4. Projections of emissions and removals from the LULUCF sector to 2020 (WP 1.4)

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4.1 Introduction

The UK is required to periodically report projections of emissions/removals from LULUCF activities to 2020 to the European Union Monitoring Mechanism and the UN Framework Convention on Climate Change. Projections of emissions for years from 2006 to 2020 have been made for each activity for the UK and for each of the Devolved Administration areas of England, Scotland, Wales and Northern Ireland. "Central" (Mid), high emission (High) and low emission scenarios (Low) were developed for each activity. The UK fluxes for each scenario are presented in Appendix A.1. For simplicity detailed information on the emissions and removals is only supplied on the basis of the reporting format defined by the IPCC LULUCF Good Practice Guidance. A summary table of the net UK flux under the different emission scenarios is shown in Table 4-1.

Table 4-1: Inventory (1990 to 2005) and projected (to 2020) Emissions and Removals data ($GgCO_2$/year). (-ve sign indicates Removal)

Year	Net (LOW)	Net (MID)	Net (HIGH)
1990	**2882**	**2882**	**2882**
1995	**992**	**992**	**992**
2000	**-449**	**-449**	**-449**
2005	**-2056**	**-2056**	**-2056**
2010	**-3294**	**-1554**	**207**
2015	**-3850**	**488**	**4338**
2020	**-4460**	**2223**	**8138**

4.2 Basis for projections

The basis for projection of each activity varies between England, Scotland, Wales and Northern Ireland as appropriate. These assumptions are described in Table 4-2, Table 4-3, Table 4-4 and Table 4-5 respectively.

4.3 Results for projections of LUCF Categories

The projections for Mid, Low and High emissions scenarios for the UK, England, Scotland, Wales and Northern Ireland are presented in Appendix A.1. The UK emissions, removals and net flux for each scenario are also plotted in Figure 4-1. The reporting format of the GPG on LULUCF is used for these data. Projections to 2020 of the Forest Land, Cropland, Grassland and Settlements (Urban) net fluxes of carbon dioxide from the atmosphere in the United Kingdom are plotted in Figure 4-2. Projections to 2020 of net fluxes of carbon dioxide from the atmosphere in England, Scotland, Wales and N. Ireland are plotted in Figure 4-3. Projections of net fluxes for Forest Land, Cropland, Grassland and Settlements for each scenario for the individual Devolved Administrations are plotted in Figure 4-4, Figure 4-5, Figure 4-6 and Figure 4-7.

Table 4-2: Scenario assumptions for projection of LUCF net Emissions (England)

Scenario assumption: England			
Category	**LOW Emission**	**MID Emission**	**HIGH Emission**
Forestry	UK Total of 30 kha/yr from 2006 in proportion to 2005 planting	Conifer planting from 2006 assumed to be as in 2005. Broadleaf planting from 2006 assumed to be as in 2005.	Conifer planting from 2006 assumed to be 0 ha/yr. Broadleaf planting from 2006 assumed to be 0 ha/yr.
Deforestation	As MID but trend adjusted to lower value (95% C.L) of 1990 to 2005 trend	Autoregressive model (10 terms) fitted to 1990 to 2005 UK data	As MID but trend adjusted to upper value (95% C.L) of 1990 to 2005 trend
Land Use Change (Soils)	Annual area land use change for 2006 to 2020 based on annual rate of change for 1990 to 2005. but minimum values from Monte Carlo simulation with range of areas	Annual area land use change for 2006 to 2020 assumed to be same as annual rate of change for 1990 to 2005. – mean values from Monte Carlo simulation starting from 2005	Annual area land use change for 2006 to 2020 based on annual rate of change for 1990 to 2005. but maximum values from Monte Carlo simulation with range of areas
Peat extraction	As MID but trend adjusted to lower value (95% C.L) of 1990 to 2005 trend	Autoregressive model (10 terms) fitted to 1990 to 2005 UK data	As MID but trend adjusted to upper value (95% C.L) of 1990 to 2005 trend
Liming	As MID but trend adjusted to lower value (95% C.L) of 1990 to 2005 trend	Autoregressive model (10 terms) fitted to 1990 to 2005 UK data	As MID but trend adjusted to upper value (95% C.L) of 1990 to 2005 trend
Lowland drainage	Flux changes from 2005 at modelled rate of change for 1990 to 2000	Flux changes from 2005 at modelled rate of change	Flux changes from 2005 value at modelled rate of change for 2010 to 2020
Non-forest biomass	Flux remains at 2005 value	Flux remains at 2005 value	Flux remains at 2005 value

Table 4-3: Scenario assumptions for projection of LUCF net Emissions (Scotland)

