



Response to the Consultation on Cutting the Cost of Keeping Warm: a new fuel poverty strategy for England

Please use this template to respond to the consultation. It will help us to record and take account of your views.

You may choose to respond to some or all of the questions. Please provide evidence for your answers where possible.

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Would you like this response to remain confidential? If yes, please state your reasons:	Yes/No <i>(Delete as appropriate)</i>


The deadline for receipt of your response is 7th October 2014

Please email your response to fuelpovertyconsultation@decc.gsi.gov.uk

Alternatively you can send it by post to:

Fuel Poverty Team
Department of Energy and Climate Change
Area 2E
3 Whitehall Place
London
SW1A 2AW

Section 2: Setting a meaningful fuel poverty target

Target	
Q1	What are your views on the interim milestones we propose to include in the fuel poverty strategy?
<p>Agree/Disagree/No comment (<i>delete as appropriate</i>)</p> <p>Comments and Evidence:</p> <p>You have proposed a series of three milestones, by which fuel poor households are brought to E by 2020, D by 2015 and then C by 2030.</p> <p>First of all we would urge you to keep an open mind on the wider cost-benefits of aiming higher than EPC C. Whole life financial and energy modelling carried out by AECB as part of our CarbonLite Retrofit programme suggests that improvements should be pitched at a 'Deep' level, one that aims for a minimum reduction in CO2 emissions from space heating of around 50% . (Please contact us for further information on how this relates to EPCs)</p> <p>'Deep' improvements in energy performance increase the comfort and health benefits enjoyed by occupants while also reducing energy consumption. At lower levels of energy efficiency, there tends to be a trade off, with the (highly desirable) comfort-taking eroding the energy savings(see http://tinyurl.com/pen4rtx), and therefore failing to deliver national benefits in terms of reduced carbon emissions, reduced need for generating capacity, and improved energy security.(see http://www.aecb.net/less-is-more-energy-security-after-oil-lim-from-the-aecb-3/).</p> <p>Secondly we would urge you to look not just at EPC ratings but also at the installed performance of efficiency improvements. You note (para 3.1.10) that you have consulted on warranties for boiler installations, but just as critical is the design, specification and installation of the full range of other energy efficiency interventions. Thus the detailing of a solid wall insulation installation can affect the final heat loss through the walls by as much as 30% (please contact us for full calculations) Thermal bridging near ground level, and at window cills and reveals is highlighted in this thermal image of a poorly-detailed EWI installation.</p>  <p>(http://www.salford.ac.uk/__data/assets/pdf_file/0006/142377/011-Hopper.pdf)</p>	

The Green Deal and ECO take account of the underperformance of many energy efficiency measures in reality, versus the performance predicted by software. While we welcome this honesty, it is more important to actually close this performance gap, and this can be done, as has been shown in, for example, some of the outcomes from the TSB funded Retrofit for the Future Competition.

Common reasons for underperformance include poor (or even worsened) airtightness, incomplete installation of loft and cavity insulation, and poor design of solid wall insulation leaving unnecessary levels of thermal bridging, for example at door and window reveals or at wall to floor junctions. Thermal bridges are especially important in with SWI as they can markedly impact performance and with internal wall insulation, can also lead to moisture/condensation related health hazards and (in combination with undesired moisture build up) fabric decay.

The AECB, the Centre for Refurbishment Excellence and others are offering training into closing the performance gap, and this kind of awareness should be integrated much more widely into tradesperson CPD.

Regarding the specific milestones you have proposed, there are two ways you could set about this. If you simply mean you would prioritise all homes below E by 2020, bringing them up to C (or above) in one visit (or if practicalities make this impossible, in stages following a whole-house plan to reach the this level), then going back to those at E and doing the same by 2025, then returning to the Ds – this is a reasonable approach, in theory.

However you yourselves point out that dwellings at EPC E & D are not efficient enough to lift their occupants out of fuel poverty in numerous instances (you state 80% of all households in fuel poverty live in such dwellings) so on the face of it this seems unlikely to lift the occupants out of fuel poverty. At best this simply defers fuel poverty for a short period.

