

Comprehensive Spending Review (CSR) Submission

by **Teach the Future**

Teach the Future recommends accelerated and consistent delivery of investment into the energy efficiency and carbon reduction of school buildings in the CSR and presents the argument, methodology, and costing for a zero-carbon education estate.

Teach the Future is a student-led initiative hosted by Students Organising for Sustainability UK (SOS-UK). Teach the Future aims to improve climate education in schools, colleges and universities as well as reduce the education estate's carbon emissions. Teach the Future has over 140 supporting organisations, including environmental NGOs such as Greenpeace and The Wildlife Trusts, as well as educational NGOs such as the National Educators Union (NEU) and the Royal Institution (RI), and construction NGOs such as the Chartered Institute of Building (CIOB), the Association of Project Management (APM) and the Royal Institute of British Architects (RIBA).

This submission is authored by students from Teach the Future with advice from energy efficiency specialists.

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1. Current energy efficiency measures for schools are inadequate:

(1.1) The allocated £9.5 billion since 2015 to improve the condition of the school estate and the additional £560 million in capital funding this year are in reality, rarely used for focused energy efficiency measures and the published list of measures funded under condition improvement funding historically shows that this money is spent on projects to repair leaking roofs, refurbish toilets, improve fire alarms and provide security fencing around schools.¹

(1.2) Due to the current version of Part L of the building regulations using out of date carbon factors, capital projects have tended to favour gas as fuel in order to meet Part L.² New and major school refurbishments have also tended to exclude energy usage from school kitchens and underestimated the use from school IT systems. Kitchen energy usage is now seen to be the largest single energy use area within primary schools.

(1.3) Interest-free loans for energy efficiency projects in maintained schools which are available through the Department for Education-backed Salix finance scheme are limited to measures which have an 8-year payback.³ This tends to rule out larger measures such as more major fabric insulation and renewable schemes.

(1.4) 72% of secondary and 27% of primary schools are now academies and therefore can only access the Salix Energy Efficiency Fund (SEEF) scheme, (and not the Salix School Energy Efficiency Loan (SEEL) scheme) which is a critical element in academy schools being able to fund the transition to net-zero. The SEEF scheme has not been

1

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/895975/Condition_improvement_fund_2020_to_2021_outcome.ods

2 <https://www.energistuk.co.uk/part-l-target-emission-rate/>

3

<https://www.salixfinance.co.uk/sites/default/files/School%20Application%20Notes%20June20.pdf>

an annual application process despite the Department for Education claims. The last available application window closed on 30th November 2018 and academies have not been able to make any applications since this date.⁴ Over the past four years, there have only been two application windows (one ending on 13th Jan 2017 and one ending on 30th Nov 2018), and there has been no long term certainty or clarity about when further stages of this funding may become available. There is some suggestion on the Salix website that the next round may become available in autumn 2020, but there were similar indications in 2019 which never materialised.

(1.5) When the last round of SEEF applications closed, it was four times oversubscribed. Around £400m worth of technical viable energy savings schemes that academies were wanting to carry out were not funded.

(1.6) SEEF projects have had a funding cap of £150,000 in the past round (this varied from the first round) giving a lack of certainty and forward planning to projects.⁵ While this cap does not pose much of a barrier for primary schools, the experience within many secondary school projects is that sums around the £250,000 are frequently required to deliver good holistic energy-saving projects, and greater funding would be required if projects were allowed to have a 12-year payback and include more substantial measures.

(1.7) One particular challenge within Voluntary Aided (VA) schools is that energy-saving projects are considered as capital works and due to the financial arrangements within these schools they have to pay VAT on these works which they can not recover and the Governing Body has to fund 10% of these costs.^{6 7} There are further restrictions around schools that do not have direct debit facilities in that they are unable to access SALIX funding.

