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Implementation of CAP reform in England

Evidence Paper

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Introduction

1. This evidence paper assesses the impact of the new Common Agricultural Policy and analyses the associated decisions being consulted upon. This introduction sets out the UK's aims for CAP, the decisions being consulted on in England and explains the structure of the rest of the document.

2. For the period 2014-2020 the EU wide budget for CAP is equivalent to 36% of the EU budget. The budget of €362.8 billion[1] (2011 prices) for the new Common Agricultural Policy (CAP) is determined by the EU budget settlement reached during the Multi-Annual Financial Framework (MFF) negotiations, and the resulting allocations between member states. The policies determining how these monies are spent is then set out in European CAP regulations and in implementing regulations for which draft texts have not yet been published.

3. The impact in the UK, and specifically in England, will be determined by the allocation of the EU budget between member states, the distribution of UK budget between England and the devolved administrations, and the impact of the CAP regulations determining how that money is spent. This includes both mandatory elements of the CAP, and issues where member states have flexibility in their spending and implementation decisions including at a national or regional level, i.e. within England or within the existing three payment regions.

4. In the context of a reduced CAP Budget, the UK's key aims for the CAP negotiations were:

   a. to increase the resilience, market orientation and international competitiveness of EU agriculture

   b. to improve CAP's capacity to deliver environmental outcomes

   c. to simplify CAP for farmers and authorities

[1] This figure is for financial years, unless otherwise stated all other figures presented in this document are for scheme years.

5. There are a number of decisions on how the CAP budgets are allocated that will play an important role in determining the impact of the new CAP[2]. These include:

    a. The option to transfer up to 15% of Pillar 1 funds to Pillar 2. The system of 'reductions' may also make a small contribution to the size of the Pillar 1 to Pillar 2 transfer.

    b. The new CAP requires farmers to undertake 'Greening' measures in order to receive 30% of their direct payment. Under the regulations, Greening will comprise three standard measures which apply across Europe, but member states may choose to operate a 'national certification scheme' as an alternative.

    c. Decisions on the implementation of direct payments that will alter the distribution of payments to English farmers, in particular the regional distribution of payments in England.

6. This evidence paper is structured as follows:

    a. The high-level impact of changes to the EU wide CAP budget, and the agreement reached by EU Agriculture Ministers in June (Chapter 1);

    b. Assessment of the options for the decision in England on the amount of funds transferred from Pillar 1 to Pillar 2 (Chapter 2);

    c. Assessment of the impact in England of the requirement for farmers to undertake Greening measures in order to receive their full direct payment (chapter 3);

    d. Other decisions on how the Pillar 1 allocation will be spent in England (Chapter 4).

7. The options for, and impact of, spending within Pillar 2 is being covered in the Rural Development Programme for England impact assessment.

8. Further assessment of aspects of Pillar 1 will be captured when options under the direct payment and sCMO regulations are exercised in the domestic legislation in England.

[2] The consultation document contains the full list of questions

9. There are interactions between some elements of the decisions outlined above, in particular:
    a. the Pillar 1 to Pillar 2 transfer will determine the finances available in each Pillar;

    b. the design of RDPE will be greatly influenced by the finances available including any transfer; and

    c. the design of the new agri-environment schemes in Pillar 2 will need to build on Greening

10. All calculations are based on an indicative English allocation of £14bn[3] for the period 2014-2019 unless otherwise indicated.

[3] Assuming 65.5% of the UK payments ceiling is allocated to England as under current SPS.

Summary table of main impacts of the new CAP

1. The below table shows where changes in the new CAP will have the most significant impact.

Table 1: Main impacts of the new CAP

Issue	Impact
EU-wide CAP budget reduced by 13% in real terms	CAP budget of €362.8bn for the period 2014-2020 (2011 prices) continues to represent a significant burden on taxpayers, with Pillar 1 budget of €277.9bn delivering poor value for money
Removal of sugar beet production quotas by end of 2017	Lowers EU sugar prices by up to 20 percent, rising to 35 per cent if restrictions on cane imports are also relaxed. Consumers enjoy overall savings of 1% in the price of the average food basket if production quotas and import restrictions are removed
Decision to transfer up to 15% of Pillar 1 budget to Pillar 2 in England	A 15% transfer would generate net benefits around £3bn from spend in Pillar 2 compared to a potential lost agricultural output of £0.1bn arising from the transfer out of Pillar 1
Greening requirements introduced as required in CAP reform	Net benefits from implementing Greening in England estimated up to £1bn, mostly arising from Ecological Focus Areas
Possible migration of basic payments 'up the hill' in England	If this option is adopted this would adjust present distribution of funds between the three English regions, increasing payments in the upland regions.

Chapter 1: Overall impact of CAP

1. This chapter sets out the main impacts of the new CAP, including the distortions it creates and the limited extent to which the new CAP has delivered on meaningful reform. It covers the overall impact of CAP, and the specific impact of direct payments and market interventions in Pillar 1.

2. The UK has argued for a new CAP to help deliver an efficient and responsive agricultural sector in the EU and globally, with the aim of an EU agriculture sector that is more competitive and market-oriented whilst providing environmental public goods that the market does not reward.

UK has sought to reduce subsidies and interventions in agriculture…

3. The UK has always made clear that its aim is a move away from subsidies and market interventions. There is scope for using taxpayers money to pay farmers for public goods that the market otherwise would not reward, such as protecting the natural environment and supporting biodiversity.

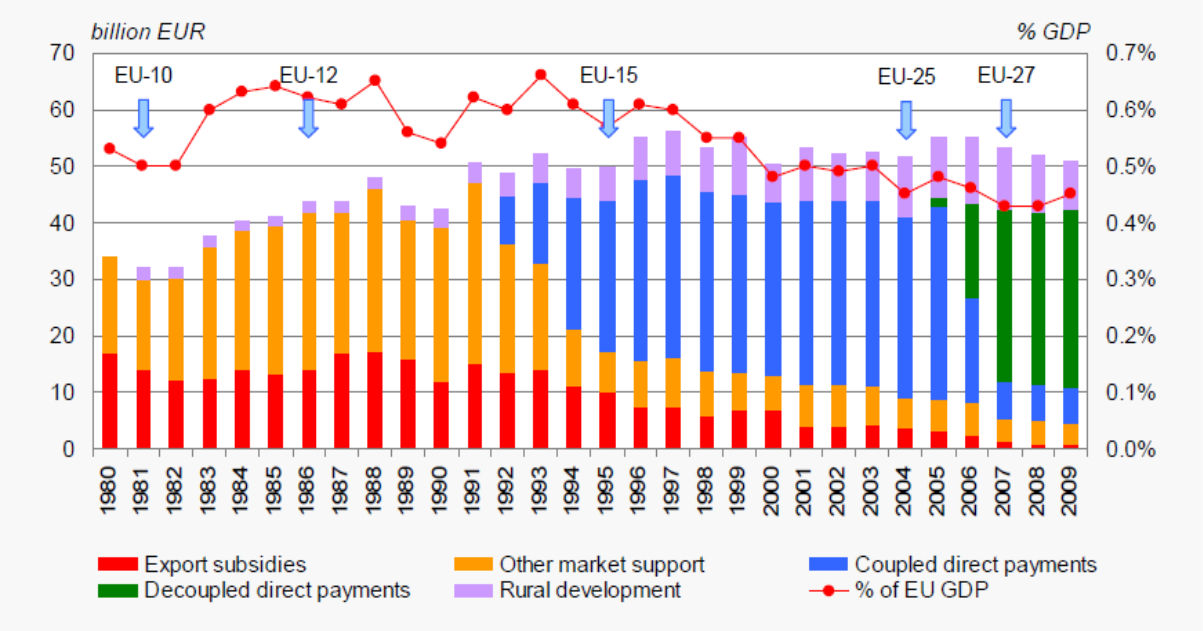
4. In this context, the UK argued for a greener CAP, with the emphasis on this being delivered through Pillar 2 of the CAP. Pillar 2 plays an important role in funding agri-environment schemes, along with measures to promote innovation, competitiveness and rural growth.

Past reforms have changed and improved the balance of EU spending…

5. Figure 1 below shows how past reforms moved away from subsidies linked to production and reducing expenditure on export refunds and other market support. Direct payments to farmers have been increasingly decoupled[4] and replaced by uncoupled payments.

[4] Coupled payments are those that are directly linked to production

Figure 1: Changing structure of CAP budget (2007 constant prices)



Source: European Commission CAP Post 2013 Key Graphs & Figures

6. Historically the combined impact of direct payments and market interventions is to raise prices for agricultural commodities. It is not only the impact on the farming sector that needs to be taken into account, but the value for money for taxpayers, and the costs to consumers of higher food prices.

7. Although the balance of expenditure has changed, there remains a significant cost to both consumers and taxpayers. At the EU level, OECD data shows that from 2010-2012 the average total support for agriculture was €91bn, with an average annual transfer from consumers of €13bn and average transfer from taxpayers of €79bn.

Other countries have successfully liberalized without the sector collapsing…

8. Other countries have successfully liberalised, for example Australia and New Zealand both radically reduced the subsidies and market support received by their farm sectors since the 1980s – see table below which gives an internationally comparable estimate of the support that producers receive from government interventions.

Table 2: Government support for Farming as a proportion of Farm incomes

Producer Support Estimates[5] as a percentage of farm receipts				
	Australia	New Zealand	US	EU
1986 – 88	10%	10%	22%	39%
1995 – 97	6%	1%	12%	34%
2010 – 12	3%	1%	8%	19%

Source: OECD – Agricultural Policy Monitoring and Evaluation 2013

9. Both countries have nearly eliminated agricultural support, in a way that has not been matched by the EU or the US. The result is that the total receipts for Australian and New Zealand farmers are nearly identical to what they would have been if output was valued at the price on world markets. In comparison EU farmers received prices that were 4% above world prices in 2010-2012[6].

10. England's resource endowment does not mean that ending subsides would result in the same export success as that experienced by highly competitive agricultural net exporters, But the trade performance of Australia and New Zealand, see Table 3 below, suggests that subsidies can be cut without making a country uncompetitive in global agricultural markets.

Table 3: Net trade performance

Agro-Food Trade Balance 2011, US$bn	
Australia	20.9
New Zealand	17.2
US	39.2
EU	-7.8

Source: OECD Agricultural Policy Monitoring & Evaluation 2012

[5] Producer Support Estimate (PSE) is the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures that support agriculture.

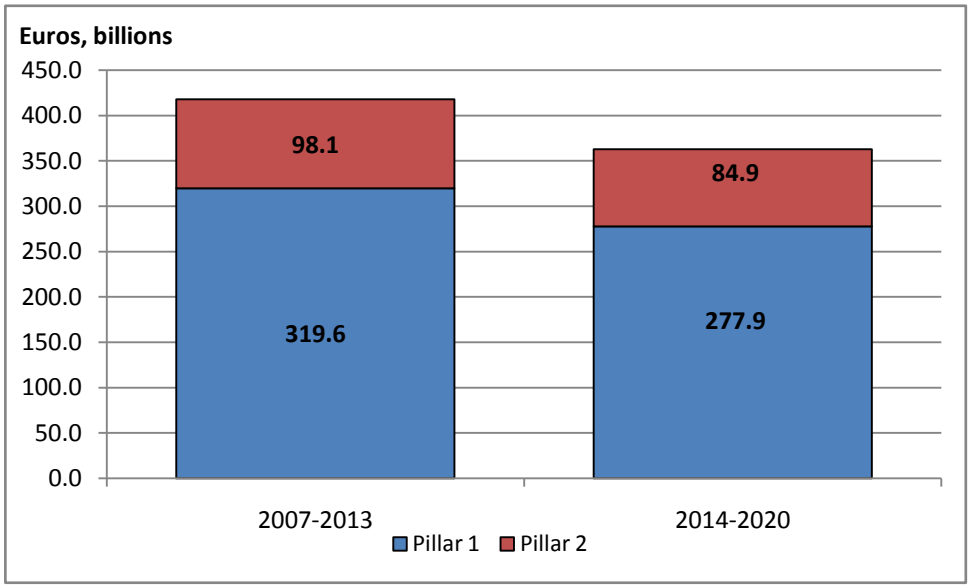
[6] Calculation of ratio of producer price to border price taken from OECD Agricultural Policy Monitoring and Evaluation 2013

MFF negotiations delivered a smaller CAP budget…

11. The EU-wide budget for CAP was agreed at €362.8 billion (2011 prices) for the period 2014-2020, equivalent to 36% of the EU budget, compared to 40% over 2007-2013.

12. Pillar 1 remains the largest part of the CAP (€277.9 billion). Pillar 1 saw a real terms cut of Euro 41.8bn, whilst Pillar 2 was cut by Euro 13.2bn, equating to a 13.1% and 13.5% cut respectively – see Figure 2 below.

Figure 2: CAP EU-wide budget change (2011 prices)



Source: European Commission

13. Given the continued size of Pillar 1, the CAP will continue to impose significant costs on EU consumers and taxpayers. Whilst the cost on taxpayers may fall slightly from historic levels[7] it will still be substantial.

Specific impact of direct payments

Although decoupled, direct payments still provide poor value for money…

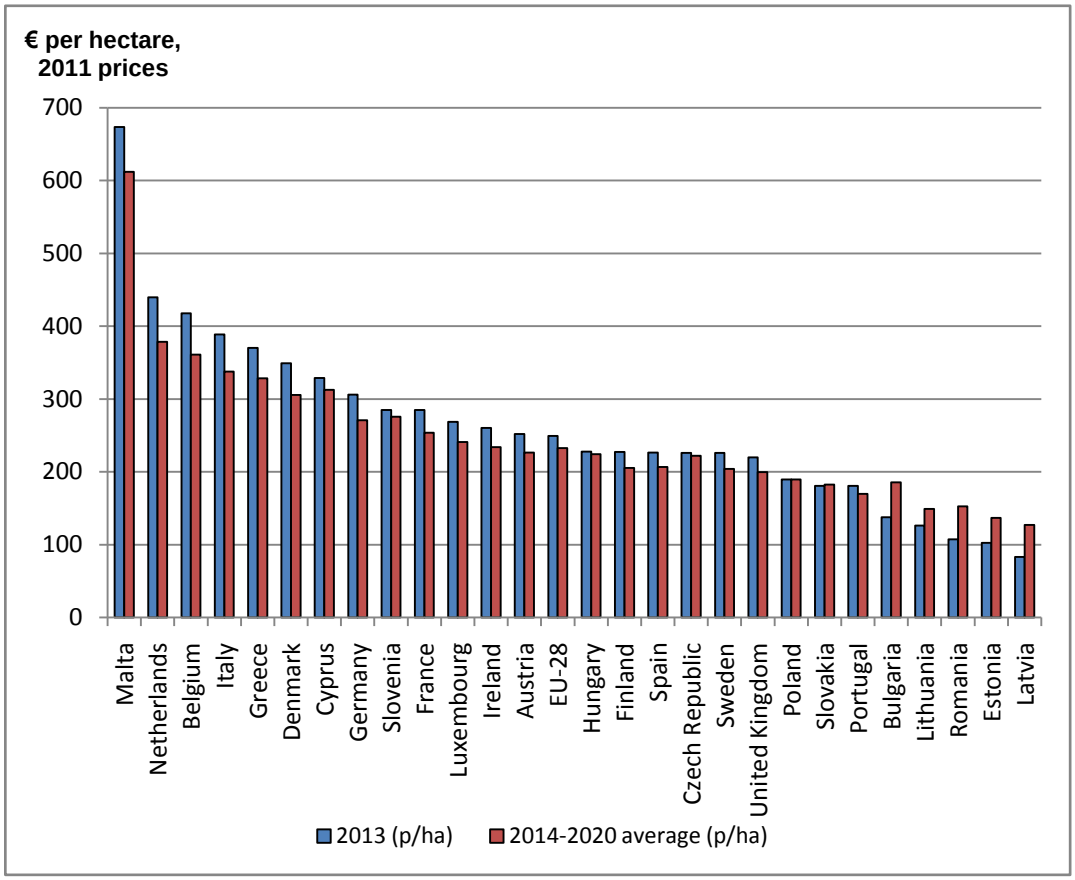
14. The majority of Pillar 1 expenditure remains on direct payments, however there is little rationale for them. Direct payments are not targeted on any particular market failure, and provide little value for money for the taxpayer. Other forms of public expenditure can usually demonstrate greater benefit than direct payments.

[7] See paragraph 6 above

15. In many respects the direct payments can be thought of as compensation for previous reforms when market support and coupled payments were reduced. And it is argued by some that they are intended to provide a form of income support for farmers.

16. The current system of direct payments gives rise to uneven allocations across the EU. The budget has been distributed according to the need to compensate for loss of previous schemes (as long ago as the mid 1990s), rather than to mitigate differences in resource endowment or other sources of competitiveness. This wide variety in payments per hectare is shown in Figure 3 below. If anything the distribution of Pillar 1 resources, with its link to historic production, follows the distribution of resource endowments.

Figure 3: Direct payments by member state per hectare (2011 prices)



Source: European Commission

And will continue to have other detrimental impacts…

17. Direct payments have several other impacts in the farming sector.

18. Farmers do not respond as directly to market price changes as they would do without the subsidy of a direct payment. In theory decoupled payments have no impact on production and so differing levels of decoupled payments should not affect production or prices, and therefore not impact on competition. Indeed under World Trade Organisation rules decoupled payments are classified as non or minimally trade distorting.

19. However, without direct payments, farmers would face market prices without subsidy to cushion the impact on farming activities. Therefore direct payments may slow down the rate of structural change which is an important part of efficiency gains in the sector.

20. Also, although direct payments are decoupled from production, they may continue to exert a very small positive influence on production, resulting in more production than is economically efficient. The reasons for this are explored in chapter 2.

21. Furthermore, the value of the direct payment is often reflected in land-prices. In particular, evidence suggests that decoupled payments tend to be capitalised into agricultural land rents and values. Studies for the European Commission[8] estimate that eliminating direct payments would lead to a 6% reduction in land use and a 30% reduction in land prices across Europe. However there would only be a modest change in agro-food production if both subsidies for CAP and trade tariffs were eliminated. This suggests that the modest reduction in direct payments agreed in the MFF will have relatively little negative impact on farm production.

22. The strength of this effect will vary across Europe depending on how much farmland is available on the market, and what other regulations are impacting on land use, tenancies and sales. If the payment is driving up land rents, then reducing the payment should drive down the land rents and the costs the farm business faces, all other things being equal. This will compensate farmers for the reduced payments; if payments are fully capitalised into land rents this will be a full compensation. However landowners, who in many cases are also farmers[9], will suffer a loss of wealth.

[8] Scenar 2020 study
[9] Farm Business Survey data suggests approximately 40% of farms are owner occupied

23. Finally, direct payments impact on farm cash-flow and debt levels. For farmers who have taken out debt against the value of their land, a loss of value could be troublesome. The sizeable minority of farmers with low levels of liquidity may find it particularly difficult to adjust to lower land prices – see Annex 1 for further analysis which finds that 18% of farms have current liabilities that exceed current assets.

