



Reporting agricultural emissions at farm level

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Disclaimer

This report has been prepared as outlined in the “Scope and Approach” section of this report. The procedures outlined in the “Scope and Approach” section constitute neither an audit nor a comprehensive review of operations. The term “Review” used in this report does not relate to a Review as defined under professional assurance standards.

The findings in this report are based on research, review of relevant documentation and discussions with Ministry staff and other relevant parties noted in the Appendix to this report. No warranty of completeness, accuracy or reliability is given in relation to the statements and representations made by, and the information and documentation provided by, those identified in the Appendix to this report and consulted as part of the process.

KPMG have indicated within this report the sources of the information provided. We have not sought to independently verify those sources unless otherwise noted within the report.

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cutting through complexity

Ministry for Primary Industries

Reporting agricultural emissions at farm level

13 December 2012



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Scope and approach	<ul style="list-style-type: none"> ■ The move to farm level reporting for agriculture under the ETS is a major change that requires careful consideration in terms of report design. The scope of our work involved drafting the high level design for reporting agricultural emissions at farm level and the elements of the compliance and audit frameworks that might sit alongside this reporting. Our work involved interviews, desktop research and reporting.
Reporting context and purpose	<ul style="list-style-type: none"> ■ Underlying drivers of the reason for moving to farm level reporting include the fact that agricultural emissions occur on-farm, farmers are best placed to report inputs/outputs that contribute to these emissions, promote awareness of the emissions associated with production, encourage the uptake of lower emissions practices and practical technologies that reduce emissions intensity or absolute emissions. ■ The purpose of farm level reporting should focus on productivity and efficiency – considering emissions as one impact of a farming system. It should encourage farmers to take steps to improve their on-farm performance.
Participants and thresholds	<ul style="list-style-type: none"> ■ Based on data from the agricultural production survey (APS), there are approximately 36,000 dairy, beef, sheep and mixed beef/sheep farming enterprises in New Zealand (APS, 2012). A significantly higher number of farms has been identified in farms on-line, which includes livestock blocks, hobby farms etc. ■ Recommended emissions sources to be included in the report design are sheep, beef, dairy and deer farming emissions including fertiliser use from these operations. ■ The participant point of obligation should be based on business owner – being those responsible for the farming operation and being the principle beneficiary of farm outputs. ■ Thresholds should be determined using the Statistics New Zealand business frame definition which aligns with the business owner point of obligation. There are established mechanism to identify and manage the associated database of potential participants which should ensure the majority of agricultural emissions are captured while small, economically insignificant agricultural concerns are not included.
Data requirements	<ul style="list-style-type: none"> ■ Emissions calculations for sheep, beef, deer and dairy farming involve calculating the energy requirements of the animal which are dependent on productivity and feed intake. A large number variables go into this calculation including those relating to: i) Animal characteristics; ii) Productivity; iii) Feed intake and manure; and iv) Nitrogen in soils and leaching. ■ Many of these data points can be obtained on-farm but a balance between accuracy and cost effectiveness means that a number will most likely still have to be derived from national databases (e.g. soil and rainfall data) or regional/national averages. We have summarised the proposed information to be requested directly and information to be taken from averages or assumptions.
Compliance and audit	<ul style="list-style-type: none"> ■ MPI are the recommended governance body for the farm level emissions reporting programme, who will be responsible for the risk assessment processes, monitoring and compliance reporting. ■ The focus of the audit programme associated with farm level emissions will be in relation to the collation, calculation and reporting processes within the governing body. This is best conducted by a sole assurance provider on a limited assurance basis.

Operational elements

- In terms of the report design implementation, having appropriate support structures in place will be critical. It has been suggested that farm accountants and/or farm advisors could be targeted to provide core support for participants. Emissions reporting should not be a significant extension of their responsibilities and aligns with their skill set.
- The reporting protocol is the key piece of operational documentation in the report design. It will inform how the data is collected, collated, the calculations that apply and the reporting timeframes that must be adhered to.
- In order to increase the completeness and accuracy of information reported, the associated infrastructure needs to be carefully designed. This includes having a clear, user-friendly interface for participant reporting.
- The transition to farm level reporting is likely to have a major impact on the industry. We recommend the transition be gradual with a phased lead-in time. Starting with a period of voluntary reporting, before the introduction of any mandatory reporting requirements. Prior to this time, engagement, communication and a pilot programme should be undertaken to finalise the design elements and road test the framework.

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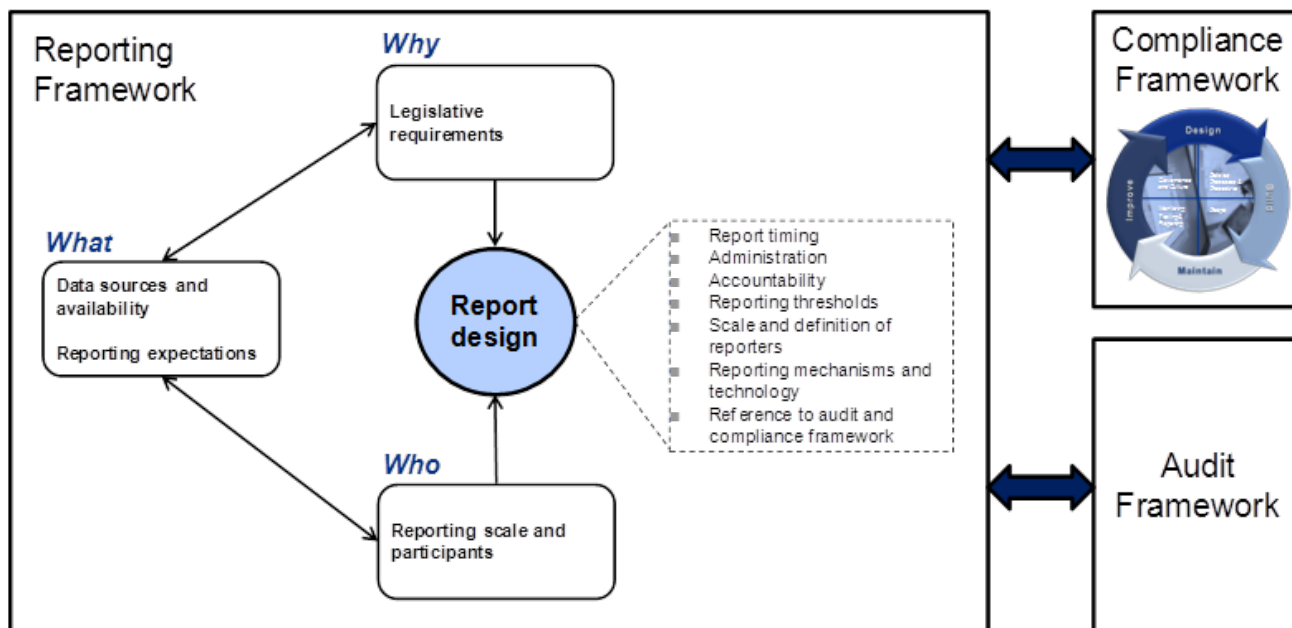
Scope and approach

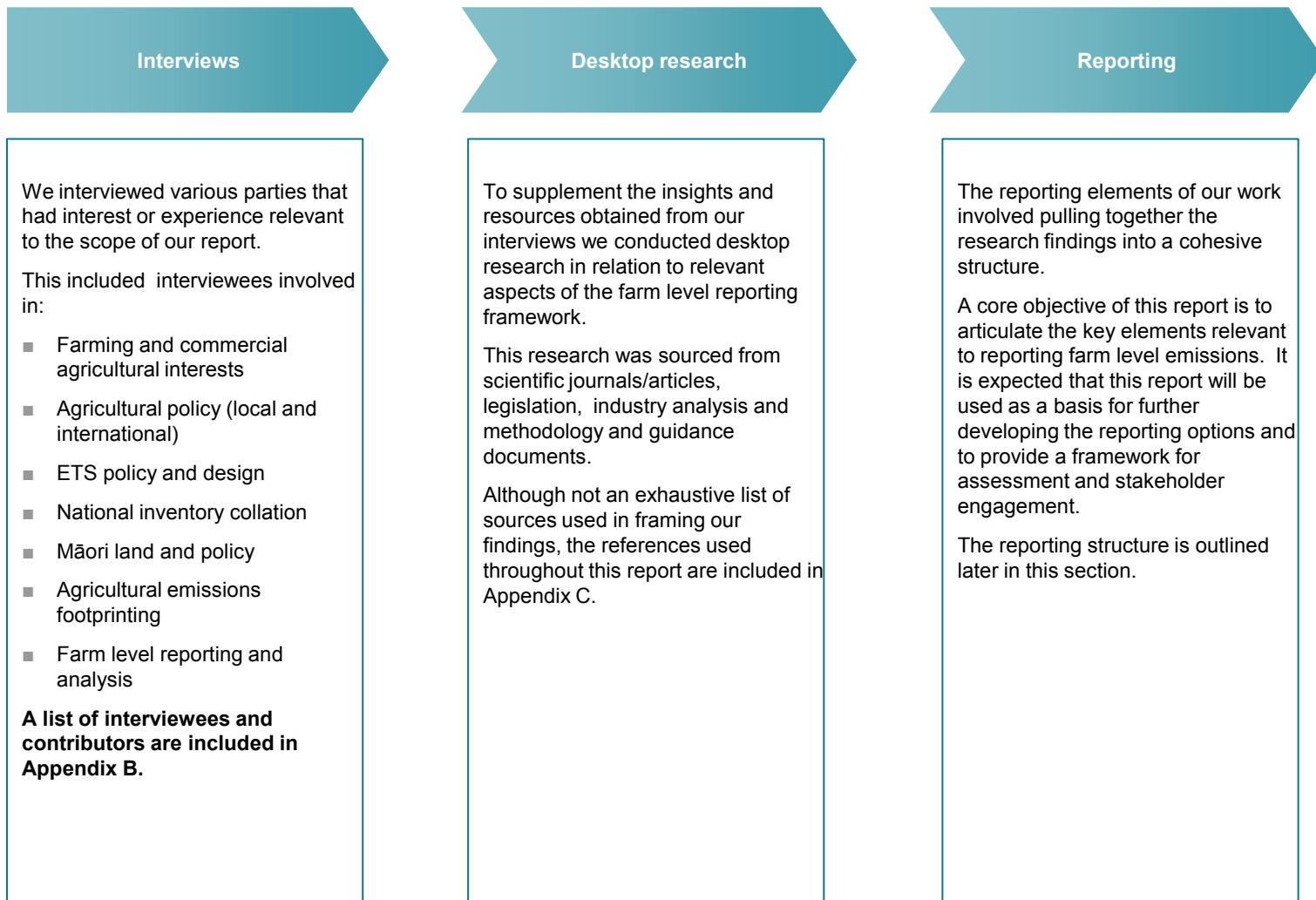
Scope of report

This report has been prepared under the terms of our contract with the Ministry for Primary Industries (MPI) dated 6 September 2012. The key outcomes under this contract are to draft the high-level design for reporting agricultural emissions at farm level under the New Zealand emissions trading scheme (ETS) and the compliance and audit frameworks that might sit alongside this reporting.

The scope of our work excludes:

- Developing reporting templates or models required to implement the design as outlined.
- Detailed financial analysis or financial impacts associated with reporting design or options.
- Assessments of the regulatory changes required to implement any proposed design.
- Implementation associated with the proposed design, compliance or audit frameworks.





A series of stakeholder interviews was undertaken to inform the findings in this report. This process and findings does not constitute comprehensive engagement on farm level emissions reporting. Interviews were conducted with 14 policy/government level stakeholders and 10 stakeholders with direct commercial interests in farming. While their input was valuable, any errors, omissions, findings or recommendations included in this report are not attributable to interviewees. The interview questions /topics are included as an Appendix to this report.

Key insights from each group are below and are reflected in the discussion and recommendations:

Policy/government level

- The project is of interest at multiple levels and ministries within Government (Minister for Primary Industries, Minister for Climate Change, MPI, EPA, MfE, TPK and MFAT).
- Understanding emissions is part of good farm management – concepts of profitability and efficiency are paramount.
- Flexibility is needed in the design to account for international changes. At the current time there is nothing set post-2020 in relation to climate change emissions targets (global).
- More details around animal performance, feed quality and live weights would improve quality of national inventory.
- Under the UNFCCC, New Zealand will continue to report emissions and removals post the Kyoto period.
- Maori are significant owners of agricultural land, and issues specific to Maori will need to be considered and addressed.
- A key driver for farm level reporting is to increase the understanding of what is happening “on farm” and to determine measures around performance.
- Farmer awareness of the ETS has increased since the TAG report in 2009 but the level of application is still low.
- Important to consider the international perspective and key trends and impacts.
- Linkage to existing schemes – could Overseer be extended? The NAIT programme cannot be used for the purpose of farm level reporting information.
- Designed carefully, with the right signals/metrics, farm level reporting could be very positive in terms of international discussions around climate change policy.
- Reporting mechanisms must be simple and there must be adequate allowance for support for participants. Keep guidance clear and provide tools that participants can use.
- Significant data in relation to land use is able to be obtained from existing databases (soil type, elevation, land capability).