Scenario assumption: Scotland			
Category	**LOW Emission**	**MID Emission**	**HIGH Emission**
Afforestation	UK Total of 30 kha/yr from 2006 in proportion to 2005 planting	Conifer planting from 2006 assumed to be as in 2005. Broadleaf planting from 2006 assumed to be as in 2005.	Conifer planting from 2006 assumed to be 0 ha/yr. Broadleaf planting from 2006 assumed to be 0 ha/yr.
Deforestation	As MID but trend adjusted to lower value (95% C.L) of 1990 to 2005 trend	Autoregressive model (10 terms) fitted to 1990 to 2005 UK data	As MID but trend adjusted to upper value (95% C.L) of 1990 to 2005 trend
Land Use Change (Soils)	Annual area land use change for 2006 to 2020 based on annual rate of change for 1990 to 2005. but minimum values from Monte Carlo simulation with range of areas	Annual area land use change for 2006 to 2020 assumed to be same as annual rate of change for 1990 to 2005. – mean values from Monte Carlo simulation starting from 2005	Annual area land use change for 2006 to 2020 based on annual rate of change for 1990 to 2005. but maximum values from Monte Carlo simulation with range of areas
Peat extraction	As MID but trend adjusted to lower value (95% C.L) of 1990 to 2005 trend	Autoregressive model (10 terms) fitted to 1990 to 2005 Scottish data	As MID but trend adjusted to upper value (95% C.L) of 1990 to 2005 trend
Liming	As MID but trend adjusted to lower value (95% C.L) of 1990 to 2005 trend	Autoregressive model (10 terms) fitted to 1990 to 2005 UK data	As MID but trend adjusted to upper value (95% C.L) of 1990 to 2005 trend
Lowland drainage	NA	NA	NA
Non-forest biomass	Flux remains at 2005 value	Flux remains at 2005 value	Flux remains at 2005 value

Table 4-4: Scenario assumptions for projection of LUCF net Emissions (Wales)

Scenario assumption: Wales			
Category	**LOW Emission**	**MID Emission**	**HIGH Emission**
Forestry	UK Total of 30 kha/yr from 2006 in proportion to 2005 planting	Conifer planting from 2006 assumed to be as in 2005. Broadleaf planting from 2006 assumed to be as in 2005.	Conifer planting from 2006 assumed to be 0 ha/yr. Broadleaf planting from 2006 assumed to be 0 ha/yr.
Deforestation	As MID but trend adjusted to lower value (95% C.L) of 1990 to 2005 trend	Autoregressive model (10 terms) fitted to 1990 to 2005 UK data	As MID but trend adjusted to upper value (95% C.L) of 1990 to 2005 trend
Land Use Change (Soils)	Annual area land use change for 2006 to 2020 based on annual rate of change for 1990 to 2005. but minimum values from Monte Carlo simulation with range of areas	Annual area land use change for 2006 to 2020 assumed to be same as annual rate of change for 1990 to 2005. – mean values from Monte Carlo simulation starting from 2005	Annual area land use change for 2006 to 2020 based on annual rate of change for 1990 to 2005. but maximum values from Monte Carlo simulation with range of areas
Peat extraction	Flux zero	Flux zero	Flux zero
Liming	As MID but trend adjusted to lower value (95% C.L) of 1990 to 2005 trend	Autoregressive model (10 terms) fitted to 1990 to 2005 UK data	As MID but trend adjusted to upper value (95% C.L) of 1990 to 2005 trend
Lowland drainage	NA	NA	NA
Non-forest biomass	Flux remains at 2005 value	Flux remains at 2005 value	Flux remains at 2005 value

Table 4-5:Scenario assumptions for projection of LUCF net Emissions (Northern Ireland)

Scenario assumption: Northern Ireland			
Category	**LOW Emission**	**MID Emission**	**HIGH Emission**
Forestry	UK Total of 30 kha/yr from 2006 in proportion to 2005 planting	Conifer planting from 2006 assumed to be as in 2005. Broadleaf planting from 2006 assumed to be as in 2005.	Conifer planting from 2006 assumed to be 0 ha/yr. Broadleaf planting from 2006 assumed to be 0 ha/yr.
Deforestation	NA	NA	NA
Land Use Change (Soils)	Annual area land use change for 2006 to 2020 based on annual rate of change for 1990 to 2005. but minimum values from Monte Carlo simulation with range of areas	Annual area land use change for 2006 to 2020 assumed to be same as annual rate of change for 1990 to 2005. – mean values from Monte Carlo simulation starting from 2005	Annual area land use change for 2006 to 2020 based on annual rate of change for 1990 to 2005. but maximum values from Monte Carlo simulation with range of areas
Peat extraction	Flux remains at 2005 value	Flux remains at 2005 value	Flux remains at 2005 value
Liming	As MID but trend adjusted to lower value (95% C.L) of 1990 to 2005 trend	Autoregressive model (10 terms) fitted to 1990 to 2005 UK data	As MID but trend adjusted to upper value (95% C.L) of 1990 to 2005 trend
Lowland drainage	NA	NA	NA
Non-forest biomass	Flux remains at 2005 value	Flux remains at 2005 value	Flux remains at 2005 value

