

## Climate Change Agreement for FDF

# Note 11: NOVEM targets

Updated July 2017

### 1. Introduction

A number of companies are finding it hard to meet their CCA targets because the way in which they use energy now has changed significantly compared to the base year.

It *may* be possible to change the way in which your CCA targets are set and your performance is measured to reflect the change in processes and products. The methodology is called a ‘**NOVEM**’ adjustment.

#### 1.1 How the NOVEM works

To illustrate how NOVEM works, we shall use an example where a site makes frozen and chilled ready meals.

- In the base year the site made more chilled meals than frozen, but recently that has changed and they now make more frozen than chilled.
- The overall output from the site has stayed the same but the overall energy use has increased due to the higher energy requirements of the frozen products.
- The site is forecast to fail at the next target period, as illustrated below.

	Base Year			Target Period		
	Production (tonnes)	Energy use (kWh)	Energy to make one tonne of product (kWh/tonne)	Production (tonnes)	Energy use (kWh)	Energy to make one tonne of product (kWh/tonne)
Chilled	60	600	10	50	n/a	n/a
Frozen	40	800	20	80	n/a	n/a
Total Site	100	1,400	14.00	130	1,850	14.23
	CCA Targets for Target Period : 14.00 less 5% = 13.30 kWh/tonne			Performance for Target Period : 14.23 kWh/tonne, therefore FAIL		

The NOVEM allows for the change in volumes of the different products to be recognised.

We calculate what the energy used by the site would have been in the base year if the site had been making the same volume of products as seen in the target period. This allows for a like for like comparison of energy use to be made because the same production levels apply. This is illustrated in the table overleaf.

	Energy to make one tonne of product IN THE BASE YEAR (kWh/tonne)	Target Period production levels (tonnes)	Energy that would have been used in the BASE YEAR at TP production levels (kWh)	Energy that has been used in Target Period (kWh)
Chilled	10	50	500	n/a
Frozen	20	80	1,600	n/a
Total Site	n/a	n/a	2,100	1,850
	CCA Targets for Target Period : 2,100 less 5% = 1,995 kWh/tonne			1,850 is less than 1,995 therefore PASS

The NOVEM adjustment calculates the energy used to make the same volume and mix of products in the base year and the target period. The percentage saving target is applied to the revised base year value and then compared against the actual use during the target period. In the case above, the site has passed because the NOVEM proves it is using less energy to make that mix of products than it would have done in the base year.

For the NOVEM to work, a company must be able to identify:

1. suitable ‘product groups’ and their base year and target period production volumes,
2. the base year energy consumption of each product group.

More information about these two points are provided in this guidance note.

Following on from bullets 1 and 2 immediately above and using the previous example, the table below illustrates what additional information you would need to identify and submit to change to a NOVEM target.

Already submitted to the CCA
  Need to submit once when apply for a NOVEM target
  Need to submit at each target period

	Base Year			Target Period		
	Production (tonnes)	Energy use (kWh)	Energy to make one tonne of product (kWh/tonne)	Production (tonnes)	Energy use (kWh)	Energy to make one tonne of product (kWh/tonne)
Chilled	60	600	10	50	n/a	n/a
Frozen	40	800	20	80	n/a	n/a
Total Site	100	1,400	14.00	130	1,850	14.23

## **1.2 When a NOVEM target may be appropriate**

In addition to coping with changes in product volumes and mixes, the NOVEM is also helpful for taking other changes in energy use into account, such as:

- New products starting after the base year.
- Products ceasing being manufactured since the base year.
- Processing previously undertaken off site being brought on to site but this does not change the end product.
- Multiple sites and each having a number of products.

## **2. Identifying appropriate product groups**

Product groups should be carefully chosen; there should be a sufficient number so that differences in energy use are recognised but not too many that make the calculations over complicated.

If a company has a number of sites making the same product, the energy consumption to make that product at each site will be different due to the other baseload activities that happen at that site. So please keep the products site specific.

In the previous example we showed products grouped by those that leave the site as ‘chilled’ or ‘frozen’ products. There may be a large number of variations in products within those groups (i.e. different flavours or sizes) but if products go through the same manufacturing process then they can be grouped together. Please refer to slide 10 of our NOVEM webinar slides for an example about crisp products to illustrate this point.