Redistribution of Pillar 1 between EU member states has relatively little impact on the UK…

24. There are many factors which affect competitiveness within Europe and the impact of differing levels of direct payments between member states is far from clear cut. The difference between productivity levels between countries reflect a wide variety of factors including:

    i. Levels of investment in research and development
    ii. The uptake of innovative approaches
    iii. Taxation levels
    iv. Natural resource endowments
    v. Structural legacy of the industry
    vi. Skills and training of the agricultural workforce
    vii. Planning and other controls on development of agricultural land

25. The outcome of the negotiations means that the new CAP involves a re-distribution towards member states that received a lower direct payment per hectare. The national envelopes are adjusted using a formula that increases payments to those Member States that currently receive less than 90% of the EU average payment per eligible hectare, reducing the gap between the current figure and 90% of the EU-27 average by one-third.

26. Modelling work using the FAPRI model[10] (see Box 1) has looked at the impact of this redistribution. The impact of this change on aggregate output is negligible, with the impact on projected EU-27 livestock numbers and crop areas are all less than 0.5%.

27. The UK gets a slight uplift in direct payments from this redistribution, but this increase, combined with the negligible EU-wide price impact, is insufficient to significantly stimulate production increase at the UK level.

[10] FAPRI-UK Project Report (2013), "Impact of CAP Post-2013 Reforms on Agriculture in the UK"

Overall, the projected impact on UK market receipts plus direct payments minus costs is insignificant (0.2 per cent).

Box 1: FAPRI – UK Modelling System

The Food and Agricultural Policy Research Institute – UK model is maintained by the Agrifood and Biosciences Institute (AFBI) at Queen's University Belfast. The FAPRI-UK modelling system captures the dynamic interrelationships among the variables affecting supply and demand in the main agricultural sectors of England, Wales, Scotland and Northern Ireland.

The model consists of a system of equations covering the dairy, beef, sheep, pigs, poultry, wheat, barley, oats, rapeseed and biofuel sectors. The UK model is fully incorporated within the EU grain, oilseed, livestock and dairy (GOLD) model run by FAPRI at the University of Missouri. The combined modelling system provides a systematic framework that takes account of interactions among the agricultural sectors in regional, EU and World markets. The model incorporates variables representing the major policy instruments associated with the EU CAP, as well as external trade commitments made by the EU.

The models generate annually-determined, 10-year Baseline projections of all the major agricultural commodity prices, production levels and greenhouse gas emissions, against which policy scenarios can be compared. Baseline projections provide a benchmark against which projections derived from policy scenarios can be compared and interpreted. The modelling system is then further simulated with changes to policy variables and the results are compared against the Baseline to isolate the policy effects across the ten-year projection period.

The FAPRI-UK project is funded by Defra and the devolved administrations. Documentation of the model is available online at Defra's research website here:

http://randd.defra.gov.uk/Document.aspx?Document=9857_FAPRI-UKDocumentationJune2011.pdf

Increase in coupled payments represents a step backward…

28. Under the current CAP, Member States have largely decoupled their payments and only a limited amount of coupling takes place in specific sectors. Under the new CAP, some Member States may use up to 8% of their direct payment ceiling for coupled payments, while others have a limit of 13%. A further 2% of direct payments can be coupled to the production of protein crops.

29. The UK has long opposed the use of coupled payments and nearly all of the UK support (except where the Scottish Government has continued to provide support to the beef sector) is now decoupled. Not only do coupled payments create market distortions but they can also result in overproduction leading to negative environmental and development impacts.

30. The CAP agreement requires that these payments may only be used to maintain current production levels – not increase them, but without careful policing across the EU, they could lead to an increase in production.

Evidence suggests that decoupling in the past improved productivity…

31. In terms of the long-term trend towards decoupling, the evidence suggests that decoupling has been effective in reducing market and trade distortions. Research[11] finds that decoupling helped improve productivity. In particular the effect of coupled subsidies on productivity levels before decoupling was negative and that in terms of productivity growth the effect was negative and statistically significant for ten of the EU-15 countries.

And that more coupled payments will distort markets…

32. Coupled payments are projected to have the most significant impact when they are used in extensive livestock sectors. Modelling has been used to determine the projected impact of coupled payments across agricultural sectors[12]. Under the next CAP (2014-2020), coupled payments worth up to 15% of Pillar 1 are permitted; in this note we take this to translate into €6 bn across the EU as a whole. The €6bn is split 80% and 20% between the E15 (old member states) and the E12 (new member states).

[11] See Rizov, Pokrivak and Ciaian (2012), "CAP subsidies and productivity of EU farms"
[12] FAPRI modelling

33. To investigate potential impacts, this amount was coupled to different sectors and compared to a baseline of no changes to coupled payments. The most marked impacts are on the dairy sector, in part because after 2015 the milk quota is abolished and therefore no longer provides a production ceiling for raw milk.

34. EU dairy cow numbers are 14% above baseline levels by the end of the period. The rise in dairy cow numbers translates into markedly higher milk production. By the end of the period, EU milk production is close to 10% above the output level contained in the baseline scenario. EU milk prices are very sensitive to production and as a consequence, EU milk prices fall 35% below baseline levels.

35. Increased raw milk output and lower EU milk prices feed through to the dairy commodity markets. Indeed, the scale of the increase in milk production is projected to lead to prices falling close to (and below) support price levels within the EU. By the end of the projection period, exports of butter could reach approximately 100,000 tonnes per annum[13]. Put another way, a third of total EU butter exports would need to be exported with subsidy in order to maintain support price levels.

Impact of market interventions

Market interventions can be costly for consumers…

36. Market price support includes intervention prices, storage aids and export subsidies. These are also funded under Pillar 1 of the CAP and cost the EU Budget approximately €4bn per annum currently.

37. Market price support combines with the EU's high agricultural import tariffs[14] (see Table 4) and the EU's biofuel policy to increase agricultural prices in the EU at an annual cost to EU consumers in 2011 of €10.7 bn[15]. Preliminary OECD figures suggest the figure in 2012 is significantly higher (over €16bn). Prior to recent international food commodity price spikes, the cost to EU consumers was much higher (€40.3bn in 2006).

[13] This is equivalent to around 5% of total EU butter production or a third of total EU butter exports.
[14] EU average applied tariffs on agricultural goods are 13.9%, source World Trade Organisation
[15] OECD Agricultural Policy Monitoring and Evaluation 2012

Table 4: EU applied agricultural tariffs are much higher than on industrial goods

		2011	2012	2013
All Products	Average of MFN tariffs	3.27%	3.21%	3.12%
	Average of preferential tariffs	0.88%	0.84%	0.83%
Agricultural	Average of MFN tariffs	14.41%	14.27%	12.78%
	Average of preferential tariffs	6.06%	5.86%	5.53%
Industrial	Average of MFN tariffs	2.43%	2.37%	2.38%
	Average of preferential tariffs	0.49%	0.47%	0.48%

Note: MFN i.e. the tariff applied to other WTO members who do not have preferential access to EU markets = Most favoured nation tariffs, In the calculation of MFN tariff averages, general tariffs (for non-WTO members) and non-MFN tariffs are included.
Source: Market Access Map, October 2013

It is unlikely that prices will fall enough to trigger greater intervention…

38. Depending on developments in world markets, the consumer cost of market price support on agricultural products could increase once again in some agricultural sectors. The latest OECD – FAO outlook projects commodity prices over the next CAP that are above EU support prices – full details are provided in Annex 2.

39. This analysis of the support price and baseline for each commodity shows that EU producer price for wheat and barley are furthest away from their respective support prices – an average 42% and 49% fall over the projection horizon would be required before intervention would be hit. For cheese, whole milk powder, butter and skimmed milk power the average reductions are -17%, -20%, -25% and -30%, respectively – see Annex 2.

40. Based on market simulations, it is possible to assess the frequency with which intervention prices would be hit, given the distribution of possible market outcomes in each year. In the cheese market, the simulations indicate there is a 45% chance in 2014 that prices would hit the level where special measures would be considered. Thereafter, the probability of triggering export subsidies remains at around 45% in 2015 and 2016. In the last three years of the projection horizon, the likelihood of exceptional measures being considered falls significantly (10%).

41. The likelihood of exceptional measures being considered for whole milk powder is very small (around 10% between 2014-2017) and virtually non-existent for butter. In the grains sector the simulations suggested that exceptional measures were extremely unlikely.

Biggest change to product specific interventions is removal of sugar quotas…

42. The existing sugar beet production quotas are a distortionary supply control and act to push up prices. However, the sugar regime also restricts imports of raw and white sugar into the EU which exacerbates the impact of the quota regime on internal prices.

43. The OECD-FAO model of global agricultural markets has been used to examine the impacts of quota extension and the trade regime[16]. The model is internationally recognised and projects all major agricultural commodity markets over the period 2012 to 2021 with detailed regional and policy coverage, including on CAP market instruments. We have concentrated on analysing the price impacts on sugar users and consumers.

44. Defra has estimated that abolishing the beet quota alone would lower EU sugar prices by up to 20 percent – see chart below. The precise impact depends on the level of sugar cane imports under the current trade restrictions. The 20 percent figure is based on the Commission forecasts of imports[17], however imports could be much smaller, and hence the price fall arising from beet quota abolition much lower.

45. The current shortage in EU imports, due to the current sugar regime, is projected to lead to EU domestic sugar prices being on average 35% higher than would be the case if trade restrictions were removed as well as beet production quotas. Based on the share of sugar and sugar-containing products in the Food Consumer Price Index (CPI), we have estimated that this broadly equates to a 1% rise in the price of the average consumer food basket.

46. To the extent that there is a subsequent decrease in the price of sugar, the removal of beet quotas is likely to have negative implications for the 18 sugar cane-producing countries of the African, Caribbean and Pacific group (ACP)[18]. Whilst the best way for ACP countries to improve competitiveness is not through extending beet quotas, it has been recognised that there are transition costs for those countries. The EU

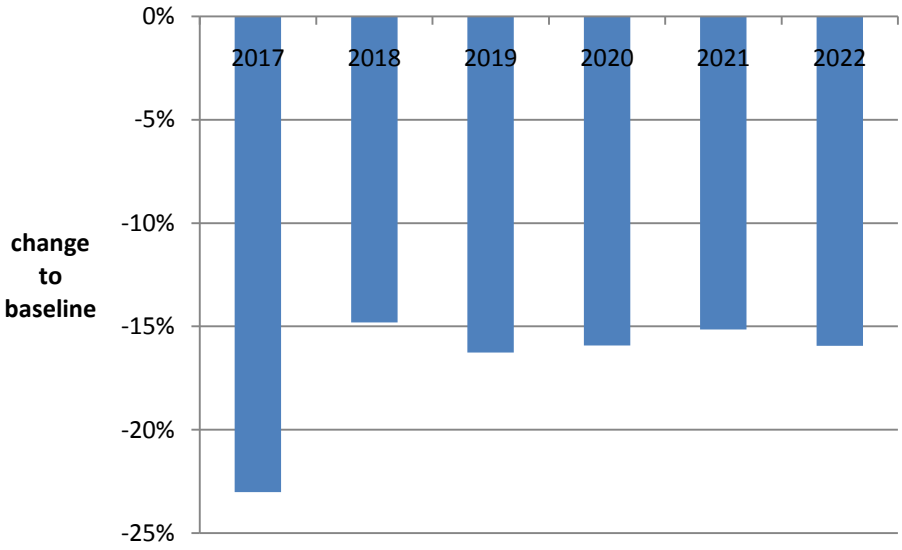
[16] DEFRA calculations using OECD-FAO Aglink-Cosimo model [to be published]. The results of any analysis based on the use of the Aglink-Cosimo model by parties outside the OECD are outside the responsibility of the OECD Secretariat. Conclusions derived by third party users of AGLINK-COSIMO should not be attributed to the OECD or its member governments.

[17] OECD-FAO Agricultural Outlook 2013-2022

[18] ODI for DFID The Impact of EU Sugar Policy Reform on Developing Countries, 2012

allocated funding for the ACP countries over seven years (2006-13) under the Accompanying Measures for Sugar Programme to help ACP countries adapt to EU reforms and to improve their competitiveness. However, the full benefits of the investment made possible by these funds, which have yet to be fully disbursed, are unlikely to be felt by many ACP countries by the time of the 2017 end date for quotas. Some developing country suppliers may struggle to be competitive on the EU market at that point. This could have knock-on effects for the UK cane industry and by-products that exclusively require cane. Further analysis of these impacts on the EU market is currently being produced by Defra.

Figure 4: Impact of removal of sugar beet production quotas on EU sugar prices



Source: Defra modelling

Chapter 2 – Impact of options to transfer up to 15% of funds in Pillar 1 to Pillar 2

1. This chapter sets out the main impacts of transferring funding from Pillar 1 (direct payments) to Pillar 2. It considers three options of transfer (1%, 9% and 15%), setting out the benefits and costs of each in turn. Funding transferred into Pillar 2 is available for the Rural Development Programme for England (RDPE) to support agri-environment schemes, growth of the rural economy and improving productivity and competitiveness of the agricultural industry. These schemes deliver a range of economic, social and environmental benefits.

2. During the period 2007 – 2013 England implemented transfers from Pillar 1 to Pillar 2. One element of this transfer was "compulsory modulation" which member states were required to transfer. The second element was "voluntary modulation" which the UK was the only member state to implement in every year of the period 2007 - 2013. On average, over 2009 - 2013 voluntary modulation was worth 12% of the direct payments ceiling for England, after the deduction of compulsory modulation. Going forward compulsory modulation will no longer be required as this has been incorporated into Pillar 2. Member states can choose to implement transfers, similar to voluntary modulation, of up to 15%.

3. The costs of transferring funding from Pillar 1 are very small in comparison to the benefits. The costs arise from a small reduction in England's agricultural production due to lower Pillar 1 payments. In this chapter we model the impact and estimate the market value of the lost output. This will be an overestimation of the economic cost of the transfer as it does not take into account the resource costs that would have been incurred in producing those extra units of production.

Summary of findings

4. Our modelling suggests that, at the aggregate level, a reduction in Pillar 1 funding will have a very small impact on England's agricultural production levels.

5. Experience with voluntary modulation in the period 2007 - 2013 suggests there was little adverse impact on England's competitiveness and whilst the evidence base in this area is limited, the UK's agricultural production has kept pace with the rest of the EU.

6. The range of net benefits of Pillar 2 spend generated by the different expenditure options are considerable. Table 5 shows that compared to the 'do minimum' option of transferring 1% from Pillar 1 to Pillar 2, the additional benefits overwhelmingly outweigh the costs of the transfer.

Table 5: Benefits and costs of transferring funding from Pillar 1 to Pillar 2

Scenario	Net Benefits of Pillar 2 spend (£m PV)	Costs of transfer - lost production (£m PV)
9% transfer	1,349 – 1,809	67
15% transfer	2,760 – 3,322	100

Notes: Costs are estimated as lost production (i.e. revenue). However this is an over- estimate of the actual costs of the transfer as farmers would save the resource costs of this production. For each of the transfer scenarios there are options for how the funding is allocated between different schemes within Pillar 2. The benefits presented in this table are the range of the central benefit estimates for each of those different options. Further sensitivity analysis is available in the RDPE impact assessment.

Costs of transferring funding from Pillar 1 to Pillar 2

Modelling the impact on agriculture of transferring money out of Pillar 1…

7. To assess the impact of transferring funding from Pillar 1 to Pillar 2 modelling has been undertaken by FAPRI[19] (see Box 1). The model provides the best tool for assessing the impact of a reduction in direct payments whilst holding all other variables constant. The model is based on an internationally recognised modelling system used globally for agricultural market analysis. The UK model has undergone robust academic peer review and is used by England, Scotland, Wales and Northern Ireland.

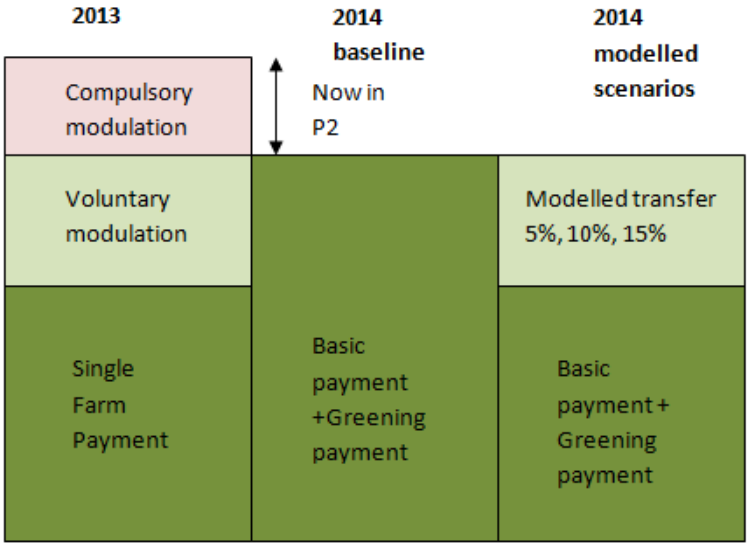
8. The modelling was jointly commissioned by DEFRA and the devolved administrations. Four scenarios have been modelled: a 5%, 10%, 15% and

[19] Sectoral Impact of Transferring Fund from CAP Pillar 1 to Pillar 2, October 2013

20% transfer levels. These transfers are after the transfer of the hitherto compulsory modulation monies from Pillar 1 to Pillar 2, which following the establishment of the 2014 - 2020 budget will be permanently part of Pillar 2. It should be noted that the 20% scenario is above the maximum 15% that can be transferred and is therefore a hypothetical scenario included to assess the sensitivity of the results. The four scenarios are assessed against a baseline of no further voluntary transfer, i.e. a scenario of 0% transfer.

9. Figure 5 illustrates the scenarios, the baseline and how these compare to the situation in 2013.

Figure 5: FAPRI scenarios and comparison to 2013 scenario



10. It should be noted that the modelled transfers (5%, 10% and 15%) differ slightly from the policy options which are:
    a. 1% - 'do minimum' transfer necessary to meet the contractual commitments from current agri-environment and forestry agreements that extend into the new Programme period.
    b. 9% - the average level of voluntary modulation in 2013.
    c. 15% - the maximum allowed under the new CAP.

11. Given the do minimum option is a 1% transfer, and the modelling has a baseline of a 0% transfer, the analysis will slightly overestimate the impact of each option. Table 6 sets out which modelled scenarios have been used when considering each of the policy options.

Table 6: Policy options and modelled options

Policy scenario	FAPRI modelled scenario	Effect on cost estimate of each policy scenario
Do minimum 1%	0%	Baseline underestimated
Option 1 - 9%	10%	Cost overestimated due to low baseline and higher modelled transfer
Option 2 -15%	15%	Cost overestimated due to low baseline

12. The FAPRI modelling was jointly commissioned by DEFRA and the devolved administrations and assumes the transfer takes place across the whole of the UK (i.e. all parts of the UK make the same choice). It also assumes that no other Member States implement a transfer.

13. Scenarios that model the impact if England implemented a transfer independently of Scotland, Wales and Northern Ireland are not available. Furthermore, we have not modelled the impact of the decision of other EU member states on Pillar transfer, including where any member states implement a reverse transfer (moving funding from Pillar 2 to Pillar 1).

14. All other potential changes to direct payments, e.g. under the Young Farmers Scheme are not included in the modelling. Furthermore the modelling does not take into account the reduction in the overall CAP budget over the period 2014 - 2020, as it was commissioned before budgets were available. However it does capture the relative impact of a transfer in the UK alone.