We agree with the recommendation from Energy Bill Revolution and the Association for the Conservation of Energy that repeat visits would be extremely wasteful. Worse than that, measures to bring a dwelling to E may actively impede the most cost-effective steps to bring a dwelling to C or above. (We also agree that confining work to households currently in fuel poverty risks exposing households just outside the current definition of fuel poverty, to fall into fuel poverty as soon a energy prices rise a little.)

We would therefore very strongly urge against the interpretation of these milestones as mandating up to three visits to each property, to bring them up to C in up to three separate steps. It certainly seems right to prioritise the worst dwellings, but bringing those dwellings merely to E or D then returning to them five to ten years later will be of little help.

In practice the street-by-street approach being trialled in ‘Green Deal for Communities’ may demonstrate that it is more cost-effective to tackle properties with a range of EPCs, but united by common postcodes, building types and “energy efficiency endpoint specifications”, to bring them all to C or above as one localised contract.

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Q2	Do you agree that we should develop indicators for energy efficiency, renewables, distribution, non-gas homes, health and children? Are there other indicators that we should monitor?
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Agree/Disagree/No comment (*delete as appropriate*)

Comments and Evidence:

While SAP may offer a 'fast and dirty' indication of progress at a nationwide level, it is a poor guide for design and a worse predictor of individual performance.

We also think the current understanding of the energy efficiency of the UK housing stock may be flawed, and that the average performance may be worse than thought – meaning among other things, that the benefit/cost ration of many interventions would be higher than thought, especially with regard to alleviating fuel poverty.

AECB's reasoning for this is as follows:

- due to empty homes/second homes using very little (e.g. frost protection heating only) then occupied dwellings really use more gas than averages suggest
- the use of electricity for secondary/backup/supplementary space heating is not identified in the ECUK tables - so more energy may be being used for space heating than is apparent using the ECUK data based on gas

We also suspect that national average internal temperature in the heating season is probably lower than the 17.2C that is modelled. Please feel free to contact us for further details.

Another of the deficiencies in SAP is the failure to take into account airtightness and its effect on ventilation rate. SAP assumes that a minimum ventilation rate of 0.5 air changes per hour will be deliberately maintained one way or another by the occupants. However in reality air change rates may be a lot higher or a lot lower, depending on both fabric, and occupant behaviour.

This oversimplification in SAP means that the considerable energy savings available by cutting unwanted, uncontrolled infiltration are overlooked. But at the same time, the SAP rating does not tell you if a building is in fact underventilated.

In order to realise the potential health and wellbeing benefits of energy upgrades, it is essential to ensure that both the thermal and the ventilation performance of the finished dwelling are good. If the health services are to become involved in recommending their patients for energy upgrades, they will certainly expect the indoor air quality of their patients' homes to be improved, not degraded!

Following on from this, the AECB welcomes the increased emphasis on the health benefits of tackling fuel poverty and building inefficiency. There are clearly economic as well as social benefits to be gained, and combining forces and, hopefully, resources to drive these improvements should yield synergistic benefits.

You note that monitoring the health impact of home energy improvement is not straightforward. As an essential first step in untangling causes and effect in this

area, AECB believes that ventilation rates or better still, indoor air quality should be recorded alongside home energy efficiency improvements, as a matter of course.

Poor IAQ is likely to be a confounding factor in any analysis of the relationship between fabric condition and excess winter deaths, just as there is a risk it can be a confounding factor in attempts actually to improve health. Warmth and good ventilation are both required for health, and homes need to be comfortable and affordable to heat even while they are properly ventilated. There is a growing theoretical understanding of the air quality, comfort and energy performance of various ventilation strategies, and these should be seen as an integral part of the drive to tackle fuel poverty. (contact AECB for information on the performance of various ventilation strategies)

Excess winter deaths are linked to both cold and damp – insulation and heating on their own are not enough to guarantee a healthy home; good ventilation and fabric in good condition, are also necessary.

Sadly much current retrofit guidance overlooks this- this needs correcting in all official advice

Though damp, mould and poor IAQ are harmful all year round, in winter, especially in the homes of the fuel poor, damp & pollution hazards may increase, because:

- Windows and vents are more likely to be shut, leading to higher indoor humidity and other indoor pollutants
- Condensation is likelier on colder indoor surfaces (eg low quality windows and uninsulated walls;
- In some areas there may be more driving rain in winter; where fabric is poorly constructed, poorly upgraded, or in disrepair this can lead to cold, wet surfaces, and possible mould growth (including hidden within the walls).