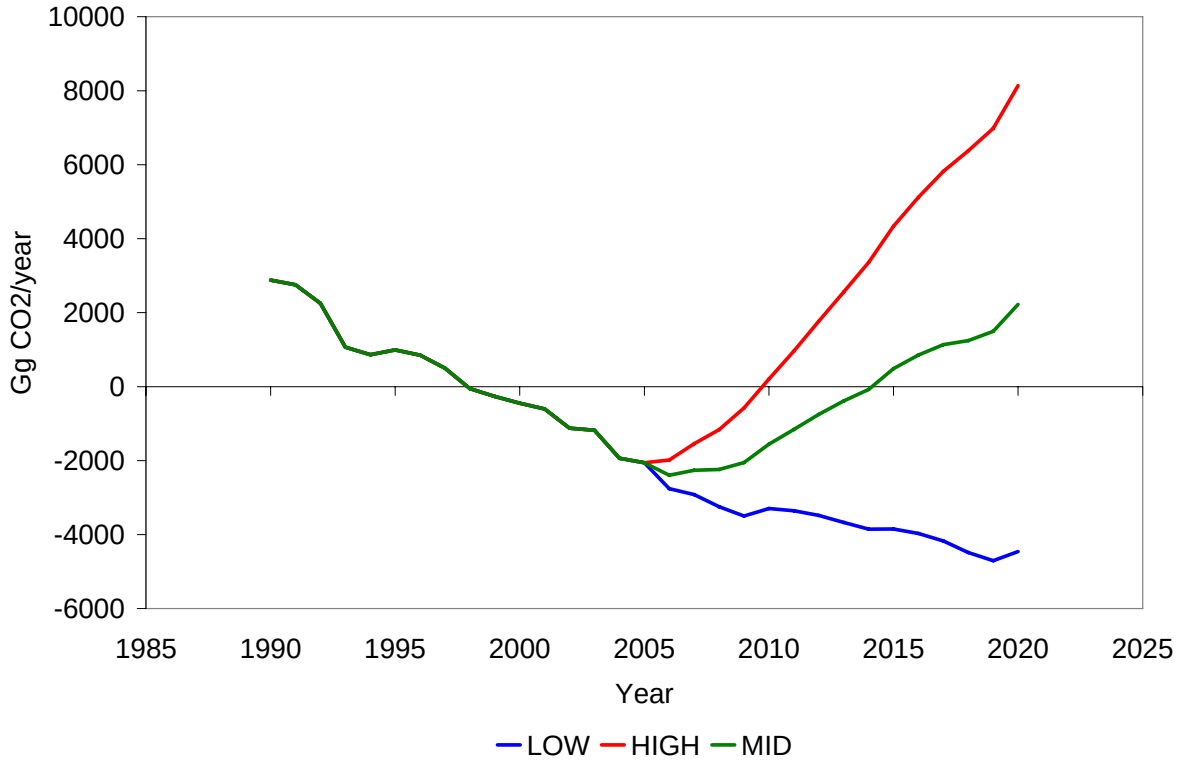

Figure 4-1: Projections to 2020 of Net Emissions and Removals of carbon dioxide from the atmosphere in the United Kingdom by Land Use, Land Use Change and Forestry for 3 future emissions scenarios