(1.8) The provision of showers and hot water systems to accommodate these is a requirement in the Department for Education design guidance. Shower facilities in most schools are very rarely used, if ever.⁸ Most showers are used as additional dry changing space or storage facilities. Due to this requirement, and poor hot water design tools, the provision of hot water within schools is typically highly excessive. A

⁴ <https://www.salixfinance.co.uk/loans/SEEF>

⁵ <https://www.salixfinance.co.uk/index.php/loans/SEEF>

⁶

<https://www.hackneyservicesforschools.co.uk/system/files/extranet/VA%20Schools%20VAT%20Guidance-130110.pdf>

⁷ <https://www.gov.uk/guidance/voluntary-aided-schools-capital-funding>

⁸ https://www1.essex.ac.uk/news/event.aspx?e_id=7295

far more efficient route to the provision of hot water for schools would be to provide this from an electric point of use hot water heaters within WCs/under each sink and with electric showers.⁹ This would avoid the over-provision of stored hot water services, avoid all gas use for hot water provision and thus decarbonise all hot water supplies as the grid decarbonises. It would also facilitate an easier transition to heat pump solutions for heating in the future as the hot water provision will not be from the heating boiler or similar. Such a solution would also radically reduce the legionella risk within schools as such low volume point of use heaters are noted to be low risk by the HSE in their Code of Practice.¹⁰ This would therefore reduce the amount of water testing and chlorination that schools frequently have to pay for and which have scope 3 carbon emissions associated with it due to the external testing and chlorination services having to drive to the school.

2. Recommendations to accelerate delivery of investment into the energy efficiency and carbon reduction of school buildings:

Recommendation 2.1 corresponds to issue 1.1, etc.

(2.1) The Department for Education prioritises Condition Improvement Funding to better support schools in undertaking the required works to become zero-carbon as opposed to other measures which have prevailed historically.

(2.2) The Department for Education ensures that all new schools from 2022 are built to passivhaus standards.¹¹ And that the use of any fossil fuel (gas, LPG, oil) is prohibited within any new school building from 2030.

(2.3) The Department for Education changes the criteria around SALIX (SEEF and SEEL) funding to extend the payback provision to 12 years. This would enable schools to use this funding for the more substantial measures required to become zero-carbon, such as PV arrays and a fabric first approach to building thermal efficiency in order to support the decarbonisation of heat and the future installation of heat pump technology.

⁹ <https://www.clage.com/en/central-or-decentral-hot-water-supply>

¹⁰ <https://www.hse.gov.uk/pubns/books/l8.htm>

¹¹ <https://www.passivhaustrust.org.uk/news/detail/?nid=675>

(2.4) The Department for Education provides a long term commitment that the SEEF process will run annually and is opened for new applications every year.

(2.5) The Department for Education invests an additional £500m to £1bn into the SEEF funding round for 2020 and each subsequent year of this Parliament to allow all academies with energy-saving schemes to obtain financing to operate. As SEEF and Salix SEELs are zero-interest loans and operate as recycling funds, such an investment over this Parliament would establish a well-resourced recycling fund for subsequent years. The Department of Education publishes a list of all successful and unsuccessful projects within each round of SEEF funding and presents this to ministers and the Chancellor to review whether additional funding of this scheme should be made in subsequent rounds.

(2.6) The Department for Education lifts the cap that each academy is able to apply for from SEEF funding to at least £250,000 for secondary schools, ideally to £500,000

(2.7 i.) The Department for Education reviews the VAT arrangements for VA schools and allows for energy saving works to be zero-rated for VAT within VA schools. Governors 10% contribution should not be required for these works, due to the resulting energy and therefore cost savings being a benefit to the school budget (not Governor's capital works budget).

(2.7 ii.) The Department for Education puts in place suitable procedures to ensure that SALIX funding is accessible to all schools including those that do not have direct debit facilities.

(2.8 i.) The Department for Education urgently revises its design requirements for new and refurbished schools on the provision of showers and radically reduces the number of showers that have to be provided to be more in line with current trends and behaviours.

(2.8 ii.) The Department for Education revises its design guidance to all schools so that hot water provision should only be made through the use of local electric point of use heaters.

(2.9) The Department for Education supports the decarbonisation of transport by installing Electric Vehicle Chargers at every school in the UK by 2025 to allow teachers and other school staff to transition to electric vehicles.

(2.10) The Department for Education bans the purchase or lease of petrol and diesel school minibuses and other vehicles from September 2022, requiring all school vehicles to be electrically fuelled.

3. How these recommendations contribute to the priorities of the CSR

- Strengthening the UK's economic recovery from COVID-19 by prioritising jobs and skills:

Increasing the scale of school carbon emissions reductions projects by increasing the number of schools and size of projects available for the SEEF scheme will create more jobs in retrofiting.

- Levelling up economic opportunity across all nations and regions of the country by investing in infrastructure, innovation and people – thus closing the gap with our competitors by spreading opportunity, maximising productivity and improving the value add of each hour worked:

Targeting schools ensures that economic investment is spread across the country in an equitable way, as there are schools in every area of the UK. School buildings are often the cornerstones of local communities, and this investment will create green job opportunities across the country.

