

EXPLANATORY STATEMENT

Carbon Credits (Carbon Farming Initiative) Act 2011

Carbon Credits (Carbon Farming Initiative—Beef Cattle Herd Management) Methodology Determination 2015

Background: Emissions Reduction Fund

The *Carbon Credits (Carbon Farming Initiative) Act 2011* (the Act) enables the crediting of greenhouse gas abatement from emissions reduction activities across the economy.

Greenhouse gas abatement is achieved either by reducing or avoiding emissions or by removing carbon dioxide from the atmosphere and sequestering carbon in soil or trees.

In 2014, the Australian Parliament passed the *Carbon Farming Initiative Amendment Act 2014*, which establishes the Emissions Reduction Fund (ERF). The ERF has three elements: crediting emissions reductions, purchasing emissions reductions, and safeguarding emissions reductions.

Emissions reduction activities are undertaken as offsets projects. The process involved in establishing an offsets project is set out in Part 3 of the Act. An offsets project must be covered by, and undertaken in accordance with, a methodology determination.

Subsection 106(1) of the Act empowers the Minister to make, by legislative instrument, a methodology determination. The purpose of a methodology determination is to establish procedures for estimating abatement (emissions reduction and sequestration) from eligible projects and rules for monitoring, record keeping and reporting. These methodologies will ensure that emissions reductions are genuine—that they are both real and additional to business as usual.

In deciding to make a methodology determination the Minister must have regard to the advice of the Emissions Reduction Assurance Committee (ERAC), an independent expert panel established to advise the Minister on proposals for methodology determinations. The Minister must not make or vary a methodology if the ERAC considers it inconsistent with the offsets integrity standards, which are set out in section 133 of the Act. The Minister will also consider any adverse environmental, economic or social impacts likely to arise as a result of projects to which the determination applies.

Offsets projects that are undertaken in accordance with the methodology determination and approved by the Clean Energy Regulator (the Regulator) can generate Australian carbon credit units (ACCUs), representing emissions reductions from the project. Project proponents can receive funding from the ERF by participating in a competitive auction run by the Regulator. The Government will enter into contracts with successful proponents, which will guarantee the price and payment for the future delivery of emissions reductions.

Further information on the ERF is available on the Department of the Environment website at: www.environment.gov.au/emissions-reduction-fund.

Background: *Carbon Credits (Carbon Farming Initiative—Beef Cattle Herd Management) Methodology Determination 2015*

The *Carbon Credits (Carbon Farming Initiative—Beef Cattle Herd Management) Methodology Determination 2015* (the Determination) provides for crediting emissions reductions from projects that improve the production efficiency of pasture-fed beef cattle herds.

The livestock sector represents around 70% of emissions from agriculture and up to 11% of total national emissions. Beef cattle production is a major livestock industry and contributes a significant proportion of all livestock emissions.

The main source of emissions from beef cattle is methane from enteric fermentation (digestion processes in ruminant animals). Beef cattle also produce nitrous oxide emissions from dung and urine. Enteric methane emissions from pasture-fed beef cattle rose by 6% between 1990 and 2013, in line with an increase in the size of the national herd.

The Determination provides for emissions reductions through adoption of measures to reduce the emissions intensity of beef production. Emissions intensity can be measured as emissions per kilogram of beef produced. Emissions intensity can be reduced through taking steps to improve productivity. For example, supplying higher quality feed improves growth rates, enabling cattle to reach market weight earlier with lower emissions over their lifetime.

Productivity improvements have delivered an overall decline in the emissions intensity of production for a large portion of the national beef cattle herd since the 1980s. However, studies show an increase in emissions intensity in recent decades, demonstrating the potential for further improvements. For example, data on the number and weight of beef cattle produced nationally for domestic consumption and export is available from the Australian Bureau of Statistics and Australian Bureau of Agricultural and Resource Economics and Sciences. When converted to standard equivalent annual emissions values for adult cattle, the data shows that emissions intensity increased by about 0.6% annually between 1994 and 2013.

The ERF credits improvements in emissions intensity—reductions in emissions per unit of output—as a practical way to support economic growth while reducing emissions. An emissions intensity approach rewards deliberate effort by crediting reductions in the emissions intensity of each unit produced, regardless of whether production is expanding or contracting.

The Determination provides for crediting of reductions in a herd's total emissions as a result of undertaking new management actions that reduce emissions intensity. Such actions can reduce emissions intensity in the following ways.

- Increasing the ratio of liveweight (LW) for age in the herd. Improving cattle productivity enables target weights to be reached earlier, thereby reducing the number of days for which cattle produce emissions. The LW of cattle relative to their age could be either the same as, or higher than, it was before the project began. Similarly, the age at which a particular weight can be reached could be earlier than it was before the project began.
- Reducing the average age of the herd, which also results in cattle producing emissions for fewer days and avoids emissions from older cattle with declining productivity.
- Reducing the proportion of unproductive animals in the herd, for example by removing heifers that fail pregnancy testing. Such actions provide more grazing area for productive animals, and can help increase birth rates and survival.
- Changing the relative numbers in each livestock class (e.g. bulls, cows and steers of different ages, as described in the National Inventory Report) within the herd to increase the herd's liveweight gain (LWG). For example, actions to improve weaner survival can reduce emissions because a smaller herd with fewer breeding cattle can produce the same or greater LW.

The Determination does not specify particular types of project activity to achieve such outcomes. However, proponents must identify in the section 22 application (see below) at least one activity that can reasonably be expected to deliver such outcomes. To be eligible for this Determination a project activity in the reporting period must be a new activity or a variation of an activity that was not being carried out before or during the emissions intensity reference period. When reporting on this new activity the proponent must report on how the activity led to emissions abatement.

Project activities could include: sowing improved pasture; introducing superior genetics; introducing feed supplements; and installing fencing on rangeland properties to allow alignment of mating and calving times with favourable seasonal conditions.

Activities can be changed during the project, as long as the requirements of the Determination are met.

The following activities are ineligible under the Determination:

- land cleared of perennial woody vegetation for the purposes of the project (unless the clearing is required by law);
- feeding of non-protein nitrogen such as urea or nitrates;
- a project activity that comprises only grazing cattle on a different area of land; and
- cattle in feedlots.

Project proponents who could use the Determination include beef cattle graziers producing cattle for live export or slaughter, sale to another producer for finishing, or breeding. Enterprises with single or multiple beef cattle grazing operations can also undertake a project. Therefore a project may also comprise multiple herds.

The Determination's flexibility in relation to eligible activities recognises the diversity of beef cattle production operations and the range of avenues for improving production efficiency. Activities adopted in extensive rangeland operations may differ from those used in more intensive operations in temperate regions.

The Determination recognises that the number of cattle managed by an entity is likely to change from year to year in the normal course of events. Numbers may be reduced during droughts and increased under favourable conditions. Cattle may also be transferred between separate properties owned by an entity, and sold on to other cattle producers.

Given these variables, the Determination does not prohibit changes in herd composition and the location in which the herd grazes during a project. However, each herd in a project needs to be tracked over time to enable estimation of baseline and project emissions and to ensure that emissions reductions are delivered only through project activities. The Determination therefore includes requirements linking each herd with a business entity and the entity's records, and requires proponents to record when they transfer cattle between related business entities.

While a reduction in the number of animals in a herd may be one outcome of a project, the Determination enables emissions reductions to be achieved through productivity improvements and does not incentivise reduced production. The Determination also does not preclude an increase in the number of animals in a herd, but any associated change in emissions intensity would be reflected in the net abatement amount.

Productivity improvements achieved through a project could result in a proponent selling larger numbers of cattle, for example to enterprises that finish cattle for slaughter. However, project activities that result in an increase in the number of animals leaving the project property are unlikely to lead to an increase in the size of the national herd. The size of the national herd is constrained by factors such as the carrying capacity of grazing land, availability of land, and environmental influences, for example drought. These factors, as well as market factors, such as the price of beef, will have a far greater influence on management decisions of other beef cattle producers than the actions of project proponents.

This assessment is supported by recent trends in the size of the national pasture-fed beef cattle herd, which fluctuates from year to year due to climate and market influences. In recent decades the overall trend has been a gradual increase; the number of pasture-fed beef cattle grew from 21.9 million in 1990 to 25.7 million in 2013. This represents an annual increase of less than 1% in the size of the national herd over 23 years. This trend indicates that the national herd size is unlikely to increase substantially in the future, regardless of the actions of project proponents.

Abatement is calculated for a reporting period as the difference between baseline and project emissions for each herd and each year in the reporting period. Where a project comprises multiple herds, total abatement is the sum of the abatement for each herd.

Baseline emissions for each year in a reporting period represent the emissions that would have occurred in the absence of project activities. LWG values are used to derive emissions intensity estimates, from which baseline emissions are estimated. The use of emissions intensity values, rather than absolute values, to calculate baseline emissions allows fluctuations in emissions due to climate/environment to be taken into account. The baseline emissions can then be considered as representative estimates for comparing with the effect on emissions of project activities.

In summary, baseline emissions are estimated as follows.

- (a) Calculate emissions intensity of historical LWG as total emissions of all animals in the herd for three emissions intensity reference period years divided by total LWG for those years.
- (b) Multiply the result of (a) by the LWG for each year in the reporting period.

Project emissions are the total emissions of the entire herd for each year.

Only enteric methane emissions and nitrous oxide emissions from dung and urine are accounted for in abatement estimates. These emissions are related to feed intake per day, the duration of that feed intake and the protein content and dry matter digestibility of the feed. These factors are incorporated in abatement calculations, and where a change in diet is a project activity, details of the change are required as an input to calculations.

Abatement estimates also require information on cattle numbers, LW and LWG. Information required for cattle numbers includes each class of cattle (e.g. all classes of heifers, steers and bulls) and the duration of their presence in the herd each year. Values for LWG may be obtained by weighing animals or, where this is not practical, through verifiable alternative means specified in the Determination.

Proponents are required to use the Beef Cattle Herd Management Calculator to calculate abatement annually. The Determination sets out the inputs required by the Herd Management Calculator.

Application of the Determination

The Determination sets out the detailed rules for implementing and monitoring offset projects that reduce greenhouse gas emissions from pasture-fed beef cattle herds. Proponents are encouraged to read the Determination in combination with any applicable regulations, rules and guidance documents.

The Determination reflects the required offsets integrity standards of the Act and assists in ensuring that emissions reductions are real and additional to business as usual. The offsets integrity standards require that an eligible project should result in carbon abatement that is unlikely to occur in the ordinary course of events and is eligible carbon abatement under the Act. In summary, the offsets integrity standards also require that:

- amounts are measurable and capable of being verified;
- the methods used are supported by clear and convincing evidence;
- material emissions which are a direct consequence of the project are deducted; and
- estimates, assumptions or projections used in a methodology determination should be conservative.

Project proponents wishing to implement projects under the Determination must make an application to the Regulator under section 22 of the Act. They must also meet the general eligibility requirements for an offsets project set out in subsection 27(4), which include compliance with the requirements set out in the Determination, and the additionality requirements in subsection 27(4A) of the Act. The additionality requirements are:

- the newness requirement;
- the regulatory additionality requirement; and
- the government program requirement.

The government program requirement is provided for in the *Carbon Credits (Carbon Farming Initiative) Rule 2015*. Subsection 27(4A) of the Act provides that a methodology determination may specify requirements in lieu of the Act's newness requirement or the regulatory additionality requirement. The Determination does not specify any requirements in lieu, and so the general requirements apply to eligible herd management projects.

Public Consultation

The Determination has been developed by the Department of the Environment in collaboration with the livestock industry through Meat and Livestock Australia and Australian Agricultural Company Limited.

The exposure draft of the Determination was published on the Department's website for public consultation from 10 December 2014 to 9 January 2015. Seven submissions were received. Details of the non-confidential submissions are provided on the Department's website: www.environment.gov.au

Determination Details

Details of the Determination are at [Attachment A](#). Numbered sections in this explanatory statement align with the relevant sections of the Determination. The definition of terms highlighted in ***bold italics*** can be found in the Determination.