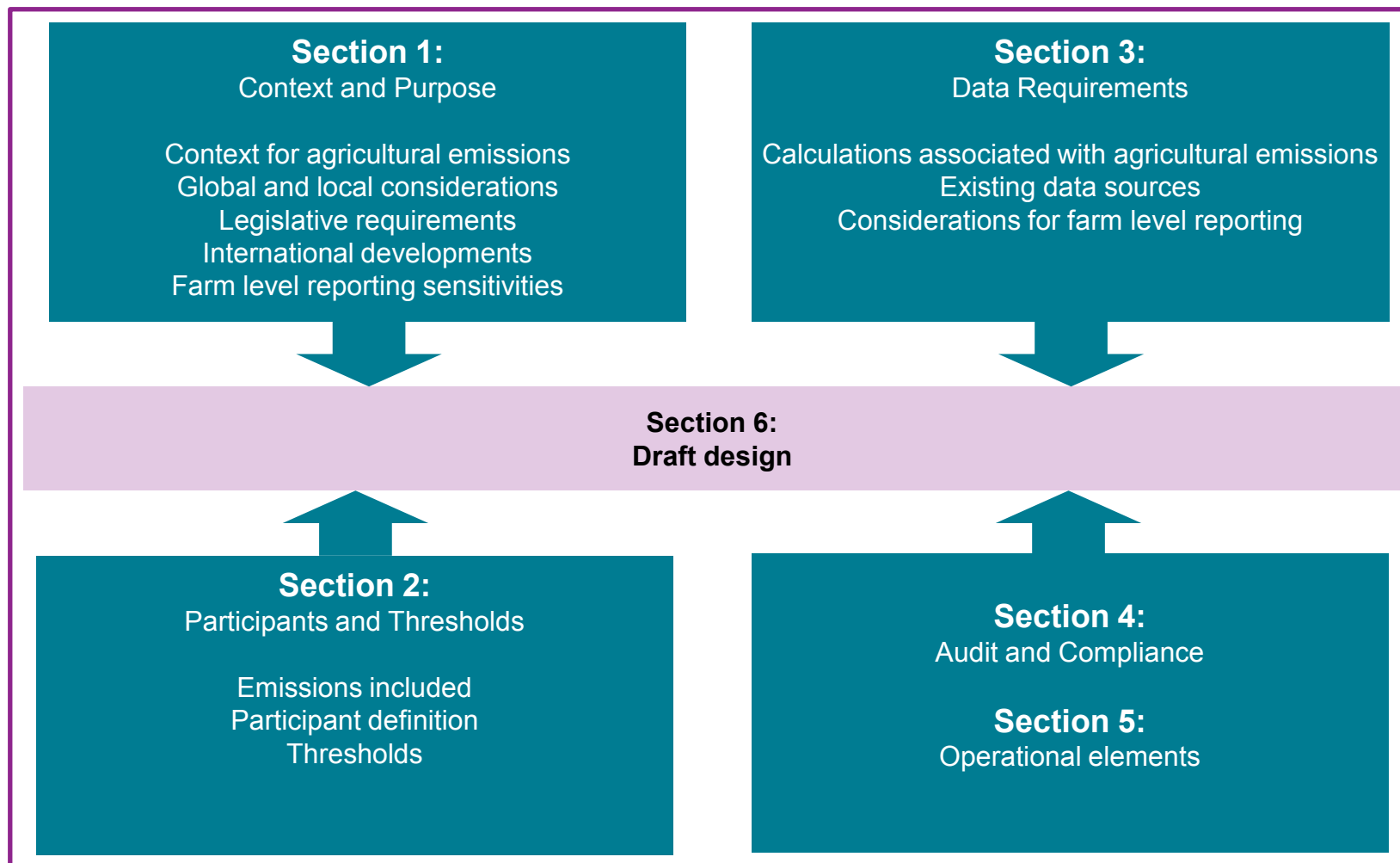
Commercial/farm level

- Immediate benefit from farm level emissions reporting not obvious but this is more about “future proofing” for the industry.
- The interface needs to be clear and easy to use – Overseer is too complex for many farmers to understand/use. Important that the calculations and assumptions behind the scenes are robust but the interface should be designed by those with skills in usability and reporting design.
- Stock owner is the logical point of obligation/reporting.
- Many farmers still have internet/broadband restrictions in terms of coverage. While an online solution makes sense (perhaps using the cloud), there needs to be the ability for the inputs to be done offline and updated later.
- Ability to recognise vegetation/tree growth as an offset for any obligation is an important consideration.
- How much of the information is able to be obtained through annual accounts or tax filings? Many variables impact income. In some ways it makes sense to use accountants as the reporting conduit. When they sign off accounts, they also sign off emission calculation inputs.
- Concern over regional council use of environmental data (e.g. Overseer). Where the data is used for compliance or regulatory purposes the uptake and acceptance is likely to be much lower.
- Benchmarking information would be useful (against peers, regional/national averages). Data confidentiality must be paramount.
- Motivations for farmers will be variable – will need to be able to cater for those who are keen to be heavily involved and those who are less interested.
- Need to be careful about additional costs imposed on farmers.
- Wherever possible, compliance should involve existing data sources (e.g. supplier details, stock reconciliations).
- Land owner and stock owner often one and the same.
- Thresholds should be set based on livestock numbers. This should determine the level of reporting. Where full information is not provided there should be “look up” tables or similar.
- Sheep movements may be significant (store stock moved off site). In a large number of cases lambs are not sent to slaughter by the farm that delivered the animal. Accounting for these movements will be tricky.
- Whatever the solution – will need to be easy to understand and will need to be auditable.

Commercial/farm level (continued)

- Regardless of point of obligation – will need to consider contractual commitments should there be a penalty/cost imposed.
- Education about the programme and implementation is key.
- Appropriate administrative support is seen as being very important. Having enough rural professionals to help and the support network in place.
- Farmers want to farm sustainably. The data information provided should be used to help find solutions rather than to penalise.
- Compliance costs for farmers are already high. Need to ensure that where possible the same compliance mechanisms are used for multiple purposes.

Figure 1: Structure of report



The following are the design elements that are covered in this report:

SECTION 1:

- Purpose

SECTION 2:

- Participants
- Emissions
- Point of obligation
- Thresholds
- Exemptions
- Structure of involvement

SECTION 3:

- Data requirements

SECTION 4:

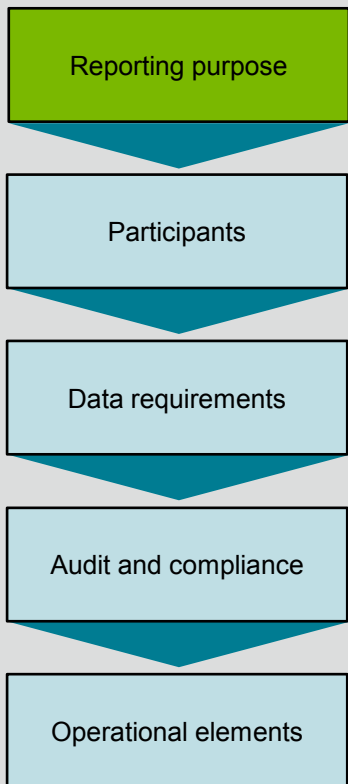
- Oversight
- Compliance
- Audit

SECTION 5:

- Governance
- Timing and transition
- Reporting interface
- Outputs

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Section 1: **Reporting context and purpose**

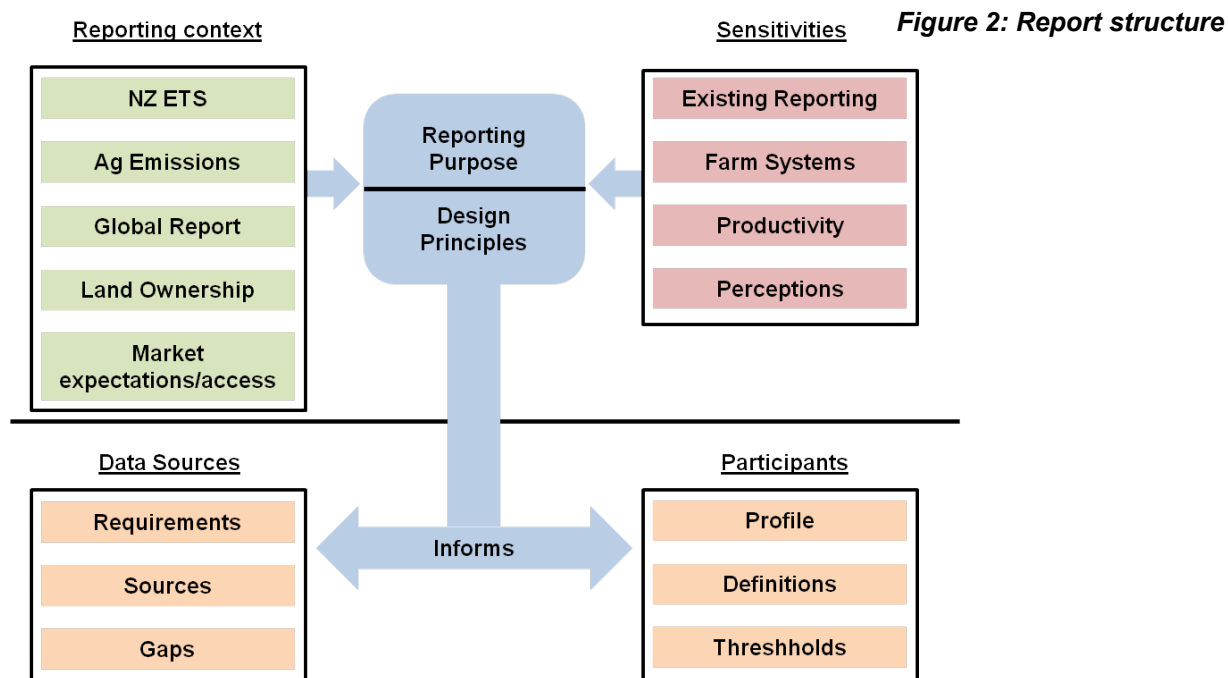


Approach

The ultimate design of the reporting framework depends on the reporting intention and articulated purpose. This can best be described in a question:

“Why are we collecting, collating and calculating information relevant to on-farm emissions?”

This must be adequately answered before articulating the design principles which will inform the functional elements of the reporting framework. The elements relevant to understanding the reporting purpose is described graphically below:



The following sections outline the context and sensitivities associated with farm level reporting. Based on this analysis the reporting purpose and design principles are articulated.

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

Emissions trading legislation and intention

The New Zealand emissions trading scheme (ETS) has been the catalyst to explore farm level emissions reporting. While there is no current legislative intention to bring agriculture into the scheme in terms of charging for emissions, the recommended option¹ is to report emissions at “farm level”.

As a result, it is important to explore the legislative intent of the ETS and the genesis of its development.

The purpose of the ETS is to:

Support and encourage global efforts to reduce greenhouse gas emissions by assisting New Zealand to **meet its international obligations...**and by **reducing New Zealand’s net emissions below business-as-usual levels** (CCRA, 3 (1) (b)).

[emphasis added]

The key elements are therefore:

- a) Meeting international obligations
- b) Reducing emissions below levels that would have occurred without an ETS

International obligations

The international obligations specifically referred to in the legislation include:

- Obligation to surrender units
- Obligation to report our national inventory

a) *Emission unit surrender (first commitment period – CP1)*

Our international obligations include the requirements under the Kyoto Protocol (Kyoto) for New Zealand to surrender emission units relevant to our human-induced emissions calculated under specified rules. For CP1, this involves calculating anthropogenic (human-induced) emissions and removals and comparing them to a 1990 baseline (the “assigned amount”). Under Kyoto New Zealand must surrender units for any emissions over the assigned amount.

The ETS is therefore intended as a mechanism to drive emission reductions from the relevant baseline in order to meet this commitment.

This commitment may be met in a number of ways. The signals provided by a market based scheme could encourage gross emission reductions, an increase in allowable sinks or the purchasing and surrendering of allowable Kyoto units. In meeting these obligations there is no specific requirement to reduce all emissions sources or increase all emissions sinks – the focus is instead on reducing total net emissions below the baseline.

¹ Refer the TAG report (2009)

Reporting context

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

International obligations (continued)

b) International reporting

New Zealand has reporting obligations under Article 12 of the United Nations Framework Convention on Climate Change (UNFCCC) and Article 7 of Kyoto and decisions 19/CMP1 and 15/CMP1. This reporting involves preparing a national inventory of greenhouse gas emissions by sources and removals by sinks.

The methodologies, content and format of the inventory are prescribed by the Intergovernmental Panel on Climate Change (IPCC). A complete inventory submission comprises the national inventory report and the common reporting format (CRF) tables. These documents are all available and downloadable on the Ministry for the Environment's website.

In designing farm level reporting, alignment or consistency (where appropriate) with the national inventory should be a key consideration.

An important concept in preparing the national reporting is "Good Practice". The IPCC has introduced a document outlining the core elements of good practice: *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (GPG) (IPCC, 2000) and the IPCC 1996 guidelines.

Good Practice is a set of procedures intended to ensure that greenhouse gas inventories are accurate in the sense that they are systematically neither over nor underestimates so far as can be judged, and that uncertainties are reduced so far as possible (GPG, A3.11).

Specific guidelines are provided to apply the GPG definition in relation to each sector. For agriculture, the GPG covers population estimation and specific methodology, reporting or quality assurance elements relevant to each emissions source.

This includes consideration of when basic or more enhanced methodologies should be applied in estimating emissions. In principle, where the emissions are derived from a *key source category* then a more advanced calculation methodology is applied.

A key source category is one that is prioritised within the national inventory system because its estimate has a significant influence on a country's total inventory of direct greenhouse gases in terms of the absolute level of emissions, the trend in emissions, or both (GPG, A3.12).

Under the GPG, improvements in the accuracy of any national reporting need to be balanced against the requirements for timeliness and cost effectiveness.

Implicitly given the legislative intention of supporting our international obligations, consistency with the national inventory principles should be a design objective. In addition, the ETS should support improvements in the quality, accuracy or completeness of this reporting.

Reporting context

Reporting purpose

Participants

Data requirements

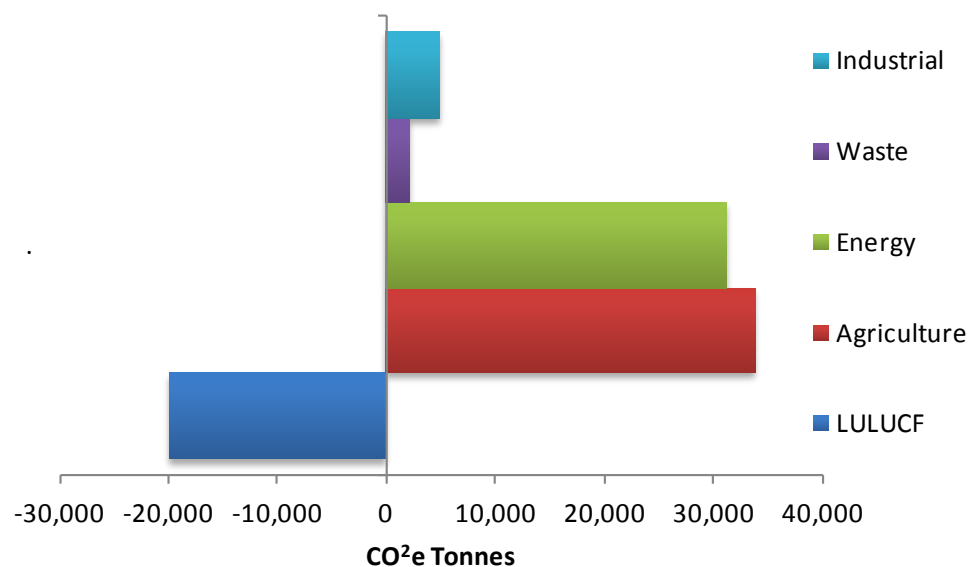
Audit and compliance

Operational elements

Reducing BAU emissions

A key purpose of the ETS was to reduce New Zealand's net emissions below business-as-usual (BAU). Business as usual in the context of the legislation relates to the estimated level of national emissions if the ETS had not been implemented. Therefore the purpose of initiatives borne under the legislation (such as the move to farm level reporting) must have an underlying focus on emissions reduction.

Figure 3: New Zealand emissions by sector in 2010 ¹



Source: MfE, 2012

Agriculture is the largest emissions source for New Zealand, contributing 47% of total emissions (2010). The vast majority (over 90%) of agricultural emissions come from dairy, sheep, deer and beef/cattle emissions – largely as a result of enteric fermentation.

¹ Emissions from the solvent and other product use sector are not presented in this figure.

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

Land ownership

When reporting farm level emissions, the point of obligation (in terms of reporting or financial impacts) will need to be clearly defined. Under the current legislation, the participant when reporting at farm level will be the “land owner” unless conditions are met for a third party to take responsibility.

If an activity listed in subpart 4 of Part 5 of Schedule 3 is carried out, the landowner of the land on which it is carried out is to be treated as the person carrying out the activity unless the EPA is satisfied that there is a written agreement in place between the landowner and a third party. (CCRA, s.213)

If the land owner is the point of obligation it is necessary to clearly define how land ownership is interpreted for the agricultural sector.

While there is some data on agricultural land ownership included in FarmsOnline, this information is restricted and is to be used for biosecurity purposes only. Land ownership information is included in FarmsOnline on a voluntary basis.

Information for Farms Online comes from a variety of sources including the landowner, LINZ and NAIT.

Land ownership details (i.e. boundary information and the names of registered owners) can be derived from LINZ data.

Māori land considerations

Māori have a special relationship with the land and the Māori concept of *taonga tuku iho* (a treasure to be handed down) is noted in the preamble to the Te Ture Whenua Māori Act 1993 (the Māori Land Act). In terms of agricultural land use, the majority of Māori land is mixed sheep and beef (33%), beef (17%) and dairy (9%) (MFE, 2007).

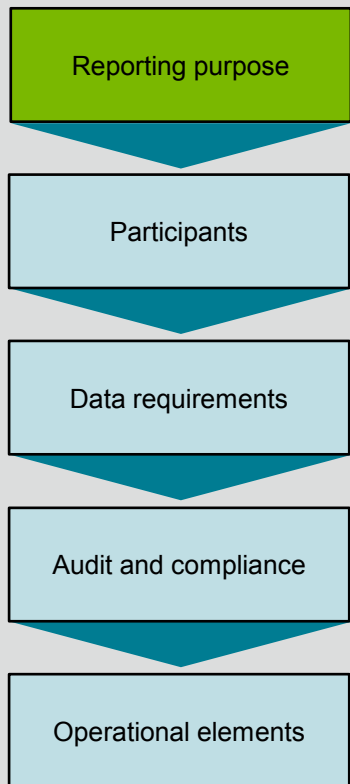
The level of detail associated with Māori land ownership is limited with research noting the “recording, maintenance and computerisation of Māori land tenure is woefully inadequate” (Robertson, 2004).

