

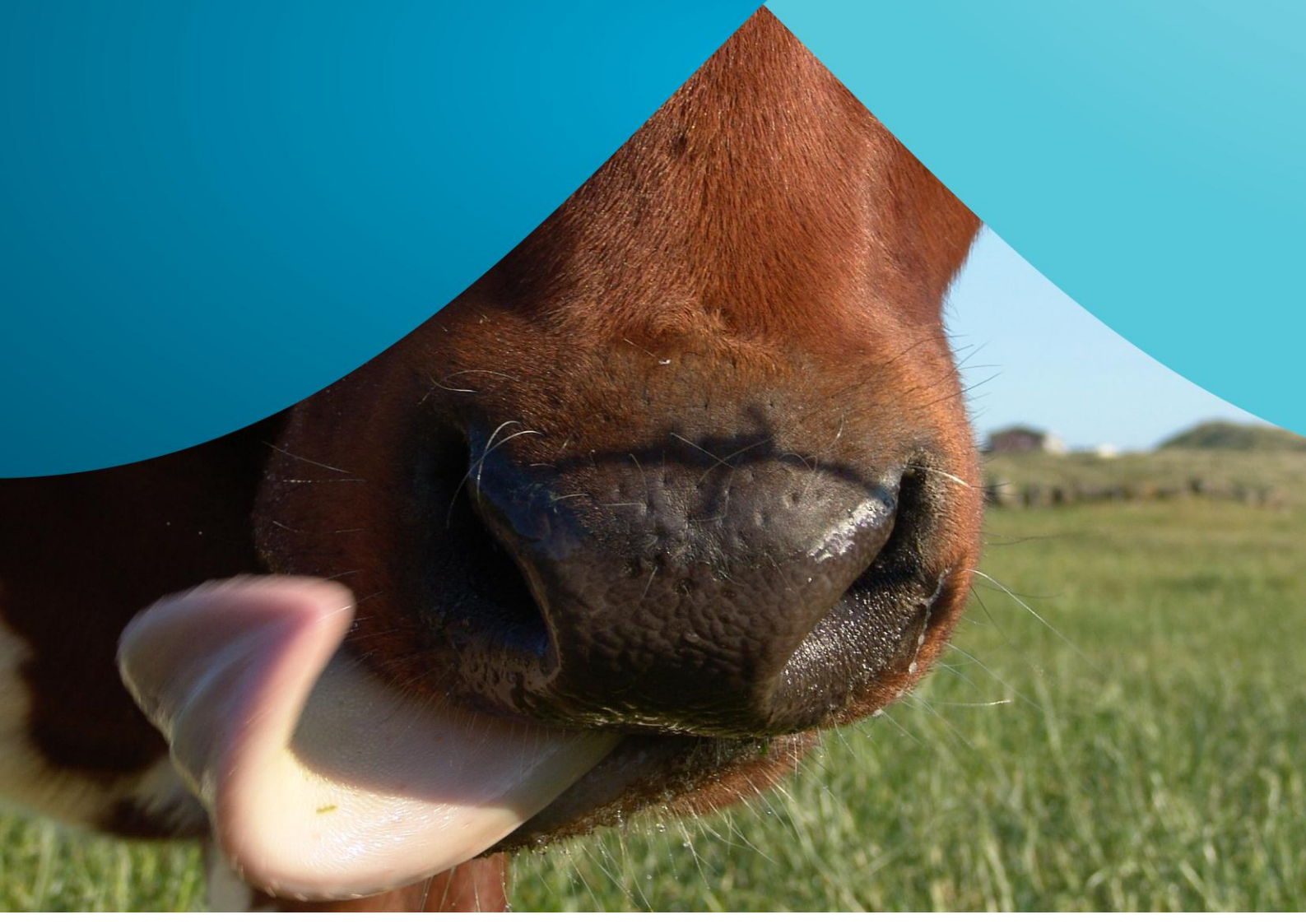


Australian Government
Clean Energy Regulator

EMISSIONS
REDUCTION
FUND

Participating in the Emissions Reduction Fund

A guide to the feeding nitrates to
beef cattle method



IMPORTANT INFORMATION ABOUT THIS GUIDE

The Clean Energy Regulator is updating the information in this guide to align it with the Emissions Reduction Fund.

While the information in this guide about the Feeding Nitrates to Beef Cattle method is current, and may be used to help you read and understand the method and its explanatory statement, general information about how to participate in the Emissions Reduction Fund requires updating.

