# Regulatory Impact Statement

## Climate Change Response (Disposal Facilities) Regulations 2010

## Agency Disclosure Statement

This Regulatory Impact Statement has been prepared by the Ministry for the Environment.

It provides an analysis of options to guide operators of solid waste disposal facilities in estimating greenhouse gas emissions and thereby fulfilling part of their obligations under section 62 of the Climate Change Response Act 2002 (the Act). The analysis assesses four options including non-regulatory guidance and three technical methodologies. The work has benefited from advice provided from an independent expert stakeholder technical advisory group.

There are no gaps, assumptions, dependencies, or any significant constraints, caveats or uncertainties concerning the analysis, except for an assumption regarding future emissions unit prices used in the fiscal impact analysis. Consultation on in-principle policy decisions and draft regulations will be targeted at testing these proposals.

The policy proposals will not impair private property rights, market competition, or override fundamental common law principles. The policy proposals will provide positive incentives for businesses to innovate and invest, in line with the objectives of the Act.

All of the policy proposals, including the status quo, impose compliance costs on solid waste disposal facility operators by virtue of those operators already having obligations under the Act. The preferred policy proposal reduces potential compliance costs to the minimum while retaining flexibility for operators to voluntarily incur extra compliance costs in order to reduce New Zealand Emissions Trading Scheme emissions costs.

There are implementation risks from the policy proposals. Participants may be upset at being required to surrender a greater number of emission units to the Crown than the Crown reports in actual emissions in any year. This situation arises through the use of different methodologies between the New Zealand Greenhouse Gas Inventory and the methods put forward in this statement. Managing this risk will require careful communication that explains the reasons for the proposed methodologies.

Stuart Calman, Director

[Signature of person] [Date]

## Status quo and problem definition

### *Status Quo*

1. The Crown is required to manage national greenhouse gas emissions under the United Nations Framework Convention on Climate Change (UNFCCC). The Kyoto Protocol requires the Crown to control emissions over 2008 to 2012 to be at five times 1990 emissions, or purchase emission units to make up for any excess emissions.
2. The Climate Change Response Act 2002 (the Act) imposes requirements on persons operating waste disposal facilities (disposal facility (DF) participants) from 1 January 2012. Section 62 of the Act states that a participant must calculate the emissions and the removals from the activity in accordance with the methodologies prescribed in regulations made under the Act.
3. Persons with obligations are required to report on their 2012 calendar year disposal facility operating activities by 31 March 2013. Persons with obligations are required to report on their 2013 calendar year disposal facility operating activities by 31 March 2014, and surrender the necessary number of emission units by 31 May 2014.
4. In addition, the Act provides for voluntary reporting of disposal facility operating activities from 1 January 2011. Promulgation of regulations in 2010 will enable voluntary reporting to be undertaken with an understanding of the requirements that will apply when reporting becomes mandatory.
5. While the solid waste disposal sector does not have unit surrender obligations under the New Zealand Emissions Trading Scheme (NZ ETS) until after the Kyoto period, for the assessment of fiscal costs this analysis assumes a continuation of the Kyoto commitment after 2012. So, if national emissions from landfills as reported in the New Zealand's Greenhouse Gas Inventory (Inventory) are more the total emissions as reported from disposal facilities under the NZ ETS, then this is a fiscal cost to the Crown.
6. Regulations as allowed under section 163 of the Act could prescribe the data or other information that must be collected, as well as prescribing methodologies that must be followed to calculate greenhouse gas emissions. There is no requirement either in the Act or by Cabinet decision that regulations are required for those purposes. Section 163 (1) of the Act states that:

   > *The Governor General may, by Order in Council made on the recommendation of the Minister, make regulations for 1 or more of the following purposes:*
   >
   > > *(a) Prescribing the data or other information that must be collected under section 62(a) [collecting prescribed data to estimate emissions] in respect of an activity, and, if relevant, the mechanism or method by which the data or information must be collected; and*
   > >
   > > *…*
   > >
   > > *(c) Prescribing a methodology or methodologies for calculating emissions or removals from the activity for the purposes of section 62(b) [calculate emissions]; and …*

7. Only solid waste disposal facilities that operate as a business, at least in part, and accept some waste from households are defined as disposal facilities in the Act and are required to participate in the NZ ETS. This is the same group of disposal facilities that are currently required to pay a levy to the Crown for each tonne of waste disposed under the Waste Minimisation Act 2008.

8. There are currently 54 disposal facilities accepting solid municipal waste in New Zealand at present and who will be required to participate in the NZ ETS. In addition, there are an unknown number of other types of waste disposal facilities such as private landfills and 'cleanfills' that are not captured by the NZ ETS activity descriptions.

