# Briefing Note

## Implications of Measures to Reduce Greenhouse Gas Emissions from Irish Agriculture by 30 percent by 2020:

## Achievement of the target through a reduction in animal numbers

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## 1. Background

- In this summary we project future agricultural activity levels and related greenhouse gas emissions based on achievement of the targets for Irish agriculture set out in the Food Harvest 2020 report.

- Agricultural activity and GHG Emissions under the ***Food Harvest 2020 (FH) Scenario*** are then compared with hypothetical 10 percent 20 percent and 30 percent reduction targets for agriculture. Under the EU Effort Sharing Agreement agreed in January 2008 Ireland is required to reduce its GHG emissions by 20 percent by 2020.[1] Note that currently no specific sectoral GHG reduction targets have been allocated in Ireland.

- We then analyse one means by which agricultural activity levels could be reduced to achieve a *10 percent, 20 percent or 30 percent GHG reduction target* for agriculture by 2020 and the implications of these changes in terms of the agricultural output value, beef processing sector output value and the associated value added in these two sectors.

- It is important to note that any reduction target would be with respect to the level of GHG emissions in 2005. GHG emissions from the sector in 2005 were a little over 18.66 Mt $CO_2$ equivalent (exclusive of the emissions from fuels used in agricultural production). Therefore, a 10 percent, 20 percent or 30 percent GHG reduction for agriculture would imply respective targets of 16.8, 14.93 or 13.06 Mt $CO_2$ equivalent (exclusive of the emissions from fuels used in agricultural production) by 2020.

- Emissions from fuels used in agricultural production are about 0.8 Mt $CO_2$ equivalent. The possibility of reductions in these emissions is not considered in this analysis.

- The end point for the analysis reported in this briefing note is 2020.

## 2. Food Harvest Scenario Definition

- In July 2010 the FH Committee report (DAFF, 2010) set ambitious targets for growth in the value and volume of production from the Irish agri-food sector to be achieved by 2020.

- The FH dairy output target is an increase of 50% in the volume of milk production by 2020 relative to the average volume of production over the period 2007-2009. No volume target is set for beef or sheep production, rather a target of increasing the output value from each of these sectors by 20% by 2020 is set relative to the average of the period 2007-2009. In the case of the pig sector the target is to increase output value by 50% by 2020.
- FH targets for forestry and bioenergy crops are not specified in the FH report, but for the purposes of this analysis an annual growth target of 7,500 ha per year is used for forestry and for bioenergy crops a target of 4,000 ha per year is specified. The analysis produced here does not estimate sequestration but it does make allowance for the cumulative reduction in agricultural area implied by these forestry and biomass planting rates, and the associated impact of GHG emissions.

[1] Commission of the European Communities, COM (2008) 17 final Brussels 23 01 2008.

- It is assumed that no WTO agreement is reached over the projection period. All Uruguay Round Agreement on Agriculture (URAA) limits on agricultural trade policy are assumed to prevail for the period to 2020.

- The FAPRI-Ireland model has been used extensively in the analysis of agricultural and trade policy changes in Ireland over the last 10 years (Donnellan and Hanrahan, 2006; Binfield et al., 2009). The FAPRI-Ireland model is used to project the FH level of agricultural production volume and determine the associated level of input usage (as well as the value of output the cost of the associated inputs and resulting operating surplus in the sector). In turn projections of GHG emissions from Irish agriculture can be provided using a model for GHG emissions projections that is integrated with the FAPRI-Ireland model.

**Notes relating to how the reduction targets are applied**

- For the purposes of this analysis, it is assumed that the reduction in GHG emissions that are needed to meet the reduction targets do not occur overnight (since this would be an unrealistic means of achieving the target) and rather the reduction takes place gradually over a ten year period from 2011 to 2020.

- The emission factors used are consistent with the Ireland National Inventory Report 2010 published by the EPA.[2]

- It is assumed in this analysis that the reductions in GHG emissions required to achieve each of the 10, 20 and 30 percent reduction targets are achieved through a reduction in the number of beef cattle (i.e. suckler cows, and their progeny). Using the FAPRI-Ireland model it is also possible to look at a range of other options (reductions in the number of dairy cows, sheep etc.). These other options have not been considered here, but the model can be used to make such as assessment should it be required.

- No consideration has been given to the mechanism (carbon taxes, carbon quota, etc.) that might achieve the GHG reductions described and it is assumed that the required reduction in beef herd numbers is achieved purely through the imposition of a quota on animal numbers.

- It is assumed that other countries' GHG abatement strategies do not impact on their levels of livestock production and that in turn there is no impact on international commodity prices arising from any agricultural GHG reductions internationally. This means that we do not consider the possibility that other EU Member States would cut cattle numbers also. By contrast if other Member States did cut cattle numbers, then this would drive up meat prices, including prices in Ireland. This would then imply that a greater reduction in output value in Ireland would occur if an animal reduction strategy were pursued to meet a GHG emissions target.

- As beef cattle numbers decline to achieve the 10, 20 or 30 percent reduction targets, land would become available for other agricultural purposes (or else production would become increasingly extensive). It is important to note that the impact on GHG emissions of

[2] McGettigan, M., P. Duffy, B. Hyde. E. Hanley, P. O'Brien, J. Ponzi and K. Black (2010) *Ireland National Inventory Report 2010. Greenhouse Gas Emissions 1990-2008 reported to the United Nations Framework Convention on Climate Change.* Environmental Protection Agency (EPA), Johnstown Castle Estate, Wexford, Ireland.

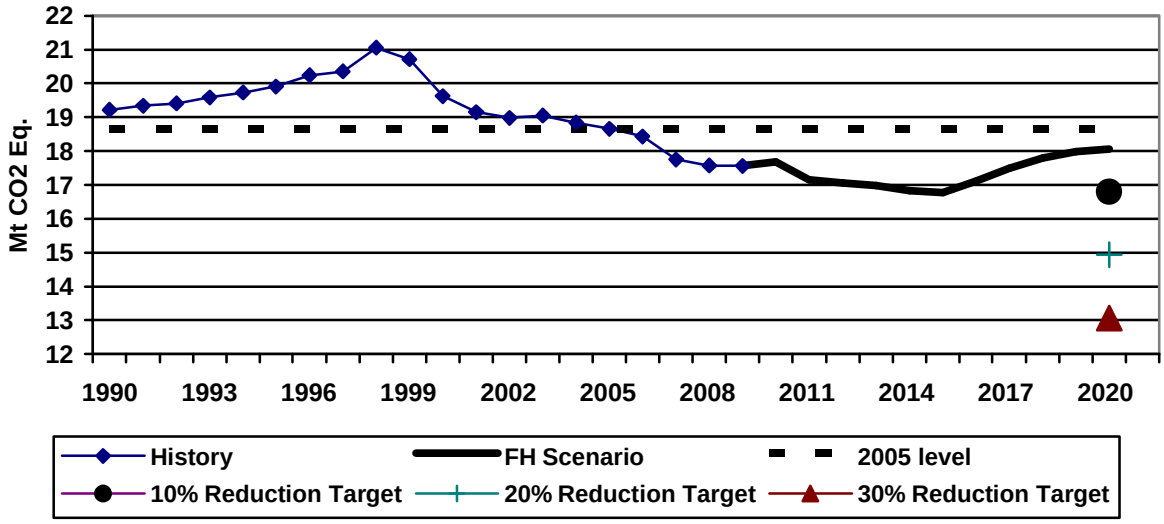
conversion of land previously used for beef cattle, to use for bio-energy crops, dairy, tillage, forestry, land abandonment, etc. would have varying implications for GHG emission levels. Detailed consideration of the impact of these different alternative uses of surplus land has not been made in this analysis, since it would require very detailed additional work.

# 3. Implications of achievement of Food Harvest for GHG Emissions and Agricultural Income

## 3.1 GHG Emissions

The activity levels specified in the FH Scenario can be used to estimate the level of GHG emissions from Irish agriculture to 2020. In Figure 3.1 historical GHG emissions are presented along with the projected level of GHG emission under the FH scenario.

**Figure 3.1: Historical and projected Food Harvest GHG emissions from Irish Agriculture**




Source: FAPRI-Ireland (2011)
Note: Excludes emissions due to fuel combustion

Under the FH scenario, GHG emissions increase in the coming years principally due to the increase in dairy cow numbers and associated dairy emissions required to meet the 50% milk volume expansion target. This increase in emissions associated with dairy expansion more than offset the contraction in emissions arising as a result of a fall in the size of the suckler herd.[3] By 2020 the level of GHG emissions under the FH scenario is almost 18.06 million tonnes $CO_2$ eq. Agricultural GHG emission projections under the FH scenario are summarised in Table 3.1, along with the calculated reduction targets.

**Table 3.1: Historical and projected Food Harvest GHG Emissions from Irish Agriculture and various hypothetical GHG reduction targets**

| | 2005 | 2020 | change | % change |
|---|---|---|---|---|
| | Mt CO2 Eq. | | | |
| **Food Harvest 2020** | **18.66** | **18.06** | **- 0.60** | **- 3** |
| **10% GHG reduction target** | | **16.80** | **-1.86** | **-10** |
| **20% GHG reduction target** | | **14.93** | **-3.73** | **-20** |
| **30% GHG reduction target** | | **13.06** | **-5.60** | **-30** |

Source: FAPRI-Ireland (2010)
Note: Excludes emissions due to fuel combustion

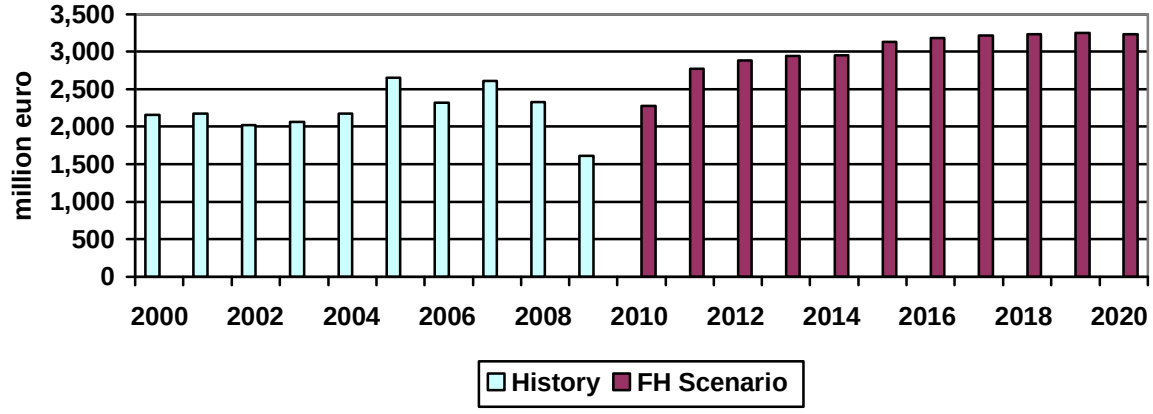
[3] It is possible for some reduction in suckler cow numbers to take place while still achieving the Food Harvest Target for beef. This is because the growing dairy herd provides additional surplus animals that can be raised for beef. Additionally, it is projected that beef prices will have to rise in order for the FH value based target to be achieved.

It is important to note that the projected level of emissions under the FH scenario do not consider potential emission reductions that might arise through the adoption of abatement technologies.

### 3.2 Agricultural Sector Output, Input and Income under the Food Harvest 2020 Scenario

It is possible to use the FAPRI-Ireland model to estimate the agricultural income (operating surplus) figure associated with achievement of the FH targets. It is found that FH would lead to an increase in agricultural income of just over € 1,000 million or 47% relative to the average for the period 2007-2009 (Figure 2). This mainly reflects the increase in the value of milk output (and milk prices due to the production of higher value added dairy products) that is necessary to provide the 50% volume increase in milk production, but it also reflects the fact that beef production with a low level of profitability is being replaced by milk production with a higher level of profitability.

**Figure 1.2: Irish Agricultural Sector Income: Historical and Food Harvest Projections**




Source: FAPRI-Ireland (2011)

Income levels for the Baseline and Food Harvest scenario are summarised in Table 3.2.

**Table 3.2: Historical and projected Food Harvest sector Income in Irish Agriculture**

| | 2007-2009 average | 2020 | change | % change |
|---|---|---|---|---|
| | Million Euro | | | |
| **Income** | **2,182** | **3,234** | **1,051** | **48** |

Source: FAPRI-Ireland (2011)

# 4. Implications of a constraint on GHG emission in Primary Agriculture

In the following discussion the impact of the imposition of 10, 20 and 30 percent GHG reduction targets on agriculture are measured relative to the FH scenario outcomes. Detailed agricultural activity level projections and GHG emissions are provided in Appendix Tables A1 to A25.

## 4.1 Implications for Agriculture of 10% reduction in GHG Emissions

- To reach the specified 2020 10 percent GHG reduction target, requires that cattle numbers are reduced to 5.22 million head by 2020. Total cattle numbers were 6.21 million head in 2005 and are projected to be 5.72 million in 2020 under FH.
- Suckler cows numbers are reduced to just over 0.74 million head by 2020 to achieve the 10 percent target. Sucker cow inventories were 1.15 million head in 2005 and are projected to be 0.93 million in 2020 under FH.
- Accordingly, by 2020 Irish beef production would be reduced to 0.515 mt to achieve the 10 percent reduction target. Beef production was 0.55 mt in 2005 and is projected to be 0.57 mt in 2020 under FH.
- Beef prices in 2020 are projected to be higher than in 2005. Rising beef prices partially offset the impact of the reduction in the quantity of beef produced, in both the FH and the 10 percent GHG reduction scenario in 2020. This means that the percent decline in beef output value is smaller than the percentage quantity reduction in both cases.
- By 2020 the value of the cattle sector under the 10 percent reduction target is €1,705 million. In 2005 beef sector value was just over €1,400 million and is projected to be €1,900 million in 2020 under FH.
- Given that there is projected to be little change in Irish beef consumption over the period to 2020, the impact which meeting the 10 percent GHG reduction target has on the value of beef production would be mirrored by a broadly similar percentage reduction in the value of Irish beef exports.

**Table 4.1: Animal numbers, Beef production and Cattle Sector value in 2005 and 2020 under Food Harvest 2020 and under a 10 percent GHG reduction target**

| | | FH | GHG Minus 10% | FH 2020 v 2005 | GHG Minus 10% v 2005 | FH v GHG Minus 10% |
|---|---|---|---|---|---|---|
| | 2005 | 2020 | 2020 | | | |
| | 000 head | | | percent change | | |
| Total Cattle | 6,210 | 5,720 | 5,224 | -8 | -16 | -9 |
| Dairy Cows | 1,120 | 1,380 | 1,380 | 23. | 23 | 0 |
| Suckler Cows | 1,150 | 930 | 737 | -19 | -36 | -21 |
| | | | | | | |
| | Million Tonnes | | | percent change | | |
| Beef Production | 0.55 | 0.57 | 0.515 | 4 | -6 | -10 |
| | | | | | | |
| | Euro Millions | | | percent change | | |
| Cattle Sector Value | 1,413 | 1,900 | 1,705 | 34 | 21 | -10 |

*Source: FAPRI-Ireland GHG Model (2011)*
Note: Cattle Numbers Refer to Housing Period

## 4.2 Implications for Agriculture of 20% reduction in GHG Emissions

- To reach the specified 20 percent GHG reduction target by 2020 requires that cattle numbers are reduced to 4.48 million head by 2020. Total cattle numbers were 6.21 million head in 2005 and are projected to be 5.72 million in 2020 under FH.

- Suckler cows numbers are reduced to just over 0.489 million head by 2020 to achieve the 20 percent target. Sucker cows were at 1.15 million head in 2005 and are projected to be 0.93 million in 2020 under FH.

- Accordingly, by 2020 Irish beef production would be reduced to 0.426 mt to achieve the 20 percent reduction target. Beef production was 0.55 mt in 2005 and is projected to be 0.57 mt in 2020 under FH.

- Beef prices in 2020 are projected to be higher than in 2005. Rising beef prices partially offset the impact of the reduction in the quantity of beef produced, in both the FH and the 20 percent GHG reduction scenario in 2020. This means that the percent decline in beef output value is smaller than the percentage quantity reduction in both cases.

- By 2020 the value of the cattle sector under the 20 percent reduction target is €1,437 million. In 2005 Beef sector value was just over €1,400 million and is projected to be €1,900 million in 2020 under FH.

- Given that there is projected to be little change in Irish beef consumption over the period to 2020, the impact which meeting the 20 percent reduction target has on the value of beef production would be mirrored by a broadly similar percentage reduction in the value of Irish beef exports.