15. Direct payments are decoupled from production in England (farmers' payments do not depend on their level of production). This means that farmers claim the same direct payment whatever their level of production and direct payments should not, in theory, influence levels of production. However, evidence suggests that direct payments do continue to exert a small influence on production[20]. The intuition behind this is that direct payments provide:
    a. Insurance and wealth effects: By increasing farmers' income, direct payments can reduce farmers' sensitivity to risks such as fluctuations in output prices[21].
    b. Improved access to finance: The steady flow of income arising from direct payments can make it easier for farmers to access credit which in turn increases investment.
    c. Higher land prices: Direct payments tend to be capitalised in land and so put an upward pressure on the cost of agricultural land. Whilst the effects in a) and b) put an upward pressure on agricultural output, higher land prices have a partial countervailing impact on production.
    d. Opportunities for cross-subsidisation: Farmers may use direct payments in ways that effectively cross subsidise a particular activity, either by accident (e.g. if costs are not closely managed) or design (e.g. if business profitability is not the primary motivation).

16. As a result of the effects listed above, direct payments can influence the decision by individual farmers to continue to operate a farm rather than exit the industry. This can free up land for use by other farmers. As a result, a fall in direct payments does have some effect on aggregate production. This will however be much lower than the impact of coupled payments which can significantly influence farmers' production decisions.

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[20] Bhaskar, Arathi & Beghin, John C. "How Coupled Are Decoupled Farm Payments? A Review of the Evidence," Journal of Agricultural and Resource Economics, Western Agricultural Economics Association, vol. 34(1), April. 2009

Witzke H., Noleppa S. and Schwarz G. "Decoupled Payments to EU Farmers, Production and Trade: An Economic Analysis for Germany." Working Paper number 90/2010 of Humboldt Universitat Zu Berlin. 2010

Chantreuil F., Levert F. and Hanrahan K. "The Luxembourg Agreement Reform of the CAP: An Analysis using the AG-MEMOD Composite model." Proceedings of the 89th European Seminar of the European Association of Agricultural Economists (EAAE) on Modelling Agricultural Policies: State of the Art and New Challenges, 2nd - 5th February 2005, Parma. 2005

[21] Heynnessey, D.A.– "The Production Effects of Agricultural Income Support Policies under Uncertainty". *American Journal of Agricultural Economics,* 80, 1, pp46-57. 1998

17. It should be noted that the increase in aggregate production that will result from direct payments is not efficient from a society point of view if the capital and labour employed in the production could be more productively employed in other activities. Furthermore, whilst at the aggregate level a reduction in direct payments could lead to a small reduction in production, there could be a much larger degree of structural change. Inefficient farmers would exit and more efficient farmers would take over some or all of their land and capital. Only the least productive land would be expected to leave agricultural production.

18. In line with the standard FAPRI EU model, it is assumed that the decoupled direct payments have a 30% production stimulating impact compared with the observed influence of the old coupled payments (a decoupling coefficient of 0.3). This means that one euro of direct payment is assumed to have the same impact on production as 0.3 euro of coupled payments. The decoupling coefficient is varied to 0.1 and 0.5 in order to assess the sensitivity of the results to this assumption. It should be noted that the decoupling coefficient in FAPRI is higher than other models such as the OECD FAO Aglink COSIMO which uses decoupling coefficients at less than 0.1.

Results show a transfer out of Pillar 1 has little impact on agricultural output…

19. The modelling reveals a very modest reduction in agricultural activity with some variation between sectors. Table 7 shows the implications or impacts on agricultural output for each of the spending options modelled.

Table 7: Projected Changes in Activity Levels in England, percentage difference in 2021 compared to no voluntary transfer

	Decoupling Coefficient 0.1				Decoupling Coefficient 0.3				Decoupling Coefficient 0.5			
	5%	10%	15%	20%	5%	10%	15%	20%	5%	10%	15%	20%
England Livestock Sector												
Beef cows	-0.2%	-0.4%	-0.7%	-0.8%	-0.5%	-1.0%	-1.5%	-2.0%	-0.7%	-1.4%	-2.2%	-2.9%
Dairy cows	0.0%	-0.1%	-0.1%	-0.2%	-0.1%	-0.2%	-0.3%	-0.4%	-0.2%	-0.4%	-0.5%	-0.7%
Total Cattle	-0.1%	-0.2%	-0.3%	-0.4%	-0.3%	-0.5%	-0.8%	-1.0%	-0.4%	-0.8%	-1.2%	-1.6%
Ewes	-0.1%	-0.2%	-0.4%	-0.4%	-0.3%	-0.6%	-0.9%	-1.2%	-0.4%	-0.9%	-1.3%	-1.8%
Total Sheep	-0.1%	-0.2%	-0.3%	-0.4%	-0.3%	-0.6%	-0.8%	-1.1%	-0.4%	-0.9%	-1.3%	-1.7%
Sows	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total pigs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Poultry production	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Milk production	0.0%	-0.1%	-0.1%	-0.2%	-0.1%	-0.2%	-0.3%	-0.4%	-0.2%	-0.4%	-0.5%	-0.7%
England Crops Sector												
Area												
Wheat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	0.0%	-0.1%	-0.1%	-0.2%
Barley	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	0.0%	-0.1%	-0.1%	-0.2%
Rapeseed	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%

Source: FAPRI "Sectoral Impact of Transferring Funds Between Pillar I and Pillar II" 2013

20. It is important to note that the FAPRI model generates estimates of the impact on production. In the analysis below these are multiplied by prices to generate lost revenue figures. This will substantially overestimate the economic costs of transferring funding from Pillar 1 to Pillar 2 because revenue figures do not take into account the costs and resources that would have been incurred in producing those extra units of production.

21. Farm Business Survey data reveals that for an average farm across England, input costs[22] equated to 78% of output in 2011/12. However, there is large variation between farms and in some cases input costs actually exceed revenue. If these were the farms to cease production the reduction in production would actually represent an economic benefit.

22. Input costs also vary by type of farm: Grazing livestock input costs were 74% of output in 2011/12, while poultry was 94%. This implies that the economic cost of the Pillar 1 to Pillar 2 transfer is in the region of just 6% to 26% of the revenue lost from the fall in output.

[22] Input costs are costs incurred in the production process, e.g. feed, materials, labour and machinery.

‘Do minimum’ (1% transfer)

23. When assessing the impact of option 1 (9% transfer) and option 2 (15% transfer) these should be considered against a baseline of the ‘do minimum’ (1% transfer). However it should be noted that the FAPRI modelling did not consider a 1% transfer. Given this options 1 and 2 are compared to a baseline of a 0% transfer and will be a slight overestimation of the impacts.

Option 1 (9% transfer from Pillar 1 to Pillar 2) has a very small impact on output…

24. The 10% transfer is the closest modelled scenario to this option and so the basis for our analysis.

25. Under this option, Table 7 shows that beef cows would be most affected with a 1.0% reduction within England by the year 2021. Ewe and sheep numbers would also be expected to fall slightly by 0.6% whilst the number of dairy cows would decrease by 0.2%. For pig, poultry, wheat, barley and rapeseed production the impact is minimal. The falls in production arise from some farms exiting the market as a result of the fall in direct payments.

26. The overall impact on prices is marginal given that prices are predominantly determined at the EU level so UK production has a small impact. Nevertheless, cattle prices and sheepmeat prices are found to increase by 0.1% under the scenario of a 10% transfer.

27. The Net Present Value of this reduction in production equates to a £67million loss of revenue although the true economic cost will be lower. Table 8 below shows how this cost is split between sectors and years. It is also worth noting that in the first year the lost revenue for beef and sheepmeat is negative, implying that production will actually increase in the first year. This is as a result of a temporary increase in the slaughter rate as farmers seek to liquidate their herd in response to the reduction in direct payments.

Table 8: Net Present Value of production lost as a result of a 10% transfer of funding from Pillar 1 to Pillar 2

	Revenue of lost production (£m, 2013 prices, to nearest £100,000)									
	2014	2015	2016	2017	2018	2019	2020	2021	Total	% fall production in year 2021 compared to baseline
Beef	-£5.5	-£0.3	£1.1	£2.4	£3.1	£3.6	£3.8	£4.0	£12.2	**-1.0%**
Sheepmeat	-£1.6	£0.5	£2.2	£2.4	£2.4	£2.4	£2.4	£2.3	£13.1	**-0.6%**
Milk	£4.9	£4.6	£4.4	£4.2	£4.0	£3.9	£3.7	£3.4	£33.2	**-0.2%**
Wheat	£0.9	£0.8	£0.8	£0.7	£0.7	£0.6	£0.6	£0.5	£5.7	**-0.0%**
Barley	£0.2	£0.2	£0.2	£0.2	£0.2	£0.2	£0.1	£0.1	£1.4	**-0.0%**
Rapeseed	£0.1	£0.1	£0.1	£0.1	£0.1	£0.1	£0.1	£0.1	£1.0	**-0.0%**
Total £ per year	-£0.9	£6.0	£8.8	£10.1	£10.6	£10.8	£10.7	£10.5	£66.6	

Source: Defra analysis based on FAPRI price and production outputs
Note: Figures presented in 2013 prices using OBR GDP deflator forecasts and discounted by 3.5%. Negative figures in 2014 and 2015 result from a temporary increase in the slaughter rate as farmers seek to liquidate their herd in response to the reduction in direct payments.

28. Varying assumptions around the degree to which production is influenced by direct payments has some impact on the results. If a decoupling coefficient of 0.5 is assumed (i.e. direct payments have 50% of the production effect of the old coupled payments), the effect on production and therefore the value of lost production will increase. A decoupling coefficient of 0.1 would significantly reduce the impact of direct payments on production. Table 7 gives an indication of the sensitivity of the results to the decoupling coefficient. A decoupling coefficient of 0.5 would result in a beef cow reduction of 1.4%, whilst a decoupling coefficient of 0.1 leads to a beef cow reduction of 0.4%.

Option 2 (15% transfer) has a greater, but still small impact on agricultural production…

29. Beef cows production is found to decrease by 1.5% within England in the year 2021 under the 15% transfer scenario. Ewe and sheep numbers would also be expected to fall slightly by 0.9% and 0.8% respectively, whilst dairy cows would reduce by 0.3%. For all other sectors the impact is negligible with 0.0% impact on pig, poultry and rapeseed output and a 0.1% reduction in wheat and barley production.

30. Cattle prices and sheepmeat prices are found to increase by 0.2% under the scenario of a 15% transfer. The Net Present Value of this reduction in production equates to £100million of lost revenue although the true economic cost will be lower. Table 9 shows how this is split between sectors and years.

Table 9: Net Present Value of production lost as a result of a 15% transfer of funding from Pillar 1 to Pillar 2

	Revenue of lost production (£m, 2013 prices, to nearest £100,000)									
	2014	2015	2016	2017	2018	2019	2020	2021		Total
Beef	-£8.2	-£0.5	£1.7	£3.6	£4.6	£5.3	£5.8	£6.0	**£18.3**	**-1.5%**
Sheepmeat	-£2.4	£0.8	£3.2	£3.7	£3.7	£3.7	£3.6	£3.4	**£19.8**	**-0.8%**
Milk	£7.4	£7.0	£6.6	£6.3	£6.0	£5.8	£5.5	£5.2	**£49.8**	**-0.3%**
Wheat	£1.4	£1.3	£1.2	£1.0	£1.0	£0.9	£0.9	£0.8	**£8.5**	**-0.1%**
Barley	£0.3	£0.3	£0.3	£0.3	£0.2	£0.2	£0.2	£0.2	**£2.0**	**-0.1%**
Rapeseed	£0.2	£0.2	£0.2	£0.2	£0.2	£0.2	£0.2	£0.2	**£1.6**	**-0.0%**
Total £ per year	**-£1.3**	**£9.0**	**£13.2**	**£15.2**	**£15.9**	**£16.2**	**£16.1**	**£15.8**	**£100.0**	

Source: Defra analysis based on FAPRI price and production outputs
Note: Figures presented in 2013 prices using OBR GDP deflator forecasts and discounted by 3.5%. Negative figures in 2014 and 2015 result from a temporary increase in the slaughter rate as farmers seek to liquidate their herd in response to the reduction in direct payments.

31. Varying the decoupling coefficient to 0.5 would lead to a beef cow reduction of 2.2% whilst a decoupling coefficient of 0.1 would result in a beef cow reduction of 0.7%.

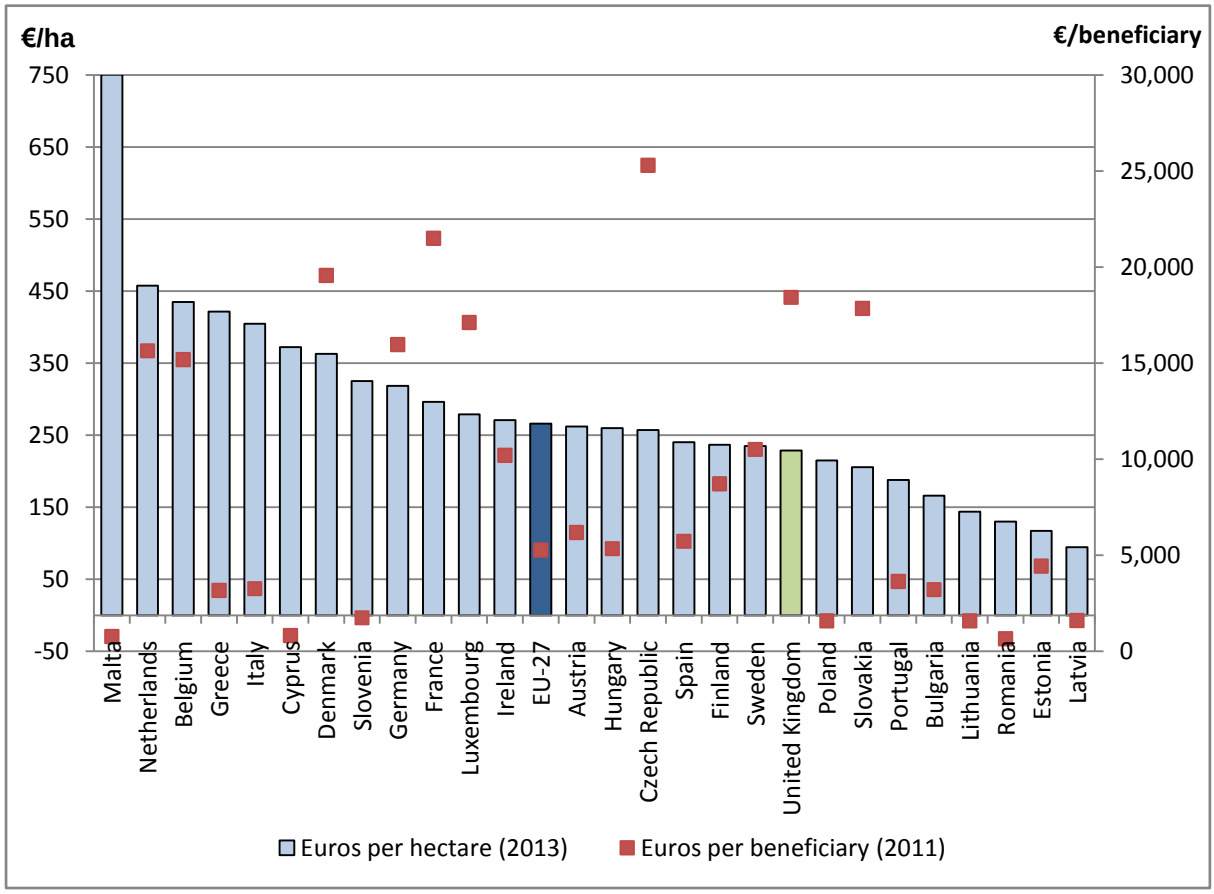
Agriculture in England not damaged by lower payments in the past…

32. The Common Agricultural Policy (CAP) has evolved into a policy under which Member States have considerable discretion as to how they organise support under both Pillars, and as a result the treatment of farmers varies across all Member States. Moreover, given that CAP Pillar 1 payments and all CAP Pillar 2 payments are deemed to be largely WTO Green Box compatible[23], then it follows that the transfer of funds between Pillars should not be significantly trade distorting, as money is simply moved from one compliant, non-distorting area of spending to another.

33. Figure 6 shows that there is already a wide variation in the levels of direct payments per hectare across different member states. The reason for this is that budgets are allocated according to the need to compensate for losses from previous schemes which were themselves varied and inconsistent. The resulting allocations are not linked to any differences in resource endowment or other sources of competitiveness. Whilst UK farmers receive less than some per hectare, they receive more per farmer than most.

[23] WTO categorise subsidies by "boxes" which are given traffic light colours (red, amber and green). In order to qualify for the "green box", a subsidy must not distort trade, or at most cause minimal distortion. Decoupled direct payments, environmental protection subsidies and regional development programmes are all classified as green box.

Figure 6: Average direct payments per beneficiary and per hectare in each member state



Source: European Commission

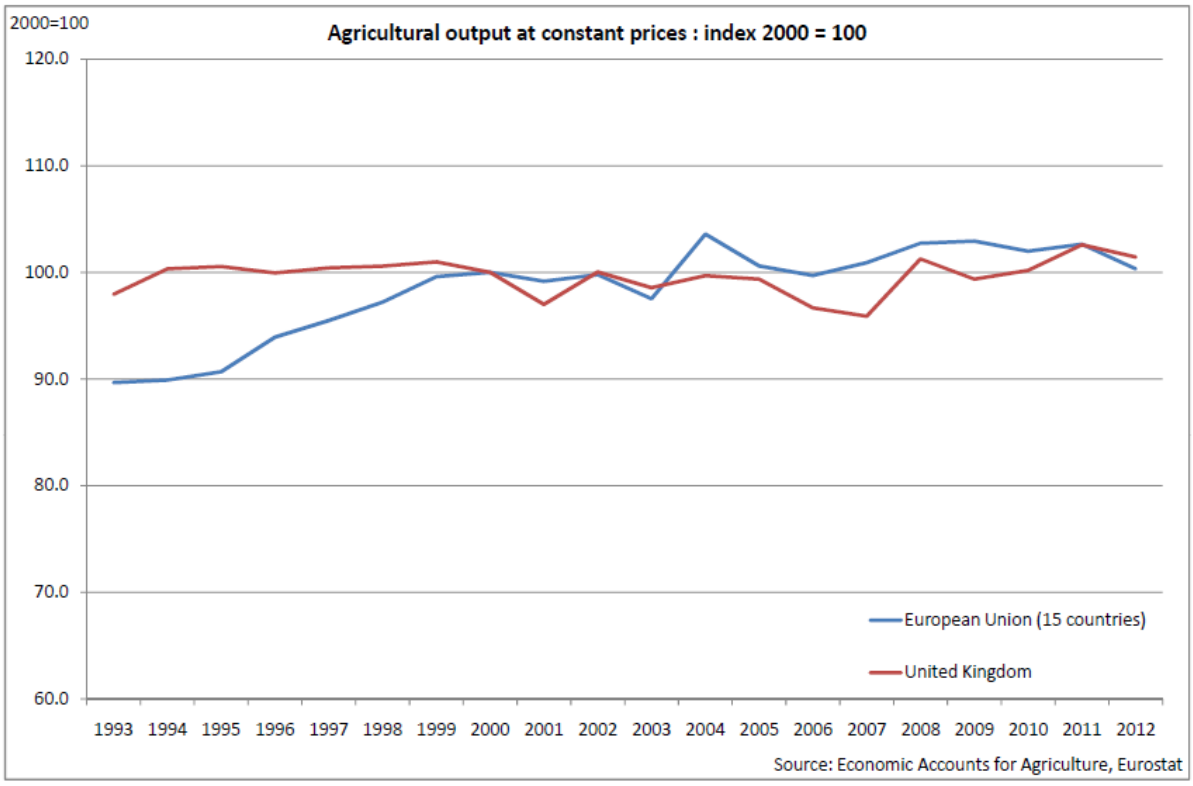
34. In addition to the existing variations, England has pursued voluntary modulation over the period 2008 - 2012 (see Table 10). The UK was the only member state to do so for each year in this period. Therefore if unilateral voluntary transfer from Pillar 1 to Pillar 2 has an impact on England's competitiveness it would equally apply to the period 2008 - 2012 as to future years.