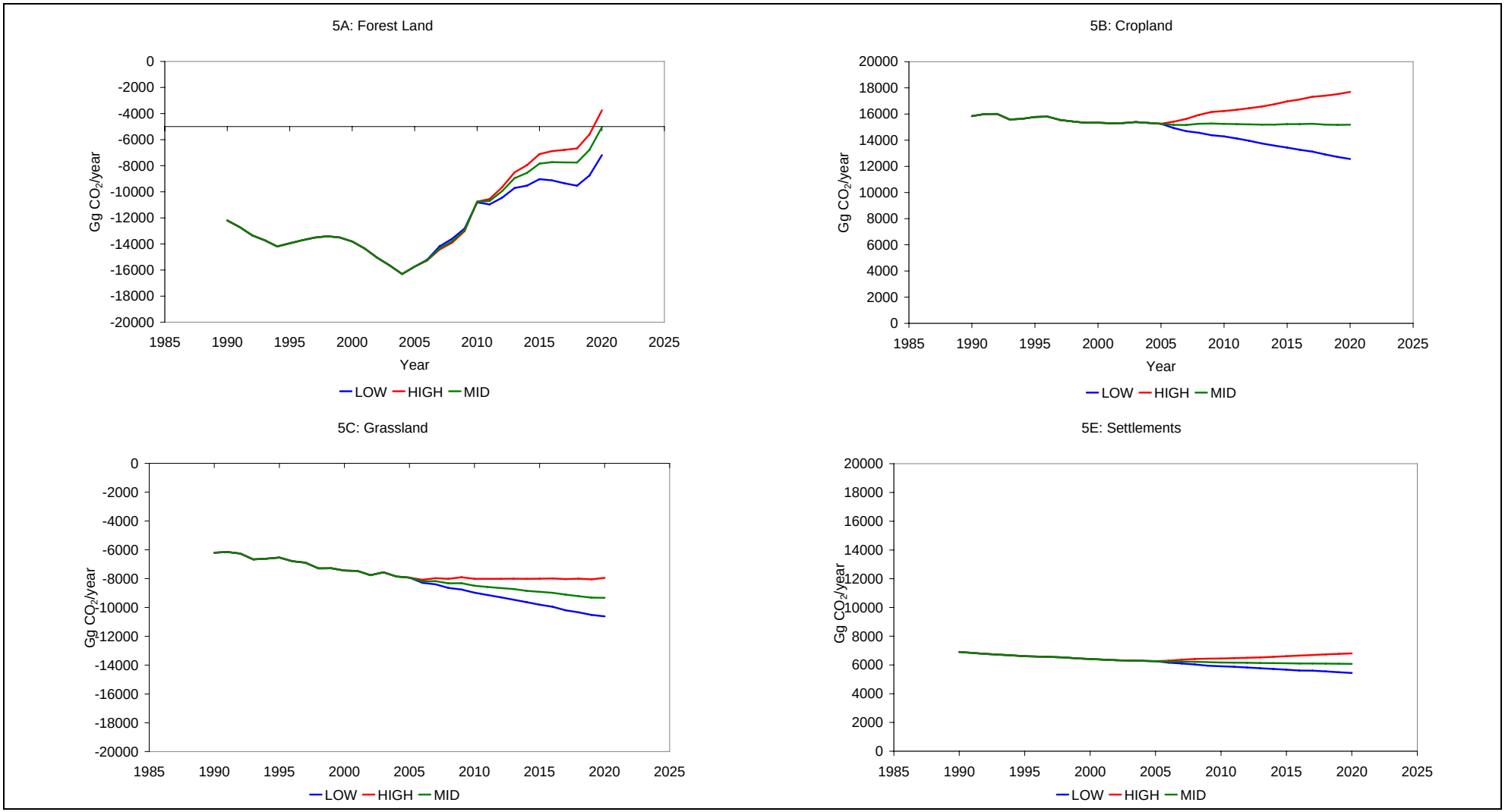

Figure 4-2: Projections to 2020 of Forest Land, Cropland, Grassland and Settlements (Urban) Net Emissions of carbon dioxide from the atmosphere in the United Kingdom by Land Use, Land Use Change and Forestry for 3 future emissions scenarios.