For the purpose of subsections 106(4), (4A) and (4B) of the Act, in making the Determination the Minister has had regard to, and agrees with, the advice of the ERAC that the Determination complies with the offsets integrity standards and that the Determination should be made. The Minister is satisfied that the carbon abatement used in ascertaining the carbon dioxide equivalent net abatement amount for a project is eligible carbon abatement from the project. The Minister also had regard to whether any adverse environmental, economic or social impacts are likely to arise from the carrying out of the kind of project to which the Determination applies and other relevant considerations.

Sub-item 393A(2) of Schedule 1 of the *Carbon Farming Initiative Amendment Act 2014* operated in relation to the Determination to deem the request to the Interim ERAC to be the relevant request to the statutory ERAC under subsection 106(10) of the Act. Sub-item 393A(3) then allowed the ERAC to consider the consultation on the exposure draft which started before 13 December 2014 and not re-open consultation under section 123D of the Act.

A Statement of Compatibility with Human Rights prepared in accordance with the *Human Rights (Parliamentary Scrutiny) Act 2011* is at [Attachment B](#).

Details of the Methodology Determination

Part 1 Preliminary

1 Name

Section 1 sets out the full name of the Determination, which is the *Carbon Credits (Carbon Farming Initiative—Beef Cattle Herd Management) Methodology Determination 2015*.

2 Commencement

Section 2 provides that the Determination commences on the day after it is registered on the Federal Register of Legislative Instruments.

3 Authority

Section 3 provides that the Determination is made under subsection 106(1) of the Act.

4 Duration

Under subparagraph 122(1)(b)(i) of the Act, a methodology determination remains in force for the period specified in the determination.

Section 4 specifies that the Determination will cease to be in force on the day before it would otherwise be repealed under Paragraph 50(1) of the *Legislative Instruments Act 2003*, i.e. the day before the 1 April or 1 October following the tenth anniversary of registration of the Determination on the Federal Register of Legislative Instruments.

However, the Determination will cease to be in force earlier if it is revoked in accordance with section 123 of the Act or section 42 of the *Legislative Instruments Act 2003*.

If the Determination expires in accordance with section 122 of the Act or is revoked in accordance with section 123 during a crediting period for a project to which the Determination applies, it will continue to apply to the project during the remainder of the crediting period under subsections 125(2) and 127(2) of the Act. Project proponents may apply to the Regulator during a reporting period to have a different methodology determination apply to their projects from the start of that reporting period (see subsection 128(1) of the Act).

Under section 27A of the Act, the ERAC may also suspend the processing of applications under a determination if there is reasonable evidence that the methodology determination does not comply with one or more of the offsets integrity standards. This does not impact

applications for declaration already received by the Regulator before such a suspension or declared eligible offset projects which apply the Determination.

5 Definitions

Section 5 defines a number of terms used in the Determination.

Section 5 also defines a number of terms not defined in the Act.

Under section 23 of the *Acts Interpretation Act 1901*, words in the Determination in the singular number include the plural and words in the plural number include the singular.

Key definitions in section 5 of the Determination include those set out below.

associate has the same meaning as in section 318 of the *Income Tax Assessment Act 1936*. The nature of associate relationships is complex and thus the definition is important when deciding if an associate relationship exists. However, in general an associate relationship involves one entity exerting some degree of influence over another. It is the duty of the person(s) responsible for preparing taxation returns of an entity (normally an accountant) to be aware of the associate relationships between the entity and other entities. Proponents should seek advice on such potential relationships when considering involvement in an eligible herd management offsets project.

business operation means an operation, consisting of the whole or a part of an entity or group of entities:

- (a) that involves pasture grazing of cattle; and
- (b) in relation to which a livestock inventory of those cattle is maintained.

A business operation could be, for example, a cattle-producing farm among a group of farms operated under one Australian Business Number (ABN) but for which separate livestock inventories are maintained. The existence of a livestock inventory that can be traced through the project to account for changes in the numbers and composition of the herd is necessary for the definition of a herd and the operation of an eligible herd management project.

entity has the same meaning as in the *A New Tax System (Goods and Services Tax) Act 1999*. Every business registered under this Act must have an ABN by which it is uniquely identified. The business must keep records for taxation purposes, and a part of such records for a business operation involving cattle is the preparation of an annual inventory of cattle that defines the cattle in the project herd owned by the entity.

inventory cattle of a business operation, at a particular time, means all cattle that are on the livestock inventory of the business operation at that time. The inventory is a key part of auditing numbers of livestock used in abatement calculations. The total herd may comprise inventory cattle and non-inventory cattle described below.

non-inventory cattle of a business operation, at a particular time, means any other cattle that are grazed with inventory cattle of the business operation at the time, except where:

- (a) the inventory cattle are under an arm's length agistment arrangement; or

- (b) the other cattle are under an arm's length agistment arrangement; or
- (c) the other cattle are inventory cattle of another herd of an eligible herd management project (and are therefore accounted for separately).

Non-inventory cattle must be accounted for if they graze with inventory cattle in competition for feed, because the supply of feed will affect emissions of all of these cattle. The exception for agisted cattle is made because, where agistment occurs, surplus feed is normally available for the agisted cattle or cattle are grazed separately for ease of management.

parent entity is a discrete business entity registered on the Australian Business Register under the *A New Tax System (Australian Business Number) Act 1999* that may include sub-entities under its control. The term is used in the Determination in recognition that a larger business may comprise several operations such as cattle grazing, sheep grazing and contracting, each with its own ABN. These sub-entities can receive capital assets such as cattle by either purchase or transfer from another sub-entity or from the cattle inventory of the parent entity. A transfer of cattle may make another sub-entity a secondary business operation for the purpose of accounting for emissions from cattle.

primary business operation is a business operation that must be described so that an initial inventory of cattle is available for the purpose of participating in a herd management project. That inventory may later be supplemented by inventory and non-inventory cattle of a secondary business operation that is created by transfers between business entities having associate relationships.

registered entity means an entity that is registered on the Australian Business Register under the *A New Tax System (Australian Business Number) Act 1999*. The term reinforces the need for entities to be registered under the Act and have the appropriate identifying ABN and business records.

secondary business operation means a business operation that is closely related to the primary business operation, usually under an associate relationship. It may be a whole business operation or a sub-entity of it, to which cattle are transferred from a primary business operation when an associate relationship exists. It may also be another sub-entity of a larger business operation comprising the primary business operation which was not initially specified as part of the primary business operation but becomes a secondary business operation by way of cattle transfers. The provision for secondary business operations avoids potential for cattle with higher emissions than other cattle to be transferred from a primary business operation to maximise apparent abatement.

sub-entity is a business operation which is part of a parent entity or group of entities. A sub-entity may or may not be an entity in its own right, and may or may not have its own livestock inventory. The definition of sub-entity is important when a single livestock business wishes to undertake a project under the Determination in relation to two or more herds.

Part 2 Herd management projects

6 Herd management projects

The effect of paragraphs 27(4)(b) and 106(1)(a) of the Act is that a project must be covered by a methodology determination, and that the methodology determination must specify the kind of offsets project to which it applies.

Section 6 provides that the Determination applies to an emissions avoidance offsets project that can be expected to result in eligible carbon abatement through reducing emissions from a herd of cattle that are ordinarily grazed together, by any of the following:

- (a) increasing the ratio of LW to age in the herd;
- (b) reducing the average age of the herd;
- (c) reducing the proportion of unproductive animals in the herd; and
- (d) changing the ratio of livestock classes in the herd to increase total annual LWG of the herd.

The Determination defines these kinds of projects as *herd management projects*.

Section 17 sets out eligibility requirements for project activities, which are agricultural practices that can reasonably be expected to reduce emissions from the herd through one of the above measures.

Part 3 Project requirements

7 Operation of this Part

The effect of paragraph 106(1)(b) of the Act is that a methodology determination must set out requirements that must be met for a project to be an eligible offsets project. Under paragraph 27(4)(c) of the Act, the Regulator must not declare that a project is an eligible offsets project unless the Regulator is satisfied that the project meets these requirements.

Part 3 sets out the requirements that must be met for a project to be eligible under this Determination.

Part 3 includes a note providing guidance on application of the eligibility requirements for identifying a herd. There is a number of specific requirements, to cover a range of different types of potential business operations and relationships. Proponents will need to determine which of the requirements apply to their particular circumstances.

8 Specifying a primary business operation to identify a herd

Section 8 sets out how a particular group of cattle can be specified as a herd for a herd management project. The characteristics of a herd must include the following:

- A continuity of management from the beginning of the emissions intensity reference period to the end of the crediting period, including any period between application for registration under section 22 of the Act and the beginning of the first reporting period. Proponents will need to keep cattle inventory records (including herds in aggregated projects). They will need these records to verify that the herd at the commencement of the crediting period is derived from transactions commencing at the beginning of the emissions intensity reference period, which reflect the management of the proponent.
- The project herd must be managed and pastured separately from other herds so that emissions from the project herd can be accurately and separately quantified.

These requirements accommodate normal business activities, while providing for each herd to be defined such that abatement is directly attributed only to the outcomes of project activities.

Subsection 8(1) provides that proponents must specify one or more business operations. Under subsection 8(2), each of the specified business operations is the ***primary business operation*** for a herd. This provides the basis for specifying an initial group of cattle meeting the requirements described above. All cattle in a herd at the time of the section 22 application must be associated with a primary business operation.

Subsection 8(3) provides that the project herd must comprise all ***inventory and non-inventory cattle*** of a ***primary business operation*** and any ***entity*** that is a ***secondary business operation*** of the project.

Both a primary and a secondary business operation may consist of one or more entities. Verification of the numbers of cattle of such entities can be obtained through business records or through data such as that contained on the National Livestock Information System (NLIS). Where multiple herds are contained in a project, each herd must be part of a business entity with its own records and inventory. This requirement links the cattle to the records of the business entity to verify cattle numbers and classes present in the herd in each year of the emissions intensity reference period and crediting period.

Cattle on the inventory of another business operation that is closely related to the primary business operation (classified as a *secondary business operation*) must be recorded. This relationship between primary and secondary business operations can be identified by the presence or absence of an associate relationship between the two businesses.

Where transfers of cattle occur between the primary business operation and another business that is an associate (for example, it is owned or controlled by a relative and is therefore not independent), the associated business becomes a secondary business operation of the project and all cattle in that business must be accounted for in calculation of the net abatement amount. This relationship does not refer to sales to a business with which the proponent has no association.

The provisions for secondary business operations prevent transfers of cattle classes with, for example, low growth rates, to other herds under a proponent's control, to maximise crediting. Transfers into a primary business do not affect the project boundary by creating a secondary business operation, because such transfers must be fully accounted for in the project.

The herd must also include any cattle that are not on the inventory of the primary or secondary business operation but which are grazed with those cattle in competition for feed. This type of grazing will reduce weight gains of the primary business herd and thus reduce abatement. It may also result in negative abatement, which is normally assumed to be caused by environmental factors and taken to be zero (see section 19).

Cattle involved in an arm's length agistment arrangement (which do not compete for feed because surplus feed must be available to facilitate agistment) do not need to be accounted for. The note to Part 3 explains that for simplicity of operation, the herd should be comprised of inventory cattle only. For example, proponents could consider avoiding actions such as co-grazing with other cattle not on the inventory and not under an agistment arrangement.

Subsection 8(4) notes that the herd excludes cattle *in utero* (before birth). Emissions of animals in utero are accounted for in the Herd Management Calculator through the additional emissions of the breeding cow as a result of increased feed intake for milk production and growth of the calf. Emissions of cattle after birth are accounted for in the calf.

Subsection 8(5) details the conditions under which another business operation may become a secondary business operation and thus be included in the project, even though it was not part of the original section 22 application.

Paragraph 8(5)(a) provides for the inclusion of another business operation as a secondary business operation in the project when a *transfer* of cattle occurs to either the inventory of the whole business operation or to the inventory of a sub-entity of the business operation. A movement of cattle by *sale* to a completely separate business operation with separate ownership and/or control does not result in the creation of a secondary business operation.

Paragraph 8(5)(b) details the conditions under which a business becomes a secondary business operation in the project after the transfer, when the primary business is either a single entity or group of entities (subparagraph 8(5)(a)(i)) or the primary business is a sub-entity of a parent entity (subparagraph 8(5)(a)(ii)). The existence of an associate relationship between the whole of the primary business and the whole of the other business, or between sub-entities of either business (even those unrelated to the transfer of cattle) is sufficient to make the whole of the receiving business a secondary business operation for the purposes of the project. This provision is included because once cattle enter one part of another business operation their movements may not be traceable within the receiving business. It helps avoid splitting of herds to maximise apparent abatement by removing cattle that have lower weight gain (and higher emissions) from the herd.