## **3. Deriving the energy use of each product group in the base year**

There are many acceptable ways of deriving the base year energy usage for each product. We have highlighted some of the most common ways in this section.

There are two underlying principles which must apply whichever method is chosen:

- a) Any energy used on site which is not directly associated to production (e.g. offices, workshops, etc) must be allocated across the different product groups. See section 3.1.1 of this note for more information.
- b) The total primary energy<sup>1</sup> used by all the product groups in the base year must equal the total primary energy of the CCA target unit<sup>2</sup> in the base year (this has already been reported in the CCA). This ensures that no energy is ‘lost’.

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1 – “Total primary energy” Please see the conversion factors worksheet in your annual data collection spreadsheet. In essence, primary energy = (fuels x 1) + (electricity x 2.6)

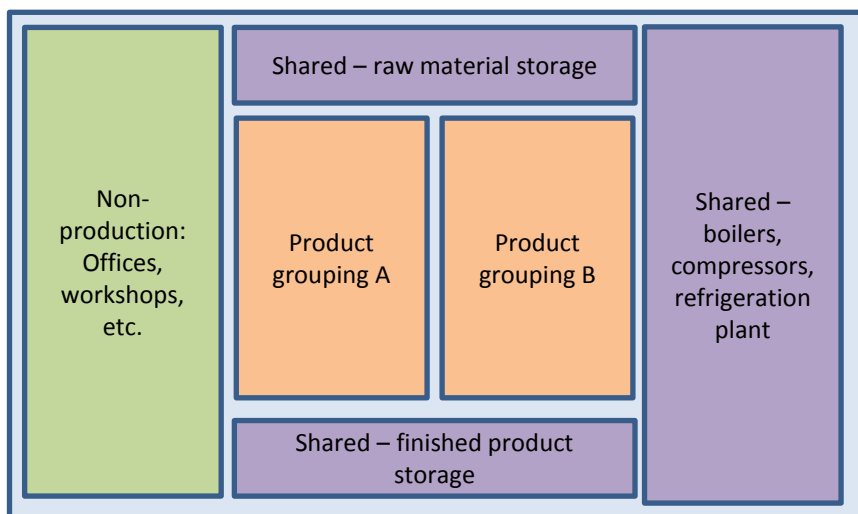
2 – “Target Unit” This is a site or group of sites in a CCA.

## 3.1 Sub-metering

If a site has sufficient sub-metering that allows for production and non-production related activities to be identified then it makes life a lot easier. If the sub-metering was not present in the base year, then the base year energy use can be back-calculated using more recent sub-metering information. In these circumstances, assumptions on how this has been done must be clearly stated and a description or copy of the calculations provided.

### 3.1.1 Allocating non-production related energy or energy used by shared utilities

The diagram below illustrates a site where two product groups shared storage areas and are provided with steam, air and cooling from central plants.



*The energy used by each product group will be made up from:*

1. *Equipment which is only used by that product group.*
2. *A proportion of the energy used by the shared activities. The proportion could be based on meters cubed of storage volume when looking at storage areas, or the different heating, cooling or air requirements to apportion the central utilities.*

3. *The non production related energy should be allocated as follows:*

- *add (1) and (2) above together to get the 'total production related energy' use for each product grouping; i.e. to give X kWh for A and Y kWh for B. Apportion the non-production energy to A and B using the ratio between X and Y – see slide 12 from the NOVEM webinar for a worked example.*