The Emissions Reduction Fund

The Emissions Reduction Fund is a voluntary scheme that aims to reduce Australia's greenhouse gas emissions by providing incentives for a range of organisations and individuals to adopt new practices and technologies to reduce their emissions.

Emissions Reduction Fund projects must be conducted according to an approved method. A number of activities are eligible under the scheme and individuals and organisations taking part may be able to earn Australian carbon credit units (ACCUs). One ACCU is earned for each tonne of carbon dioxide equivalent (tCO₂-e) stored or avoided by a project. ACCUs may be sold to generate additional income, either to the Government through a Carbon Abatement Contract or on the secondary market.

Why participate?

As well as contributing to Australia's efforts to reduce the amount of greenhouse gas entering the atmosphere and the opportunity to earn ACCUs, running an Emissions Reduction Fund project may offer a range of other benefits for scheme participants. Examples include increases in biodiversity, better air quality, reduced energy consumption or income from electricity generation exported into the grid.

Using this guide

This guide provides an introduction to using the Carbon Credits (Carbon Farming Initiative) (Reducing Greenhouse Gas Emissions by Feeding Nitrates to Beef Cattle) Methodology Determination 2014. Methods set out the rules for conducting activities under the Emissions Reduction Fund to earn ACCUs.

The guide is complementary to the [Carbon Credits \(Carbon Farming Initiative\) Act 2011¹](#) (the Act), the associated legislative rules, approved method and explanatory statement, but does not replace them. It has been prepared by the Clean Energy Regulator, an independent Australian statutory authority responsible for administering legislation to reduce carbon emissions and increase the use of clean energy.

¹ <http://www.comlaw.gov.au/Series/C2011A00101>

Overview of a Feeding Nitrates to Beef Cattle project

A Feeding Nitrates to Beef Cattle project involves fully or partially replacing urea supplements with nitrate supplements in pasture-fed beef cattle.

Urea is often used as a feed supplement to increase the amount of protein in the diet of pasture-fed beef cattle. When some or all of the urea is replaced by nitrate supplements, the cattle produce less methane as they digest their food. Methane is a potent greenhouse gas, therefore, supplementing their diet with nitrates instead of urea can reduce the amount of greenhouse gas emissions produced by pasture-fed beef cattle. You can earn ACCUs for the amount of methane emissions you avoid by feeding your cattle nitrate supplements.

In a Feeding Nitrates to Beef Cattle project, the nitrate is supplied to the herd as a lick block. The methane emissions avoided by feeding the herd nitrates instead of urea are estimated using the Carbon Farming Initiative Beef Nitrates Calculator (the Nitrates Calculator), which is published by the Department of the Environment.

To conduct a Feeding Nitrates to Beef Cattle project and earn ACCUs, make sure you read and understand the method, other legislative requirements and how to use the Nitrates Calculator. To do this you will need to:

- Download the [Carbon Credits \(Carbon Farming Initiative\)\(Reducing Greenhouse Gas Emissions by Feeding Nitrates to Beef Cattle\) Methodology Determination 2014²](#) and [Explanatory Statement³](#).
- Download and understand how the [Carbon Credits \(Carbon Farming Initiative\) Act 2011 \(the CFI Act\)⁴](#), the [Carbon credits \(Carbon Farming Initiative\) Regulations 2011⁵](#) and the [Carbon Credits \(Carbon Farming Initiative\) Rule 2015⁶](#) apply to a project.
- Download the [Carbon Farming Initiative Beef Nitrates Calculator \(Nitrates Calculator\)⁷](#).
- Ensure you have the legal right to conduct your project as well as the consent of anyone with a legal interest in the land (eligible interest holders).
- Apply to register as a scheme participant, to open an account in the Australian National Registry of Emissions Units (ANREU) and to conduct a Feeding Nitrates to Beef Cattle project.
- Set up your project according to the instructions in Parts 2 and 3 of the method. Set up record keeping and monitoring systems for your project as required by Part 5 of the method.