9. Greenhouse gas emissions from some disposal facilities are currently controlled by the National Environmental Standard on Air Quality (NES). Only disposal facilities above a threshold[1] are required to meet the NES obligations, which cap maximum concentrations of methane at the landfill surface. The NES requires New Zealand's disposal facilities to install and operate landfill gas collection systems. There are no inconsistencies or conflicts between the NES objectives and the NZ ETS.

***Problems to be solved***

10. As noted above, DF participants are required to report on emissions under the Act. This policy process is therefore one of implementing an already agreed policy process.

11. The problem is that there is a fiscal risk to the Crown in the absence of mandated methods. Persons with obligations under the Act would have no standardised approaches to reporting their activities. It is likely that this would result in substantial underestimation of emissions. There would be no consistency of reporting across the people with obligations. Additionally, the Crown would not have any basis to contest an individual's reporting as inaccurate.

12. An additional problem is that the NZ ETS imposes obligations on open disposal facilities only. Landfill methane continues to be emitted after a facility closure. Hence, a sizable proportion of emissions from disposal facilities would not be included within the NZ ETS, which would reduce the effectiveness of the scheme in incentivising emissions reducing techniques and behaviours. The problem is therefore one of being able to ensure the costs of all emissions from waste is priced equitably by the NZETS. This problem is termed the emissions post-closure issue in this RIS.

13. Similarly, waste disposed up to fifty years ago continues to emit methane today. It is inequitable to assign these emissions to DF participants. The operators are unable to recover any emissions costs from the persons who disposed the waste. This problem is termed the legacy waste issue in this RIS.

## Objectives

14. The objectives of any intervention are to:

    a) Align, as closely as practicable, to the principles and methodologies used to calculate the Inventory with the methodologies that participants will use to calculate their emissions or removals under the NZ ETS thus avoiding fiscal risk to the Crown;

    b) Minimise transaction and compliance costs to participants in terms of the information that must be collected and reported;

    c) Minimise administrative costs, including compliance costs, for the NZ ETS administrator

    d) Provide the best price signal including if possible, incentives for improved emissions efficiency;

    e) Avoid creating perverse incentives;

[1] The threshold is 'one million tonnes in capacity'.

f) Provide participants with certainty so that the methodologies are known ahead of time;

g) Facilitate verification of emissions or removals.

15. There is a need to establish practical and accurate methods by which DF participants can meet their reporting obligations under the NZ ETS. The requirements for data collection and verification are intended to provide the right balance between simplicity and the robustness of emissions returns. It is important that emissions returns are robust as both the liabilities of DF participants to surrender emission units, are based upon their emissions returns.

## Regulatory impact analysis

16. Waste emissions methodologies and emissions factors were considered by an independent expert stakeholder technical advisory group (TAG) over March and April 2010. The TAG comprised sector experts from the waste sector, consulting and academic fields. The TAG explored three broad options that could provide guidance for participants to calculate their emissions.

    a. Direct measurement; where participants are required to measure actual emissions in the year using field based equipment.

    b. Mass balance option; where participants are required to report on anticipated emissions from waste disposed in the year using a default emissions factor, or a unique emissions factor if approved

    c. First order decay option; where participants are required to report on estimated actual emissions from waste disposed in the year using a default emissions factor, or a unique emissions factor if approved and a logarithmic model that takes into account varying decay rates of different types of waste

17. The option not considered by the TAG was non-regulatory guidance, where participants are able to chose a method to estimate emissions with support from non-binding guidance materials from the government. The TAG pre-supposed regulations would be promulgated to provide methodological guidance.

**Option 1: Non-regulatory guidance**

18. Non-regulatory guidance could take the form of published reports and calculators. Participants could utilise overseas methodologies such as the methodological options detailed within the Australian National Greenhouse and Energy Reporting regulations. New Zealand officials could develop similar technical forms and materials that would generate a degree of consistency in approach between participants.

19. The benefit of a non-regulatory approach would be to minimise compliance costs for participants through maximise flexibility in methodological choice.

20. A non-regulatory approach would not align with the Inventory method and therefore have fiscal implications for the Crown. This is because the Inventory would report a substantially different estimate of total emissions than might be reported by all participants. Methodological flexibility would enable participants to report the lowest possible estimate of annual emissions.

21. Non-regulatory guidance will not result in an adequate price signal. Under-estimating emissions will limit the effectiveness of the NZ ETS in incentivising actions to reduce emissions from disposal facilities in the medium to long term because the cost signal would be reduced.

22. Finally, non-regulatory guidance will not facilitate verification of emissions or removals. Without mandated methodologies, considerably more ad-hoc judgements will be used by participants. Such judgements are unlikely to repeatable without documented evidence of the context in which they were made.

