Department for
Energy Security
& Net Zero

Climate Change Agreements: consultation on extension to 31 March 2027 & further proposals on any potential future scheme

Closing date: 10 May 2023

March 2023

Any enquiries regarding this publication should be sent to us at:
cca@beis.gov.uk

Introduction

The Climate Change Agreements (CCA) scheme, first established in 2001, serves the dual purpose of making energy and carbon savings through energy efficiency targets whilst also helping to reduce energy costs in eligible industrial sectors by providing a significant discount to participating businesses on the Climate Change Levy (CCL) paid. The targets provide a basis on which organisations can make improvements to the energy efficiency of their facilities over a set period, ensuring their contribution to UK-wide goals, in return for reduced rates of CCL on their energy bills, estimated to be worth around £255m in total in 2021/22[1]. Participants can also see significant energy bill savings from the energy efficiency improvements they make towards these targets.

Between 1990 and 2019, the UK cut emissions faster than any other G7 country, a 44% reduction[2] whilst growing our economy by 78%[3]. Incentivising energy efficiency is proving to be a proactive way to drive the gains in carbon reduction and reaching net zero. The most recent CCA Biennial Progress Report published by the Environment Agency shows an overall adjusted emissions reduction of 9.3 million tonnes of CO2e (a reduction of over 15% compared to the 2008 baseline) under the current CCA Scheme, which started in 2013, to the end of Target Period 4 in December 2020[4]. In 2021 we published our Net Zero Strategy[5], which sets out policies and proposals for decarbonising all sectors of the UK economy to meet our net zero target by 2050, as well as our Industrial Decarbonisation Strategy[6], which sets out how industry can decarbonise in line with net zero while remaining competitive and without pushing emissions abroad.

Since its establishment, the CCA scheme has helped businesses become more energy efficient and there was found to be strong support for a future scheme in the evaluation of the scheme published in 2020[7].

The current scheme targets ended on 31 December 2022 with reduced rates of CCL in available until 31 March 2025 for those who meet targets and other obligations under the scheme. Our Industrial Decarbonisation Strategy committed to further assessment of the purpose and targeting of a long-term CCA scheme following the extension.

In December 2021, we published our initial consultation setting our key aspects of a future scheme and reforms under consideration.

On 15 March 2023, the Government confirmed that the current scheme would be extended. Targets will be in place from 1 January 2024 to 31 December 2024, with performance against those Targets allowing reduced rates of CCL to continue to be available for eligible businesses for a further two years until 31 March 2027.In this consultation, we set out our proposals for this extension.

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[1] https://www.gov.uk/government/statistics/main-tax-expenditures-and-structural-reliefs
[2] Note, emissions figures exclude IAS. UNFCCC, 'GHG emissions with LULUCF', https://di.unfccc.int/time_series
[3] GDP, PPP (constant 2017 international $), World Bank https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.KD
[4] Biennial progress report TP4 with baseline year of 2008 - https://www.gov.uk/government/publications/climate-change-agreements-cca-biennial-report/climate-change-agreements-biennial-progress-report-for-2019-and-2020
[5] https://www.gov.uk/government/publications/net-zero-strategy
[6] https://www.gov.uk/government/publications/industrial-decarbonisation-strategy
[7] https://www.gov.uk/government/publications/second-climate-change-agreements-scheme-evaluation

In addition, following on from our previous consultation we set our views on some proposed reforms which could be taken forward as part of any potential future scheme following this extension. No decisions have been yet made on whether a future scheme will be pursued.

Contents

General information

Why we are consulting

This consultation seeks views on the proposal to extend the current Climate Change Agreements (CCA) scheme by a further two years, as well as some further developed proposals for reforms for a potential future CCA scheme.

Consultation details

Issued: Wednesday 15th March 2023

Respond by: Wednesday 10th May 2023

Enquiries to:

Email: cca@beis.gov.uk

Consultation reference: Climate Change Agreements: consultation on extension to 31 March 2027 & further future scheme proposals

Audiences:

We are seeking views from: sector associations and business which participate in the scheme; operators of facilities not currently in the scheme that may be eligible; and organisations such as trade associations, NGOs, consultants, energy suppliers, academia and other stakeholders who have an interest in the scheme.

Territorial extent:

The CCA scheme operates on a UK-wide basis.

How to respond

Outline whether responses should be provided in a particular preferred format, where electronic responses should be emailed to, which address to send hardcopy responses to, whether to use different addresses for responses for the devolved administrations, etc.

Respond online at: https://beisgovuk.citizenspace.com/climate-change/ccas-extension-future-scheme-2023

or

Email to: cca@beis.gov.uk

When responding, please state whether you are responding as an individual or representing the views of an organisation.

Your response will be most useful if it is framed in direct response to the questions posed, though further comments and evidence are also welcome.

Confidentiality and data protection

Information you provide in response to this consultation, including personal information, may be disclosed in accordance with UK legislation (the Freedom of Information Act 2000, the Data Protection Act 2018 and the Environmental Information Regulations 2004).

If you want the information that you provide to be treated as confidential, please tell us, but be aware that we cannot guarantee confidentiality in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not be regarded by us as a confidentiality request.

We will process your personal data in accordance with all applicable data protection laws. See our privacy policy.

We will summarise all responses and publish this summary on GOV.UK. The summary will include a list of names or organisations that responded, but not people's personal names, addresses or other contact details.

Quality assurance

This consultation has been carried out in accordance with the Government's consultation principles.

If you have any complaints about the way this consultation has been conducted, please email: beis.bru@beis.gov.uk.

Background

The Climate Change Agreements (CCA) scheme is a voluntary scheme that encourages businesses in a wide range of industrial sectors with energy-intensive processes, such as chemicals, paper and ceramics to agricultural businesses such as intensive pig and poultry farming to invest in energy efficiency measures in return for reduced rates of Climate Change Levy (CCL). It directly supports an energy efficient, low-carbon future.

The first CCA scheme was introduced in 2001, alongside CCL, in recognition of the fact that CCL would increase the cost of energy for energy intensive industry and potentially impact competitiveness in certain sectors. The current scheme started on 1 April 2013 and is currently scheduled to run until 31 March 2025.

The former Department of Energy and Climate Change (DECC) and industry sectors negotiated climate change umbrella agreements in 2012. Together they agreed the energy efficiency or carbon reduction targets for a sector – the sector commitment. The agreement is then held between the sector association and the Environment Agency - the administrator of the CCA scheme. Umbrella agreements also list the processes that are eligible for a CCA, while underlying agreements are held by a site, or group of sites, owned by individual operators within a sector, and set out the energy or carbon efficiency targets appropriate for their type of operation.

When first established, the current scheme had four, two-year Target Periods (TP), with targets ending on 31 December 2020 and reduced rates of CCL until 31 March 2023. At Spring Budget 2020, the Government announced that the current CCA scheme would be reopened to new entrants for a set period and extended for a further two years until March 2025 through the addition of a fifth TP ending on 31 December 2022. Prior to the extension, stakeholders were consulted on the proposed changes, such as a new baseline year of 2018 for the added TP5 and an increase of the buy-out price from £14 to £18 per tonne of carbon dioxide equivalent. TP5 targets were negotiated between the former Department for Business, Energy and Industrial Strategy (BEIS) and sectors. New entrants were able to apply to join the scheme at certain times through to 30 November 2020.

The final TP currently in place (‘Target Period 5’) ends on 31 December 2022, with operators who meet obligations for TP5 being eligible for certification for reduced rates of CCL from 1 July 2023 to 31 March 2025 (‘Certification Period 6’).

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Target Period (TP)	TP1: 1 Jan 2013 to 31 Dec 2014		TP2: 1 Jan 2015 to 31 Dec 2016		TP3: 1 Jan 2017 to 31 Dec 2018		TP4: 1 Jan 2019 to 31 Dec 2020		TP5: 1 Jan 2021 to 31 Dec 2022				
Certification period (CP)	CP1: 1 Apr 2013 to 30 Jun 2015		CP2: 1 Jul 2015 to 30 Jun 2017		CP3: 1 Jul 2017 to 30 Jun 2019		CP4: 1 Jul 2019 to 30 Jun 2021		CP5: 1 Jul 2021 to 30 Jun 2023		CP6: 1 Jul 2023 to 31 Mar 2025		

Figure 1 Current CCA scheme Target and Certification Periods

In December 2021, we published our initial consultation setting our key aspects of a potential future scheme and reforms under consideration.

Climate Change Agreements Scheme Evaluation

An evaluation of the second CCA scheme was published in 2020, and the final report can be found here – [www.gov.uk/government/publications/second-climate-change-agreements-scheme-evaluation.](www.gov.uk/government/publications/second-climate-change-agreements-scheme-evaluation)

The evaluation showed that there is strong support from existing participants for a future CCA-style policy and provides evidence that the current CCA scheme has contributed to both energy efficiency and competitiveness objectives. The evaluation also suggests that the cost-effectiveness of the scheme could be improved if it was targeted more closely at sectors that are at risk from carbon leakage (i.e. that are both energy intensive and trade intensive), and added that the success of any future policy to support clean growth will be strongly influenced by the targeting of the scheme and the stringency of the targets set for participants.

Slightly more than half of Target Units (TUs)[8] achieved their targets without using buy-out or banked surplus[9] in each TP[10], with little variation between TPs despite changes in the cost of buy-out. The average level of underperformance[11] was low (4-6.5% of total emissions for the scheme). The level of overachievement[12] of targets was greater (8.7%-13.5% of total emissions), exceeding the level of underperformance in each of the first three TPs. Almost all CCA participants had taken some action on energy efficiency since the start of the scheme. However, about half of firms reported that the scheme did not influence their energy efficiency action.