**Table 4.2: Animal numbers, Beef production and Cattle Sector value in 2005 and 2020 under Food Harvest 2020 and under a 20 percent GHG reduction target**

| | | FH | GHG Minus 20% | FH v 2005 | GHG Minus 20% v 2005 | FH v GHG Minus 20% |
|---|---|---|---|---|---|---|
| | 2005 | 2020 | 2020 | | | |
| | 000 head | | | percent change | | |
| Total Cattle | 6,210 | 5,720 | 4,480 | -8 | -28 | -22 |
| Dairy Cows | 1,120 | 1,380 | 1,380 | 23 | 23 | 0 |
| Suckler Cows | 1,150 | 930 | 489 | -19 | -57 | -47 |
| | | | | | | |
| | Million Tonnes | | | percent change | | |
| Beef Production | 0.55 | 0.57 | 0.426 | 4 | -23 | -25 |
| | | | | | | |
| | Euro Millions | | | percent change | | |
| Cattle Sector Value | 1,413 | 1,900 | 1,437 | 34 | 2 | -24 |

*Source: FAPRI-Ireland GHG Model (2011)*
Note: Cattle Numbers Refer to Housing Period

### 4.3 Implications for Agriculture of 30% reduction in GHG Emissions

- To reach the specified 30 percent GHG reduction target by 2020 requires that cattle numbers are reduced to 3.70 million head by 2020. Total cattle numbers were 6.21 million head in 2005 and are projected to be 5.72 million in 2020 under FH.

- Suckler cows numbers are reduced to just over 0.266 million head by 2020 to achieve the 30 percent target. Sucker cows were at 1.15 million head in 2005 and are projected to be 0.93 million in 2020 under FH.

- Accordingly, by 2020 Irish beef production would decreases to 0.328 mt to achieve the 30 percent reduction target. Beef production was 0.55 mt in 2005 and is projected to be 0.57 mt in 2020 under FH.

- Beef prices in 2020 are projected to be higher than in 2005. Rising beef prices partially offset the impact of the reduction in the quantity of beef produced, in both the FH and the 30 percent GHG reduction scenario in 2020. This means that the percent decline in beef output value is smaller than the percentage quantity reduction in both cases.

- By 2020 the value of the cattle sector under the 30 percent reduction target is €1,171 million. In 2005 Beef sector value was just over €1,400 million and is projected to be €1,900 million in 2020 under FH.

- Given that there is projected to be little change in Irish beef consumption over the period to 2020, the impact which meeting the 30 percent reduction target has on the value of beef production would be mirrored by a broadly similar percentage reduction in the value of Irish beef exports.

**Table 4.3: Animal numbers, Beef production and Cattle Sector value in 2005 and 2020 under Food Harvest 2020 and under a 30 percent GHG reduction target**

| | | FH | GHG Minus 30% | FH v 2005 | GHG Minus 30% v 2005 | FH v GHG Minus 30% |
|---|---|---|---|---|---|---|
| | 2005 | 2020 | 2020 | | | |
| | 000 head | | | percent change | | |
| Total Cattle | 6,210 | 5,720 | 3,700 | -8 | -40 | -35 |
| Dairy Cows | 1,120 | 1,380 | 1,380 | 23 | 23 | 0 |
| Suckler Cows | 1,150 | 930 | 266 | -19 | -77 | -71 |
| | | | | | | |
| | Million Tonnes | | | percent change | | |
| Beef Production | 0.55 | 0.57 | 0.328 | 4 | -40 | -42 |
| | | | | | | |
| | Euro Millions | | | percent change | | |
| Cattle Sector Value | 1,413 | 1,900 | 1,171 | 34 | -17 | -38 |

*Source: FAPRI-Ireland GHG Model (2011)*
Note: Cattle Numbers Refer to Housing Period

### 4.4 Implication of 10, 20 and 30% GHG reduction for operating surplus in agriculture.

While the reductions in the value of beef output resulting from the 10, 20 and 30 percent GHG reduction targets are substantial, these reductions have only a limited impact on the level of operating surplus by 2020, since much of this beef production is loss making (the cost of production exceeds output value). The impact of the 10, 20 and 30 percent GHG reduction targets on the operating surplus in agriculture are shown in Table 4.4.

**Table 4.4: Historical and projected Sectoral Income under Food Harvest 2020 and under the 10, 20 and 30 percent GHG reduction target.**

| | 2007-2009 average | 2020 | Increase on 2007-2009 average | % change |
|---|---|---|---|---|
| | Million Euro | | | |
| **Food Harvest** | **2,182** | **3,233** | **1,051** | **48** |
| **10% GHG reduction** | | **3,184** | **1,002** | **46** |
| **Change vs. Food Harvest** | | **-49** | | |
| **20% GHG reduction** | | **3,117** | **935** | **43** |
| **Change vs. Food Harvest** | | **-116** | | |
| **30% GHG reduction** | | **3,038** | **856** | **39** |
| **Change vs. Food Harvest** | | **-195** | | |

Source: FAPRI-Ireland (2011)

# 5. Implications for the Beef processing sector of a constraint on GHG emission in Primary Agriculture

In this section we first produce an estimate of the consequences for the beef processing sector in terms of output value and value added of the achievement of the Food Harvest 2020 target. We then examine the reduction in both output and value added at processing level that would arise due to the lower throughput of cattle associated with a reduction in the cattle population due to the imposition of the 10, 20 and 30 percent reduction targets on GHG emissions from primary agriculture.

**The following assumptions are made:**

- The cattle used in beef processing in Ireland are sourced exclusively within Ireland.
- Live exports decline as the numbers of cattle that are available for disposal decline due to lower total cattle inventories.
- Under the FH scenario the output value in the beef processing sector increases at the same percentage rate as output value in the primary cattle sector.

**Food Harvest 2020**

- It is estimated that the output of beef processing in 2005 was €2,200 and that under FH this would rise to €2,960 by 2020. It is estimated that the value added of beef processing in 2005 was €286 and that under FH that this would rise to €460 by 2020

**Impact on beef processing of a 10 Percent cut in Agricultural GHG emissions**

- If beef production declines due to the 10 percent GHG reduction target, then in 2020 the value of output in beef processing would decline relative to the FH level by **€304** million to about **€2,656** million per annum.
- The corresponding reduction in beef processing value added, due to a 10 percent GHG reduction target, is **€47** million, relative to the Food Harvest level by 2020. This would mean that the GVA in beef processing would be €413 million in 2020.

**Impact on beef processing of a 20 Percent cut in Agricultural GHG emissions**

- If beef production declines due to the 20 percent GHG reduction target, then the value of output in beef processing in 2020 would decline relative to the FH level by **€721** million to about **€2,239** million.
- The corresponding reduction in beef processing value added, due to a 20 percent GHG reduction target, by 2020 is **€112** million relative to the Food Harvest level. This would mean that the GVA in beef processing would be €348 million in 2020.

**Impact on beef processing of a 30 Percent cut in Agricultural GHG emissions**

- If beef production declines due to the 30 percent GHG reduction target, then the value of output in beef processing would decline by **€1,136** million to about €1,824 million.
- The corresponding reduction in beef processing value added, due to a 30 percent GHG reduction target, by 2020 is **€176** million relative to the FH level. This would mean that the GVA in beef processing would be €284 million in 2020.

Table 5.1 below summarises these different scenarios.

**Table 5.1: Impact of GHG reduction on the Output and Value added in Beef Processing**

| | | 2005 | FH | 10% GHG cut | 20% GHG cut | 30% GHG cut |
|---|---|---|---|---|---|---|
| Output | € million | 2,200 | 2,960 | 2,656 | 2,239 | 1,824 |
| Change relative to FH | € million | | | -304 | -721 | -1,136 |
| GVA | € million | 286 | 460 | 413 | 348 | 284 |
| change relative to FH | € million | | | -47 | -112 | -176 |
| % reduction in GVA relative to FH | % | | | -10 | -24 | -38 |

Source: FAPRI-Ireland (2011)

# Summary

## 10 percent cut in GHG emissions

- On foot of a 10% reduction in GHG emissions, the decline in primary cattle output value relative to that which would be achieved under the Food Harvest initiative would be € 195 million per annum (€1, 900 m less €1,705 m, see Table 4.1).
- The associated decline in the value of output of the beef processing industry would be €304 million per annum (Table 5.1) assuming that the decline in the value of output from beef processing reflects the decline the value of cattle output at the farm level.
- It is not appropriate to add the primary and beef processing sector changes in sectoral output value together to get an aggregate agri-food sector change in output value, since to do so would be to commit a double counting error.
- Compared with Food Harvest in 2020, the reduction in operating surplus in the agricultural sector as a result of the achievement of the 10 percent GHG reduction target is projected to be € 49 m per annum (€3,233m – € 3,184m, see Table 4.4).
- The reduction in gross value added in the beef processing sector is estimated to be €47 million, relative to the Food Harvest 2020 level.
- It is appropriate to add gross value added in the primary and beef processing sector together to get an aggregate measure of the change in GVA associated with the achievement of the 10 percent GHG reduction target.
- The reduction in GVA in the agri-food sector associated with the achievement of the 10 percent GHG reduction target, in the manner examined in this briefing note, is projected to be €96 million (€49 m + €47 m) per annum.

## 20 percent cut in GHG emissions

- On foot of a 20% reduction in GHG emissions, the decline in primary cattle output value relative to that which would be achieved under the Food Harvest initiative would be € 463 million per annum (€1,900 m -€1,437 m, see Table 4.2).
- The associated decline in the value of output of beef processing would be €721 million per annum (Table 5.1) assuming that the decline in the value of output from beef processing reflects the decline the value of cattle output at the farm level.
- It is not appropriate to add the primary and beef processing sector changes in sectoral output value together to get an aggregate agri-food sector change in output value, since to do so would be to commit a double counting error.
- Compared with Food Harvest in 2020, the change in operating surplus in the agricultural sector (which is equivalent to gross value added in the primary agricultural sector) as a result of the achievement of the 20 percent GHG reduction target is projected to be € 116 million per annum (€3,233m – € 3,117m, see Table 4.4).
- The reduction in gross value added in the beef processing sector is estimated to be €112 million, relative to the Food Harvest 2020 level.
- It is appropriate to add gross value added in the primary and beef processing sector together to get an aggregate measure of the change in GVA associated with the achievement of the 20 percent GHG reduction target.

- The reduction in GVA in the agri-food sector associated with the achievement of the 20% GHG reduction target, in the manner examined in this briefing note, is projected to be €228 million per annum (€116 m + €112 m).

## 30 percent cut in GHG emissions

- On foot of a 30% reduction in GHG emissions, the decline in primary cattle output value relative to that which would be achieved under the Food Harvest initiative would be € 729 million per annum (€1, 900m -€1,171m, see Table 4.3).
- The associated decline in the value of output of beef processing would be €1,136 million per annum (Table 5.1) assuming that the decline in the value of output from beef processing reflects the decline the value of cattle output at the farm level.
- It is not appropriate to add the primary and beef processing sector changes in sectoral output value together to get an aggregate agri-food sector change in output value, since to do so would be to commit a double counting error.
- Compared with Food Harvest in 2020, the change in operating surplus in the agricultural sector as a result of the achievement of the 30 percent GHG reduction target is projected to be € 195 million per annum (€3,233m – € 3038m, see Table 4.4).
- The decline in gross value added in the beef processing sector is estimated to be €176 million, relative to the Food Harvest 2020 level.
- It is appropriate to add gross value added in the primary and beef processing sector together to get an aggregate measure of the change in GVA associated with the achievement of the 30 percent GHG reduction target.
- The reduction in GVA in the agri-food sector associated with the achievement of the 30% GHG reduction target, in the manner examined in this briefing note, is projected to be €371 million per annum (€195m + € 176 m).

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# APPENDIX TABLES

## Table A1: Historical and Projected Baseline GHG emissions from Irish Agriculture

| | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|---|
| | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* |
| Total CH4 from Fermentation(CH4 Gg/Yr) | 452.07 | 458.71 | 452.52 | 437.48 | 411.85 | 395.62 | 396.77 |
| Total CH4 from Manure (CH4 Gg/Yr) | 110.69 | 111.84 | 109.90 | 107.07 | 102.43 | 98.59 | 100.15 |
| **Total CH4 from Livestock** | 562.76 | 570.55 | 562.42 | 544.55 | 514.28 | 494.20 | 496.92 |
| **CO2 equivalent of CH4** | 11,818.00 | 11,981.45 | 11,810.80 | 11,435.60 | 10,799.90 | 10,378.27 | 10,435.29 |
| Total N2O emitted from Slurry System(Gg N2O/yr) | 0.18 | 0.19 | 0.19 | 0.18 | 0.17 | 0.16 | 0.16 |
| Total N2O from Solid System(Gg N2O/yr) | 1.10 | 1.18 | 1.20 | 1.11 | 1.02 | 0.97 | 0.96 |
| Total N2O from Pasture System(Gg N2O/yr) | 9.04 | 9.32 | 9.33 | 9.10 | 8.30 | 7.91 | 7.74 |
| Direct N2O emissions from fertiliser (N2O Gg/yr) | 7.34 | 8.30 | 7.84 | 6.81 | 7.01 | 6.34 | 6.32 |
| Direct N2O from soils - FAW (Gg N2O/yr) | 1.49 | 1.56 | 1.61 | 1.53 | 1.46 | 1.39 | 1.39 |
| Direct N2O from N-Fixing Crops N2O (Gg N2O/yr)) | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Direct N2O-Crop Residue (Gg N2O/yr) | 0.39 | 0.38 | 0.43 | 0.35 | 0.20 | 0.19 | 0.18 |
| Indirect Emissions of N2O due to volatilisation of NH3 from manure and fertiliser inputs (N2O Gg/Yr) | 1.42 | 1.48 | 1.55 | 1.39 | 1.31 | 1.24 | 1.23 |
| Nitrous Oxide Emissions from Leaching (Gg of N2O/yr) | 2.92 | 3.16 | 3.09 | 2.83 | 2.77 | 2.56 | 2.55 |
| **Total Nitrous Oxide** | 23.89 | 25.59 | 25.22 | 23.31 | 22.24 | 20.77 | 20.55 |
| **CO2 equivalent of N2O** | 7,404.66 | 7,931.89 | 7,819.38 | 7,227.54 | 6,894.77 | 6,440.11 | 6,371.18 |
| Total Agriculture CO2 equivalent emissions | 19,222.66 | 19,913.34 | 19,630.18 | 18,663.14 | 17,694.67 | 16,818.38 | 16,806.47 |
| Fuel Combustion | 689.16 | 950.92 | 858.14 | 899.52 | 850.00 | 850.00 | 850.00 |
| **Total CO2e Gg** | 19,911.82 | 20,864.26 | 20,488.32 | 19,562.66 | 18,544.67 | 17,668.38 | 17,656.47 |

Source: FAPRI-Ireland (2010).