23. Consequently, non-regulatory guidance is not a recommended approach to addressing the policy problems.

**Option 2: Regulations for direct measurement of emissions**

24. There is increasing research into and use of direct measurement of disposal facility emissions. Direct measurement generally involves the use of flux boxes set out at regular intervals on a landfill surface, although there are other alternative techniques. Emissions are determined from samples and models or are continuously measured.

25. Direct measurement techniques reduce the potential for over-estimating emissions and increase the accuracy of DF participants' financial obligations under the Act.

26. The Inventory does not use direct measurement, and there is no particular method current recommended by the Intergovernmental Panel on Climate Change, who publishes the inventory guidelines. Without an internationally accepted method, administrative and compliance costs for participants and the NZ ETS administrator would be higher than would otherwise be the case.

27. Requiring direct measurement of emissions would be costly to DF participants. Depending on the technique used, estimates of annual costs to a DF participant to estimate emissions to a satisfactory low uncertainty degree would be $75,000 per year.

28. Because direct measurement estimates actual emissions, the method would not address either the emissions post-closure or the legacy waste problems.

29. The Waste TAG considered the use of direct measurement techniques to fulfil NZ ETS obligations and concluded that the compliance costs and complexity from sampling and testing outweighed any benefits from its use, even if those benefits included lowered NZ ETS costs for the DF participant.

30. Consequently, the direct measurement is not recommended for regulations.

**Option 3: Regulations for the mass balance approach – preferred option**

31. The mass balance (MB) approach to estimating emissions from disposal facilities reports emissions as if they were emitted in the year that the waste was disposed. In other words, MB estimates anticipated emissions. The actual emissions profile of a disposal facility is quite different as emissions will continue to be generated from a body of waste for many years after it is deposited through varying rates of decomposition. MB does not consider the time factor for emissions.

32. Both MB and the alternative first order decay (FOD) method (described below) assume the availability of information relating to the composition of waste being disposed. Other information common to both methods and important to the determination of emissions are the carbon content of the waste, the methane generation potential of the waste, as well as the quantity of waste disposed annually. MB does not require information on waste disposed historically, unlike FOD.

33. MB can be reduced to the use of an emissions factor multiplied by the amount of waste deposited in the year. Existing regulations under the Waste Minimisation Act 2008 could be replicated in order to minimise compliance costs, as DF participants are already reporting waste quantities deposited using those rules. In such a scenario, compliance costs are minimised.

34. MB does not estimate actual emissions so will not include emissions from legacy waste. This was noted by the TAG as an important advantage.

35. MB ‘solves’ the problem of emissions post-closure. A DF participant using MB would report those emissions in the year the waste was disposed. Accordingly, MB removes a risk of the Crown picking up the cost of post-closure emissions.

36. The TAG preferred the MB method coupled with the voluntary opportunity for DF participants to apply for UEFs. In their view, this approach would minimise compliance costs, account for total anticipated emissions, was fair and equitable across disposal facilities, and encourage behaviour to reduce emissions.