Two situations involving the creation of a secondary business operation for a primary business that transfers cattle to another (non-project) business are described below.

(i) The primary business operation consists of a single entity or a group of entities.

An example of a single entity would be a single farm involved in a beef cattle business operation under one ABN. An example of a business operation consisting of a group of entities would be an aggregated project consisting of individual cattle business operations collaborating for the purpose of undertaking a herd management project and forming a registered entity to manage the collection and recording of data and to allocate credits.

When the primary business operation transfers cattle to another (non-project) business operation that has an associate relationship with the primary business operation, the whole non-project business becomes a secondary business operation in the project (Fig. 1).

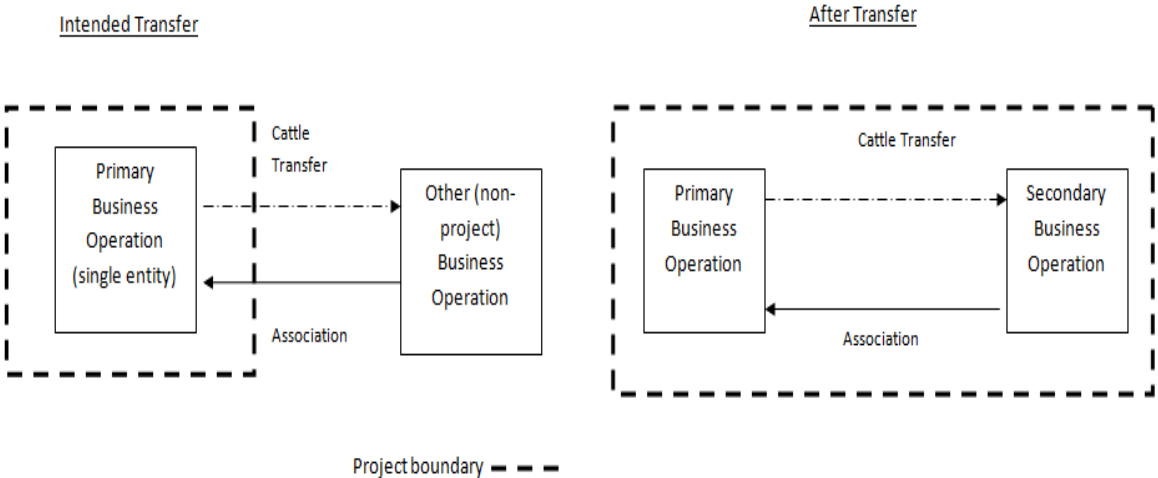


Fig. 1. Effect on the project boundary of livestock transfers between single entity business operations when an associate relationship exists.

(ii) The primary business is a sub-entity of a parent entity and the receiving business is a sub-entity of a parent entity.

Any form of associate relationship between any two parts of each business makes the whole of the business receiving cattle by transfer a secondary business operation of the project.

If the associate relationship is between any sub-entity or entities of the primary business operation and a sub-entity or entities of the (non-project) business operation, then the whole of the other (non-project) business operation becomes a secondary business operation in the project (Fig. 2). The associate relationship may not necessarily be directly between a cattle related entity of the primary business and the parent entity or sub-entity that receives the cattle.

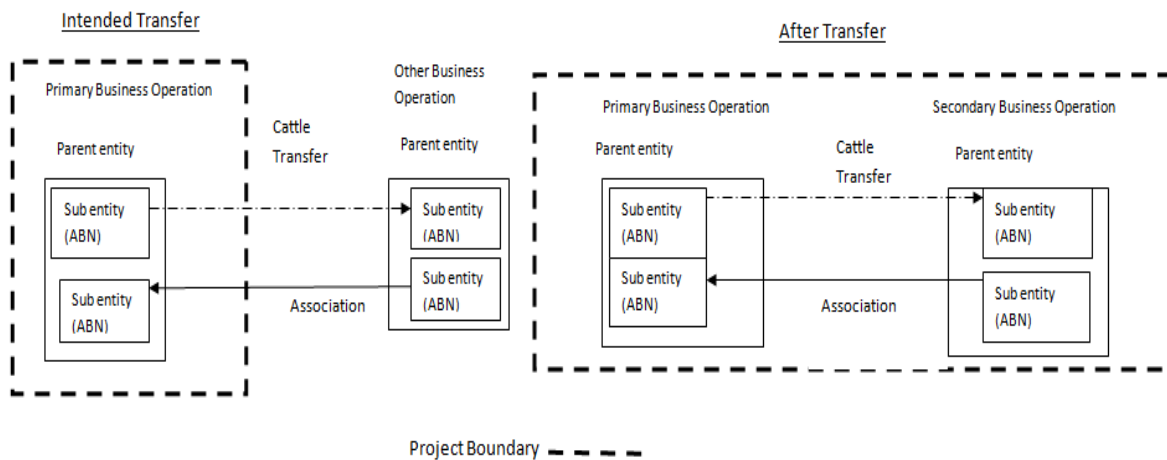


Fig. 2. Effect on the project boundary of livestock transfers between sub-entities of a parent entity when an associate relationship exists between any two sub-entities.

Transfers *from* a sub-entity that is the primary business operation to an associated sub-entity of another (non-project) business sub-entity affect the project boundary. The whole of the other business operation becomes a secondary business operation of the project (Fig. 3).

Intended Transfer

After Transfer

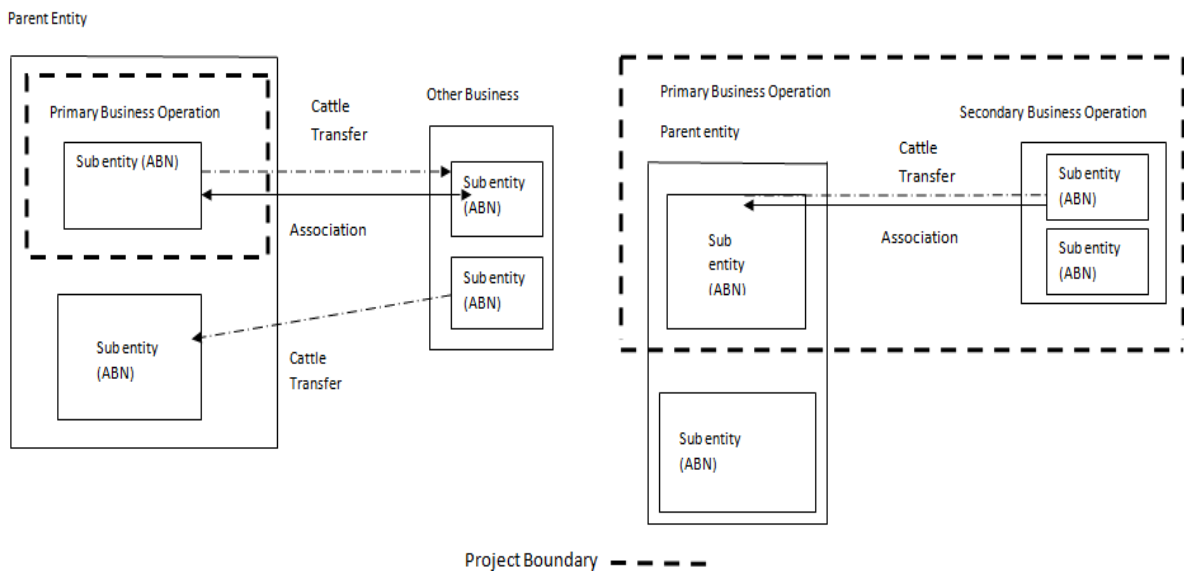


Fig.3. Effect on the project boundary of livestock transfers from a sub-entity of another business to a sub-entity of the parent entity containing the primary business operation.

Transfers *into* a (non-project) sub-entity of the parent entity that includes the primary business operation do not affect the project boundary by including that non-project sub-entity in the project. The non-project sub-entity that is not part of the primary business operation will remain independent since the transfer is transparent and accountable in the livestock inventory of the receiving sub-entity.

Paragraph 8(7)(a) also notes that transfers between eligible herd management projects do not affect the project boundary by creating a secondary business. The transferred cattle are fully accounted for in emissions estimates.

Subsection 8(6) deals with a situation where the primary business is a sub-entity of a parent entity and transfers occur to another sub-entity of the parent entity.

Paragraph 8(6)(a) considers transfers between the primary business operation and another sub-entity of the parent entity where the receiving sub-entity does not have a separate livestock inventory. In this case the whole parent entity becomes a secondary business operation of the project (Fig. 4).

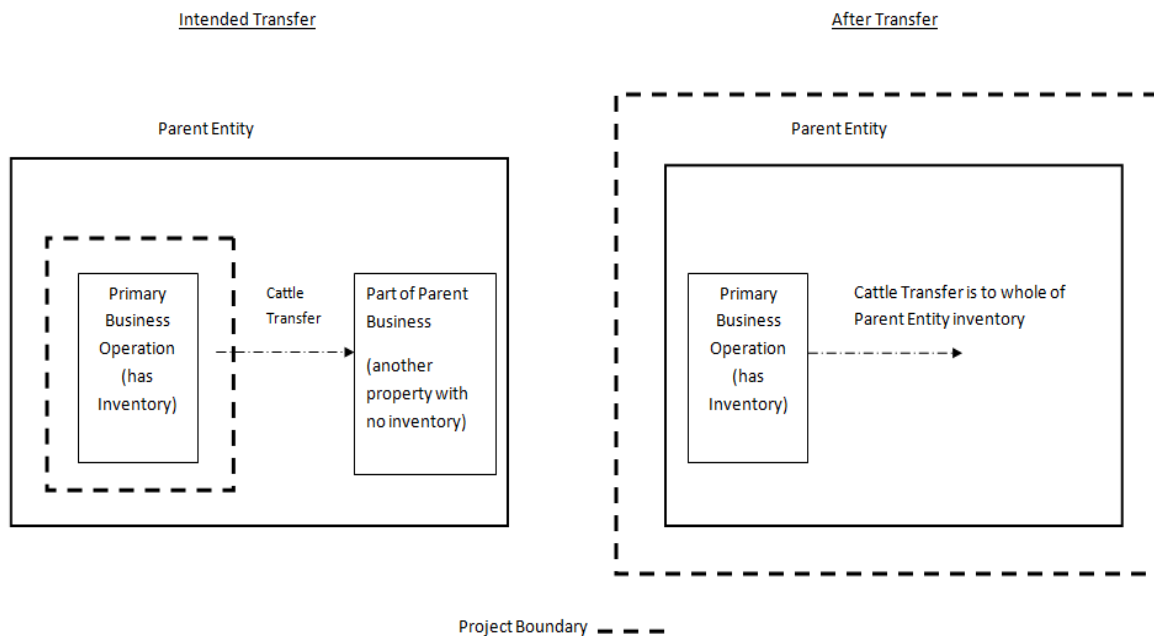


Fig. 4. Effect on the project boundary of livestock transfers between two sub-entities of a parent entity, where the receiving sub-entity has no livestock inventory.

Paragraph 8(6)(b) covers a transfer from the primary business operation to another sub-entity of the parent business having its own livestock inventory. In this case only the receiving sub-entity, not the whole parent business, becomes a secondary business operation for purposes of estimating emissions (Fig. 5).