Findings from the evaluation, as well as input from stakeholder bodies, such as the UK Emissions Trading Group, have informed the Government of the strengths of the scheme and shown where there are opportunities to improve it. Some of these considerations were incorporated in the recent extension and others are proposed for this extension to strengthen the scheme in the short term. However, these recommendations will feed more fully into the design of any potential scheme in future should the government decide to pursue one.

Climate Change Levy (CCL)

The scope of this consultation does not include CCL policy or the level of reduction to CCL main rates accessed through participation in the CCA scheme. All tax rates are kept under review by HM Treasury and are set by the Chancellor at fiscal events. Government has set out the main rates and reduced rates through to 31 March 2025[13].

[8] 'Target Unit' means the facility or group of facilities to which an agreement applies.
[9] TUs can carry forward or 'bank' surplus accumulated by exceeding their Targets in a previous Target Period.
[10] The evaluation reviewed data from Target Periods 1-3
[11] Underperformance means the buy-out plus banked surplus that a TU needed to use to meet its Target for a given TP, as a proportion of total reported emissions for the relevant TP.
[12] Overperformance means the surplus generated by a TU relative to its Target, as a proportion of total reported emissions for the relevant TP.
[13] https://www.gov.uk/guidance/climate-change-levy-rates

Wider Policy Landscape

The CCA scheme operates within a broader set of existing policies which are part of our strategy for business energy efficiency and industrial decarbonisation. Other policies in this space include:

- Combined Heat and Power Quality Assurance - https://www.gov.uk/guidance/combined-heat-power-quality-assurance-programme
- Energy Savings Opportunity Scheme - https://www.gov.uk/guidance/energy-savings-opportunity-scheme-esos
- Energy Technology List - https://www.gov.uk/guidance/energy-technology-list
- Industrial Energy Transformation Fund - https://www.gov.uk/government/collections/industrial-energy-transformation-fund
- Streamlined Energy and Carbon Reporting scheme - https://www.gov.uk/government/publications/environmental-reporting-guidelines-including-mandatory-greenhouse-gas-emissions-reporting-guidance
- UK Emissions Trading Scheme - https://www.gov.uk/government/publications/participating-in-the-uk-ets/participating-in-the-uk-ets
- Energy Bill Relief Scheme - https://www.gov.uk/government/publications/energy-bill-relief-scheme-ebrs-scheme-documents
- Energy Intensive Industries (EIIs) exemption from indirect costs of funding Contracts for Difference (CFD), the Renewables Obligation (RO) and the small-scale Feed in Tariff (FIT) - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1094666/cfd-ro-fit--exemption-guidance-revised-july-2022.pdf
- EII compensation for the indirect emission cost from the UK Emissions Trading Scheme (ETS) and Carbon Price Support (CPS) - https://www.gov.uk/government/consultations/review-of-the-schemes-to-compensate-energy-intensive-industries-for-indirect-emission-costs-in-electricity-prices

Current CCA scheme extension

At a time of volatile energy prices, we recognise the need for clarity and certainty on the continuation of CCA policy as a part of the Government's strategy for energy efficiency and business support. At Autumn Statement 2022, the Chancellor announced that new Government funding worth £6 billion will be made available for energy efficiency measures from 2025 to 2028, in addition to the £6.6 billion provided in this Parliament. As well as this, the Government provided an unprecedented package of support for non-domestic users through winter 2022-23 and the Energy Bills Discount Scheme will mean eligible non-domestic energy users will receive a discount on high energy bills until 31 March 2024.

Alongside these packages, the Government is proposing that the current CCA scheme should be extended by a further two years to continue providing participants with support with their energy costs by making the reduced rates of CCL available until 31 March 2027. As part of the extension, we are proposing some reforms to enhance the scheme's effectiveness. These proposals include enhanced reporting of actions taken and the decarbonisation potential of facilities in the scheme which will help share best practice within sectors so participants can maximise their efficiency improvements in the most economical way.

A two-year extension means that there is time to continue our plans to explore a potential future reformed CCA scheme, with this consultation covering some aspects of that potential scheme, and minimises the potential period before we can bring in possible reforms to enhance the scheme beyond what is possible with an extension to an existing scheme. We recognise that, should the government decide to move forward with any new CCA scheme, we would need to carefully consider the options for reform and how the scheme should be targeted to maximise the effectiveness of the scheme, thereby protecting taxpayers while continuing to support UK industry.

1. Do you foresee any impacts arising from this two-year extension?

Target Period and Certification Period dates

This proposal is for a two-year extension to the scheme. The previous TP (Target Period 5) ended on 31 December 2022. We are proposing that the Target Period for this extension (Target Period 6) will cover the period from 1 January 2024 to 31 December 2024. This will allow time for negotiations with sector agreements on the level of these targets and for the Department for Energy Security & Net Zero to put the necessary legislation in place before those targets begin.

While this means there is in theory a gap year, where we will not measure performance, our intention is that the targets for TP6 will reflect an ongoing trajectory of improvement following the end of TP5. Certification for reduced rates of CCL is currently scheduled to end on 31 March 2025, the end of Certification Period 6 (CP6). Sector associations report on performance for a Target Period by 1 May following the end of each TP, with those facilities which have met their obligations being certified to receive reduced rates of CCL from 1 July. In order to ensure enough time for the reporting process for the new TP, we intend to vary CP6 so that this will now end on 30 June 2025. This is necessary as otherwise participants would not have the certification necessary to benefit from reduced rates of CCL between 1 April 2025

and 30 June 2025. The added CP7, for which facilities will only be certified having met obligations in TP6, will begin on 1 July 2025 and end on 31 March 2027.

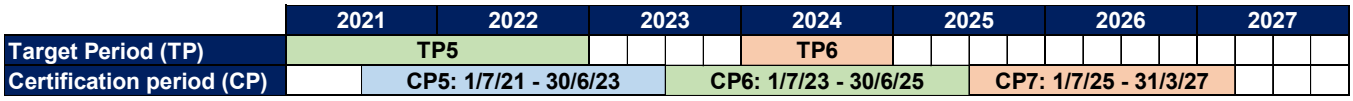


Figure 2 Proposed Target and Certification Periods (including extension to existing CP6)

Summary of proposed dates

- Certification Period 6 – end date extended from 31 March 2025 to 30 June 2025
- Target Period 6 – New Target Period from 1 January 2024 to 31 December 2024
- Certification Period 7 – New Certification Period from 1 July 2025 to 31 March 2027

2. Do you agree with the proposed dates for Target Period 6 and Certification Period 6?

Eligibility

We are not proposing any changes to the eligibility criteria for the extension period. This will ensure that all current operators who continue to meet the existing eligibility will maintain their benefits of participating in the scheme.

All sector associations who currently hold umbrella agreements will be able to engage with the process to vary these agreements to add the new target and Certification Periods, as well as enabling new entrants to the scheme (see 'New entrants' section below).

All current operators will be expected to confirm to their sector association before assenting the variation to their underlying agreement for the extension that they remain eligible under current scheme criteria.

We are not considering the addition of new sectors or processes for this extension but may do so for any potential longer-term scheme.

Whilst eligibility criteria reform is not in scope of this proposed two-year extension, as part of the previous consultation on future CCA scheme proposals we set out our intention to review what the eligibility criteria should be for any potential future scheme. Further proposals are not being set out for potential future scheme criteria at this time.

3. Do you foresee any issues with maintaining the current scheme eligibility criteria?

New entrants

The last new entrants window for facilities to join the scheme was open from December 2021 to 31 March 2022.

As the scheme will be extended, we will also allow a new period in which facilities not currently in the scheme but eligible under the scheme criteria will be able to apply to join. These applications will open on 1 May 2023 and close on 30 September 2023. The eligible process must have commenced at the facility before this closing date.

Facilities which make a successful application to join will be eligible to claim the reduced rates of CCL from 1 January 2024 or from the date where the operator provides their assent to the proposed agreement if later than 1 January 2024.

4. Do you agree with the dates proposed for new entrant applications?

Baseline for targets

The previous extension to add TP5 also updated the baseline year to be used for all participants to 2018 (or later in the case of new entrant greenfield facilities). We are proposing to continue to use 2018 as a baseline for the TP6 targets, meaning existing participants will not be required to provide any new baseline data. Rules for the baseline year to be used for greenfield facilities will remain the same.

5. Do you agree with the proposal to maintain 2018 as the baseline year?

Target setting

New targets were set when the scheme was last extended to add TP5. Initial proposals were made to sectors who then had an opportunity to make a counterproposal to be considered.

As we propose to set TP6 with the same baseline year as TP5 and given that the actual performance data for TP5 will be available from 1 May 2023, our initial proposal for a TP6 target will consider the performance improvement that has been achieved in TP5 and whether that trajectory may be maintained or exceeded.

Final targets will be agreed through bilateral negotiation with sector associations, and we expect to have these in place by November 2023. After TP5 reporting is complete (1 May 2023), we will consider the performance for each sector against their TP5 targets and will confirm a target proposal by June 2023. The basis for the target proposal will be explained to sectors to ensure this is transparent. Sector associations will then have time to consider this offer and will be asked to confirm to the Government by a set deadline whether they intend to accept this target. If they do not accept the target, they will be asked to provide an evidenced counter proposal.