37. The mass balance approach prescribed through regulations is also the preferred approach of officials.

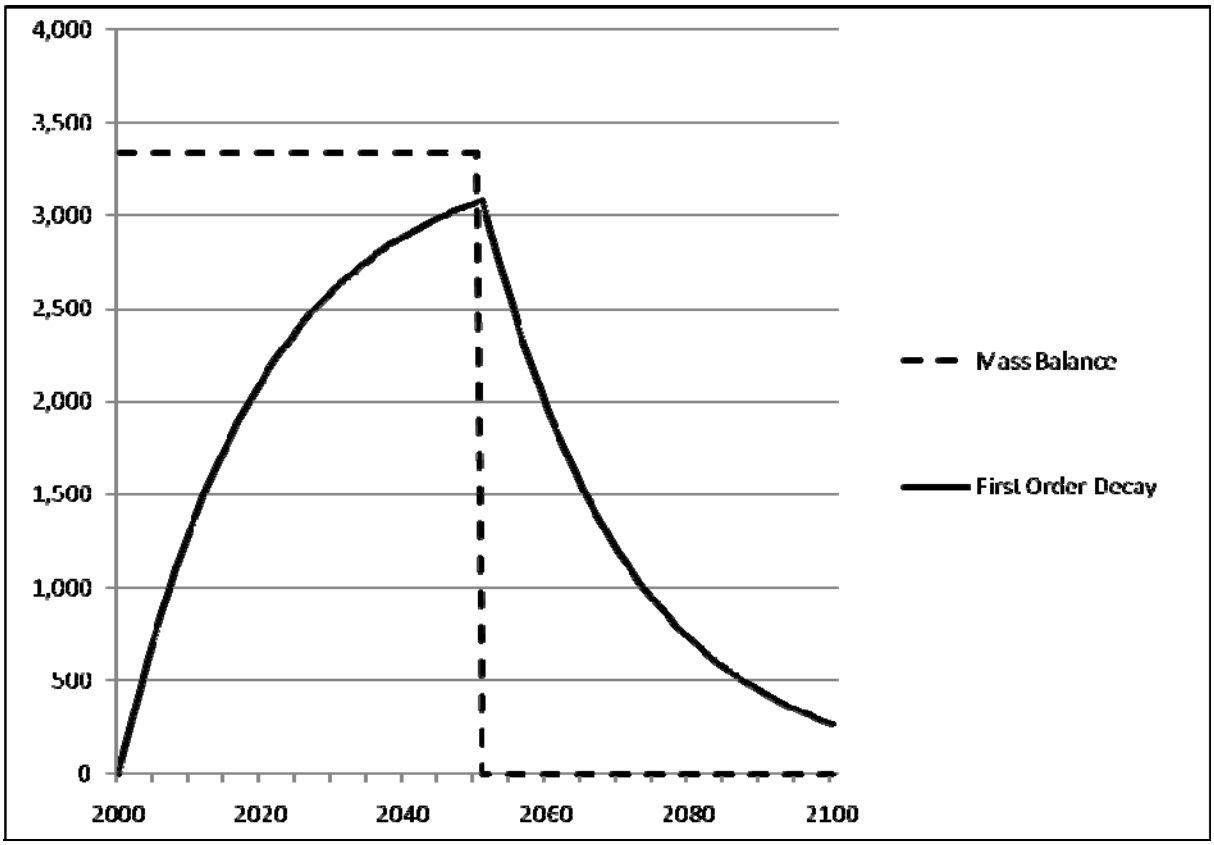
**Option 4: First order decay approach**

38. The first order decay method (FOD) differs in terms of calculation from MB by introducing a time factor to decomposition assumptions. Differing types of organic waste decompose at different rates (for example, food is fast while wood is slower). If DF participants were required to use FOD, they would need information regarding waste disposed annually at the site since opening. That information should include the composition of that waste, although national data could be used in the absence of site specific compositional data.

39. FOD models estimate actual annual emissions, and consequently does not solve the legacy waste or emissions post-closure problems.

40. A comparison of the differences between timing of emissions for MB and FOD are illustrated in figure 1 below:

**Figure 1: MB vs FOD emissions from hypothetical disposal facility**




41. The figure illustrates a hypothetical disposal facility that opens in 2000 and closes in 2050 and accepts a constant amount of waste each year. The dashed line is the MB method and the solid line, slightly curving, is the output of a FOD model.

42. The key conclusion from figure 1 is that the MB approach will report higher estimates of emissions each year than FOD, simply because a proportion of emissions under FOD occur after landfill closure. This means FOD will place more emissions costs on the Crown than under MB. It is important to repeat that the two methods are estimating different outputs however, as MB reports on potential emissions and FOD estimates actual emissions.

43. DF participants would benefit from using FOD to estimate emissions rather than MB. Figure 1 illustrates that estimates are always lower under FOD than MB for an individual disposal facility, unless the landfill only accepts a very small amount of waste in its closing year. The reduction in NZ ETS costs would then flow through to disposal facility users, who, because the potential emissions from their waste is not being fully priced at the gate, would incur less costs to dispose their waste. Lowered NZ ETS costs will affect the incentives on DF participants and waste generators to take up emissions reducing behaviours.

44. Modelling has been performed for 2013 to 2020 using national historic waste quantities and assuming a static amount of waste is disposed each year to test the fiscal differences between the two methods. The results are presented in Table 1 below:

**Table 1: Fiscal difference between MB and FOD methods ($50/unit)[2]**

| Year | $m |
|---|---|
| 2013 | 11.0 |
| 2014 | 9.9 |
| 2015 | 8.9 |
| 2016 | 7.8 |
| 2017 | 6.8 |
| 2018 | 5.8 |
| 2019 | 4.7 |
| 2020 | 3.7 |

45. Table 1 shows that requiring the use of MB will likely result in the reporting of potential emissions than are greater than the actual emissions reported in the inventory. This will result in a surplus of units to the value of $11m in 2013 assuming a static quantity of waste is disposed annually. It is worth noting that the difference between MB and FOD decrease over time. Also, the indicated shortage of units should be compared against the expected value of units surrendered in 2013 of $114m.