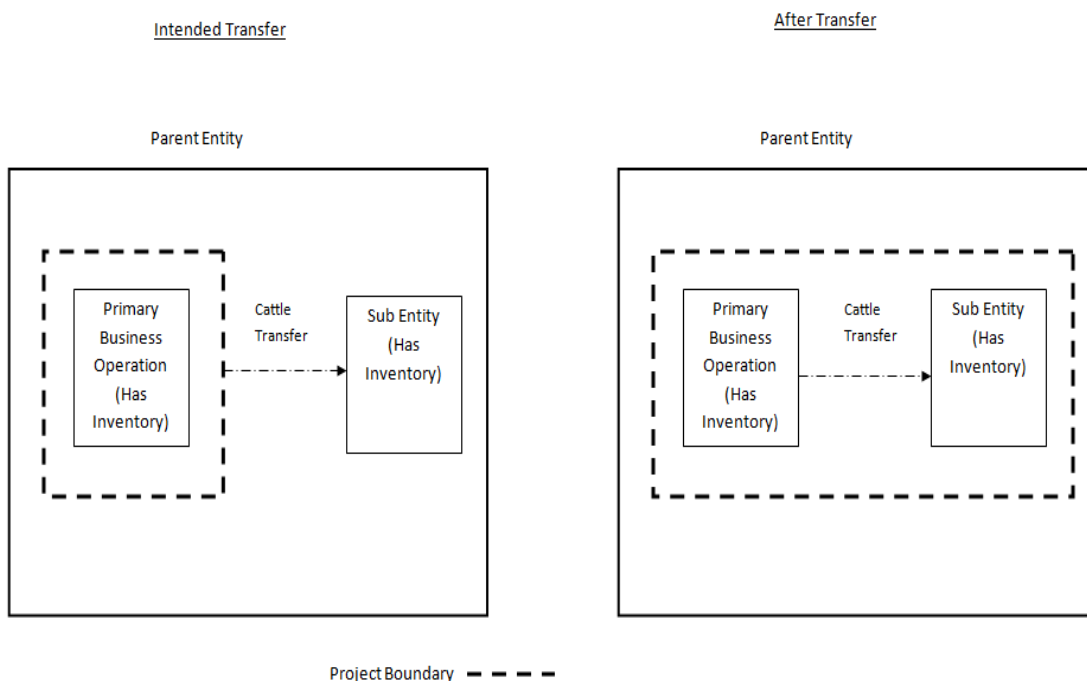


Fig. 5. Effect on the project boundary of livestock transfers between two sub-entities of a parent entity, where the receiving sub-entity has a livestock inventory.

This situation is common in corporate organisations reporting to the Australian Securities and Investments Corporation (ASIC). Under the ASIC reporting framework, accurate estimates are required of cattle numbers and classes in individual parts of a larger business. These operations keep individual inventories of cattle for herds on each property within a larger business. The individual properties may be linked in a transparent way with another business such as a finishing property, which is included in the project as part of the primary business. The provision allows a large corporate organisation to limit the scope of adoption of a project to particular linked parts of its larger parent entity.

Paragraph 8(7)(a) allows exceptions to the provisions of subsections 8(5) and 8(6) where:

- (i) the transfers involve live export or slaughter as soon as practicable after transfer; or
- (ii) the transfers are to another eligible herd management project that is able to fully account for the additional emissions of transferred cattle.

Paragraph 8(7)(b) allows proponents to negate transfers that took place before the beginning of the emission intensity reference period.

Subsection 8(8) provides for a business operation that became a secondary business operation under the project as a result of the provisions of subsection 8(5) to cease to be a secondary business operation if that secondary business operation ceases to be an associate of the primary business. Once the activities that created the secondary business cease, the business is no longer a part of the project, and associated emissions cease to be accounted for.

Subsection 8(9) similarly allows for a business that became a secondary business operation of the project as a result of transfers to it under the provisions of paragraphs 8(6)(a) and 8(6)(b), to cease to be a secondary business operation if such transfers cease and do not recommence.

9 Other eligibility requirements relating to specifying a business operation

Section 9 outlines other eligibility requirements for specifying a business operation that must be met at the time of the section 22 application. The detailed requirements are provided in sections 10 to 13.

10 Separate business operation requirement

Section 10 describes the separate business operation requirement. The requirement is fundamental to the definition of a herd through business records and inventories. A herd management project meets the requirement if:

- (a) the business operation is a registered entity or a group of entities; or
- (b) the business operation is a sub-entity of a parent entity where:
 - (i) the parent entity is a registered entity or group of registered entities; and

- (ii) the sub-entity has a separate livestock inventory from all other livestock inventories maintained by the parent entity; and
- (iii) the sub-entity is responsible for management of its inventory and non-inventory cattle:
 - (A) as a discrete part of a parent entity over time; and
 - (B) in such a way that it is possible to account fully for all movements (transfers and sales) into and out of its livestock inventory, whether to other livestock inventories of the parent entity or to other business operations.

Maintenance of a separate inventory for a sub-entity is sufficient, without registration under an ABN, to qualify a business operation as a separate business.

11 Business continuity requirement

Section 11 sets out the business continuity requirement. This requirement helps ensure that abatement is generated by management changes attributable to the proponent and the business or businesses under their management throughout the project period. A business operation meets this requirement if at the time of the section 22 application:

- (a) it has managed the herd since the beginning of the emissions intensity reference period; and
- (b) it can reasonably be expected to manage the herd, in accordance with any applicable agreement with the project proponent to the end of the crediting period; and
- (c) the information on the cattle movements referred to in Schedule 1 is available from the beginning of the emissions intensity reference period; and
- (d) if the registered entity or entities referred to in section 10 as part of the business operation requirement have varied or vary at any future time in the crediting period:
 - (i) the livestock inventories of the entity and/or sub-entity are transferred in such a way that the resulting total inventory of cattle in the new business operation after the variation reflects the same number and distribution of classes of cattle as existed before the variation; and
 - (ii) the change has no practical effect on the continuity of management of the herd for the purposes of the project.

This requirement means that continuity of management and of records and inventories is required regardless of business structure or registration throughout the period from the start of the emissions intensity reference period to the end of the crediting period (including any time between the section 22 application and the commencement of the crediting period). The provision also allows for flexible business structures and ownership during the project. The provision avoids the potential for a project to involve a herd that has no relationship to a herd (and its associated management approaches) that existed during the emissions intensity reference period (see below).

12 Secondary business operations requirement

Section 12 describes the secondary business operation requirement. Under this requirement, a business operation that ceases to be a secondary business operation under the provisions of section 8 must not recommence activities that would re-establish it as a secondary business. This provision avoids repeated transfers that could obscure the real structure of the herd over time. Even where a new primary business operation is established under different ownership but with the same inventory and management (see paragraph 11(d)), this provision would still apply because the herd in the new business operation would need to be the same one as that existing before the change of ownership. Transfers from the previous primary business operation to another business operation that had previously received cattle but had ceased to do so, could not recommence under the new ownership arrangements.

13 Additional information required in section 22 application

Section 13 provides for additional information requirements in relation to each primary business operation for the section 22 application, as provided for in paragraph 9(b). The information only needs to be provided for those emissions intensity reference period years where there is a change in any of the information required compared to the previous year. The additional information is required to establish clearly the nature of each primary business operation, as distinct from possible secondary business operations. The requirements are as follows.

- (a) If the business operation is a registered entity or group of registered entities, the following details of the entity or entities could be provided to describe the entity and sub-entities:
 - the Property Identification Code(s) (PIC(s)) nominating the location of the primary business;
 - PICs for all other properties on which the project herd is managed as a secondary business;
 - ABN, details of management and the activities that comprise the business of the entity or group of entities;
 - a declaration by the business account of the associates of the business operation.
- (b) If the business operation is a sub-entity:
 - (i) details of the registered entity or registered sub-entities that make up the parent entity. This information will need to be in sufficient detail to establish relationships between sub-entities of a parent entity that indicate whether an associate relationship exists;
 - (ii) a description of the sub-entity in terms of its PIC, activities, management, associate relationships and ABN or Australian Company Number (ACN). The provision requires compliance with subparagraphs 10(b)(ii) and

10(b)(iii) in regard to the maintenance of discrete inventories of livestock and independence of management. Therefore a description of how the entity maintains a discrete inventory and management system that is readily identifiable from those of other sub-entities or the parent entity would be required;

- (iii) a declaration by the proponent of any transfers during the emissions intensity reference period of cattle to another sub-entity of the parent entity or to the parent entity. A description of each other relevant sub-entity is also required.
- (c) If the entity or entities making up the business operation, or the parent entity of the business operation, have changed since the beginning of the emissions intensity reference period, a description of the changes and details of all entities is required. This provision is required only for the years in which changes were made, but should show the original and new structures and ABNs or ACNs.
- (d) The years constituting the emissions intensity reference period for the herd.
- (e) Details of any business operation that was a secondary business operation for the herd during the emissions intensity reference period.
- (f) The land on which the cattle of the herd grazed during each year of the emissions intensity reference period other than under an arm's length agistment arrangement. There is no requirement to link a herd to a particular land area for the duration of the project. Identifying the land on which the cattle grazed assists in determining a herd for the emissions intensity reference period. The provision links a herd to a primary business operation by way of linkage to an initial land area.
- (g) To the extent possible at the time of application, details of the land on which the cattle of the herd are expected to graze during each year of the crediting period, other than under an arm's length agistment arrangement. This information is relevant to the specification of a project Region, which is a requirement for abatement calculations (see below). It is also applicable to project activity requirements (see paragraph 17(2)(d)). The eligibility requirements for defining a herd recognise that grazing of cattle is dynamic and that land may be owned or leased during the project, and bought or sold. Therefore there is no requirement that the land used in the crediting period be the same land used in the emissions intensity reference period.

The provisions in paragraphs 13(f) and 13(g) around arm's length agistment arrangements, compared to other land used for grazing, separate an arm's length agistment arrangement involving parties acting independently from a situation of co-grazing where surplus feed is not necessarily available. An agistment arrangement that is not at arm's length could include, for example, an arrangement between two properties owned by the proponent. The effect of requiring an arm's length arrangement is that a proponent cannot create a contract

for an agistment arrangement between two associated entities, simply to avoid the creation of a secondary business operation (see section 8). Any arm's length agistment arrangement must be formalised in a written contract.

14 Requirement relating to emissions intensity reference period

Section 14 sets out the requirements for determining the emissions intensity reference period, which is the historical period preceding the project. Information from this period is used to estimate historical emissions intensity and calculate baseline emissions.

Subsection 14(1) provides that the emissions intensity reference period must comprise three of the seven years immediately preceding the date of the section 22 application. A period of three years is required to provide a reasonable estimate of emissions intensity.

Records of LWG are required to determine emissions intensity. Allowing selection of three years from a seven-year period recognises that the required yearly records may not be available for a particular year.

Subsection 14(1) provides that each of the three years making up the emissions intensity reference period must have LWG values greater than zero for each herd in the project. This requirement avoids distorting emissions intensity estimates for the three year emissions intensity reference period, which could occur for example through selecting one or more years where LWG was negative.

Subsection 14(2) provides that the emissions intensity reference period must comprise the three years with LWG greater than zero that are closest to the date of the section 22 application. This requirement avoids selection of years based on LWG values, which could influence emissions intensity estimates.

The three years making up the emissions intensity reference period need not be consecutive, and each herd in a project may have different emissions intensity reference periods. This allows proponents flexibility if a particular year in the last three years of the seven-year period does not have positive LWG data.

Subsection 14(3) defines annual LWG for the herd as the LWG calculated using Equation 5 (subsection 21(4)).

15 Requirements relating to the management of herds

Section 15 sets out the types of cattle eligible for a herd management project.

Subsection 15(1) requires that only beef cattle herds that are grazed in Australia may participate in eligible offsets projects.

Subsection 15(2) requires that the majority of feed for the herd must come from grazing on pastures (which may be naturalised, improved or native) or from forage crops (e.g. grazing oats, grazing triticale, forage sorghums). In the Herd Management Calculator (see below), the extent of supplementation is thus limited to 50% of feed intake.

Subsection 15(3) requires an eligible herd to be managed in a way consistent with one of the following:

- (a) ANZSIC class 0142 (beef cattle farming); or
- (b) ANZSIC class 0144 (sheep-beef cattle farming); or
- (c) ANZSIC class 0145 (grain-sheep or grain-beef cattle farming).

These ANZSIC classes provide standard classifications for different types of cattle grazing based activities. The first note to section 15 notes that herds managed in specialised feedlots (ANZSIC class 0143; beef cattle feedlots) are not eligible. Feedlot cattle are not eligible as their diets consist of high levels of dry matter digestibility (DMD) and crude protein (CP) supplied via hand or mechanical feeding and they spend little to no time grazing on naturalised pasture.

The second note to section 15 recognises that in the normal course of managing a herd, some individual animals will leave the herd and some will be added to the herd.