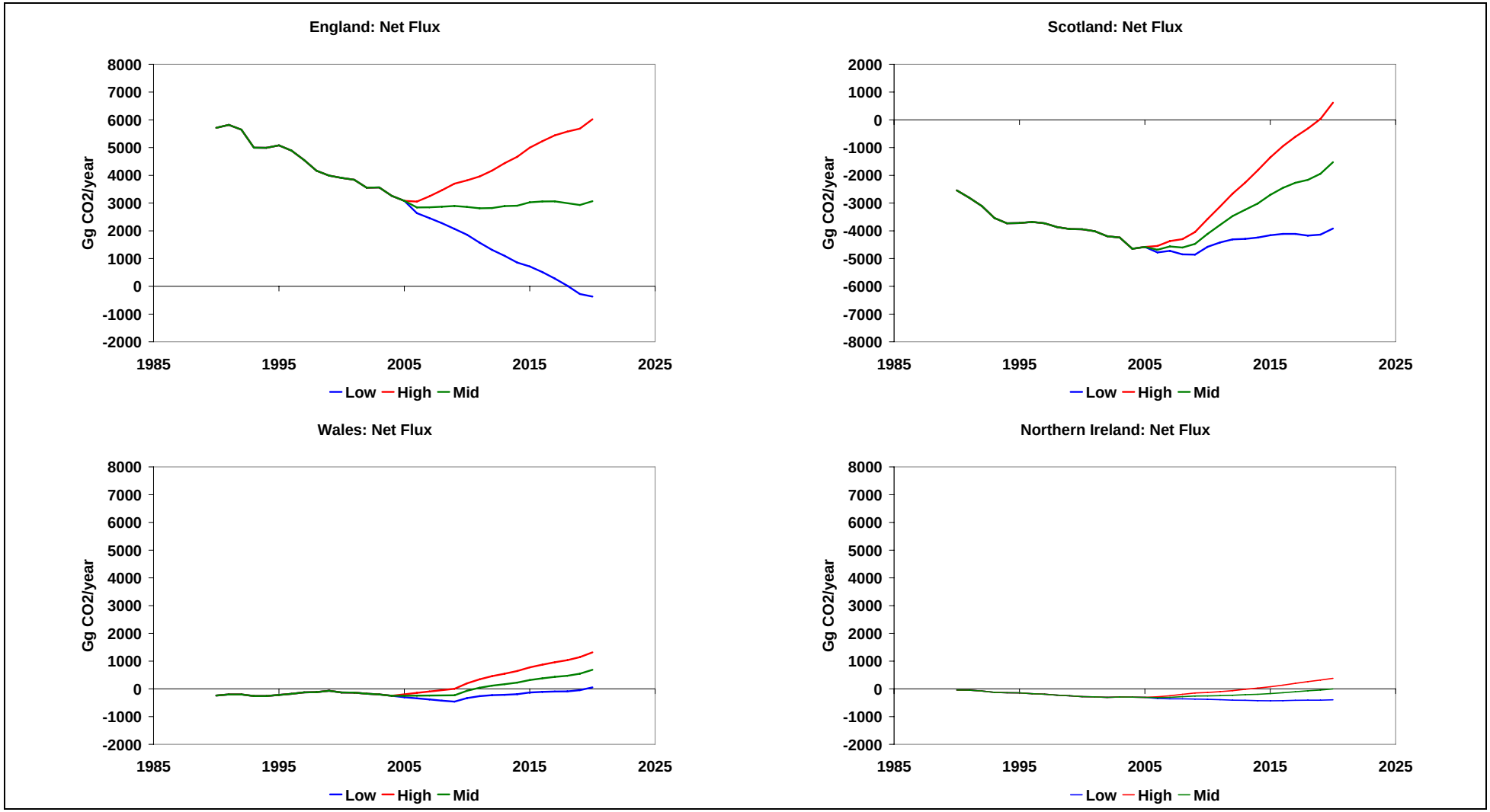

Figure 4-3: Projections to 2020 of Net Emissions of carbon dioxide from the atmosphere in England, Scotland, Wales and Northern Ireland by Land Use, Land Use Change and Forestry for 3 future emissions scenarios.