46. Further modelling has been performed on Inventory reported emissions from 2000 to 2008 to assess the differences in the methods. The results are presented in table 2 below:

**Table 2: Difference between MB and FOD 2000 – 2008 ($25/unit)**

| Year | $m |
|---|---|
| 2000 | 12.4 |
| 2001 | 15.1 |
| 2002 | 18.3 |
| 2003 | 20.5 |
| 2004 | 24.3 |
| 2005 | 23.2 |
| 2006 | 22.2 |
| 2007 | 22.4 |
| 2008 | 22.6 |

[2] Modelling of emissions prices associated with the NZ ETS across Departments always assume $25 per unit until 1 January 2013, and $50 per unit thereafter. These are assumptions, not estimates or projections.

47. Table 2 illustrates that the increasing waste quantities in New Zealand over the 2000 to 2008 period would have lead to excess units surrendered over emissions reported if the Inventory if the MB approach had been used by NZ ETS disposal facility participants.

48. FOD methods require the use of spreadsheet based models. Some DF participants are familiar with these models as they are used in assessing the viability and performance of landfill gas collection systems. However, for the large majority of DF participants, FOD models will be very complex to understand and therefore introduce uncertainty and compliance costs. These issues could be mitigated through guidance and communications.

49. As noted earlier, FOD does not easily allow a DF participant to recover the costs of all emissions from a DF user's waste, as some of those emissions occur well into the future where the prices of emission units are unknown. The TAG was opposed to this option primarily for that reason, but also because of its complexity relative to MB.

50. If the NZ ETS required the use of FOD, then there would be a large difference between the emissions reported in the Inventory and those total emissions reported from DF participants, because the Inventory would also count emissions from closed DFs. As illustrated by Figure 1 above, this could result in a substantial fiscal implication.

51. Because FOD does not solve any of the policy problems, it is not the recommended policy approach.

**Addressing operational issues 1: Emissions factor**

52. There are three ways that DF participants can manage emissions aside from simply reducing the amount of waste being disposed. Each need to be considered for inclusion in the regulations. The first is the calculation of the emissions factor.

53. The emissions factor to be used by a LP participant could be calculated by requiring each to regularly collect data on waste composition. This would be more accurate in terms of emissions estimates, but would carry large compliance costs. Each weighted survey of waste to determine composition costs around $50,000, and at least two such surveys would be needed each year. Visual surveys are far cheaper, but carry reliability risks due to large uncertainties. Because waste composition changes according to the season (more garden waste in summer, for example), at least two surveys would be required. For many small landfills, such compliance costs are unwanted (as noted by the TAG). It is probable that for the majority of landfills the resulting site specific emissions factors would not vary statistically from the national average as reported in the Inventory.

54. An alternative approach would be to provide a default emissions factor ('DEF') in the regulations based on the information in the Inventory. While this would reduce compliance costs, it would not incentivise an important emissions reducing opportunity – that of reducing the organic component in waste disposed. DF participants who utilise organic diversion practises would have quite different waste composition and therefore emissions that landfills that do not divert green waste. A single emissions factor to be applied across all DF participants would therefore not recognise or incentivise organic waste diversion.

55. An opportunity for DF participants to apply for a unique emissions factor ('UEF') could be provided in the regulations. Participants would then have the opportunity to minimise compliance costs through using the DEF or to reduce their NZ ETS costs by measuring waste composition and using a UEF based on that information. Information generated by the inventory agency on waste composition, though UEF applications could then be reflected in updates to the DEF and within the Inventory. Such a method provides for

minimal compliance costs as well as allowing the NZ ETS to recognise an important source of emissions reductions from disposal facilities.

56. Using a DEF avoids high compliance costs for DF participants in calculating their emissions. In all cases, required activity data will already be collected by DF participants. Therefore, the costs of reporting emissions will be relatively low. By setting a DEF, the costs of determining a UEF are avoided, unless they are outweighed by the benefit to a participant.

57. DF participants that calculate emissions factors that are lower than the DEF may use a UEF. This approach increases the accuracy of reporting for certain participants. It also provides incentives for them to reduce emissions by disposing waste with a lower organic content. If a DEF alone is used, the quantity of emission units a participant is required to surrender will not be reduced if they dispose less organic waste than is assumed by the DEF. In contrast, if a participant disposes less organic waste and uses a UEF, they will be required to surrender fewer emissions units.

58. The use of UEFs may result in lower emissions reported to the Crown than are reported in the inventory. If 25% of the waste deposited in NZ has a UEF applied to it that is 10% less than the DEF, this would result in a fiscal cost of $2.8m per year. This cost would not be permanent as the emissions factor used by the inventory is expected to reflect the information contained in UEF applications. Also, this costs should be matched against the excess surrender of units through prescribing the MB approach.