One significant challenge is in dealing with the complexity of ownership characterised by a large number of owners holding a small interest in individual titles or amalgamated entities. An illustration of this is that at June 2012, there were 2.7 million ownership interests in 27,308 freehold titles – an average of 99 interests per title (based on data from the Māori Land Court, Ministry of Justice, 2012).

As noted, there is incomplete information on the details of Māori land tenure but research performed by Te Puni Kokiri indicate that Māori land is characterised by a divergence in management/governance structures. This poses challenges when defining the point of obligation in terms of accountability.

One assumption that could be made is where farming operations are of a size that require significant capital investment, governance arrangements are more likely to be in place as a requirement by banks and/or investors.

These challenges are important considerations when moving to farm level emissions reporting.



Global demand and impact

Reporting on agricultural emissions at farm level will create an additional administrative burden and compliance costs for farmers. Any rationale behind this change needs to incorporate an understanding of the future for agricultural land and how this is impacting emissions (globally and locally) and what the future of agriculture means for the report design.

Globally, the world is facing a range of challenges that will impact the agricultural sector.

Population increases, demographic shifts and the rise of middle-class incomes in developing countries means that agricultural production needs to increase by 60% over the next 40 years to meet the rising demand for food (FAO, 2012). Agriculture will also be significantly impacted by Climate Change.

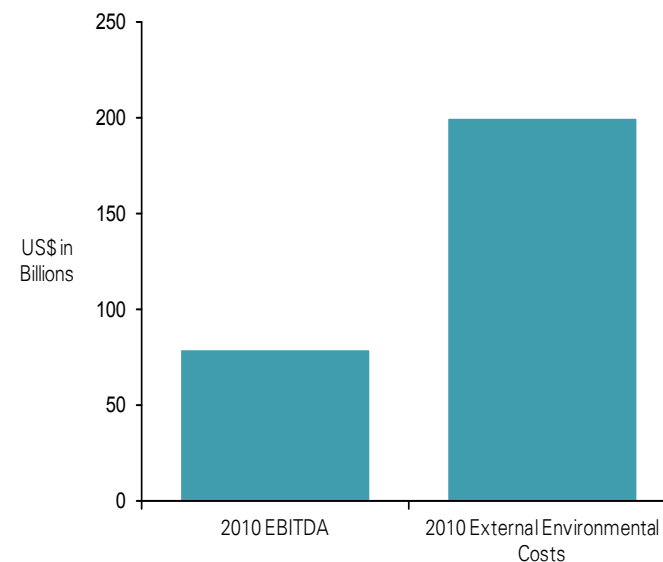
The significant increase in production will increase pressure on already stressed environmental systems. As an example of this impact, recent KPMG International research has indicated that incorporating environmental costs would more than eliminate the profits made in the food sector.

Inherent in these impacts is the interconnection between water, food and energy. Agriculture is a significant water user - accounting for 70% of the world's fresh water use (UN, 2008). As water is also critical to energy use there are potential conflicts and trade-offs necessary to deal with the growth in both energy and food demand.

Recognising these interdependencies and the projected demand profile, there will need to be a focus on efficiency and productivity. Using existing resources to produce more with the same or fewer impacts will not only be important, but necessary.

In terms of context for reporting agricultural emissions at farm level the arguments around productivity and efficiency are very relevant.

Figure 4: External environmental costs compared to food sector earnings (EBITDA)



Source: KPMG, 2012

Reporting context

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

Agricultural productivity

There is a greater focus on agricultural productivity in relation to food production, to ensure food security and sustainability of supply, and to take into consideration climate change impacts.

Policies that focus on innovation and the adoption of technologies are gaining prominence. This is reflected in the commitment of G20 leaders in the 2011 Cannes Declaration to agree to further invest in agriculture, particularly in the poorest countries, and 'decide to invest in research and development in agricultural productivity'.

Policies that encourage agricultural productivity can focus on:

- Investing in research and development (R&D) and extension programs to accelerate technology adoption.
- Building the knowledge and skills of farmers.
- Facilitating structural adjustment - some policy settings can impede structural adjustment as they diminish incentives to pursue efficiency gains.
- Reducing regulatory burdens.

R&D and extension programs are considered to be a very effective way to increase agricultural productivity.

Interestingly, the OECD, in their Agricultural Policy Monitoring and Evaluation 2012, reported that there is **limited evidence of the link between policy support, and specific policies, with improving agricultural productivity** and competitiveness (OECD, 2012).

Examples of the productivity trend within the agricultural sector globally include:

- Agriculture is increasingly seen as part of the solution to climate change by sequestering more carbon in the soil and biomass (The World Bank, 2011) and through cultivar development.
- Global research and development (R&D) spending has increased by more than 40% in the private sector between 1994-2010 across a range of agricultural sectors, including: biotechnology, crop protection chemicals, synthetic fertilisers, farm machinery, animal health, animal breeding and genetics, and animal nutrition (Waves, 2012).
- In Australia, the Federal Department of Agriculture, Fisheries and Forestry ran a \$35 million Regional Food Producers Innovation and Productivity Program. This program provided grants for the design and implementation of new technologies, production or processing techniques; the adoption of food production or processing technologies developed overseas; and the innovative redesign of existing production/processing lines to improve efficiencies and productivity.
- The European Commission has proposed to allocate €1.5 billion through Horizon 2020, as part of the proposals for the Common Agricultural Policy post 2013.
- Farm machinery research also increased substantially reflecting rising demand for farm mechanisation (Waves, 2012). This includes significant developments in New Zealand (e.g. new seed drilling technologies).

Reporting purpose

Participants

Data requirements

Audit and compliance

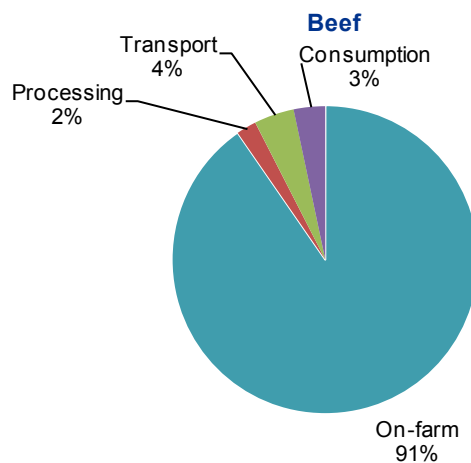
Operational elements

Footprinting agricultural emissions

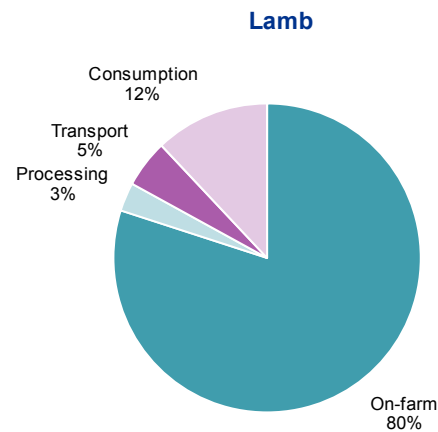
Given the global impact of food and food production, a growing body of research has been focussed on understanding the emissions profile (or footprint) of agricultural products. Recent footprinting research in New Zealand includes:

- Dairy carbon footprint (Fonterra, 2010)
- Exported New Zealand beef (Liebering et al, 2012)
- Exported New Zealand lamb (Ledgard et al, 2010)

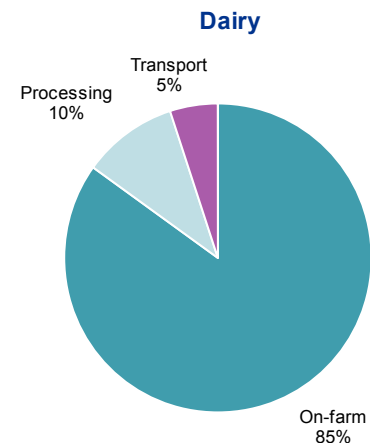
Figure 5: Agricultural product lifecycle emissions



Source: Liebering, 2012



Source: Ledgard, 2010



Source: Fonterra, 2010

Reporting context

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

Footprinting agricultural emissions (continued)

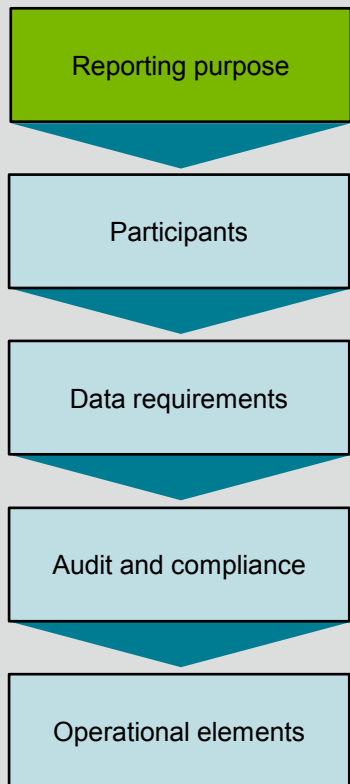
The studies have identified that the predominate source of emissions relating to agricultural production come from on-farm processes. The current national emissions inventory (discussed above) does not take a lifecycle approach to emissions. It instead considers direct emissions relating to specific activities (e.g. enteric fermentation, manure management etc). The key benefit of a lifecycle approach is that it enables a more complete picture of emissions impacts relating to agricultural production and can support requests for product environmental transparency.

In response to challenges relating to supply chain transparency and biosecurity, New Zealand has introduced the National Animal Identification and Traceability (NAIT) scheme. NAIT provides an electronic means to track animal movements and provides details on animal provenance and ownership.

Although currently used primarily for biosecurity purposes it also has market access potential as demands for safe and environmentally sustainable food increase.

Based on the above, considerations relevant to the on-farm reporting framework include:

- Flexibility in design is important to ensure that the requirements can be adapted to reflect a broader footprinting approach over time
- Linking with and enhancing existing initiatives (e.g. NAIT) should be considered a possibility, recognising the political challenges associated with this option.
- Ensuring all identified sources are able to be captured. For example: emissions from feed brought on-farm; emissions relevant to animals that are moved between farms
- Allocation decisions between emissions sources and production of by-products (e.g. distinction between emissions allocated to wool and sheep meat)



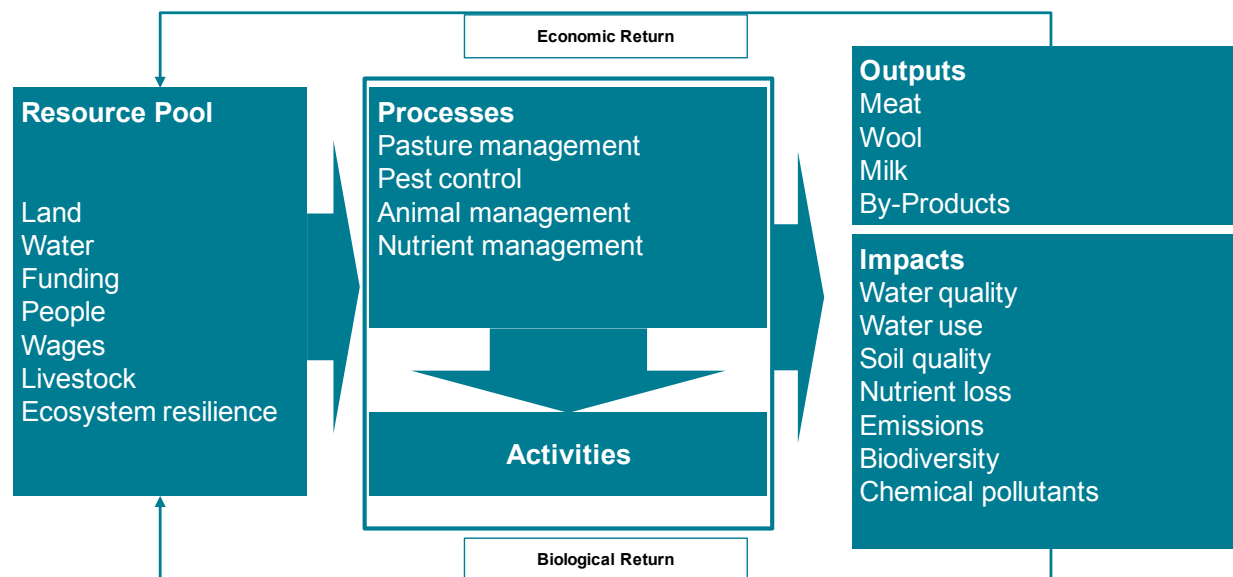
In making a shift to on-farm emissions reporting, it is necessary to be cognisant of the following reporting sensitivities which will impact the success or otherwise of any report design:

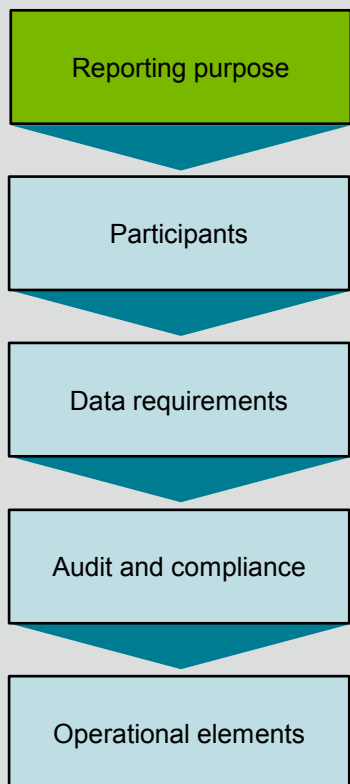
- Farming systems
- Existing reporting requirements
- Stakeholder perceptions

Farming systems

Considered as a system, livestock production may be described in the following way:

Figure 6: Livestock Farming System





Farming systems (continued)

The quality and quantity of the outputs and significance of the impacts all have a bearing on the overall sustainability of the farming operation. The presumed intention from farming practices is to ensure that production is able to continue indefinitely. This means farmers must be able to adapt processes over time to manage outputs and impacts in order to enhance the resource pool. This is not one-dimensional or linear. Inherent in all systems, especially natural systems, is complexity – particularly at the intersection of natural and human systems. Decisions in one area (e.g. increasing fertiliser use) will have a range of impacts which may be conflicting in terms of the overall sustainability objective (e.g. increase pasture growth and output, decrease water quality, increase emissions).

The generating of agricultural emissions is one of the impacts from farming processes. While the purpose of this proposed design is to elicit information in relation to emissions, the systems concept must be kept as a key underlying consideration.

Any design must not collect emissions information for its own sake but as a means to understand the extent of the impact and the interconnectedness with processes, outputs and the resource pool.

Existing reporting requirements

Moving to farm level reporting will require additional information from farmers to be requested. The types of information that will be needed is discussed further in section 3. In order to make an informed decision about the types of information to request, the design must take into consideration the level of reporting that farmers already perform relevant to farming systems and the nature of that reporting.

While a comprehensive stocktake of relevant farmer reporting has not been completed, the following is a snapshot we have obtained from discussions with farmer clients:

- Animal health plans and declarations
- Cattle need to be tagged under the NAIT programme
- Sheep are not required to be tagged at this time but forms are required to be completed
- Details around animal maintenance (inductions, treatments, drenching)
- Details around herd provenance /genetic history (dairy – through LIC)
- Fertiliser and nutrient application (under AgriQuality regime) – this may be provided by fertiliser suppliers

It is recommended that this information is further developed with farmer stakeholder groups to understand more fully the extent of reporting.

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

Existing reporting requirements (continued)

Future reporting developments of note include Fonterra's Nitrogen Management Programme (NMP) which will be rolled out to the 10,500 Supply Fonterra partners over the next few years.

"The Supply Fonterra Nitrogen Management Programme is being implemented to provide you with reliable information about your farm's nitrogen conversion efficiency and modelled nitrogen loss on an annual basis."