Table 10: Average modulation rates (compulsory + voluntary) in the UK, 2008-12

Year	2008	2009	2010	2011	2012
England	5+13 = 18%	7+12 =19%	8+11 = 19%	9+10 = 19%	10+9 = 19%
Wales	5+2.5 = 7.5%	7+2.2 =9.2%	8+2.8 = 10.8%	9+2.5 = 11.5%	10+1.5 =11.5%
Scotland	5+8 = 13%	7+6.5 =13.5%	8+6 =14%	9+5 = 14%	10+4 = 14%
Northern Ireland	5+6 = 11%	7+5 = 12%	8+5 =13%	9+5 = 14%	10+4 = 14%

36. Figure 7 shows the agricultural output trends in the UK and the rest of the EU over the period 1993 to 2012. This shows that UK production has kept pace with the rest of the EU. Although it isn't possible to tell what the UK production would have been in the absence of modulation this does provide some evidence that voluntary modulation in England hasn't led to a fall of UK output relative to the EU.

Figure 7: Agricultural output trends in the UK and the EU



Impact of increasing the Pillar 2 funding

Pillar 2 is designed to deliver a number of benefits…

37. The Rural Development Programme for England (RDPE) is the mechanism through which the Pillar 2 funds are distributed. The next RDPE will operate through four broad channels these are as follows:

    - Farming and Forestry Competitiveness (FFC)
    - Growth Programme (GP)
    - New Environmental Land Management Schemes (NELMS)
    - LEADER

38. Evidence on outcomes associated with RDPE is used to estimate the benefits associated with transferring funds into Pillar 2 from Pillar 1. The benefits of spending under Pillar 2 encompass economic, environmental and social benefits (see the RDPE impact assessment for further details).

39. Table 11 below summarises the review of evidence on the benefits of the Rural Development Programme which for consistency are presented as a Benefit Cost Ratio (BCR). These BCRs present the net benefits of each activity for every £ that it costs to deliver the activity. The BCRs are not all produced on a consistent basis and so are not directly comparable. A detailed explanation of evidence behind each of these BCR estimates can be found in the RDPE impact assessment. It should also be noted that for many activities there are additional non quantified social and environmental benefits.

Table 11: Benefit Cost Ratio (BCR) conclusions for RDPE activities taken from the RDPE Impact Assessment

Area of activity	Sub-area	BCR ranges (Best Estimate)	Source	Confidence
A) i. Environmental land management: Agri-environment	Mid-tier	**2.2 – 5.3 (3.5)**	FERA Report + additional internal analysis drawn from variety of published sources	**Good** Ranges reflect reasonably robust and recent evidence
	Higher-tier	**2.2 –5.5 (3.7)**		
A) ii. Environmental land management: Forestry	Creation	**1.6 – 4.7 (3.2)**	Internal analysis using published sources	**Low-Moderate** Carbon valued robustly, Landscape/Biodiversity uses proxies and reflect old valuation evidence
	Management	**5.0 – 6.1 (5.6)**		Wood fuel valued robustly, Biodiversity/Landscape uses proxies and reflect old valuation evidence
B) Farming and forestry productivity		**0.86 – 1.73 (0.86)**	Forthcoming CCRI report	**Low** Illustrative estimates – rely on financial proxy approach and reflect interviews with small sample of beneficiaries and non-beneficiaries
C) EU Growth Programme		**0.8 – 11.0 (1.8)**	Internal analysis of different types of RDPE growth interventions	**Low-Moderate** Internal estimates vary in robustness and are sometimes illustrative.
D) LEADER	Business	**6.05 – 6.71 (6.38)**	Ekosgen Evaluation Report	**Moderate** Estimates reflect thorough methodology but there is uncertainty as to representativeness of the sample compared to current LEADER programme.
	Community	**3.55 – 3.87 (3.71)**	Ekosgen Evaluation Report	

40. Benefit estimates of increased Pillar 2 spend are made by taking the BCR estimates for each of the funding streams of the programme and multiplying by the relevant estimate of cost in each scenario to produce an estimate of the benefits. An implicit assumption of this methodology is that Pillar 2 spending offers constant returns to scale.

41. When estimating the benefit care has been taken to ensure that whatever basis the individual BCR is estimated on, that same methodology is used to revert back to a robust benefits estimate.

42. Sensitivity analysis is undertaken whereby the transferred funding is allocated between the activities (FFC, GP and NELMS) in different proportions[24]. This generates a range of benefits achievable under each of the options. More detail on each of the variations modelled can be found in the RDPE impact assessment.

Combining costs and benefits of Pillar 2 expenditure…

43. Once the benefit figures have been estimated, costs of delivering the RDPE programs are subtracted including administration costs (both public and private) in order to generate a net benefit. Table 12 shows the results. It should be noted that these benefits are over and above the benefits of the do minimum 1% transfer.

Table 12: Benefits of increased spending under Pillar 2

Option	Funding transferred from Pillar 1 to Pillar 2 (£m)	Gross benefits of additional Pillar 2 spending (£m)	Estimated total costs, including admin costs (£m)	Net benefits of transferred (£m)
9% transfer	1,215	2,615 – 2,885	1,076– 1,294	1,349 – 1,809
15% transfer	1,889	4,762 – 5,089	1,767 – 2,040	2,760 – 3,322

Note – In order to avoid double counting, the revenue costs of the production lost as a result of the transfer are not taken into account in these benefit figures. The costs and benefits are presented together in Table 13.

[24] The LEADER spend is kept fixed within the sensitivity analysis.

Benefits of Pillar 2 spend far exceed the costs of a Pillar 1 reduction…

44. Table 13 summarises the costs and benefits of transferring funding from Pillar 1 to Pillar 2. As described in the sections above, the benefits are those additional net benefits generated as a result of the increased Pillar 2 spending based on the RDPE scenarios set out in RDPE impact assessment. The costs of reducing Pillar 1 arise from a small reduction in agricultural production. These costs will be overestimated as they are compared to a baseline of no transfer and are lost revenue figures unadjusted for cost of sales. The transferred funding itself is not counted as a cost or benefit in either calculation.

Table 13: Net Present Value (NPV) of benefits and costs (£m in 2013 prices)

Option	Scenario	Benefits of Pillar 2 spend (£m PV)	Costs of transfer - lost production (£m PV)
1	9% transfer	1,349 – 1,809	67
2	15% transfer	2,760 – 3,322	100

Notes: Costs are estimated as lost production (i.e. revenue). However this is an over- estimate of the actual costs of the transfer as farmers would save the resource costs of this production. For each of the transfer scenarios there are options for how the funding is allocated between different schemes within Pillar 2. The benefits presented in this table are the range of the central benefit estimates for each of those different options. Further sensitivity analysis is available in the RDPE impact assessment.

45. It is clear from Table 13 that the 15% transfer option secures the highest value for money.

Distributional impacts

46. This section examines the impact of reducing Pillar 1 payments at the individual farm level. It considers the distributional impact of a reduction in direct payments which would result from a lower Pillar 1 fund.

47. The transfer of funding from Pillar 1 to Pillar 2 will reduce direct payments by 9% or 15% compared to a situation where there was no transfer. A key question is how many farmers would find farming unprofitable as a result of this reduction.

48. Farm Business Income is very similar to net profit used in financial accounts. It is a measure of the financial return to all unpaid labour

(farmers and spouses etc.) and on their capital invested in farm land and buildings. The Farm Business Survey collects a range of financial data and using this dataset, Table 14 presents farm business income over the last five years.

Table 14: Impact of additional P1 to P2 transfer on frequency of negative farm business income

	Actual	Modelled scenario with 6% point higher transfer		
Number of times in last 5 years that farm business income was negative	(% of farm businesses)	(% of farm businesses)	% of total England agricultural output	% of total England agricultural input costs
Not negative in last 5 years	71.0%	67.6%	70.3%	66.7%
Negative in 1 year of last 5	16.1%	18.5%	17.4%	18.6%
Negative in 2 years of last 5	4.5%	5.4%	4.7%	5.5%
Negative in 3 or more years of last 5	8.4%	8.6%	7.6%	9.1%
All farms	**100%**	**100%**	**100%**	**100%**

Source: Defra analysis of Farm Business Survey

49. The first column in Table 14 shows the incidence of negative farm business income over the last five years during which period the transfer from Pillar 1 to Pillar 2 has been 19% (comprised of 10% compulsory and 9% voluntary in 2012). The second column examines how this would have changed had the transfer from Pillar 1 to Pillar 2 been 6% points higher than the actual rate for each of the years in the period. This models a future scenario where compulsory modulation is a permanent part of Pillar 2 and an additional 15% is transferred. The direct payments that farmers previously received are reduced accordingly and then the impact this would have on farm business income is assessed.

50. The table shows that under the higher levels of transfer, there would have been a small increase in the percentage of farms experiencing negative farm business income in at least 1 of the last 5 years (from 29% of farms

to 32%). However the impact on farms experiencing negative incomes in 3 or more of the last 5 years is negligible.

51. It should be noted that the analysis in Table 14 applies a cut to historical direct payments and keeps all other factors such as prices fixed. In reality there is evidence that direct payments are capitalised into land rents and prices (see Chapter 1 for discussion). A reduction in direct payments would therefore be expected to feed through into a fall in land prices, thereby reducing the input costs of farming, with a particular benefit to tenanted farms. Recent research examined land rents in six new EU member states following their EU accession. It concluded that up to €0.25 of each €1 of direct payments is capitalised into land rents[25]. Therefore the impact on farm business income is likely to be lower than the analysis above suggests.

52. For the scenario of higher level of transfer, the last two columns of the table show how the farms in each income category contribute to England's total agricultural output and costs. It shows that 8.6% of English farms that would have experienced negative income in at least 3 of the 5 years contributed just 7.6% of agricultural output and accounted for 9.1% of total agricultural costs. This analysis suggests that these farms suffer from low productivity.

53. Examining the impact of additional levels of transfer from Pillar 1 to Pillar 2, Table 15 shows how an increase by 6% points would have affected the average farm income per year had it been implemented over the period 2006/07 to 2010/11.

[25] Kristine Van Herck and Liesbet Vranken, 2013, Direct Payments and Land Rents Evidence from New Member States, Factor Markets Working Paper No. 62/August 2013

Table 15: Impact of additional Pillar 1 to Pillar 2 transfer on average income per year

Farm type	Original FBI	Change in FBI due to higher level of transfer	Change as % of original Farm Business Income
Dairy	75,201	-2,333	-3.1%
Less Favoured Areas (LFA) Grazing Livestock	19,939	-1,554	-7.8%
Lowland Grazing Livestock	25,491	-1,557	-6.1%
Cereals	60,109	-2,482	-4.1%
General cropping	65,994	-2,459	-3.7%
Pigs	36,368	-287	-0.8%
Poultry	93,441	-644	-0.7%
Mixed	36,031	-2,089	-5.8%
Horticulture	48,328	-179	-0.4%
All farm types	**47,897**	-1,891	-3.9%

54. Across all farm types there would be a 4% reduction in incomes on average over the 5 year period as a result of moving from the existing 9% transfer to a higher 15% transfer. Grazing farm types would lose more than average (7.8% in the case of those in the Less Favoured Areas) and these types tend to be more reliant on the Single Payment Scheme to supplement their incomes.

55. Farm Business Income is not the only source of income for many farm households. Other household income is derived from any salaries farmers receive from off farm work and any salaries from other family members. Table 16 presents farm business income over the last five years together with average non farm income. It shows that those farms with negative

farm business income in 3 out of the last 5 years receive, on average, £22,200 a year in non farm income.

Table 16: Frequency of negative farm business income 2007/08 – 2011/12 and non farm income in 2011/12

Number of times in last 5 years that farm business income was negative	% of farm businesses	Average non-farm income[(a)] in 2011/12 (£)	Confidence interval for non-farm income in 2011/12 (£) (±)
Not negative in last 5 years	78%	£15,000	£2,200
Negative in 1 year of last 5	12%	£12,200	£2,700
Negative in 2 years of last 5	4%	£15,700	£5,500
Negative in 3 or more years of last 5	6%	£22,200	£4,600
All farms	**100%**	£15,100	£1,800

Source: Farm Business Survey (England), excluding businesses which started up more recently than 2007/8.

Chapter 3 – Costs and benefits of implementing Greening in England

Introduction

1. Ministers have decided that the broad approach to Greening in England should be to adhere to the basic measures contained in the Direct Payments Regulation. They have chosen not to implement Greening in England in a way which draws upon the alternative, equivalent measures that may be taken up through a national Certification Scheme. This analysis does not attempt to cover the costs and benefits of any of the equivalent measures. It should be noted that this analysis was based upon latest available drafts of the Direct Payment Regulation.

2. The Greening analysis presented in this evidence document attempts to assess the costs and benefits of the broad direction[26] of how it will be implemented.

3. From 1 January 2015, 30% of the direct payment will be dependent upon farmers carrying out three land management measures: Crop Diversification, Ecological Focus Areas and Permanent Grassland. A substantial percentage of farmers either fall below the minimum size threshold, or are already compliant.

4. The rationale put forward by the European Commission is that the Greening measures will deliver environmental benefits, and thus provide some value for money for from the Greening part of the direct payment regime.

[26] Announced 10 October 2013

5. The analysis demonstrates that:

    a. There are net benefits from implementing Greening in England of up to £1bn[27].
    b. Both the costs and benefits arise primarily from Ecological Focus Areas.
    c. There is little evidence on the environmental benefits of crop diversification.
    d. A substantial percentage of farmers either fall below the minimum size threshold, or are already compliant with the Greening measures.
    e. Modelling suggests rising prices will offset the reduction in output due to Greening in terms of impact on farm incomes, compared to the current situation.

6. This assessment is subject to uncertainty however, particularly on the benefits of greening and costs of crop diversification. Further details on these uncertainties are set out below.

7. Our analysis suggests the majority of the farmers subject to the Crop Diversification requirement incur costs which exceed the value of the Greening payment. Farmers are therefore assumed not to comply with Greening and therefore there are no costs of the Greening proposals for these farmers. However, the non-compliance with Greening for certain farmers is relatively small in terms of reduced direct payments, which are estimated to be around £120m[28]27, equivalent to 1.3% of total direct payments.

8. In the first two years, non-compliant farmers will lose 30% of the Pillar 1 subsidy payment. This rises to 36% in 2017 and 37.5% thereafter. This implies more farmers will find it economic to comply with Greening in future years. In this analysis, a penalty of 30% has been modelled in all years, potentially underestimating the levels of compliance.

9. It is assumed the Greening requirements will apply from 1st January 2015 to 31st December 2020. Costs and benefits are therefore assumed to apply over this six year period only as they involve changes to land management which are unlikely to result in longer term impacts.

[27] Present Value £2013/14 prices
[28] Present Value £2013/14 prices

Background on Greening

10. Under the European Commission regulations, Greening will comprise of three standard measures which apply throughout Europe:

    a. **Crop Diversification (CD)**: farmers with more than 10 hectare (ha) of arable land must cultivate at least two crops; those with more than 30 ha must cultivate at least three.
    b. **Ecological Focus Area (EFA)**: Farmers with more than 15 ha of arable land must maintain at least 5% of that arable land as EFA. Member States have the ability to define the features which will qualify as meeting the EFA requirement drawing from a list in the regulations — these could, for example, include fallow land, landscape features or buffer strips.
    c. **Permanent Grassland (PG)**: member states must ensure that the ratio of permanent grassland to agricultural area does not fall by more than 5% compared to the baseline of permanent pasture in 2012 (plus the area of permanent grassland in 2015 that wasn't permanent pasture in 2012). Farmers would be required to reinstate converted grassland if the ratio fell by more than 5%. This requirement may apply at either a regional or farm level.

11. This section will set out the costs and benefits of each measure, although it should be recognised that how farmers choose to implement one measure may constrain or make it easier to implement the other measures. This could act to increase or decrease the cost estimates presented in the analysis below. It should be noted that a substantial majority of farms will either be exempt from, or currently compliant with, the Greening measures, and therefore face no additional costs.

12. This section will also present evidence on the market impacts that will result from the adoption of Greening across the EU, including a case study illustrating the potential impact on an average cereals farm.

13. The analysis relies on a number of important assumptions, detailed in the sections below. For example, the costs are based on a single year's data which may not reflect costs over the period which Greening applies.

14. For the Crop Diversification and EFA measures, an assessment has been made of whether the cost of Greening exceeds that of the Greening payment on an individual farm basis. For farms where the costs of

Greening for both these measures exceed the Greening payment they will have the incentive not to comply with Greening. The costs and benefits for these farms have therefore been excluded from the central estimate of net benefits. Farms also subject to the Permanent Grassland measure may also face additional costs which could cause total Greening costs to exceed the value of the Greening payment.

15. The introduction of Greening in England will involve increased administrative costs to Natural England and the Rural Payments Agency. These arise from revisions to existing agri-environment agreements to verification of the Greening measures. The estimation of these costs is set out in a section below.