We (Department for Energy Security & Net Zero) will write to sector associations shortly after publication of this consultation with some additional details for the target setting and counter proposal process so they can begin preparations should they expect to do this.

Sectoral umbrella agreements including the final agreed target levels will be published after those agreements have been assented. Actual performance against those targets will be published by the Environment Agency as part of a biennial report in 2025[14].

[14] See here for previous Climate Change Agreements biennial reports from the Environment Agency: https://www.gov.uk/government/publications/climate-change-agreements-cca-biennial-report

When the scheme was extended in 2020, surplus which was accumulated from TP1-4 was not carried forward and so could not be used to meet any underperformance against TP5 targets. This was in part due to the fact that the targets for TP5 were newly negotiated and only for a single target period. As we are doing the same for TP6 and with a proposal that actual performance for TP5 is used to inform those targets, we are again proposing that surplus from previous targets will not be carried forward to be used against any TP6 underperformance for a TU. TUs which have overperformed against TP5 targets will have seen a benefit in reduced energy costs and maintaining this performance should also help them achieve the new, one-year, TP6 target period.

In addition, an amendment to the technical annex to scheme agreements[15] will be made to account for operators with absolute target type and how we will deal with Rule 6.4 of the agreements[16] on the reduction in throughput, given that performance data for TP6 will only be reported for a single year. This rule currently says:

> "When an Operator has made a notification that throughput has decreased during a Target Period by more than 10% from 2 times the throughput in the base year, the Administrator may adjust the previous target using either method 1 or method 2 below."

For TP6 only, we will amend this this to:

> "When an Operator has made a notification that throughput has decreased during a Target Period by more than 10% of the throughput in the base year, the Administrator may adjust the previous target using either method 1 or method 2 below."

The adjustment methods are set out in the technical annex and we do not currently intend to make amendments to these.

6. Do you agree with process as set out for agreeing sectoral targets?

7. Do you agree with the proposal that surplus from previous Target Periods should not be brought forward for use in TP6?

8. Do you agree with the proposed amendment to Rule 6.4 to account for operators with absolute targets?

Reporting requirements

In our previous consultation, we discussed the mandatory disclosure to the scheme administrator of action taken during the Target Period to improve energy efficiency and decarbonisation, to understand how participants are going further than business as usual as a result of participation in the scheme.

We are proposing to introduce this change into the scheme extension and require reports to the scheme administrator alongside TP6 reporting by 1 May 2025. Operators are already required to keep "records of energy saving actions and measures implemented during each

[15] https://www.gov.uk/government/publications/climate-change-agreements-technical-guidance
[16] https://www.gov.uk/government/publications/climate-change-agreements-scheme-revised-templates-for-umbrella-and-underlying-agreements

Target Period" under rule 14.2.2 of the underlying agreements[17] - so participants should be collating and retaining this information already. Some participants will also be collecting and reporting this information to comply with Streamlined Energy and Carbon Reporting (SECR) requirements to disclose information on energy efficiency actions taken in their annual reports. We believe that this disclosure by the TP6 reporting deadline of 1 May 2025 gives participants a significant lead time to be ready to report on this information to the scheme administrator.

We intend to develop a standardised template to be completed by all participants so that this information is collated in a consistent and digital way to enable us to aggregate and analyse the reports. We expect to produce sector-level reports, using TU reports in aggregate only as previously done with the scheme biennial reports and with consideration for commercial confidentiality, which will be shared and disseminated via sector associations. This would improve awareness among participants of best practice in the sector.

We are also proposing to require reporting of information on energy efficiency and decarbonisation potential at a facility, rather than just the actions which have already been completed. We expect this would help businesses to formally assess investment opportunities, share insights within sectors and to help assess how improvements can be made at least cost. This would also be valuable to the Government in assessing the level of support to offer through the scheme in the light of the known improvements that could be delivered in a future CCA scheme. Some participants will already be undertaking energy audits in 2023 as required by the Energy Savings Opportunity Scheme (ESOS). Information from those audits could be used for this reporting requirement, and this may also be an opportunity for the experience developed through that scheme to be spread to CCA participants that are not currently within scope of ESOS. This proposal could also build on the methods for the target setting work discussed later in this consultation for a potential longer term CCA scheme.

9. Do you agree with the proposal to introduce mandatory reporting to the Environment Agency of action taken in Target Period 6 by 1 May 2025?

10. What are your views on extending this reporting to include provision of further evidence of energy efficiency and decarbonisation potential?

Buy-out price

When the scheme was last extended, the buy-out price was updated to reflect the increased value of the reduced rates of CCL the scheme offers. This was to help maintain the buy-out price as an effective mechanism for encouraging meeting targets through actual improvements in performance.

When considering the value of the reduced rates of CCL per tCO2e of underperformance, as calculated using CCA scheme emissions factors, this would be worth an estimated £13.70/tCO2e for electricity and £37.25 /tCO2e for gas using 2024/25 CCL rates[18].

[17] An agreement between the operator of a target unit and the Scheme Administrator that governs the obligations of the Administrator and the target unit (and its constituent eligible facilities) within the CCA scheme https://www.gov.uk/government/publications/climate-change-agreements-scheme-revised-templates-for-umbrella-and-underlying-agreements

[18] Converted using published Climate Change Levy reduced rates for 2024/25 and scheme emissions factors used to convert underperformance to tCO2e for the purpose of calculating buy-out and surplus (0.521 kgCO2e/kWh for electricity and 0.185 kgCO2e/kWh for gas)

As we did with the previous scheme extension, we are proposing to maintain a link between the buy-out price and the calculated value of the reduced rates of CCL per tCO2e of underperformance, (recognising that CCA targets are based on overall energy use and not specific to any energy type) and therefore increasing the buy-out price from the £18/tCO2e for TP5 to £25/tCO2e for TP6. We believe that this is justified to ensure buy-out remains a suitable disincentive for operators to achieve recertification without implementing energy efficiency measures whilst still ensuring that those who have relatively low levels of underperformance maintain a net benefit when considering the reduced rates of CCL that can be received.

11. Do you agree with the proposal to increase the buy-out price to £25/tCO2e?

Financial penalty price

We are proposing to make several changes with regards to financial penalties.

Currently there is a £250 minimum penalty that may be imposed where there is a failure by an operator to provide information or if that information is inaccurate under several of the scheme regulations, or if they fail to make any other notification required under the terms of an underlying agreement. This minimum value has not increased since the beginning of the current scheme. To help ensure that this minimum penalty remains a deterrent, we are proposing to increase this to £500.

12. Do you agree with the proposal to increase the minimum financial penalty from £250 to £500?

Where penalties are appropriate as a result of an operator being found to have provided inaccurate Target Period data for a TU, the size of the penalty is based on the magnitude of the inaccuracy.

Currently, the size of the penalty will be the greater of £250 or an amount calculated based on £18/tCO2e for the difference between the actual emissions and the reported emissions for the Target Period.

As we are proposing an increased buy-out price for TP6, the penalty for inaccurate data in relation to baselines or reporting for TP6, the penalty will be the greater of £500 or £25/tCO2e in line with the section on buy-out price above.

The calculation for other penalties is proposed to remain unchanged.

13. Do you agree with the proposal to increase the financial penalty price for providing inaccurate Target Period data in line with the buy-out cost per tCO2e for TP6?

The current scheme legislation does not allow the scheme administrator any discretion in regard to financial penalties. We are proposing amendments to the ‘Climate Change Agreements (Administration) Regulations 2012’ to provide the Environment Agency with discretion to waive or to impose a lower financial penalty where they consider it appropriate. We intend to make amendments to ensure the publication process in respect of penalties is set out in the CCA legislation. The intention is for the scheme administrator to continue publishing penalties however to make this process more transparent it will be an obligation provided for in the regulations.

14. **Do you agree with giving the scheme administrator discretion to waive or reduce penalty amount when considered appropriate?**

15. **In which situations do you believe it would be appropriate for a penalty to be waived or reduced?**

Administrative/Rule changes

The Government is therefore not proposing to implement any substantive administrative changes for the extension (TP6) beyond those set out above. More substantive reforms are under consideration for any future scheme as set out in the second part of this consultation.

16. **Do you agree with the proposal to maintain scheme rules for the purpose of this extension?**

17. **Beyond the proposals listed above, are there any other reforms / changes you would recommend for this extension?**

Next steps and milestones for target setting and variations to agreements

Below is an indicative view of next steps and timing following the launch of this consultation. It is subject to the outcome of this consultation.

Action	Date
Target setting process letters sent to sector associations	March 2023
Applications for TP6 new entrants open	1 May 2023
Consultation closed	10 May 2023
Government response published	July 2023
Government to send letters to sector associations confirming target offer	June 2023
Deadline for sector associations to provide evidenced target counter proposal	31 July 2023
Deadline for new entrants to make applications	30 September 2023
Department for Energy Security & Net Zero issue final target offers to sectors & instruct the Environment Agency to vary sector umbrella agreements	October 2023
Sector associations distribute targets amongst participants for agreement with the Environment Agency	October – December 2023

Amendments to CCA legislation to be in force by	30 November 2023[19]
New umbrella agreements issued and assented	December 2023
New/varied underlying agreements issued	December 2023

18. Do you agree with the proposed timeline for the target setting and agreement variation process?

19. How would the proposed timeline affect you and/or businesses within your sector?

[19] Expected timeline (and subject to parliamentary timing) with a view to have implementing legislation in force prior to the start of TP6 (1 January 2024).