16 Animal identification requirement

Section 16 sets out requirements for identifying animals in a herd, including the livestock class and date of entry (e.g. when bought) or discovery (e.g. when born) in the herd. For each year in the emissions intensity reference period and crediting period, the project proponent must be able to identify the date at which an individual animal, as a member of a group of animals of a particular animal class, enters the herd. This could be done using, for example, NLIS tag numbers recorded as the date of entry in a herd book. Identification of entry dates is required so that the duration of emissions of an animal within a group of sale animals, for example, can be accurately estimated.

17 Project activity

Section 17 sets out the requirements for eligible project activities.

Subsection 17(1) requires that proponents must undertake at least one **project activity** for each year in the crediting period and for each herd in a project.

A project activity is an agricultural practice that complies with the requirements of subsection 17(2).

Paragraph 17(2)(a) requires a project activity to be an agricultural practice that can reasonably be expected to reduce emissions from the herd through one of the measures specified in paragraphs 6(1)(a) to (d).

Project activities may include, but are not limited to:

- feeding supplements containing higher levels of DMD and CP, particularly in dry seasons when naturalised pasture can have low nutritional value;
- changes that influence the age of the herd, such as culling of unproductive animals or reducing the number of breeders to produce the same weight of livestock sold or a

higher survival rate of weaners;

- installing new fencing to ensure joining can be timed to occur when feed is most plentiful, thereby improving the survival and health of heifers and calves; and
- genetic improvements that increase the productivity of the herd.

Proponents may choose to undertake multiple project activities, but only one project activity is required for a herd management project to be eligible. As indicated in the note to subsection 17(1), if a project involves more than one herd, different project activities may be adopted for each herd. In addition, project activities can change over time as long as they comply with subsection 17(2).

Paragraph 17(2)(b) requires that a project activity must either:

- (i) have not been undertaken during the emissions intensity reference period; or
- (ii) be a variation of a practice that was undertaken during the emissions intensity reference period.

A variation of a practice that was undertaken during the emissions intensity reference period could be, for example, a substantial increase in the number of cattle fed supplements. It may also involve the substantial expansion or rehabilitation of improved pastures or an intensification of an existing practice, e.g. a doubling of the establishment of watering points from previous practice. The proponent must be able to demonstrate in the section 22 application that the extent of the proposed variation can reasonably be expected to reduce emissions from cattle.

Allowing for activities that are variations of previous practices recognises that an increase in production efficiency of the herd can be achieved through incremental improvements to existing management practices, beyond the level that would otherwise have occurred in a business as usual situation.

Paragraph 17(2)(c) provides that feeding non-protein nitrogen to a herd is not an eligible project activity. The feeding of non-protein nitrogen supplements for cattle includes urea and nitrates. Urea is a commonly used supplement in some regions, while nitrates are not commonly used. The *Carbon Credits (Carbon Farming Initiative) (Reducing Greenhouse Gas Emissions by Feeding Nitrates to Beef Cattle) Methodology Determination 2014* provides for crediting emissions reductions from projects that feed nitrate supplements to cattle, either in place of, or in addition to, urea. That determination provides specifically for this particular activity, and therefore the activity is not eligible for herd management projects. However, the Determination does not preclude feeding of non-protein nitrogen to a herd involved in a herd management project. Separate projects using the two determinations could potentially be undertaken for the same herd if all requirements of both determinations can be met.

Paragraph 17(2)(d) provides that simply moving the herd to graze on a different area of land is not an eligible project activity. Moving a herd to a different area of land does not meet the Determination's requirements regarding agricultural practices that can reasonably be

expected to reduce emissions. However, the Determination does not preclude grazing a herd on a different area of land if an eligible agricultural practice is undertaken.

Subsection 17(3) provides that at least one agricultural practice must be nominated in the section 22 application.

Subsection 17(4) provides that, for each practice nominated, the section 22 application should include the following information to demonstrate that each practice can reduce emissions through one of the measures in subsection 17(1) and meet the other requirements of subsection 17(2).

- (a) A description of the practice.
- (b) An explanation of how the practice can reasonably be expected to reduce emissions from the herd through one of the measures specified in paragraphs 6(1)(a) to (d).
- (c) Evidence to support the explanation. Types of evidence could include scientific papers, industry guidance documents or state/territory advice/guidelines amongst others. For example, state and territory government agencies and organisations such as Meat and Livestock Australia (MLA) publish information on a range of improved herd management practices, and industry advisers may provide written advice in support of a practice.
- (d) For any practice not undertaken in the emissions intensity reference period, a statement indicating that fact.
- (e) For any practice that is a variation of a practice undertaken in the emissions intensity reference period, a description of the previous practice and how the practice represents a variation of that practice.
- (f) A statement that the practice does not consist of feeding non-protein nitrogen to a herd.
- (g) A statement that the practice does not consist only of grazing the herd on a different area of land.

Subsection 17(5) provides that, where a subsequent decision is made to implement a different agricultural practice as a project activity, the practice must also meet the requirements of subsection 17(2).

A suggested approach for describing project activities is provided in Table 1. The examples included are indicative, and should not be considered as recommended actions or a comprehensive list.

Proponents are not required to provide information on other activities undertaken as part of managing the herd that are not directly related to the project.

Table 1: Suggested approach for describing project activities in accordance with eligibility requirements

Project activity	Corresponding activity in the emissions intensity reference period	How is this a new practice not previously undertaken or a variation of a previous practice?	How the project activity can reasonably be expected to reduce emissions	Supporting evidence of the potential effect on emissions	Evidence to verify the action was undertaken*
Supplement feeding	Pasture feeding only	Feed is purchased and supplied to the herd during the dry season, improving the diet compared to the previous practice of providing pasture only.	Improved diets, particularly in the dry seasons, can increase LWG and prepare cattle for market at an earlier age. Better nutrition also improves animal health, survival and reproduction; reducing the proportion of unproductive animals in the herd.	Industry guidance documents Journal papers Documented consultant advice	Invoices and receipts from feed suppliers Management records of feeding
Phosphorus supplements as required	Little or no Phosphorus supplementation	Phosphorus supplementation in the diet delivers productivity benefits particularly in young stock.	Supplementation in phosphorus deficient areas improves growth rate, reducing time to slaughter. It increases heifer survival, reduces the average age of the herd and improves survival to weaning. It also results in a change in herd structure that increases the proportion of animals in the herd with higher LWG rates.	Documented consultant recommendation Journal papers Industry guidance documents	Invoices /receipts from feed suppliers Management records of the amount and timing of feeding
Installation of new fences to enable improved management of joining time	Minimal fencing and limited management of joining time	New fences allow bulls to be separated from heifers and more effective control over joining.	By controlling joining calves can be born when feed is available increasing survival of heifers and calves to weaning. Survival of heifers/calves reduces the average age of the herd.	State or territory government information materials	Invoices/ receipts for purchase of fencing materials Invoices from fencing contractor

Project activity	Corresponding activity in the emissions intensity reference period	How is this a new practice not previously undertaken or a variation of a previous practice?	How the project activity can reasonably be expected to reduce emissions	Supporting evidence of the potential effect on emissions	Evidence to verify the action was undertaken*
Greater density of watering points	Low watering point density resulting in overgrazing areas close to water and uneaten feed at the outer limits of stock movement.	The rate of watering point establishment is increased, improving access to a wider feeding area and providing faster turnoff.	More watering points allow the herd to graze over a greater distance, increasing the rate of feed intake and reducing wasted energy in seeking water and feed. The outcomes reduce the time to slaughter, increase survival of calves and heifers, resulting in a reduced average age of the herd and a higher proportion of animals with higher LWG rates.	Published industry case studies	Invoices/ receipts for purchase of materials used to store or distribute water Invoices from contractor Date-stamped photographs of watering point installation
Use of Estimated Breeding Values to select bulls	Use visual, subjective assessment for selection.	Increased efficiency of feed conversion to reduce the average number of days from birth to slaughter in the herd.	Bulls selected using estimated breeding values will produce progeny with more efficient feed conversion, reducing number of days from birth to slaughter.	Published research	Invoices/receipts and catalogues with genetic information on bulls
Increased planting of improved pastures	Smaller areas of improved pastures, with pastures dominated by native species.	Improved pastures are of better nutritional quality and result in increased cattle growth rates.	Increase the percentage of improved pastures to improve the quantity and quality of pasture per hectare, thus increasing production efficiency and reduce the number of days from birth to slaughter.	Published studies	Invoices/receipts for purchase and planting of improved pasture species

*Evidence verifying that actions were undertaken is not required to meet eligibility requirements but must be provided when reporting for the project. Examples have been included to show how the suggested approach could also assist with meeting reporting, record-keeping and monitoring requirements (see Part 5).

18 Project not to involve feeding of cattle on cleared land

Subsection 18(1) provides that a herd management project must not involve the feeding of cattle on land that has been, for the purposes of the project, partially or wholly cleared of perennial woody vegetation.

This requirement avoids the potential for clearing to be undertaken for the specific purpose of carrying out herd management project activities, such as pasture establishment. Clearing woody vegetation releases carbon dioxide that had previously been sequestered in the vegetation biomass. If the clearing of vegetation occurred for the purposes of the project then this release of carbon would offset project emissions reductions.

Subsection 18(2) provides an exception whereby a project could be undertaken on land where clearing was required by law. For example, the clearing of a declared woody weed species may be required by law. In this case, the land could be used for project activities following clearing.

Subsection 18(3) provides that where land has been partially or wholly cleared of woody perennial vegetation and the land would have been cleared if the project had not been undertaken, then the clearing is taken not to have been for the purposes of the project. This provision recognises that clearing for agricultural purposes may be undertaken, for example, in accordance with a previously approved vegetation management plan or clearing permit providing for clearing over a period of time. The Determination does not prevent such activities that would have been undertaken in the normal course of business.

Part 4 Net abatement amount

Division 1 The net abatement amount

19 Method for calculating the net abatement amount

Paragraph 106(1)(c) of the Act provides that a methodology determination must specify how to calculate the carbon dioxide equivalent net abatement amount for the project in relation to a reporting period.

The equations in subsections 19(2) and 19(3) set out the calculation of the carbon dioxide equivalent net abatement amount for the project.

The carbon dioxide equivalent net abatement amount is calculated as the sum of abatement for all herds in the project across all years in the reporting period (Equation 1).

Equation 2 calculates the carbon dioxide equivalent net abatement amount for each herd and for each year in the reporting period, as used in Equation 1. These equations demonstrate how to calculate abatement as the difference between the baseline emissions for each herd and each year of the reporting period and the project emissions for each herd and each year of the reporting period.

These calculations show the change in total emissions as a result of the project. Changes in emissions intensity resulting from project activities are incorporated in the calculation of baseline emissions (see section 21).

In some circumstances, emissions for a year in a reporting period could be higher than baseline emissions, as a consequence of natural variation or a disturbance event. For example, cattle scheduled to be sold or transferred at a particular time may need to be retained for a longer period because their condition is poor due to a drought. Any annual abatement amounts for herds that are less than zero are not deducted from the carbon dioxide equivalent net abatement amount. Instead, any negative abatement amounts are taken to be zero. Abatement is calculated by summing all amounts that are zero and greater than zero. This means that proponents are not liable for an increase in emissions in a project year.

Environmental variations could also result in positive effects on emissions reductions. The exclusion of negative abatement amounts from the net abatement amount calculation would generate an over-crediting risk in the absence of a discount applied to positive abatement amounts. In the Determination the exclusion of negative abatement amounts from the net abatement amount calculation is possible because of the application of a 4% variance discount on positive abatement amounts to the baseline. The application of this discount reduces the risk that abatement is generated, and consequently credits are issued, for an emissions decrease that is the consequence of natural variation, and not improved management.

20 Gases accounted for in abatement calculations

Section 20 lists the greenhouse gases and emissions sources that are accounted for in order to determine the net abatement amount for a herd management project. The emission sources and greenhouse gases that need to be taken into account when calculating the carbon dioxide equivalent net abatement for the project are enteric methane emissions and nitrous oxide emissions from dung and urine.

A number of emissions sources are excluded from the abatement calculations, for the following reasons.

