

Project number: 6282

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Irish Times – Long Term GHG Emissions Projections for Irish Agriculture



Key external stakeholders:

Policy Makers, Farm Organisations, Food Processing Industry, Environmental NGOs

Practical implications for stakeholders:

The project facilitated the development of the first set of long term projection of GHG emissions from Irish Agriculture

- Projection of Irish agricultural GHG emissions over a short term (10 year) horizon have been available for over a decade. There is now an increasing demand for projections that extend over a much longer time frame, up to 2030 and even up to 2050. These projections are required by policy makers to assist them in their negotiations regarding future GHG emission reduction commitments within the EU.

Main results:

The projections developed within the project showed the likely future path for various sectors of Irish agriculture, the associated animal populations, levels of crop production as well as the input requirements needed to generate this output. In turn this data is converted into projections of overall GHG emissions from the agriculture sector in Ireland.

The research provided the first insights into the possible level of GHG emission from Irish Agriculture over the long term, with 2050 used as a horizon point for the first time. This research is particularly of use to policy makers who are charged with negotiating the terms of the agreements on emissions reductions targets at the EU level.

It was found that as Irish agricultural output increases, the relative importance of different sectors as a source of emissions will change. Due to a projected increase in milk production, GHG emissions associated with the dairy herd are projected to increase. However, GHG emissions from the specialist beef herd are projected to decline, as the number of suckler cows in the national herd is projected to fall. Overall, in this reference scenario it is projected that there will be an increase in emissions from the agriculture sector in aggregate, meaning that there is a strong incentive to find mechanisms to address the source of these emissions, so that emissions are decoupled from the growth in food production.

Opportunity / Benefit:

The work from the project provides an Irish perspective on the reliability of projections of GHG emissions from Irish agriculture that are produced by other organisations internationally.

Collaborating Institutions:

University College Cork
Economic and Social Research Institute

Teagasc project team: Trevor Donnellan
Kevin Hanrahan

External collaborators: Brian O Gallachoir (UCC)
John Paul Deane (UCC)
Alessandro Chiodi (UCC)
John Fitzgerald (ESRI)
John Curtis (ESRI)

The project also benefited from the oversight of a Steering Committee, with members representing the Dept of Environment, Dept of Agriculture, Food and the Marine, the Environmental Protection Agency, as well as a number of international academics.

1. Project background:

Agricultural GHG emissions comprise over 30 percent of Ireland's GHG total emissions at present. As a consequence of existing agreements and agreements yet to be concluded, Ireland faces limitations on the total level of GHG emissions it can produce, with specific reduction targets set out for achievement by particular dates in the future. Failure to meet these targets will result either in fines or a requirement to buy carbon credits on the international market.

While no specific reduction target applies to Irish agriculture at present, it is imperative, given the size of the emissions from the sector, that Ireland has a good understanding of the possible level of emissions in the future in the absence of measures to reduce emissions. Additionally, it is important to be able to assess the likely abatement potential that might exist, albeit that this requires a degree of speculation with regard to the level of take up of existing and potential future technological measures in the future.

2. Questions addressed by the project:

- How will Irish agriculture evolve in the period to 2050?
- What will the implications be for GHG emissions from the agriculture sector to 2050?

3. The experimental studies:

Model projections to 2050 were developed for agricultural activity in the context of a reference scenario. Fundamental assumptions had to be made in order to carry out long term projections, in order to address considerations where there is considerable future uncertainty. A key example would be our interpretation of how the Common Agricultural Policy would be expected to evolve beyond the life of the current EU Budget which extends only to 2020. For the purposes of the reference scenario it was assumed that agricultural subsidies would remain unchanged in nominal terms, meaning that their real value would decline over time.

These projections of agricultural activity and input usage were then converted into projections of agricultural GHG emissions.

4. Main results:

These projections represent a reference scenario and are developed under the assumption that technologies to reduce emission are unavailable or remain unutilized. As such they represent a worse case scenario and it could be expected that abatement measures would reduce the level of emissions relative to this reference scenario.

The projections to 2050 indicate that the dairy sector will continue to expand over the long term, through the addition of dairy cows and higher levels of milk yield, By contrast, the specialist beef sector is projected to decrease in size, as much of the sector is economically vulnerable due to its dependence of subsidies. Even though the dairy sector is projected to expand, the decline in the suckler herd means that the overall increase in the Irish cattle population is limited and therefore, while emissions are projected to increase, the increase is smaller than would be the case if the size of the suckler herd was maintained at existing levels.

5. Opportunity/Benefit:

The work from the project provides an Irish perspective on the reliability of projections of GHG emissions from Irish agriculture that are produced by other organisation internationally. From a modelling perspective, without these projections, in formulating its negotiating position Ireland would need to rely exclusively on projections for Ireland developed by research institutes and agencies internationally and would be unable to verify or challenge the reliability of such projections.

6. Dissemination:

Early output from the project was presented at the 133rd Seminar of the European Association of Agricultural Economists in Chania, Greece in July 2013.

Output from the project was presented at a conference organised by the Environmental Protection Agency in Dublin in May, 2014.

Main publications:

Donnellan, T., Hanrahan, K. and Breen, J. (2014). Development and Application of Economic and Environmental Models of Greenhouse Gas Emissions from Agriculture: Some Difficult Choices for Policy Makers. In: Zopounidis, C., Kalogeras, N., Mattas, K., Dijk, G., Baourakis, G. Agricultural Cooperative Management and Policy: New Robust, Reliable and Coherent Modelling Tools. Switzerland: Springer.

Carbon-Neutrality as a horizon point for Irish Agriculture: A qualitative appraisal of potential pathways to 2050, (2013) Teagasc, Ireland <http://www.teagasc.ie/publications/2013/3002/CarbonNeutrality.pdf>

Popular publications:

Donnellan T. (2013) Livestock farming and GHG emissions reductions in Ireland Presented at the 3rd Animal Task Force's seminar: Responsible Livestock Farming Systems Wednesday 6 November 2013, Brussels

7. Compiled by: Trevor Donnellan