## 3.2 Calculations using ratings and usage

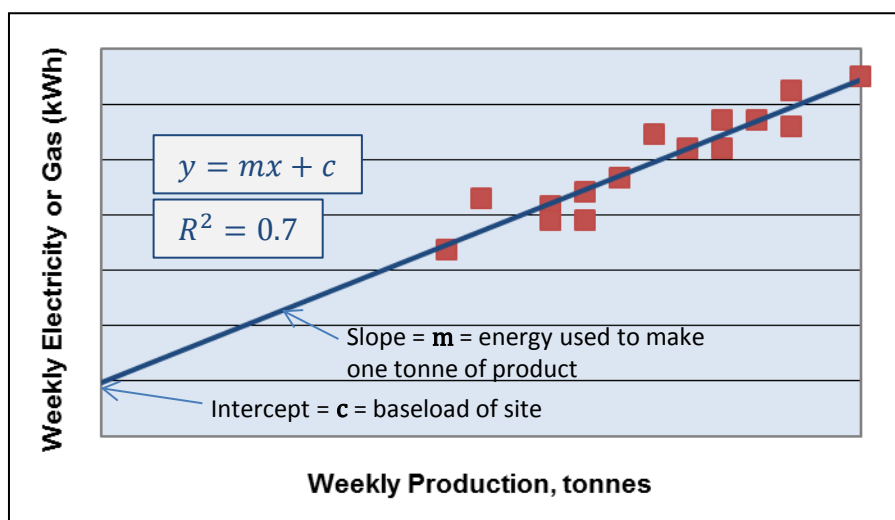
If a site does not have sub-meters, or, very few sub-meters, then the energy use of production equipment, shared activities and non production activities can be estimated using the rating of equipment, their load factors and hours of operation. In these circumstances, assumptions on how this has been done must be clearly stated and a description or copy of the calculations provided. Please see section 3.1.1 for guidance on allocating non-production energy across the product groups.

## 3.3 Analysis of main meter readings and production numbers

It is good practice for sites to regularly record readings of their main electricity meter and fuel usage (e.g. gas main meter). This data can be analysed to help identify the energy usage of the product groups. In this section, we highlight some of the different analyses that can be undertaken (this is not an exhaustive list and companies could find another method to be appropriate).

### 3.3.1 Regression

The graph below shows a plot of **base year** weekly electricity or gas use against just one product group. (We discuss multiple product groups further down this page.)



A 'line of best fit'; known as a 'trendline' in excel, has been added to the graph. The 'equation' for that line has been displayed and this gives the  $y=mx+c$  formula.

The equation means that for one tonne of energy product made it takes 'm' kWh of energy to make it. And when no product is being made, the site uses 'c' kWh of energy.

The  $R^2$  value gives an indication of how representative or accurate the line of best fit is. An  $R^2$  value above 0.7 is usually considered acceptable.

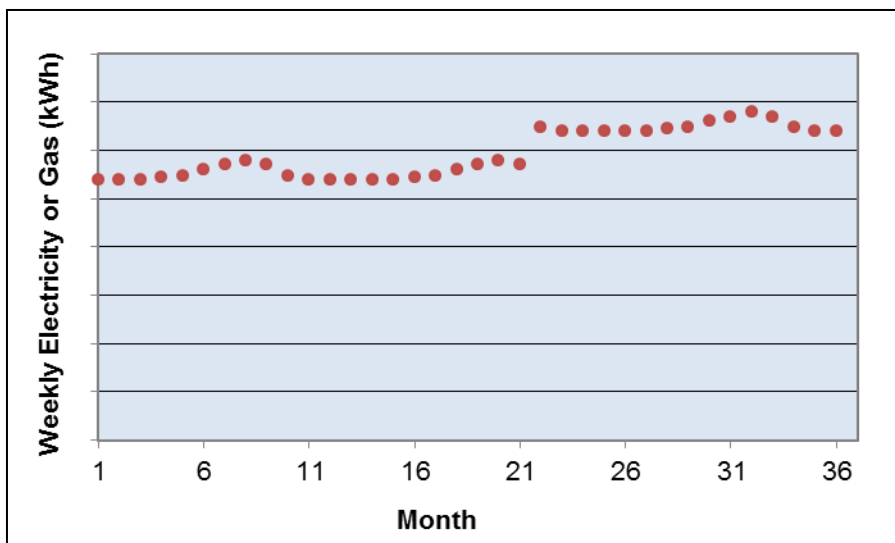
*In switching to a NOVEM, this type of analysis on a single product site is not needed (we can just use the already reported kWh/tonne values for that site). We have only provided this explanation to help with understanding how multiple products are handled.*

**Multiple products:** a graph cannot be generated where there is more than one product, however, there is a function in Excel called 'Regression' where an analysis on multiple products can be undertaken. (The 'Regression' function is available through the 'Analysis ToolPak' Add-in.)