All this can be monitored – nb some of this is behavioural research, q11

While warmer homes and cheaper heat are always desirable and in many cases can help reduce these other indoor environmental hazards, this cannot be taken for granted. Simply making a home warmer is not guaranteed to make it healthier.

30- 40% of the excess winter deaths are from cardiovascular causes, almost as many are from respiratory problems. Many of these are related to winter flu epidemics, but mould, dust mite, CO, NO₂ and VOCs are all pollutants that exacerbate respiratory conditions, and all tend to be found in higher concentrations in winter when people tend to reduce their ventilation.

Excess winter illnesses are less well quantified, but dampness and indoor pollution (as above) are implicated in many chronic respiratory conditions such as asthma and COPD (chronic obstructive pulmonary disease) that tend to worsen in winter. Some of these pollutants (notably CO and VOCs) are also thought to contribute to cardiovascular disease. See for example <http://www.epa.gov/region1/healthyhomes/iaq.html>

Please refer to <http://www.aecb.net/publications/aecb-response-nice-national-institute-health-care-excellence-excess-winter-deaths-illnesses-guideline-consultation/> for further explanation.

It is worth noting that theoretical ventilation rates -- as based on fabric infiltration rates, purpose-provided ventilation and the scope for purge ventilation -- are not going to correlate directly with indoor air quality, especially in households in fuel poverty, who often make strenuous efforts to reduce all controllable ventilation in order to keep warm, and to reduce fan running costs – even at the expense of IAQ. See for example <http://www.goodhomes.org.uk/downloads/members/ian-mawditt-operation-and-behaviour.pdf>-(information based on work carried out for DCLG)

Section 3: Developing a Roadmap for 2030

3.1 Warmer Homes

Q3 Do you have evidence or views that will be of use in shaping our proposed research into park homes in 2014? You may prefer to respond to this question through the broader call for evidence published separately.

Agree/Disagree/No comment (*delete as appropriate*)

Comments and Evidence:

Q4 How can the fuel poverty strategy best support non-gas fuel poor households, particularly as we move to decarbonise heating? Please consider both short and long term action, and include evidence where possible.

Agree/Disagree/No comment (*delete as appropriate*)

Comments and Evidence:

The challenge of decarbonising UK heat supply affordably is immense, deep retrofit of UK stock will meet this challenge half way. The cost effective balance between retrofit (reducing demand) and low carbon heat generation and distribution needs to be found through modelling and monitoring of pilot projects relating to different urban and rural situations and different building types.

Without deep retrofit, any increase in electrical heating (even when based on renewables and made more efficient via heat pumps) risks putting intolerable peak loads onto the grid, and may overwhelm local transmission lines. With deep retrofit, in particular the use of very well detailed roof and external wall insulation and

draughtproofing, peak loads will be lower and it may be possible to use the domestic water stores and the house itself as a 'thermal store' enabling a degree of demand response, at least on an hour-to-hour basis. This would offer the possibility of cheaper tariffs for the households concerned, plus and lowered capital costs reducing energy prices nationally

Q5 Do you have views or evidence that will be of use in shaping our research on the potential for improved controls to help fuel poor groups manage their heating?

Agree/Disagree/No comment (*delete as appropriate*)

Comments and Evidence:

We recommend you explore the benefits of a continuous heating regime, with simplified weather compensated controls combined with implementation of a whole house plan for fabric retrofit. Heating controls on their own can be quick and cheap to install and help with bills, but they can never make a cold house warm.

Q6 What existing evidence should we consider in analysing the impacts of energy efficiency measures on health and/or social care service costs?

Agree/Disagree/No comment (*delete as appropriate*)

Comments and Evidence:

There is far too little published evidence on the health impacts of energy efficiency improvements. There is even less that also takes into account the 'before and after' indoor air quality. However the AECB is convinced that the health dividend is a critical additional benefit from retrofit of the housing stock and we very much welcome the explicit linkage of the two here.