(Supply Fonterra Environment Programme brochure)

Fonterra are asking farmers to provide the following inputs for this programme:

- Nitrogen fertiliser use
- Supplementary feed use
- Fodder crops
- Animal numbers

These details will be incorporated into Overseer – an established nutrient management calculator.

Fonterra have specified they will be adding additional on-farm sustainability programmes in coming years to address "priorities such as water usage, animal welfare, greenhouse gas emissions and biodiversity" (*Supply Fonterra: Our path to a sustainable future* – overview booklet).

The Overseer nutrient management tool produces three indicators which cover efficiency of converting nitrogen into dairy products, nitrogen lost to leaching and phosphorus loss to run off, these indicators have been developed in partnership with DairyNZ and Fert Research. As of March 2012 there were already 3,000 dairy farmers using the tool, they can compare their own nutrient use performance against the regional average (Fert Research, 2012).

In order to ensure consistency, a specific nitrogen protocol has been developed outlining how Overseer is to be used in the supply Fonterra NMP

Although specifically developed for nitrogen, it is possible that the protocol could be adapted to cover emissions calculations within Overseer. This is currently being investigated with the key consideration being the intention of the calculation and what the outputs will be used for. There is uncertainty in the Overseer model and there is a trade off between accuracy and simplicity.

Reporting purpose

Participants

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Operational elements

Stakeholder perceptions

The ETS involvement of the agricultural sector and the amended design which would have seen that sector charged for emissions from 2015 has not had support amongst farmer groups.

The most vocal opponent has been the farmer advocacy group – Federated Farmers. Federated Farmers stated position on the ETS is that the biological emissions should only be taxed under the ETS where:

- Competitors in other countries have similar schemes or otherwise face similar emissions costs
- Commercially viable mitigation technologies are available for widespread uptake
- International rules allow New Zealand to recognise the uptake of such technologies

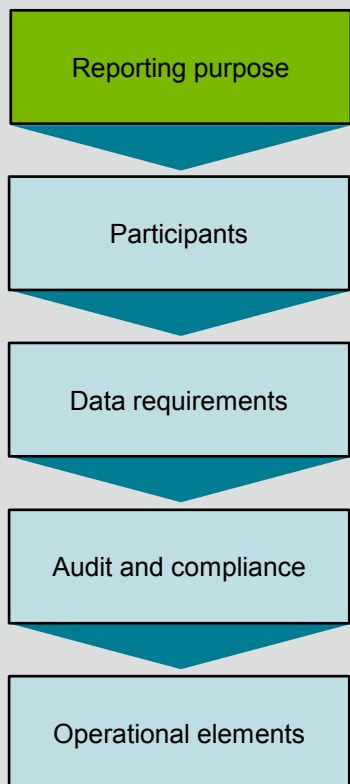
(Source: <http://www.fedfarm.org.nz/n40.html>)

Outside of groups such as Federated Farmers, there has been a relatively low level of engagement with farmers on the ETS.

Per the 2009 Agricultural Technical Advisory Group (TAG) report: *Point of obligation designs and allocation methodologies for agriculture and the New Zealand Emissions Trading Scheme* – “the level of farmer awareness regarding the rationale behind an emissions trading scheme and the detailed implications is low” (TAG, 2009). While engagement has increased since the time of this report – particularly in relation to forestry – it would be disingenuous to suggest there is widespread understanding of the ETS in the rural sector.

Due to the lack of awareness, it is critical that any amendments which have placed a direct responsibility on farmers, have a clearly articulated rationale. But more than that, this rationale or purpose needs to have multiple advocates – especially those from within the rural community itself.

The importance of engagement and education was noted in discussions with farmers and other commercial stakeholders.



Key considerations

From the sections above, the core considerations relevant to reporting agricultural emissions at farm level are:

- Underlying focus of the emissions efficiency of production.
- Emissions information collected is used in the broader context of a sustainable farming system.
- The design enables benchmarking, the inclusion of mitigation techniques and opportunities for increased profitability.
- Balancing the principles of accuracy, timeliness and cost effectiveness.
- Consideration of the national agricultural emissions reporting and facilitate improvements to this reporting in terms of accuracy or reduced uncertainty.
- Flexibility in design needed to enable lifecycle considerations to be embedded.
- Productivity is a key driver for farm level reporting but the effectiveness of policy intervention in this regard has been limited.
- Data requests are carefully considered to not require duplicate information or to overburden farmers with information requests – where the required level of detail can be obtained elsewhere it should not also be requested from farmers for emissions calculations.

Purpose

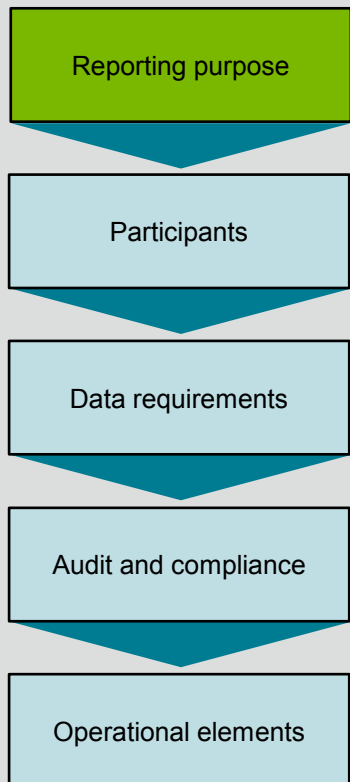
The intention of the analysis in the preceding section was to answer the following:

“Why are we collecting, collating and calculating information relevant to on-farm emissions?”

Based on the key considerations the proposed purpose for farm level reporting of agricultural emission is below:

Farm level emissions are calculated in order to **promote awareness of the emissions associated with production and encourage the uptake practices or technologies that reduce emissions intensity.**

The information collated is used to understand emissions in the context of on-farm impacts relevant to outputs – enabling benchmarking, recognition of mitigation techniques and other initiatives that support overall farm productivity and profitability.



Reporting Principles

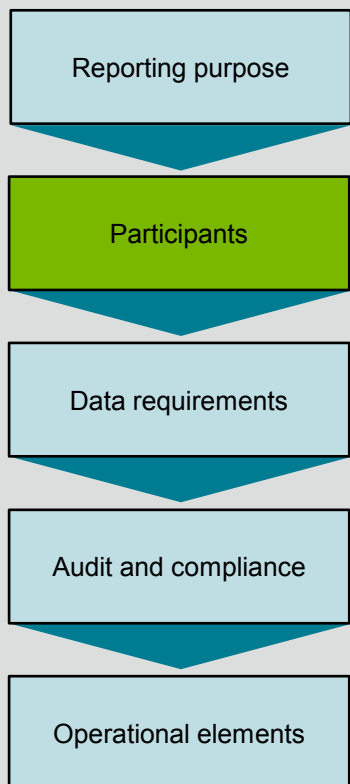
In order to meet the reporting purpose, the following design principles are proposed:

Table 1: Reporting principles

Core principles	
National integrity	<ul style="list-style-type: none"> Where possible, the report design aligns and references the national inventory calculations and enhances national emissions reporting. This does not limit the ability of the on-farm reporting to extend beyond the areas covered by the national inventory.
Productivity measure	<ul style="list-style-type: none"> Farm level emissions are reported relative to the quality and quantity of farm outputs. Any reporting measures or targets are made on this basis.
Supplementary principles	
Flexibility	<ul style="list-style-type: none"> The report design is flexible to ensure the reporting of on-farm emissions is able to be enhanced over time. The complexity of the calculations can be updated as science/research develops and legislative requirements change. The framework must be able to be extended to support product footprinting calculations.
Cost effectiveness	<ul style="list-style-type: none"> The report design considers the cost of any reporting feature against the benefits to be realised in terms of achieving the reporting purpose. Wherever possible, existing data sources are used to provide input into emissions calculations.
Integration	<ul style="list-style-type: none"> The report design enables the connection with other on-farm impact assessments – for example water, waste, nutrients, traceability. This is to align with the farming systems approach where impacts are assessed relevant to farm resources and profitability.
Completeness	<ul style="list-style-type: none"> The report design recognises all emissions sources and sinks for the categories being reviewed and the scope of the emissions calculation.
Performance focus	<ul style="list-style-type: none"> The report design is focussed on providing meaningful outputs for farm-level participants. The information reported should enable support or advice to be appropriately directed and should direct action towards improvements in emissions performance.
Auditability	<ul style="list-style-type: none"> The report design prioritises information that is able to be verified or audited.

The background features a complex geometric design with overlapping blue and white shapes. A large, dark blue trapezoidal shape is positioned on the left, partially overlapping a lighter blue shape. To the right, a white trapezoidal shape is visible. The overall composition is modern and minimalist.

Section 2: Participants and thresholds



Approach

Given the potential scale of participants for farm level reporting of emissions, an important element in the report design is determining **who should report, how these participants are defined** and the **scale or extent of their involvement**. This section will address these questions in order to build the draft reporting framework. This will involve an assessment of the scale of potential participants and considerations of thresholds, exemptions and the structure of how participants are involved.

Specifically, the following section will address:

- Emissions source inclusions
- Definition of the point of obligation – who are the reporting participants
- Determination of threshold levels

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

Emissions sources

As referred to in the previous section, the most significant sources of emissions come from dairy, sheep, deer and beef livestock predominately through methane from **enteric fermentation** (67% of total agricultural emissions) and nitrous oxide from **manure deposited onto pasture and leaching** (20% of total).

Emissions from **fertiliser use** are also a significant component of total agricultural emissions (6% of total) with a proportion of these emissions also relating to beef, sheep, deer and dairy farming operations. In the 2009 TAG report it was recommended that the point of obligation for fertiliser emissions remain at the processor level on the basis that the price signals were the same (TAG, 2009). We have recommended including this as a farm level data requirement on the basis that there appears to be significant programmes in place or proposed (e.g. Overseer, Fonterra's Nutrient Management Programme) relevant to fertiliser application and nitrogen leaching/run-off. Including in our reporting framework makes sense to enable multiple uses of the same data and aligns with the reporting principles (integration).

There are a number of other sources which make up a very small percentage of total agricultural emissions. These are not recommended to be included in the design as the administrative burden of collecting these amounts would not be justifiable.

The following summarises the recommended emissions inclusions and exclusions for the report design:

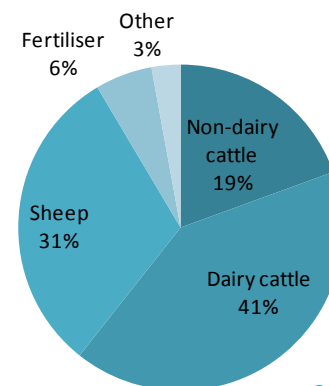
Inclusions

- Sheep, beef, deer and dairy livestock emissions
- Fertiliser use from sheep, beef, deer and dairy farming operations

Exclusions

- All other livestock emissions
- Fertiliser use other than for sheep, beef, deer and dairy farming operations
- Nitrogen fixing crops

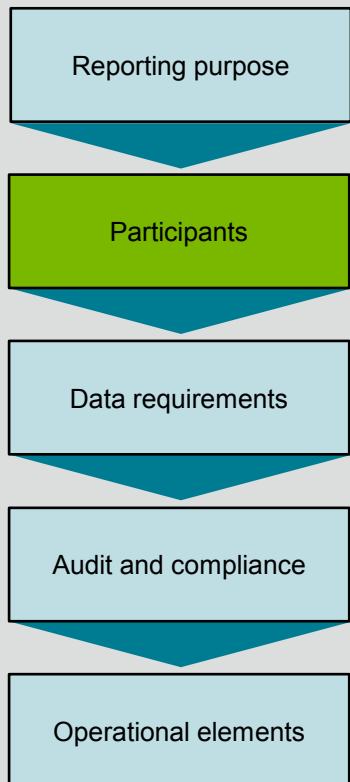
Figure 7: Agricultural emissions breakdown (2010)



Source: MfE, 2012

Figure 7 illustrates the breakdown of total 2010 agricultural emissions by sector as outlined in the New Zealand Greenhouse Gas Inventory.

Point of obligation



Point of obligation

The purpose of the point of obligation assessment is to determine how the farm level reporting participant should be defined. This is not straightforward as farming operations have multiple structures which need to be considered. In order to make this determination we assess potential options against the following criteria:

Completeness

- The participant definition should include those responsible for the vast majority (>90%) of the emissions to be covered in the report design (refer prior section). The definition should not enable emissions to be inadvertently missed through interpretation.

Simplicity

- Participants must be easily identifiable from the definition. This means there should be no ambiguity about who is meant in the participant definition and potential conflicts are acknowledged and clarified. In addition, any existing mechanisms that group agricultural sector participants should be considered for their application to emissions reporting.
- Simplicity also refers to the ability for the point of obligation to be explained. If the participant definition leaves too many questions then it is inadequate as the starting point to determine reporting obligations.

Compliance

- While there will need to be specific consideration relating to compliance under the report design (refer separate section), defining participants in a way that makes testing inclusion easy (and lowers compliance cost) is also a key criteria. This will also relate to the alignment with existing mechanisms (as above).

Alignment with principles/purpose

- The point of obligation should be consistent with the previous analysis associated with the underlying drivers and purpose of farm level emissions reporting.

Reporting purpose

Participants

Data requirements

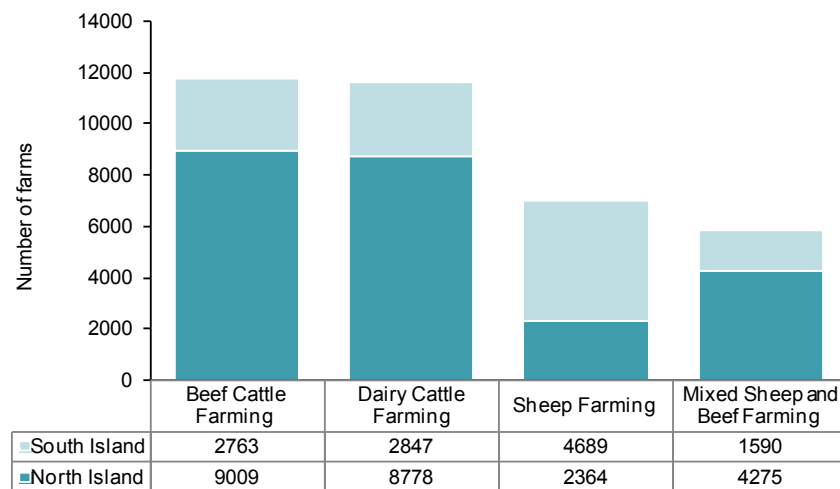
Audit and compliance

Operational elements

Point of obligation (continued)

Based on the agricultural production survey (APS) there are approximately 36,000 dairy, beef, sheep and mixed beef/sheep farming enterprises. The APS defines a farm as one or more blocks of land, managed as a single operation, that is engaged in agricultural activity. This could be described as a “farming enterprise” Applying the definition from Statistics New Zealand, **“a farming enterprise...is a business or other activity that owns, leases or is otherwise involved in the operation of one or more farms”**.

Figure 8: Analysis of farms (numbers)



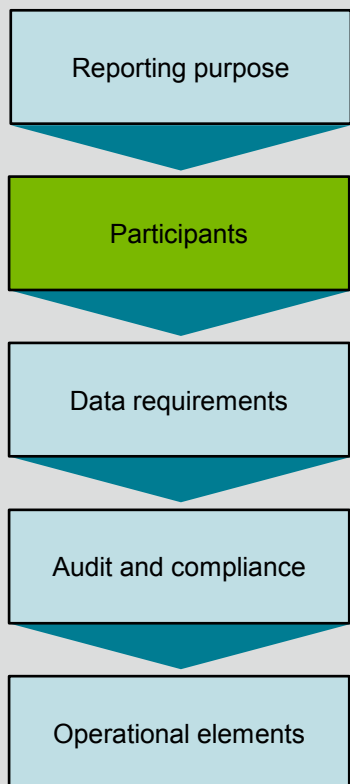
Source: APS, 2012

Type of farm

Considerations associated with determining the farm level point of obligation include:

- The vast majority of “in scope” emissions come from livestock and livestock management.
- Those farming enterprises responsible for livestock management may not be the same as those responsible for the land.
- Livestock may be leased or not otherwise owned by those responsible for farm management.
- Land ownership details may not be conducive to identifying the “responsibility” for emissions – for example Maori land ownership records indicate multiple owners.
- Stock records and other details of stock management are maintained by the stock owner.