59. There are currently no fees associated with applications for UEFs in the Climate Change (Unique Emissions Factors) Regulations 2009. In line with that existing policy, DF participants seeking approval to use a UEF would be expected to meet the full costs of sampling, testing and verification required in the regulations before an application is submitted for consideration. As UEFs are voluntary, DF participants will only face these costs if they assess the benefit of using a UEF is greater than the costs of the application process. The costs of sampling and weighing are estimated at $50,000 per test, and at least two tests will be required for a UEF application.

**Addressing operational issues 2: landfill gas (LFG) collection and destruction**

60. LFG capture and destruction is the second important way to mitigate emissions. Both the MB and FOD options do not automatically deduct LFG destroyed from estimates of emissions, so if the regulations use either of those methods, then there will need to be a mechanism to have those emission reductions recognised.

61. About 12 open disposal facilities (out of 54) currently collect LFG. The regulations will allow for an estimate of LFG collection efficiency if there is a system in operation. The efficiency of LFG systems only vary significantly when the coverage of the system is expanded or reduced.

62. There are current regulatory controls on LFG emissions through the National Environmental Standards on Air Quality (NES). The NES caps surface methane concentrations for DFs that have a capacity greater than one million tonnes of waste. The NES has provided incentive for New Zealand's disposal facilities to install and operate landfill gas collection systems. There are no inconsistencies or conflicts between the NES objectives and the NZ ETS.

63. A modern LFG system, if properly installed and maintained, can reduce emissions by up to 90%. This means a disposal facility that previously had emissions of 10,000 tonnes of carbon dioxide equivalent in a year would report 1,000 tonnes, a reduction of 9,000 tonnes and an annual reduction in NZ ETS costs of $450,000 (assuming $50 per unit).

64. There are two possible broad ways to estimate the emissions avoided through LFG gas systems. The first uses information developed for the inventory on the average efficiency of such systems in New Zealand. Such an approach would have low compliance costs as relevant DF participants would simply include the estimate in their calculations. However, it would significantly overestimate emission reductions for DF participants with poorly performing LFG systems or those with low coverage. It would underestimate the effectiveness of LFG systems for those DF participants that are actively managing them to produce the highest possible amounts of LFG. In doing the latter, such an approach would provide no incentive for any DF participant to extract more landfill gas that assumed by the default value.

65. The alternative method would require the use of the metered information on gas passing through a LFG system. There is limited information on how many LFG systems in New Zealand are already metered. The TAG commented that almost all have meters installed. For those DF participants without meters, the one-off cost of installing one is around $30,000 each plus maintenance costs. This one-off cost would be outweighed by the consequent reductions in emissions liabilities for any landfill that disposes more than 500 tonnes of waste in a year.

66. Data collected by meters relates to actual emissions from the waste deposited to date. This is directly compatible with FOD. If the regulations required the use of MB, then metered data would need to be converted to an efficiency factor through comparing metered data with the modelled emissions from the disposal facility. Consequently, DF participants would need to use FOD to model annual emissions and match against the metered data. Most DF participants with LFG systems already perform such modelling when assessing the investment and operation of such systems. For some, both the installation of meters and the familiarisation of FOD principles would be new compliance costs. Again, these costs would be significantly outweighed by the NZ ETS savings from including the reductions in the emissions estimations.

67. As noted above, the efficiency of a LFG system only varies on the increase or decrease of system coverage. In order to minimise compliance costs, it could be appropriate to make the use of a LFG efficiency estimate a matter of application to the NZ ETS administrator. Such a policy would require participants to comply with specified processes regarding modelling and metering. Results would be used to calculate an LFG efficiency estimate in accordance with calculation methods.

68. The verification for LFG efficiency estimate applications would be necessary to ensure the necessary quality control enabling applications to be made without fees. In order to minimise the risk that an efficiency estimate becomes obsolete but is continued to be used, the approval granted to use an efficiency estimate would clarify its duration and the requirements for ongoing monitoring.

69. As noted above, most DF participants with LFG systems already meter gas flow. For those that do not, there will be a one-off cost of about $30,000 to purchase and install the equipment. Ongoing costs relate to equipment calibration and maintenance. There will be additional costs associated with understanding and modelling LFG generation in order to develop an estimate of collection efficiency, however, again, most large modern disposal facilities with LFG systems routinely carry out such assessments.

70. Given the relatively high costs of assessing waste composition as well as installing a LFG system, there seems to be no reason to require any thresholds to be part of the eligibility criteria. DF participants are only likely to proceed with determining a UEF if they are reasonably certain that their waste composition is noticeably different to that assumed in

the DEF. Such observations might be informed by the operation of a green waste diversion system, for example.