- improving outcomes in public services, including supporting the NHS and taking steps to cut crime and ensure every young person receives a superb education

One in six schools in England requires urgent repairs, which could be directly addressed through energy efficiency investment, or the savings from which would allow budget for further repairs.¹² Investment in school buildings would also improve

¹²

<https://www.theguardian.com/education/2019/dec/08/revealed-one-in-five-school-buildings-in-england-require-urgent-repairs>

education, as the built environment plays a key role in a student's education.¹³ Additionally, the transition to more sustainable education buildings would give students an opportunity to better understand sustainability and net-zero, key to preparing them for a net-zero future.

- Making the UK a scientific superpower, including leading in the development of technologies that will support the government's ambition to reach net zero carbon emissions by 2050:

Greater investment in energy efficiency and retrofit projects will increase the demand for new technologies which help retrofit and decarbonise the UK's housing, a key part of the journey to net-zero.

- Improving the management and delivery of our commitments, ensuring that all departments have the appropriate structures and processes in place to deliver their outcomes and commitments on time and within budget:

This submission has looked at several examples of failure to deliver the maximum saving outcomes in the Salix SEEF scheme, and inefficiencies in Department for Education design guidelines. By reviewing the Department for Education's processes and increasing funding for the SEEF scheme, the management and delivery of emissions reduction projects can be massively improved and schools can benefit from increased savings.

4. The argument for a zero-carbon education estate

The UK government has committed to bring all greenhouse gas emissions to net zero by 2050. This pathway to net-zero emissions will need to include education buildings, and there is a strong argument in favor of making this one of the first sectors to be completely decarbonised. There are education buildings, from schools and colleges to universities, in all parts of the UK. This means that by investing to retrofit and decarbonise education buildings we can ensure that investment is spread across

¹³

https://www.google.com/url?q=https://www.architectsjournal.co.uk/archive/great-schools-the-importance-of-good-design&sa=D&ust=1600419683403000&usg=AFQjCNE_zPebUaqsrokIXGOSevV76Brqrg

the country in an equitable way, contributing greatly to the government's levelling up agenda. This will also ensure that key retrofitting skills are installed across the UK, and begin building the skills base necessary for the task of decarbonising the UK's housing stock. With an unemployment crisis on the horizon, the government needs big investment into high quality, sustainable jobs and decarbonising the education estate is the perfect opportunity for this.

Investment in the UK's education estate will also bring about huge benefits for students and communities across the country. Repairing and retrofitting school buildings, often the cornerstones of local communities, will positively impact the individuals and families who use the facilities. Currently one in six schools in England requires urgent repairs, putting staff and students at risk and negatively affecting their education. With this investment, education buildings would not only become more fit for purpose, but also the sustainability hubs of communities across the UK, unconsciously educating students and their families about sustainability and net-zero.¹⁴

Our recommendation

- (a) By 1 January 2022 all new educational buildings must be designed and constructed to ensure that they are net zero emissions buildings, and deliver a net biodiversity gain, and
- (b) all existing educational buildings must be refurbished, renovated or retrofitted to achieve net zero emissions buildings status by no later than 1 January 2030.

Below methodology and costing by Simon Alsbury at Energise Ltd, For any queries related to this work, please contact simon@energise.com or call 01480 220280.

Methodology

The assumed technical approach to modelling the changes required has been taken to mirror the technical recommendations within the January 2010 publication Road to Zero Carbon, Final Report of the Zero Carbon Task Force.¹⁵ This approach is summarised by the diagram below. To produce a basis of validation of the cost rates per m2 assumed in the calculations, a modelled school for each of Primary and