## Table A2: Baseline Activity Levels for Irish Agriculture - Housing Period

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cattle | 000 head | 5,848.1 | 5,661.2 | 5,577.7 | 5,505.3 | 5,447.3 | 5,399.9 | 5,385.5 | 5,393.4 | 5,388.8 | 5,361.9 | 5,314.4 |
| Dairy Cows | 000 head | 1,107.0 | 1,117.2 | 1,109.5 | 1,108.5 | 1,111.3 | 1,113.3 | 1,153.2 | 1,178.7 | 1,194.7 | 1,203.2 | 1,205.5 |
| All Other Cattle (excl. Dairy Cows) | 000 head | 4,741.1 | 4,544.0 | 4,468.2 | 4,396.8 | 4,336.0 | 4,286.6 | 4,232.2 | 4,214.7 | 4,194.1 | 4,158.7 | 4,108.9 |
| Other Cows | 000 head | 1,069.5 | 1,049.4 | 1,028.8 | 1,020.0 | 1,009.2 | 999.9 | 996.8 | 984.8 | 967.7 | 947.6 | 926.5 |
| Dairy Heifers | 000 head | 222.5 | 215.9 | 227.5 | 228.0 | 232.3 | 239.0 | 243.3 | 245.8 | 246.9 | 246.8 | 249.0 |
| Other Heifers | 000 head | 118.5 | 106.9 | 101.7 | 98.9 | 95.3 | 92.8 | 90.7 | 89.2 | 87.5 | 85.4 | 83.1 |
| Cattle < 1 yrs | 000 head | 1,565.1 | 1,507.3 | 1,477.5 | 1,448.4 | 1,423.9 | 1,402.7 | 1,377.0 | 1,374.0 | 1,372.8 | 1,366.7 | 1,353.1 |
| Cattle < 1 yrs - male | 000 head | 772.9 | 788.3 | 772.7 | 757.5 | 744.7 | 733.6 | 720.2 | 718.6 | 718.0 | 714.8 | 707.7 |
| Cattle < 1 yrs - female | 000 head | 792.2 | 719.0 | 704.8 | 690.9 | 679.2 | 669.1 | 656.8 | 655.4 | 654.8 | 651.9 | 645.4 |
| Cattle 1 - 2 yrs | 000 head | 1,174.0 | 1,123.1 | 1,100.9 | 1,079.2 | 1,061.0 | 1,045.2 | 1,026.0 | 1,023.8 | 1,022.9 | 1,018.4 | 1,008.2 |
| Cattle 1 - 2 yrs - male | 000 head | 654.8 | 678.3 | 664.9 | 651.8 | 640.8 | 631.2 | 619.7 | 618.3 | 617.8 | 615.0 | 608.9 |
| Cattle 1 - 2 yrs - female | 000 head | 519.2 | 444.8 | 436.0 | 427.4 | 420.2 | 413.9 | 406.4 | 405.5 | 405.1 | 403.3 | 399.3 |
| Cattle > 2 yrs | 000 head | 533.7 | 483.8 | 474.2 | 464.9 | 457.0 | 450.2 | 442.0 | 441.0 | 440.6 | 438.7 | 434.3 |
| Cattle > 2 yrs - male | 000 head | 300.4 | 277.6 | 272.1 | 266.8 | 262.3 | 258.4 | 253.6 | 253.1 | 252.9 | 251.7 | 249.2 |
| Cattle > 2 yrs - female | 000 head | 233.3 | 206.2 | 202.1 | 198.1 | 194.8 | 191.9 | 188.3 | 187.9 | 187.8 | 186.9 | 185.1 |
| Bulls | 000 head | 57.8 | 57.6 | 57.5 | 57.3 | 57.2 | 56.8 | 56.5 | 56.1 | 55.6 | 55.1 | 54.5 |
| Total Sheep | 000 head | 4,694.6 | 4,986.0 | 5,321.2 | 5,572.0 | 5,287.6 | 5,077.0 | 4,968.9 | 4,900.7 | 4,852.3 | 4,821.9 | 4,805.7 |
| Ewes Lowland | 000 head | 1,782.9 | 2,029.2 | 2,211.7 | 2,360.1 | 2,204.9 | 2,077.8 | 1,995.8 | 1,937.9 | 1,895.5 | 1,867.4 | 1,850.9 |
| Ewes Upland | 000 head | 445.7 | 458.1 | 476.0 | 490.7 | 487.3 | 466.0 | 450.8 | 439.3 | 430.2 | 423.5 | 418.7 |
| Rams | 000 head | 66.9 | 74.6 | 80.6 | 85.5 | 80.8 | 76.3 | 73.4 | 71.3 | 69.8 | 68.7 | 68.1 |
| Other Sheep>1 | 000 head | 98.3 | 121.0 | 133.8 | 145.2 | 135.7 | 124.7 | 116.3 | 110.0 | 105.2 | 101.8 | 99.7 |
| Lambs | 000 head | 2,300.8 | 2,303.1 | 2,419.1 | 2,490.6 | 2,379.0 | 2,332.2 | 2,332.5 | 2,342.2 | 2,351.7 | 2,360.5 | 2,368.3 |

Source: FAPRI-Ireland (2010)

## Table A3: Baseline Activity Levels for Irish Agriculture - Pasture Period

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cattle | 000 head | 6,531.9 | 6,323.1 | 6,229.9 | 6,149.1 | 6,084.3 | 6,031.3 | 6,015.2 | 6,024.1 | 6,018.9 | 5,988.9 | 5,935.8 |
| Dairy Cows | 000 head | 1,117.9 | 1,128.7 | 1,120.6 | 1,119.6 | 1,122.5 | 1,124.6 | 1,167.0 | 1,194.1 | 1,211.1 | 1,220.1 | 1,222.6 |
| All Other Cattle (excl. Dairy Cows) | 000 head | 5,414.0 | 5,194.4 | 5,109.3 | 5,029.5 | 4,961.8 | 4,906.7 | 4,848.1 | 4,829.9 | 4,807.7 | 4,768.8 | 4,713.2 |
| Other Cows | 000 head | 1,130.3 | 1,109.1 | 1,087.3 | 1,078.0 | 1,066.6 | 1,056.8 | 1,053.5 | 1,040.9 | 1,022.7 | 1,001.5 | 979.2 |
| Dairy Heifers | 000 head | 215.3 | 208.9 | 220.2 | 220.7 | 224.8 | 231.3 | 235.4 | 237.9 | 238.9 | 238.9 | 241.0 |
| Other Heifers | 000 head | 127.2 | 114.8 | 109.2 | 106.1 | 102.3 | 99.6 | 97.3 | 95.8 | 93.9 | 91.7 | 89.2 |
| Cattle < 1 yrs | 000 head | 1,527.2 | 1,456.4 | 1,429.3 | 1,402.6 | 1,380.4 | 1,361.2 | 1,338.9 | 1,336.6 | 1,335.5 | 1,329.7 | 1,317.0 |
| Cattle < 1 yrs - male | 000 head | 750.6 | 715.8 | 702.5 | 689.3 | 678.4 | 669.0 | 658.0 | 656.9 | 656.4 | 653.5 | 647.3 |
| Cattle < 1 yrs - female | 000 head | 776.6 | 740.6 | 726.8 | 713.2 | 702.0 | 692.2 | 680.8 | 679.7 | 679.1 | 676.2 | 669.7 |
| Cattle 1 - 2 yrs | 000 head | 1,454.7 | 1,387.3 | 1,361.5 | 1,336.0 | 1,314.9 | 1,296.6 | 1,275.4 | 1,273.1 | 1,272.2 | 1,266.6 | 1,254.5 |
| Cattle 1 - 2 yrs - male | 000 head | 857.3 | 817.6 | 802.4 | 787.4 | 774.9 | 764.1 | 751.6 | 750.3 | 749.7 | 746.4 | 739.3 |
| Cattle 1 - 2 yrs - female | 000 head | 597.4 | 569.7 | 559.1 | 548.7 | 540.0 | 532.5 | 523.7 | 522.8 | 522.4 | 520.2 | 515.2 |
| Cattle > 2 yrs | 000 head | 890.5 | 849.3 | 833.5 | 817.9 | 804.9 | 793.8 | 780.7 | 779.4 | 778.8 | 775.4 | 768.0 |
| Cattle > 2 yrs - male | 000 head | 598.9 | 571.1 | 560.5 | 550.0 | 541.3 | 533.8 | 525.1 | 524.2 | 523.7 | 521.5 | 516.5 |
| Cattle > 2 yrs - female | 000 head | 291.6 | 278.1 | 272.9 | 267.8 | 263.6 | 259.9 | 255.7 | 255.2 | 255.0 | 253.9 | 251.5 |
| Bulls | 000 head | 68.7 | 68.6 | 68.4 | 68.2 | 67.8 | 67.4 | 66.9 | 66.4 | 65.7 | 65.0 | 64.2 |
| Total Sheep | 000 head | 4,694.6 | 4,986.0 | 5,321.2 | 5,572.0 | 5,287.6 | 5,077.0 | 4,968.9 | 4,900.7 | 4,852.3 | 4,821.9 | 4,805.7 |
| Lowland Ewes | 000 head | 1,782.9 | 2,029.2 | 2,211.7 | 2,360.1 | 2,204.9 | 2,077.8 | 1,995.8 | 1,937.9 | 1,895.5 | 1,867.4 | 1,850.9 |
| Upland Ewes | 000 head | 445.7 | 458.1 | 476.0 | 490.7 | 487.3 | 466.0 | 450.8 | 439.3 | 430.2 | 423.5 | 418.7 |
| Rams | 000 head | 66.9 | 74.6 | 80.6 | 85.5 | 80.8 | 76.3 | 73.4 | 71.3 | 69.8 | 68.7 | 68.1 |
| Other Sheep>1 | 000 head | 98.3 | 121.0 | 133.8 | 145.2 | 135.7 | 124.7 | 116.3 | 110.0 | 105.2 | 101.8 | 99.7 |
| Lambs | 000 head | 2,300.8 | 2,303.1 | 2,419.1 | 2,490.6 | 2,379.0 | 2,332.2 | 2,332.5 | 2,342.2 | 2,351.7 | 2,360.5 | 2,368.3 |

Source: FAPRI-Ireland (2010)

## Table A4: Baseline Activity Levels for Irish Agriculture (PART I)

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pigs | 000 head | 1,504.8 | 1,526.2 | 1,539.4 | 1,545.8 | 1,546.4 | 1,542.9 | 1,537.1 | 1,530.3 | 1,523.4 | 1,517.0 | 1,511.2 |
| Gilts in Pig | 000 head | 21.9 | 22.2 | 22.3 | 22.4 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.4 |
| Gilts not yet Served | 000 head | 18.8 | 19.1 | 19.2 | 19.3 | 19.3 | 19.4 | 19.4 | 19.4 | 19.4 | 19.3 | 19.3 |
| Sows in Pig | 000 head | 97.3 | 98.7 | 99.5 | 99.8 | 100.0 | 100.1 | 100.1 | 100.1 | 100.0 | 100.0 | 99.9 |
| Other Sows for Breeding | 000 head | 30.8 | 31.2 | 31.5 | 31.6 | 31.6 | 31.7 | 31.7 | 31.7 | 31.6 | 31.6 | 31.6 |
| Boars | 000 head | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Pigs 20 Kg + | 000 head | 1,010.6 | 936.5 | 950.9 | 959.9 | 964.4 | 964.7 | 962.1 | 957.8 | 952.9 | 947.9 | 943.3 |
| Pigs Under 20 Kg | 000 head | 420.8 | 395.2 | 400.8 | 404.3 | 406.0 | 406.1 | 405.2 | 403.7 | 401.9 | 400.1 | 398.4 |
| Poultry | 000 head | 13,814.7 | 13,701.5 | 13,809.9 | 14,049.8 | 14,411.8 | 14,871.6 | 15,370.5 | 15,899.2 | 16,459.2 | 17,059.2 | 17,672.1 |
| Layer | 000 head | 1,761.9 | 1,747.5 | 1,761.3 | 1,791.9 | 1,838.0 | 1,896.7 | 1,960.3 | 2,027.7 | 2,099.2 | 2,175.7 | 2,253.9 |
| Broiler | 000 head | 11,381.5 | 11,288.3 | 11,377.6 | 11,575.2 | 11,873.5 | 12,252.2 | 12,663.3 | 13,098.8 | 13,560.3 | 14,054.6 | 14,559.5 |
| Turkey | 000 head | 671.3 | 665.8 | 671.1 | 682.7 | 700.3 | 722.7 | 746.9 | 772.6 | 799.8 | 829.0 | 858.7 |
| Horses | 000 head | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 |
| Mules | 000 head | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 |
| Goats | 000 head | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 |
| Fertiliser | kg of N | 363,046.0 | 329,608.1 | 324,423.9 | 337,969.4 | 330,481.3 | 327,976.3 | 328,902.1 | 330,349.3 | 330,610.2 | 329,535.9 | 327,139.4 |

Source: FAPRI-Ireland (2010)

## Table A5: Baseline Activity Levels for Irish Agriculture (PART II)

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pulses Production | tonnes | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 |
| Potatoes Production | tonnes | 400,572 | 404,052 | 400,670 | 393,954 | 383,516 | 370,973 | 356,866 | 341,943 | 326,777 | 311,722 | 296,909 |
| Sugar Beet Production | tonnes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Barley Production | tonnes | 1,180,069 | 1,096,718 | 1,099,231 | 1,088,902 | 1,078,338 | 1,070,296 | 1,061,975 | 1,056,060 | 1,050,307 | 1,045,062 | 1,039,742 |
| Oats Production | tonnes | 143,024 | 136,733 | 131,287 | 128,362 | 126,406 | 125,385 | 124,640 | 124,255 | 124,059 | 124,002 | 123,980 |
| Wheat Production | tonnes | 600,428 | 609,357 | 639,867 | 658,821 | 674,321 | 688,572 | 700,211 | 711,080 | 720,013 | 727,476 | 733,285 |
| Pasture | hectares | 2,131,235 | 2,132,148 | 2,132,045 | 2,129,895 | 2,127,788 | 2,128,761 | 2,130,635 | 2,131,948 | 2,132,745 | 2,133,427 | 2,134,267 |
| Hay | hectares | 224,754 | 223,754 | 223,334 | 223,301 | 223,314 | 222,801 | 222,226 | 221,796 | 221,493 | 221,234 | 220,976 |
| Silage | hectares | 1,023,880 | 1,019,324 | 1,017,410 | 1,017,260 | 1,017,318 | 1,014,983 | 1,012,363 | 1,010,405 | 1,009,024 | 1,007,842 | 1,006,670 |
| Rough Grazing | hectares | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 |
| Wheat Area Harvested | 000 ha | 68.7 | 70.8 | 73.2 | 75.1 | 76.6 | 77.9 | 78.8 | 79.4 | 79.9 | 80.2 | 80.3 |
| Spring Wheat Area Harvested | 000 ha | 15.8 | 16.3 | 16.8 | 17.2 | 17.6 | 17.9 | 18.1 | 18.2 | 18.4 | 18.4 | 18.5 |
| Winter Wheat Area Harvested | 000 ha | 52.9 | 54.5 | 56.4 | 57.8 | 59.0 | 60.0 | 60.7 | 61.2 | 61.5 | 61.8 | 61.9 |
| Barley Area | 000 ha | 168.6 | 169.3 | 167.4 | 165.7 | 164.0 | 162.4 | 160.6 | 158.9 | 157.3 | 155.8 | 154.4 |
| Spring Barley Area Harvested | 000 ha | 150.3 | 150.9 | 149.2 | 147.7 | 146.2 | 144.7 | 143.2 | 141.7 | 140.2 | 138.9 | 137.6 |
| Winter Barley Area Harvested | 000 ha | 18.3 | 18.4 | 18.2 | 18.0 | 17.8 | 17.6 | 17.5 | 17.3 | 17.1 | 16.9 | 16.8 |
| Oats Area Harvested | 000 ha | 18.8 | 17.7 | 16.9 | 16.3 | 15.9 | 15.7 | 15.5 | 15.3 | 15.1 | 15.0 | 14.9 |
| Spring Oats Area Harvested | 000 ha | 3.8 | 3.6 | 3.4 | 3.3 | 3.2 | 3.2 | 3.1 | 3.1 | 3.1 | 3.0 | 3.0 |
| Winter Oats Area Harvested | 000 ha | 15.0 | 14.1 | 13.5 | 13.0 | 12.7 | 12.5 | 12.3 | 12.2 | 12.1 | 12.0 | 11.9 |
| Potatoes Area Harvested | 000 ha | 12.7 | 12.8 | 12.5 | 12.2 | 11.8 | 11.4 | 10.9 | 10.4 | 9.9 | 9.4 | 8.9 |
| Sugar Beet Area Harvested | 000 ha | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Fodder Beet Area Harvested | 000 ha | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Turnips Area Harvested | 000 ha | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Silage Area Harvested | 000 ha | 1,023.9 | 1,019.3 | 1,017.4 | 1,017.3 | 1,017.3 | 1,015.0 | 1,012.4 | 1,010.4 | 1,009.0 | 1,007.8 | 1,006.7 |
| Hay Area Harvested | 000 ha | 224.8 | 223.8 | 223.3 | 223.3 | 223.3 | 222.8 | 222.2 | 221.8 | 221.5 | 221.2 | 221.0 |
| Maize Area Harvested | 000 ha | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 |

Source: FAPRI-Ireland (2010)