A 'multiple regression' analysis of base year data will produce an 'm' value for each product, a 'c' value for non production energy and an  $R^2$  valued to judge accuracy. The 'c' value then needs apportioning between the two products as described in section 3.1.1.

### 3.3.2 Other changes in energy use

The graph below shows a plot of monthly electricity or gas use over a three year period. The trend of usage indicates some seasonality in the energy use during the year. A notable increase in energy use in month 22 can be seen because a major piece of new equipment was installed.



#### ***Same products but extra processing step***

If the increase in energy use is due to a new process being undertaken at site but the end product has not changed, then from a NOVEM perspective this creates two different product groups as there are differences in energy use.

One product group is that made before week 22, and the other is that made after week 22.

#### ***New products***

If the increase in energy use is due to a new product being made, then the energy data before and after the change must be analysed against production to understand the energy use of the products made before and after week 22.

As new products were not made during the base year, in essence they are given their own later baseline. Hence we need to understand the energy use of that new product group and apportion some of the non-production energy to that product too.

## **4. Next steps**

If you can you:

- identify appropriate product groups across your CCA target unit and their base year and target period production volumes, and
- derive the base year energy use of each product group,

then you should investigate whether it would be more appropriate for your company to have a NOVEM CCA target. We have provided a NOVEM calculation spreadsheet template to enable companies to identify if they would be 'better off'. The spreadsheet asks for information about your current CCA, and a rough estimation of the information needed to switch to a NOVEM target and forecasts the next target period performance with and without a NOVEM target.

If switching to a NOVEM target is appropriate then an application must be prepared and submitted to make the change formally (this is discussed overleaf).

## **5. Making an application to change to a NOVEM target**

The application must contain:

- i. A description of the changes across the target unit that explain why a NOVEM target is more suitable (this can be in the covering email or a separate word or pdf document).
- ii. A site plan showing the production and non-production areas (simple diagrams are fine in a word or pdf file).
- iii. A process flow diagram to show the major energy using processes for each product grouping (in a word or pdf file).
- iv. A description of how the base year energy use for each product group has been derived (in a word or file), or, copies of the actual calculations with clear written descriptions of the calculations/analysis (in a spreadsheet file).
- v. A completed version of our NOVEM calculation spreadsheet so we can check your calculations and forecast change in results; this is make sure we agree that it looks like you'll be 'better off'.

### **Timing**

The deadlines for submitting your NOVEM application are shown below. Once we have received your application, we will check it and liaise with you if we believe that any further information will be needed, and then send it to the Environment Agency (EA) for their review. The EA may also come back with questions hence the entire review process may take a couple of months. The application must be signed off in it's entirety before the end of the last October in the target period. Meeting this deadline will change to a NOVEM for the target period which is about to end and all remaining target periods.

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|------------------|--|
| <b>July 2016</b> | Your application must be submitted to FDF via SLR if you want to change to a NOVEM for <b>Target Periods 2, 3 and 4</b> . If approved, the Responsible Person must assent to a new agreement before the end of October 2016. |
| <b>July 2018</b> | Your application must be submitted to FDF via SLR if you want to change to a NOVEM for <b>Target Periods 3 and 4</b> . If approved, the Responsible Person must assent to a new agreement before the end of October 2018.    |
| <b>July 2020</b> | Your application must be submitted to FDF via SLR if you want to change to a NOVEM for <b>Target Period 4</b> . If approved, the Responsible Person must assent to a new agreement before the end of October 2020.           |

*For further information please contact SLR's FDF CCA helpdesk:*

+44 (0)844 800 1880

[fdcca@slrconsulting.com](mailto:fdcca@slrconsulting.com)

or visit [www.fdf.org.uk/ccl](http://www.fdf.org.uk/ccl)

The full suite of FDF CCA Guidance Notes are listed below and can be accessed via contacting the helpdesk or visiting the website.

Guidance Note	Title
1	What is a CCA
2	Applying for a CCA
3	FDF CCA Administration Charges
4	Completing HMRC PP10 and PP11 Forms
5	Timetable of FDF CCA Activities
6	Obligations under your CCA including audits
7	Reporting data at each Target Period
8	How CCAs interact with other schemes
9	Glossary and Abbreviations
10	What happens if...
11	NOVEM target
12	Stringency tests on targets
13	HMRC State Aid Reporting