- Emissions from fossil fuel use in farm vehicles and equipment. These emissions are small relative to livestock emissions. Published information shows that use of fossil fuels for all purposes in beef production represents approximately 2% of enteric emissions of an adult animal. Improvements in efficiency of diesel engines contribute to this low proportion. Any change in emissions from these sources due to project activities would be immaterial.
- Emissions from the production and transport of supplementary feed, where feed supplementation is a project activity. The cost of growing and transporting cattle feed, particularly to northern Australia, is considerable compared to benefits and there is little evidence of this type of feeding except when driven by drought situations. In southern Australia the emissions from this source would occur anyway for alternative markets in the absence of the project.
- Emissions from animal feed production and transport from off-site sources. Such emissions are highly variable and difficult to quantify. For example, nitrous oxide emissions associated with irrigated grain production will be higher than for dryland production because of the use of higher rates of nitrogen fertiliser. In addition, proponents may not be able to identify the source of feed supplements, for example when purchased as bulk grain.
- Emissions from nitrogen fertilisers used in pasture establishment are not likely to be material because most pastures used in beef cattle production rely on legumes (which do not require nitrogen fertiliser) for their nitrogen requirements.
- Emissions from the operation of the property and routine marketing of cattle such as cattle breeding, husbandry, transport and processing. These emissions will not change materially between the baseline and project. Projects are likely to be managed within a given property carrying capacity and focus on the production of the same or fewer numbers at the same or higher LWG in less time.

Division 2 The baseline emissions

21 The baseline emissions

Section 21 provides that the baseline emissions for each year in the reporting period for each herd in the project are estimated from methane and nitrous oxide emissions for each herd for every year in the reporting period that would have occurred had the project not been implemented.

To estimate avoided emissions, a baseline of emissions for the amount of LWG produced in the reporting period is required. Subsection 21(1) Equation 3 provides that baseline emissions are estimated by multiplying LWG for each herd for each project year by historical annual emissions intensity of LWG, and applying a variance discount of 4%.

Beef cattle production records for the period 1994-2013 indicate that there is an approximate 8% annual variation in LW production for export or slaughter. The 4% discount on the baseline assumes that approximately half of this variation is due to natural variation beyond proponents' control and half is due to management factors. The application of this 4% variance discount helps to ensure that abatement amounts exclude emissions reductions that may have occurred due to environmental variation.

Subsection 21(2) Equation 4 provides that historical annual emissions intensity for use in Equation 3 is calculated as follows.

- (a) For the emissions intensity reference period:
 - (i) calculate the total emissions, in t CO₂-e, of the herd for each of the three years of the emission intensity reference period;
 - (ii) estimate LWG in each of the three years of the emissions intensity reference period;
 - (iii) sum the total emissions of the herd for all three emissions intensity reference years;
 - (iv) divide the total emissions in the emissions intensity reference period by the sum of the total herd LWG for each year of the reference period to calculate historical emissions intensity.

Using an emissions intensity approach for determining baseline emissions means that the herd size, composition and environmental conditions are the same for the baseline emissions and the project emissions in each year in the reporting period. The approach helps to remove the influence of environmental variation on emissions estimates so that the effects of project activities on emissions can be recognised.

Subsection 21(3) provides that the calculations in Equation 4 assume that the herd's diet in the emissions intensity reference period consisted entirely of pasture from the region primarily occupied by the herd. This assumption is made because it is unlikely that historical data for alternative diets, particularly the type, quality and quantity of supplements, would be available. However, the identification of the region is a requirement for the purpose of

calculating abatement, and enables the influence on emissions of the feed type in the selected region to be automatically included in calculations (see section 29).

Subsection 21(4) Equation 5 provides for calculations to determine LWG for each herd for each year in the emissions intensity reference reporting periods. The LWG for each year is the total LW in tonnes of animals in the herd at the end of the year and animals leaving the herd during the year, less the total LW of animals present in the herd at the beginning of a year and entering the herd during the year.

Division 3 The project emissions

22 Project emissions

Section 22 provides that emissions of methane and nitrous oxide resulting from the project must be calculated for each year in the reporting period and for each herd. Project emissions will comprise the total emissions of enteric methane and nitrous oxide from dung and urine from all animals in each herd.

Division 4 Use of Herd Management Calculator to perform calculations

23 Requirement to use Herd Management Calculator

Paragraph 23(a) requires that proponents use the *Herd Management Calculator* for calculations in relation to each herd and for each year in the crediting and emissions intensity reference periods. The Herd Management Calculator is available on the Department's website.

Paragraph 23(b) requires all inputs to be entered into the Herd Management Calculator in the manner described in the Calculator. Schedules 1 and 2 specify the required inputs. The Herd Management Calculator includes all the calculations required to determine the net abatement amount in accordance with the Determination. This Calculator will use data inputs made by proponents to calculate emissions for the project automatically, and the change between baseline and project emissions. Emissions are calculated for methane emissions from enteric fermentation (according to diet, duration of emissions, animal numbers and class, LW and LWG) and nitrous oxide emissions from dung and urine, as listed in section 20.

The Herd Management Calculator has two main entry pages for inputting herd data. Entry page 1 requires data on cattle present in the herd for the whole of the year, including numbers and LW of cattle for each year of the emissions intensity reference and project periods. Data on cattle entered in the first entry page corresponds to the data for Item 2 of Schedule 1. Data for this entry page is only available at the end of the project year when both the opening numbers and LW by class of animals identified as being in the herd at the start of the year and their corresponding closing weights and numbers at the end of the year are known.

Data entry page 2 is for cattle that are in the herd for only a part of the emissions intensity reference period or project year. These cattle may be present at the beginning of the year, the

end of the year or during the year. They include births, transfers within the herd or into or out of the herd to non-project herds, purchases and sales of cattle. Data on cattle entered in the second entry page corresponds to the data for Items 3–7 of Schedule 1.

For both data entry pages, factors such as deaths or unaccounted losses or gains are estimated by difference from the opening stock, purchases, sales, births and closing stock (for data entry page 2) or opening stock and closing stock (for data entry page 1). In the Herd Management Calculator, all deaths are assumed to occur at the midpoint of the reporting year and are estimated by difference between opening stock, transactions and closing stock. This assumption is adopted because proponents are unlikely to be able to determine the date of death of all animals with reasonable accuracy.

Paragraph 23(c) requires that calculations using factors or parameters from an external source are to be taken from the version of the source in force at the end of the reporting period. Examples of such factors or parameters are the global warming potentials for methane and nitrous oxide prescribed by the *National Greenhouse and Energy Reporting Regulations 2008*.

24 Assessment of average liveweight for inputs into the Calculator

Accurate estimates of LW of all classes of animals from the beginning of the emissions intensity reference period to the end of the crediting period are necessary for estimating abatement. Section 24 provides the framework for grouping animals to assess average LW for inputs to the Herd Management Calculator. This framework informs detailed provisions for assessing average LW for the crediting period and emissions intensity reference period in sections 25 and 26 respectively.

Subsection 24(1) provides that, for specified inputs in Schedule 1, each livestock class of a group or subgroup of animals is an **input group**. The dates of the arrival and departure of the animals, which are required inputs in Schedule 1, are defined as **input dates**.

Subsection 24(2) allows for estimating LW of a class of animals in an input group either as a single group or, for greater accuracy, several **weighing groups** according to the dates of arrival in, and/or departure from, the herd. A weighing group is an input group, or a part of an input group, for which LW is determined separately. A project proponent might wish to divide an input group into different weighing groups if they intend to apply different methods for weighing to different animals in the input group.

Example 1 in the notes at the end of subsection 25(1) demonstrates how this provision gives greater accuracy of estimation according to age and date of arrival into and departure from the herd.

Subsection 24(3) provides that the average LW of animals in several weighing groups is the weighted average of the weights in each group.

It is assumed that normal best practice in weighing will involve prior calibration of scales using standard weights according to the manufacturer's directions.

25 Inputs in the crediting period

Section 25 sets out the methods and timing for ascertaining LW in the crediting period. In general, direct measurement is required, except for mature weight animals and a default for weight at branding, tagging or other first-time identification procedure. One of the following methods is to be used.

Paragraph 25(1)(a) provides for weighing all animals in a weighing group within one month before or after the input date and calculating the average. This timing is required because daily LW changes over greater periods would result in unacceptable errors in estimation of emissions.

Paragraph 25(1)(b) allows for the use of a statistically valid sampling procedure as an alternative to weighing all animals in a weighing group, with the same timing requirements as above. Further details on a suitable procedure are given under section 30 of this Explanatory Statement. The accuracy required in sampling is not prescribed, because it will vary according to local industry practice and is usually determined according to environmental and management conditions at a financial audit. The note to subsection 25(1) indicates that values ascertained consistently with Accounting Standard AASB 141-*Agriculture* would be expected to meet the requirements of this method. Proponents may wish to seek the advice of a financial auditor with experience of local industry standards when determining the required degree of precision in sampling.

Paragraph 25(1)(c) allows the LW for each class of animals in the herd at the beginning of the first year of the crediting period to be determined from the weighing group rather than separate groups. This approach applies average LW of all animals in the herd, calculated in accordance with subsection 25(2). This provision recognises that information to identify weights of separate groups from historical data may not be available and that accurate measurement of a starting weight is essential.

Paragraph 25(1)(d) allows for the use of LW at the end of the previous year as an adequate estimate of LW at the beginning of the next year. The paragraph refers to subsection 25(3), which requires that when this method is used all animals in the weighing group must have been included in the input group at the end of the previous year.

Paragraph 25(1)(e) provides for the use of hot standard carcass weight of cull animals in the reporting year (converted to LW using the dressing out percentage supplied by the abattoir) as an exception to the use of direct measurement in the crediting period. This covers bulls and cows greater than 3 years of age that are not normally weighed because they usually reach a mature weight at 3 years old. Subsection 25(4) provides further details on this method.

Paragraph 25(1)(f) allows an exception to direct measurement on farm. Instead, measured weights from purchase and sale documentation may be used where such animals are bought or sold within one month before or after the input date.

Paragraph 25(1)(g) recognises that a weight at branding/tagging of newly born animals (branding/tagging is usually undertaken at 6 to 8 weeks after birth) is not usually taken and allows for a default weight of 75 kilograms (kg) to be entered into the Herd Management Calculator.

Two examples of application of methods for ascertaining inputs are provided under subsection 25(1).

Subsection 25(2) allows for calculating average LW of a livestock class at the beginning of the crediting period by weighing either all the animals in the class or a sample of the animals in the class. The provision is made to arrive at a measured weight for the beginning of the crediting period but can apply, as noted in paragraph 25(2)(b), for other input dates.

Subsection 25(3) deals with the provisions of paragraph 25(1)(d). It allows weight at the end of one year to be used as an estimate of weight at the beginning of the following year if the weighing group was accounted for in the input group entered at the end of the previous year. Any sales or transfers out of the weighing group at the end of the previous year would negate this option, because the average weight of the group would change between the end of the previous year and the beginning of the new year.

Subsection 25(4) provides, for the purposes of paragraph 25(1)(e), for estimating LW of mature cows and bulls using hot standard carcass weight and either an actual dressing out percentage of cull animals or a default parameter of 55% dressing out weight. The provision recognises the use of the 55% default in the industry and the possibility that individual abattoirs may not report dressing out percentages. Dressing out percentages reflect the carcass resulting from removal of particular portions of the animals such as the hide, hooves, head and tail and a weight taken before chilling. LW may be calculated by dividing the hot standard carcass weight by the dressing out percentage expressed as a fraction.

26 Inputs in the emissions intensity reference period

Subsection 26(1) provides a hierarchy of methods to estimate LW for the emissions intensity reference period. The methods include options recognising that direct measurements using on-farm scales may not have been made. The first method in the hierarchy for which relevant data is available must be used.

Paragraph 26(1)(a) provides that any of the methods available for the crediting period can be used.

Paragraph 26(1)(b) provides the option of converting total value and animal numbers from sales or purchase documents to an average LW using an indicator price, as described in subsection 26(2). Animals in the weighing class must have been bought or sold within one month before or after the input date.

Paragraph 26(1)(c) allows for the use of a linear projection between a beginning and an ending weight to estimate a weight during the emissions intensity reference period, particularly for the beginning and end of each year. Further, the projection can be between two points up to 12 months before the beginning or after the end of the emissions intensity reference period. The method involves subtracting an assumed birth weight of 35kg from an opening weight and then calculating the liveweight gain rate per month between that modified opening weight and the end weight. A weight at any time after the opening weight date is then derived by multiplying the liveweight gain rate by the number of months involved.