## Table A6: Historical and Food Harvest Scenario Projections of GHG emissions from Irish Agriculture

| | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|---|
| | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* |
| Total CH4 from Fermentation(CH4 Gg/Yr) | 452.07 | 458.71 | 452.52 | 437.48 | 411.85 | 398.49 | 430.30 |
| Total CH4 from Manure (CH4 Gg/Yr) | 110.69 | 111.84 | 109.90 | 107.07 | 102.43 | 101.46 | 114.29 |
| **Total CH4 from Livestock** | 562.76 | 570.55 | 562.42 | 544.55 | 514.28 | 499.95 | 544.59 |
| **CO2 equivalent of CH4** | 11,818.00 | 11,981.45 | 11,810.80 | 11,435.60 | 10,799.90 | 10,498.98 | 11,436.32 |
| Total N2O emitted from Slurry System(Gg N2O/yr) | 0.18 | 0.19 | 0.19 | 0.18 | 0.17 | 0.17 | 0.19 |
| Total N2O from Solid System(Gg N2O/yr) | 1.10 | 1.18 | 1.20 | 1.11 | 1.01 | 0.98 | 1.01 |
| Total N2O from Pasture System(Gg N2O/yr) | 9.04 | 9.32 | 9.33 | 9.10 | 8.30 | 7.99 | 8.33 |
| Direct N2O emissions from fertiliser (N2O Gg/yr) | 7.34 | 8.30 | 7.84 | 6.81 | 7.01 | 5.75 | 6.13 |
| Direct N2O from soils - FAW (Gg N2O/yr) | 1.49 | 1.56 | 1.61 | 1.53 | 1.45 | 1.41 | 1.55 |
| Direct N2O from N-Fixing Crops N2O (Gg N2O/yr)) | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Direct N2O-Crop Residue (Gg N2O/yr) | 0.39 | 0.38 | 0.43 | 0.35 | 0.20 | 0.19 | 0.18 |
| Indirect Emissions of N2O due to volatilisation of NH3 from manure and fertiliser inputs (N2O Gg/Yr) | 1.42 | 1.48 | 1.55 | 1.39 | 1.31 | 1.25 | 1.32 |
| Nitrous Oxide Emissions from Leaching (Gg of N2O/yr) | 2.92 | 3.16 | 3.09 | 2.83 | 2.76 | 2.46 | 2.63 |
| **Total Nitrous Oxide** | 23.89 | 25.59 | 25.22 | 23.31 | 22.23 | 20.20 | 21.35 |
| **CO2 equivalent of N2O** | 7,404.66 | 7,931.89 | 7,819.38 | 7,227.54 | 6,891.96 | 6,263.21 | 6,618.36 |
| Total Agriculture CO2 equivalent emissions | 19,222.66 | 19,913.34 | 19,630.18 | 18,663.14 | 17,691.86 | 16,762.19 | 18,054.68 |
| Fuel Combustion | 689.16 | 950.92 | 858.14 | 899.52 | 850.00 | 850.00 | 850.00 |
| **Total CO2e Gg** | 19,911.82 | 20,864.26 | 20,488.32 | 19,562.66 | 18,541.86 | 17,612.19 | 18,904.68 |

Source: FAPRI-Ireland (2010)

## Table A7: Food Harvest Activity Levels for Irish Agriculture - Housing Period

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cattle | 000 head | 5,848.1 | 5,661.1 | 5,579.2 | 5,514.0 | 5,467.9 | 5,435.9 | 5,476.4 | 5,576.3 | 5,662.4 | 5,709.6 | 5,714.9 |
| Dairy Cows | 000 head | 1,107.0 | 1,117.1 | 1,108.1 | 1,107.3 | 1,109.3 | 1,110.5 | 1,199.3 | 1,265.0 | 1,316.0 | 1,353.9 | 1,380.8 |
| All Other Cattle (excl. Dairy Cows) | 000 head | 4,741.1 | 4,544.0 | 4,471.1 | 4,406.7 | 4,358.6 | 4,325.4 | 4,277.1 | 4,311.3 | 4,346.4 | 4,355.7 | 4,334.1 |
| Other Cows | 000 head | 1,069.5 | 1,049.4 | 1,029.8 | 1,022.9 | 1,013.8 | 1,008.3 | 1,017.0 | 1,008.1 | 987.5 | 958.7 | 925.1 |
| Dairy Heifers | 000 head | 222.5 | 215.9 | 227.2 | 227.5 | 236.8 | 252.6 | 264.6 | 273.7 | 280.3 | 284.9 | 289.5 |
| Other Heifers | 000 head | 118.5 | 106.9 | 102.2 | 99.8 | 96.8 | 94.8 | 93.4 | 93.2 | 92.3 | 90.5 | 87.9 |
| Cattle < 1 yrs | 000 head | 1,584.1 | 1,507.3 | 1,478.3 | 1,451.5 | 1,429.6 | 1,409.6 | 1,377.0 | 1,393.6 | 1,417.9 | 1,435.2 | 1,440.2 |
| Cattle < 1 yrs - male | 000 head | 828.5 | 788.3 | 773.1 | 759.1 | 747.7 | 737.2 | 720.2 | 728.9 | 741.6 | 750.6 | 753.2 |
| Cattle < 1 yrs - female | 000 head | 755.6 | 719.0 | 705.1 | 692.4 | 681.9 | 672.4 | 656.8 | 664.8 | 676.3 | 684.6 | 687.0 |
| Cattle 1 - 2 yrs | 000 head | 1,180.3 | 1,123.1 | 1,101.5 | 1,081.5 | 1,065.2 | 1,050.3 | 1,026.0 | 1,038.4 | 1,056.5 | 1,069.4 | 1,073.1 |
| Cattle 1 - 2 yrs - male | 000 head | 712.8 | 678.3 | 665.2 | 653.2 | 643.3 | 634.4 | 619.7 | 627.2 | 638.1 | 645.8 | 648.1 |
| Cattle 1 - 2 yrs - female | 000 head | 467.5 | 444.8 | 436.2 | 428.3 | 421.9 | 416.0 | 406.4 | 411.3 | 418.4 | 423.5 | 425.0 |
| Cattle > 2 yrs | 000 head | 508.4 | 483.8 | 474.5 | 465.9 | 458.9 | 452.5 | 442.0 | 447.3 | 455.1 | 460.7 | 462.3 |
| Cattle > 2 yrs - male | 000 head | 291.8 | 277.6 | 272.3 | 267.4 | 263.3 | 259.7 | 253.6 | 256.7 | 261.2 | 264.4 | 265.3 |
| Cattle > 2 yrs - female | 000 head | 216.7 | 206.2 | 202.2 | 198.5 | 195.5 | 192.8 | 188.3 | 190.6 | 193.9 | 196.3 | 197.0 |
| Bulls | 000 head | 57.9 | 57.8 | 57.6 | 57.6 | 57.5 | 57.5 | 57.2 | 57.1 | 57.0 | 56.8 | 56.5 |
| Total Sheep | 000 head | 4,694.6 | 4,986.0 | 5,364.4 | 5,651.5 | 5,399.0 | 5,211.9 | 5,122.2 | 5,070.4 | 5,037.4 | 5,021.7 | 5,020.2 |
| Ewes Lowland | 000 head | 1,782.9 | 2,029.2 | 2,235.2 | 2,405.8 | 2,271.0 | 2,158.8 | 2,088.2 | 2,039.6 | 2,005.3 | 1,984.3 | 1,974.6 |
| Ewes Upland | 000 head | 445.7 | 458.1 | 479.0 | 496.6 | 495.8 | 477.2 | 464.1 | 454.3 | 446.8 | 441.4 | 437.9 |
| Rams | 000 head | 66.9 | 74.6 | 81.4 | 87.1 | 83.0 | 79.1 | 76.6 | 74.8 | 73.6 | 72.8 | 72.4 |
| Other Sheep>1 | 000 head | 98.3 | 121.0 | 135.6 | 148.8 | 141.0 | 131.4 | 124.0 | 118.4 | 114.3 | 111.4 | 109.8 |
| Lambs | 000 head | 2,300.8 | 2,303.1 | 2,433.3 | 2,513.2 | 2,408.2 | 2,365.4 | 2,369.2 | 2,383.2 | 2,397.5 | 2,411.8 | 2,425.5 |

Source: FAPRI-Ireland (2010)

## Table A8: Food Harvest Activity Levels for Irish Agriculture - Pasture Period

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cattle | 000 head | 6,531.9 | 6,323.1 | 6,231.5 | 6,158.7 | 6,107.2 | 6,071.6 | 6,116.8 | 6,228.3 | 6,324.5 | 6,377.2 | 6,383.2 |
| Dairy Cows | 000 head | 1,117.9 | 1,128.7 | 1,119.1 | 1,118.3 | 1,120.4 | 1,121.7 | 1,216.1 | 1,285.9 | 1,340.1 | 1,380.3 | 1,408.9 |
| All Other Cattle (excl. Dairy Cows) | 000 head | 5,414.0 | 5,194.4 | 5,112.5 | 5,040.5 | 4,986.8 | 4,949.9 | 4,900.7 | 4,942.5 | 4,984.4 | 4,996.9 | 4,974.2 |
| Other Cows | 000 head | 1,130.3 | 1,109.1 | 1,088.4 | 1,081.0 | 1,071.5 | 1,065.7 | 1,074.8 | 1,065.4 | 1,043.6 | 1,013.2 | 977.7 |
| Dairy Heifers | 000 head | 215.3 | 208.9 | 219.9 | 220.2 | 229.1 | 244.5 | 256.1 | 264.9 | 271.3 | 275.7 | 280.2 |
| Other Heifers | 000 head | 127.2 | 114.8 | 109.7 | 107.1 | 103.9 | 101.7 | 100.2 | 100.0 | 99.1 | 97.1 | 94.3 |
| Cattle < 1 yrs | 000 head | 1,527.2 | 1,456.4 | 1,430.0 | 1,405.4 | 1,385.8 | 1,368.4 | 1,341.5 | 1,358.4 | 1,381.5 | 1,397.6 | 1,402.3 |
| Cattle < 1 yrs - male | 000 head | 750.6 | 715.8 | 702.8 | 690.7 | 681.1 | 672.5 | 659.3 | 667.6 | 679.0 | 686.9 | 689.2 |
| Cattle < 1 yrs - female | 000 head | 776.6 | 740.6 | 727.2 | 714.7 | 704.7 | 695.9 | 682.2 | 690.8 | 702.5 | 710.7 | 713.1 |
| Cattle 1 - 2 yrs | 000 head | 1,454.7 | 1,387.3 | 1,362.1 | 1,338.7 | 1,320.1 | 1,303.5 | 1,277.9 | 1,294.0 | 1,316.0 | 1,331.3 | 1,335.8 |
| Cattle 1 - 2 yrs - male | 000 head | 857.3 | 817.6 | 802.7 | 788.9 | 778.0 | 768.2 | 753.1 | 762.6 | 775.5 | 784.6 | 787.2 |
| Cattle 1 - 2 yrs - female | 000 head | 597.4 | 569.7 | 559.4 | 549.8 | 542.1 | 535.3 | 524.8 | 531.4 | 540.4 | 546.7 | 548.6 |
| Cattle > 2 yrs | 000 head | 890.5 | 849.3 | 833.9 | 819.5 | 808.1 | 798.0 | 782.3 | 792.1 | 805.6 | 815.0 | 817.7 |
| Cattle > 2 yrs - male | 000 head | 598.9 | 571.1 | 560.8 | 551.1 | 543.5 | 536.6 | 526.1 | 532.7 | 541.8 | 548.1 | 549.9 |
| Cattle > 2 yrs - female | 000 head | 291.6 | 278.1 | 273.1 | 268.4 | 264.6 | 261.3 | 256.2 | 259.4 | 263.8 | 266.9 | 267.8 |
| Bulls | 000 head | 68.7 | 68.7 | 68.6 | 68.5 | 68.3 | 68.1 | 67.9 | 67.7 | 67.3 | 66.9 | 66.3 |
| Total Sheep | 000 head | 4,694.6 | 4,986.0 | 5,364.4 | 5,651.5 | 5,399.0 | 5,211.9 | 5,122.2 | 5,070.4 | 5,037.4 | 5,021.7 | 5,020.2 |
| Lowland Ewes | 000 head | 1,782.9 | 2,029.2 | 2,235.2 | 2,405.8 | 2,271.0 | 2,158.8 | 2,088.2 | 2,039.6 | 2,005.3 | 1,984.3 | 1,974.6 |
| Upland Ewes | 000 head | 445.7 | 458.1 | 479.0 | 496.6 | 495.8 | 477.2 | 464.1 | 454.3 | 446.8 | 441.4 | 437.9 |
| Rams | 000 head | 66.9 | 74.6 | 81.4 | 87.1 | 83.0 | 79.1 | 76.6 | 74.8 | 73.6 | 72.8 | 72.4 |
| Other Sheep>1 | 000 head | 98.3 | 121.0 | 135.6 | 148.8 | 141.0 | 131.4 | 124.0 | 118.4 | 114.3 | 111.4 | 109.8 |
| Lambs | 000 head | 2,300.8 | 2,303.1 | 2,433.3 | 2,513.2 | 2,408.2 | 2,365.4 | 2,369.2 | 2,383.2 | 2,397.5 | 2,411.8 | 2,425.5 |

Source: FAPRI-Ireland (2010)

## Table A9: Food Harvest Activity Levels for Irish Agriculture (PART I)

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pigs | 000 head | 1,504.8 | 1,543.5 | 1,602.3 | 1,674.2 | 1,747.9 | 1,824.1 | 1,903.9 | 1,986.9 | 2,072.6 | 2,160.8 | 2,251.2 |
| Gilts in Pig | 000 head | 21.9 | 22.2 | 22.5 | 22.6 | 22.6 | 22.7 | 22.7 | 22.7 | 22.6 | 22.6 | 22.6 |
| Gilts not yet Served | 000 head | 18.8 | 19.1 | 19.3 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 |
| Sows in Pig | 000 head | 97.3 | 98.9 | 100.0 | 100.6 | 100.8 | 100.9 | 100.9 | 100.9 | 100.8 | 100.8 | 100.7 |
| Other Sows for Breeding | 000 head | 30.8 | 31.3 | 31.6 | 31.8 | 31.9 | 31.9 | 31.9 | 31.9 | 31.9 | 31.9 | 31.8 |
| Boars | 000 head | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Pigs 20 Kg + | 000 head | 1,010.6 | 936.1 | 962.6 | 1,005.0 | 1,057.6 | 1,111.8 | 1,167.9 | 1,226.8 | 1,288.1 | 1,351.5 | 1,416.7 |
| Pigs Under 20 Kg | 000 head | 420.8 | 395.2 | 405.4 | 420.8 | 439.7 | 459.1 | 479.1 | 500.0 | 521.8 | 544.3 | 567.5 |
| Poultry | 000 head | 13,814.7 | 13,710.5 | 13,882.4 | 14,175.2 | 14,582.3 | 15,081.4 | 15,614.8 | 16,174.1 | 16,761.6 | 17,386.5 | 18,022.0 |
| Layer | 000 head | 1,761.9 | 1,748.6 | 1,770.5 | 1,807.9 | 1,859.8 | 1,923.4 | 1,991.5 | 2,062.8 | 2,137.7 | 2,217.4 | 2,298.5 |
| Broiler | 000 head | 11,381.5 | 11,295.7 | 11,437.3 | 11,678.5 | 12,013.9 | 12,425.1 | 12,864.6 | 13,325.3 | 13,809.4 | 14,324.2 | 14,847.8 |
| Turkey | 000 head | 671.3 | 666.2 | 674.6 | 688.8 | 708.6 | 732.8 | 758.8 | 785.9 | 814.5 | 844.9 | 875.7 |
| Horses | 000 head | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 |
| Mules | 000 head | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 |
| Goats | 000 head | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 |
| Fertiliser | kg of N | 363,072.9 | 316,290.6 | 310,767.6 | 304,506.2 | 297,032.6 | 297,508.8 | 303,919.7 | 310,707.4 | 315,378.6 | 317,588.2 | 317,348.1 |

Source: FAPRI-Ireland (2010)