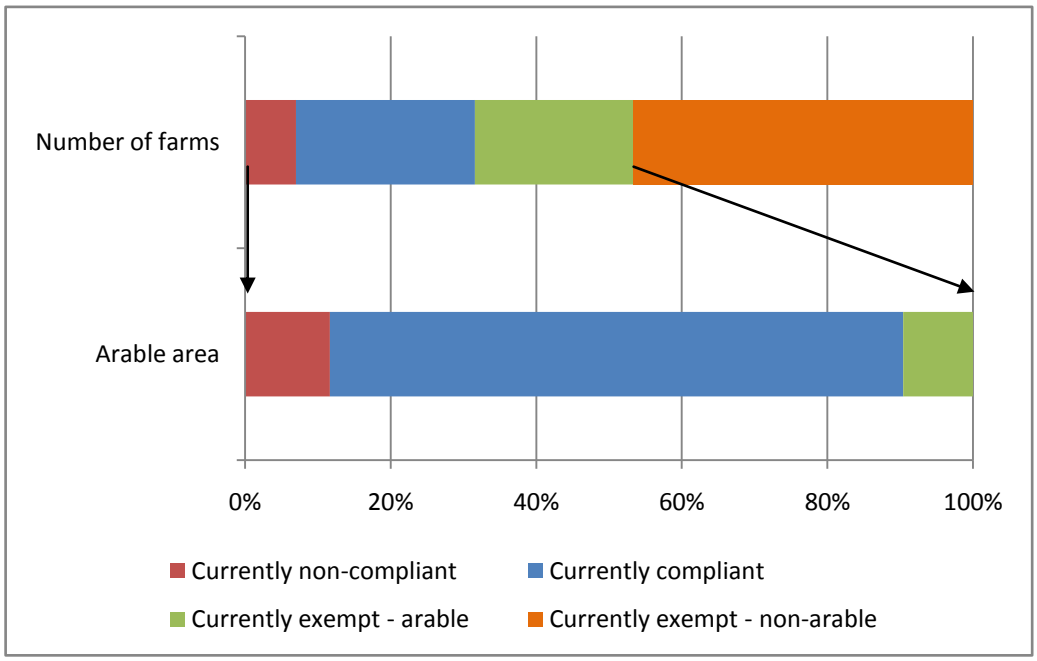
16. Given the Greening payment is 30% of the Direct Payment; assumptions have had to be made about the intra-UK allocation of CAP funds and the level of Pillar 1 to Pillar 2 transfer. The Greening payment has been based on a 15% transfer and assumes England maintains its share of intra-UK CAP funding for direct payments, equating to an average value of £53/hectare in nominal terms.

Crop Diversification

Many farms are either exempt or already comply with this requirement…

17. Figure 8 shows that about 7% of farms, using 2010 June Survey data, will need to amend their farming practices to comply with the crop diversification requirement. These farms comprise almost 12% of the total arable area in England, after excluding those farms which are entirely permanent grass.

Figure 8: Analysis of compliance of all farms and arable area (as % of overall arable area)



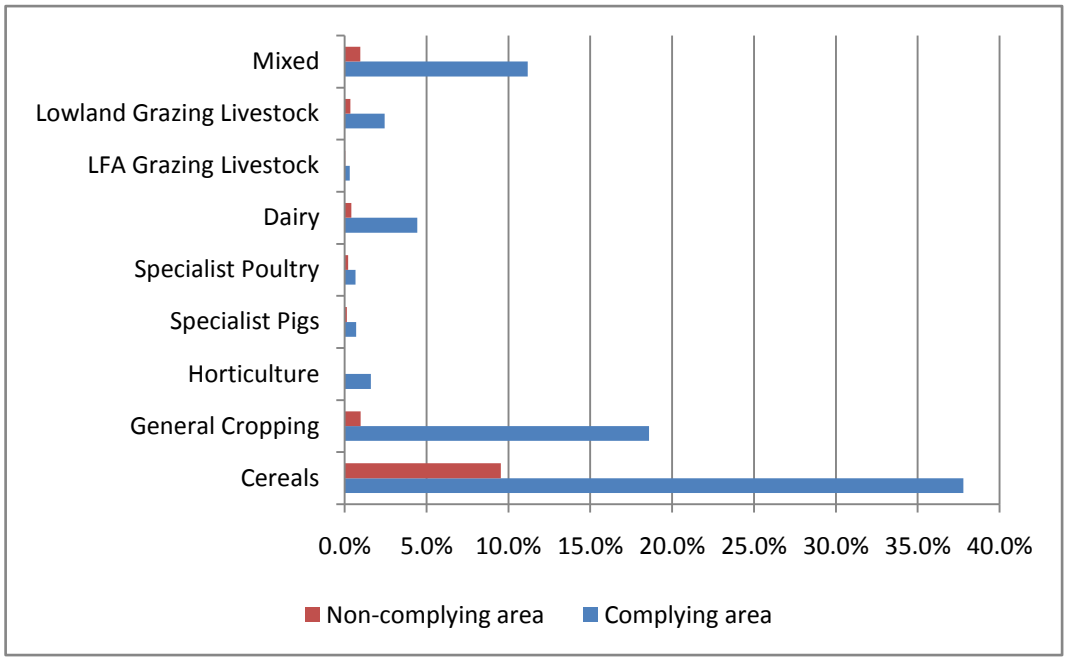
18. These figures are based on 2010 survey data only. They are therefore estimates of the percentages of farms that may or may not need to change their farming practices over 2015-20 i.e. there may be movement between the categories as farming practices change up to 2015.

19. It can be seen that whilst almost 70%[29] of farms will be exempt from this measure, they only represent around 10% of the total arable area. This is because they either have less than 10ha arable land or their arable land is entirely fallow or temporary grass. However, whilst only around 20% of farms are currently compliant, they represent almost 80% of the total arable area. Overall, less than 10% of farms would need to amend their farming practices to comply with this requirement.

20. Figure 9 shows which types of farms, using 2010/11 data, will need to amend their farming practices to comply with the crop diversification requirement.

[29] Around 47% of farms have no arable area and are therefore excluded from the arable area

Figure 9: Complying and non-complying farmed area (as % of overall arable area)



Source: Defra analysis

21. In terms of number of farms and arable area, the cereals sector will bear the majority of the burden of the CD measure. The estimation of costs is the subject of the remainder of the section.

Farm business survey is used to estimate the costs on farms who adjust…

22. The costs for CD are taken from the Farm Business Survey[30] and are based on a measure of income called Gross Margin (GM) per farm. This is the income from different crop enterprises (i.e. sales revenue) minus the variable input costs (e.g. fertiliser, seed). It does not include any fixed costs such as rent, labour and machinery depreciation.

23. Similarly for the EFA requirement, estimates of costs per hectare are taken from 2010/11 Defra FBS data. They have been used to estimate the annual costs, but it is important to note that agricultural prices and costs will vary year by year. Selecting a single year will not take account of

[30] https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs/series/farm-business-survey
The FBS is an annual survey providing information on the financial position and physical and economic performance of farm businesses in England. The sample of around 1,900 farm businesses covers all regions of England and all types of farming. Results are weighted to represent the whole population of farm businesses that have at least 25,000 Euros of standard output as recorded in the annual June Survey of Agriculture and Horticulture. In 2010 there were just over 56,000 farm businesses meeting this criterion

changes to costs which may occur over time, affecting the estimates of the costs of the measures over the six year period. Also, given the FBS only represents farms with an annual turnover of more than €25,000, the forgone income from farming activities may be higher than if the whole population of farms had been included[31].

24. This cost data has been combined with information from the June Census[32] on the structure of the agricultural industry to derive an estimate of the total costs of each requirement.

25. To estimate the costs of the CD measure, the average farm crop GM of compliant farms was compared to individual farm GMs of those who are not. This was done by farm type and region (North, East and West).

26. Where a non-compliant farm has a higher GM than the average for compliant farms, the difference was assumed to be the cost for that farm to comply with the CD measure. This calculation was performed for all the non-compliant farms in the FBS sample to derive an estimate of the average cost per hectare by farm and region. This cost was then applied to non-compliant farms in the June 2010 Census. Around 40% of the non-compliant farms in the FBS had lower crop GM's than the average value for compliant farms. This suggests that these farms would find it more profitable to comply with CD. In reality, there may be other reasons why this may not be the case but it isn't possible to make an assessment of what their costs may be so it has been assumed they face no additional cost.

Costs of complying with crop diversification are mostly borne by the cereals sector…

27. The costs for the CD measure as a whole are driven significantly by the costs to the cereals sectors, as shown in Table 17. When applying the costs to non-compliant farms in the June Census it has been assumed that all farms would incur a cost to meet the CD requirements. This is unlikely, as shown by the analysis of the FBS farms outlined in the previous paragraph. In reality, many farms would only need to make marginal changes to their cropping at a significantly lower cost than has been

[31] Assuming smaller farms make lower returns than larger farms.
[32] https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs/series/structure-of-the-agricultural-industry

estimated. In addition, specialisation may have been a driver of productivity improvements. Therefore, more specialised farms may be more efficient compared to those who are more compliant. This could act to further inflate the cost overestimation.

28. Horticulture and general cropping farms have been excluded from this analysis for a number of reasons. Firstly, on horticulture farms, crop areas are recorded at too high a level of aggregation to distinguish individual crops and assess the extent to which they would comply with the CD requirement. Secondly, on many general cropping and horticulture farms the cropping gross margin includes permanent crops which are not subject to the CD requirement. This inflates the level of compliance costs. Thirdly, closer inspection of sub-samples of these farm types in the FBS indicates that many of them would already comply or could do so with minor changes to their rotations. For those that couldn't, the financial benefits would probably not be sufficient to do so.

29. Table 17 shows the costs to different farm types assuming farmers implement the CD measure regardless of whether it makes economic sense to do so. The low and high cost sensitivity scenarios are based on 95% confidence intervals around the central scenario for different farm type gross margins.

Table 17: Annual costs of Crop Diversification (all farms)

£millions (2013/14 prices)	Low	Central	High
Cereals	8.6	43.5	78.3
General Cropping	See note in Para 28		
Horticulture			
Specialist Pigs	0.4	0.7	1.0
Specialist Poultry	0.0	0.1	0.2
Dairy	-0.1	0.7	1.4
LFA Grazing Livestock	0.0	0.0	0.0
Lowland Grazing Livestock	1.6	3.2	4.7
Mixed	1.6	7.7	13.8
All farm types	**12.3**	**55.9**	**99.5**

30. Excluding farms who would find it uneconomic to comply with Greening has a very large impact on the cost estimates. Table 18 below breaks down the costs for each farm type of complying with the CD measure, excluding those farms who would find it uneconomic to implement Greening on the CD and EFA measures.

31. Given the analysis in Table 18 excludes farms which would find it uneconomic to comply with the CD and EFA measures, overestimates of costs at the farm level could lead to them being excluded from the aggregate estimate of costs across all farms. This implies the aggregate cost estimates could be underestimates.

Table 18: Annual costs of Crop Diversification[33] (excluding farms who would find it uneconomic to comply with Greening)

£millions (2013/14 prices)	Low	Central	High
Cereals	0.1	0.7	1.3
General Cropping			
Horticulture			
Specialist Pigs	0.0	0.1	0.1
Specialist Poultry	0.0	0.1	0.2
Dairy	-0.1	0.6	1.3
LFA Grazing Livestock	0.0	0.0	0.0
Lowland Grazing Livestock	0.0	0.0	0.0
Mixed	0.1	0.3	0.6
All farm types	**0.2**	**1.9**	**3.6**

[33] Assuming landscape features are eligible to comply with the EFA requirement

32. Whilst there is good evidence on the environmental benefits of crop rotation, there is only very limited evidence that monocultures have a detrimental impact on biodiversity[34]. It has therefore been assumed there are no environmental benefits from this requirement.

33. Analysis using the CAPRI[35] model of European agriculture also suggests limited environmental benefits from the Greening measures. Whilst the model projects increases in measures of crop species diversity and reductions in agricultural emissions, these effects are very modest and varied across regions. At the aggregate UK level changes in crop diversity and emissions are less than 2%.

Ecological Focus Areas

EFA will require more farms to make adjustments to comply…

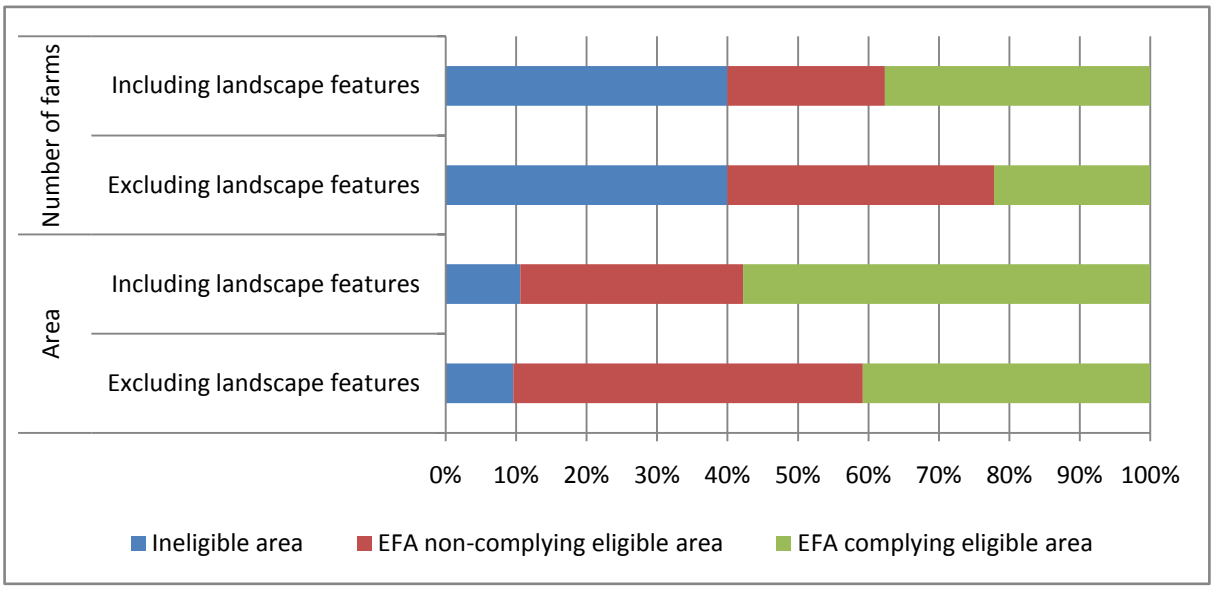
34. FBS data has been used to look at how the EFA measure as defined in paragraph 10 might affect farms of different types in England and how this impact might vary according to whether landscape features are eligible for inclusion.

35. In the analysis eligible area has been assumed to include the utilised agricultural area of the farm, less permanent grass and permanent crops. A second definition further includes landscape features, but this may overestimate the eligible area, as it includes all landscape features, where only those adjoining arable land are included.

36. Figure 10 shows the number and hectarage of farms which are estimated to currently breach the EFA measure on their farm. Figures are presented whether or not landscape features are eligible to count towards the EFA.

[34] GWCT (2010). Conserving the Brown Hare. Game & Wildlife Conservation Trust, Fordingbridge
[35] Common Agricultural Policy Regionalised Impact model, maintained at the CAPRI team at University of Bonn.

Figure 10: Number and hectarage of farms which are estimated to currently breach the EFA requirement



Source: Defra analysis

37. Clearly, the inclusion of landscape features as being eligible for the EFA measure increases the number of farms and % of farmland area which are already compliant. However, this would consequently reduce the environmental benefits of putting land into an EFA.

Cost of complying with EFA is greatest for cereals and general cropping…

38. For farms that do not meet the 5% EFA requirement, costs are estimated assuming that the remaining area needed to meet the requirement is taken out of production. The cost of this is estimated using the farm's cropping GM. Only two thirds of the GM per hectare is included in the cost calculation on the basis that farmers would take out their least productive land. Analysis of the Farm Business Survey shows that farmers tend to use their least productive land to implement agri-environment measures. Therefore, a reduction in the GM is appropriate to obtain a more realistic estimate of the costs. No estimates of management costs have been included where the options within the EFA may impose additional land management responsibilities.

39. Farms which have a negative GM have been excluded from the analysis, as this would imply the EFA measure would increase their profitability. As for the CD measure, there may be other reasons why this may not be the case. Estimates of the total costs for each farm type are shown in Table 19 below[36].

40. Excluding those farms that would find it uneconomic to comply with Greening has a much smaller impact on the costs of the EFA measure than the equivalent comparison for the CD measure, with the largest drops occurring for the horticulture and cereals sectors. This can be seen in Table 19 below, and arises owing to the way in which the costs have been estimated. EFA costs are only applied to the relatively small percentage of land placed into an EFA whereas CD costs are applied to the whole farm area.

[36] In the CD analysis, both horticulture and general cropping were excluded from the analysis as they were expected to comply. The costs in
Table 19 therefore overestimate the EFA costs to these sectors as more farms than have been estimated will find it economic to comply with the EFA.

Table 19: Annual costs of EFA requirement

£millions (2013/14 prices)	All farms		Only farms where it is economic to comply	
	Landscape features **ineligible**	Landscape features **eligible**	Landscape features **ineligible**	Landscape features **eligible**
Cereals	20.2	9.5	16.5	7.7
General Cropping	12.3	8.7	11.6	8.2
Horticulture	6.5	3.1	0.0	2.2
Specialist Pigs	0.8	0.4	0.7	0.3
Specialist Poultry	0.3	0.1	0.3	0.1
Dairy	1.6	0.5	1.6	0.5
LFA Grazing Livestock	0.1	0.0	0.1	0.0
Lowland Grazing Livestock	1.0	0.3	0.9	0.2
Mixed	6.6	2.0	6.0	1.9
All farm types	**49.2**	**24.6**	**37.6**	**21.2**

41. As can be seen in Table 19 most farm types face an increase in costs when landscape features are excluded, estimated to be about 80%, on average, for all farm types. However, Horticulture farms would actually see a reduction in costs if landscape features were excluded. This is because, for the majority of horticulture farms, the inability to claim landscape features renders it uneconomic to comply with Greening. It is therefore assumed they would not comply, therefore reducing their costs when these features are excluded.

42. Cereal farms would see the largest total cost to comply with EFA requirements and these farms make up almost a half of the total farm eligible area that would have to comply with the EFA regulations. Cereal farms are estimated to have between 1.3%-2.4%[37] of land already in an EFA compliant feature, so would not require as much change to farming practices as other farm types. However, cereal farms tend to have higher gross margins than farm types which also need to comply so would face higher costs to put this land into EFAs.

Quality of environmental management has a big impact on benefits generated…

43. The environmental impacts of the EFA measure are heavily dependent on the quantity and quality of environmental management which occurs on the EFA. This analysis is based on the assumption that in England the EFA requirement will be fulfilled by the basic measures alone.

44. The EFA requirement is estimated to deliver benefits of between £1,000-£1,500m[38] over the lifetime of the policy. This range is driven by upper and lower bounds on the valuation of changes in farmland bird populations and the impact and valuation of reductions in pollutants. The EFA requirement is likely to have additional biodiversity benefits, beyond those of farmland birds. However, owing to data limitations only this subset of benefits has been assessed i.e. there may be broader environmental benefits.

45. The estimation of the valuation of farmland bird benefits has been taken from the Good Agricultural and Environmental Condition standards in England Impact Assessment[39], published in 2009. This IA analysed two scenarios:

    a. Cross compliance requirements complemented by voluntary Environmental Stewardship (ES) 'top ups';
    b. An industry led voluntary approach

46. Option a) scenario 1 assumed that 4% of cultivated land would require some sort of 'environmental management', e.g. buffer strips alongside watercourses and farmland bird plots. Apart from the farmland bird plots,

[37] Depending on whether landscape features are included
[38] Present Value, £2013 prices
[39] http://webarchive.nationalarchives.gov.uk/20130123162956/http:/www.defra.gov.uk/corporate/consult/gaec/

these measures are similar in scope and coverage to those in the EFA requirement and therefore option a) has been used as the basis for this analysis. Given option a) in the GAEC IA contained more demanding measures, the figures presented below are likely to be overestimates of the benefits. In addition, more land is assumed to be taken out of production in the GAEC analysis and therefore this further increases the likelihood the benefits of improvements to farmland bird populations have been overestimated in the EFA requirement.