¹⁴

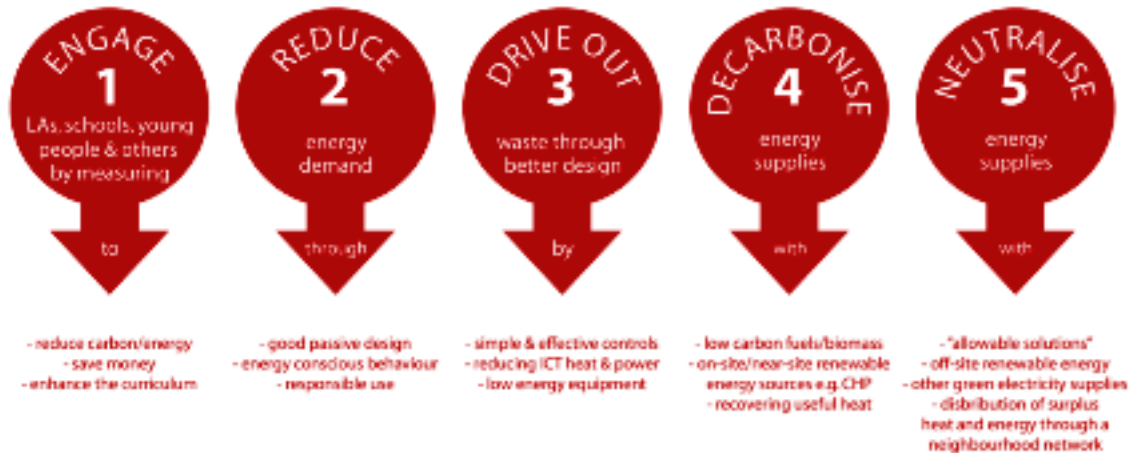
<https://www.theguardian.com/education/2019/dec/08/revealed-one-in-five-school-buildings-in-england-require-urgent-repairs>

¹⁵ <https://dera.ioe.ac.uk/672/1/00111-2010DOM-EN.pdf>

Secondary has been modelled in software called RETScreen.¹⁶ These models are available on request to anyone interested.

THE ENERGY > CARBON 'HIERARCHY'

"Halve the demand, double the efficiency, and halve the carbon in the supplies, and you are down to one-eighth of the emissions"
Task Force Member Bill Bordass



Costing

Marginal improvement cost of all new schools being Net Zero from 2022 onwards	£9,557,189,000
Retrospective improvement cost for all existing schools (exc. maintenance spend)	£13,810,968,000
TOTAL	£23,368,157,000

The methodology behind each component calculation is as follows:

¹⁶

<https://www.nrcan.gc.ca/maps-tools-publications/tools/data-analysis-software-modelling/retscreen/7465>

All floor area, building type and condition analysis was taken from the Property Data Survey Programme.¹⁷

1. Marginal improvement cost of all new schools being Net Zero from 2022 onwards

- a. To assess the cost of all new schools being moved to Net Zero, the cost of a Net Zero school was assessed per m².
- b. To conduct this analysis, two methods were taken, each to validate each other:
 - i. The first was to model a concept school of the size of the average primary and the average secondary school in the UK. The cost rates used in the assessment were taken from SPONS 2018 (construction industry price book). This model was conducted in RETScreen.
 - ii. The second was to compare actual Net Zero schools (as measured by having an EPC rating of less than 0) to the typical cost of school construction. The typical cost of school construction used was taken from the National School Delivery Cost Benchmarking study undertaken in 2017. The cost of the Net Zero school was taken from actual examples of Net Zero schools. The comparison between was then drawn per m² on an average basis. The calculated cost premium for a Net Zero school is £598.67 per m².
- c. The cost of new builds was then assessed based upon the planned school building as declared in Government policy statements.
- d. Only the marginal improvement cost is presented compared to the National School Delivery Cost Benchmarking study as all other costs would be incurred for educational need fulfilment rather than for the explicit achievement of the Net Zero commitment.
- e. All figures were then adjusted for assumed inflation over the period of the commitment.
- f. As the target number of new schools is largely only enough to fulfil additional educational need, all new schools are considered to be for additional fulfilment only.

2. Retrospective improvement cost for all existing schools (exc. existing maintenance spend)

- a. To assess the cost of upgrading all existing schools being moved to Net Zero, the cost of Net Zero remedial action was assessed per m².

¹⁷ <https://www.gov.uk/government/publications/property-data-survey-programme>

- b. To conduct this analysis concept school models of the size of the average primary and the average secondary school in the UK were constructed via RETScreen. The cost rates used in the assessment were taken from SPONS 2018 (construction industry price book).
- c. The figures were then corrected based upon the current progress towards Net Zero which was assessed using the EPC rating dataset for educational buildings, where an EPC rating of 0 is defined as a Net Zero school (or net zero energy).
- d. All figures were then adjusted for assumed inflation over the period of the commitment.
- e. As the target number of new schools is largely only enough to fulfil additional educational needs, all existing schools are assumed to be included in the scope of the transition to Net Zero.
- f. The calculated cost of transition per square meter to a Net Zero school is £287.41 per m².