## Table A10: Food Harvest Activity Levels for Irish Agriculture (PART II)

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pulses Production | tonnes | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 |
| Potatoes Production | tonnes | 400,572 | 404,053 | 400,685 | 393,991 | 383,579 | 371,080 | 357,017 | 342,135 | 327,004 | 311,977 | 297,184 |
| Sugar Beet Production | tonnes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Barley Production | tonnes | 1,183,886 | 1,099,852 | 1,101,806 | 1,089,301 | 1,075,650 | 1,063,626 | 1,049,396 | 1,036,552 | 1,023,156 | 1,009,757 | 996,002 |
| Oats Production | tonnes | 143,015 | 136,725 | 131,254 | 128,112 | 125,832 | 124,376 | 122,963 | 121,783 | 120,696 | 119,675 | 118,644 |
| Wheat Production | tonnes | 595,672 | 605,174 | 635,974 | 654,234 | 668,332 | 680,438 | 688,507 | 694,919 | 698,724 | 700,536 | 700,354 |
| Pasture | hectares | 2,131,235 | 2,132,159 | 2,132,191 | 2,130,342 | 2,128,716 | 2,130,473 | 2,133,643 | 2,136,196 | 2,137,992 | 2,139,661 | 2,141,639 |
| Hay | hectares | 224,754 | 223,755 | 223,342 | 223,370 | 223,463 | 223,051 | 222,577 | 222,305 | 222,232 | 222,219 | 222,185 |
| Silage | hectares | 1,023,880 | 1,019,327 | 1,017,448 | 1,017,574 | 1,018,000 | 1,016,120 | 1,013,962 | 1,012,725 | 1,012,390 | 1,012,332 | 1,012,176 |
| Rough Grazing | hectares | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 |
| Wheat Area Harvested | 000 ha | 68.1 | 70.3 | 72.7 | 74.6 | 75.9 | 76.9 | 77.4 | 77.6 | 77.5 | 77.2 | 76.7 |
| Spring Wheat Area Harvested | 000 ha | 15.7 | 16.1 | 16.7 | 17.1 | 17.4 | 17.7 | 17.8 | 17.8 | 17.8 | 17.7 | 17.6 |
| Winter Wheat Area Harvested | 000 ha | 52.5 | 54.1 | 56.0 | 57.4 | 58.5 | 59.3 | 59.6 | 59.8 | 59.7 | 59.5 | 59.1 |
| Barley Area | 000 ha | 169.1 | 169.8 | 167.8 | 165.8 | 163.6 | 161.3 | 158.7 | 156.0 | 153.3 | 150.6 | 147.9 |
| Spring Barley Area Harvested | 000 ha | 150.7 | 151.3 | 149.6 | 147.8 | 145.8 | 143.8 | 141.5 | 139.1 | 136.6 | 134.2 | 131.8 |
| Winter Barley Area Harvested | 000 ha | 18.4 | 18.4 | 18.2 | 18.0 | 17.8 | 17.5 | 17.2 | 17.0 | 16.7 | 16.4 | 16.1 |
| Oats Area Harvested | 000 ha | 18.8 | 17.7 | 16.9 | 16.3 | 15.9 | 15.5 | 15.2 | 15.0 | 14.7 | 14.5 | 14.3 |
| Spring Oats Area Harvested | 000 ha | 3.8 | 3.6 | 3.4 | 3.3 | 3.2 | 3.1 | 3.1 | 3.0 | 3.0 | 2.9 | 2.9 |
| Winter Oats Area Harvested | 000 ha | 15.0 | 14.1 | 13.5 | 13.0 | 12.7 | 12.4 | 12.2 | 12.0 | 11.8 | 11.6 | 11.4 |
| Potatoes Area Harvested | 000 ha | 12.7 | 12.8 | 12.5 | 12.2 | 11.8 | 11.4 | 10.9 | 10.4 | 9.9 | 9.4 | 8.9 |
| Sugar Beet Area Harvested | 000 ha | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Fodder Beet Area Harvested | 000 ha | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Turnips Area Harvested | 000 ha | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Silage Area Harvested | 000 ha | 1,023.9 | 1,019.3 | 1,017.4 | 1,017.6 | 1,018.0 | 1,016.1 | 1,014.0 | 1,012.7 | 1,012.4 | 1,012.3 | 1,012.2 |
| Hay Area Harvested | 000 ha | 224.8 | 223.8 | 223.3 | 223.4 | 223.5 | 223.1 | 222.6 | 222.3 | 222.2 | 222.2 | 222.2 |
| Maize Area Harvested | 000 ha | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 |

Source: FAPRI-Ireland (2010)

## Table A11: Food Harvest 10% GHG Reduction Scenario Projections of GHG emissions from Irish Agriculture

| | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|---|
| | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* |
| Total CH4 from Fermentation(CH4 Gg/Yr) | 452.07 | 458.71 | 452.52 | 437.48 | 411.85 | 382.01 | 401.43 |
| Total CH4 from Manure (CH4 Gg/Yr) | 110.69 | 111.84 | 109.90 | 107.07 | 102.43 | 98.18 | 108.50 |
| **Total CH4 from Livestock** | 562.76 | 570.55 | 562.42 | 544.55 | 514.28 | 480.19 | 509.93 |
| **CO2 equivalent of CH4** | 11,818.00 | 11,981.45 | 11,810.80 | 11,435.60 | 10,799.90 | 10,084.05 | 10,708.60 |
| Total N2O emitted from Slurry System(Gg N2O/yr) | 0.18 | 0.19 | 0.19 | 0.18 | 0.17 | 0.16 | 0.18 |
| Total N2O from Solid System(Gg N2O/yr) | 1.10 | 1.18 | 1.20 | 1.11 | 1.01 | 0.94 | 0.94 |
| Total N2O from Pasture System(Gg N2O/yr) | 9.04 | 9.32 | 9.33 | 9.10 | 8.30 | 7.64 | 7.71 |
| Direct N2O emissions from fertiliser (N2O Gg/yr) | 7.34 | 8.30 | 7.84 | 6.81 | 7.01 | 5.37 | 5.51 |
| Direct N2O from soils - FAW (Gg N2O/yr) | 1.49 | 1.56 | 1.61 | 1.53 | 1.45 | 1.36 | 1.46 |
| Direct N2O from N-Fixing Crops N2O (Gg N2O/yr)) | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Direct N2O-Crop Residue (Gg N2O/yr) | 0.39 | 0.38 | 0.43 | 0.35 | 0.20 | 0.19 | 0.18 |
| Indirect Emissions of N2O due to volatilisation of NH3 from manure and fertiliser inputs (N2O Gg/Yr) | 1.42 | 1.48 | 1.55 | 1.39 | 1.31 | 1.19 | 1.23 |
| Nitrous Oxide Emissions from Leaching (Gg of N2O/yr) | 2.92 | 3.16 | 3.09 | 2.83 | 2.76 | 2.33 | 2.41 |
| **Total Nitrous Oxide** | 23.89 | 25.59 | 25.22 | 23.31 | 22.23 | 19.20 | 19.64 |
| **CO2 equivalent of N2O** | 7,404.66 | 7,931.89 | 7,819.38 | 7,227.54 | 6,891.96 | 5,953.27 | 6,087.76 |
| Total Agriculture CO2 equivalent emissions | 19,222.66 | 19,913.34 | 19,630.18 | 18,663.14 | 17,691.86 | 16,037.32 | 16,796.36 |
| Fuel Combustion | 689.16 | 950.92 | 858.14 | 899.52 | 850.00 | 850.00 | 850.00 |
| **Total CO2e Gg** | 19,911.82 | 20,864.26 | 20,488.32 | 19,562.66 | 18,541.86 | 16,887.32 | 17,646.36 |

Source: FAPRI-Ireland (2010)

## Table A12: Food Harvest 10% GHG Reduction Scenario Activity Levels for Irish Agriculture - Housing Period

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cattle | 000 head | 5,848.1 | 5,661.1 | 5,511.2 | 5,372.8 | 5,257.1 | 5,163.0 | 5,149.5 | 5,203.9 | 5,247.2 | 5,253.6 | 5,224.2 |
| Dairy Cows | 000 head | 1,107.0 | 1,117.1 | 1,108.1 | 1,107.3 | 1,109.3 | 1,110.5 | 1,199.3 | 1,265.0 | 1,316.0 | 1,353.9 | 1,380.8 |
| All Other Cattle (excl. Dairy Cows) | 000 head | 4,741.1 | 4,544.0 | 4,403.1 | 4,265.4 | 4,147.7 | 4,052.4 | 3,950.2 | 3,938.9 | 3,931.2 | 3,899.7 | 3,843.4 |
| Other Cows | 000 head | 1,069.5 | 1,049.4 | 994.7 | 956.6 | 919.4 | 889.6 | 876.7 | 850.7 | 816.7 | 777.7 | 736.5 |
| Dairy Heifers | 000 head | 222.5 | 215.9 | 227.2 | 227.5 | 236.8 | 252.6 | 264.6 | 273.7 | 280.3 | 284.9 | 289.5 |
| Other Heifers | 000 head | 118.5 | 106.9 | 102.2 | 97.5 | 91.4 | 86.2 | 81.9 | 79.1 | 76.0 | 72.4 | 68.4 |
| Cattle < 1 yrs | 000 head | 1,584.1 | 1,507.3 | 1,462.4 | 1,416.5 | 1,376.1 | 1,339.6 | 1,292.9 | 1,297.4 | 1,308.7 | 1,312.3 | 1,305.1 |
| Cattle < 1 yrs - male | 000 head | 828.5 | 788.3 | 764.8 | 740.8 | 719.7 | 700.6 | 676.2 | 678.5 | 684.5 | 686.4 | 682.6 |
| Cattle < 1 yrs - female | 000 head | 755.6 | 719.0 | 697.5 | 675.7 | 656.4 | 639.0 | 616.7 | 618.8 | 624.2 | 626.0 | 622.5 |
| Cattle 1 - 2 yrs | 000 head | 1,180.3 | 1,123.1 | 1,089.6 | 1,055.4 | 1,025.4 | 998.2 | 963.3 | 966.7 | 975.1 | 977.8 | 972.5 |
| Cattle 1 - 2 yrs - male | 000 head | 712.8 | 678.3 | 658.1 | 637.4 | 619.3 | 602.8 | 581.8 | 583.8 | 588.9 | 590.6 | 587.3 |
| Cattle 1 - 2 yrs - female | 000 head | 467.5 | 444.8 | 431.6 | 418.0 | 406.1 | 395.3 | 381.5 | 382.9 | 386.2 | 387.3 | 385.1 |
| Cattle > 2 yrs | 000 head | 508.4 | 483.8 | 469.4 | 454.6 | 441.7 | 430.0 | 415.0 | 416.4 | 420.1 | 421.2 | 418.9 |
| Cattle > 2 yrs - male | 000 head | 291.8 | 277.6 | 269.4 | 260.9 | 253.5 | 246.8 | 238.1 | 239.0 | 241.1 | 241.7 | 240.4 |
| Cattle > 2 yrs - female | 000 head | 216.7 | 206.2 | 200.0 | 193.7 | 188.2 | 183.2 | 176.8 | 177.4 | 179.0 | 179.5 | 178.5 |
| Bulls | 000 head | 57.9 | 57.8 | 57.6 | 57.6 | 57.2 | 57.0 | 56.3 | 55.8 | 55.0 | 54.3 | 53.4 |
| Total Sheep | 000 head | 4,694.6 | 4,986.0 | 5,364.4 | 5,651.5 | 5,399.0 | 5,211.9 | 5,122.2 | 5,070.4 | 5,037.4 | 5,021.7 | 5,020.2 |
| Ewes Lowland | 000 head | 1,782.9 | 2,029.2 | 2,235.2 | 2,405.8 | 2,271.0 | 2,158.8 | 2,088.2 | 2,039.6 | 2,005.3 | 1,984.3 | 1,974.6 |
| Ewes Upland | 000 head | 445.7 | 458.1 | 479.0 | 496.6 | 495.8 | 477.2 | 464.1 | 454.3 | 446.8 | 441.4 | 437.9 |
| Rams | 000 head | 66.9 | 74.6 | 81.4 | 87.1 | 83.0 | 79.1 | 76.6 | 74.8 | 73.6 | 72.8 | 72.4 |
| Other Sheep>1 | 000 head | 98.3 | 121.0 | 135.6 | 148.8 | 141.0 | 131.4 | 124.0 | 118.4 | 114.3 | 111.4 | 109.8 |
| Lambs | 000 head | 2,300.8 | 2,303.1 | 2,433.3 | 2,513.2 | 2,408.2 | 2,365.4 | 2,369.2 | 2,383.2 | 2,397.5 | 2,411.8 | 2,425.5 |

Source: FAPRI-Ireland (2010)

## Table A13: Food Harvest 10% GHG Reduction Scenario Activity Levels for Irish Agriculture - Pasture Period

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cattle | 000 head | 6,531.9 | 6,323.1 | 6,155.6 | 6,001.0 | 5,871.8 | 5,766.7 | 5,751.7 | 5,812.4 | 5,860.8 | 5,867.9 | 5,835.0 |
| Dairy Cows | 000 head | 1,117.9 | 1,128.7 | 1,119.1 | 1,118.3 | 1,120.4 | 1,121.7 | 1,216.1 | 1,285.9 | 1,340.1 | 1,380.3 | 1,408.9 |
| All Other Cattle (excl. Dairy Cows) | 000 head | 5,414.0 | 5,194.4 | 5,036.5 | 4,882.7 | 4,751.4 | 4,645.0 | 4,535.6 | 4,526.5 | 4,520.7 | 4,487.6 | 4,426.1 |
| Other Cows | 000 head | 1,130.3 | 1,109.1 | 1,051.2 | 1,011.0 | 971.7 | 940.2 | 926.6 | 899.1 | 863.1 | 821.9 | 778.4 |
| Dairy Heifers | 000 head | 215.3 | 208.9 | 219.9 | 220.2 | 229.1 | 244.5 | 256.1 | 264.9 | 271.3 | 275.7 | 280.2 |
| Other Heifers | 000 head | 127.2 | 114.8 | 109.7 | 104.6 | 98.1 | 92.5 | 87.9 | 84.8 | 81.6 | 77.7 | 73.4 |
| Cattle < 1 yrs | 000 head | 1,527.2 | 1,456.4 | 1,414.8 | 1,372.0 | 1,335.1 | 1,301.9 | 1,261.8 | 1,267.1 | 1,278.2 | 1,281.6 | 1,275.0 |
| Cattle < 1 yrs - male | 000 head | 750.6 | 715.8 | 695.3 | 674.3 | 656.2 | 639.9 | 620.1 | 622.7 | 628.2 | 629.9 | 626.6 |
| Cattle < 1 yrs - female | 000 head | 776.6 | 740.6 | 719.4 | 697.7 | 678.9 | 662.1 | 641.6 | 644.3 | 650.0 | 651.7 | 648.3 |
| Cattle 1 - 2 yrs | 000 head | 1,454.7 | 1,387.3 | 1,347.7 | 1,306.9 | 1,271.7 | 1,240.2 | 1,201.9 | 1,207.0 | 1,217.5 | 1,220.8 | 1,214.5 |
| Cattle 1 - 2 yrs - male | 000 head | 857.3 | 817.6 | 794.2 | 770.2 | 749.5 | 730.9 | 708.3 | 711.3 | 717.5 | 719.4 | 715.7 |
| Cattle 1 - 2 yrs - female | 000 head | 597.4 | 569.7 | 553.4 | 536.7 | 522.3 | 509.3 | 493.6 | 495.7 | 500.0 | 501.3 | 498.7 |
| Cattle > 2 yrs | 000 head | 890.5 | 849.3 | 825.0 | 800.0 | 778.5 | 759.2 | 735.8 | 738.9 | 745.3 | 747.3 | 743.5 |
| Cattle > 2 yrs - male | 000 head | 598.9 | 571.1 | 554.8 | 538.0 | 523.6 | 510.6 | 494.8 | 496.9 | 501.3 | 502.6 | 500.0 |
| Cattle > 2 yrs - female | 000 head | 291.6 | 278.1 | 270.2 | 262.0 | 255.0 | 248.6 | 241.0 | 242.0 | 244.1 | 244.7 | 243.5 |
| Bulls | 000 head | 68.7 | 68.7 | 68.3 | 67.9 | 67.1 | 66.5 | 65.6 | 64.8 | 63.7 | 62.6 | 61.2 |
| Total Sheep | 000 head | 4,694.6 | 4,986.0 | 5,364.4 | 5,651.5 | 5,399.0 | 5,211.9 | 5,122.2 | 5,070.4 | 5,037.4 | 5,021.7 | 5,020.2 |
| Lowland Ewes | 000 head | 1,782.9 | 2,029.2 | 2,235.2 | 2,405.8 | 2,271.0 | 2,158.8 | 2,088.2 | 2,039.6 | 2,005.3 | 1,984.3 | 1,974.6 |
| Upland Ewes | 000 head | 445.7 | 458.1 | 479.0 | 496.6 | 495.8 | 477.2 | 464.1 | 454.3 | 446.8 | 441.4 | 437.9 |
| Rams | 000 head | 66.9 | 74.6 | 81.4 | 87.1 | 83.0 | 79.1 | 76.6 | 74.8 | 73.6 | 72.8 | 72.4 |
| Other Sheep>1 | 000 head | 98.3 | 121.0 | 135.6 | 148.8 | 141.0 | 131.4 | 124.0 | 118.4 | 114.3 | 111.4 | 109.8 |
| Lambs | 000 head | 2,300.8 | 2,303.1 | 2,433.3 | 2,513.2 | 2,408.2 | 2,365.4 | 2,369.2 | 2,383.2 | 2,397.5 | 2,411.8 | 2,425.5 |