47. Great care must be taken when interpreting the total valuations presented below, as respondents' willingness to pay to save species from extinction is likely to be higher than for a reversal of a decline. The study may also have been subject to 'scope insensitivity', where the willingness to pay for an individual outcome is higher than if it had been included as a package of several outcomes. Given Greening is expected to achieve multiple environmental outcomes, this is a significant risk. Hence, the figures presented below are very likely to overestimate the true value of the benefits from increases in farmland bird species arising from the EFA requirement.

48. The probabilities were taken from a report[40] produced by FERA, which relied on expert elicitation workshops. These estimated the probabilities of improvements in different types of species population over a five year period, and are set out in Table 20.

Table 20: Probability of reversing decline of seven farmland bird species in option a) of GAEC IA

Skylark	Yellowhammer	Grey partridge	Corn bunting	Lapwing	Turtle dove	Kestrel
0.02	0.05	0.03	0.04	0.01	0	0.2

[40] Foster, V & Mourato, S. (2000). Valuing the Multiple Impacts of Pesticide Use in the UK: A Contingent Ranking Approach. Journal of Agricultural Economics, Vol 51, No 1, pp1-21

49. A study by Foster and Mourato (2000)[41] indicated that a household in England in 1996 was willing to pay on average £13.50 per year in order to prevent the loss of one species of declining farmland bird (1998 prices). Taking account of inflation this translates into a figure of £19.17 in 2013 prices. In addition, as there has been GDP growth per household since 1996, and evidence that willingness to pay for environmental quality is positively correlated with income growth, then these values have also been inflated to express them in terms of 2015 values[42].

50. To estimate the total value of this option in terms of farmland birds, the WTP estimates are multiplied by estimates of the numbers of households in the UK and then the probabilities in Table 20. This gives a present value of benefits of around £1,300m (£2013 prices) over the period 2015-2020.

51. In order to attempt to represent some of the uncertainty attached to the benefits, a lower estimate has also been produced. This does not make an allowance for increases in willingness to pay owing to GDP growth. This estimate is £1,000m (£2013 prices) over the period 2015-2020.

52. Placing land into an EFA will prevent arable crops being grown on that area, and therefore there will be reduced inputs applied to the EFA, particularly fertilisers. Fertiliser use is associated with greenhouse gas and air quality emissions. It may also cause water pollution through leaching and run-off into water courses. These pollution impacts have been estimated using a farm pollution model called Farmscoper[43].

53. The impact of EFA on GHGs, water and air quality emissions was estimated by averaging the impacts of two agri-environment options within Farmscoper:

    EF13 - Uncropped cultivated areas for ground-nesting birds – arable;
    EF11 - Uncropped, cultivated margins for rare plants on arable land.

54. The GHG impacts were then valued using the DECC non-traded price of carbon, increasing over time in line with the carbon price guidance[44]. The

[41] Foster, V & Mourato, S. (2000). Valuing the Multiple Impacts of Pesticide Use in the UK: A Contingent Ranking Approach. Journal of Agricultural Economics, Vol 51, No 1, pp1-21
[42] In the upper scenario they are further inflated to take account of increasing GDP per household in real terms up to 2020.
[43] http://www.adas.co.uk/Home/Projects/FARMSCOPER/tabid/345/Default.aspx
[44] https://www.gov.uk/carbon-valuation

air quality impacts were valued using Defra guidance[45] on the human health impacts of ammonia. These valuations omit any consideration of the ecosystems services costs, and are therefore an underestimate of the benefits of EFA.

55. Water quality benefits are monetised using evidence from a report called "Economic benefits of measures to reduce diffuse water pollution from agriculture (DWPA) in England". It estimated the benefits from improved drinking water, amenity from improved water quality, improved fishing, reduced eutrophication, bathing quality and wetlands ecosystems. The ranges in this report were then used in a Monte Carlo analysis to arrive at ranges for the costs of different water pollutants. In common with the air quality values, adjustments have been made to the figures to account for evidence that environmental quality is a normal good i.e. willingness to pay for environmental quality increases as a result of increases in economic growth. Finally, the estimates have been increased in line with the number of households.

56. Applying these per hectare values to the additional hectares of land which are expected to be placed into an EFA gives a central value of £30m (Present Value, £2013 prices). The range around this central estimate is £20m-£180m, driven by upper and lower estimates of the prices of environmental impacts, whether landscape features are eligible for inclusion in the EFA and ranges around the emissions saving impact.

Permanent Grassland

Greening restricts the loss of permanent grassland during the next CAP…

57. The ratio of permanent grassland (PG)[46] to agricultural area must not fall by more than 5%[47], compared to a baseline ratio, at any point over the Greening period. The baseline ratio will be calculated as the area of land under permanent pasture in 2012 plus the area of permanent grassland in 2015 which was not permanent pasture in 2012, divided by the agricultural area. The exact baseline ratio can therefore only be calculated in 2015, however it can be estimated by considering recent trends in permanent

[45] https://www.gov.uk/air-quality-economic-analysis
[46] Permanent grassland is defined as land used to grow grasses of other herbaceous forage naturally or through cultivation that has not been included in the crop rotation of the holding for five years or longer.
[47] It is assumed this is a relative change rather than a net change. For example, if the ratio is 40%, it must not fall below 38%. This interpretation of the EU regulations will need to be clarified prior to implementation. If the alternative interpretation is used (the threshold is a 5% point reduction), the costs will be zero in the central scenario.

grassland and assuming a projection of these out to 2015. Table 21 shows the recent flows of PG, derived from Rural Payments Agency Single Payment Scheme datasets.

Table 21: The proportion of the agricultural area in England changing between dominant land types

Year	Permanent grassland converting to other uses (% of agricultural area)	Conversion to permanent grassland (% of agricultural area)	Net change in permanent grassland (% of agricultural area)
2005 - 2006	0.8%	0.77%	-0.03%
2006 - 2007	0.56%	0.37%	-0.19%
2007 - 2008	0.69%	0.25%	-0.44%
2008 - 2009	0.42%	0.35%	-0.07%
Average	**0.62%**	**0.44%**	**-0.18%**

Source: Changes in the area of Grassland in England, Defra Agricultural Change and Environmental Observatory, May 2010.
Note: The data presented in this table summarise the net field level changes for those fields that could be matched in consecutive Single Payment Scheme datasets. They therefore represent a subset of all fields for which a claim is submitted (see Appendix 7 of 'Changes in the area of Grassland in England' for further details). Therefore the figures do not match with those presented in later in Table 23.

58. To estimate three scenarios for the 2015 baseline, the gross growth in permanent grassland has been estimated by taking the average, lowest and highest annual growth rates for conversion to PG. These scenarios are outlined in Table 22.

Table 22: Baseline Ratio

	Low	Central	High
Scenario / Assumptions	High levels of land converting into grassland	Trends in changes in grassland over the period 2005-09 persist	Low levels of land converting into grassland
Assumed total agricultural land (2011)*	8,663,000 ha		
Annual % of ag. land that becomes PG (2012-2015)**	0.77%	0.44%	0.25%
Estimated total PG in baseline calculation (permanent pasture in 2012 + gross gains in PG over period 2012-2015)	3,891,000 ha	3, 766,000 ha	3, 677,000 ha
Baseline ratio	**44.9%**	**43.5%**	**42.4%**

* Total agricultural area varies year on year. The figure presented here is the agricultural area recorded by the Rural Payments Agency in 2011 which is also the median annual agricultural area over the period 2005-2011.
** Based on minimum, maximum and mean changes shown in Table 21

59. Table 21 shows that there have also been losses of permanent grassland from 2005-2009 which have outweighed the gains. Assuming these trends continue, the level of PG in 2015 will already be below the 2015 baseline ratio. Table 23 shows recent trends in permanent pasture over a longer time period of 2005-2011.

Table 23: Recent trends in Permanent Pasture (2005 – 2011)

Year	Permanent pasture (hectares)	Agricultural area (hectares)	PP as % of ag. land	Net change in PP as % of ag. land
2005	3,893,700	8,893,160	43.8	
2006	3,840,413	86,58,608	44.4	0.57
2007	3,821,780	8,700,129	43.9	-0.43
2008	3,572,285	8,366,686	42.7	-1.23
2009	3,731,067	8,762,143	42.6	-0.11
2010	3,661,124	8,611,869	42.5	-0.07
2011	3,672,117	8,663,135	42.4	-0.12
Average				**-0.23**

Source: RPA

Permanent Grassland may fall enough to trigger intervention…

60. In order to assess the potential impact of the restriction on the loss of permanent grassland, we consider three scenarios. Table 24 sets these out together with estimates of the ratio of PG to agricultural area in 2015 under the three scenarios. It also goes on to estimate how the level of PG may change over 2015-2020 under those three scenarios.

Table 24: Estimates of PG over time

	Low	Central	High
Scenario / Assumptions	Low levels of loss of permanent grassland and high levels of gain. By 2020 PG as a percentage of ag. land has increased back to the peak experienced over the period 2006-11	Trends in changes in grassland over the period 2006-11 persist	High levels of loss of permanent grassland and low levels of gain. The net loss of grassland is 3 times higher than that observed over the period 2005-11
Assumed total agricultural land *	8,663,000 ha		
Estimated level of total grassland in 2015	3,748,000ha	3,592,000ha	3,433,000ha
Annual net change in the ratio of PG to ag. land area (2016-2020)	0.22%	-0.23%	-0.69%
Estimated Grassland in 2020	3,844,000ha	3,493,000ha	3,134,000ha
Reference ratio in 2020	44.4%	40.3%	36.2%
Percentage change in PG to ag land area ratio compared to baseline ratio by 2020	**-1.2%**	**-7.3%**	**-14.8%**

* Total agricultural area varies year on year. The figure presented here is the agricultural area recorded by the Rural Payments Agency in 2011 which is also the median annual agricultural area over the period 2005-2011.

61. In both the central and high scenarios, the 5% constraint is expected to bite by 2020, whereas the ratio of PG to agricultural area ratio increases under the low scenario and in 2020 is just 1.2% below the baseline ratio. However, it is not only 2020 which is relevant, whether the constraint will bite in earlier years is also important.

62. Figure 11 shows the projections of the PG to agricultural land ratio for the three scenarios. Whilst Figure 12 shows how the change in these ratios compare to the 5% threshold

Figure 11: Permanent Grassland as a percentage of agricultural land under three PG scenarios

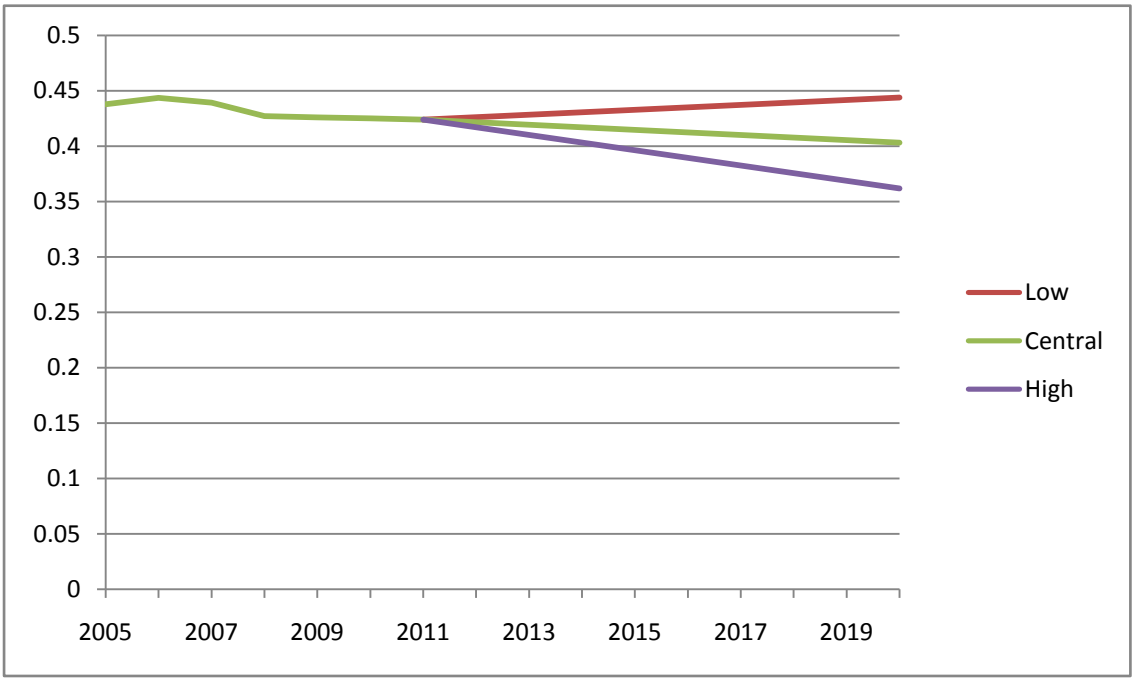
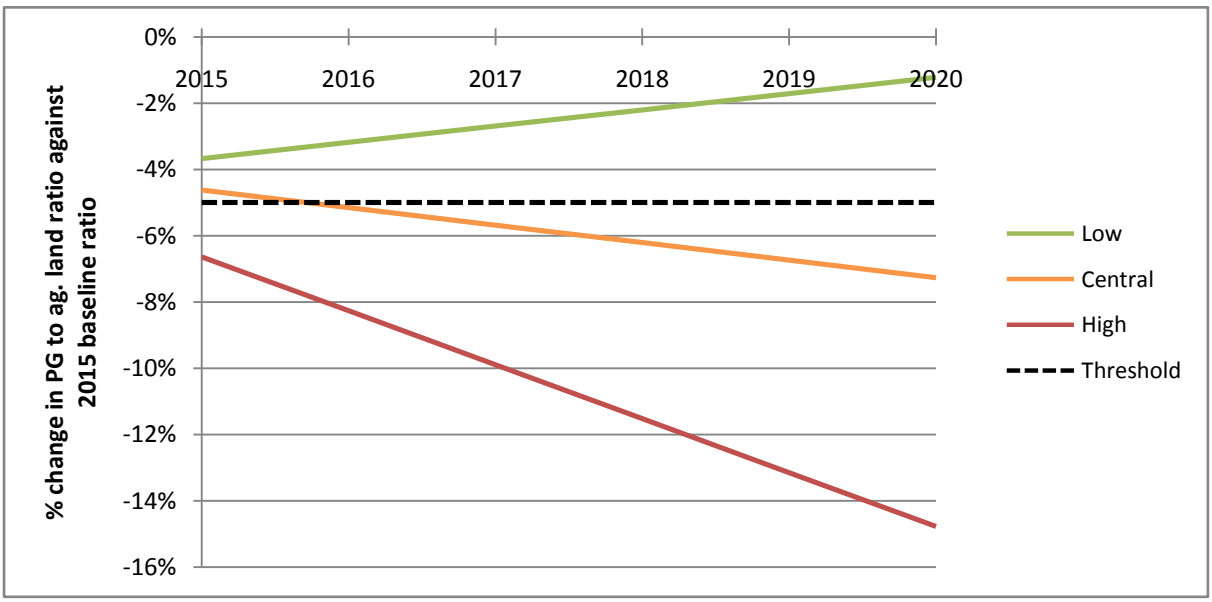


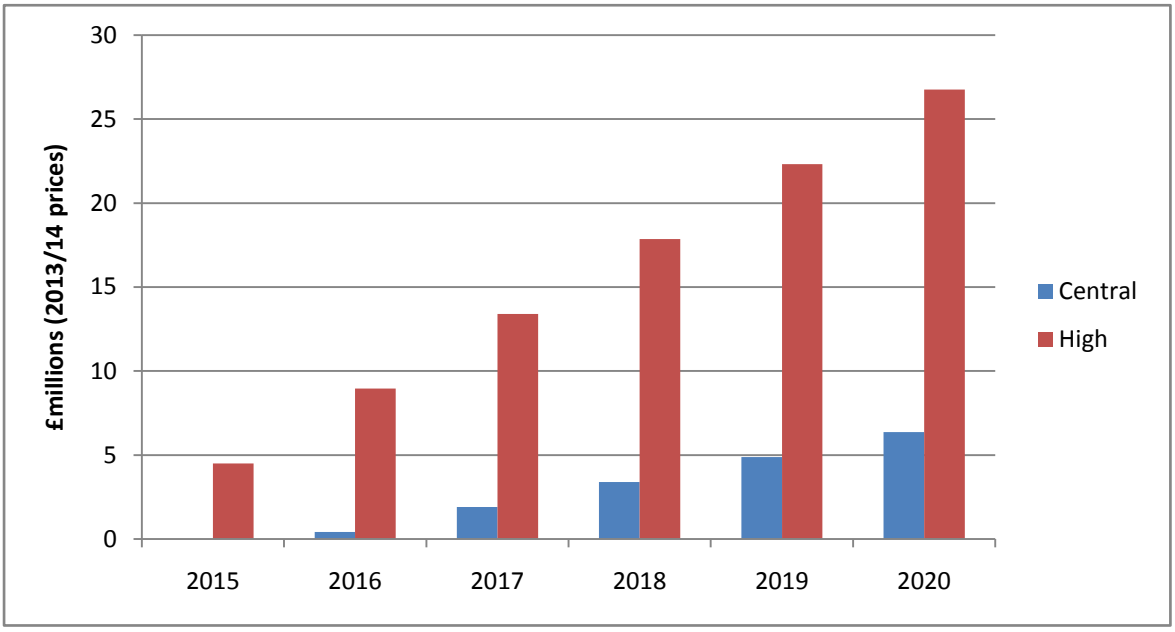
Figure 12: Percentage change in ratio of PG to agricultural land



Note: This graph shows the relative change in the ratio of permanent grassland to agricultural land which is not the same as the net change. In the high scenario the ratio falls by 14.8% by 2020 which equates to a 6.3% point fall in the ratio of permanent grassland to agricultural land. In all scenarios the ratio starts below the baseline due to the method through which the baseline ratio is calculated.

63. For this analysis, it has been assumed that the measure is implemented at the national level, and therefore the costs only occur if the 5% is breached at an aggregate, national level. Figure 13 shows how these costs change over time under the central and high scenarios, which equate to a present value cost of £14m and £78m respectively. It should be noted that this analysis is based on the assumption that the threshold is a 5 percent change in the ratio of PG to agricultural land rather than a 5 percentage point change. This interpretation of the EU regulations will need to be clarified prior to implementation. If the alternative interpretation is used the costs will be substantially lower and will be zero in the central scenario.

Figure 13: Costs of PG requirement for the central and high scenarios



64. The PG analysis assumes that behaviour of farmers does not change in response to the Greening measures prior to 2015. In reality, some farmers may be incentivised to plough permanent grassland prior to 2015 in an attempt to retain flexibility to increase cropping once the new Greening measures take effect. Forthcoming research by ADAS used focus groups of farmers to assess potential responses to the new Greening measures. These focus groups revealed that some farmers are considering ploughing grassland prior to 2015 in response to Greening measures. However farmers noted that three Greening measures work to some degree in different directions in terms of incentives. Reducing permanent grassland would maintain flexibility to increase cropping in future but it would increase commitments under the crop diversification and EFAs which apply to 'arable land'. Thus the overall response is uncertain and will vary by farm type. Three farm sectors are considered in turn below.