² <http://www.comlaw.gov.au/Details/F2014L01129>

³ <https://www.comlaw.gov.au/Details/F2014L01129/Explanatory%20Statement/Text>

⁴ <http://www.comlaw.gov.au/Series/C2011A00101>

⁵ <http://www.comlaw.gov.au/Series/F2011L02583>

⁶ <http://www.comlaw.gov.au/Details/F2015L00156>

⁷ <http://www.environment.gov.au/climate-change/emissions-reduction-fund/cfi/methodologies/determinations/reducing-greenhouse-gas-emissions-beef-cattle-nitrate-supplements>

- Estimate the average annual abatement of your project, obtain an audit schedule for your project from the Clean Energy Regulator and Engage a Category 2 Greenhouse and Energy Auditor early on in your project. Submit audits of your project according to your audit schedule.
- Determine the amount of carbon your project stores using the calculations in Part 4 of the method. Convert the amount of carbon captured into carbon dioxide equivalents (CO₂-e).
- Submit your project report and application for ACCUs to the Clean Energy Regulator for assessment.

What does a Feeding Nitrates to Beef Cattle project look like?

A project can be located anywhere in Australia, including external territories. It must involve partially or fully replacing urea supplements with nitrate supplements in the form of lick blocks to pasture-fed herds of beef cattle. Feedlot beef cattle are excluded (see section 1.3 of the explanatory statement).

The project area must have been used to feed urea supplements to cattle at least once in the five years before the project is declared by the Clean Energy Regulator. Abatement, or the overall reduction in greenhouse gas emissions as a result of a project, is achieved when nitrate is partially or fully substituted for urea as a dietary supplement.

If nitrates were fed where no urea has been fed, the nitrous oxide emissions associated with the cattle's dung and urine would result in an increase in greenhouse gas emissions, rather than a decrease.

As projects using this method are associated with the land and not the cattle, land that has never been used for feeding urea to cattle cannot be used in a project, even if the herd has previously been fed urea on a different area of the property.

Land from different parts of the same property, and even from different properties, can be used for a project, but each parcel of land must have been used to feed cattle urea supplements in the previous five years.

Details of what is required for a Feeding Nitrates to Beef Cattle project to be considered eligible by the Clean Energy Regulator, including evidence showing a history of urea supplementation, are in Part 2 of the method and Chapter 1 of the explanatory statement.

Why supplement with nitrates or urea?

Australian pasture is often low in both protein and digestibility, so supplementing with urea or nitrates allows cattle to either maintain their weight or gain low levels of weight, instead of losing weight. The supplements increase the amount of nitrogen that bacteria in the cattle's digestive system can convert to protein. Nitrogen also improves the digestibility of the pasture.

Because the pasture is easier for the cattle to digest, they tend to consume more of it, which improves productivity, but in turn means they produce more enteric methane emissions. Enteric emissions are the gases produced in a cow's digestive system when it digests food. Microbes in the digestive system ferment the feed, producing greenhouse gases as a by-product. The cattle release methane – a strong greenhouse gas – primarily through burping and a smaller amount by passing wind.

However, replacing some or all of the urea with nitrates reduces the amount of enteric methane produced by the cattle for the same feed intake, and therefore helps to reduce greenhouse gas emissions.

Ensure the safety of your stock

Users of this method should be aware that it is important to feed nitrates and urea at safe levels because overfeeding can cause toxicity and even death.

The method and explanatory statement provide information on the process of feeding nitrate supplements to reduce this risk, however it is recommended producers seek independent advice for their situation before implementing a project. At all times, you should follow standard industry precautions for safe feeding of supplements, and use best practice approaches to animal welfare. See Chapter 2 of the [explanatory statement](#)⁸ for more information.

Setting up and running a Feeding Nitrates to Beef Cattle project

A project must be run in accordance with the method, the explanatory statement and using the Beef Nitrates Calculator. These materials must be used to estimate accurately the amount of net abatement in greenhouse gases, and therefore the amount of ACCUs that can be earned.

Parts 3 and 4 of the method and Chapters 2 and 3 of the explanatory statement explain in detail how to set up and run a project, and how to calculate the net abatement. Setting up and running a project can be divided into a number of parts, namely establishing the project area, calculating the baseline for your project, running a feeding period and calculating net abatement.

The Beef Nitrates Calculator will help you work out many of the factors you need to know along the way including diet information for your region, safe nitrate feeding levels and the correct nitrogen to sulphur ratio for your herd.

⁸ <https://www.comlaw.gov.au/Details/F2014L01129/Explanatory%20Statement/Text>

You can also use the Beef Nitrates Calculator before applying to run a Feeding Nitrates to Beef Cattle project to check that is feasible in your situation.