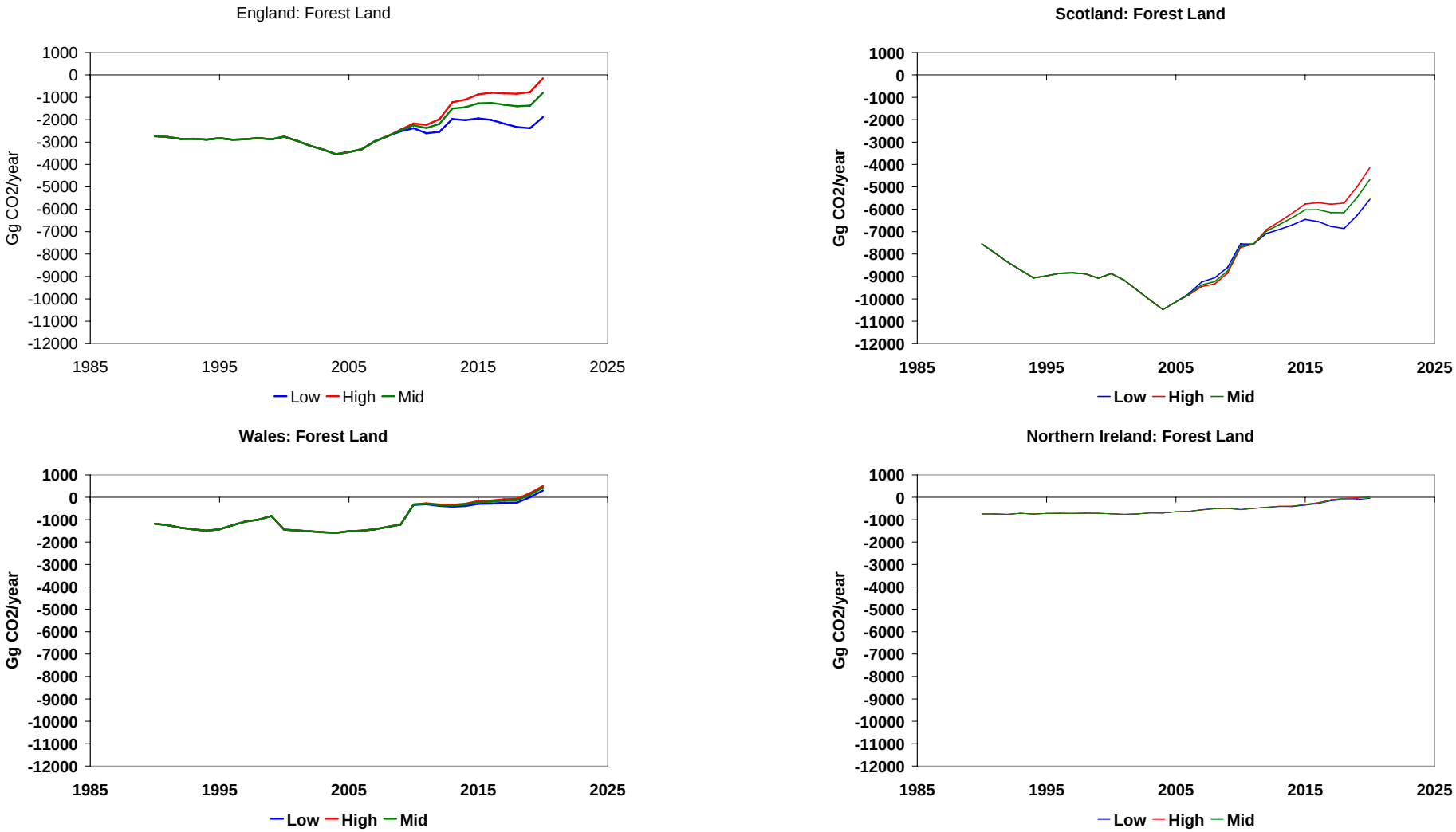

Figure 4-4: Projections to 2020 of Net Emissions of carbon dioxide from the atmosphere in England, Scotland, Wales and Northern Ireland by the Forest Land Category (5A) for 3 future emissions scenarios.

