COLLABORATIONS FOR CHANGE

Global Goals for Tomorrow's Education, Today

19TH ~ 21ST JUNE 2018 KEELE UNIVERSITY

Keele Smart Energy Network Demonstrator

A national R&D facility to deliver UK comparative advantage in global smart energy markets

Headline Sponsor

CarbonCredentials

European Union
European Regional Development Fund

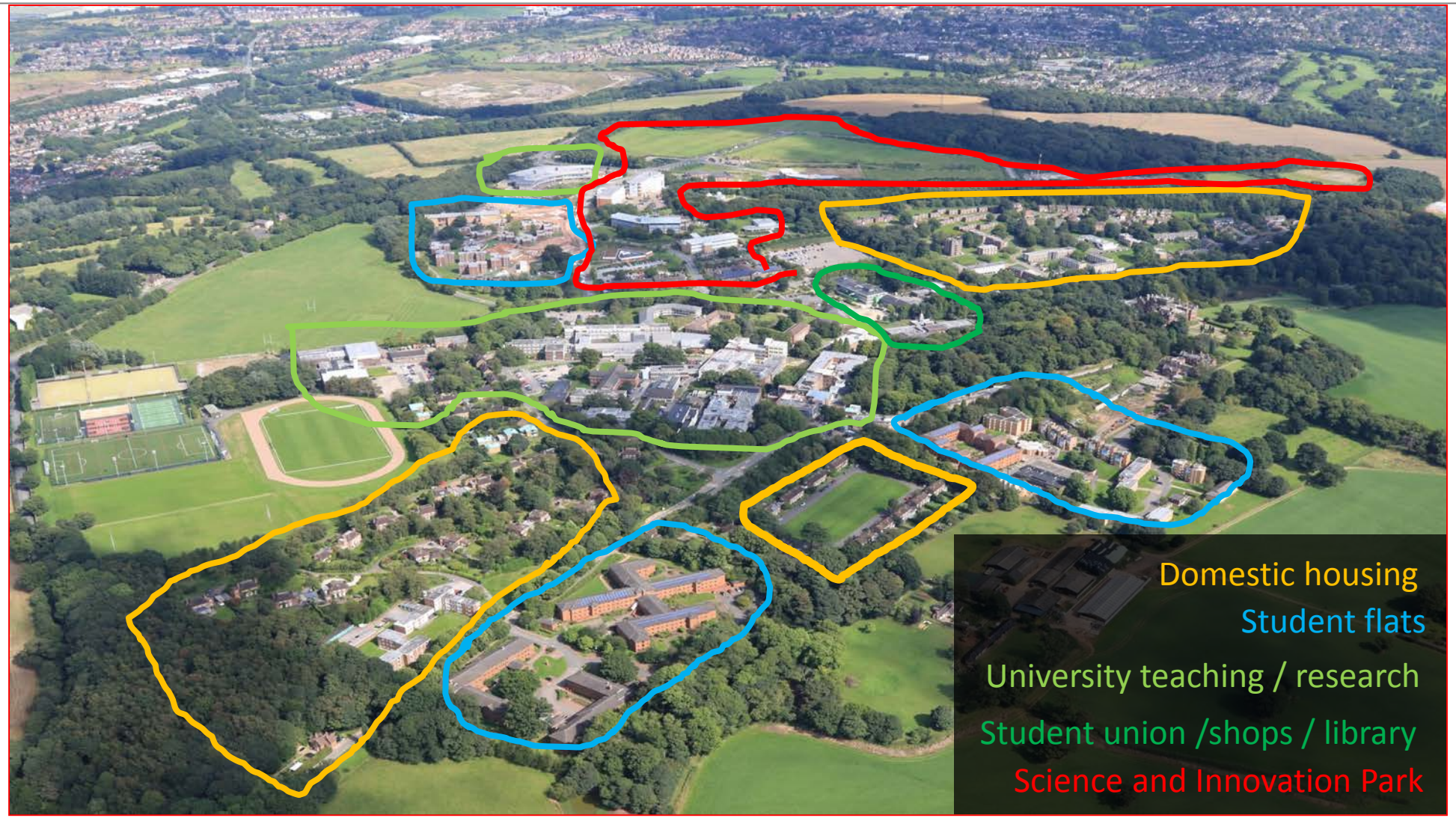
Funded by UK Government

Keele UNIVERSITY

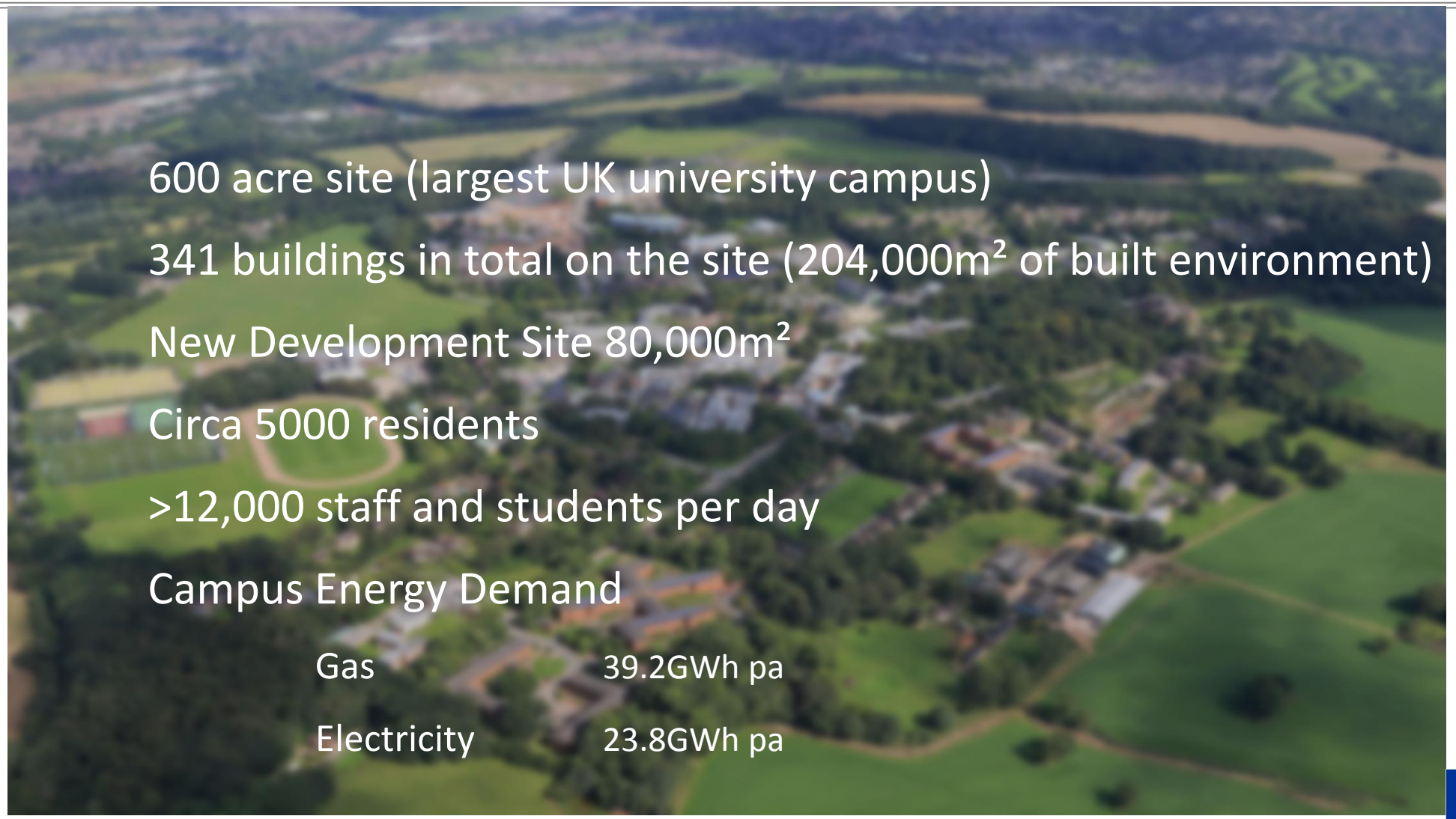
The Vision

- Renewable/Sustainable Energy Plan 2008
  - To be self-sufficient in Energy – security of supply.
  - To deliver targeted CO_2 reduction - 34% by 2020 and 80% by 2050 from 1990 baseline.
  - To develop the Keele campus to become a "Living Laboratory" for Research and Development for alternative energy solutions.
  - To improve energy efficiency, thus mitigating the upward trend in energy consumption and pricing.