Source: FAPRI-Ireland (2010)

## Table A14: Food Harvest 10% GHG Reduction Scenario Activity Levels for Irish Agriculture (PART I)

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pigs | 000 head | 1,504.8 | 1,543.5 | 1,602.3 | 1,674.2 | 1,747.9 | 1,824.1 | 1,903.9 | 1,986.9 | 2,072.6 | 2,160.8 | 2,251.2 |
| Gilts in Pig | 000 head | 21.9 | 22.2 | 22.5 | 22.6 | 22.6 | 22.7 | 22.7 | 22.7 | 22.6 | 22.6 | 22.6 |
| Gilts not yet Served | 000 head | 18.8 | 19.1 | 19.3 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 |
| Sows in Pig | 000 head | 97.3 | 98.9 | 100.0 | 100.6 | 100.8 | 100.9 | 100.9 | 100.9 | 100.8 | 100.8 | 100.7 |
| Other Sows for Breeding | 000 head | 30.8 | 31.3 | 31.6 | 31.8 | 31.9 | 31.9 | 31.9 | 31.9 | 31.9 | 31.9 | 31.8 |
| Boars | 000 head | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Pigs 20 Kg + | 000 head | 1,010.6 | 936.1 | 962.6 | 1,005.0 | 1,057.5 | 1,111.8 | 1,167.9 | 1,226.8 | 1,288.1 | 1,351.5 | 1,416.7 |
| Pigs Under 20 Kg | 000 head | 420.8 | 395.2 | 405.4 | 420.8 | 439.7 | 459.0 | 479.1 | 500.0 | 521.8 | 544.3 | 567.5 |
| Poultry | 000 head | 13,814.7 | 13,710.7 | 13,882.7 | 14,175.8 | 14,583.2 | 15,082.5 | 15,616.2 | 16,175.7 | 16,763.5 | 17,388.8 | 18,024.6 |
| Layer | 000 head | 1,761.9 | 1,748.6 | 1,770.6 | 1,808.0 | 1,859.9 | 1,923.6 | 1,991.6 | 2,063.0 | 2,138.0 | 2,217.7 | 2,298.8 |
| Broiler | 000 head | 11,381.5 | 11,295.8 | 11,437.6 | 11,679.0 | 12,014.6 | 12,426.0 | 12,865.7 | 13,326.7 | 13,811.0 | 14,326.1 | 14,849.9 |
| Turkey | 000 head | 671.3 | 666.2 | 674.6 | 688.8 | 708.6 | 732.9 | 758.8 | 786.0 | 814.6 | 845.0 | 875.9 |
| Horses | 000 head | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 |
| Mules | 000 head | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 |
| Goats | 000 head | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 |
| Fertiliser | kg of N | 363,072.9 | 312,177.5 | 302,318.5 | 291,947.9 | 280,757.8 | 277,958.7 | 281,541.1 | 285,632.5 | 287,667.5 | 287,565.2 | 285,256.7 |

Source: FAPRI-Ireland (2010)

## Table A15: Food Harvest 10% GHG Reduction Scenario Activity Levels for Irish Agriculture (PART II)

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pulses Production | tonnes | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 |
| Potatoes Production | tonnes | 400,572 | 404,039 | 400,655 | 393,947 | 383,523 | 371,013 | 356,944 | 342,057 | 326,922 | 311,894 | 297,100 |
| Sugar Beet Production | tonnes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Barley Production | tonnes | 1,183,886 | 1,099,812 | 1,102,916 | 1,091,753 | 1,079,564 | 1,069,096 | 1,056,348 | 1,044,918 | 1,032,863 | 1,020,746 | 1,008,216 |
| Oats Production | tonnes | 143,015 | 136,720 | 131,386 | 128,401 | 126,290 | 125,015 | 123,778 | 122,766 | 121,841 | 120,978 | 120,099 |
| Wheat Production | tonnes | 595,672 | 605,152 | 636,614 | 655,706 | 670,764 | 683,938 | 693,067 | 700,528 | 705,353 | 708,160 | 708,942 |
| Pasture | hectares | 2,131,235 | 2,132,082 | 2,131,755 | 2,130,091 | 2,128,851 | 2,131,014 | 2,134,563 | 2,137,435 | 2,139,477 | 2,141,361 | 2,143,540 |
| Hay | hectares | 224,754 | 223,747 | 223,326 | 223,239 | 223,177 | 222,602 | 221,977 | 221,571 | 221,382 | 221,265 | 221,133 |
| Silage | hectares | 1,023,880 | 1,019,290 | 1,017,372 | 1,016,976 | 1,016,693 | 1,014,076 | 1,011,229 | 1,009,380 | 1,008,520 | 1,007,986 | 1,007,385 |
| Rough Grazing | hectares | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 |
| Wheat Area Harvested | 000 ha | 68.1 | 70.3 | 72.8 | 74.7 | 76.2 | 77.3 | 78.0 | 78.2 | 78.3 | 78.1 | 77.7 |
| Spring Wheat Area Harvested | 000 ha | 15.7 | 16.1 | 16.7 | 17.2 | 17.5 | 17.8 | 17.9 | 18.0 | 18.0 | 17.9 | 17.8 |
| Winter Wheat Area Harvested | 000 ha | 52.5 | 54.1 | 56.1 | 57.6 | 58.7 | 59.6 | 60.0 | 60.3 | 60.3 | 60.1 | 59.8 |
| Barley Area | 000 ha | 169.1 | 169.7 | 168.0 | 166.2 | 164.2 | 162.2 | 159.8 | 157.3 | 154.7 | 152.2 | 149.7 |
| Spring Barley Area Harvested | 000 ha | 150.7 | 151.3 | 149.7 | 148.1 | 146.3 | 144.6 | 142.4 | 140.2 | 137.9 | 135.7 | 133.4 |
| Winter Barley Area Harvested | 000 ha | 18.4 | 18.4 | 18.3 | 18.1 | 17.8 | 17.6 | 17.4 | 17.1 | 16.8 | 16.5 | 16.3 |
| Oats Area Harvested | 000 ha | 18.8 | 17.7 | 16.9 | 16.3 | 15.9 | 15.6 | 15.3 | 15.1 | 14.9 | 14.6 | 14.4 |
| Spring Oats Area Harvested | 000 ha | 3.8 | 3.6 | 3.4 | 3.3 | 3.2 | 3.2 | 3.1 | 3.0 | 3.0 | 3.0 | 2.9 |
| Winter Oats Area Harvested | 000 ha | 15.0 | 14.1 | 13.5 | 13.0 | 12.7 | 12.5 | 12.2 | 12.1 | 11.9 | 11.7 | 11.5 |
| Potatoes Area Harvested | 000 ha | 12.7 | 12.8 | 12.5 | 12.2 | 11.8 | 11.4 | 10.9 | 10.4 | 9.9 | 9.4 | 8.9 |
| Sugar Beet Area Harvested | 000 ha | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Fodder Beet Area Harvested | 000 ha | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Turnips Area Harvested | 000 ha | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Silage Area Harvested | 000 ha | 1,023.9 | 1,019.3 | 1,017.4 | 1,017.0 | 1,016.7 | 1,014.1 | 1,011.2 | 1,009.4 | 1,008.5 | 1,008.0 | 1,007.4 |
| Hay Area Harvested | 000 ha | 224.8 | 223.7 | 223.3 | 223.2 | 223.2 | 222.6 | 222.0 | 221.6 | 221.4 | 221.3 | 221.1 |
| Maize Area Harvested | 000 ha | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 |

Source: FAPRI-Ireland (2010)

## Table A16: Food Harvest 20% GHG Reduction Scenario Projections of GHG emissions from Irish Agriculture

| | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|---|
| | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* |
| Total CH4 from Fermentation(CH4 Gg/Yr) | 452.07 | 458.71 | 452.52 | 437.48 | 411.85 | 357.01 | 359.04 |
| Total CH4 from Manure (CH4 Gg/Yr) | 110.69 | 111.84 | 109.90 | 107.07 | 102.43 | 93.21 | 99.96 |
| **Total CH4 from Livestock** | 562.76 | 570.55 | 562.42 | 544.55 | 514.28 | 450.22 | 459.01 |
| **CO2 equivalent of CH4** | 11,818.00 | 11,981.45 | 11,810.80 | 11,435.60 | 10,799.90 | 9,454.71 | 9,639.11 |
| Total N2O emitted from Slurry System(Gg N2O/yr) | 0.18 | 0.19 | 0.19 | 0.18 | 0.17 | 0.15 | 0.16 |
| Total N2O from Solid System(Gg N2O/yr) | 1.10 | 1.18 | 1.20 | 1.11 | 1.01 | 0.88 | 0.83 |
| Total N2O from Pasture System(Gg N2O/yr) | 9.04 | 9.32 | 9.33 | 9.10 | 8.30 | 7.11 | 6.79 |
| Direct N2O emissions from fertiliser (N2O Gg/yr) | 7.34 | 8.30 | 7.84 | 6.81 | 7.01 | 4.80 | 4.60 |
| Direct N2O from soils - FAW (Gg N2O/yr) | 1.49 | 1.56 | 1.61 | 1.53 | 1.45 | 1.29 | 1.34 |
| Direct N2O from N-Fixing Crops N2O (Gg N2O/yr)) | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Direct N2O-Crop Residue (Gg N2O/yr) | 0.39 | 0.38 | 0.43 | 0.35 | 0.20 | 0.19 | 0.18 |
| Indirect Emissions of N2O due to volatilisation of NH3 from manure and fertiliser inputs (N2O Gg/Yr) | 1.42 | 1.48 | 1.55 | 1.39 | 1.31 | 1.12 | 1.10 |
| Nitrous Oxide Emissions from Leaching (Gg of N2O/yr) | 2.92 | 3.16 | 3.09 | 2.83 | 2.76 | 2.14 | 2.10 |
| **Total Nitrous Oxide** | 23.89 | 25.59 | 25.22 | 23.31 | 22.23 | 17.69 | 17.10 |
| **CO2 equivalent of N2O** | 7,404.66 | 7,931.89 | 7,819.38 | 7,227.54 | 6,891.96 | 5,484.40 | 5,301.65 |
| Total Agriculture CO2 equivalent emissions | 19,222.66 | 19,913.34 | 19,630.18 | 18,663.14 | 17,691.86 | 14,939.11 | 14,940.76 |
| Fuel Combustion | 689.16 | 950.92 | 858.14 | 899.52 | 850.00 | 850.00 | 850.00 |
| **Total CO2e Gg** | 19,911.82 | 20,864.26 | 20,488.32 | 19,562.66 | 18,541.86 | 15,789.11 | 15,790.76 |

Source: FAPRI-Ireland (2010)

## Table A17: Food Harvest 20% GHG Reduction Scenario Activity Levels for Irish Agriculture - Housing Period

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cattle | 000 head | 5,848.1 | 5,661.1 | 5,406.2 | 5,154.7 | 4,932.7 | 4,746.9 | 4,657.5 | 4,619.9 | 4,586.5 | 4,540.6 | 4,477.8 |
| Dairy Cows | 000 head | 1,107.0 | 1,117.1 | 1,108.1 | 1,107.3 | 1,109.3 | 1,110.5 | 1,199.3 | 1,265.0 | 1,316.0 | 1,353.9 | 1,380.8 |
| All Other Cattle (excl. Dairy Cows) | 000 head | 4,741.1 | 4,544.0 | 4,298.1 | 4,047.4 | 3,823.4 | 3,636.4 | 3,458.2 | 3,354.9 | 3,270.5 | 3,186.8 | 3,097.0 |
| Other Cows | 000 head | 1,069.5 | 1,049.4 | 940.4 | 854.3 | 775.4 | 712.1 | 671.6 | 626.2 | 579.3 | 533.1 | 489.2 |
| Dairy Heifers | 000 head | 222.5 | 215.9 | 227.2 | 227.5 | 236.8 | 252.6 | 264.6 | 273.7 | 280.3 | 284.9 | 289.5 |
| Other Heifers | 000 head | 118.5 | 106.9 | 102.2 | 93.9 | 83.1 | 73.1 | 64.6 | 58.2 | 52.4 | 46.9 | 41.6 |
| Cattle < 1 yrs | 000 head | 1,584.1 | 1,507.3 | 1,437.8 | 1,362.4 | 1,293.3 | 1,231.2 | 1,163.4 | 1,134.8 | 1,116.9 | 1,100.2 | 1,079.0 |
| Cattle < 1 yrs - male | 000 head | 828.5 | 788.3 | 752.0 | 712.5 | 676.4 | 643.9 | 608.5 | 593.5 | 584.2 | 575.4 | 564.3 |
| Cattle < 1 yrs - female | 000 head | 755.6 | 719.0 | 685.8 | 649.8 | 616.9 | 587.3 | 554.9 | 541.3 | 532.8 | 524.8 | 514.7 |
| Cattle 1 - 2 yrs | 000 head | 1,180.3 | 1,123.1 | 1,071.3 | 1,015.1 | 963.6 | 917.4 | 866.8 | 845.6 | 832.2 | 819.7 | 804.0 |
| Cattle 1 - 2 yrs - male | 000 head | 712.8 | 678.3 | 647.0 | 613.1 | 582.0 | 554.0 | 523.5 | 510.7 | 502.6 | 495.1 | 485.6 |
| Cattle 1 - 2 yrs - female | 000 head | 467.5 | 444.8 | 424.3 | 402.0 | 381.7 | 363.3 | 343.3 | 334.9 | 329.6 | 324.7 | 318.4 |
| Cattle > 2 yrs | 000 head | 508.4 | 483.8 | 461.5 | 437.3 | 415.1 | 395.2 | 373.4 | 364.3 | 358.5 | 353.1 | 346.3 |
| Cattle > 2 yrs - male | 000 head | 291.8 | 277.6 | 264.8 | 250.9 | 238.2 | 226.8 | 214.3 | 209.0 | 205.7 | 202.6 | 198.8 |
| Cattle > 2 yrs - female | 000 head | 216.7 | 206.2 | 196.7 | 186.3 | 176.9 | 168.4 | 159.1 | 155.2 | 152.8 | 150.5 | 147.6 |
| Bulls | 000 head | 57.9 | 57.8 | 57.6 | 57.6 | 56.8 | 56.2 | 54.8 | 53.7 | 52.1 | 50.7 | 48.9 |
| Total Sheep | 000 head | 4,694.6 | 4,986.0 | 5,364.4 | 5,651.5 | 5,399.0 | 5,211.9 | 5,122.2 | 5,070.4 | 5,037.4 | 5,021.7 | 5,020.2 |
| Ewes Lowland | 000 head | 1,782.9 | 2,029.2 | 2,235.2 | 2,405.8 | 2,271.0 | 2,158.8 | 2,088.2 | 2,039.6 | 2,005.3 | 1,984.3 | 1,974.6 |
| Ewes Upland | 000 head | 445.7 | 458.1 | 479.0 | 496.6 | 495.8 | 477.2 | 464.1 | 454.3 | 446.8 | 441.4 | 437.9 |
| Rams | 000 head | 66.9 | 74.6 | 81.4 | 87.1 | 83.0 | 79.1 | 76.6 | 74.8 | 73.6 | 72.8 | 72.4 |
| Other Sheep>1 | 000 head | 98.3 | 121.0 | 135.6 | 148.8 | 141.0 | 131.4 | 124.0 | 118.4 | 114.3 | 111.4 | 109.8 |
| Lambs | 000 head | 2,300.8 | 2,303.1 | 2,433.3 | 2,513.2 | 2,408.2 | 2,365.4 | 2,369.2 | 2,383.2 | 2,397.5 | 2,411.8 | 2,425.5 |

Source: FAPRI-Ireland (2010)