Proposals for any potential future CCA scheme

In our previous consultation[20] we set out key areas where we are considering reform for a potential future CCA scheme. We are grateful to all respondents for the feedback received to this consultation. While at this stage we are moving forward with an extension to the existing CCA scheme, we will continue progressing these proposals ahead of any final decision on whether to take forward a future scheme.

We want to take this opportunity to set out some further developed proposals we have for reforms under a potential new CCA scheme, and would welcome input from stakeholders so that we can continue to develop these alongside the implementation of the extension. Further consultation (e.g. on scheme length, eligibility and detailed scheme design) would be undertaken in the event of a new CCA scheme being confirmed.

In particular, we wish to focus on the areas of target setting, reporting and how performance against targets should be measured to further enhance what a CCA scheme could deliver in the future. Decisions on CCA policy beyond the current two-year extension, including whether to pursue any future scheme, will be taken in context of wider developments in Government policies, including energy efficiency.

Scheme targets

Process for setting targets

One of the key recommendations from the scheme evaluation[21] was to have more consistency in the stringency of targets, as the scheme was found to have greater influence on energy efficiency for sectors with more stringent targets. As such, for any future scheme we would put in place processes and reporting mechanisms which ensure that the targets for the scheme would be set with stringency in mind, and with consideration for the significant overall value to businesses that the CCA scheme represents. There is a challenging pathway to net zero with industry having a significant role to play in how we reach it, and we must ensure that the CCA targets will push industry to meet that challenge. Key to this will be how we go about setting targets for the scheme.

In previous target negotiations, Government has first established a proposed target for each sector based on relevant existing evidence and overarching strategic aims, with sector associations then able to make a counter proposal using a standardised counter proposal template. This has not included the assessment of facility level potential to understand both the improvements already made and the overall potential for energy efficiency and decarbonisation.

We believe that incorporating more facility level evidence would strengthen the target setting process, and therefore for a new scheme we would seek to undertake a process of gathering data at this level to understand the potential for both energy efficiency and measures that

[20] ‘Climate Change Agreements (CCAs): proposals for a future scheme’ https://www.gov.uk/government/consultations/climate-change-agreements-ccas-proposals-for-a-future-scheme
[21] https://www.gov.uk/government/publications/second-climate-change-agreements-scheme-evaluation

provide low-carbon electricity and/or heat on site. We would also want to collect evidence on the relationship between energy consumption and production at a site, as this would not only be relevant for target setting but also how we propose to monitor targets going forward.

As this would be based on facility level data, a sampling approach would be agreed with sectors so we can ensure that a sufficiently representative sample of facilities complete this exercise so that a suitable sector level target can be proposed.

As with previous target setting exercises, sectors would have the opportunity to challenge the target that is proposed, but it is hoped that this fully transparent and ground up approach will mean sectors agree more readily to what is put forward.

20. Do you agree with the proposed approach of collecting facility level data to establish targets for any potential future scheme?

21. What else should be considered in setting targets for any potential future scheme?

In our previous consultation we set out that we aim to continue focusing on driving energy efficiency. Views from respondents were mixed with some agreeing with a focus on energy efficiency, others believing the scheme should allow a mix of carbon and energy targets, and a few arguing that many participants will have exhausted much of the energy efficiency potential and that switching to carbon targets would be better aligned with reaching net zero.

We remain of the view that the scheme should continue to primarily target improvements to energy efficiency, given energy efficiency's significant and continued contribution to the overall action required to decarbonise, as well as reducing the cost of deep decarbonisation. However, through the facility level evidence target setting process we have set out, we would also look at the potential for decarbonisation measures such as those that provide low-carbon electricity and/or heat to reduce the carbon emissions of a site and if these may be appropriately incentivised by carbon targets. This would also consider the extent to which other support measures already in place that may be more suitable in driving decarbonisation e.g. Contracts for Difference and the Carbon Capture and Storage Infrastructure Fund.

Through an evidence-based target setting process we would agree suitable targets so that the final target is one which is appropriate and achievable for the sector, would lead to greater efficiencies and would deliver maximum effectiveness of the scheme.

22. Do you agree that targets should be primarily focused on the implementation of cost-effective energy efficiency improvements, and that the target setting exercise is the best way to determine where carbon targets would be more appropriate?

Reporting & performance assessment

Facility level reporting and targets

Currently multiple facilities operated by a business can be grouped together and a target applies to all. Applications to join the CCA scheme are at Facility level, and then Operators are allowed to combine Facilities together into a TU. In doing so, there is no requirement for each individual Facility to report its performance. Data would still need to be gathered by Operators and Sector Associations at Facility level in order to report at TU level.

Of the 3,512 TUs currently included in the CCA scheme, 421 (~12%) contain more than one Facility. These TUs (known as bubbled TUs) contain 6,037 (66%) of the 9,128 facilities currently included in the scheme. TUs with very large numbers of facilities tend to be in the supermarket and craft baking sectors.

While the option to combine facilities into a single TU can be beneficial to businesses in some ways, in practice TU reporting creates significantly more administration:

- For Sector Associations in combining Facility level data to submit reports at TU level.
- For the Department for Energy Security & Net Zero and the Environment Agency in establishing various complex rules to address TU reporting and where the makeup of the TU can change over time.
- For Operators in working out which Facilities to group together and appreciating the implications of doing so.
- For Operators in working out the relative performance of their Facilities – understanding which had performed best and which needed more improvement investment.

In consideration of a potential new scheme, we are proposing the removal of the ability to combine Facilities into a single TU, and instead target performance would be reported and assessed at a Facility level.

Moving to Facility level reporting would remove the following complex rules/requirements currently in the scheme:

- Rationalisation rules.
- Stringency Test.
- Including Facilities that have different Base Years in a TU.
- Revising a target when including/excluding a new Facility in a TU.
- Including greenfield Facilities in a TU.
- Conditions for including/excluding Facilities in a TU.
- Types of variations for Facilities joining/leaving a TU.

It would also significantly simplify:

- Treatment of data errors and secondary reporting.
- Cumulative correction of data over more than one previous Target Period.

Developments would be made to the CCA register to enable bulk uploading of the reports in recognition of the fact that more individual reports will be required from Operators/Sector Associations.

23. Do you agree with moving to Facility level reporting and performance measurement?

24. What do you think the impact of this change would be for your sector?

Target types & measuring performance

In our previous consultation we set out a view on the types of targets to be used and a move to universal use of Novem/product relative targets. The intention of this was part of our proposed reforms to better ensure that the measured performance is reflective of action taken to improve energy efficiency and to mitigate the impact of other changes at a Facility which could be reflected in the reported data. In many cases, actual improvements in energy efficiency performance can be masked by other changes at a Facility, and this is something we would wish to rectify. In response to the proposal to change to mandatory Novem targets, some agreed with this, highlighting the benefit of allowing sites to better understand the effects of changing product mixes on their apparent performance. Some had concerns about this adding additional burden to the reporting process, including the need for additional submetering in some cases.

While we recognise the concern some respondents had about the additional burden of making Novem target types mandatory, we believe that this element of the proposed reform would be necessary to ensure that any potential future scheme operates effectively and that performance improvements are being monitored as accurately as possible.

We have considered the proposal to adopt mandatory Novem further, as well as other reforms outlined in this consultation, and we are proposing further changes to how performance would be monitored. We are considering the implementation of a unified target type which would replace all existing targets. This would be adapted from the Novem methodology, and considers the proportion of energy which is fixed (i.e. energy that must be consumed before any of the activity constituting the Facility's selected throughput is incurred) and energy which is variable (i.e. directly linked to production). It would also require, as the current Novem method does, reporting broken down by types of products at a Facility.

The current methodology, which consider absolute energy or carbon for absolute targets or energy in relation to throughput for relative targets, has the potential to obscure actual improvements made to energy/carbon efficiency as throughput and product mix at a Facility change. Further illustration of the effect that not considering fixed and variable energy can have on apparent performance as throughput changes can be found in Annex 1.

The proposed method is intended to give a more accurate view of performance and how this links to production, allowing better understanding of how a Facility is performing in terms of energy/carbon savings.

For each Facility, this would require an estimate of the Fixed Energy Consumption (FEC) and Variable Energy Consumption (VEC). There are various ways in which the FEC could be calculated for this purpose, including regression analysis or use of sub-meter and product run data. More detail on this is included in Annex 1.

For those familiar with the Novem method currently used in the scheme, the adaption required to the Novem method to account for FEC and VEC(s) is simply to include the FEC as a 'no production change' product in the Novem reporting template. We understand this may require some additional reporting, but ultimately we believe these are reforms which would not only significantly strengthen how performance is measured in a potential future scheme, improving the assessment of savings made in a Target Period, but also simplify the scheme rules by having only a single target type and target calculator. It should also force sites to examine their energy consumption in more detail, which is likely to lead to a better understanding of it and the identification of opportunities to improve efficiency.

25. Do you agree with the proposal to reform reporting as described above?

26. What would the impact of this change of reporting be for you and/or your sector (e.g. estimated operational/logistical costs or overarching impacts)?

Carbon Emissions Factors and Primary Electricity Factors

Carbon Emissions Factors

Currently the scheme has a locked set of emissions factors established at the start of the scheme[22]. An effect of this is that when carbon emissions are calculated for each TP, these do not use the current emissions factors for those years. This means that the emissions reported do not accurately reflect the actual emissions for the years in question, and that they do not align with those that would be recorded for other regulations or schemes. A number of responses to the previous consultation raised this issue and made the suggestion that emissions factors should be updated to better align CCAs with other schemes and reporting regulations.