A Small Town Living Laboratory



Small Town Demand



600 acre site (largest UK university campus)

341 buildings in total on the site (204,000m² of built environment)

New Development Site 80,000m²

Circa 5000 residents

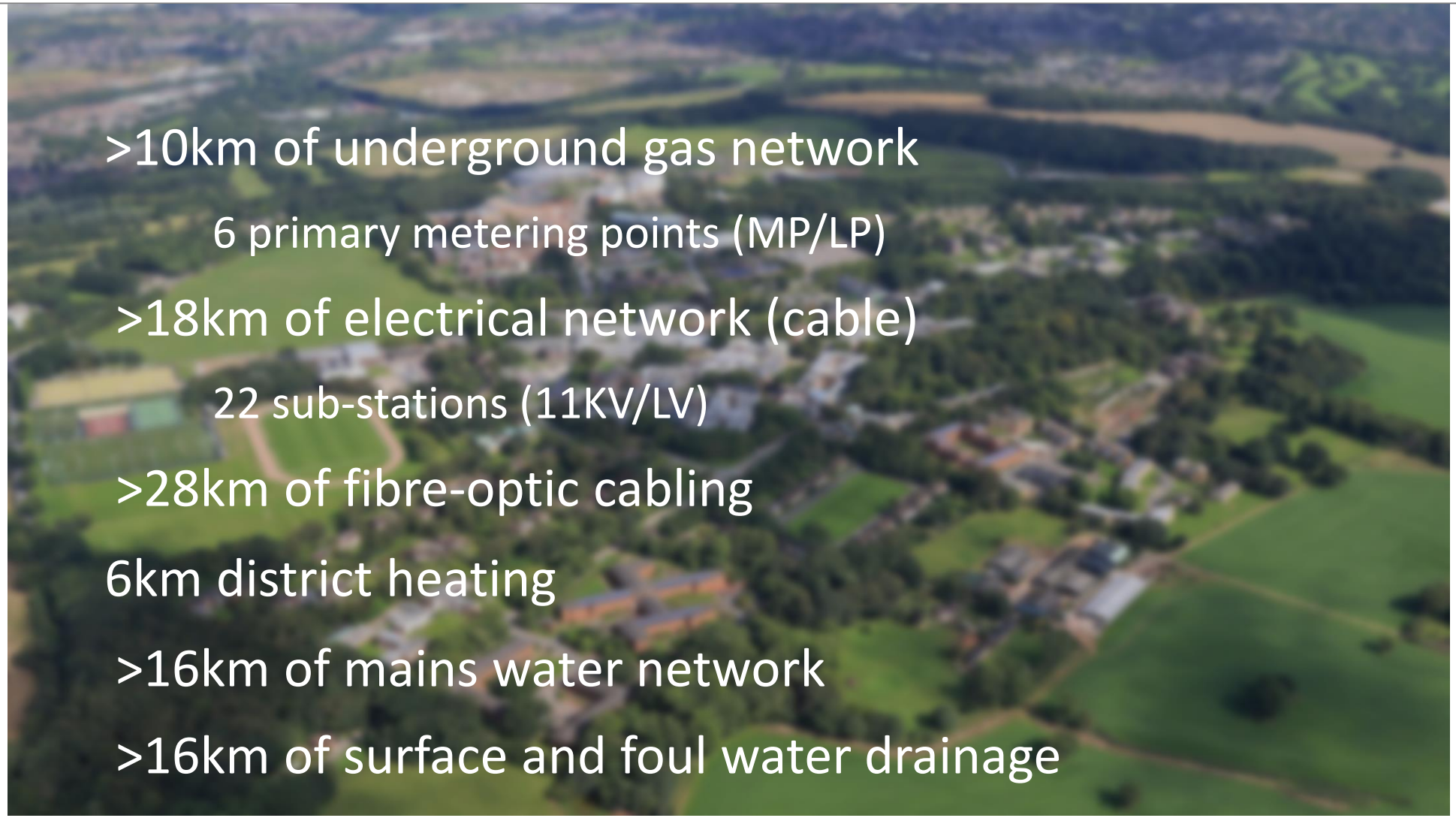
>12,000 staff and students per day

Campus Energy Demand

Gas	39.2GWh pa
Electricity	23.8GWh pa

COLLABORATIONS FOR CHANGE
Global Goals for Tomorrow's Education, Today
19TH – 21ST JUNE 2018 KEELE UNIVERSITY
eauc
European Union
European Regional Development Fund