## Table A18: Food Harvest 20% GHG Reduction Scenario Activity Levels for Irish Agriculture - Pasture Period

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cattle | 000 head | 6,531.9 | 6,323.1 | 6,038.3 | 5,757.4 | 5,509.5 | 5,301.9 | 5,202.1 | 5,160.1 | 5,122.8 | 5,071.6 | 5,001.4 |
| Dairy Cows | 000 head | 1,117.9 | 1,128.7 | 1,119.1 | 1,118.3 | 1,120.4 | 1,121.7 | 1,216.1 | 1,285.9 | 1,340.1 | 1,380.3 | 1,408.9 |
| All Other Cattle (excl. Dairy Cows) | 000 head | 5,414.0 | 5,194.4 | 4,919.2 | 4,639.1 | 4,389.1 | 4,180.3 | 3,986.1 | 3,874.2 | 3,782.7 | 3,691.3 | 3,592.5 |
| Other Cows | 000 head | 1,130.3 | 1,109.1 | 993.9 | 902.9 | 819.5 | 752.6 | 709.8 | 661.8 | 612.3 | 563.4 | 517.0 |
| Dairy Heifers | 000 head | 215.3 | 208.9 | 219.9 | 220.2 | 229.1 | 244.5 | 256.1 | 264.9 | 271.3 | 275.7 | 280.2 |
| Other Heifers | 000 head | 127.2 | 114.8 | 109.7 | 100.8 | 89.1 | 78.5 | 69.4 | 62.5 | 56.3 | 50.3 | 44.7 |
| Cattle < 1 yrs | 000 head | 1,527.2 | 1,456.4 | 1,391.3 | 1,320.4 | 1,256.5 | 1,199.2 | 1,139.2 | 1,113.9 | 1,098.1 | 1,082.7 | 1,063.5 |
| Cattle < 1 yrs - male | 000 head | 750.6 | 715.8 | 683.8 | 649.0 | 617.5 | 589.4 | 559.9 | 547.5 | 539.7 | 532.1 | 522.7 |
| Cattle < 1 yrs - female | 000 head | 776.6 | 740.6 | 707.5 | 671.5 | 638.9 | 609.8 | 579.3 | 566.5 | 558.4 | 550.6 | 540.8 |
| Cattle 1 - 2 yrs | 000 head | 1,454.7 | 1,387.3 | 1,325.3 | 1,257.8 | 1,196.8 | 1,142.3 | 1,085.2 | 1,061.1 | 1,046.0 | 1,031.3 | 1,013.0 |
| Cattle 1 - 2 yrs - male | 000 head | 857.3 | 817.6 | 781.1 | 741.3 | 705.3 | 673.2 | 639.5 | 625.3 | 616.5 | 607.8 | 597.0 |
| Cattle 1 - 2 yrs - female | 000 head | 597.4 | 569.7 | 544.3 | 516.5 | 491.5 | 469.1 | 445.6 | 435.8 | 429.6 | 423.5 | 416.0 |
| Cattle > 2 yrs | 000 head | 890.5 | 849.3 | 811.3 | 770.0 | 732.7 | 699.3 | 664.3 | 649.6 | 640.4 | 631.4 | 620.1 |
| Cattle > 2 yrs - male | 000 head | 598.9 | 571.1 | 545.6 | 517.8 | 492.7 | 470.3 | 446.8 | 436.8 | 430.7 | 424.6 | 417.1 |
| Cattle > 2 yrs - female | 000 head | 291.6 | 278.1 | 265.7 | 252.2 | 239.9 | 229.0 | 217.5 | 212.7 | 209.7 | 206.8 | 203.1 |
| Bulls | 000 head | 68.7 | 68.7 | 67.8 | 67.0 | 65.4 | 64.1 | 62.2 | 60.5 | 58.3 | 56.5 | 54.1 |
| Total Sheep | 000 head | 4,694.6 | 4,986.0 | 5,364.4 | 5,651.5 | 5,399.0 | 5,211.9 | 5,122.2 | 5,070.4 | 5,037.4 | 5,021.7 | 5,020.2 |
| Lowland Ewes | 000 head | 1,782.9 | 2,029.2 | 2,235.2 | 2,405.8 | 2,271.0 | 2,158.8 | 2,088.2 | 2,039.6 | 2,005.3 | 1,984.3 | 1,974.6 |
| Upland Ewes | 000 head | 445.7 | 458.1 | 479.0 | 496.6 | 495.8 | 477.2 | 464.1 | 454.3 | 446.8 | 441.4 | 437.9 |
| Rams | 000 head | 66.9 | 74.6 | 81.4 | 87.1 | 83.0 | 79.1 | 76.6 | 74.8 | 73.6 | 72.8 | 72.4 |
| Other Sheep>1 | 000 head | 98.3 | 121.0 | 135.6 | 148.8 | 141.0 | 131.4 | 124.0 | 118.4 | 114.3 | 111.4 | 109.8 |
| Lambs | 000 head | 2,300.8 | 2,303.1 | 2,433.3 | 2,513.2 | 2,408.2 | 2,365.4 | 2,369.2 | 2,383.2 | 2,397.5 | 2,411.8 | 2,425.5 |

Source: FAPRI-Ireland (2010)

## Table A19: Food Harvest 20% GHG Reduction Scenario Activity Levels for Irish Agriculture (PART I)

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pigs | 000 head | 1,504.8 | 1,543.5 | 1,602.3 | 1,674.2 | 1,747.9 | 1,824.1 | 1,903.9 | 1,986.8 | 2,072.5 | 2,160.7 | 2,251.2 |
| Gilts in Pig | 000 head | 21.9 | 22.2 | 22.5 | 22.6 | 22.6 | 22.7 | 22.7 | 22.7 | 22.6 | 22.6 | 22.6 |
| Gilts not yet Served | 000 head | 18.8 | 19.1 | 19.3 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 |
| Sows in Pig | 000 head | 97.3 | 98.9 | 100.0 | 100.6 | 100.8 | 100.9 | 100.9 | 100.9 | 100.8 | 100.8 | 100.7 |
| Other Sows for Breeding | 000 head | 30.8 | 31.3 | 31.6 | 31.8 | 31.9 | 31.9 | 31.9 | 31.9 | 31.9 | 31.9 | 31.8 |
| Boars | 000 head | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Pigs 20 Kg + | 000 head | 1,010.6 | 936.1 | 962.6 | 1,005.0 | 1,057.5 | 1,111.7 | 1,167.9 | 1,226.8 | 1,288.1 | 1,351.4 | 1,416.7 |
| Pigs Under 20 Kg | 000 head | 420.8 | 395.2 | 405.4 | 420.8 | 439.7 | 459.0 | 479.0 | 500.0 | 521.8 | 544.3 | 567.5 |
| Poultry | 000 head | 13,814.7 | 13,710.9 | 13,883.3 | 14,176.8 | 14,584.6 | 15,084.3 | 15,618.5 | 16,178.8 | 16,767.3 | 17,393.1 | 18,029.6 |
| Layer | 000 head | 1,761.9 | 1,748.7 | 1,770.6 | 1,808.1 | 1,860.1 | 1,923.8 | 1,991.9 | 2,063.4 | 2,138.5 | 2,218.3 | 2,299.4 |
| Broiler | 000 head | 11,381.5 | 11,296.0 | 11,438.1 | 11,679.8 | 12,015.8 | 12,427.5 | 12,867.6 | 13,329.2 | 13,814.0 | 14,329.7 | 14,854.0 |
| Turkey | 000 head | 671.3 | 666.3 | 674.6 | 688.9 | 708.7 | 733.0 | 758.9 | 786.2 | 814.8 | 845.2 | 876.1 |
| Horses | 000 head | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 | 98.1 |
| Mules | 000 head | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 |
| Goats | 000 head | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 | 10.1 |
| Fertiliser | kg of N | 363,072.9 | 305,825.6 | 289,270.1 | 272,624.5 | 255,953.9 | 248,538.3 | 246,355.3 | 245,564.6 | 244,154.9 | 241,728.9 | 237,976.8 |

Source: FAPRI-Ireland (2010)

## Table A20: Food Harvest 20% GHG Reduction Scenario Activity Levels for Irish Agriculture (PART II)

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pulses Production | tonnes | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 |
| Potatoes Production | tonnes | 400,572 | 404,018 | 400,612 | 393,884 | 383,443 | 370,919 | 356,838 | 341,943 | 326,805 | 311,775 | 296,982 |
| Sugar Beet Production | tonnes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Barley Production | tonnes | 1,183,886 | 1,099,755 | 1,104,592 | 1,095,481 | 1,085,552 | 1,077,495 | 1,067,035 | 1,057,844 | 1,047,936 | 1,037,860 | 1,027,252 |
| Oats Production | tonnes | 143,015 | 136,713 | 131,586 | 128,839 | 126,990 | 125,997 | 125,030 | 124,285 | 123,619 | 123,006 | 122,366 |
| Wheat Production | tonnes | 595,672 | 605,121 | 637,582 | 657,945 | 674,483 | 689,311 | 700,079 | 709,193 | 715,646 | 720,033 | 722,327 |
| Pasture | hectares | 2,131,235 | 2,131,971 | 2,131,108 | 2,129,743 | 2,129,110 | 2,131,897 | 2,135,997 | 2,139,277 | 2,141,849 | 2,144,199 | 2,146,642 |
| Hay | hectares | 224,754 | 223,735 | 223,302 | 223,038 | 222,737 | 221,916 | 221,065 | 220,466 | 220,070 | 219,767 | 219,494 |
| Silage | hectares | 1,023,880 | 1,019,237 | 1,017,264 | 1,016,063 | 1,014,691 | 1,010,949 | 1,007,075 | 1,004,346 | 1,002,543 | 1,001,160 | 999,917 |
| Rough Grazing | hectares | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 |
| Wheat Area Harvested | 000 ha | 68.1 | 70.3 | 72.9 | 75.0 | 76.6 | 77.9 | 78.7 | 79.2 | 79.4 | 79.4 | 79.1 |
| Spring Wheat Area Harvested | 000 ha | 15.7 | 16.1 | 16.7 | 17.2 | 17.6 | 17.9 | 18.1 | 18.2 | 18.2 | 18.2 | 18.2 |
| Winter Wheat Area Harvested | 000 ha | 52.5 | 54.1 | 56.2 | 57.8 | 59.0 | 60.0 | 60.7 | 61.0 | 61.2 | 61.1 | 61.0 |
| Barley Area | 000 ha | 169.1 | 169.7 | 168.3 | 166.7 | 165.1 | 163.5 | 161.4 | 159.2 | 157.0 | 154.8 | 152.5 |
| Spring Barley Area Harvested | 000 ha | 150.7 | 151.3 | 150.0 | 148.6 | 147.1 | 145.7 | 143.8 | 141.9 | 139.9 | 138.0 | 136.0 |
| Winter Barley Area Harvested | 000 ha | 18.4 | 18.4 | 18.3 | 18.1 | 17.9 | 17.8 | 17.5 | 17.3 | 17.1 | 16.8 | 16.6 |
| Oats Area Harvested | 000 ha | 18.8 | 17.7 | 16.9 | 16.4 | 16.0 | 15.7 | 15.5 | 15.3 | 15.1 | 14.9 | 14.7 |
| Spring Oats Area Harvested | 000 ha | 3.8 | 3.6 | 3.4 | 3.3 | 3.2 | 3.2 | 3.1 | 3.1 | 3.0 | 3.0 | 3.0 |
| Winter Oats Area Harvested | 000 ha | 15.0 | 14.1 | 13.5 | 13.1 | 12.8 | 12.6 | 12.4 | 12.2 | 12.0 | 11.9 | 11.7 |
| Potatoes Area Harvested | 000 ha | 12.7 | 12.8 | 12.5 | 12.2 | 11.8 | 11.4 | 10.9 | 10.4 | 9.9 | 9.4 | 8.9 |
| Sugar Beet Area Harvested | 000 ha | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Fodder Beet Area Harvested | 000 ha | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Turnips Area Harvested | 000 ha | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Silage Area Harvested | 000 ha | 1,023.9 | 1,019.2 | 1,017.3 | 1,016.1 | 1,014.7 | 1,010.9 | 1,007.1 | 1,004.3 | 1,002.5 | 1,001.2 | 999.9 |
| Hay Area Harvested | 000 ha | 224.8 | 223.7 | 223.3 | 223.0 | 222.7 | 221.9 | 221.1 | 220.5 | 220.1 | 219.8 | 219.5 |
| Maize Area Harvested | 000 ha | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 |

Source: FAPRI-Ireland (2010)

## Table A21: Food Harvest 30% GHG Reduction Scenario Projections of GHG emissions from Irish Agriculture

| | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|---|
| | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* | *Gg* |
| Total CH4 from Fermentation(CH4 Gg/Yr) | 452.07 | 458.71 | 452.52 | 437.48 | 411.85 | 327.14 | 316.35 |
| Total CH4 from Manure (CH4 Gg/Yr) | 110.69 | 111.84 | 109.90 | 107.07 | 102.43 | 87.26 | 91.32 |
| **Total CH4 from Livestock** | 562.76 | 570.55 | 562.42 | 544.55 | 514.28 | 414.40 | 407.67 |
| **CO2 equivalent of CH4** | 11,818.00 | 11,981.45 | 11,810.80 | 11,435.60 | 10,799.90 | 8,702.34 | 8,561.05 |
| Total N2O emitted from Slurry System(Gg N2O/yr) | 0.18 | 0.19 | 0.19 | 0.18 | 0.17 | 0.14 | 0.15 |
| Total N2O from Solid System(Gg N2O/yr) | 1.10 | 1.18 | 1.20 | 1.11 | 1.01 | 0.80 | 0.71 |
| Total N2O from Pasture System(Gg N2O/yr) | 9.04 | 9.32 | 9.33 | 9.10 | 8.30 | 6.47 | 5.86 |
| Direct N2O emissions from fertiliser (N2O Gg/yr) | 7.34 | 8.30 | 7.84 | 6.81 | 7.01 | 4.08 | 3.70 |
| Direct N2O from soils - FAW (Gg N2O/yr) | 1.49 | 1.56 | 1.61 | 1.53 | 1.45 | 1.20 | 1.21 |
| Direct N2O from N-Fixing Crops N2O (Gg N2O/yr)) | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Direct N2O-Crop Residue (Gg N2O/yr) | 0.39 | 0.38 | 0.43 | 0.35 | 0.20 | 0.19 | 0.19 |
| Indirect Emissions of N2O due to volatilisation of NH3 from manure and fertiliser inputs (N2O Gg/Yr) | 1.42 | 1.48 | 1.55 | 1.39 | 1.31 | 1.02 | 0.96 |
| Nitrous Oxide Emissions from Leaching (Gg of N2O/yr) | 2.92 | 3.16 | 3.09 | 2.83 | 2.76 | 1.90 | 1.78 |
| **Total Nitrous Oxide** | 23.89 | 25.59 | 25.22 | 23.31 | 22.23 | 15.83 | 14.56 |
| **CO2 equivalent of N2O** | 7,404.66 | 7,931.89 | 7,819.38 | 7,227.54 | 6,891.96 | 4,908.68 | 4,512.20 |
| Total Agriculture CO2 equivalent emissions | 19,222.66 | 19,913.34 | 19,630.18 | 18,663.14 | 17,691.86 | 13,611.02 | 13,073.24 |
| Fuel Combustion | 689.16 | 950.92 | 858.14 | 899.52 | 850.00 | 850.00 | 850.00 |
| **Total CO2e Gg** | 19,911.82 | 20,864.26 | 20,488.32 | 19,562.66 | 18,541.86 | 14,461.02 | 13,923.24 |

Source: FAPRI-Ireland (2010)