We are however very concerned that without adequate understanding of the relationships between building behaviour and the health of occupants, huge opportunities to improve health may be missed – or health may even be endangered.

In relation to the temperature and energy saving (ie affordability) improvements resulting from deep retrofit, and the associated internal air quality, detailed monitoring data is available via the AECB low energy building database (<http://www.aecb.net/featured/low-energy-buildings/>) and in the case studies published by the Technology Strategy Board and the RIBA (<http://www.ribabookshops.com/item/residential-retrofit-20-case-studies/80472/>). However the health impact of the works was not monitored so far as we are aware.

We are aware of one UK study on the impacts of home energy interventions into warmth and indoor air quality on health - a study undertaken at Bangor university where heating and ventilation systems in the homes of children with asthma were upgraded simultaneously, and the children appeared to enjoy an improvement in

health (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3207091/>)

We can also direct you to ongoing investigations of deep retrofits in social housing where the health of occupants is being monitored as part of the landlords cost benefit analysis (see for example http://www.encraft.co.uk/?attachment_id=2036, presentation by Steve Groves) . You yourselves are also aware of some pioneering collaborations between local authorities and health boards, which should be followed closely.

There is some published literature about the burdens of indoor pollutants: see for example the references in these articles (<http://www.katedeselincourt.co.uk/wp-content/uploads/2014/03/Healthy-buildings-Green-Building-Magazine.pdf> and <http://www.katedeselincourt.co.uk/does-natural-ventilation-work-references-and-links/>). However, these are mostly observational studies and do not relate to particular interventions.

However, the picture is incomplete to say the least, and we believe a great deal more of this kind of research is required into the building science that relates insulation, airtightness, ventilation, relative humidity, condensation, fabric integrity, mould and dust mite allergen loads, and indoor pollutants such as PM2.5, CO, NOx, VOCs and so forth.

For example, we need more information (explored for example through AQ testing and surveys) on the effects on IAQ (eg spore concentrations) of mouldy (suspended) floor voids or cavities behind IWI on battens, and studies of the way airtightness and the range of possible ventilation strategies improves or worsens this problem, for example, by altering transport of air from affected fabric into the living space, or conversely, bringing in uncontaminated air, reducing the relative humidity to reduce mould growth, etc.

Tying these findings with biomedical evidence on the health impact of indoor pollution would greatly enhance your understanding of the impacts of energy efficiency measures on health and/or social care service costs.

With regard to the HIDEEM model, we would want to be reassured that it allowed for the modelling of realistic building interventions (eg modelling SWI with and without thermal bridging, for example), and also offered the full range of possible technologies, such as mechanical extract ventilation, Passivhaus-level insulation, solar shading, etc. AECB would be delighted to assist with the development of this model, as we have access to performance data for a very wide range of interventions.

We would however be wary of relying on modelling alone, and believe that energetic monitoring of ongoing pioneering retrofit programmes is essential 'proof of the pudding' (see Q13)

Q7	How can we best support interventions to enable fuel poor people with existing health problems, or at risk of health problems, to benefit from energy efficiency measures? We would particularly welcome evidence on barriers you have encountered or examples of best practice.
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Agree/Disagree/No comment (delete as appropriate)

Comments and Evidence:

First and foremost DECC, DCLG and DoH must jointly recognise that improvements in the quality of housing is a national infrastructure investment worthy of major funding. At the moment, funding is unsustainably confined to what can be levied on energy bills – which as we saw last year is highly politically contentious, even at the current wholly inadequate levels. Central funding is needed. (see also q14 below)

There is little doubt that deep retrofit with airtightness and good mechanical ventilation squares the circle of providing real energy savings and affordable warmth while improving, rather than compromising, indoor air quality. Anecdotally, health benefits are considerable (see <http://www.bere.co.uk/blog/healthy-results-in-passive-house-air-quality-tests-comparing-particulates-in-a-passive-house> and <http://www.bere.co.uk/blog/healthy-results-in-passive-house-air-quality-tests-comparing-particulates-in-a-passive-house>), and modelling certainly bears this out. (see for example <http://researchbank.rmit.edu.au/view/rmit:18559>)

Such interventions must however be quality assured, for example via AECB self-certification or Passivhaus certification to be sure that benefits are realised. With regard to those suffering, or at risk of, housing-related health problems, - We believe a system of mandated referrals is well worth trying – see q8 below.