Funded by UK Government
Keele UNIVERSITY

A Small Town Infrastructure



Making it Happen - Finance

• **Use of Funds**	• **Source of Funds**	• **Status**

• Capital Investment
  • 4 year implementation programme
  • Enable Distributed Energy Resources
	• £9.2 million
	  • £4.5m BEIS
	  • £4.7m ERDF
		• Secured

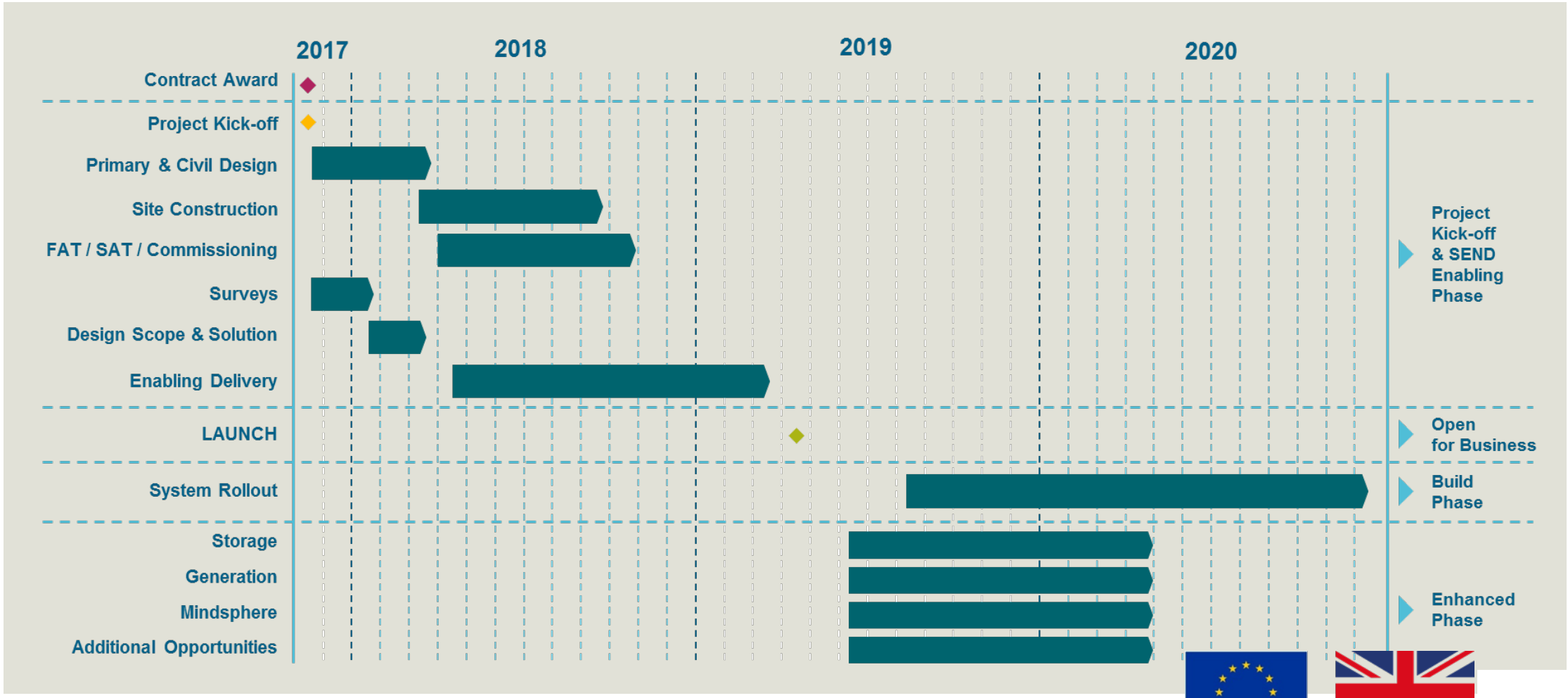
• Revenue Investment
  • Technical operator expertise
  • 26 x Business collaborations
  • Supply Chain Development
	• £5.7 million
	  • £4.3m ERDF
	  • £1.4m Keele University
		• Secured