We are proposing that for a new scheme the emissions factors would be updated during each TP, using the latest published emissions factors at that time.

This change will mean that where there are carbon targets in the scheme, the reported performance will change as a result of changing emissions factors over time. This would be factored into target setting using assumed trajectories for emissions.

27. Do you agree that carbon emissions factors should be updated to the currently available factors for each TP?

Primary Electricity Factors

The scheme operates on the basis of primary energy[23] rather than delivered energy.

For grid electricity consumed, this is currently multiplied by 2.6 to account for the primary fuel used to generate the electricity.

We are proposing that for the new scheme the grid electricity multiplication factor should be updated to account for greening of the grid and consideration should be given to reviewing and updating it for each Target Period.

28. Do you agree that the primary electricity factor for electricity should be updated for any potential new scheme?

Treatment of self-generated electricity (e.g. Photovoltaic (PV), wind or hydro)

In the current scheme, the carbon emissions factor and primary energy multiplication factor for self-generated electricity (e.g. PV, wind or hydro) has been fixed to match that for grid electricity. This decision was made to avoid double incentivisation with the Feed-In Tariff[24] and other renewable support schemes. While we want to continue to ensure that the scheme does not double incentivise with other policies in this space, we believe that the conversions made

[22] [Reference for current factors from Operations Manual]
[23] The primary fuel (or other primary energy source such as wind or solar energy) consumed in the process of generating and delivering to the point of consumption secondary forms of energy such as electricity, heat or mechanical power.
[24] https://www.ofgem.gov.uk/environmental-and-social-schemes/feed-tariffs-fit

should reflect the reality for those generation sources and to ensure the scheme better aligns with other reporting mechanisms. We are therefore proposing that the multiplication factor for self-generated electricity from PV, wind or hydro would be updated to 1.0, and the carbon emissions factor would be 0 tCO2e/kWh. Ensuring there is no double incentive with other renewable electricity generation scheme will be considered through the target setting process as well as our proposed reforms to reporting and performance measurement.

29. Do you agree that self-generated electricity should be accounted for as set out above?

Inclusion of UK Emissions Trading Scheme (UK ETS) energy in target energy

As part of our previous consultation, we asked respondents about synergies with other schemes/regulations. A few respondents raised that the interaction between the CCA scheme and the UK ETS should be considered. In addition, we have been looking at how the current interaction between the schemes affects how the current rules regarding UK ETS installations at CCA facilities affect the settings of targets and how actual performance against these is measured.

Under the first CCA scheme, a mechanism to address the double counting of surplus (or deficit) was established because companies could benefit (or be penalised) for a reduction (or increase) in respect of the same emissions in CCA and EU Emissions Trading System (as it was at the time). In both schemes, surplus could be traded. The mechanism adjusted the CCA target to cancel out the double counting of surplus (or deficit), in the case of surplus the CCA target was tightened and in the case of deficit the CCA target was slackened.

For the current CCA scheme, it was decided that energy under EU ETS would be excluded from the CCA scheme target energy, but still able to claim the reduced rates of CCL. This aimed in part to avoid the complexities of the double counting method used in the first scheme.

Exclusion of EU/UK ETS energy from the target energy in the current CCA scheme has resulted in significant complexities and distortions in the measurement of performance for Facilities in the UK ETS and particularly for Facilities shifting energy consumption into or out of the UK ETS. Excluding UK ETS energy from the target energy has resulted in some targets where the target energy which is not included in the UK ETS is minimal.

In the current CCA scheme, CCA surplus is tied to the Facility (or TU) that gained it and has no value other than to offset the same Facility (or TU) not meeting the target in a following Target Period – it cannot be traded – and so there is less concern about whether there is any double counting that needs to be addressed.

Companies must participate in the UK ETS if they meet the relevant criteria, so they must comply with its requirements - surplus carbon to trade or buying carbon depending on their position at the end of the year. CCA is voluntary but brings a significant benefit in terms of the CCL rebate on all leviable energy including UK ETS energy. CCA surplus is a secondary benefit and different from the UK ETS surplus because it cannot be traded and is based on a different price for carbon.

We are therefore considering that UK ETS energy should be included in the target energy for any potential future CCA scheme. In addition to the benefit of removing the complexities and distortions in the measurement of performance, this would remove the following rules/requirements to provide some simplification to scheme administration:

- Rules/requirements concerning changes to UK ETS status.
- The ‘Special Reporting Mechanism’ developed and introduced to account for circumstances where Combined Heat and Power (CHP) is used to supply a Facility covered by UK ETS and the consumption of CHP generated electricity could be exchanged with grid electricity consumption. The requirement to use this mechanism was not made mandatory and this has added to the distortions seen.

In summary, inclusion of UK ETS energy in the CCA Facility target would bring the following potential benefits:

- bring significant simplifications to the rules/requirements, including the target setting calculators and reporting templates.
- reduce the burden on stakeholders.
- reduced the potential for distorted surplus/buy-out results.
- improve the assessment of savings.
- attribute surplus and buy-out more fairly/equitably to Facilities.

30. Do you agree with the proposal to bring UK ETS energy into the target energy for any new scheme?

Annual Reporting

In the last consultation we asked if the reporting of energy and throughput data should be reported annually. Currently the reporting of this data is required at the end of a Target Period only. The aim of annual reporting would be to enhance data collection practices by operators, encouraging them to maintain awareness of progress against targets and also to afford an opportunity for the Environment Agency to provide an estimate of any potential costs in relation to underperformance against targets, giving businesses time to make enhancements to improve performance or to improve preparedness to pay these costs.

When proposed in our last consultation, a majority of respondents disagreed with adding annual reporting to the scheme, with most of the concern being the added level of burden for operators without a clear benefit. We note that some sectors are already collecting this data annually or even more frequently for a small number of sectors.

Having considered the feedback, we still believe that having some form of annual reporting alongside the main TP reporting would be beneficial, both for Government and scheme participants. We would propose to move forward with this for any future scheme where we expect that two-year Target Periods will be maintained. The annual reporting would take the same form as the reporting required at the end of a Target Period for measuring performance (not including the proposed additional reporting of action taken/potential for the scheme extension), however this would not be used to formally assess performance against targets. The interim reporting would be used to provide an estimate of the performance outcome at the end of a Target Period. This data would not be published.

While we are asking participants to report more frequently than the current scheme, this should not create a significant data collection burden, given this is data that would be collected for scheme reporting anyway and participants will benefit from estimates of performance giving them time to make improvements or to plan for any potential buy-outs.

Annual reporting would provide government with more frequent views of the performance of the scheme, and how well it is performing in line with expected target trajectories. The same reporting system used for TP reporting will be developed to also be used for this reporting, and we will work with participants to understand if there are any opportunities to align what is reported with data reported under other schemes in this space.

31. Do you have any further views on adding annual reporting beyond those provided in the last consultation under any potential future scheme?

Buy-out

Most respondents to the last consultation were happy with the buy-out mechanism in the scheme as a safety net for those who do not meet their targets to remain certified to receive the CCL reductions. We would intend to maintain this mechanism for any new scheme.

The influence of the buy-out mechanism in discouraging underperformance was noted in a few instances from the consultation responses while highlighting that a significant increase in rate could impact the number of participants joining the scheme.

In our previous consultation we set out a potential proposal to calculate this buy-out in energy terms. Feedback on this was mixed. A few saw a benefit in linking targets expressed in energy terms with a buy-out calculated in kWh and agreed with this approach, as long as conversion factors were set from the beginning. Some suggested it should remain calculated in carbon, arguing this is well understood as the mechanism from the current scheme and with their preference to move to more carbon targets.

Having considered the feedback, we propose that a future scheme should continue to use a calculated tCO2e figure to calculate buy-out and surplus, as has been done for the current scheme. The reason for this is that the current method is well understood and can operate for both energy and carbon targets.

32. Do you agree with maintaining the calculation for buy-out in carbon rather than energy?

One reason for exploring a change to a buy-out calculated in kWh was to make clearer the link between underperformance, the CCL reduction gained and the required buy-out. CCL is not a carbon price, but one levied on energy use. While the buy-out is set using a cost per tCO2e, this is not intended to be a carbon price equivalent to that used in other schemes.

While we are not setting out a specific methodology for calculating buy-out for a future scheme, we are seeking views on how this should be calculated going forward. While currently this is based on a fixed £/tCO2e value which is set through legislation, it may be possible for this to be calculated by a formula which would consider factors such as updated emissions factors, current CCL reduced rates and reported performance.

By making this a dynamic value with a set formula, this would provide a transparent method of calculating the buy-out price, and ensure that it maintains a value which can remain closely linked to the level of financial benefit received by remaining certified.

33. What are your views on how buy-out could be calculated for any potential future scheme?

34. Would you agree or disagree with this utilising a formula rather than a fixed value set out in legislation?

Surplus

In the last consultation, we did not propose any changes to the surplus mechanism and sought views from respondents on this. A majority of respondents were positive about the surplus mechanism and would like to see it continue in any future scheme.

The surplus mechanism would continue to provide benefits to those who overperform against targets. Any accumulated surplus could be used to offset underperformance in subsequent Target Periods. From the consultation responses it was evident that a surplus mechanism encourages performance and rewards where one has overperformed.