65. Many hill farmers have limited areas of arable land (annual crops and grassland <5years) but more intensive upland farms (dairy and livestock) will have commitments to crop diversification and EFAs under Greening. There is a risk that this encourages responses which are detrimental to the environment such as cultivation of unsuitable land in the SDA and therefore a loss of permanent grassland.

66. For dairy farmers in the lowlands, crop diversification may be less challenging insofar as the land is more suited to cropping and many are already growing forage maize and/or some cereals for feeding on farm. However, managing both cereals and maize may provide logistical challenges such as the need for separate clamps for storage – both are often contractor-grown (and harvested) crops so there may be a need for additional investment. An alternative (although not widely mentioned in the research) is the use of red clover leys as forage crops – this could reduce reliance on bag nitrogen and have environmental benefits. In terms of EFAs, many may struggle to find 5% of land to commit. Consequently, some dairy farmers may forgo the Greening payment rather than complicate their systems or get involved in land swops with neighbouring arable farms. Therefore the impact on permanent grassland is unclear.

67. For mainstream arable farmers, crop diversification is less challenging so there may be less pressure on permanent grassland. Although there is a real risk that arable EFAs will be targeted at land that is currently in an Environmental Stewardship scheme rather than their more productive land. This represents a risk and it will be important to consider the economics of the choices such farmers will make (across a range of contexts), in terms of Greening or Stewardship. Some specialist arable farmers will have issues with Greening – both crop diversification and EFAs – insofar as they block crop land under a contract farming agreement or as specialist growers of vegetable crops. Their choice is between opting out of Greening or finding paper-agreements which meet the requirements of the scheme. The latter may prove complex for implementation as land holding areas might change annually.

68. The benefits of preventing further grassland being converted to cropland are primarily in terms of reduced greenhouse gas emissions from fertiliser use. There may also be some biodiversity benefits, but these have not been quantified.

69. The level of total benefits are derived by multiplying the area of land estimated to be prevented from conversion to cropland under the central

scenario by the estimate of tonnes of CO2e saved per hectare from the UK GHG Inventory and applying the DECC non-traded CO2e price. In the central scenario, benefits are estimated to be around £55m and in the high scenario £285m[48]. The upper end of the range is driven by the prevention of large amounts of grassland being converted to cropland.

Agricultural market impacts of Greening

Modelling can investigate the impact on EU wide prices and output…

70. As Greening will be implemented across the EU, and there are potentially some significant changes to the area of land available for agriculture, there may be wider agricultural market effects which impact on both input and output prices.

71. This question was investigated by the FAPRI[49]-UK modelling team, who maintain a model of the UK agricultural sector which is integrated within a wider European FAPRI model. The model projects agricultural production, consumption, trade and prices. In the UK, results can be broken down to the DA level.

72. It is important to bear in mind that the FAPRI-UK model projects impacts on agricultural commodity markets; it is not a farm-level model. The baseline scenario, against which the impacts shown in this note are judged, is a continuation of the current CAP policy.

[48] £2013 prices, present value, central non-traded price of carbon

[49] Food and Agricultural Policy Research Institute – UK based at the Agrifood and Biosciences Institute (AFBI) in Belfast. The FAPRI-UK modelling system captures the dynamic interrelationships among the variables affecting supply and demand in the main agricultural sectors of England, Wales, Scotland and Northern Ireland. The model consists of a system of equations covering the dairy, beef, sheep, pigs, poultry, wheat, barley, oats, rapeseed and biofuel sectors. The UK model is fully incorporated within the EU grain, oilseed, livestock and dairy (GOLD) run by FAPRI at the University of Missouri. The combined modelling system provides a systematic framework that takes account of interactions among the agricultural sectors in regional, EU and World markets

73. A CAP “Greening” scenario was simulated in the EU and UK models. As this analysis was carried out last year, it does not fully reflect the latest Greening position. The scenario was comprised of the following:

(a) Ecological focus areas (EFAs)

74. 7% of area is assumed to be devoted to EFAs, 2% of which is assumed to be met through existing ecological features on arable areas. This implies 5% of arable land is taken out of production. Equivalent rates for example in France, Germany, and Italy are 3.9%, 4.7% and 2.4% of arable area respectively.

(b) Crop Diversification

75. Changes to EU crop areas in response to the diversification requirement are obtained from the Commission’s published impact study. Within the UK, agricultural census data on arable areas for each individual farm were obtained for England, Scotland and Northern Ireland and used to inform assumptions about the impact of the crop diversification requirement. Further, sub-scenarios reflect the uncertainty as to how farmers will respond to the crop diversification measures and differ in relation to whether livestock (or mixed) farms who violate crop diversification measures will continue to grow areas of arable crops. These sub-scenarios are not fully detailed in the following tables and charts, but the average impact across scenarios is presented.

76. The permanent grassland proposal was not incorporated into the modelling analysis because it was assumed that the proposal would have little impact on agricultural markets at the aggregate level across the UK and within the EU.

Impact of falling output on farm incomes is offset by rising prices…

77. The following table gives the percentage change in EU commodity prices in the Greening scenario as compared to the baseline scenario. The results show that Greening takes land out of production, reduces arable output across the EU, raising European (and therefore UK) prices relative to a baseline scenario of no Greening. Although both EFA and CD requirements change the type and extent of crops being grown; it is the EFA requirement which has a larger impact on prices.

78. The largest price increase is projected for barley. The EFA requirement has a similar projected impact across crops but barley is more affected by

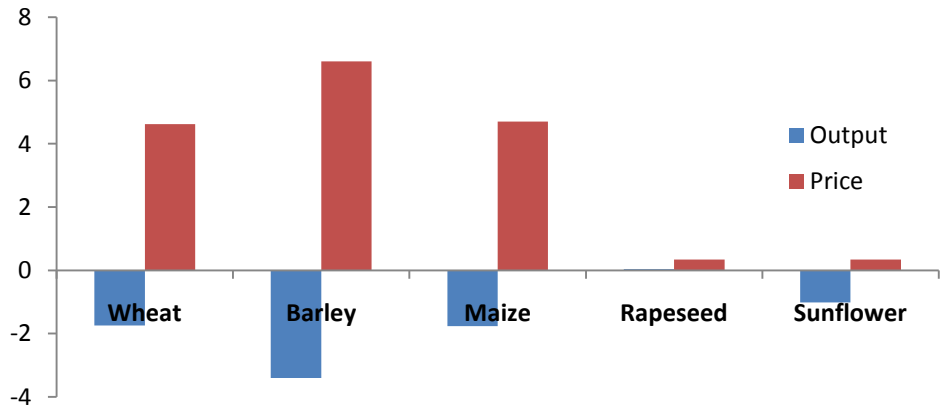
crop diversification than the other crops since it is the main crop grown for home feed purposes on livestock holdings.

Table 25: Price changes arising from Greening

Commodity	% price change to baseline
Barley	6.6
Maize	4.7
Wheat	4.6
Poultrymeat	2.2
Pigmeat	2.1
Beef	1.2
Sheepmeat	0.8
Rapeseed	0.4

79. Whilst impacts are concentrated in the arable sector, there are knock-on impacts on livestock prices through higher feed costs. The chart below shows the projected percentage changes in EU crop output and prices.

Figure 14: Price and output changes arising from Greening



80. As the costs in this analysis are based on 2010/11 gross margins, they do not take account of these price impacts. Doing so may increase gross margins, increasing the cost estimates presented in each section.

Case Study: Impact of Greening proposals on a typical cereal farm

81. The table below illustrates the impact of these price changes on the crop gross margin of the average cereal farm once the impact of the Greening proposals have been realised through lower outputs and higher prices in the EU. This is based on cropping data collected in the Farm Business Survey and represents the average situation for all specialist cereal farms in 2011/12.

82. No account has been taken for the effect of inflation on either crop outputs or inputs in future years. Similarly it has been assumed that production will remain constant.

Table 26: Crop gross margin for a typical cereal farms showing effect of EU price changes post Greening.

	Assumed hectarage and yield			2011/12 data		Impact of Greening on prices and revenues		
	ha/farm	tonnes produced	t/ha	£/tonne	total revenue	£/tonne	total revenue	Change in revenues
Winter wheat	72.4	609	8.4	£158	£96,215	£165	£100,641	4.6%
Winter barley	8.9	60	6.7	£151	£9,065	£161	£9,664	6.6%
Spring barley	7.1	47	6.7	£173	£8,229	£185	£8,772	6.6%
Other cereals	4.5	30	6.5	£187	£5,524	£187	£5,524	-
Oilseed rape	33.5	132.0	3.9	£ 374	£49,430	£376	£49,628	0.4%
Peas & beans (dry/stockfeed)	6.4	25.2	4.0	£ 213	£5,344	£213	£5,344	-
Potatoes	0.1	3.0	40.5	£116	£349	£116	£349	-
Sugar beet	2.4	166.3	69.3	£30	£4,996	£30	£4,996	-
Other crops incl. horticultural crops	3.7	8.6	2.3	£330	£2,821	£330	£2,821	-
Fallow & arable fodder crops	10.4				£13,533		£13,533	-
Total hectares	149.4							
Total crop revenues					**£195,507**		**£201,272**	**3%**
Total cropping costs					**£61,843**		**£61,843**	-
Average farm gross margin from cropping enterprises					**£133,664**		**£139,429**	**4%**

83. These figures show that, on average, cereal farmers could expect their total crop revenue and crop gross margin to increase by between 3 and 4% as a result of higher wheat, barley and oilseed rape prices following

the introduction of Greening across the EU[50]. This would amount to just under £40 per hectare.

84. No costs have been included for crop diversification as the cropping in this table would comply with the requirements. However the cost for farms that would need to comply is estimated to be between £55 and £136[51] per hectare and is likely to affect around a third of cereal farms. As noted previously these are likely to be an overestimate of costs. In reality many farmers would be able to comply with the CD requirements by making marginal changes to their crop rotations at little or no expense.

85. The cost of complying with the EFA requirements is expected to be around £9/ha if landscape features such as hedges and ditches are excluded as eligible features, or £4/ha if they are included.

Impact of Greening on amount of direct payments claimed

86. The Crop Diversification and EFA sections conclude that Greening imposes costs on some farms which exceed the value of the Greening payment. Is it assumed therefore that these farms choose not to comply with Greening.

87. These farms will therefore forgo 30% of their Direct Payment. By comparing the SPS eligible area for the farms which do and do not comply, an estimate of the forgone Direct Payment can be determined.

88. Table 27 shows the forgone Direct payment for individual sectors. A flat rate payment of £53 per hectare has been assumed, which doesn't reflect any differences in the Direct Payment at a regional level.

[50] Commodities such as peas, potatoes and sugar beet are not included in the FAPRI model, but there may also be price impacts.
[51] The range is based on the 95% confidence interval, i.e. in statistical terms we are 95% certain the true average cost lies in this range. However, this does not take into account that we may be overestimating crop diversification costs – see para 28.

Table 27: Forgone Direct Payment for farms who find it too expensive to comply

£ 2013/14 prices	Forgone Direct Payment per year (£m)
Cereals	26
General Cropping	0
Horticulture	0
Specialist Pigs	0
Specialist Poultry	0
Dairy	0
LFA Grazing Livestock	0
Lowland Grazing Livestock	1
Mixed	4
All farm types	**30**

89. The present value of payments foregone by farmers is estimated to be around £120m, equivalent to 1.3% of total Pillar 1 payments.

Administrative Costs

90. The administrative costs of Greening would fall on both the Rural Payments Agency (RPA) and Natural England (NE). There would be upfront costs involved in capturing farm level data, mapping of environmental features and ongoing costs around delivery of land management. The costs to NE are upfront costs to change existing agri-environment agreements to remove any overlap to avoid 'double-funding' of the same environmental features.

91. Based on an initial assessment of the resource implications of Greening, it is estimated that these costs will be around £100m[52] over the lifetime of the policy.

[52] £2013/14 prices, present value

Chapter 4 – Other decisions on how Pillar 1 direct payments will be spent in England

1. Previous chapters have considered the impact of a Pillar 1 to Pillar 2 transfer and the new Greening requirements. This chapter considers the other aspects of the Pillar 1 direct payments where England has flexibility and a choice about how the money available for England is allocated. Over the period 2014-2019 this will sum to €11.9bn[53] after a 15% transfer to Pillar 2. The impact of different options are considered together with what can practically be implemented within the time available without risking delay of payments under the new CAP.

2. Specifically, this chapter considers:
   a. Regional distribution of direct payments
   b. Reductions and the redistributive payment
   c. Minimum claim size and other changes to Pillar 1

3. The table below summarises the decisions and rationales on the full range of direct payments issues.

Table 28: Rationale for other direct payments announcements

Feature	Options	Status	Rationale for status
Regional distribution of direct payments	Definition of payment regions Distribution of funding among payment area	Decision: No new regions or amendment of existing regional boundaries Consulting on increasing the proportion of funding allocated to upland areas	Any change to current areas would be costly and time consuming
Reductions and the redistributive payment	Whether to implement reductions or make redistributive payments or both. The rate of reduction to be used for reductions Whether to implement salary mitigation	Preference: Apply the minimum level of progressive reduction with no salary mitigation.	Minimise the disincentives for farms to grow in size. Minimise the administrative costs for both farmers and the RPA

[53] Assuming 65.5% of the UK direct payments ceiling is allocated to England

Feature	Options	Status	Rationale for status
Minimum claim size	Minimum claim size can be set between 1-5 hectares or between €100 - €200.	Decision: Increase the current minimum of 1 hectare to 5 hectares	To achieve best value for money by reducing time and money spent processing very small claims
Small farmers scheme	Option of implementing small farmers scheme with a flat payment of €1250	Decision: Not to operate a small farmers scheme	Costs of implementing scheme likely to outweigh benefit given small number of farms likely to participate. Not desirable to exempt farmers from cross compliance
Young farmers scheme	Limit on number of entitlements for which the claim for additional payments can be made. Require particular skills or training in order to qualify	Consulting on limit. Consulting on whether to introduce additional skills requirements	Difficulty in capturing informal skills and administrative cost of implementation
Areas facing Natural Constraint (ANC)	Whether to adopt payments linked to ANC classification	Decision: Not to adopt now	Potentially expensive mapping exercise. Current classifications are robust
Active farmer test	Whether to extend the negative list of business types ineligible for direct payments. The threshold at which the negative list applies	Consulting on extension to negative list Decision: Adopt a threshold of €5,000 for the purposes of applying the negative list.	In order to minimise administrative burden for farmers and the RPA

Regional distribution of direct payments – increasing upland payments

4. England already uses a regional system for distributing direct payments, and therefore would continue to use a regional system for the Basic Payment Scheme and Greening payments. There are currently three regions: lowlands, Severely Disadvantaged Area (SDA) and SDA moorlands. There is the option to revisit the number of regions and also the proportion of funding which is allocated to each of the three regions.

5. SDA and SDA moorland areas, commonly known as the uplands, account for approximately 15% of agricultural land in England. Currently they receive lower direct payments per hectare than the lowlands: Combined the SDA and SDA moorland regions account for just 7% of direct payments.

6. The current distribution of payments among the three English regions is based on historic patterns of subsidy. Typically subsidies were influenced by, or linked to, levels of agricultural production. As agricultural production in the uplands is severely restricted by soil, relief, aspect or climatic conditions these areas historically received lower subsidies.

7. Two indicative options for regional distributions are considered here. For simplicity we have assumed:
    - England receives 65.526% of UK Pillar 1 (in line with 2012);
    - 15% is transferred to Pillar 2;
    - 3% is used for the National Reserve;
    - 2% is allocated to a young farmers scheme; and
    - No other schemes other than the Basic Payment and Greening are funded.

8. To mimic the option of rolling forward entitlements in England, we use the current entitlements (used and unused in 2012), after eliminating those who currently claim on less than 5ha, to estimate plausible new payment rates in the first substantive year of the new CAP programme, 2015.

Table 29: Option 1 – No change

Per hectare	Non SDA	SDA	SDA Moorland
Basic Payment + Greening	€242	€195	€34

9. Table 29 shows the resulting payments for option 1, where the share of payments to each region remaining the same as in 2012. For comparison the 2012 (post modulation) average payment rates were €263 for lowlands, €211 for SDA and €37 for SDA moorland. As a result of a smaller overall CAP budget and a higher proposed level of transfer to Pillar 2 the 2015 rates are 8% below the 2012 rates in nominal terms.

10. An alternative option would be to increase upland payments (i.e. to the SDA and SDA Moorland regions). For this we have modelled a scenario where SDA payment rates equal non-SDA payment rates, and where both upland areas (SDA and SDA moorlands) receive an equal increase (€25) in their per hectare payments as compared to 2012 payment rates. The resulting payments are shown in Table 30. The drop in Non-SDA payments is now 10% in nominal terms compared to 2012. Both the SDA and SDA moorland areas receive €25 increases on their 2012 average payment per hectare rates.

Table 30: Option 2 - Increase in Uplands Payment

Per hectare	SDA and lowlands	SDA Moorland
Basic Payment + Greening	€236	€62

11. To the extent that Direct Payments slow structural change by subsidising loss-making businesses, protecting upland farms from cuts at the expense of lowlands would be expected to see structural change continue to be slowed in the uplands, whilst there might be some acceleration in the lowlands. Direct payments also tend to be capitalised into land rents and prices, so sharp increases in payment rates could see rents and land prices increase.

12. UELS is anticipated to be phased out as agreements expire. The increase in direct payments under this option would to some extent take place in parallel with upland farms exiting existing UELS agreements, so that for many upland farms, there would be some stability in the overall level of subsidy. Some upland farmers would, for a transitional period, receive both UELS and the increased Basic Payment and Greening payment.

13. The FAPRI report “Impact of CAP Post-2013 Reforms on Agriculture in the UK” (February 2013) looked at the effects of moving to uniform payment rates in Scotland, Wales and Northern Ireland (as well as the rest of the EU). Although a very different scenario to what is being looked at here, it is informative. The report concluded that the redistribution of direct payments has little overall impact on markets. Flattening payments in Scotland, Wales and Northern Ireland would have little effect on production as the beneficiaries would likely by extensive producers, on lower quality land,

where the production response is limited. A similar conclusion can be inferred for efforts to redistribute payments from lowlands to uplands in England.

Reductions and the redistributive payment

14. The new CAP requires that there is some reduction in basic payments going to the largest claimants. This can be implemented either through reductions, redistributive payments or a combination of the two. Greening payments are not subject to either progressive reduction or redistributive payments.

15. This section considers the impact of the two options. It explains that the costs of reductions are lower than those of redistributive payments and the benefits are also larger. Therefore the preferred option is to implement minimum level of reductions with no use of redistributive payments.

Reductions reduce payments for those receiving above €150,000

16. Reductions apply to all basic payments over €150,000, with a minimum of 5%. In addition there is the option of whether salary costs would be deductable when calculating the progressive reduction payment due. The most severe implementation of reductions would be a 100% reduction for payments over €150,000, effectively capping payments at a maximum of €150,000.

17. The money recovered from reductions must be transferred into the Rural Development Programme.

18. This section first estimates the number of farms that may be subject to reductions, and then considers the costs and benefits of applying such a reduction.