Point of obligation



Point of obligation (continued)

Valid options in terms of the farm level point of obligation include:

- Those with direct responsibility for the livestock (stock owner)
- Those with direct responsibility for the farm land (land owner)
- Those responsible for the farming business and who benefit directly from the trading operation (business owner)

In some circumstances the above will be one and the same. The following analyses each option.

Stock owner

The stock owner has direct responsibility for the source of a significant portion of agricultural emissions (i.e. the livestock). In many cases the stock owner and the land owner may be one and the same, with a significant exception being 50:50 sharemilking arrangements where the sharemilker owns the herd and shares in the profits of the farm operation. Benefits of a stock owner point of obligation include:

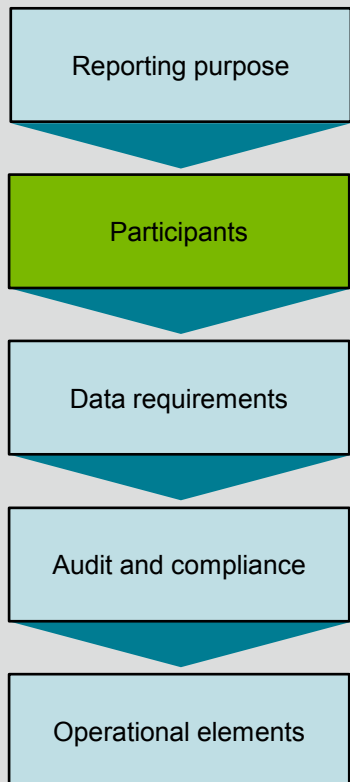
- Stock owner will have the ability to change the way stock are managed to improve overall performance.
- Records for key variables relevant to emissions calculations (e.g. stock numbers, fertiliser use) will be maintained by stock owners.
- The stock owner may benefit from improvements in emissions intensity and productivity (weight gain, milk production etc).

There are also challenges associated with stock owner as the point of obligation. These include:

- There is potential confusion when defining stock owner where stock leasing arrangements are in place.
- There may be limited ability for stock owners to make broader changes to the farm operation and limited incentives to invest in technologies which improve the farm as a whole (including emissions performance). This is contra to the reporting purpose and farming systems view.
- There are mechanisms in place to identify the “farm operation” but these may not include stock owner. For example, the APS selects participants based on the Statistics New Zealand business frame and identifies “all businesses engaged in ‘agricultural production activity’”. The unit determined will be blocks of land, managed as a single operation that involves agricultural activity. The stock owner may not be covered under this mechanism.

Given the limitations above, the stock owner is not the recommended participant point of obligation.

Point of obligation



Point of obligation (continued)

Land owner

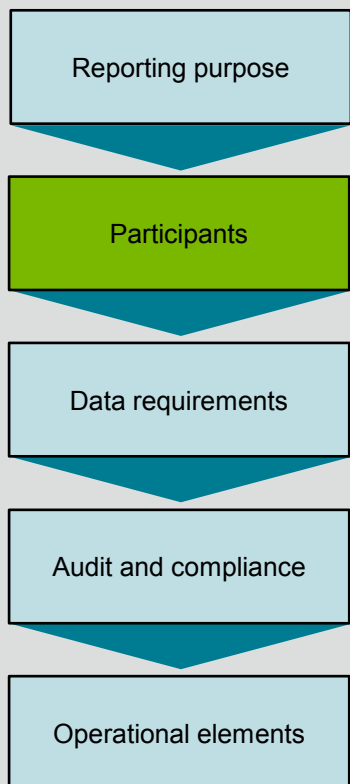
The land or farm owner is a legitimate option in terms of the point of obligation for farm level emissions reporting. Agriculture is a land-based profession and, as noted in the farming systems discussion, the land owner has responsibility for what happens on their land and the associated impacts. Arguments for a land owner point of obligation include:

- There are processes in place to identify land owners. As noted, land ownership details (i.e. boundary information and the names of registered owners) can be derived from Land Information New Zealand (LINZ) data.
- The land owner may have the equity to make significant investments in technology that will impact farm level emissions.
- It aligns more with the farm systems viewpoint in that emissions are collected as one component of the impacts of farming operation.
- The land owner may have a longer term view than those who are responsible solely for farm production.

There are also challenges with a land owner point of obligation, including:

- The land owner may not have access to records relevant to emissions calculations or there may be difficulties in obtaining accurate information. This may impact the completeness of emissions reported.
- If included as the point of obligation, there will need to be the flexibility to transfer the reporting obligation (in some instances) to those with more of the farm management responsibility (e.g. stock owner, farm manager).
- There may not be a strong incentive to make changes unless there is a direct and measurable impact on overall farm returns. The land owner may not be in the position to make any operational changes that will improve emissions intensity.
- Land ownership details may not be conducive to identifying the “responsibility” for emissions – for example Maori land ownership records indicate multiple owners. Determining who should be the reporting party is therefore problematic.

Point of obligation



Point of obligation (continued)

Business owner

Farming in New Zealand has a significant impact on the economy – 50% of exports come from pastoral agricultural production. Each farm is a business and has the challenges of managing capital in a way that maximises return. In this sense the point of obligation could be understood in terms of those responsible for the capital and who benefit from the returns from the farming “enterprise”. Arguments for the business owner point of obligation in terms of farm level emissions include:

- Aligns closely with the systems viewpoint discussed earlier. As a business, the farm has resources, operations and impacts/outputs. Those with the greatest degree of ownership over the resources and who benefit from the output are more likely to use emissions reporting as one element of business management information.
- As previously noted, the Statistics New Zealand business frame identifies “all businesses engaged in ‘agricultural production activity’”. The starting point for a business owner point of obligation is therefore already in place.
- Provided all farming businesses that are engaged in agricultural activity are identified, completeness over the “sources” of emissions should be more easily confirmed and tested.

The above are strong arguments in favour of a business owner point of obligation. However, there will be challenges in implementation, particularly in respect of a workable definition. For instance, in the situation of a 50:50 sharemilking arrangement, the sharemilker may receive benefits from herd sales as well as milk production. This means they benefit significantly from the farming operation but the farm owner maintains the equity. There are also situations where the equity in the farm is shared, often among a variety of owners/structures.

Under the Statistics New Zealand business frame, a definition exists for “economically significant” enterprises. This is based on income, employment and reporting requirements of the operation. The challenge will be where there are more than one “enterprise” associated with a farming operation (e.g. sharemilker is identified as well as land owner). However, there are already protocols in place to deal with these situations in determining the APS population.

In addition, the identified “sources” of emissions in the report design are sheep, beef, deer and dairy farming. It will be important that the design can isolate these sources without creating a significant additional administrative burden. The classification included in the Statistics New Zealand business frame should assist in this regard.

Point of obligation

Point of obligation

Table 2: Point of obligation

Category	Definition	Completeness	Simplicity	Compliance	Align with purpose / principles
Stock owner	<ul style="list-style-type: none"> Owns the livestock and is responsible for the farming operation. Benefits from the farm production and livestock sales. 	✓	-	-	-
Land owner	<ul style="list-style-type: none"> Owns the land on which the farming operation is performed. Benefits from the farm production but may not always be involved in the day to day management of the farm. 	✓	✓	✓	✓
Business owner	<ul style="list-style-type: none"> Is primarily responsible for the trading operation and receives the majority of the benefit from farm production. Meets the “business operation” criteria under the Statistics New Zealand business frame. 	✓✓	✓	✓	✓✓

- No/limited alignment ✓ Some alignment ✓✓ Strong alignment

Based on the assessment above, the recommended point of obligation is the “business owner” as defined above. There is significant benefit in aligning with the existing reporting mechanism used in the APS and the definition and processes applied are consistent with the intent of the report design.

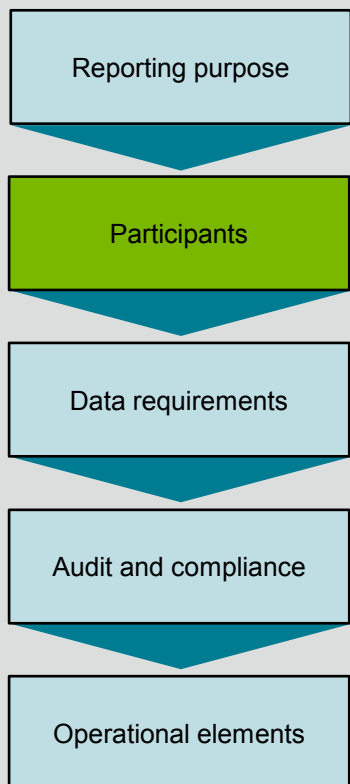
Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements



Threshold recommendation

Threshold determination involves identifying which of those participants must report under the framework and to what extent they must report. In essence, this involves a trade off between accuracy and completeness of the emissions reported and the cost or administrative burden associated with gathering the information required.

Discussions with farmers through the course of our research indicates that provided the reporting interface is carefully designed and the outputs meaningful, those who are willing to provide more information should be able to but there should be some benefit from providing this additional detail. Bearing in mind that this data should have an appropriate level of accuracy and auditability to ensure it is seen as a robust measure of farm performance.

Given the business owner point of obligation it is **recommended that the Statistics New Zealand (Stats NZ) business frame (BF) population relevant to the emissions sources (sheep, beef, dairy and deer) is used to determine whether or not reporting is required.**

The BF is a list of businesses in New Zealand, based on their registration for goods and services tax (GST) with Inland Revenue. It records details such as business names and addresses, predominant type of industrial activity performed, institutional sector, employment levels, and the degree of overseas ownership (Stats NZ). It is already used by the APS in determining survey participants. The classification of businesses listed under the BF is such that it enables appropriate identification of entities involved in sheep, beef, dairy and deer farming. The pool of participants is therefore already defined and classified.

Another benefit of the BF for determining the threshold level is that it only captures “economically significant enterprises”. In the context of agricultural businesses, this is defined as an enterprise that meets one or more of the following criteria:

- Annual expenses or sales (subject to GST) of more than \$30,000
- 12 month rolling mean employee count of greater than three
- Part of a group of enterprises
- Registered for GST and involved in agriculture or forestry
- Over \$40,000 of income recorded in the IR10 annual tax return.

This will enable exclusion of small hobby farms or “lifestylers” who will not make a significant impact on the emissions totals relative to the effort required to manage the data submission. Use of the BF also lines up with the approach and source data used in the national emissions inventory. This alignment is a principle of the overall report design as previously discussed.

It is recommended that all those who meet the criteria and definitions determined under the BF will report under the proposed farm level emissions reporting framework. The extent of information required will be addressed in the following section.

The background features abstract geometric shapes in various shades of blue (dark navy, medium blue, and light blue) and white. The shapes are layered and angular, creating a modern, architectural feel. The text is positioned on the right side, overlaid on a dark blue rectangular area.

Section 3:

Data requirements

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

Data requirements

For the purposes of our assessment, the emissions data required relates to the emissions sources included (sheep, beef, deer and dairy farming). Specifically, this covers:

- Enteric fermentation
- Manure and effluent management
- Soil emissions associated with fertiliser application and animal grazing

In general, emissions from livestock are based on the energy requirements and feed intake of the animal which are estimated from productivity and feed characteristics.

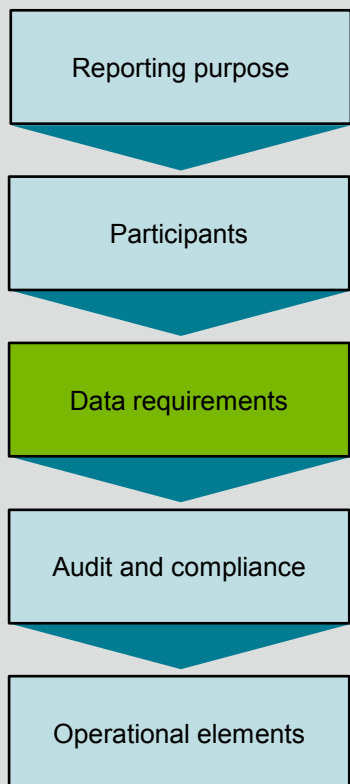
Emissions associated with enteric fermentation are based on converting the animal energy requirements (based on classification and productivity) and energy content of the feed, into methane emissions.

In terms of manure management the pertinent variables relate to feed intake and digestibility which are used to calculate the amount of faecal dry matter (FDM) contained in manure. This can then be converted into emissions based on the methane yield of the FDM.

Soil emissions relate predominately to the application of nitrogen to soil through animal waste or fertiliser. The vast majority of nitrogen from animals is applied during grazing. To determine the amount of nitrogen excreted, information is required in relation to nitrogen intake in food and the amount retained (e.g. in milk/wool and for live weight gain). Other variables such as climate and soil type and topography also has a significant impact on soil emissions.

A number of data points are required to calculate these emissions. However there are existing mechanisms to estimate or determine the information required and this is done for the national emissions inventory calculation. The key recommendation is that all participants (as previously defined) must report a basic level of data but there will be some additional voluntary information requested for those who want a more customised calculation performed.

The following section outlines the existing data sources required to calculate farm level emissions and whether in the proposed report design this information should be mandatory, voluntary, or not required (i.e. calculated using alternative sources or assumptions/estimations).



Data sources

Agricultural data relevant to emissions is collected in a variety of forms and for a variety of purposes. Identified sources of information relevant to on-farm emissions are listed below. Refer Appendix A for more detail.

- | | |
|--|--|
| <ul style="list-style-type: none"> • Overseer (on-line nutrient management and emissions calculator) • Agricultural Production Survey (APS) (annual agricultural statistics collected by Statistics New Zealand) • Farm Monitoring (production and financial statistics for a range of farm types) • National Animal Identification and Traceability programme (NAIT) • National greenhouse gas inventory | <ul style="list-style-type: none"> • Beef/sheep slaughter statistics • Farms Online (contact information collected for biosecurity purposes) • Dairy statistics provided by Livestock Improvement Corporation – LIC (production, herd details, milk prices) • On-farm and production analysis provided by Beef + Lamb (production, prices, balance sheet performance) • Hoofprint programme (on-line programme for Alliance suppliers to calculate their on-farm emissions) |
|--|--|

While there are a number of sources that have information relevant to farm level emissions calculations, these tend to be voluntary in nature (e.g. Overseer, Hoofprint) and collated on a sample/survey basis. In making the transition to a farm level point of obligation for agricultural emissions there will implicitly need to be both; a level of compulsion to provide information; and a complete population (however defined) of data. The following sections outline the data requirements and sources relevant to the beef, dairy and sheep on-farm emissions under the following categories:

- Animal characteristics
- Productivity
- Feed intake and manure
- Nitrogen in soils and leaching

For each data point required we have made a recommendation as to whether this information should be reported by all participants or voluntary. The distinction has been made between information that is the most significant in determining emissions and is easily obtainable by participants (mandatory) and information which provides a level of refinement – increasing the relevance of the individual submission and reporting for the participant. Where the voluntary information is not supplied, assumptions or estimations will be made. Some information that will be used to determine farm level emissions is recommended to be excluded from the information requested as it is unlikely participants will have access to this data.

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

Animal characteristics

The following details are relevant to calculating energy requirements (classification, age), productivity (breed) and the overall scale of emissions associated with the farming operations (numbers).