35. With consideration for the reforms outlined elsewhere in this consultation, do you have any comments on how surplus should operate for any potential future scheme?

Timing

As we are progressing with an extension to the existing scheme and not committing to what may follow the extension to this stage, we expect any reforms as set out above would, at the earliest, take effect for targets following the end of TP6 (31 December 2024), and with effect on certification for reduced rates of CCL from 1 April 2027. We expect to run a further consultation prior to the implementation of any future CCA policy.

36. Please provide any comments on the timing of any potential future scheme.

Next steps

This consultation will run for 8 weeks. The responses will be analysed, and a government response is expected to be published by July 2023.

Consultation questions

1. Do you foresee any impacts arising from this two-year extension?

2. Do you agree with the proposed dates for Target Period 6 and Certification Period 6?

3. Do you see any issues with maintaining the current scheme eligibility criteria?

4. Do you agree with the dates proposed for new entrant applications?

5. Do you agree with the proposal to maintain 2018 as the baseline year?

6. Do you agree with process as set out for agreeing sectoral targets?

7. Do you agree with the proposal that surplus from previous Target Periods should not be brought forward for use in TP6?

8. Do you agree with the proposed amendment to Rule 6.4 to account for operators with absolute targets?

9. Do you agree with the proposal to introduce mandatory reporting to the Environment Agency of action taken in Target Period 6 by 1 May 2025?

10. What are your views on extending this reporting to include provision of further evidence of energy efficiency and decarbonisation potential?

11. Do you agree with the proposal to increase the buy-out price to £25/tCO2e?

12. Do you agree with the proposal to increase the minimum financial penalty from £250 to £500?

13. Do you agree with the proposal to increase the financial penalty price for providing inaccurate Target Period data in line with the buy-out cost per tCO2e for TP6?

14. Do you agree with giving the scheme administrator discretion to waive or reduce penalty amount when considered appropriate?

15. In which situations do you believe it would be appropriate for a penalty to be waived or reduced?

16. Do you agree with the proposal to maintain scheme rules for the purpose of this extension?

17. Beyond the proposals listed above, are there any other reforms / changes you would recommend for this extension?

18. Do you agree with the proposed timeline for the target setting and agreement variation process?

19. How would the proposed timeline affect you and/or businesses within your sector?

20. Do you agree with the proposed approach of collecting facility level data to establish targets for a future scheme?

21. What else should be considered in setting targets for any potential future scheme?

22. Do you agree that targets should remain primarily focused on the implementation of cost-effective energy efficiency improvements, and that the target setting exercise is the best way to determine where carbon targets would be more appropriate?

23. Do you agree with moving to Facility level reporting and performance measurement?

24. What do you think the impact of this change would be for your sector?

25. Do you agree with the proposal to reform reporting as described above?

26. What would the impact of this change of reporting be for you and/or your sector (e.g. estimated operational/logistical costs or overarching impacts)?

27. Do you agree that carbon emissions factors should be updated to the currently available factors for each TP?

28. Do you agree that the primary electricity factor for electricity should be updated for a new scheme?

29. Do you agree that self-generated electricity should be accounted for as set out above?

30. Do you agree with the proposal to bring UK ETS energy into the target energy for any new scheme?

31. Do you have any further views on adding annual reporting beyond those provided in the last consultation?

32. Do you agree with maintaining the calculation for buy-out in carbon rather than energy?

33. What are your views on how buy-out could be calculated for any potential future scheme?

34. Would you agree or disagree with this utilising a formula rather than a fixed value set out in legislation?

35. With consideration for the reforms outlined elsewhere in this consultation, do you have any comments on how surplus should operate for a future scheme?

36. Please provide any comments on the timing of any potential future scheme.

Annex 1: The relationship between throughput and energy consumption

The relationship between energy consumption in a Facility can be very complex and difficult to determine. However, consideration of a simple case can be used to identify key elements of

the relationship that are most important to include in the measurement of performance improvement that is attributable to improved energy efficiency.

Figure 3 illustrates a typical relationship between energy consumption and throughput for a Facility producing a single consistent product. The relationship includes:

- Fixed energy consumption which is not a function of the Facility's production activity.
- Variable energy consumption which depends on production activity.

The viable range of production would depend on the processes and Facility capacity. The viable range may be small if for instance the production equipment is designed to run continuously at an optimum rate, or the viable range may be significant if for instance production is batched depending on orders placed. The slope of the curve may vary for various reasons, but a typical trend may be that energy efficiency improves up to the optimum production rate and then declines again. Non-viable low production would be the range over which it is not economically worth running the production equipment, not just in terms of energy consumption but other factors such as staff costs.

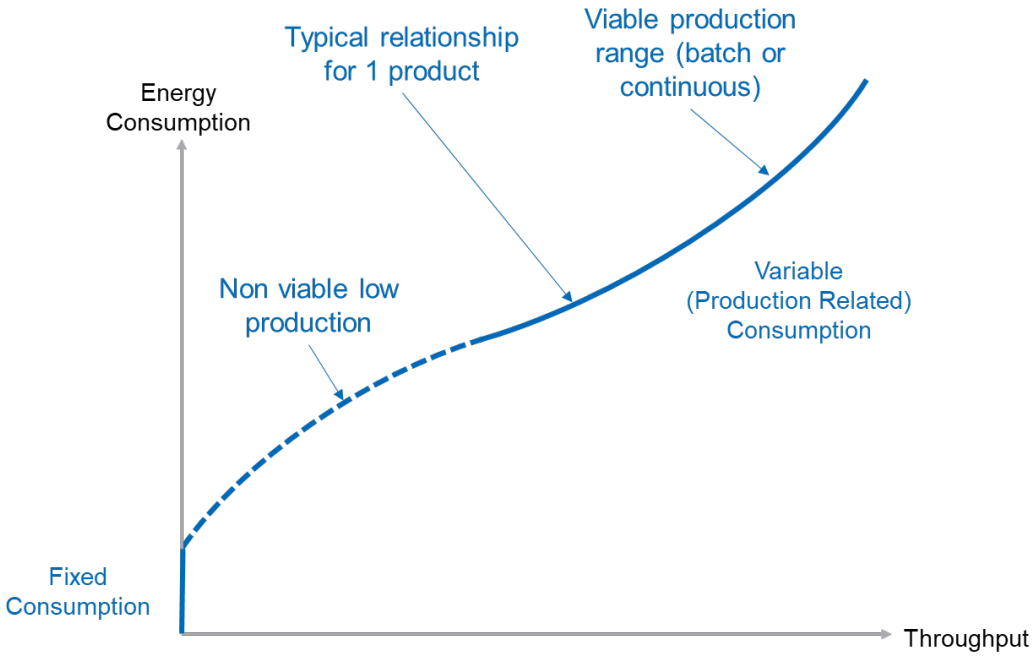


Figure 3 Typical relationship between energy consumption and throughput

In practice establishing such a detailed relationship over a range of production may be impractical and could be subject to variability depending on many factors: the equipment condition, staff experience, environmental conditions etc. However, the baseline relationship between energy consumption and throughput can reasonably be described by the amount of fixed energy consumption and the slope of the curve around the optimum production rate. Figure 4 shows this baseline relationship as the Fixed Energy Consumption (FEC) + the Baseline Variable Energy Consumption (VEC).

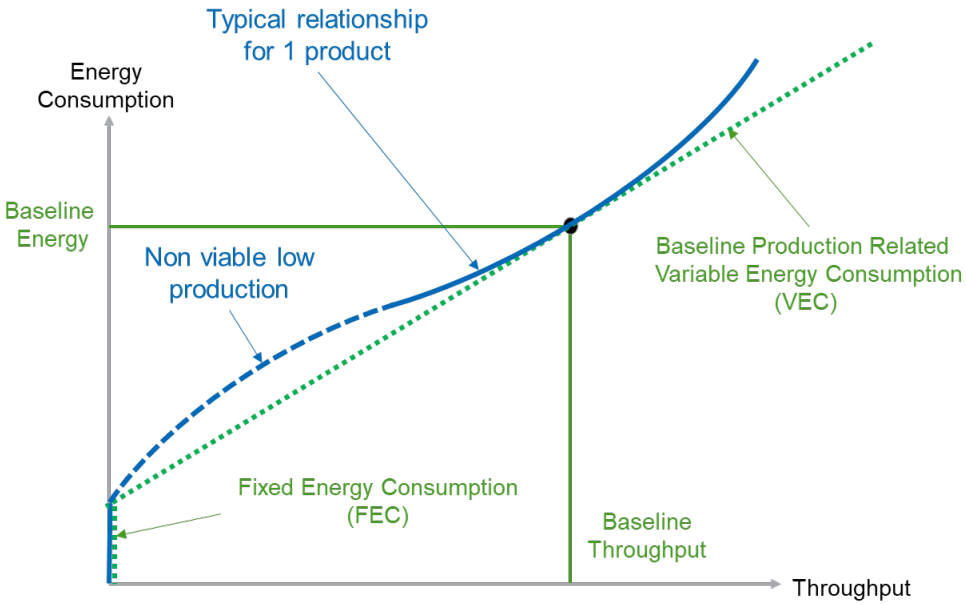


Figure 4 Baseline relationship between energy consumption and throughput

The difference between this baseline relationship and the actual relationship is due the effect of productivity on energy efficiency. Figure 5 illustrates that if productivity was optimal for the baseline and productivity subsequently dropped or increased in a Target Period then the Target Period VEC may increase indicating a reduction in energy efficiency. Essentially a change in performance between the baseline and a subsequent Target Period may include a contribution arising from a change in productivity. This seems reasonable – effectively it is incentivising optimum utilisation of Facilities as a contribution to energy efficiency improvement. If the baseline is based on low or high productivity, then an apparent energy efficiency improvement in a Target Period could be gained simply by shifting to optimum production but again this seems like a reasonable improvement to incentivise.