Regarding barriers to uptake, we believe that exemplar retrofits can help – there is anecdotal evidence for instance that once on house in a neighbourhood undergoes external wall insulation, others tend to follow. Carrying out an exemplar retrofit on the home of a vulnerable patient could therefore both assist that patient and act as a boost to uptake of similar measures nearby.

Environmental health officers have reported that enforcement of improvements in the private rented sector is particularly difficult, even when dwellings are clearly in breach of statutory housing standards (never mind when seeking anything above the legal minimum), because occupants fear ‘retaliatory eviction’ (or possibly rent increases) if the landlord is required to spend money on the property.

As a paper published by the Chartered Institute of Environmental Health warns: Not only are landlords frequently uninterested in improving their properties: “Some tenants do not want intervention, fearing eviction [‘revenge eviction’], rental increase or homelessness, and working in this sector can sometimes be a thankless task. However, it is at the bottom end of the private rented sector, including HMOs, where some of our most acute and stubborn health inequalities exist and perpetuate.” <http://www.cieh.org/WorkArea/showcontent.aspx?id=46516>

It is hard to see how DECC can tackle this issue however, without the active co-operation of DCLG and DWP.

Q8	Do you think development of a system of ‘mandated’ health referrals – linked to eligibility for fuel poverty interventions – is feasible? Considering issues
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such as scope, verification or benefit to recipients, how might it work?

Agree/Disagree/No comment (*delete as appropriate*)

Comments and Evidence: yes, we believe a system of mandated referrals is well worth trying.

However, this is more than a question of “improving the EPC”. For this to be effective, collaboration between building scientists, environmental health officers and health professionals should be facilitated, to develop enhanced ‘diagnosis’ of building fabric & services deficiencies that are impinging/may impinge on health.

This could include detection of:

1. Cold – uninsulated fabric, draughts, or both
2. Damp – distinguishing between condensation, rising damp, driven rain, and leaks.
3. Poor background ventilation, or underused ventilation owing to fuel poverty/discomfort
4. Poor purge ventilation, or underused purge ventilation owing to fuel poverty/discomfort. Underuse of purge ventilation owing to security/noise/pollution issues may also increase risk of overheating in hot weather.
5. Ingress of outdoor pollutants (eg particulates from traffic)
6. Indoor pollution from moisture, CO, etc
7. Contamination by mould

Ideally the identification of such issues in the home of a vulnerable household should trigger a whole-house intervention to tackle all the issues at once. We recognise however that it may not be possible to arrange this in time to ameliorate a ‘health emergency’ (such as worsening angina, COPD etc) However, collaboration between the three sectors mentioned above could enable both the prescription of immediate ‘health and energy first aid’ to the dwelling (for example, a new boiler/heating system, priority for insulation, improvement of airtightness coupled with the fitting of single room continuous extract ventilation, secure ventilation grilles to avoid the need for fans or air conditioning, the replacement of a faulty suspended floor), plus a long term ‘treatment plan’ for the dwelling.

Developing such a programme is something the AECB would be very pleased to assist with. We have a 25-year history of practical research into building behaviour, and we are pioneering much of the building science research that is revealing the best combination of retrofit measures to save energy and safeguard building fabric and occupant health.

3.2 Supporting People

Q9 Do you have views on how best to align the Warm Home Discount with the Low Income High Cost indicator?

Agree/Disagree/No comment (*delete as appropriate*)

Comments and Evidence:

Q10 In considering the reduction in means-testing for pensioners brought about by the Government's pension reforms, do you have views on additional ways to target direct payments and bill support to the fuel poor?

Agree/Disagree/No comment (*delete as appropriate*)

Comments and Evidence:

3.4 Improving Delivery

Q11 Do you have views on where we should focus future fuel poverty related behavioural research and do you know of any additional on-going work in this field?

Agree/Disagree/No comment (*delete as appropriate*)

Comments and Evidence:

See answer to q2

Ongoing work – see UCL - [The Bartlett School of Environment, Energy and Resources](#)

Q12 To help inform development of the Community Energy one stop shop, what types of capacity support would help community groups increase their impact on fuel poverty (for example, information, training, mentoring, or local networking)?

