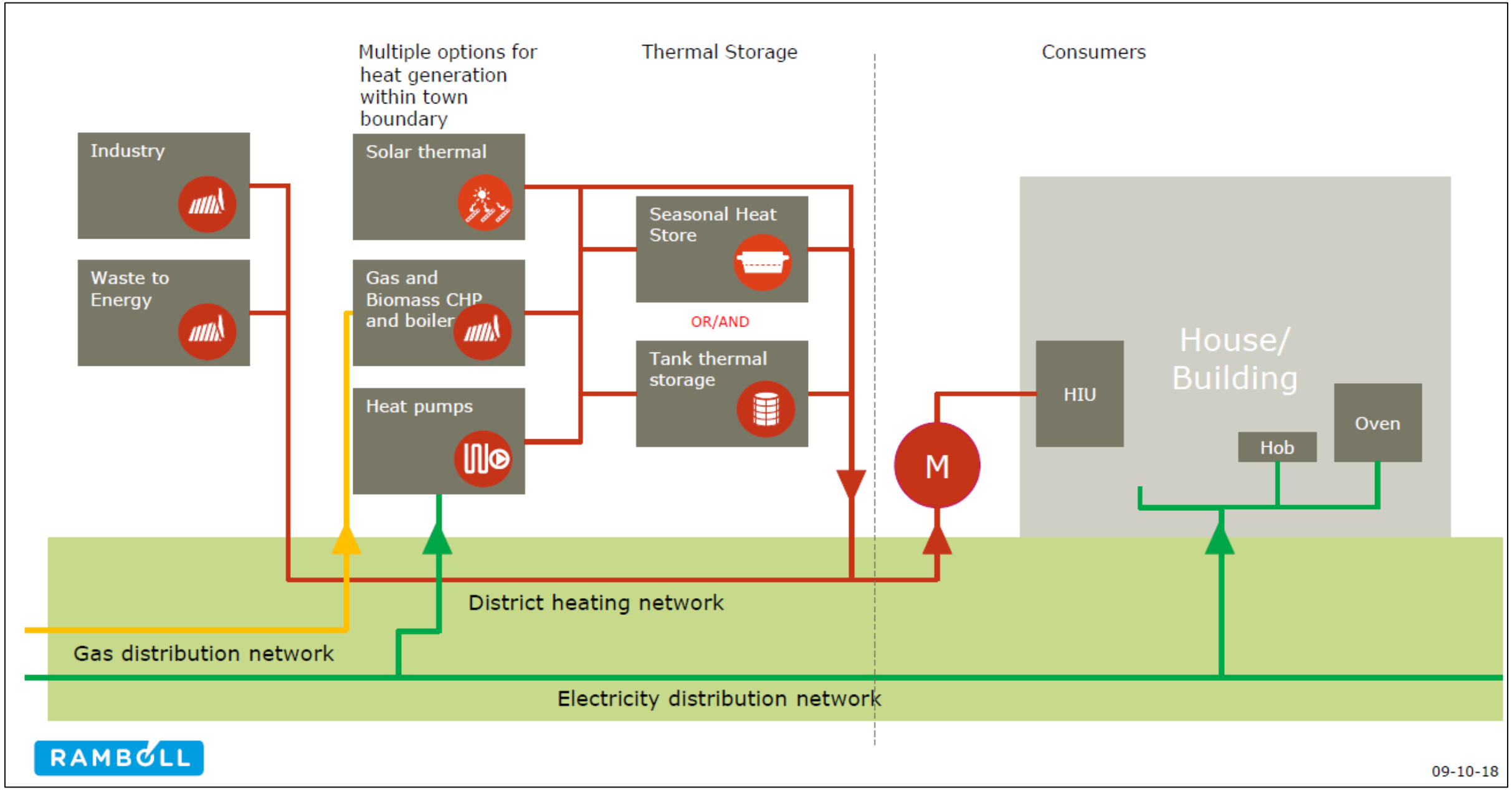


75%

of emissions reductions since 2012 have come from the power sector



Clear goals, ambitious strategy and well-designed policies have been effective. These lessons must now be applied to other sectors


Multiple options for heat generation within town boundary
Thermal Storage
Consumers
Industry
Waste to Energy
Solar thermal
Gas and Biomass CHP and boiler
Heat pumps
Seasonal Heat Store
OR/AND
Tank thermal storage
M
HIU
House/ Building
Hob
Oven
District heating network
Gas distribution network
Electricity distribution network
RAMBOLL
09-10-18

Supporting information

General Projects Supporting info required:

- Technical Specifications
- Evidence of costs, consistent with project cost breakdown
- Risk Assessment and mitigation
- Evidence of savings
- Project delivery plan, key milestones & contingency

Additional info to improve business case ranking:

- How the project fits in to longer term decarbonisation plan for the estate
- Metered energy data if available

Supporting information

- Solar PV
  - Technical Specifications - panels and inverter
  - Description of the site (roof or ground)
    - Details of ongoing or completed planning permission
    - DNO grid connection application for large systems
  - Calculations to estimate annual output of the array.
  - Evidence for expected onsite consumption
    - E.g. power demand profile, metered data

Supporting Information

Glazing

Calculations detailing:

- Boiler efficiency or other heating element
- Fuel type + price
- U value calculation – U value source (Vesma, Manufacturers publication)
- Assumption of internal temperature
- Length of heating season

AHUs

- Technical Specifications
- Power rating of existing and proposed fans
- Operational hours of the units

Project Examples & Knowledge Share

- Glasgow School of Art – Building Refurbishment
  - Whole building holistic approach
  - Collaboration with Local Authority
- Cranfield University – Solar PV and LED Lighting
  - Good student engagement
- University of Reading – Lab Upgrades
  - CO_2 reduction
- University of St George's – Chiller Replacement
  - Client Contribution

More information and Materials available on the Salix Knowledge Share Area, including case studies, project knowledge slides and best practice documentation.

https://www.salixfinance.co.uk/knowledge-share

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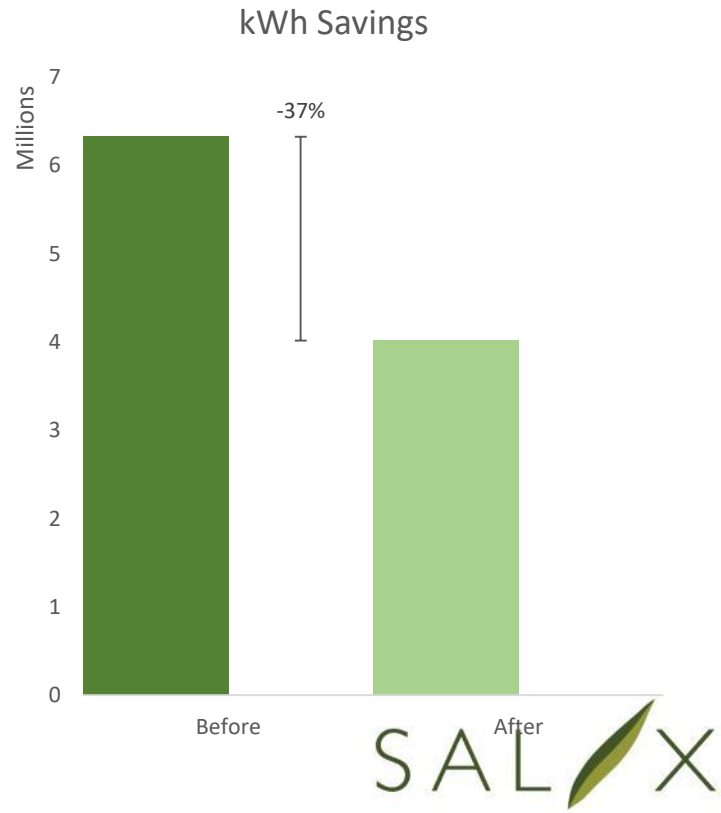
Glasgow School of Art - Refurbishment of Stowe College

Loan Value	Annual Financial Saving	Annual Carbon Saving
£1,020,280	£127,535	514 tCO_2e

- Primary aim: to make significant environmental improvements to the fabric and running costs of a little-altered building from the 1930s
- Holistic approach taken to whole building refurbishment
- Included the upgrade or replacement of 10 inefficient technologies ranging from heat recovery & boiler replacement to pipework insulation and hand dryers
- Improvements to thermal performance significantly improved the student & staff experience across 6 floors.
- Collaboration with the local council to improve nearby cycle infrastructure



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Cranfield University – Solar PV and LED Lighting

Loan Value	Technical Payback	Annual Carbon Saving	Annual Financial Saving
£1,601,474	5 years	725 tCO_2e	£329,108

- Large **1-Megawatt Solar farm** spanning 2 hectares across the university's estate – designed to match peak demand
- Reduced their electricity consumption by replacing existing fluorescent lighting with **5,044 LED lights across 40 campus buildings**
- Provides 5% of electricity for main campus
- 100% of project cost financed through Salix
- Data from the PV array is being used in the development of research projects at the university
- On-site generation is cheaper and provides resilience against energy market volatility
- Available Online here

Reading University – Fume Cupboard Upgrades

Loan Value	Technical Payback	Annual Carbon Saving	Annual Financial Saving
£605,000	3.2 years	645 tCO_2e	£316,680

- The University of Reading identified fume cupboards in their teaching labs which had **been running 24/7 since they were installed**.
- Redesigned with variable air volume (VAV) controls, high-efficiency extract fans, sensors and inverters
- Part funded with £405,000 of internal funding.
- **The fume cupboards now operate only when required** which is estimated to be 12 hours per day, 5 days per week, and 25 weeks per year.
- Following the success of this project, the University of Reading have carried out an **estate wide review of all of their fume cupboards**.

- Available Online here

Timescales

1st Nov
- Submission Deadline

13th Nov
- Initial project queries

22nd Nov
- All queries resolved

31st Dec
- Outcomes received

31st March 2020
- First Round Funding

March to July '20
- Project start dates

31st July 2021
- Project Completions

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Public Sector Network

- Online network exclusively for UK public sector professionals
- Peer & expert knowledge sharing
- Users can share knowledge & questions surrounding energy & environmental management
- Relaunched with new user-friendly design
- Events listings
- Optional weekly digest

Register here: http://publicsector.carbontrust.com

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CARBON TRUST

Thank you for listening

Can ask specific questions over the lunch break, or contact our team

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technical@salixfinance.co.uk

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