71. The verification of either a UEF or a LFG efficiency estimate would be based on an assessment that the testing and calculations had followed any applicable standard or method. Therefore, the costs of verification should be relatively small (approximately $1000) and only a minor proportion of the costs of making an application for a UEF or collection efficiency estimate.

**Addressing operational issues 3: Oxidation**

72. The third method that DF participants can use mitigate emissions is through the choice of cover material used to cap deposited waste. Engineered cover materials ('caps') can convert a proportion of methane emissions from the decomposing waste beneath to carbon dioxide. The inventory assumes that 10% of LFG is converted this way, in accordance with international guidance. There is overseas evidence that this may be a very low estimate, especially where caps are engineered in a way to actively mitigate emissions. The use of a single value in the regulations for oxidation would therefore not incentivise the installation and maintenance of highly effective caps. Conversely, 10% is undoubtedly a high estimate for DF participants that do not place daily, intermediate or high quality final caps.

73. One option is to allow for site-specific values for oxidation. The collection of such information is very complex and usually only performed for theoretical studies on methods and techniques. A myriad of matters need to be considered in any assessment including weather conditions, soil temperature and rainfall, the frequency and number of samples, and the design of the actual equipment being used.

74. However there are no peer-reviewed and published international methodologies or standards that estimate the effect of a cap on disposal facility emissions. This is true of other emissions trading schemes as well as guidance in the development of national greenhouse gas inventories.

75. With expected rapid increases in knowledge of both direct measurement of emissions and the effective on oxidation of capping processes, not including direct measurement methods in the regulations is preferred for now. Should generally accepted methods become available and accepted for use in national inventories, then the regulations could be amended.

## Consultation

76. Officials have worked with members of an independent expert stakeholder technical advisory group for two months to explore and develop preferred methodologies. The members of the TAG were selected from a public nominations process in December 2009. Members of the TAG were from major disposal facility operator companies, consulting firms, large and small local authorities, and academia. Three meetings were held to complete a report to officials.

77. The TAG report highlights the inability of the NZ ETS to include emissions from closed disposal facilities[3]. This was a major reason for the TAG recommending the mass balance method. The TAG noted:

[3] There is no data on the quantity of emission from closed landfills.

*The exemption of emissions from closed facilities has meant the TAG cannot recommend methods that estimate actual emissions. While such methods, including direct emissions monitoring and first order decay models, would better match the current models used by NZ disposal facilities, the national inventory method, methods under other emissions trading schemes and the IPCC recommended methods, they do not account for future emissions from a given quantity of waste*.

78. The TAG noted that the 2011 review of the NZ ETS could be an opportunity to revise the legislation so that disposal facilities closed after implementation of the scheme are included. If this occurs, the TAG recommended the amendment of the disposal facilities NZ ETS regulations.

79. The TAG considered that the mass balance method with flexibility for site specific factors to be recognised was the most simple and cost effective method. It would incentivise and recognise efforts to reduce emissions, as well as ensuring the person responsible for the waste generation was faced with the full costs of emissions from that waste. The site specific factors that the TAG recommended be included were the development of site information on waste composition, landfill gas collection efficiency and oxidation.

80. Additional advice on costs has also been sought from technical experts.

81. A draft of this RIS was circulated to the following departments for comment: the Treasury, the Ministry for Agriculture and Forestry, the Ministry of Economic Development, the Ministry of Foreign Affairs and Trade, the Ministry of Transport and Te Puni Kokiri. The Department of Prime Minister and Cabinet was informed. Departments agree with the preferred option.

82. Following Cabinet in-principle decisions, exposure draft regulations will be released for public consultation.

## Conclusions and recommendations

83. This RIS considers four options to fulfilling to the NZ ETS obligations of disposal facilities under the Climate Change Response Act 2002. The non-regulatory approach is not recommended as it would create too much uncertainty for participants, lead to inconsistency within the sector and intra-sector, and inevitably underestimate emissions to the cost of the Crown.

84. The direct measurement approach is also not recommended as there is no standardised approach internationally that officials can call upon to include in the regulations. Additionally, the approach would create substantial compliance costs for all DF participants. Finally, it would not consider the full costs of emissions from disposal facilities because it would not count emissions after closure.

85. The mass balance and first order decay models differ through the latter's inclusion of a time factor. This inclusion results in added complexity and compliance costs. It also results in lowered estimates of annual emissions compared mass balance to the benefit of the participant and cost for the Crown, primarily because it does not count emissions after closure. Consequently, the first order decay method would result in the Crown bearing the costs of a substantial amount of emissions. It would also create cost uncertainty for DF participants, as they would report emissions from waste disposed in previous years, but not have any ability to recover the costs of those emissions from the polluter. The mass balance approach is preferred by officials, and the TAG, for those reasons.