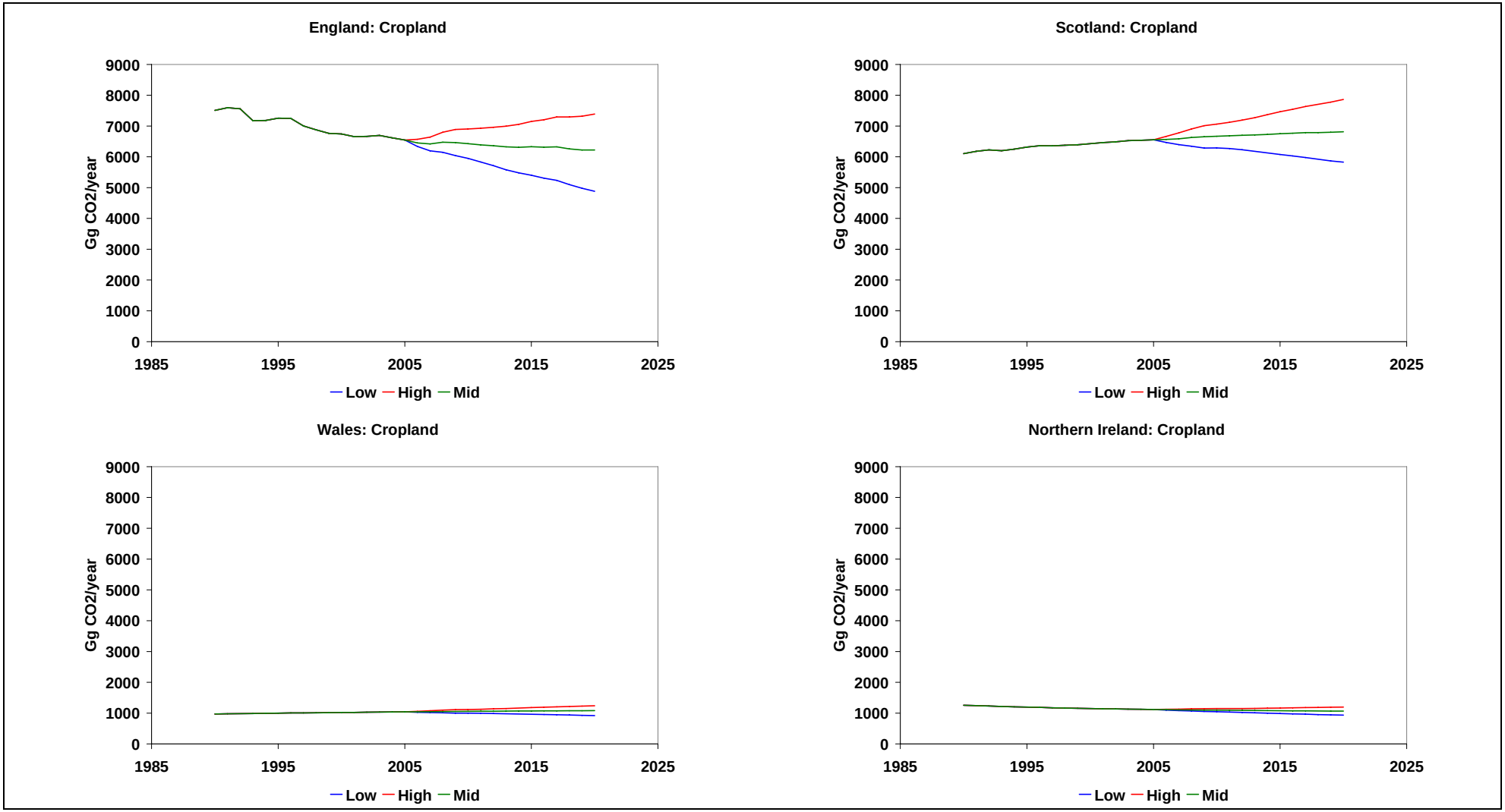

Figure 4-5: Projections to 2020 of Net Emissions of carbon dioxide from the atmosphere in England, Scotland, Wales and Northern Ireland by the Cropland Category (5B) for 3 future emissions scenarios

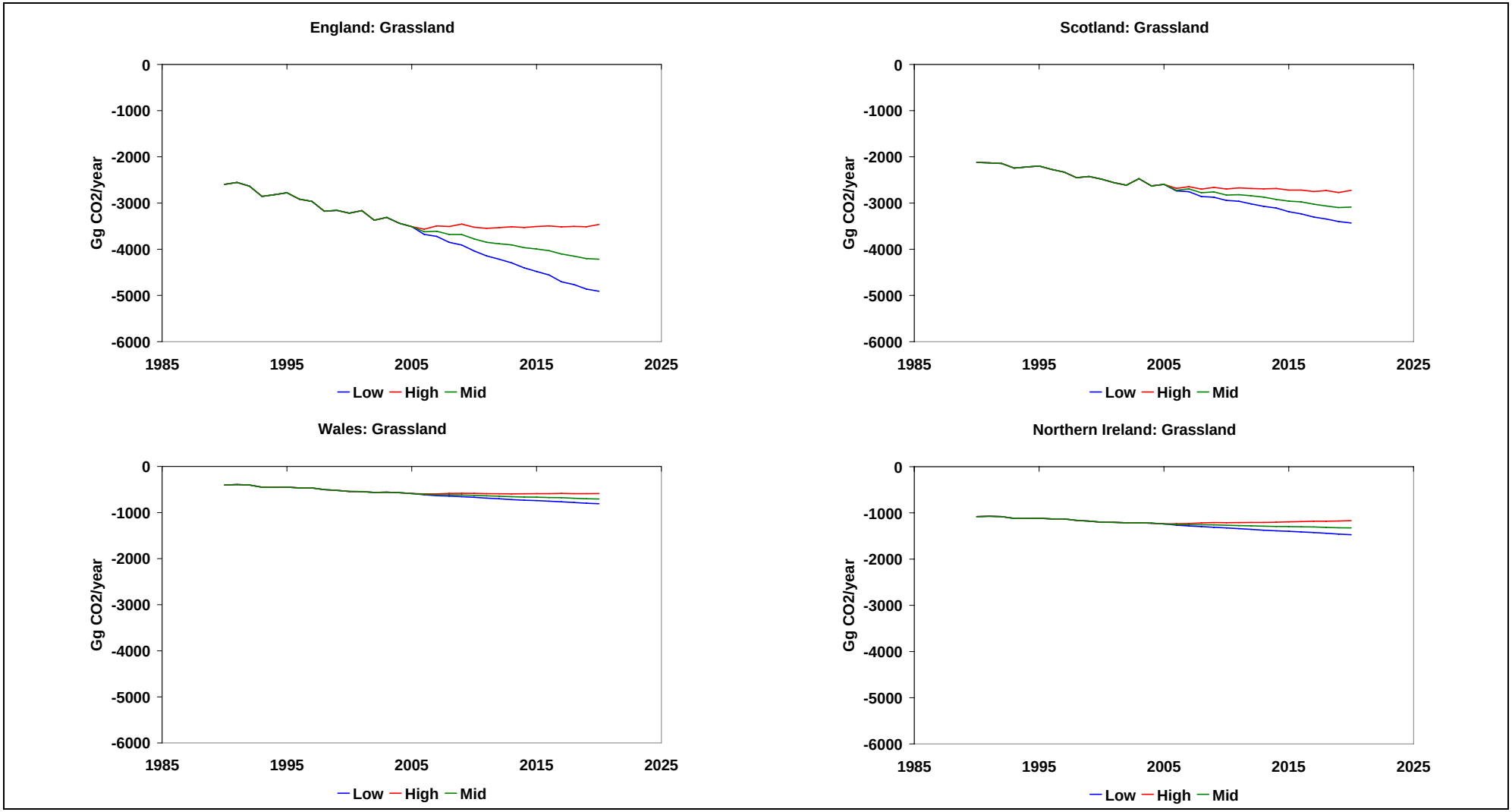

Figure 4-6: Projections to 2020 of Net Emissions of carbon dioxide from the atmosphere in England, Scotland, Wales and Northern Ireland by the Grassland Category (5C) for 3 future emissions scenarios