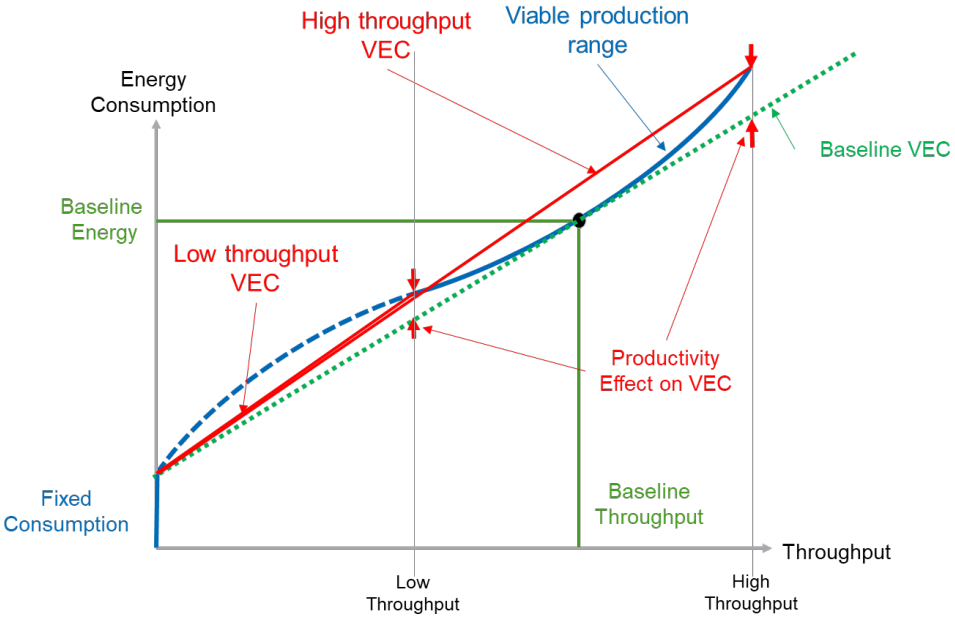


Figure 5 Productivity effect on performance

The current CCA scheme does not describe the baseline relationship between energy consumption and throughput in terms of Fixed Energy Consumption and throughput related Variable Energy Consumption. It measures performance in terms of Specific Energy

Consumption alone (Relative energy targeting) or in terms of Total Energy Consumption alone (Absolute energy targeting). This introduces a significant mathematical error in the measurement of performance as demonstrated below.

Fixed Energy Effect (Facilities with Relative Targets)

Figure 6 compares the measurement of performance using FEC and VEC against the measurement of performance using Specific Energy Consumption (SEC).

- If throughput in a Target Period increases relative to the baseline SEC an apparent 'mathematical' performance improvement is generated.
- If throughput in a Target Period decreases relative to the baseline SEC an apparent 'mathematical' performance decline is generated.

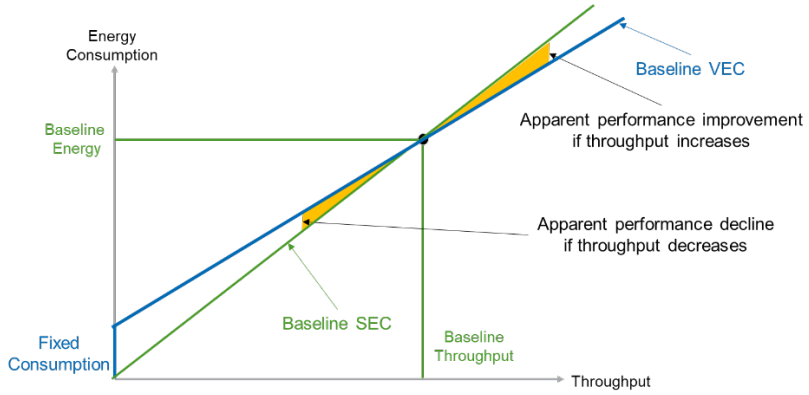
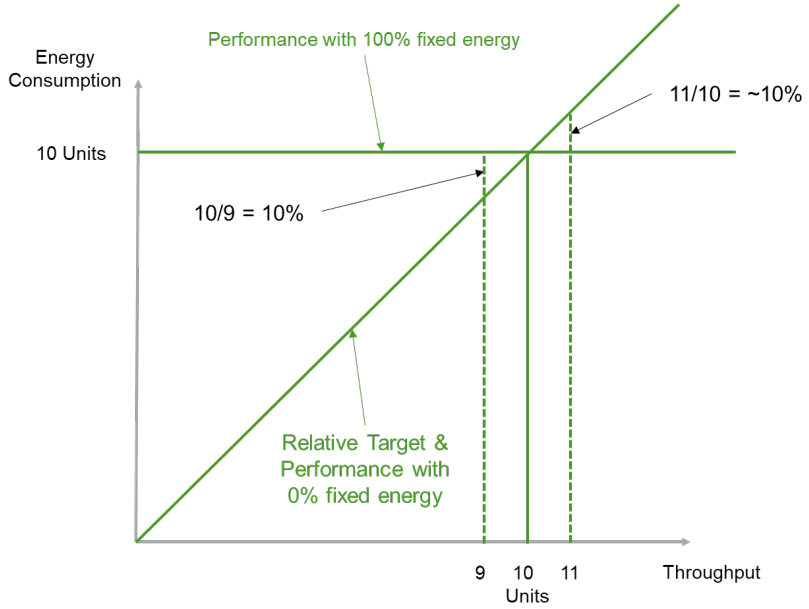


Figure 6 The effect of fixed energy consumption for a Relative Energy Target

This mathematical effect occurs irrespective of whether energy efficiency measures have been implemented and it can be significant compared with the performance improvement target. Figure 7 illustrates the effect if a Facility assigned a Relative Target has 0% or 100% Fixed Energy Consumption and there is a change in Target Period throughput of 90% or 110% relative to the Base Year.



Fixed Energy	Relative target
0% (Relative Performance)	90% Throughput 0% Apparent Improvement in Performance
	100% Throughput 0% Apparent Improvement in Performance
100% (Absolute Performance)	90% Throughput 10/9 = 10% Apparent Decline in Performance
	110% Throughput 10/11 = ~10% Apparent Improvement in performance

Figure 7 Illustration of effect for Facility with a Relative Target

It would be an extreme case if a Facility with 100% Fixed Energy Consumption was given a Relative Target. However, the apparent performance improvement if there is a change in Target Period throughput of 90% or 110% relative to the Base Year can be calculated for small percentages of Fixed Energy Consumption. The results are:

Fixed energy %	Apparent performance improvement at 90% of Base Year Throughput	Apparent performance improvement at 110% of Base Year Throughput
5%	-0.55%	0.46%
10%	-1.10%	0.92%
20%	-2.17%	1.85%

The significance of this effect depends on the Sector Target. Some Sectors have had a fairly small % target over 4 Target Periods, for instance around 5% improvement and so the effect of fixed energy consumption can easily be significant compared with the target improvement in one Target Period.

Since this mathematical effect can overwhelm performance improvement that can be attributed to energy efficiency measures we would be minded to remove it in any new potential CCA scheme by measuring performance in terms of FEC and VEC.

Fixed Energy Effect (Facilities with Absolute Targets)

Essentially a similar mathematical effect applies for Facilities with an Absolute Target where performance is measured relative to the baseline Total Energy Consumption (TEC).

Figure 6 compares the measurement of performance using FEC and VEC against the measurement of performance using the Total Energy Consumption (TEC).

If throughput in a Target Period decreases relative to the baseline TEC an apparent 'mathematical' performance improvement is generated.
If throughput in a Target Period increases relative to the baseline TEC an apparent 'mathematical' performance decline is generated.

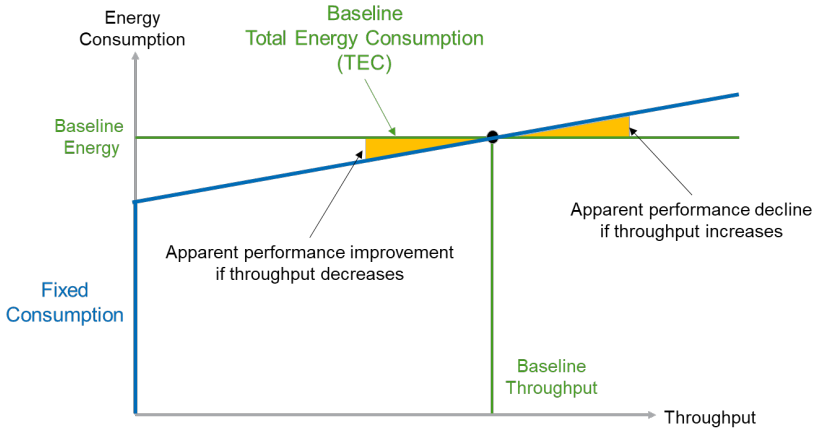
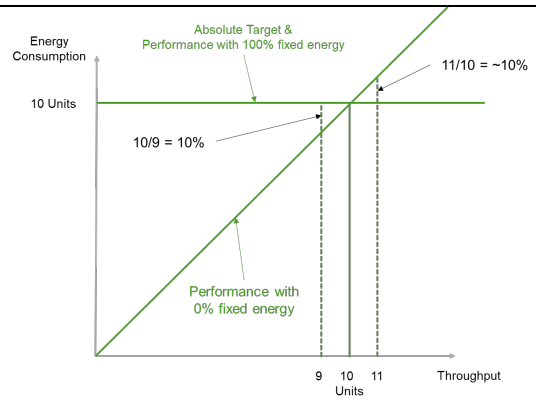


Figure 6 The effect of throughput for an Absolute Energy Target

Measuring performance relative to the Base Year energy consumption (or carbon emissions) is only suitable if there is a very high proportion of fixed energy (for instance in a Facility that must run major plant continuously) or if throughput is very stable. The apparent improvement in performance with decreased throughput does not represent an improvement in energy efficiency and is not economically sensible as the fixed energy is being consumed for less purpose. The CCA scheme limits the reduction in throughput to 10% before an absolute target is adjusted via a 'taper' to reset it to a relative target.