Paragraph 26(1)(d) allows for an estimate of average LW of a class to be obtained using the method described in subsection 26(4) from an average of data from either all sales, purchases or an indicator price. This option can be used to provide an estimate of LW for the beginning of the emissions intensity reference period when no scale weights, sales or purchase information or hot standard carcass weights for the first emissions intensity reference period year is available.

Subsection 26(2) describes the use of an indicator price from MLA as the industry marketing body under the *Australian Meat and Live-stock Industry Act 1997*. The numbers sold and the total value of sales from receipts, available from the MLA website, may be used to estimate LW. The data can be used to determine the appropriate average price for the class of animal in the nearest reference sale location to the project in a particular week of the year in which the animal was sold. Prices are available for young cattle (calves and vealers), trade steers, medium steers, medium cows and feeder steers.

Subsection 26(3) allows for the use of the default 55% dressing out parameter in combination with an indicator price where the price is quoted on a carcass weight basis.

Subsection 26(4) describes a method for estimating average LW of a class for an input date in the emissions intensity reference period from the average of all purchase, sale or indicator price data. As noted above, this method is a last option where application of the Determination would otherwise not be possible until new data had been collected.

Part 5 Reporting, record-keeping and monitoring requirements

Division 1 Operation of this part

27 Application

Subsection 106(3) of the Act provides that a methodology determination may require the project proponent of an eligible offsets project to comply with specified monitoring, record-keeping and reporting requirements.

Under Parts 17 and 21 of the Act, a failure to comply with these requirements may constitute a breach of a civil penalty provision, and a financial penalty may be payable.

The reporting, record-keeping and monitoring requirements specified in Part 5 of the Determination are in addition to any requirements specified in the Act and subordinate legislation.

Proponents are required to monitor and keep records to demonstrate that the project meets the eligibility parameters listed in Part 3 of the Determination.

Division 2 Offsets report requirements

The Act and subordinate legislation provide for flexible reporting periods. Proponents should be aware that the Act and subordinate legislation may also specify other reporting and notification requirements affecting the Determination.

28 Information in each offsets report

Section 28 requires each offsets report to include information on:

- (a) the project activity undertaken in each year in the reporting period;
- (b) all inputs and outputs from the Herd Management Calculator for the reporting period;
- (c) any entity that became a secondary business operation entity during the reporting period;
- (d) any entity that ceased to be a secondary entity in the reporting period; and
- (e) a statement that:
 - (i) identifies the land on which the inventory cattle grazed in each year of the reporting period (other than land on which the cattle grazed under an arm's length agistment arrangement); and
 - (ii) indicates that the land was not cleared, for the purposes of the project, partially or wholly of perennial woody vegetation except as allowed under section 18.

Proponents should assume that any data presented on the herd, the associated business operation or the land associated with such operations may be subject to audit and a request for independent data and information for verification.

Note that under the Act, a proponent has up to six months after the end of any reporting period to provide the project report. This provision is particularly relevant to multiple herds and to aggregated projects, because, for example, an aggregator may have project herds to report on that have different dates for the end of the project year.

Division 3 Record-keeping requirements

The effect of paragraph 106(3)(c) of the Act is that a methodology determination may require the project proponent of an eligible offsets project to comply with specified record-keeping requirements.

The *Carbon Credits (Carbon Farming Initiative) Rule 2015* requires a wide range of records relating to the establishment, operation, abatement claimed and events affecting the project, be kept. In addition to this general requirement, section 29 of the Determination sets out specific record-keeping requirements for a herd management project in relation to supplementary feed in the crediting period.

29 Records that must be created and kept for purchased feed

Subsection 29(1) requires that records must be kept for activities involving a change in the diet of the herd or part of the herd when the change in diet involved purchased feed.

Subsection 29(2) requires that if feed was purchased from a commercial supplier, a fodder declaration form, commodity vendor declaration form, or equivalent record containing data on the CP and DMD of the feed constituting the dietary change must be kept.

Subsection 29(3) requires that if the feed was purchased from a non-commercial supplier, the proponent must keep a purchase invoice that describes the type of purchased feed. For example, lucerne hay, sorghum silage, distillers grains or feed barley are some of the feed options available. This information is used in the Herd Management Calculator through default tables to estimate the change in emissions related to modified diets.

Division 4 Monitoring requirements

Paragraph 106(3)(d) of the Act provides that a methodology determination may require the proponent of an eligible offsets project to comply with specified monitoring requirements.

The *Carbon Credits (Carbon Farming Initiative) Rule 2015* contains record-keeping requirements that relate to data that is collected while monitoring the project.

30 General

Subsection 30(1) requires that a proponent must conduct sufficient monitoring of the herd to determine the inputs required under Schedule 1. Monitoring methods are not specified but the data collected must satisfy Regulator and auditor requirements for factors such as collection method, reliability and compliance with the Determination.

Subsection 30(2) requires that in the crediting period, if the project activity involves a dietary change, the project must undertake sufficient monitoring to comply with Schedule 2.

Subsection 30(3) specifies monitoring requirements relating to the specification of a herd as described under section 8. These requirements are:

- (a) the land on which the inventory cattle of the primary business operation grazed in each year of the reporting period (other than land on which the cattle grazed under an arm's length agistment arrangement);
- (b) the non-inventory cattle of the primary business operation for the herd during each year of the reporting period;
- (c) any business operation that becomes, or ceases to be, a secondary business operation for the herd during the reporting period;
- (d) for each secondary business operation—its inventory cattle and its non-inventory cattle during that reporting period;
- (e) any changes to the entity or entities that constitute:
 - (i) the primary business operation for the herd during the reporting period; or
 - (ii) the parent entity of a primary business operation.

The following recommendations are provided to assist proponents in deciding on appropriate monitoring methods.

Use of a previous audit

In deciding whether existing records are adequate to satisfy the monitoring requirements, a proponent should consider whether available data has already been audited and provided for another purpose. For example, a registered auditor other than an auditor engaged to review an Emissions Reduction Fund project may have previously examined a parameter in Division 4 for another purpose such as taxation prior to project commencement. In this case, if the opinion of that auditor was not an adverse opinion, the Regulator may consider whether the requirements of the Determination have been met for the monitoring of that parameter.

Use of secondary data

Alternatively, to meet the monitoring requirements for the project, it is recommended that, where possible, the proponent has two records or more available to support the determination of each parameter. Records that could be recorded by the proponent could come from a livestock agent, a carrier, from a purchase or sale, or derived from the NLIS tag system. It is the responsibility of the proponent to have the records required to validate emissions and emissions reductions produced in the project.

The data monitoring methods that could be used by a project proponent or collected from an independent source are set out below for the parameters in sections 24, 25, 26 and 29.

Number and average age of cattle in each livestock class

Records from a proponent could include:

- data from a herd book from an annual muster to account for entries to and exits from the herd and attrition factors such as deaths in the herd;
- taxation records of the opening and closing inventory of stock to support the herd book; and
- the data input page of the Herd Management Calculator.

Records from an independent source may include:

- records from the NLIS;
- abattoir receipts indicating numbers of cattle slaughtered;
- records of cattle exported overseas;
- receipts from sales or transfers of cattle with the name of purchaser/transferee and the date of sale/transfer; and
- cartage contractor receipts indicating date of cartage, cattle numbers and destination.

LW and LWG

Records for LW and LWG from a proponent may include:

- data from the herd book recorded at an annual or seasonal muster and at point of sale; and
- the data input page from the Herd Management Calculator.

Records from an independent source may include:

- abattoir receipts indicating hot standard carcass weight converted to LW;
- Eastern States Daily Indicator Prices published on the MLA website and converted to LW based on the total value of sales or purchases and the numbers of animals in each class that were sold or purchased at a particular time and location. A default dressing out percentage of 55% may be used where prices are quoted as carcass weight;
- receipts from exporter indicating weight at sale; and
- saleyard receipts from point of sale for LW.

Diet

Records created by a proponent may include:

- days on supplement/established pasture in each credit reporting year from herd book entries of date of entry and date of exit from supplementation for each class of cattle supplemented; and
- a record of the time the cattle spend on feeding regimes in a herd book or feeding records from a delegate of the proponent supported by invoices/receipts, herd book records; and
- the data input page from the Herd Management Calculator.

Other records that can be used from an independent source are given in section 29.

LW Sampling Approach

LW and LWG for each livestock class in the herd can be determined from either direct measurement of the whole herd or sample herd or direct measurement of a random sample of all animals and classes in the herd. A suggested sampling approach is given below.

The requirements of the Determination can be met with any statistically valid sampling approach that provides an accurate representation of the fair value of livestock at any time (see AASB 141 for details of fair value concepts). Fair value is based on the numbers and LW at any time plus an acceptable price per kg. In practice, multiple sampling is conducted over time, and a projection of future LW is obtained, which can be used, for example, to estimate fair value of livestock at a future merger or acquisition date. The difference between such an estimate and the actual numbers and LW reflects the degree of precision of the estimate obtained by sampling. A financial auditor may set a target precision considered acceptable for the local conditions. The following is a suggested approach to sampling that can be used to meet any desired Targeted Precision (see below) set by an auditor.

Step 1: Pilot survey

For each cattle class, undertake a pilot survey to estimate variance in LW in relation to each group in that cattle class.

To undertake a pilot survey it is recommended that the proponent start by weighing a random sample of 10% of the animals of the class. A 10% sample is often close enough to give an accurate estimate of LW. However, it is not, on its own, a guarantee of adequate estimation of true average LW for the group, as every group in every herd has different variability around a mean weight.

Where multiple groups of cattle are separated by subdivision, breed, feed quality or any other parameter that makes the group identifiable as a unit, each group must be sampled separately. A 10% random sample may be taken, for example, as the weights of 10 randomly selected animals, regardless of size or other characteristics, out of 100 to enter a weighing race. Every animal in the group must have an equal chance of being selected for weighing.

Step 2: Number of animals to be sampled to meet targeted precision

In order to determine the sample size required to estimate LW of animals in each group, to a required precision, Steps 2.1 and 2.2 in this sampling method should be completed in relation to each group. These steps are intended to provide an estimate of the variability of weights around an average weight that is the variance of the weights of the group.

Step 2.1: Coefficient of variation of each group

Use the data from the pilot survey to determine the standard deviation of the sample taken from the group. The standard deviation is a numerical value used to indicate how widely individuals in a group vary. The standard deviation of a sample is the square root of the sum of squared deviations from the mean of the samples taken.

$s_{pre,i} = \sqrt{(\bar{x} - \bar{x}_i)^2 / N - 1}$	Equation 1 (sampling approach)
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Where:

$s_{pre,i}$ = sample standard deviation of LW from pilot or preliminary group (i) (kg LW).

x = individual weight of a sample animal in group (i).

\bar{x}_i = sample mean weight from pilot data measured in group (i) (kg LW).

N = number of animals in a pilot sample of a group (i).

In order to determine the coefficient of variation within each sample taken from each group, the following formula must be completed:

$CV_i = \left(\frac{s_{pre,i}}{\bar{x}_i} \right) \times 100$	Equation 2 (sampling approach)
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Where:

CV_i = coefficient of variation of pilot sample in group (i).

$s_{pre,i}$ = sample standard deviation from pilot data in group (i) (kg of LW).

\bar{x}_i = sample mean weight from pilot data measured in group (i) (kg LW).

Step 2.2: Number of animals to sample in each group

LW of a sample of a group in a herd should be within the accuracy demanded by an auditor. For example, the standard may be $\pm 5\%$ of the true value of the mean of the groups in the class at a 90% confidence level. The level of accuracy required is usually chosen by an auditor using local knowledge to provide an estimate of fair value of livestock at any time (see “LW sampling approach” above for derivation of fair value). This is the approach used under the recommended provisions of the AASB 14 system.

The standard of accuracy required is referred to as the **Targeted Precision**.

In order to estimate the required sample size to achieve the Targeted Precision in each group, the following formula should be used:

$n_i = \frac{CV_i^2 \times t_{val}^2}{SE^2}$	Equation 3 (sampling approach)
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Where:

n_i = estimated number of sample animals required to meet Targeted Precision (i).