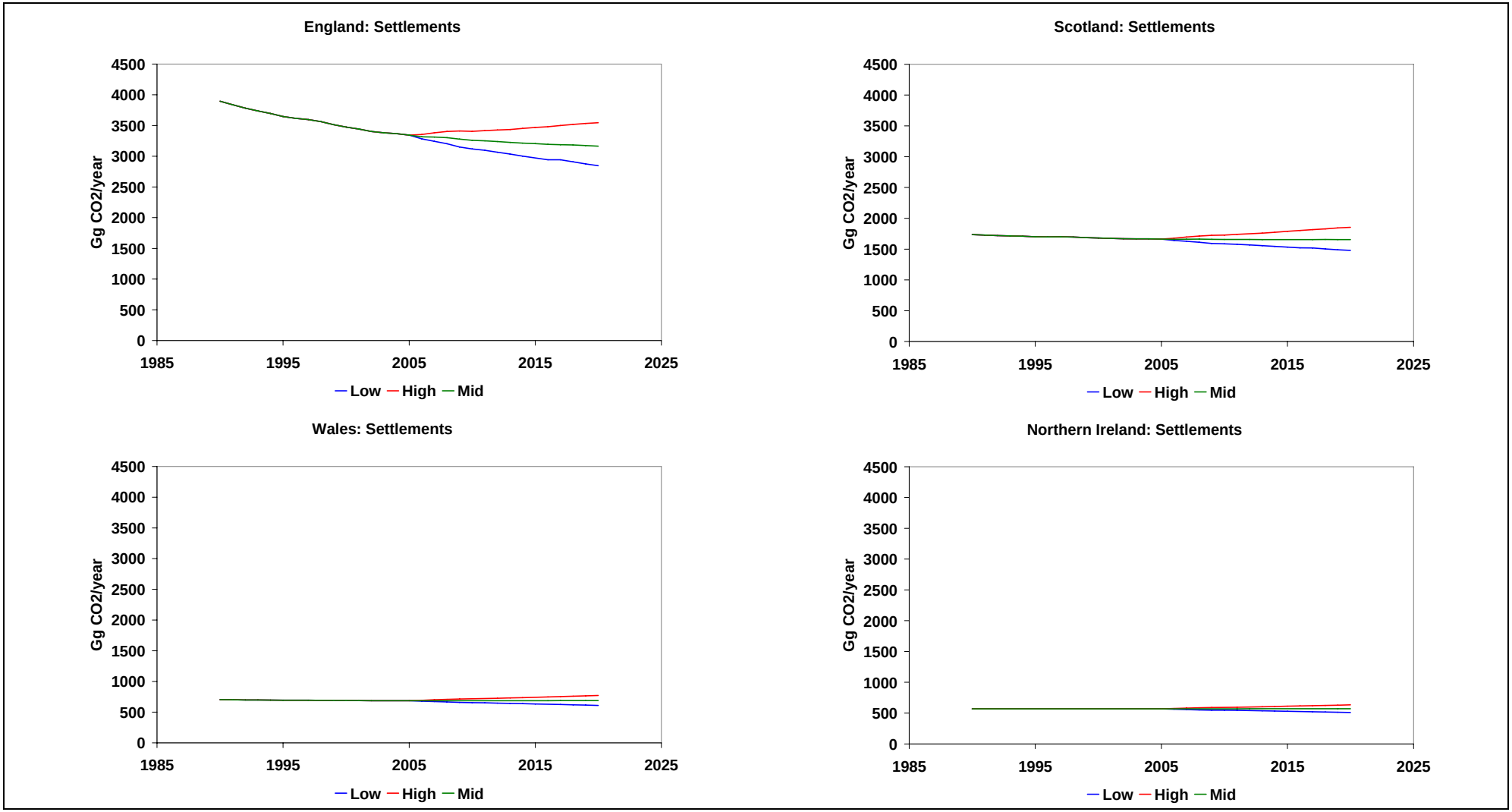

Figure 4-7: Projections to 2020 of Net Emissions of carbon dioxide from the atmosphere in England, Scotland, Wales and Northern Ireland by the Settlements (Urban) Category (5E) for 3 future emissions scenarios