This mathematical effect occurs irrespective of whether energy efficiency measures have been implemented and it can be significant compared with the performance improvement target. Figure 7 illustrates the effect if a Facility assigned an Absolute Target has 0% or 100% Fixed Energy Consumption and there is a change in Target Period throughput of 90% or 110% relative to the Base Year.



Fixed Energy	Absolute Target
0% (Relative Performance)	90% Throughput 9/10 = 10% Apparent Improvement in performance
	110% Throughput 11/10 = ~10% Apparent Decline in Performance
100% (Absolute Performance)	90% Throughput 0% Apparent Improvement in Performance
	110% Throughput 0% Apparent Improvement in Performance

Figure 7 Illustration of effect for Facility with an Absolute Target

The apparent performance improvement if there is a change in Target Period throughput of 90% or 110% relative to the Base Year can be calculated for small percentages of Fixed Energy Consumption. The results are:

Fixed energy %	Apparent performance improvement at 90% of Base Year Throughput	Apparent performance improvement at 110% of Base Year Throughput
80%	2.00%	-2.00%

Fixed Energy Effect (Facilities with Novem Targets)

Facilities that use the Novem method currently experience a similar mathematical error in performance measurement as they use SECs. The error is however more complex and depends on the change in throughput for each of the products.

Currently when there is more than one product each will have its own SEC which has to incorporate a proportion of the Fixed Energy Consumption to satisfy the rule that SEC1 x Production1 + SEC2 x Production2 +etc = Total Energy Consumption.

When a new Novem product is introduced at a Facility an element of fixed energy consumption must be assigned to it. This is to account for the situation where the new product replaces an existing one. If an existing product is no longer produced the fixed energy consumption assigned to it effectively disappears. This assignment of fixed energy consumption has always been a fudge in the use of Novem which can mean it is not possible to satisfy the rule that SEC1 x Production1 + SEC2 x Production2 +etc = Total Energy Consumption. The effect of fixed energy consumption cannot be completely ignored and yet the way it has been handled has not been mathematically robust.

Adapting the Novem method

A method for measuring performance using both FEC and VEC is needed to remove the mathematical error that the current assessment in terms of SEC or TEC causes. This method also needs to be able to handle more complex relationships between energy consumption and throughput that arise when a Facility produces products with significantly different VECs.

The Novem method can easily be adapted to use FEC and VECs and in fact the inclusion of FEC will remove the issues caused by assigning fixed energy consumption to SECs.

This adaptation requires the estimation of baseline FEC and the VECs for Facilities. These can be determined by slightly modifying the methods established for determining baseline SECs:

- Sub-meter and product run data:

  This can give the true variable energy consumption for a product as it may exclude fixed energy consumed at the Facility. Under the current scheme the fixed energy must be apportioned to the products to try to meet the requirement that the SEC1 x Production1 + SEC2 x Production2 +… = Total Energy Consumption.

- A multi-regression analysis of monthly/weekly/ daily Total Energy Consumption against production data.

  This has been used to determine the product SECs, ‘automatically’ assigning fixed energy to each product. However, it may be adapted to determine and deduct the Fixed Energy Consumption from the total energy (Y axis intercept) and assess the Variable Energy Consumption for each product.

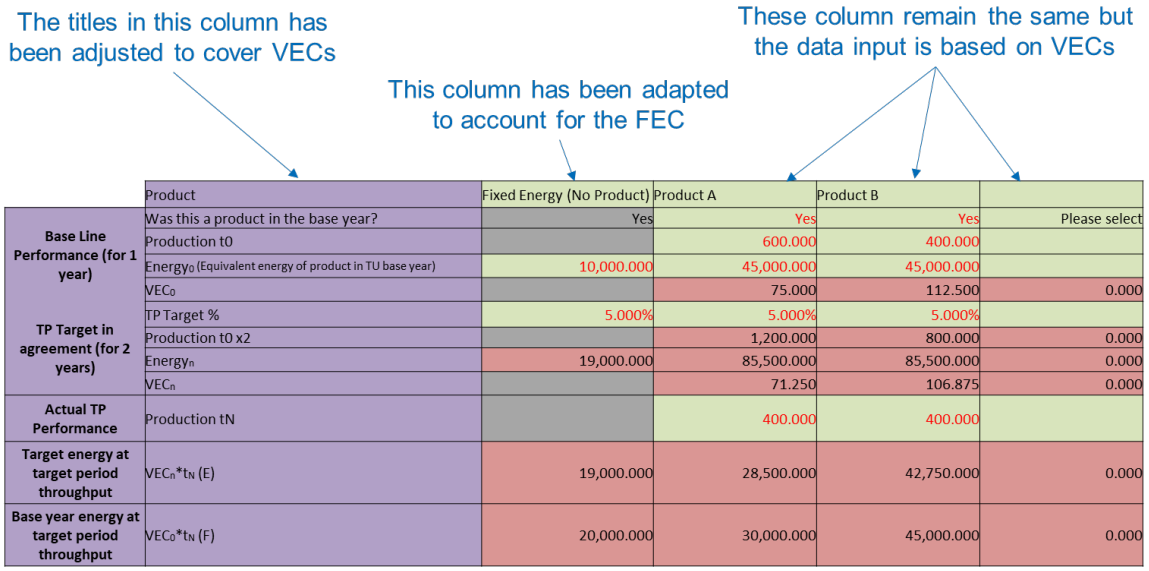
In addition, the Fixed Energy Consumption may be determined:

- Using meter readings taken during periods when the Facility is ready to produce but production lines have not started.

- Using an estimation method not unlike the way ineligible energy is estimated in a 70/30 assessment.

- Using bespoke analysis for more complex Facilities that are supported by an energy manager and particularly if they are complying with ISO 50001, for which a key element is monitoring and measuring.

The adaption required to the Novem method to account for FEC and VEC(s) is simply to include the FEC as a 'no production change' product in the Novem reporting template. Figure 8 shows this adaptation with some example data.



	Product	Fixed Energy (No Product)	Product A	Product B	
Base Line Performance (for 1 year)	Was this a product in the base year?	Yes	Yes	Yes	Please select
	Production t0		600.000	400.000	
	$Energy_0$ (Equivalent energy of product in TU base year)	10,000.000	45,000.000	45,000.000	
	VEC_0		75.000	112.500	0.000
TP Target in agreement (for 2 years)	TP Target %	5.000%	5.000%	5.000%	
	Production t0 x2		1,200.000	800.000	0.000
	$Energy_n$	19,000.000	85,500.000	85,500.000	0.000
	VEC_n		71.250	106.875	0.000
Actual TP Performance	Production tN		400.000	400.000	
Target energy at target period throughput	$VEC_n * t_N$ (E)	19,000.000	28,500.000	42,750.000	0.000
Base year energy at target period throughput	$VEC_0 * t_N$ (F)	20,000.000	30,000.000	45,000.000	0.000

Figure 8 Adapted Novem Method for measurement performance using FEC and VEC(s).

The adaptation works with one VEC or multiple VECs, however, the Fixed Energy Consumption (No Product) column and a VEC column will always be needed. This means all Facilities would need to use the adapted Novem method at least in its simplest form for FEC and a single VEC. However, a very significant benefit of moving to this approach is that Novem would be the only Target type needed in the new scheme. The method works the same and gives exactly the same results as for a Relative Target type if FEC is zero (FEC 0%) and gives exactly the same results as for an Absolute Target type if FEC is equivalent to the TEC (FEC 100%). If a new product needs to be introduced the existing functionality in the reporting template will work and because it would have a VEC there would be no issue around reapportionment of the FEC. It will always be possible to satisfy the rule FEC+ VEC1 x Production1 + VEC2 x Production2 +etc = Total Energy Consumption.

In the current CCA scheme Novem for multiple products has not been widely used as it has been thought too complex. However, its use has been encouraged and would achieve fairer results for many Facilities where the products produced have a range of energy intensity. Various bespoke 'historical' throughput accounting methods have been used across several Sectors and it would be much better to replace these with Novem VECs.

The current Novem reporting template can be modified to make its use much simpler. Furthermore, it may be the only reporting template that would be needed, the separate templates for Relative and Absolute Target types would not be needed as these target types would not be needed.

This consultation is available from: www.gov.uk/government/consultations/climate-change-agreements-consultation-on-extension-and-future-scheme-2023

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