## Table A22: Food Harvest 30% GHG Reduction Scenario Activity Levels for Irish Agriculture - Housing Period

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cattle | 000 head | 5,848.1 | 5,661.1 | 5,277.4 | 4,887.1 | 4,536.7 | 4,245.8 | 4,038.0 | 3,917.7 | 3,834.3 | 3,766.2 | 3,704.2 |
| Dairy Cows | 000 head | 1,107.0 | 1,117.1 | 1,108.1 | 1,107.3 | 1,109.3 | 1,110.5 | 1,199.3 | 1,265.0 | 1,316.0 | 1,353.9 | 1,380.8 |
| All Other Cattle (excl. Dairy Cows) | 000 head | 4,741.1 | 4,544.0 | 4,169.3 | 3,779.8 | 3,427.4 | 3,135.3 | 2,838.7 | 2,652.7 | 2,518.2 | 2,412.4 | 2,323.4 |
| Other Cows | 000 head | 1,069.5 | 1,049.4 | 873.8 | 728.8 | 601.8 | 504.4 | 440.5 | 384.3 | 336.7 | 297.5 | 266.3 |
| Dairy Heifers | 000 head | 222.5 | 215.9 | 227.2 | 227.5 | 236.8 | 252.6 | 264.6 | 273.7 | 280.3 | 284.9 | 289.5 |
| Other Heifers | 000 head | 118.5 | 106.9 | 102.2 | 89.6 | 72.8 | 57.2 | 44.2 | 34.4 | 26.5 | 20.1 | 14.9 |
| Cattle < 1 yrs | 000 head | 1,584.1 | 1,507.3 | 1,407.7 | 1,296.0 | 1,191.1 | 1,097.7 | 986.5 | 925.2 | 884.8 | 854.8 | 828.1 |
| Cattle < 1 yrs - male | 000 head | 828.5 | 788.3 | 736.2 | 677.8 | 622.9 | 574.1 | 515.9 | 483.9 | 462.7 | 447.0 | 433.1 |
| Cattle < 1 yrs - female | 000 head | 755.6 | 719.0 | 671.5 | 618.2 | 568.1 | 523.6 | 470.5 | 441.3 | 422.0 | 407.7 | 395.0 |
| Cattle 1 - 2 yrs | 000 head | 1,180.3 | 1,123.1 | 1,048.9 | 965.7 | 887.5 | 817.9 | 735.0 | 689.4 | 659.3 | 636.9 | 617.0 |
| Cattle 1 - 2 yrs - male | 000 head | 712.8 | 678.3 | 633.5 | 583.2 | 536.0 | 494.0 | 443.9 | 416.4 | 398.2 | 384.6 | 372.6 |
| Cattle 1 - 2 yrs - female | 000 head | 467.5 | 444.8 | 415.4 | 382.5 | 351.5 | 323.9 | 291.1 | 273.0 | 261.1 | 252.2 | 244.4 |
| Cattle > 2 yrs | 000 head | 508.4 | 483.8 | 451.8 | 416.0 | 382.3 | 352.3 | 316.6 | 297.0 | 284.0 | 274.4 | 265.8 |
| Cattle > 2 yrs - male | 000 head | 291.8 | 277.6 | 259.3 | 238.7 | 219.4 | 202.2 | 181.7 | 170.4 | 163.0 | 157.4 | 152.5 |
| Cattle > 2 yrs - female | 000 head | 216.7 | 206.2 | 192.5 | 177.3 | 162.9 | 150.1 | 134.9 | 126.5 | 121.0 | 116.9 | 113.3 |
| Bulls | 000 head | 57.9 | 57.8 | 57.6 | 57.6 | 56.3 | 55.2 | 53.0 | 51.3 | 48.7 | 46.7 | 44.0 |
| Total Sheep | 000 head | 4,694.6 | 4,986.0 | 5,364.4 | 5,651.5 | 5,399.0 | 5,211.9 | 5,122.2 | 5,070.4 | 5,037.4 | 5,021.7 | 5,020.2 |
| Ewes Lowland | 000 head | 1,782.9 | 2,029.2 | 2,235.2 | 2,405.8 | 2,271.0 | 2,158.8 | 2,088.2 | 2,039.6 | 2,005.3 | 1,984.3 | 1,974.6 |
| Ewes Upland | 000 head | 445.7 | 458.1 | 479.0 | 496.6 | 495.8 | 477.2 | 464.1 | 454.3 | 446.8 | 441.4 | 437.9 |
| Rams | 000 head | 66.9 | 74.6 | 81.4 | 87.1 | 83.0 | 79.1 | 76.6 | 74.8 | 73.6 | 72.8 | 72.4 |
| Other Sheep>1 | 000 head | 98.3 | 121.0 | 135.6 | 148.8 | 141.0 | 131.4 | 124.0 | 118.4 | 114.3 | 111.4 | 109.8 |
| Lambs | 000 head | 2,300.8 | 2,303.1 | 2,433.3 | 2,513.2 | 2,408.2 | 2,365.4 | 2,369.2 | 2,383.2 | 2,397.5 | 2,411.8 | 2,425.5 |

Source: FAPRI-Ireland (2010)

## Table A23: Food Harvest 30% GHG Reduction Scenario Activity Levels for Irish Agriculture - Pasture Period

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cattle | 000 head | 6,531.9 | 6,323.1 | 5,894.4 | 5,458.6 | 5,067.2 | 4,742.3 | 4,510.2 | 4,375.8 | 4,282.6 | 4,206.6 | 4,137.3 |
| Dairy Cows | 000 head | 1,117.9 | 1,128.7 | 1,119.1 | 1,118.3 | 1,120.4 | 1,121.7 | 1,216.1 | 1,285.9 | 1,340.1 | 1,380.3 | 1,408.9 |
| All Other Cattle (excl. Dairy Cows) | 000 head | 5,414.0 | 5,194.4 | 4,775.4 | 4,340.3 | 3,946.8 | 3,620.6 | 3,294.1 | 3,089.9 | 2,942.5 | 2,826.3 | 2,728.4 |
| Other Cows | 000 head | 1,130.3 | 1,109.1 | 923.5 | 770.2 | 636.0 | 533.1 | 465.6 | 406.1 | 355.8 | 314.4 | 281.4 |
| Dairy Heifers | 000 head | 215.3 | 208.9 | 219.9 | 220.2 | 229.1 | 244.5 | 256.1 | 264.9 | 271.3 | 275.7 | 280.2 |
| Other Heifers | 000 head | 127.2 | 114.8 | 109.7 | 96.1 | 78.1 | 61.4 | 47.4 | 36.9 | 28.5 | 21.6 | 16.0 |
| Cattle < 1 yrs | 000 head | 1,527.2 | 1,456.4 | 1,362.6 | 1,257.2 | 1,159.6 | 1,072.9 | 972.9 | 917.5 | 881.2 | 853.7 | 829.8 |
| Cattle < 1 yrs - male | 000 head | 750.6 | 715.8 | 669.7 | 617.9 | 569.9 | 527.3 | 478.2 | 450.9 | 433.1 | 419.6 | 407.8 |
| Cattle < 1 yrs - female | 000 head | 776.6 | 740.6 | 692.9 | 639.3 | 589.7 | 545.6 | 494.7 | 466.5 | 448.1 | 434.1 | 422.0 |
| Cattle 1 - 2 yrs | 000 head | 1,454.7 | 1,387.3 | 1,297.9 | 1,197.6 | 1,104.5 | 1,021.9 | 926.7 | 873.9 | 839.4 | 813.2 | 790.4 |
| Cattle 1 - 2 yrs - male | 000 head | 857.3 | 817.6 | 764.9 | 705.8 | 650.9 | 602.3 | 546.2 | 515.0 | 494.7 | 479.3 | 465.8 |
| Cattle 1 - 2 yrs - female | 000 head | 597.4 | 569.7 | 533.0 | 491.8 | 453.6 | 419.7 | 380.6 | 358.9 | 344.7 | 334.0 | 324.6 |
| Cattle > 2 yrs | 000 head | 890.5 | 849.3 | 794.6 | 733.1 | 676.2 | 625.6 | 567.3 | 535.0 | 513.9 | 497.8 | 483.9 |
| Cattle > 2 yrs - male | 000 head | 598.9 | 571.1 | 534.4 | 493.0 | 454.7 | 420.7 | 381.5 | 359.8 | 345.6 | 334.8 | 325.4 |
| Cattle > 2 yrs - female | 000 head | 291.6 | 278.1 | 260.2 | 240.1 | 221.4 | 204.9 | 185.8 | 175.2 | 168.3 | 163.0 | 158.5 |
| Bulls | 000 head | 68.7 | 68.7 | 67.2 | 65.9 | 63.3 | 61.2 | 58.1 | 55.7 | 52.5 | 49.9 | 46.7 |
| Total Sheep | 000 head | 4,694.6 | 4,986.0 | 5,364.4 | 5,651.5 | 5,399.0 | 5,211.9 | 5,122.2 | 5,070.4 | 5,037.4 | 5,021.7 | 5,020.2 |
| Lowland Ewes | 000 head | 1,782.9 | 2,029.2 | 2,235.2 | 2,405.8 | 2,271.0 | 2,158.8 | 2,088.2 | 2,039.6 | 2,005.3 | 1,984.3 | 1,974.6 |
| Upland Ewes | 000 head | 445.7 | 458.1 | 479.0 | 496.6 | 495.8 | 477.2 | 464.1 | 454.3 | 446.8 | 441.4 | 437.9 |
| Rams | 000 head | 66.9 | 74.6 | 81.4 | 87.1 | 83.0 | 79.1 | 76.6 | 74.8 | 73.6 | 72.8 | 72.4 |
| Other Sheep>1 | 000 head | 98.3 | 121.0 | 135.6 | 148.8 | 141.0 | 131.4 | 124.0 | 118.4 | 114.3 | 111.4 | 109.8 |
| Lambs | 000 head | 2,300.8 | 2,303.1 | 2,433.3 | 2,513.2 | 2,408.2 | 2,365.4 | 2,369.2 | 2,383.2 | 2,397.5 | 2,411.8 | 2,425.5 |

Source: FAPRI-Ireland (2010)

## Table A24: Food Harvest 30% GHG Reduction Scenario Activity Levels for Irish Agriculture (PART I)

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pigs | 000 head | 1,504.84 | 1,543.46 | 1,602.30 | 1,674.16 | 1,747.91 | 1,824.06 | 1,903.87 | 1,986.82 | 2,072.52 | 2,160.73 | 2,251.17 |
| Gilts in Pig | 000 head | 21.86 | 22.21 | 22.46 | 22.59 | 22.65 | 22.67 | 22.67 | 22.66 | 22.65 | 22.63 | 22.61 |
| Gilts not yet Served | 000 head | 18.83 | 19.13 | 19.35 | 19.46 | 19.51 | 19.53 | 19.53 | 19.52 | 19.51 | 19.49 | 19.47 |
| Sows in Pig | 000 head | 97.32 | 98.87 | 100.01 | 100.58 | 100.84 | 100.94 | 100.95 | 100.90 | 100.83 | 100.76 | 100.66 |
| Other Sows for Breeding | 000 head | 30.79 | 31.28 | 31.64 | 31.82 | 31.91 | 31.94 | 31.94 | 31.92 | 31.90 | 31.88 | 31.85 |
| Boars | 000 head | 1.97 | 2.00 | 2.02 | 2.03 | 2.04 | 2.04 | 2.04 | 2.04 | 2.04 | 2.04 | 2.04 |
| Pigs 20 Kg + | 000 head | 1,010.58 | 936.14 | 962.62 | 1,005.01 | 1,057.54 | 1,111.74 | 1,167.89 | 1,226.82 | 1,288.10 | 1,351.43 | 1,416.64 |
| Pigs Under 20 Kg | 000 head | 420.75 | 395.21 | 405.35 | 420.80 | 439.68 | 459.05 | 479.05 | 500.01 | 521.79 | 544.30 | 567.46 |
| Poultry | 000 head | 13,814.66 | 13,711.33 | 13,884.14 | 14,178.07 | 14,586.33 | 15,086.75 | 15,621.78 | 16,182.79 | 16,772.02 | 17,398.51 | 18,035.46 |
| Layer | 000 head | 1,761.89 | 1,748.71 | 1,770.75 | 1,808.24 | 1,860.30 | 1,924.13 | 1,992.36 | 2,063.91 | 2,139.06 | 2,218.96 | 2,300.20 |
| Broiler | 000 head | 11,381.48 | 11,296.35 | 11,438.72 | 11,680.88 | 12,017.23 | 12,429.51 | 12,870.31 | 13,332.51 | 13,817.95 | 14,334.10 | 14,858.86 |
| Turkey | 000 head | 671.29 | 666.27 | 674.67 | 688.95 | 708.79 | 733.11 | 759.11 | 786.37 | 815.00 | 845.44 | 876.40 |
| Horses | 000 head | 98.10 | 98.10 | 98.10 | 98.10 | 98.10 | 98.10 | 98.10 | 98.10 | 98.10 | 98.10 | 98.10 |
| Mules | 000 head | 8.80 | 8.80 | 8.80 | 8.80 | 8.80 | 8.80 | 8.80 | 8.80 | 8.80 | 8.80 | 8.80 |
| Goats | 000 head | 10.10 | 10.10 | 10.10 | 10.10 | 10.10 | 10.10 | 10.10 | 10.10 | 10.10 | 10.10 | 10.10 |
| Fertiliser | kg of N | 363,073 | 298,032 | 273,260 | 249,035 | 226,089 | 211,399 | 203,979 | 199,921 | 196,902 | 194,250 | 191,356 |

Source: FAPRI-Ireland (2010)

## Table A25: Food Harvest 30% GHG Reduction Scenario Activity Levels for Irish Agriculture (PART II)

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pulses Production | tonnes | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 | 18,600 |
| Potatoes Production | tonnes | 400,572 | 403,994 | 400,564 | 393,813 | 383,353 | 370,813 | 356,720 | 341,818 | 326,676 | 311,646 | 296,856 |
| Sugar Beet Production | tonnes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Barley Production | tonnes | 1,183,886 | 1,099,690 | 1,106,601 | 1,099,975 | 1,092,803 | 1,087,694 | 1,080,104 | 1,073,703 | 1,066,425 | 1,058,788 | 1,050,401 |
| Oats Production | tonnes | 143,015 | 136,705 | 131,825 | 129,368 | 127,838 | 127,190 | 126,561 | 126,148 | 125,800 | 125,486 | 125,124 |
| Wheat Production | tonnes | 595,672 | 605,085 | 638,741 | 660,644 | 678,989 | 695,836 | 708,654 | 719,826 | 728,273 | 734,552 | 738,605 |
| Pasture | hectares | 2,131,235 | 2,131,845 | 2,130,350 | 2,129,376 | 2,129,504 | 2,133,053 | 2,137,756 | 2,141,737 | 2,144,777 | 2,147,288 | 2,149,606 |
| Hay | hectares | 224,754 | 223,722 | 223,275 | 222,796 | 222,203 | 221,083 | 219,970 | 219,100 | 218,489 | 218,038 | 217,685 |
| Silage | hectares | 1,023,880 | 1,019,177 | 1,017,141 | 1,014,960 | 1,012,259 | 1,007,157 | 1,002,087 | 998,124 | 995,337 | 993,284 | 991,675 |
| Rough Grazing | hectares | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 | 441,200 |
| Wheat Area Harvested | 000 ha | 68.1 | 70.3 | 73.0 | 75.3 | 77.1 | 78.7 | 79.7 | 80.4 | 80.8 | 81.0 | 80.9 |
| Spring Wheat Area Harvested | 000 ha | 15.7 | 16.1 | 16.8 | 17.3 | 17.7 | 18.1 | 18.3 | 18.5 | 18.6 | 18.6 | 18.6 |
| Winter Wheat Area Harvested | 000 ha | 52.5 | 54.1 | 56.3 | 58.0 | 59.4 | 60.6 | 61.4 | 61.9 | 62.2 | 62.4 | 62.3 |
| Barley Area | 000 ha | 169.1 | 169.7 | 168.6 | 167.4 | 166.2 | 165.0 | 163.4 | 161.6 | 159.8 | 157.9 | 156.0 |
| Spring Barley Area Harvested | 000 ha | 150.7 | 151.3 | 150.2 | 149.2 | 148.1 | 147.1 | 145.6 | 144.0 | 142.4 | 140.7 | 139.0 |
| Winter Barley Area Harvested | 000 ha | 18.4 | 18.4 | 18.3 | 18.2 | 18.1 | 17.9 | 17.8 | 17.6 | 17.4 | 17.2 | 16.9 |
| Oats Area Harvested | 000 ha | 18.8 | 17.7 | 16.9 | 16.5 | 16.1 | 15.9 | 15.7 | 15.5 | 15.4 | 15.2 | 15.0 |
| Spring Oats Area Harvested | 000 ha | 3.8 | 3.6 | 3.4 | 3.3 | 3.3 | 3.2 | 3.2 | 3.1 | 3.1 | 3.1 | 3.0 |
| Winter Oats Area Harvested | 000 ha | 15.0 | 14.1 | 13.5 | 13.1 | 12.9 | 12.7 | 12.5 | 12.4 | 12.3 | 12.1 | 12.0 |
| Potatoes Area Harvested | 000 ha | 12.7 | 12.8 | 12.5 | 12.2 | 11.8 | 11.4 | 10.9 | 10.4 | 9.9 | 9.4 | 8.9 |
| Sugar Beet Area Harvested | 000 ha | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Fodder Beet Area Harvested | 000 ha | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Turnips Area Harvested | 000 ha | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Silage Area Harvested | 000 ha | 1,023.9 | 1,019.2 | 1,017.1 | 1,015.0 | 1,012.3 | 1,007.2 | 1,002.1 | 998.1 | 995.3 | 993.3 | 991.7 |
| Hay Area Harvested | 000 ha | 224.8 | 223.7 | 223.3 | 222.8 | 222.2 | 221.1 | 220.0 | 219.1 | 218.5 | 218.0 | 217.7 |
| Maize Area Harvested | 000 ha | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 |

Source: FAPRI-Ireland (2010)