86. Allowing site-specific factors to be used by DF participants is important to create the incentives to mitigate emissions. Officials favour the voluntary opportunity for unique emissions factors to be applied for based on weighted surveys of waste composition. Similarly, applications could be considered for estimates of the efficiency of an operational landfill gas collection system. It is recommended that these be matters that are best regulated for through the amendment of the existing Climate Change (Unique Emissions Factors) Regulations 2009 in order to take advantage of its prescribed procedures for verification and recognition of verifiers.

## Implementation and Risks

87. Pending Cabinet approval, the Climate Change Response (Disposal Facilities) Regulations and amendments to the Unique Emissions Factors Regulations will be promulgated by 1 October 2010. Following this, there will be a period of targeted stakeholder engagement with the sector to inform them of the final design of the regulations. This will include the development and dissemination of guidance materials, regional workshops for all participants and individual case management for certain participants. The Climate Change Response (Disposal Facilities) Regulations and related amendments to the Unique Emissions Factor Regulations will come into effect on 1 January 2011.

88. There are fiscal implications to the Crown due to the reporting of disposal facility participants being out of line with national inventory reporting. This might mean the Crown may need to purchase additional Kyoto units to meet its Kyoto commitments, or it may receive excess units from participants. A divergence between reporting will arise when UEFs are approved, and due to the difference in method recommended in this RIs and that used in the inventory.

89. The use of UEFs may result in participants surrendering fewer emissions units overall, in which case there could be a fiscal cost of up to $2.8m. This risk will be managed by ensuring the inventory emissions factor reflects the information contained in UEF applications.

90. The divergence in methodologies will result in disposal facility participants surrendering more units than are matched by reported emissions in the inventory. It is expected that the excess surrender of units may be worth $11.0 million to the Crown in 2013, with the excess amount expected to decline over time.

91. There is a risk that disposal facility participants will consider this to be unfair. This risk will be managed by ensuring the participants are aware that they are reporting potential emissions, not actual, and that there is a difference between the two reporting methodologies. Part of that message could include acknowledging that over time, both methodologies will report equal amounts of emissions. The key advantage for DF participants from the MB approach, aside from its simplicity, is that it enables the participant to calculate and pass on the full life-cycle emissions costs of the waste to the consumer.

92. There are implementation risks from poor communication, including disposal facility participants being unaware of their obligations or not understanding the methodologies. These risks will be managed through industry and government lead communications efforts, including bi-annual sectoral workshops and NZ ETS implementation meetings. Communications networks developed through the Waste Minimisation Act 2008 are already successfully being used for NZ ETS implementation work.

93. Compliance costs are mitigated mostly though the choice of methodological approach. The mass balance approach is simple and uses a default emissions factor and waste quantity data already reported for the purposes of the Waste Minimisation Act 2008. Compliance costs will be further reduced through the development of a calculator tool so that disposal facility participants only need input a small amount of data to determine their emissions liability. Participants who wish to apply for site specific factors will have higher compliance costs than they otherwise would have. These costs are outweighed by the effect any site specific factor would likely have on the emissions liability of the participant, particularly for landfill gas collection systems.
94. Part of the Climate Change Response (Disposal Facilities) Regulations will be the same as the regulations under the Waste Minimisation Act 2008 - Waste Minimisation (Calculation and Payment of the waste disposal levy) Regulations 2009. It is intended that methods used to determine annual quantity of waste disposed for reporting for one set of regulations will be able to be used for the other. There is no ability to remove the reporting under the Waste Minimisation Regulations as information obtained for either of the two primary legislations cannot be shared for other purposes.
95. The Climate Change Response (Disposal Facilities) Regulations will impact on the existing Resource Management (National Environmental Standards Relating to Certain Air Pollutants, Dioxins and Other Toxics) Regulations 2004. Part of those regulations requires disposal facilities of a certain capacity to install and operate landfill gas collection and destruction systems to a particular level of effectiveness.

## Monitoring, evaluation and review

96. Compliance and enforcement of the regulations will be in accordance with the Subpart 4 of Part 4 of the Act that sets out the provisions relating to offences and penalties. The proposed regulations are to be administered by the chief executive of the Ministry of Economic Development as part of his role in administering the Act.
97. The government can review regulations at any time. Furthermore, the regulations may be reviewed in the context of the scheduled reviews of the operation and effectiveness of the NZ ETS, as required by section 160 of the Act. The first review is to be completed by the end of 2011.
98. It is intended that the DEF in the proposed regulations will be updated as the emissions factor become more precise, whether it be as a result of information gathered from UEF applications or changes to the IPCC rules or guidelines. Changes to the DEF will require the regulations to be amended.