Agree/Disagree/No comment (*delete as appropriate*)

Comments and Evidence:

see answer to 13

Q13 What support would help to increase partnership working between community groups and other local level actors (ranging from Local

Authorities to Health and Well-Being Boards and energy efficiency installers) in order to tackle fuel poverty?

Agree/Disagree/No comment (*delete as appropriate*)

Comments and Evidence:

AECB is developing simple guidance to help retrofitters avoid the worst moisture related risks, and mitigate the remaining risks for example by reducing residual rising damp, or rain wetting on IWI retrofits, generally planning in appropriate inward or outward ‘drying pathways’ associated with insulation and airtightness measures.

Locally delivered energy advice and retrofit programmes delivered by qualified and experienced advisers, closely linked in to local services and community groups, are crucial, to enable effective and supported follow through of referrals, as opposed to sending vulnerable householders into the ‘black hole’ of national listings of advisors and installers.

Local provision via qualified and experienced advisors also enables advice to be delivered at the appropriate level and in the appropriate form and medium, according to need – which may range from a technical assessment of a home to a personal home visit to help with bills, use of controls, ventilation and so on.

With regard to ventilation, identifying that there is “not enough ventilation” is not simply a matter of checking what is installed, it is, crucially, a matter of checking what is being used (see for example Ventilation and Indoor Air Quality in Part F 2006 Homes BD 2702 DCLG 2010 <http://www.scribd.com/doc/43637758/Ventilation-and-Indoor-Air-Quality-in-Part-F-2006-Homes>, and <http://www.goodhomes.org.uk/downloads/members/ian-mawditt-operation-and-behaviour.pdf>).

A ventilation installation can be regs compliant and theoretically capable of delivering a healthy rate of air exchange, but due either to the fact that it causes excessive discomfort (eg cold, draughts, noise) of the occupant’s circumstances (excessively cold home, fear of unaffordable electricity consumption by mechanical fans). This is a more subtle thing to detect.

Some of the systemic problems can only be addressed with a deeper change to guidance and practice relating to ventilation. The health community may have a useful role to play in driving this change. The AECB would be pleased to assist with developing any guidance.

There is currently no provision in the mainstream energy improvement programmes, and no funding. This should be changed, and good air quality should be seen as an integral part of an energy efficient, healthy home.

Q14	How can Government support a collaborative approach to developing the fuel poverty evidence base? What are the best ways to communicate priorities? What tools would be useful to ensure a quality approach consistent with the low income high cost indicator?
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Agree/Disagree/No comment (*delete as appropriate*)

Comments and Evidence:

We urge you to take energetic steps to support the pioneers of deep retrofit with assistance in monitoring the outcomes of their work – both in terms of the building performance, and the benefits to occupants. This early skill set should be captured as a matter of urgency to best inform ongoing wider-scale work. The AECB is one excellent source of contact with many of these pioneering interventions and would be pleased to assist. (see also answer to q6)

Re your desire for a quality approach: You state in 3.1.20 that you wish to increase the transparency of cost information where policies are paid for by energy consumers, and note that the ongoing acceptability depends in part on how benefits are shared.

We would agree that transparency of cost is important. We would however like to see more energetic efforts made, and at the level of BiS, DWP, DoH and the Treasury (and not simply DECC), to increase the shared understanding of the economic and social benefits of home retrofits; and also for DECC to cast the carbon savings in terms of marginal cost of abatement (to the nation, and to individual bill payers) in relation to other abatement measures such as renewable generation, nuclear power, CCS, and so forth.

Attempting to tackle fuel poverty via a levy on fuel bills is fundamentally self-defeating – or it would be if it were carried out at anything near the scale required. It is fundamentally regressive and hits those in fuel poverty hardest of all.

We agree with numerous commentators who have stated with very good reason that the national retrofit programme is a priority national infrastructure project, just as for example, high speed rail or flood defence is an infrastructure project. As such it should be funded centrally. It would be interesting to see the costs and benefits in terms of households benefiting via employment, or improved living conditions (or both) and their geographical and demographic distribution -- for all such infrastructure projects.