Table 3: Data sources

Data requirement	Category	Current source	Mandatory	Voluntary	Exclude
Animal numbers	Sheep, Beef, Deer, Dairy	APS and IRD	✓	-	-
Animal classification (subcategory)	Sheep, Beef, Deer, Dairy	APS and IRD	✓	-	-
Animal age	Sheep, Beef, Deer, Dairy	-	-	-	✓
Breed	Dairy	Dairy NZ	✓	-	-

Considerations

- Requesting the numbers of animals in each sub-category will help ensure alignment with the national inventory.
- In relation to animal numbers, there is the risk that taking an average approach may not pick up the movements of stock off farm (e.g. grazing). A consideration is that with each subcategory, the number of stock and total number of months on property be requested, to reflect sales or transfers.
- While animal age is an important variable to determine emissions at slaughter it can likely be determined from the subcategory analysis and is therefore excluded from direct farm level information requests.

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

Productivity

The following information is required to calculate the animal energy requirements and therefore emissions from enteric fermentation.

Table 3: Data sources (continued)

Data requirement	Category	Current source	Mandatory	Voluntary	Exclude
Live weight and/or carcass weight	Dairy	LIC dairy statistics	-	✓	-
Live weight and/or carcass weight	Sheep, Beef, Deer	Slaughter statistics Reference to dairy statistics	-	✓	-
Pregnancy and gestation	Beef, Dairy, Deer	Assumption	-	-	✓
Lambing percentages	Sheep	Assumption	✓	-	-
Milk protein, fat, yield	Dairy	Calculated from LIC dairy statistics	✓	-	-
Milk protein, fat, yield	Sheep, Beef, Deer	Assumption	-	-	✓
Greasy fleece weight	Sheep	Assumption	✓	-	-

Considerations

- Dairy farmers may not have information on the live weights of cows or heifers. The additional accuracy provided by having farm specific weights may not outweigh the additional work required. In addition, the key efficiency in dairy production relates to milk, not live weight gain.
- Live weights for beef and sheep may be more easily obtained at farm level. This may be an average across each subcategory. The details may also be available from processors.
- It would be important to include some on-farm specifics relating to milk as it is the key source of dairy productivity and therefore provides for measuring and benchmarking performance.

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

Feed intake and manure

Details associated with feed energy and digestibility are needed to calculate manure emissions. The nitrogen related emissions from animal deposits is calculated based on the nitrogen in the feed less the amount retained.

Table 3: Data sources (continued)

Data requirement	Category	Current source	Mandatory	Voluntary	Exclude
Feed type	Sheep, Beef, Deer, Dairy	Assumption	-	✓	-
Feed digestibility	Sheep, Beef, Deer, Dairy	Assumption	-	✓	-
Manure management system	Sheep, Beef, Deer, Dairy	Assumption	-	✓	-
Nitrogen in diet	Sheep, Beef, Deer, Dairy	Assumption	-	-	✓
Nitrogen in wool	Sheep	Assumption	-	-	✓
Nitrogen in milk	Dairy	LIC dairy statistics	-	-	✓
Nitrogen retained in body tissue	Sheep, Beef, Deer, Dairy	Assumption	-	-	✓

Considerations

- Farmers may have information on the type of feed supplied to animals over the period. This could be categorised in such a way that provides for some customisation at the farm level. The quality of feed and digestibility will determine the energy content so some customisation seems appropriate for Tier 3 reporters.
- Farmers are unlikely to have detailed information on nitrogen retained or the digestibility of feed. It seems reasonable to exclude these from the information requests at this time and keep the assumptions and data inputs at a higher level.

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

Nitrogen from soils and leaching

The primary source of data relating to direct soil emissions (non-animal related) is total fertiliser applied. From this information emissions factors are applied to determine the direct conversion of nitrous oxide (N₂O) from the application or the N₂O emitted through leaching.

Table 3: Data sources (continued)

Data requirement	Category	Current source	Mandatory	Voluntary	Exclude
Nitrogen fertiliser applied	Sheep, Beef, Deer, Dairy	Fertiliser sales	✓	-	-
Nitrous oxide inhibitors	Sheep, Beef, Deer, Dairy	APS	-	✓	
Soil type	Sheep, Beef, Deer, Dairy	Assumption	-	✓	-
Rainfall	Sheep, Beef, Deer, Dairy	Assumption	-	-	✓

Considerations

- Providing fertiliser applied (or fertiliser purchases as a proxy) should be obtainable from farmers. It is conceivable that fertiliser companies could provide this information as part of the supply arrangement. From discussions with MPI staff it appears that fertiliser suppliers are already providing much of the input into the Overseer nutrient management programme. Similar to fertiliser, Nitrous oxide inhibitors may be obtainable by farmers or through suppliers.
- The report design should be able to allow for emissions and productivity benefits from enhanced fertiliser management, and where possible, the improvements to farm management in terms of leaching.
- Soil nitrous oxide emissions are strongly influenced by soil water content – impacted by soil type (as a proxy for drainage) and rainfall/drought/climate. While these elements could be included at farm level this level of detail should come from NIWA data.

Summary farm level requirements

The following table summarises the farm level emissions information recommended for the report design. A relatively small amount of data is required to be supplied by participants with the remainder being voluntary or not required.

Table 4: Summary of data requirements

Source	Mandatory	Voluntary	Exclude
Beef and deer farming	<ul style="list-style-type: none"> Animal numbers & classification Fertiliser applied 	<ul style="list-style-type: none"> Live weight and/or carcass weight Feed type & digestibility Manure management Nitrous oxide inhibitors Soil type 	<ul style="list-style-type: none"> Animal age Pregnancy and gestation Milk protein, fat, yield Nitrogen in diet Nitrogen retained Rainfall
Sheep	<ul style="list-style-type: none"> Animal numbers & classification Lambing percentages Greasy fleece weight Fertiliser applied 	<ul style="list-style-type: none"> Live weight and/or carcass weight Feed type & digestibility Manure management Nitrous oxide inhibitors Soil type 	<ul style="list-style-type: none"> Animal age Milk protein, fat, yield Nitrogen in diet Nitrogen retained Rainfall
Dairy	<ul style="list-style-type: none"> Animal numbers & classification Breed Milk protein, fat, yield Fertiliser applied 	<ul style="list-style-type: none"> Live weight and/or carcass weight Feed type & digestibility Manure management Nitrous oxide inhibitors Soil type 	<ul style="list-style-type: none"> Animal age Pregnancy and gestation Nitrogen in diet Nitrogen retained Rainfall

Reporting purpose

Participants

Data requirements

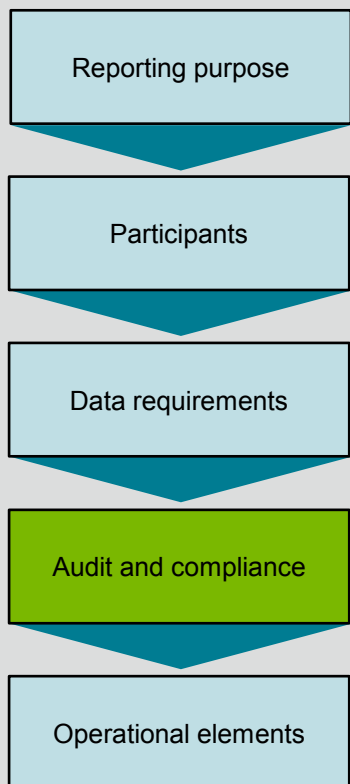
Audit and compliance

Operational elements

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Section 4: Audit and compliance

Compliance framework



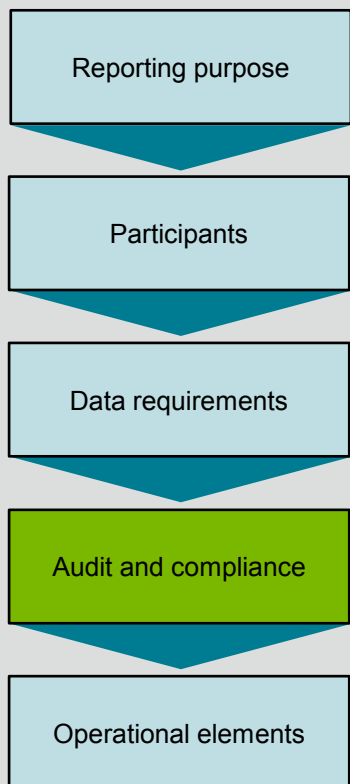
Elements of a compliance framework

Compliance in the context of farm level emissions reporting is an outcome whereby **the defined participants meet their reporting obligations**.

The reporting obligations of participants under the report design are to **provide specified information** in accordance with the reporting protocol that is **accurate** and, when combined with other data sources, enables a **reasonable estimate** of the emissions associated with a **farming enterprise**.

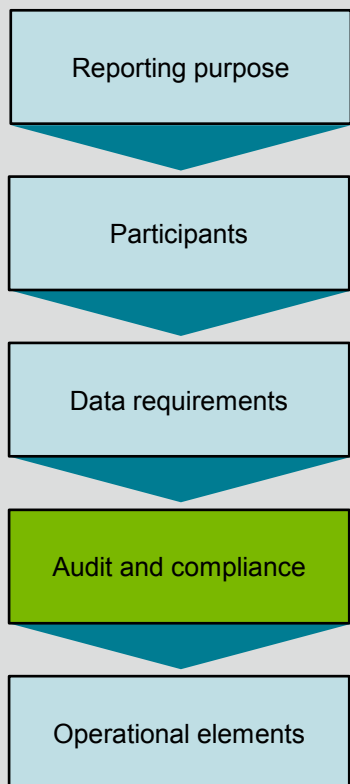
Good practice compliance programmes are designed around principles associated with: Commitment; Implementation; Monitoring and Measuring; and Continuous Improvement. Applying these principles, the following are the key elements of a compliance framework and a summary of how these apply to the farm level emissions report design:

- **Data analysis**
 - Data collected from participants must be accurate and be collected in a format that is suitable for analysis and review. Where data is collected from multiple sources these must be collated in order for review to happen.
 - Data received from farm level must be combined with any other information needed to determine each participant's emissions profile. Each participant will have a set of data and emissions calculations that can be audited and used for benchmarking and reporting purposes.
- **Risk assessment**
 - Based on the scale of the participants and the nature of the data, identify the key risks that compliance will not be achieved. This may be based on any of: the subjectivity of the information provided; the incentives associated with misstatement; the capability/capacity of the participants; or the quality of data gathering techniques.
 - For each emissions category (sheep, beef, deer, dairy), develop a risk register identifying the risks that the compliance with the reporting obligations will not be achieved. Scale these risks in terms of likelihood and consequence.
- **Controls**
 - Based on the risk assessment, controls are designed to mitigate and manage the identified risks of non-compliance. Wherever possible, these controls should not be specific to the compliance programme but part of business as usual processes.
 - Reporting agricultural emissions at farm level will be driven by a very clear reporting protocol which specifies the information to be provided and supporting information to be retained. The controls associated with approvals and review will be based on this protocol.



Elements of a compliance framework (continued)

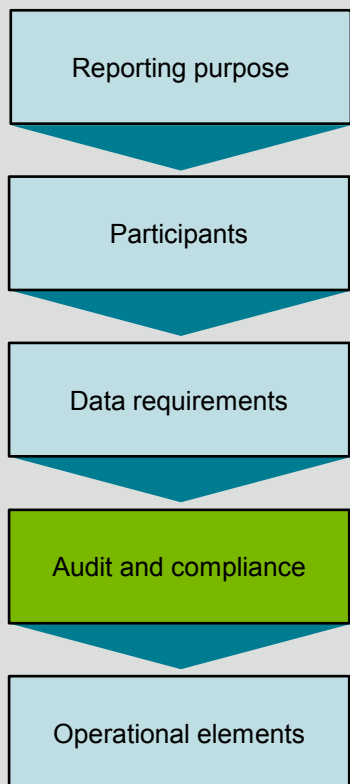
- **Responsibility**
 - Responsibility for compliance with the information requests is clearly assigned and the expectations of participants are communicated.
 - Reporting participants are responsible for the accuracy of the reported information. This responsibility must be clearly defined. Although participants may not directly supply all farm level information, they should be provided a reported summary for review and approval.
- **Training**
 - Critical to compliance is that appropriate training needs are identified and the training programme is on-going, practical and based on the needs of those allocated responsibility for compliance.
 - Training and awareness of the farm level reporting programme needs to extend beyond farmers to include other groups such as accountants, farm consultants and key suppliers who will be responsible for some of the farm level information required. Training should be incorporated into existing farm management programmes.
- **Monitoring**
 - Monitoring involves both the monitoring of the compliance programme itself and the compliance performance of the participants.
 - Compliance performance refers to the extent to which the reported information is accurate and has been supplied in accordance with the reporting protocol. This involves setting benchmarks/targets and reviewing information received using a risk weighting and analytical techniques to identify potential breaches. This process should also identify the participants and submissions subject to audit (refer separate section).
 - Monitoring of the compliance programme around emissions reporting should be performed by the internal audit function of the governing department (refer separate section on governance). This will involve reviewing the adequacy of controls, the effectiveness of following up compliance failures and the adequacy of training and support.



Elements of a compliance framework (continued)

- **Compliance reporting and remedial action**
 - Compliance reporting of farm level emissions reporting should be incorporated into existing management reporting associated with the ETS. It should be based on the monitoring programme as above and the key indicators associated with compliance performance. These reports should be authorised and approved by the responsible department management.
 - Where a compliance breach by participants has been identified, this should be reported and appropriate remedial action taken. In the first instance this will involve discussions with participants involved and ensuring the training, support and communication has been sufficient. A clear escalation process should be defined and communicated for the situation where compliance is continually breached after remedial action has been performed.
- **Performance management**
 - The identification of performance metrics associated with farm level emissions reporting is an important element in assessing the compliance programme. These metrics should include: numbers of participants reporting; timeliness of reporting; identified breaches of reporting protocol; and the use of feedback mechanisms.
- **Continuous improvement**
 - The compliance programme for farm level emissions reporting should be reviewed on a periodic basis under the internal audit programme of the governing department. This should cover: results of compliance and any breaches; effectiveness of training and support; adequacy of resources; changes made due to prior reviews; complaints and participant feedback.
 - Recommendations identified through this process must be made to the governing body for review and implementation.

Audit framework



Elements of an audit framework

The purpose of an audit framework is to increase the credibility of the reported information and process by enabling an independent opinion over the defined subject matter. As such, the audit framework for farm level emissions must consider:

- **Parties** – who will be subject to audit and how auditors will be defined.
- **Subject matter** – what will be the information subject to audit procedures.
- **Criteria** – against what the subject matter will be assessed.
- **Reporting** – what level of audit opinion is appropriate and how this opinion is communicated.

The following summarises the key considerations for the design of an audit framework given the report design elements outlined.

Audited party

Given the potential scale of reporting participants, a feasible number of participant audits will only cover a very small proportion of total reported emissions. Feedback from potential participants has indicated that while an audit regime is important to ensure the credibility of the process, this should be managed so as to minimise disruption or impact to farmers. The recommendation is that the initial focus of the audit regime should be in relation to the collation and calculation processes of the governing body rather than individual participant submissions.

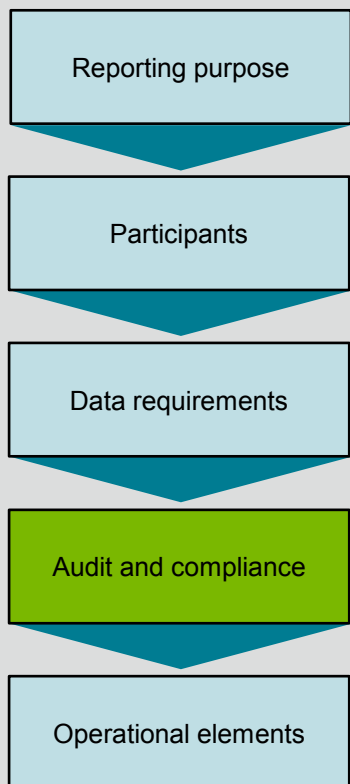
This will cover the details per the reporting protocol (refer separate discussion) including:

- Data collection
- Data collation and emissions calculations (including the appropriateness of assumptions applied)
- Risk assessment processes and associated controls
- Data review and compliance monitoring
- Accuracy of reporting to participants

The audit focus is therefore more on the processes and the ways in which the governing body are managing the risks of misstatement in the reported information.