Establish the project area

The project area, also known as the baseline area, is the property on which your project will be implemented. It must have a demonstrated history of urea use at least once in the previous five years (see section 2.4 in the method). Different properties can be used, but each must have a demonstrated history of urea use at least once in the previous five years. You can demonstrate the history of urea supplementation by providing auditable records such as tax records and/or receipts, for the purchase of urea, and/or a Commodity Vendor Declaration Form for the supplement to demonstrate its composition.

You must also be able to supply verifiable records of urea use for the baseline and project year on your property. If you add to the project, for example by purchasing another property, that property will require the same evidence of urea use if it was to be included in or combined with your project.

Although the land must have been used to feed urea supplements, the herd of cattle fed nitrates in the project does not need to be the same herd that was previously fed urea.

Calculate project baseline

The project baseline represents what would happen if your project did not occur. For a Feeding Nitrates to Beef Cattle project, the baseline is the enteric methane emissions that would have occurred if urea supplements were fed to cattle over the reporting period (see section 4.2 in the method).

The baseline provides a point against which the enteric methane emissions of a herd fed with nitrate supplements can be compared. The baseline for your project must be calculated using the Nitrates Calculator. The Nitrates Calculator will automatically establish your baseline for each reporting period based on the data you enter about the size and composition of a herd in a reporting year (see section 4.6 in the method).

Is this project suitable for my situation?

Using nitrate supplements for pasture-fed cattle is only suitable if the land you propose to use for the project has sufficient pasture to meet the herds' required daily mass intake. You also need to take into account the levels of protein available from the pasture.

Running a project and using nitrate supplements according to the method will only avoid emissions and benefit livestock health when the protein levels of the pasture are too low to meet the herd's requirements. If your herd's protein requirements are already being met by your pasture, supplementing with nitrates will not provide any further production benefit.

Chapter 2 of the explanatory statement provides more detail on how to determine a property's pasture availability, the protein requirements for an animal class and regional feed protein concentrations. This information will help you to determine if you can feasibly run a project on your land.

Recommended process for running a feeding period

A feeding period, or nitrate supplementation period, is the time when nitrate lick blocks are made available to a herd. A feeding period must occur over consecutive days to be able to calculate the net abatement of CO₂ for your project.

When you have determined that it is feasible to run a project, given the protein requirements of your herd and protein levels of your pasture, and your ability to ensure the safety and well-being of your stock during a feeding period, you need to identify the amount of nitrates required by your herd.

You can use the Nitrates Calculator to determine the level of supplementation needed (see Chapter 2 of the explanatory statement for more information).

Remember to take into account existing sources of nitrates in the project area that livestock may be exposed to such as other feed sources including weeds, and also water. In doing so, the risk of any toxicity may be reduced further (See Chapter 2, Section 2.13 of the Explanatory Statement for more information).

Nitrates must be supplied to cattle as lick blocks with specified sulphur to nitrate ratio. Sulphur is included in the lick blocks to reduce the risk of toxicity (see subsections 3.2(1) and (2) of the method). The amount of lick blocks you begin the project with is called the opening stock. To calculate the opening stock, count and weigh all lick blocks before feeding to the herd, or record the total weight of the blocks fed to the herd.

Take care not to exceed the nitrate supplementation limit, and introduce nitrates at a reduced rate for the first two weeks (see subsections 3.3(1) and (2) of the method). If you are also feeding the

herd urea, be guided by the relevant state and territory regulations and guidelines to avoid toxicity and wastage (see Chapter 2 of the explanatory statement).

Either during the feeding period, or up to 75 days before feeding, you must count and record the number of cattle in each livestock class that you intend to graze (see section 5.3 of the method). You also need to determine the average liveweight of cattle in each livestock class, which you can do using either farm records or the National Inventory Report (see section 5.4 of the method). At the end of the feeding period, remove any uneaten or partially consumed lick blocks and calculate the closing stock by counting and weighing what is left of your opening stock.

What's tCO₂-e?

CO₂-e is a measure of the warming effect of different greenhouse gases that allows them to be compared to the equivalent amount of carbon dioxide. It refers to the amount of carbon dioxide that would give the same warming effect as each greenhouse gas that is emitted or stored by an activity.

Calculating the net amount of abatement and number of ACCUs

This is the final step in the calculations to determine the number of ACCUs that may be issued for a reporting period. At this stage the total change in carbon stock for the project area is calculated and then converted to tonnes of carbon dioxide equivalents or CO₂-e.