CV_i = coefficient of variation in pilot data as calculated in Equation 5 (expressed as a percentage).

t_{val} = two-sided students t-value, at the degree of freedom equal to (n-1) where (n) is the number of animals, for a 90% confidence level.

SE = desirable or allowed level of sampling error (expressed as a percentage (in this example it is fixed as 5%)).

When the number of animals required in a sample to obtain the targeted precision has been established, the sampling procedure to obtain a true estimate of LW in a group from a sample should be validated using Step 2. This step involves additional sampling to either supplement the sample survey data and thus achieve Targeted Precision, or reduce the numbers in the sample whilst achieving the desired level of Targeted Precision.

Step 3: Validation of sample size in a LW survey

Once the number of animals in a sample required to obtain the Targeted Precision has been obtained (Equation 3 sampling approach), the process of sampling should be repeated using that number of animals.

Step 3.1: Standard error

The actual standard error of LW of animals in the sample should be calculated using the following formula:

$SE_{i,r} = \frac{s_{i,r}}{\sqrt{n_{i,r}}}$	Equation 4 (sampling approach)
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Where:

SE_{i,r} = actual standard error of the LWs in the pilot survey in group (i) for reporting period (r).

s_{i,r} = standard deviation of the LW data in group (i) for reporting period (r) (kg LW).

n_{i,r} = number of sample animals from group (i) for reporting period (r).

i = group (i).

r = reporting period (r).

Step 3.2: Determination of Targeted Precision

In order to determine whether the survey has achieved Targeted Precision, the following formula should be used:

$TP_{i,r} = \frac{SE_{i,r} \times t_{val}}{\bar{Q}_{i,r}} * 100$	Equation 5 (sampling approach)
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Where:

TP_{i,r} = Targeted Precision error limit of the LW of a group (i) for reporting period (r) (%).

SE_{i,r} = standard error of the survey in group (i) for reporting period (r) (kg).

t_{val} = two-sided students t-value, at the degree of freedom equal to (n-1) where (n) is the number of animals sampled for a 90% confidence level.

$\bar{Q}_{i,r}$ = sample mean from LW data in group (i) using for the reporting period (r) (kg).

i = group (i).

r = reporting period (r).

The 90% confidence level must be used when determining the t-value.

The final value of TP_{ir} must be less than or equal to the value required by the auditor (usually 5% or lower).

If the TP_{ir} error limit is greater than the required value, additional animals must be surveyed until the Targeted Precision error limit is less than or equal to the required value. It is recommended that the proponent use Step 2 to test whether the sampling procedure needs to be repeated to meet the Targeted Precision at the time of initial muster, so that re-mustering is avoided.

Proponents may choose to obtain LW data through opening and closing stocks of a breeding herd that remains on the property from year to year and/or from weights at entry and exit from the herd for turnover stock. Entry and exit weights can be measured on-farm, obtained from purchase invoices and sale receipts, abattoir data, or from other sources as approved by the auditor. The opening and closing stocks of a class can be within a month before or after the annual project date. The Herd Management Calculator will project data from actual dated opening and closing stocks of animals to an annualised basis.

In Entry Page 1, LW data from opening and closing stocks and entry and exit weights is used by the LW and LWG model in the Herd Management Calculator to provide seasonal estimates of LW by class in the project. The model uses the relationship between feed quality and consumption, geographic location and other biological variables to estimate seasonal variation in LW and LWG. The estimates are then validated against the opening and closing LW (and/or entry and exit LW for turnover stock) entered by the proponent. The seasonal value of LW and LWG, the time on supplement and the seasonal variation in supplement composition provide the data for calculating annual methane and nitrous oxide emissions from the herd.

In Entry Page 2, a linear approach is used to calculate seasonal LWG for all cattle classes.

Division 5—Reporting under section 77A of the Act

31 Requirements relating to reporting under section 77A of the Act

For section 77A of the Act, a project may only be divided into parts that consist of one or more whole herds.

A whole herd is required, as noted in section 8, based on business records as the project boundary. Division of the herd may create inaccurate estimates of overall project abatement, as recognised by the provisions of the business operation requirement.

The existence of separate businesses alone (and separate herds) may not satisfy the criteria for definition of a project herd if there is herd interaction. For example, a proponent may control a (primary) turnover or livestock trading business in which steers are sold or transferred regularly for slaughter and a (secondary) breeding business that provides steers to the turnover operation. In this case both businesses contribute to emissions generated by cattle under the control of the proponent and must be considered together. Alternatively, if the turnover business operates solely on cattle purchased from outside the control of the proponent (i.e. outside the project boundary), that business constitutes a single project herd for the purposes of calculating eligible abatement.

Schedule 1—Inputs into Herd Management Calculator—general

The table in Schedule 1 describes the inputs required by the Herd Management Calculator, and the units (where applicable) to be used for each data input. Each data input is required for the emissions intensity reference period and crediting period. The inputs are derived as follows.

1. Identification of a region primarily occupied by each herd in the project. The region may comprise a territory, state, or a state and a sub-region, such as the Pilbara region of Western Australia. The regions are specified in the National Inventory Report.
2. For animals present in the herd at both the start and the end of the year:
 - (a) cattle numbers for each livestock class must be recorded for each year of the emissions intensity reference period and the crediting period at the beginning and end of each year; and
 - (b) average LW for each livestock class must be recorded for each year of the emissions intensity reference period and the crediting period at the beginning and end of each year.

This information is required separately for this part of the herd (Resident Herd) because the emissions of the animals present throughout the year are calculated in a different manner from the animals present for only a part of the year (Transient Herd). The difference is due to the fact that emissions are calculated on a seasonal basis in the Herd Management Calculator (in line with the National Inventory) based on changes in LW, feed quality and animal numbers. For animals present throughout the year the changes in LW are estimated in the Herd Management Calculator using a model based on the starting and ending weights and the location by region and diet of the animal. For animals present for a part of the year, the model is not required and a linear LW growth rate is assumed across seasons.

3. For animals that were in the herd at the start of the year but left during the year:
 - (a) the number of animals in each livestock class at the beginning of the year; and
 - (b) the average LW of each class at the beginning of the year.

An estimate of the average weights of a group of cattle is required for section 24. Individual animals also need to be identified with their particular group to ensure an accurate calculation of LW and LWG. For example, if a group of steers was purchased at the beginning of the project year on, for example, 1 April and was sold or transferred, with other animals purchased at other dates, in two groups on 31 May and 15 July. It will be necessary to be able to identify, at the time of sale, when all the animals being sold, entered the herd. Methods of identifying the animals by purchase date could include NLIS ear tags (preferred for auditing), brands, breeds, sex or any other reliable and durable method.

4. For each sub-group of sale or disposal animals, that were in the herd at the start of the year but left during the year:
 - (a) the date(s) they left the herd;

- (b) the reason they left the herd (i.e. whether they left for live export/slaughter or for sale for another purpose (such as sale to breeding or transfer to another herd));
- (c) the number of animals by class in each sub-group that left the herd; and
- (d) the average LW of each livestock class in the sub-group that left the herd.

This information on animal numbers and LW is required to calculate their combined impact on emissions.

5. For animals that entered the herd during the year:

- (a) the date they entered the herd;
- (b) how they entered the herd by origin (e.g. birth, purchase, internal or external transfer);
- (c) the numbers in each class and the date they entered the herd; and
- (d) the average LW of the animals that entered the herd on the date they entered.

‘Other management actions’ as a means of stock entry include transfer of animals from a herd outside the project.

6. For the sub-group of animals described in point 5 above that entered the herd during the year and was present at the end of the year:

- (a) the number of animals in each livestock class at the end of the year; and
- (b) the average LW of animals in each class at the end of the year.

As noted for item 2 of the table, the opening and closing stocks of animals, including their LW, are required by the Herd Management Calculator to ensure accurate accounting.

7. For the sub-group of animals described by point 5 above that entered and left the herd during the year:

- (d) the date(s) they left the herd;
- (e) the reason they left the herd (i.e. for live export or slaughter or for another purpose);
- (f) the number of animals by class in each sub-group that left the herd on each date; and
- (g) the average LW of each livestock class in the sub-group that left the herd at each date.

This information applies in particular to animals traded during the year. For example, store animals purchased and sold as fat animals. The difference in combined LW and numbers plus the duration over which the change occurs is used to calculate the change in emissions of the group between entry and exit from the herd.

The information required in items 1–7 is used to create a rolling account of animals that enter and leave the herd during the year, using their entry date as a starting point. When animals present in the herd for the whole of the previous year are sold or transferred in the project year, they are accounted for using this information.

When the complete inventory is considered, any discrepancies between opening and closing stocks are identified as unaccounted animal increases or attritions (e.g. deaths and unaccounted losses). Such animals may be unaccounted losses due to environmental factors,

such as drought or unaccounted gains from animals that wander onto the project property due to the lack or poor quality of fencing in an adjacent property. Thus there is no need for entry of data on deaths. All unaccounted losses are assumed to occur in the middle of the year but unaccounted gains are assumed to have created emissions for the emissions intensity reference or project years.

Schedule 2—Inputs into Herd Management Calculator—dietary change

The note in Schedule 2 applying to paragraph 23(b) covers the method by which changes in the diet of the animal, from an assumed pure pasture diet in the reference period to a mixed pasture and supplement-based diet in the project, contribute to emission changes. The paragraph requires that the dietary change inputs to the Herd Management Calculator for DMD and CP for the crediting period are determined as a weighted average of supplementary feed and naturalised pasture feed (from seasonal values of the National Inventory Report).

Values for CP and DMD are established automatically in the Herd Management Calculator if the proponent specifies a particular supplement. The cattle feeds covered in the Herd Management Calculator are: grain, mixed grain, hay, cotton seed, improved pasture, leucaena, silage and crop. Values for northern Australia and southern Australia are included and are used according to the region specified by the proponent.

A proponent may provide for supplementary feed from the values given in a commodity vendor declaration form, fodder declaration form or equivalent (see section 29). If using unlisted purchased supplements, proponents must enter DMD and CP content from the records specified in section 29.

The weighted average provision is specified because a diet can be made up of several components such as grain and naturalised pasture. The Herd Management Calculator assumes that proponents would feed certain maximum proportions of the diet for each component entered into the Calculator. Example include grain (25%) (high levels are cost-prohibitive), cottonseed (20%) (owing to potential gossypol poisoning), and leucaena (30%) (due to potential mimosine poisoning). No more than two supplements in addition to a forage component may be selected. If two forage components (e.g. improved pasture and silage) are selected, the supplements will be limited to the balance required to make up 100% of the diet. Any further entries are ignored in calculation. The weighted average composition of the diet is then calculated.

In addition to diet quality information, item 3a of Schedule 2 requires the number of days in which the dietary supplement was fed. For simplicity to calculate nitrous oxide and methane emissions, it is assumed that if more than 50% of animals in any livestock class were supplemented, then all of the animals in that class were supplemented for the designated period. Proponents may consider keeping records of volumes and dates of supplement purchases as part of verifying the supplementation of a class of animals.

Statement of Compatibility with Human Rights

Prepared in accordance with Part 3 of the Human Rights (Parliamentary Scrutiny) Act 2011

Carbon Credits (Carbon Farming Initiative—Beef Cattle Herd Management) Methodology Determination 2015

This legislative instrument is compatible with the human rights and freedoms recognised or declared in the international instruments listed in section 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011*.

Overview of the legislative instrument

The *Carbon Credits (Carbon Farming Initiative—Beef Cattle Herd Management) Methodology Determination 2015* (the Determination) sets out the detailed rules for implementing and monitoring offsets projects that would reduce emissions of greenhouse gases from grazing beef cattle through improvement in production efficiency of beef cattle herds.

Project proponents wishing to implement the Determination must make an application to the Clean Energy Regulator (the Regulator) and meet the eligibility requirements set out under the Determination. Offsets projects that are approved by the Regulator can generate Australian carbon credit units, representing emissions reductions from the project.

Project proponents can receive funding from the Emissions Reduction Fund by submitting their projects into a competitive auction run by the Regulator. The Government will enter into contracts with successful proponents, which will guarantee the price and payment for the future delivery of emissions reductions.

Human rights implications

This legislative instrument does not engage any of the applicable rights or freedoms.

Conclusion

This legislative instrument is compatible with human rights as it does not raise any human rights issues.

Greg Hunt, Minister for the Environment