At a later stage this audit regime may extend to cover selected participants but that is not an initial recommendation.

Audit framework



Auditors

Auditors should be selected based on relevant experience in performing assurance of non-financial information under recognised assurance standards (e.g. ISAE 3000). Unlike the unique emissions factor verification regime under the ETS, an individual auditor (rather than panel) should be selected to perform the assurance work. This may be extended to a panel if the audit regime intends to cover individual participant submissions.

Subject matter

As noted, we recommend the subject matter of the audit programme for farm level emissions be the data collection processes, emissions calculations and participant reporting performed by the governing body. For more detail, refer the discussion around operational elements in Section 5.

Criteria

Under an audit programme, criteria are the benchmarks used to evaluate or measure the subject matter. Selecting suitable criteria is critical to ensuring a reasonably consistent evaluation of the subject matter. In this case the criteria should be the specific requirements established under the reporting protocol relevant to subject matter outlined above.

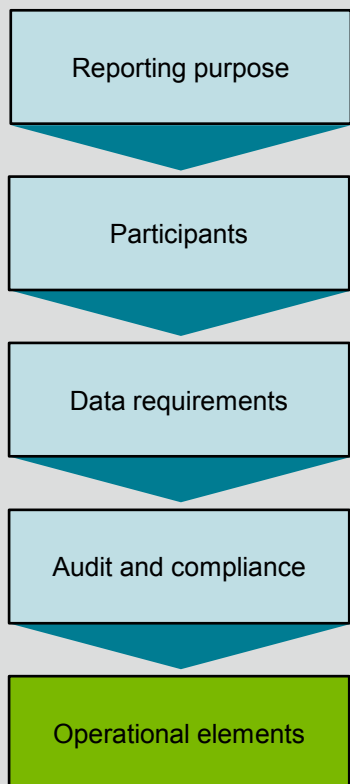
Reporting

In any assurance engagement there are the: 1) assurance providers (auditors); 2) the party responsible for the subject matter; and 3) the intended users. The users are the person(s) for whom the audit report is prepared. In relation to the proposed framework, it is recommended that the audit reporting be addressed to the reporting participants under the farm level reporting framework. This is to provide the participants some comfort that their information has been collected with due consideration to confidentiality, that the calculations have been based on agreed standards and that their reporting is a complete and accurate representation of their emissions based on the information supplied.

The level of assurance work performed and associated cost, should be kept to an appropriate level. We recommend that a limited level of assurance is provided and that potential providers supply an audit programme that illustrates how they will confirm that nothing has come to their attention to suggest that the subject matter has not been calculated in accordance with the reporting protocol. The audit should be performed on an annual basis, in conjunction with the reporting and calculations being performed.

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Section 5: Operational elements



Key operational elements

A significant challenge associated with farm level reporting will be managing the implementation of the reporting requirements and determining how the on-going data collation and review process will be conducted.

From our discussions with potential participants, any reporting interface must be clear and easily understood. A significant concern was also raised in relation to the support and expertise available to help with the reporting.

Operational elements covered include:

- Governance and support structures
- Reporting structure and protocol
- Reporting infrastructure and interface
- Transitional arrangements

Governance

The question of governance in relation to farm level reporting of emissions refers to the responsibility for determining the reporting requirements and assessing risk and compliance associated with the reporting framework. This could be any one of several government agencies involved in emissions reporting or the agricultural sector. The most relevant of these are:

- **Ministry for Primary Industries (MPI)**
 - MPI is described as the government “hub” for the primary sector and covers agriculture, forestry and fisheries as well as food safety and bio security. MPI administer the forestry elements of the ETS.
- **Ministry for the Environment (MfE)**
 - MfE is the government’s principle advisor on the environment with strategic priorities in relation to land use, water and climate change. They focus on training and best practice, policy strategies and information on New Zealand’s environmental management systems and environmental standards.
- **Environmental Protection Authority (EPA)**
 - The EPA administers applications for major infrastructure projects of national significance, and regulates new organisms, hazardous substances and chemicals. They administer the ETS and the New Zealand Emissions Unit Register under the Climate Change Response Act 2002.

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

Governance (continued)

Farm level reporting is initially as much about education and communication as data collection and regulatory compliance. Discussions with potential participants indicate there is concern about the potential of additional regulation and compliance in this area which would impact the acceptance amongst farmers.

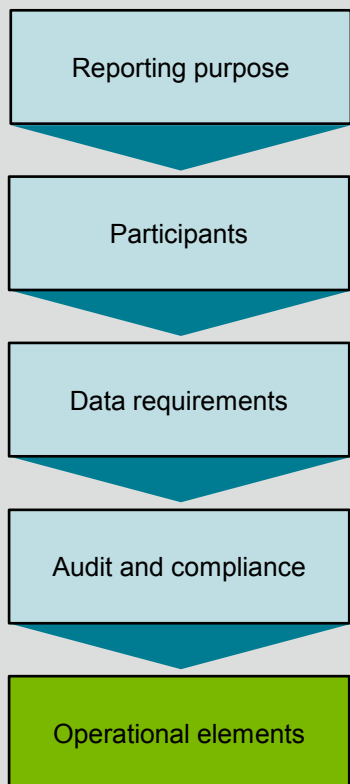
We recommend the lead agency responsible for farm level agricultural emissions reporting is the Ministry for Primary Industries (MPI). Reporting emissions at farm level is a significant shift for the industry and will require careful communication with stakeholders. For this to be successful, the lead agency should be the one most connected to farmers and potential participants.

Support for participants

Evidence from the forestry implementation of the ETS indicated that the level of support needed for participants should not be underestimated. Discussions with potential participants found a key concern was the lack of qualified rural professionals able to assist with implementing farm level emissions reporting. An emerging theme was that trusted farm advisors would need to be equipped to help manage the reporting process. Several interviewees noted the accountant as being a good fit for this purpose. Having an advisor assist with reporting is also likely to improve the awareness and uptake amongst farmer groups. This is provided the additional reporting is not onerous and beyond the advisor's capacity in the ordinary course of business.

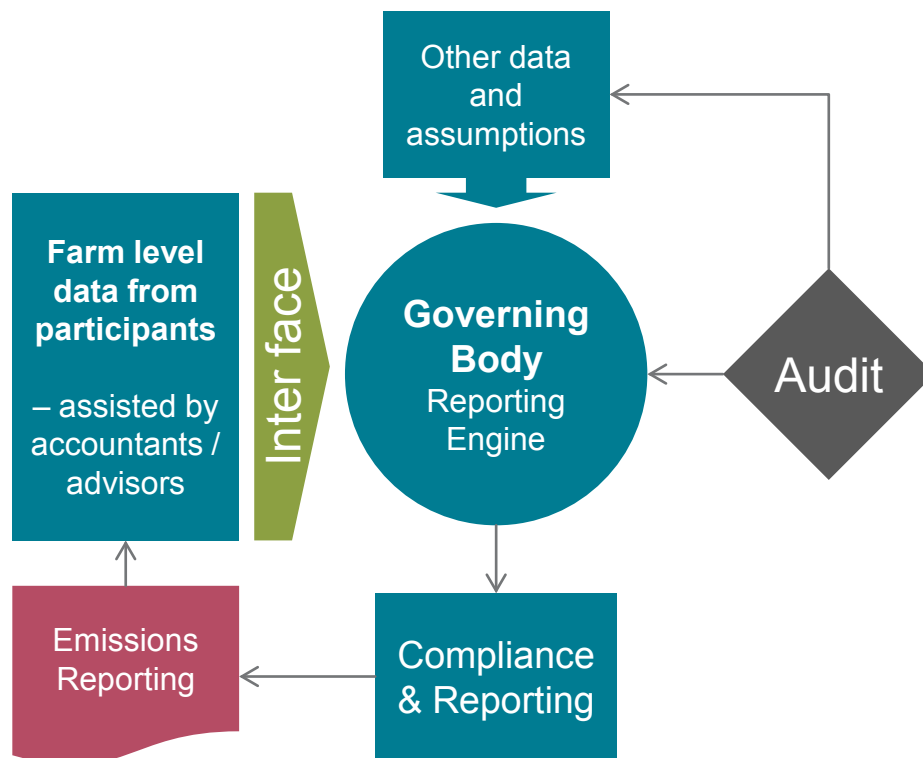
Given that some of the key data sources can be obtained from farm accounts (e.g. stock numbers, fertiliser purchased) it is recommended that rural accountants are engaged to form the core support for reporting participants. Farmers work closely with accountants to get their accounts and tax position right. Including emissions reporting should not be a significant extension of their responsibilities. Accountants will not have to become emissions experts. They will be helping to complete a regulatory submission in accordance with a specified protocol (refer next section). This is closely aligned with their expertise and experience.

The engagement and communication campaign associated with the report design should include a separate focus on accountants. Engagement with accountants over forestry reporting under the ETS was undertaken by MAF (now MPI) during 2011 with some success. However, it was too late to be effective in facilitating front end support. Any engagement with accountants or other advisors about farm level emissions reporting must occur from early on in the design phase and pre-implementation.



Reporting structure

The following outlines the proposed structure for reporting farm level emissions.



Key elements:

- Farm level data is requested and collected as per the reporting protocol.
- Information is supplied in relation to the reporting period in one submission through the reporting interface.
- A snapshot summary of data submitted is sent to participants for their confirmation or amendment.
- Direct farm level data is combined with other data and assumptions in the governing body database and calculation engine.
- Emissions for each reported participant is calculated as specified in the reporting protocol.
- Monitoring and compliance of the inputs and calculations is performed.
- An emissions report is submitted to participants. The report structure is specified in the reporting protocol.
- Audit of the governing body calculation and reporting processes is performed.

Reporting purpose

Participants

Data requirements

Audit and compliance

Operational elements

Reporting protocol

Key to the success of the report design implementation and on-going management of farm level emissions reporting is the reporting protocol. The protocol articulates the responsibilities of the parties involved and sets clear expectations in terms of the timelines, data collection, calculations, confidentiality and reporting outputs. It also sets the benchmark against which the governing body will be audited. As such, the protocol must therefore describe an *auditable* process.

The protocol will also be important in driving consistency in the reported information by providing specific “rules” about how the data is collected and details of any evidence that is required to be maintained. Key elements of the reporting protocol are summarised below.

Responsibilities

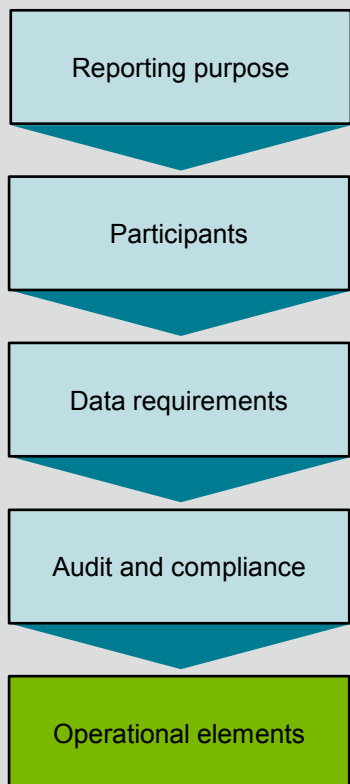
- Defines who is required to report and the conditions for any transfer of the reporting obligations to another person.
- Outlines the responsibilities of participants to report and participant rights in terms of information security and privacy.
- Provides details on contacting the governing body for any complaints, review or appeals processes.

Timelines

- Reporting will be based on an annual submission by participants. Aligned with the balance dates of many farmers (typically May or June) and farm accountants being the preparers of the emissions information
- The protocol will establish deadlines in terms of receiving submissions, confirming the emissions summary, receiving the final report and any appeals process.

Data

- Specifies exactly what is required for each data point that is collected directly from participants. For example, fertiliser application could be defined as: “total fertiliser purchased during the reporting period”; or “total fertiliser spread during the reporting period”. The protocol will specify these requirements clearly to ensure consistency in data collection.
- For data that is not directly requested, the protocol outlines where this data comes from and any inherent uncertainty.



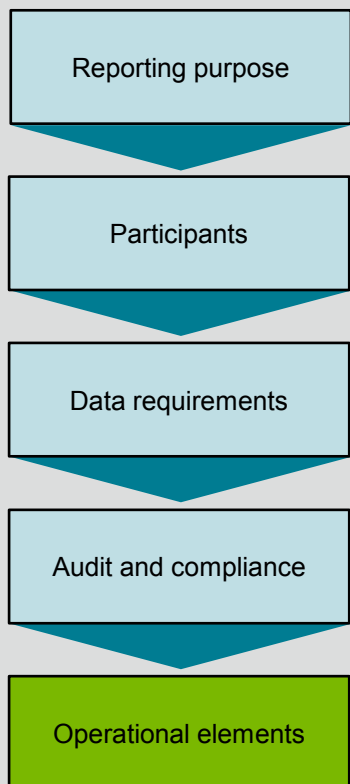
Reporting protocol (continued)

Calculations

- From discussions with potential participants there is a need to separate the technical emissions calculations from the reporting interface. We agree this is a good approach, however the protocol should step through how the emissions calculations are performed. This will form a component of the audit discussed earlier.
- Participants will want to be reassured that the calculations are robust and based on best practice even if they do not “see” or necessarily understand how they are performed.

Reporting

- Through our interviews and research, the reporting output should enable participants to benchmark themselves and take actions to improve their overall emissions performance. This benchmarking should be against regional averages, national averages and, where possible, international comparisons.
- The reporting will need to be clear and easy to follow. A good example is the reporting by Fonterra under the nutrient management programme. This provides a very clear picture of performance against regional averages and the regional distribution in terms of nitrogen leaching.
- The protocol should be clear about the nature of the reporting that will be provided to participants and for what purpose this reporting will be put.



Reporting infrastructure

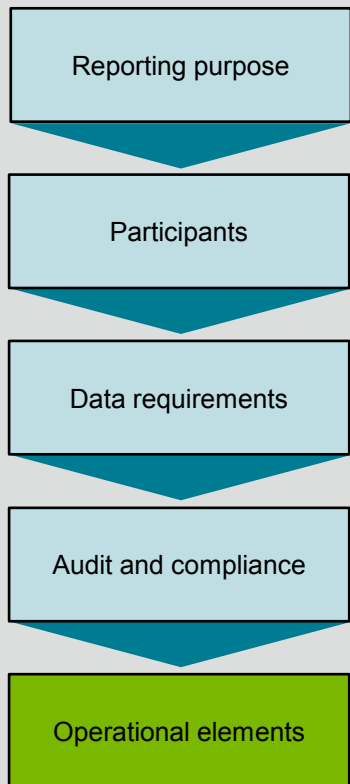
As indicated in the reporting structure, key reporting infrastructure required includes:

1. The reporting interface – What the participants see and complete in order to submit data.
2. The calculation engine – The database used to collate vast amounts of data from multiple sources that will be used in the emissions calculations. The engine will also support the back end calculations that apply to this data.
3. The reporting system – How the calculated data is translated into clear and concise reports for participants and how the information can be accessed and used by other interested parties (e.g. Government, national inventory compilers) for approved purposes.

Each of the above and the system as a whole will require significant investment in terms of technology. The scale of participants is vast and existing emissions reporting infrastructure (e.g. the emissions unit register) should be assessed to determine whether it will be fit for purpose. Should agriculture one day be included in the ETS in terms of liability, units would need to be allocated to, and surrendered by, farmers. Registry accounts for allocated New Zealand units (NZUs), surrender processes and reporting will need to be connected to the calculation and reporting infrastructure.

From the perspective of participants, the reporting interface will be critical to the uptake and quality of emissions information supplied. Discussions with potential participants have indicated that reporting templates should be easy to follow and complete. While the calculations behind the interface may be complex and detailed, what is completed by participants should not be. There needs to be careful consideration made to usability and appropriate skills used for the interface design.