The Nitrates Calculator estimates the net abatement in methane emissions from running your project and converts the methane emissions avoided into carbon dioxide equivalents (CO₂-e).

CO₂-e is a measure of the warming effect of different greenhouse gases that allows them to be compared to the equivalent amount of carbon dioxide. It refers to the amount of carbon dioxide that would give the same warming effect as each greenhouse gas that is emitted or stored by an activity.

The Nitrates Calculator estimates the net abatement by subtracting the actual emissions from the baseline, or hypothetical emissions that would have occurred if you did not feed nitrates to the herd (see section 4.6 in the method). To use the Nitrates Calculator, you enter data on herd counts and composition, feeding start and end dates, and opening and closing stocks of nitrates and any urea for each feeding period (see section 4.4 in the method). The Nitrates Calculator then estimates the baseline and actual emissions for the entire herd for each feeding period in each area.

The Nitrates Calculator will automatically estimate the net abatement amount for each feeding period in each area once you have entered the required data.

This gives the abatement generated by the project for which you may be eligible to be issued with ACCUs.

Using the Nitrates Calculator

You can use the Nitrates Calculator to help you plan your project. The calculator contains yellow and green boxes. Yellow boxes are for you to enter data. Green boxes are automatically generated by the calculator and are protected, so that you cannot change them.

You begin on the 'Data Entry' page by selecting your region and entering the start and end dates of your feeding period (called the supplementation period) and the adaptation period. Then enter your herd information, including numbers of each livestock class and average liveweight per class. If you don't have farm records for liveweight, you can choose to use default data from the National Inventory Report. Diet information for your region is sourced from the National Inventory Report and is automatically included in the calculator. This includes dry matter intake and digestibility, milk production, metabolisable energy and total crude protein.

The next step is to enter data about the nitrate (and any urea) blocks at the beginning and end of your feeding period (i.e. your opening and closing stock). The data you need includes the brand of block used, number and weight of blocks, and concentration of nitrate (or urea) and sulphur.

At the bottom of the Data Entry page is a summary of the data entered and supplied. In this section, the calculator shows you the recommended levels of nitrates, as well as sulphur to nitrate ratios, based on your herd data and the length of the feeding period. If your data shows that you will exceed safe feeding levels, the calculator will warn you by turning the relevant box from green to red. You can therefore use the calculator to determine a safe nitrate feeding level and correct nitrogen to sulphur ratio for your herd.

Once you have entered the data, the results are automatically calculated for you. The 'Results' page will show you the actual emissions from your herd and the baseline (hypothetical) emissions that would have been produced if you did not feed nitrates to your herd. The calculator also shows the amount of nitrous oxide emissions that result from the herd's dung and urine. These amounts are assumed to remain the same whether you supplement with nitrate or urea, and so the change in them is counted as zero.

The actual emissions are then subtracted from the baseline emissions to calculate the net abatement amount in carbon dioxide equivalents (CO₂-e). Note that the net abatement amount only applies to one feeding period for one herd in one area. You need to use a new sheet to add the abatement amounts for each feeding period, herd and area when submitting your reports and applications for ACCUs.

Lick blocks: composition, adaptation periods and overfeeding risks

The project uses lick blocks to supply nitrate (and any urea) because they are cost-effective, low-waste, and easy to supply and remove. The lick blocks must contain the correct ratio of sulphur to nitrogen to reduce the risk of potential toxic effects resulting from nitrate or urea consumption. Lick blocks may also contain a source of sugar, such as molasses, to provide extra energy and to attract the cattle. Salt can also be used as an attractant.

The total amount of nitrate (and any urea) fed to a herd in the form of lick blocks cannot exceed 30 per cent of the herd's total amount of crude protein intake. It is important to feed nitrates and urea at safe levels, because overfeeding can cause toxicity and even death. Feeding nitrates at or below the levels recommended in the method can potentially reduce reproductive efficiency and lower weight gains unrelated to any change in feed intake that may occur. This should be considered when deciding whether or not to run a Feeding Nitrates to Beef Cattle project. To reduce these risks, you must introduce the lick blocks at a lower concentration for the first two weeks of each feeding period. This is called the adaptation period.