• Distributed energy resources	• > 5MW DER from Private Sector	• Being Sought

Making it Happen - Procurement

- How do you procure a moving target
  - We don't know what we want
  - Setting the goals
- Lessons
  - Take your time (12 months)
  - Resource the process (> 1 person/yr)
  - Get lots of professional advice (>£100k)
  - Celebrate success

Delivering the Plan



European Union
European Regional Development Fund
Funded by UK Government
Keele UNIVERSITY

Key Outputs

- 4096 T CO_2e reduction pa by 2021 (circa 30% current emissions)
- Cost reduction through optimised network management
- Enable a high penetration of renewables
- Living lab to enable R&D by academics and industry
- Generate £40m GVA uplift from the government's £16m investment (>2:1 ROI) increasing to £80m GVA by 2036 (>5:1 ROI).

Driving Collaboration

- Use procurement processes to drive collaborations
  - Siemens for capital developments and future R&D
  - Stopford Energy & Environment for SME support
- Support 243 Staffordshire SMEs
  - Provide consultancy and advisory service to 217 SMEs (Stopford)
  - Fund Research Development & Innovation projects with 40 SMEs (PhD and Masters)
    - Generate 9 – "new enterprises"
    - Generate 7 – "new to firm" products

Next Steps

- Develop 5MW renewable generation / 10MW storage
  - Seeking investor / constructor / operator
  - Offer long-term supply contract certainty
  - Initial mix of wind / solar / battery storage
- Explore new approaches as part of SEND research
  - What are fundable projects
  - Using new technology to address fuel poverty
  - Exploring new energy resources e.g. mine water
- Integrating Education and Student Experience
  - Projects for Students
  - Hackathon challenges
  - Internship opportunities

Example Collaborations

McCAMLEY

- First prototype vertical axis wind turbine installed 2012.
  - Self-starting
  - Self-feathering
  - Bird and bat friendly
  - Vibration free and virtually silent
  - Radar benign

Cadent
Your Gas Network

- Evaluation of hydrogen produced by electrolysis injected into gas supply
- Feasibility, economics, impact on assets, impact on end use devices

Contact Details

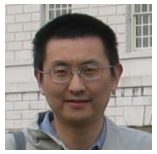
COLLABORATIONS FOR CHANGE
Global Goals for Tomorrow's Education, Today
19TH ~ 21ST JUNE 2018 KEELE UNIVERSITY

Presenters

Dr Ian Madley
Head of Partnership Development (Natural Sciences)
i.c.madley@Keele.ac.uk

Phil Butters
Director of Estates and Development
p.butters@Keele.ac.uk

Key Staff

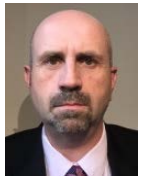


Professor Zhong Fan
SEND Director
z.fan@keele.ac.uk

Professor David Healey
Professor in Practice
d.l.healey@keele.ac.uk

Dr Jun Cao
Research Fellow in Energy & Sustainability
j.cao@keele.ac.uk

Dr Peter Matthews
Research Fellow in Energy & Sustainability
p.d.matthews@keele.ac.uk



Mark Schneider
SEND Programme Delivery Manager
m.p.schneider@keele.ac.uk

Melanie Watts
SEND RD&I Project Manager
M.Watts@Keele.ac.uk

The SDG Accord

The University and College Sector's Collective Response to the Global Goals

End extreme poverty, inequality and climate change

www.sdgaccord.org

eauc