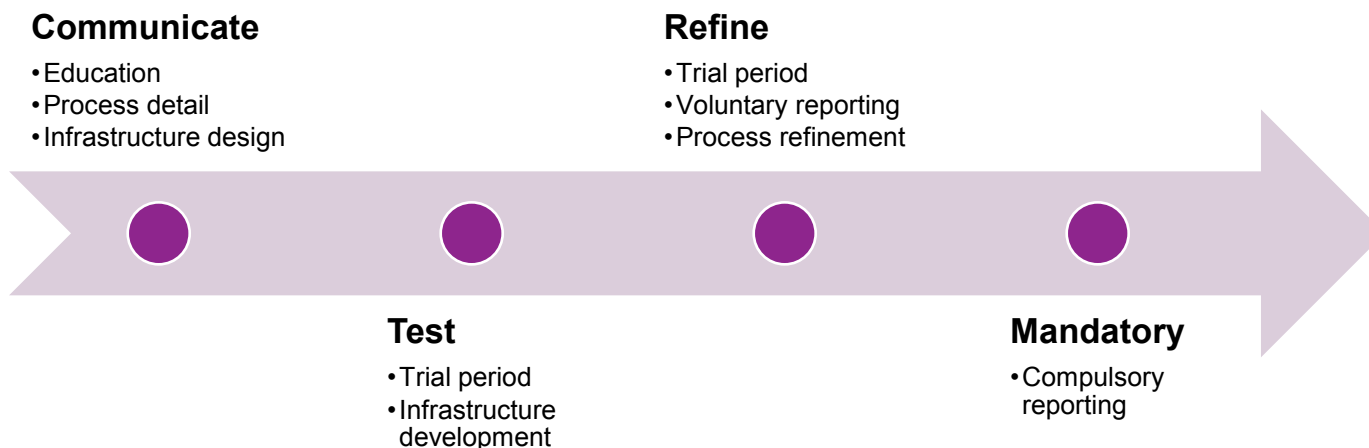
An online system for reporting would be the most appropriate in terms of streamlining the process of data collation. However, a significant education and engagement program would be required to support farmers. While a paper system of reporting wouldn't require the same level of education, it would potentially add significant cost to the administrative process of data collection and entry into a separate system for emission calculations.



Transition

Amongst potential participants interviewed, a consistent theme around the implementation of farm level reporting was that it should not happen until there has been a comprehensive engagement/education campaign and, importantly, the support structures are in place to give it the best chance of being successful.

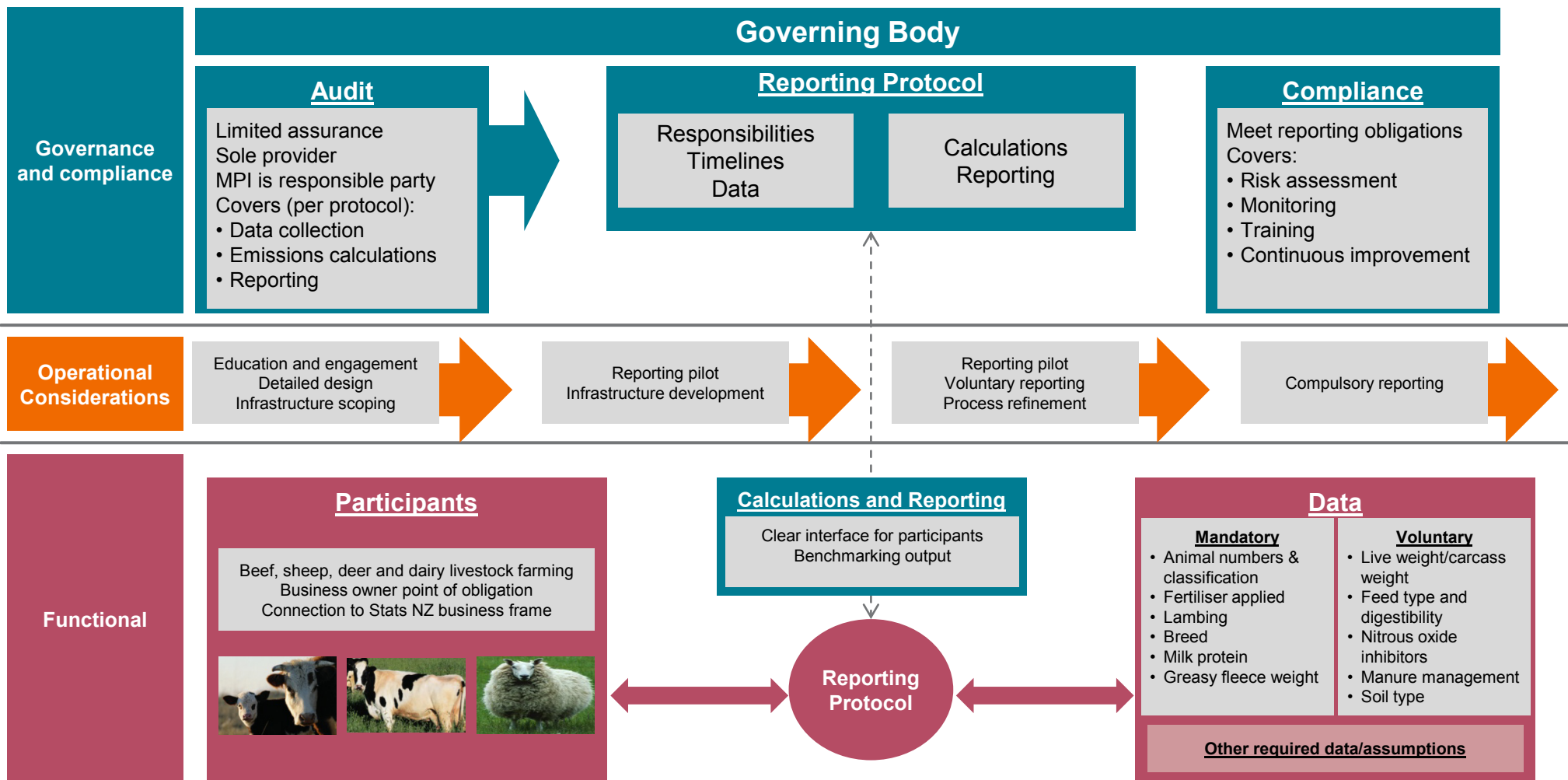
Once a more detailed design has been articulated this should be tested through engagement and education. In order to test the design we recommend a trial period is run with a representative sample of participants. The outcome may result in changes to the design elements. This trial period will be critical to help identify design weaknesses and to ensure the protocol, interface and other infrastructure is fit for purpose. Voluntary reporting should be introduced prior to any mandatory reporting.



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Section 6: Draft design for farm level reporting

Bringing together a summary of the findings in this report, the following outlines the reporting, compliance and audit framework recommended for reporting agricultural emissions at farm level.





cutting through complexity

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Appendices

- A: Data sources**
- B: List of interviews**
- C: Interview questions**
- D: Report references**

Overseer	Agricultural Production Survey (“APS”)
<p>Description</p> <p>Overseer is a decision support farm model that provides tools to examine the impact of nutrient flows and use within a farm. Calculates a nutrient budget for a farm considering inputs, outputs and nutrient cycling. It also allows for mitigation options associated with nutrient use to be assessed. Overseer also includes a greenhouse gas calculator.</p>	<p>Description</p> <p>APS is an annual survey sent to all livestock, arable, horticulture and forestry farmers (including lifestyle blocks). It is used to keep up-to-date information on NZ’s agricultural, horticultural and forestry activity.</p>
<p>Data captured</p> <ul style="list-style-type: none"> • Block details • Stocking information • Feed structures (use of pads etc) • Effluent systems (ponds, pumps etc) • Feed supplements • Fuel and electricity use • Soil details • Fertiliser use and DCD application • Irrigation details 	<p>Data captured</p> <ul style="list-style-type: none"> • Primary farm activity • Number of each type of livestock/fruit crop/forest type • Size of farm • Ownership of farm/operating information • Land type on farm (i.e. does include native bush) • Supplementary feed crop to livestock (hay, baleage, grain etc.) • Area of land with effluent spreading • Area of land with fertiliser spreading • Amount of renewed and cultivated pasture

Farm Monitoring	NAIT
<p>Description</p> <p>Provides a short-term view of the financial and production status of a range of farm types throughout New Zealand. It examines revenue and expenditure for the past season, outlines what farmers are budgeting for the year ahead and provides information on trends and issues facing the sectors.</p>	<p>Description</p> <p>The NAIT database stores information about each animal's individual RFID tag number, its location, and the contact details of the person in charge of the animal. It provides reliable, up-to-date information on individual animal locations and movements. It links people, property and livestock to provide lifetime animal traceability and enhances NZ's biosecurity response to help safeguard the NZ brand and farmers income.</p>
<p>Data captured</p> <ul style="list-style-type: none"> • Pastoral conditions overview • Income analysis – Dairy, beef, sheep, deer - 2011 final vs. 2012 budget • Farm spending patterns • NZ climatic conditions i.e. soil moisture comparison • Number of stock per region • Dairy, beef, sheep and deer financial sector overviews • Sector issues and trends; morale, debt, legislation changes, image, ownership and environmental issues 	<p>Data captured</p> <ul style="list-style-type: none"> • Keeps up-to-date information on who owns which animals and their movements by registering each animal individually. • All cattle livestock are accounted for where born and where died.

National greenhouse gas inventory (agriculture)

Description

The inventory is the official annual report of all human-caused emissions and removals of greenhouse gases in New Zealand and looks at it from a national level. They obtain their data from the APS.

Data captured

- Total agricultural emissions
- Breakdown of agricultural emissions, i.e manure, fermentation etc.
- Breakdown total emissions by livestock (beef, sheep, dairy, deer)
- Average milk production and live weight data dairy cows collected from LIC, other livestock types collected from MAF.
- Methane calculations based on international methodology, IPCC guidelines
- Manure emission calculations using IPCC guidelines

Farms Online

Description

FarmsOnLine is a website that gives for accurate up-to-date contact details for rural properties in New Zealand. It gives MAF instant access to information so it can respond quickly to a biosecurity alert or natural disaster. It is voluntary to be registered on the site to provide the most up-to-date information. It is used in correspondence with NAIT.

Data captured

- Provides contact and location details of farms to support NAIT
- Personal details such as name of land owner or occupier and farm boundary details
- Purely used or contact details, i.e. address, phone number and email of landowner.

LIC dairy statistics	Hoofprint
<p>Description</p> <p>Provides statistical information related to the NZ dairy industry. The report shows trends in farm production activities and in particular dairy herd improvement and herd records.</p> <p>Data is sourced from LIC National Database, dairy companies, Animal Evaluation database, Animal Health Board Annual Report (year ending 30 June 2010), Quotable Value New Zealand Rural Property Sales Statistics, and Statistics New Zealand.</p>	<p>Description</p> <p>Developed by Alliance to communicate to markets what NZ farm footprints look like and how they can be improved. Used to help Alliance reduce its supply chain carbon footprint. The Hoofprint programme is available to all Alliance group shareholders.</p>
<p>Data captured</p> <ul style="list-style-type: none"> • Milk production • Herd size and number trends vs. land area required • Herd number and production analysis by region • Herd improvements and weights • Number of births • Breed percentages per region • Milk prices and payouts 	<p>Data captured</p> <ul style="list-style-type: none"> • Herd statistics • Live weights • Production

Beef + lamb on-farm and production analysis

Description

Beef and Lamb NZ provides farmers with R&D tools, industry trends, local and international events. They use farmer levies to deliver farm research and support, eliminating market trade barriers, developing a skilled workforce and providing information to the sector on analysis to help decision-making across the sector.

Data captured

- National and local level statistics on beef and lamb prices
- National and local level beef and lamb production and exports
- National and local level balance sheets

Landcorp

Description

Largest agribusiness operation in New Zealand, owning 122 farms and 1.5 million livestock (dairy, sheep, beef, deer).

Data captured

- Research to increase farm productivity
- Soil, nutrient and water quality

FertResearch

Description

Fert Research is an industry association, funded by member companies to address issues of common public good relating to fertiliser and to ensure that such fertilisers are used safely, responsibly and effectively, while avoiding or minimising adverse environmental effects.

Data captured

- Data on soil nutrient levels in agricultural used soil
- Data on leakage in soil due to agriculture
- Comparison of agricultural soil quality variations over different locations across New Zealand.

The interviews were conducted over the period 3 September to 20 November.

Policy/technical interviews conducted.

Organisation	Position
Ministry for Primary Industries	Senior Policy Analyst, Climate Change Policy
Ministry for Primary Industries	Climate Change Manager
Te Puni Kokiri	Senior Policy Analyst – Environmental Issues
Ministry for Primary Industries	Senior Analyst, Greenhouse Gas Inventory
Ministry for Primary Industries	Business Analyst, Farms Online
Ministry for Primary Industries	Senior Policy Analyst, International Policy
Ministry for Primary Industries	Senior Policy Analyst, International Policy
Ministry for Primary Industries	ETS Operations Analyst
Ministry for Primary Industries	Manager ETS Operations
Ministry for Environment	Senior Analyst, ETS Operational Policy
Ministry for Primary Industries	Acting Manager Macro Analysis
Ministry for Primary Industries	Policy Analyst, Farm Monitoring
Ministry for Primary Industries	Senior GIS Analyst, Sector Policy
AgResearch	Principal Scientist, Pastoral Research

The interviews were conducted over the period 3 September to 20 November.

Farm level/commercial interviews conducted.

Interviewees:
Sheep and beef farmer in the Wairapapa
Sharemilker in the Waikato
Environment Programme Manager – Fonterra
Dairy farmer in Central North Island
Dairy farmer in Waikato
Sheep and beef farmer in Hawkes Bay
Rural Economist, ANZ Institutional
Senior Agribusiness Manager, Westpac
Branch Manager, based in the South Island, Rabobank
Branch Manager, based in the North Island, Rabobank

1. Background and purpose of interview

The Ministry for Primary Industries (MPI) is investigating how the reporting of agricultural emissions at farm level might work. They have engaged KPMG to draft a reporting framework that includes considerations around governance, administration, compliance/audit, reporting thresholds, data, and participants to form part of this research.

As an important member of the farming community, you have been asked to provide input to help inform our findings. We greatly appreciate your time. Please note that any information you provide will in no way be attributed to you personally.

2. Interview questions

2.1 Farm level emissions reporting

- Where you aware that MPI were investigating the possible farm level reporting of emissions?
- Do you see any potential benefit from reporting emissions at farm level?
- What are your key concerns associated with this approach?

2.2 Reporting thresholds

In order to implement farm level reporting of emissions, thresholds for participation need to be determined ie what is the reporting “population” and who is the point of obligation. If farm level of emissions were to be implemented:

- To what extent do you think the reporting of emissions should be mandatory?
- Should the point of obligation for reporting be “land owner”, “stock owner” or some other criteria?
- In terms of thresholds for involvement in reporting – do you have any comments in relation to who should be included/excluded and any threshold criteria (e.g. stock numbers, land area, ownership structure)?

2.3 Operational elements and outputs

Emissions are an output of the farming process. Calculating emissions requires information about: animal characteristics (weight, age, breed); production (milk protein, milk fat, wool weight, lambing/calving); feed intake (feed type, digestibility of feed, nitrogen content, manure management); soil and fertiliser (soil type, rainfall, fertiliser application). Assuming some of this information was to be requested at a farm level:

- Are there particular sources of information that are more difficult to obtain?
- Can you see any operational benefit from having some of this information collected and collated (e.g. benchmarking).
- To avoid duplication, are there mechanisms through which you currently report that should be considered in light of this approach (e.g Overseer)

If implemented, what type of reporting output would be useful for farmers?

Incentives for behaviour change will likely feature in any reporting framework. Is this appropriate? What should be important in terms of measuring performance

2.4 Transition and compliance

- If farm level reporting was to be implemented, what type of transitional arrangements should be adopted?
- How best would compliance with any reporting requirements be monitored?
- There is concern about the cost and additional administrative burden for farmers should farm level reporting be implemented. Do you have any thoughts / considerations about how costs could be minimised while providing meaningful information?

3. Please note any other comments or concerns

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