During the adaptation period, nitrates cannot be fed at more than 25 grams per adult animal equivalent per day or 3.5 grams per kilogram of dry matter intake (whichever occurs first) per day. An adult animal equivalent has a liveweight of 450 kilograms. Once the two weeks of adaptation are over, this rate can be doubled (see subsection 3.3(3) of the method). At all times, you should follow standard industry precautions for safe feeding of supplements, and use best practice approaches to animal welfare. See Chapter 2 of the explanatory statement for more information.

Monitoring and record keeping

The Clean Energy Regulator recommends developing a plan for the monitoring, data collecting and record keeping required for an offsets report as specified in Part 5 of the method. The means of collecting and recording data will need to be in place from the start of the project. Should an offsets report and associated audit show that data collecting and record keeping has not been in place for the entire reporting period, ACCUs may not be issued for some or all of that reporting period.

When developing your plan, make sure you have the right controls and processes around your data. Are you collecting your data efficiently? Will you be able to maintain your data in the event of an emergency such as a fire?

Project and audit reports

You need to report on your project to the Clean Energy Regulator and may report as frequently as every six months where allowed for in the legislative rules made under the *Carbon Farming Initiative Act (2011)*. Audits are required where indicated in your project's audit schedule, which the Clean Energy will provide following registration of your project.

For emissions avoidance projects, the first report must be made between six months to two years from the date the project was registered and then up to every two years thereafter.

Division 5.4 of the method lists the information that must be included in your project reports. Applications for ACCUs can be made at the same time as you submit your project and audit reports using the *Certificate of entitlement including offsets report form*. Full reporting, record keeping and monitoring requirements are set out in regulations and rules made under the Act. You should familiarise yourself with these requirements.

The Clean Energy Regulator will not issue Australian carbon credit units automatically on receipt of a project report.

Emissions Reduction Fund projects are able to generate credits throughout their crediting period. Crediting periods for each type of project are set out in Part 5 of the *CFI Act*. The crediting period for a Feeding Nitrates to Beef Cattle project is 7 years.

The role of audit

Audits assess whether a project complies with the project registration, the relevant method and legislative requirements. Audit reports must be prepared by a registered Category 2 Greenhouse and Energy Auditor; a list of auditors is available on the Clean Energy Regulator website under [National Greenhouse and Energy Reporting](#)⁹.

The Clean Energy Regulator recommends you engage your auditor early when developing your project to ensure the project is auditable and to assist the auditor to plan activities throughout the reporting and post-reporting periods.

The costs of any audit are your responsibility or the responsibility of your organisation. You must make available to the auditor all necessary documents and information, including data records, receipts and other supporting documentation, and calculation spread sheets.

Making changes to a project

You must notify the Clean Energy Regulator of any changes to your or your project's circumstances or operations that may affect project ownership, the project's eligibility or the amount of abatement reported and the number of ACCUs claimed. A project owner must seek approval from

⁹ <http://www.cleanenergyregulator.gov.au/NGER/For-auditors/Register-of-auditors>

the Clean Energy Regulator if they intend to make a significant change from the project as outlined in the application.

Resources

- For more information on participating in the ERF - www.cleanenergyregulator.gov.au¹⁰
- For more information regarding method development – www.environment.gov.au
- www.comlaw.gov.au¹¹ is the site where you can find all legislative instruments including the:
 - » [*Carbon credits \(Carbon Farming Initiative\) Act 2011 \(current version\)*](#)¹²
 - » [*Carbon credits \(Carbon Farming Initiative\) Regulations 2011*](#)¹³
 - » [*Carbon Credits \(Carbon Farming Initiative\) Rule 2015*](#)¹⁴
 - » [*Carbon Credits \(Carbon Farming Initiative—Reducing Greenhouse Gas Emissions by Feeding Nitrates to Beef Cattle\) Methodology Determination 2015*](#)¹⁵
 - » [*Explanatory statement*](#)¹⁶
- Enquiries on participating in the ERF - 1300 553 542; enquiries@cleanenergyregulator.gov.au

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¹¹ <http://www.comlaw.gov.au/>

¹² <http://www.comlaw.gov.au/Series/C2011A00101>

¹³ <http://www.comlaw.gov.au/Series/F2011L02583>

¹⁴ <http://www.comlaw.gov.au/Details/F2015L00156>

¹⁵ <https://www.comlaw.gov.au/Details/F2014L01129/Explanatory%20Statement/Text>

¹⁶ <https://www.comlaw.gov.au/Details/F2014L01129/Explanatory%20Statement/Text>