The number of farms that may be affected is relatively small…

19. In order to assess the potential impact of reductions, analysis was undertaken using 2011 Farm Business Survey data. The Farm Business Survey (FBS) is the largest and most extensive business survey of farms in England. It is commissioned by Defra and carried out by Rural Business Research. The dataset contains information about the size of farms and wage costs which is used in the following manner:

a. For each farm in the survey, 2015 farm level basic payments are estimated by using the stated number of hectares and assuming basic payment rates per hectare of €166 for Non SDA, €134 for SDA and €23 for SDA moorland.
b. For each farm, basic payments over €150,000 are subjected to a 5% reduction
c. The number of farms affected and the total amount of the reductions are calculated for those farms in the farm business survey.
d. Steps b. and c. are repeated with the variation that wage costs are deducted from any basic payments over €150,000 and a 5% reduction is applied to any remaining balances.
e. The results are scaled up in order to make an assessment of what the aggregate impact would be for the farming population as a whole. The farm business survey analysis is taken as a representative sample of the farming population[54]. In order to scale up the farm level weightings are taken from the farm business survey and applied.
f. Sensitivity analysis is used to assess the impact that reductions would have if applied to 2012 payment rates. This allows the result to be compared to actual RPA data to assess accuracy of the model.

20. Further analysis was also undertaken using RPA data for 2012 payments which assesses the number of farms that would have been affected by reductions if the policy had been implemented in 2012. Given that payment rates in 2012 were higher than they will be in 2015 this should be taken as an upper bound estimate of the number of farms affected. The following methodological approach was taken:

    a. For each farm 30% of the 2012 payment was deducted to mimic the Greening payment element of payments that will not be subject to reductions
    b. The number of farms with remaining payments over €150,000 were assessed
    c. 5% of payments over €150,000 were calculated
    d. Note that the RPA data does not contain information about salaries paid and as a result it is not possible to use this dataset to assess the impact of reductions with salary mitigation.

[54] There are limitations with using the Farm Business Survey for this purpose. While the survey is representative of the farming population as a whole there will be limitations when considering small sub samples at the extremes of the population, such as the largest recipients of direct payments.

21. Table 31 shows the results of the analysis and the total number of claimants in England who would be expected to be affected by the different progressive reduction options. The lower figure in the range is that derived from the analysis of the farm business survey. The higher figure is derived from the analysis of 2012 RPA payment data and will be an overestimation given 2015 payment rates are lower. The analysis assumes the payment rates per hectare are as in option 1 in the section above, where the share of payments to each region remaining the same as in 2012.

22. The results shows that under minimum reductions between 340 and 560 claimants would be expected to experience some reductions to their payments. The total reductions experienced by these claimants are expected to be between €1.7m to €2.7m. However this rises to between €34.7m and €53.4m if 100% reductions are applied and payments are capped at €150,000.

Table 31: Number of claimants affected by reductions

Option	Estimated number of farms affected (to nearest 5 farms)	Estimated Annual transfer to Rural Development	Administrative burden on RPA
Option 1: 5% only above €150,000 (no salary mitigation)	340 - 560	€1.7m - €2.7m	Low
Option 2: 5% above €150,000 with salary mitigation	35 – 80 will face reductions[55]. Although 340 - 560 would need to submit information regarding salaries.	€0.1m - €0.7m	High
Option 3: capping at €150,000 (no salary mitigation)	340 - 560	€34.7- €53.4m	Low

[55] The range for option 2 is generated using Farm Business Survey data and applying 2015 payment rates and then higher 2012 payment rates. RPA data cannot be used for this option as it does not contain information about salaries

23. The number of farms that would experience reductions would fall to the range 35 to 80 if reductions are applied after taking salary costs into account. However it should be noted that all 340 to 560 claimants with payments over €150,000 would need to provide information about salary costs. This would impose administrative costs on both claimants, who would need to provide detail on salaries of all staff, and for the RPA, who would need to verify the information.

24. Table 32 shows the number of claimants that would be affected by progressive reduction payments if the basic payments were set such that the uplands receive higher payments as set out in Table 30. The results are that a slightly smaller number of farms would be affected and the overall reduction in payments they would receive is also slightly lower. Note it is not possible to use the historic RPA data for this scenario so there is no range presented.

Table 32: Number of claimants affected by reductions when uplands payment rates are increased

Option	Estimated number of farms affected (to nearest 5 farms)	Estimated Annual transfer to Rural Development	Administrative burden on RPA
Option 1: 5% only above €150,000 (no salary mitigation)	325	€1.6m	Low
Option 2: 5% above €150,000 with salary mitigation	40 will face reductions. Although 325 would need to submit information regarding salaries.	€0.1m	High
Option 3: capping at €150,000 (no salary mitigation)	325	€32.9m	Low

There are costs, as well as benefits, to implementing reductions…

25. The total reductions experienced by claimants as a result of reductions are transferred into the Rural Development Programme which would generate economic and social benefits.

26. The costs of reductions arise from administrative costs and, more importantly, from productivity losses as a result of the disincentive for farms to grow in size. It is difficult to quantify this cost; however it is potentially significant for the largest farms.

27. Due to economies of scale driven by large fixed costs of agricultural equipment, larger farms have the potential to achieve higher levels of productivity than smaller farms. By creating a disincentive to grow, reductions could prevent these productivity gains from being realised and ultimately adversely affect the competitiveness of England's agricultural sector.

28. Table 33 presents analysis from the farm business survey regarding farm level productivity. It demonstrates that productivity generally increases with farm size.

Table 33: Productivity by farm size

Size category (as defined by number of FTE workers)	Average size of farm (hectares)	Farm business productivity (£output/£input)
Very small (part-time)	79	1.124
Small	110	1.126
Medium	143	1.140
Large	188	1.168
Very Large	343	1.164

Source: Farm Business Survey
Note: Farm business productivity is calculated as farm business output divided by total factor costs. Farm business output included output from non agricultural diversified activities and subsidies.

Redistributive payments would alter the distributions to all farmers…

29. The European regulations contain a provision to redistribute funds within Pillar 1 to support smaller farmers. By redistributing payments, Member States can top up a claimant's basic payment for their first tranche of land (up to 54 hectares in the UK) by up to 65%. These enhanced payments on the first tranche of land are paid at the expense of a reduced basic payment on all land: broadly, the effect is to increase the value of direct payments for small farms, and to reduce the value for large farms. If redistributive payments are adopted in preference to reductions there is a requirement that between 5% and 30% of the national ceiling is spend on this.

30. In order to assess the impact of redistributive payments, first payment rates per hectare are calculated for different scenarios and then the impact on some case study farms are considered. In undertaking this analysis it is assumed that England decides to implement uplift in uplands payments.

31. To identify the payment rates per hectare for different scenarios RPA data regarding 2012 claims are used. The following methodology is applied:

    a. Take the total budget available for basic payments and allocate it between the three regions in line with existing allocations - 93% is allocated to the lowlands, 6% to SDA and 1% to moorland.
    b. Taking a starting basic payment rate of €166 for lowlands, €134 for SDA and €23 for moorland, calculate the level of the redistributive payments which will be the % uplift (20% or 65%) of the basic payment for each region.
    c. Using RPA data on 2012 farm level payments apply the modelled redistributive payments to the first 54 hectares of each and every farm. For this step it is assumed that each farm will claim the uplift on their most 'valuable' 54 hectares of land, so they will claim on any lowlands land held first, then SDA and finally SDA moorland.
    d. Assess what the total spend would be for each of the regions under this scenario. This is calculated as the total entitlements for each region multiplied by the basic payment plus the redistributive payments which were calculated in step c.
    e. If the total spend implied in step d is higher than the budget available for each region (as calculated in step a) then the basic payment and redistributive payment are reduced by a factor which brings them back in line with the available budget for that region.

32. The aggregate spend on these redistributive payments is checked to ensure it is between 5% and 30% of the total national ceiling.

33. Table 34 shows the resulting basic payments and redistribution payments. These are used to model the impact for different case study farms.

Table 34: Payment rates under different redistributive payment scenario

	Region	Basic Payment €	Greening €	Redistribution €	Top up as % of envelope
Scenario 1 No Top Up	Non SDA	166	76	0	0%
	SDA	134	61	0	
	Moorland	23	11	0	
Scenario 2 20% Top up	Non SDA	154	76	31	4.8%
	SDA	123	61	25	
	Moorland	23	11	5	
Scenario 3 65% Top Up	Non SDA	132	76	86	13.5%
	SDA	103	61	67	
	Moorland	23	11	15	

Table 35: Payments for case study farms where there are no redistributive payments

Farm type	**Hectares**	**Basic Payment**	**Greening**	**Redistribution**	**Total**
Small Dairy	80	€ 13,300	€ 6,100	€ 0	**€ 19,400**
Large Dairy	200	€ 33,300	€ 15,100	€ 0	**€ 48,400**
Large Cereals	300	€ 49,900	€ 22,700	€ 0	**€ 72,600**
Specialist Pig	50	€ 8,300	€ 3,800	€ 0	**€ 12,100**
LFA Grazing (120ha SDA, 40ha Moorland)	160	€ 17,000	€ 7,700	€ 0	**€ 24,700**

34. Table 35 shows the payments that each of the case study farms would receive if there were no redistributive payments. Whilst Table 36 and Table 37 show the payments that the same farms would receive with a 20% and 65% redistribution payment.

35. The results show a 20% uplift increasing the total payments for our example small dairy farm by 3% and the specialist pig farm experiences an 8% increase. In comparison the large dairy and large cereals farmers see reductions of 1.3% and 2.5% respectively.

Table 36: Payments for case study farms where there is a 20% uplift on the first 54 hectares

Farm type	Hectares	Basic Payment	Greening	Redistribution	Total
Small Dairy	80	€ 12,300	€ 6,100	€ 1,700	**€ 20,000**
Large Dairy	200	€ 30,800	€ 15,100	€ 1,700	**€ 47,600**
Large Cereals	300	€ 46,200	€ 22,700	€ 1,700	**€ 70,600**
Specialist Pig	50	€ 7,700	€ 3,800	€ 1,500	**€ 13,000**
LFA Grazing (120ha SDA, 40ha Moorland)	160	€ 15,600	€ 7,700	€ 1,300	**€ 24,700**

36. The 65% uplift would see the small dairy farm example experiencing payments 10 % higher than with no redistribution, and the specialist pig farmer's total payments increasing by 21%. In comparison the large dairy and large cereal farmers payments decrease by 5% and 8% respectively. In all scenarios the Less Favoured Areas (LFA) grazing farm payment varies very little.

Table 37: Payments for case study farms where there is a 65% uplift on the first 54 hectares

Farm type	Hectares	Basic Payment	Greening	Redistribution	Total
Small Dairy	80	€ 10,600	€ 6,100	€ 4,600	**€ 21,300**
Large Dairy	200	€ 26,400	€ 15,100	€ 4,600	**€ 46,200**
Large Cereals	300	€ 39,700	€ 22,700	€ 4,600	**€ 67,000**
Specialist Pig	50	€ 6,600	€ 3,800	€ 4,300	**€ 14,700**
LFA Grazing (120ha SDA, 40ha Moorland)	160	€ 13,300	€ 7,700	€ 3,600	**€ 24,700**

There are significant costs to implementing redistributive payments…

37. Unlike reductions, operating redistributive payments does not lead to any reduction to the overall spend on direct payments. There is no transfer into the Rural Development Programme and so no benefits from additional spending in Pillar 2. The impact is purely a redistribution of direct payments from larger farms to smaller farms.

38. The costs of redistributive payments, as with reductions, arise from administrative costs and the disincentive for farms to grow in size.

39. Redistributive payments are made for the first 54 hectares at the expense of land over the 54 hectare limit. In comparison reductions only affect farms with payments over €150,000 which equates to around 880 hectares of non SDA land. Therefore under redistributive payments the disincentive for farms to grow starts at just 54 hectares whilst under reductions this is 880 hectares. It follows that the costs of productivity losses resulting from the disincentive to grow will be larger under redistributive payments than reductions.

Minimum claim size and other changes to Pillar 1 direct payments

a. Minimum claim size

40. England must set a minimum claim for the basic payment scheme and other direct payments. The minimum must be set by either area (between 1 and 5 hectares) or by value (in the range of €100 - €200). Currently England operates an area based threshold of one hectare. This section considers the costs and benefits of a higher threshold.

41. Table 38 shows that if the minimum claim size was increased to 5 hectares, the number of claimants would reduce by around 16,000 or 15%. The area of land on which direct payments are paid would reduce by just 0.6%. Moorland would be largely unaffected by the changes, with just 39 hectares no longer receiving payments as a result of the change.

Table 38: Number and land area of CAP claimants under a 1 and 5 hectare minimum claim size

	1 hectare	5 hectares	Change
Number of holdings	115,452	97,787	17,665 (15%)
Number of claimants in 2012	103,863	88,127	15,736 (15%)
Eligible hectares of land			
Non SDA	7,306,444	7,263,410	43,034 (0.6%)
SDA	569,764	566,433	3,330 (0.6%)
Moorland	419,270	419,232	39 (0.01%)
Total	8,295,478	8,249,075	46,403 (0.6%)

Administrative savings but small loss of land area subject to cross compliance…

42. Reducing the number of claimants by 15% would bring benefits in the form of administrative savings for the RPA.

43. Environmental costs could arise as 46,000 hectares of land would cease to be subject to cross compliance. However these costs will be limited to aspects of cross compliance which are not also required under existing English or EU law.

b. Young farmers scheme

44. There is no comprehensive dataset for the age of claimant farmers. This is not information which RPA currently routinely collect however it is held for a minority of farmers. Assuming this small sample is representative of the whole farming population implies that there are currently 9,000 young farmers. Further analysis would be necessary to establish the proportion of these that have entered the sector in the last five years.

45. We will produce analysis of the impact of the young farmers' scheme following consultation and once final regulations are available.

Further analysis following the consultation

46. For measures that are purely spending decisions no formal impact assessment will be needed but further analysis may be undertaken following the consultation when making a decision. An impact assessment will be produced for measures where action must be taken but there are options as to how we implement it which place burdens on farmers.

Annex 1: Impact of direct payments cuts on farmer with high debt levels

47. One way to think about how problematic cuts to direct payments might be for England's farmers is to look at their liquidity ratios, which measures the short-term viability of farms. A large proportion of the assets on a farm, such as land or machinery, will typically have a monetary value that is difficult or costly to realise in the short term. The liquidity ratio shows the ability of a farm to finance its immediate financial demands from its current assets, such as cash, savings or stock. If the liquidity ratio is equal to or above 100%, then a farm is able to meet its current liabilities using current assets. If the liquidity ratio is less than 100%, then a farm cannot meet its immediate financial demands using current assets. Whilst the majority of farms have strong liquidity ratios (and 1 in 20 have no current liabilities), there is a sizeable minority had a liquidity ratio of less than 100%.

Table 39: Liquidity Ratios in English farms

All Farm Types	Owner - Occupied		Tenanted		Mixed Tenure		All Tenure Types	
	2008/09	2010/11	2008/09	2010/11	2008/09	2010/11	2008/09	2010/11
Less than 60%	10%	8%	8%	8%	9%	10%	9%	9%
> 60% to ≤ 100%	6%	7%	10%	11%	11%	10%	9%	9%
> 100% to ≤ 140%	4%	4%	13%	12%	7%	9%	7%	7%
> 140% to ≤ 200%	8%	7%	9%	8%	6%	9%	7%	8%
200% and above	65%	68%	54%	57%	63%	61%	62%	63%
Nil current liabilities	7%	7%	5%	6%	3%	2%	5%	5%
Average Liquidity Ratio (Per Farm)	2.26	2.76	2.42	1.99	2.38	2.42	2.35	2.43

Source: Farm Business Survey

Annex 2: The likelihood of falling prices leading to market intervention

48. The following figures show the baseline estimate of commodity prices, drawing on the latest modelling work in OECD – FAO Outlook publication.

Figure 15 to Figure 20: EU producer and support prices (taking into account macro macroeconomic and global crop Yield uncertainties

Figure 15: Cheese

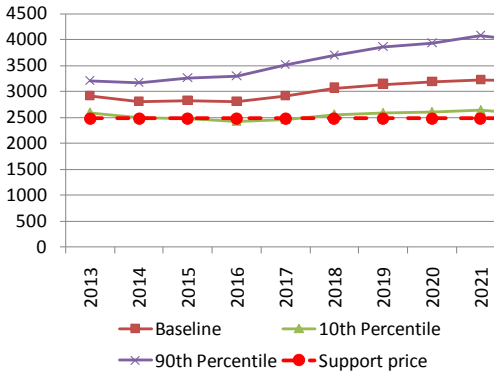


Figure 16: Skimmed milk powder

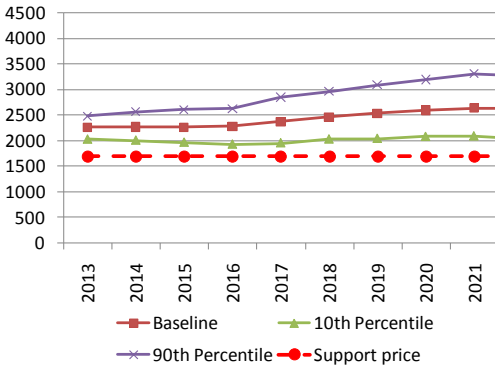


Figure 17: Butter

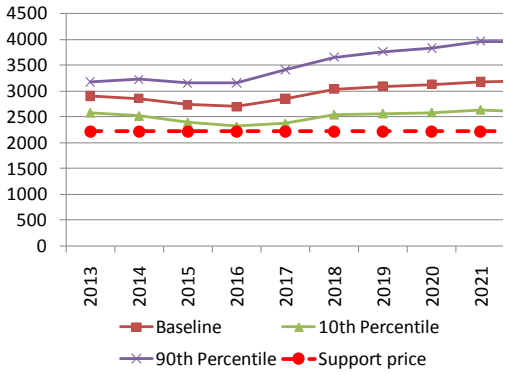


Figure 18:Whole milk powder

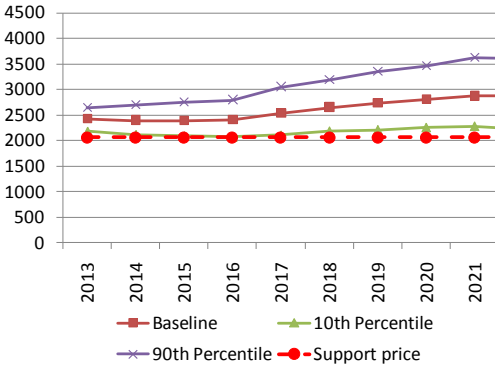


Figure 19:Common wheat

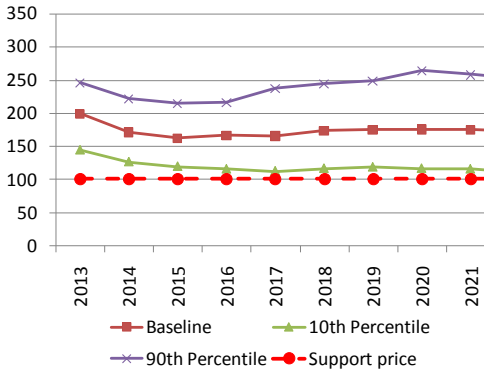
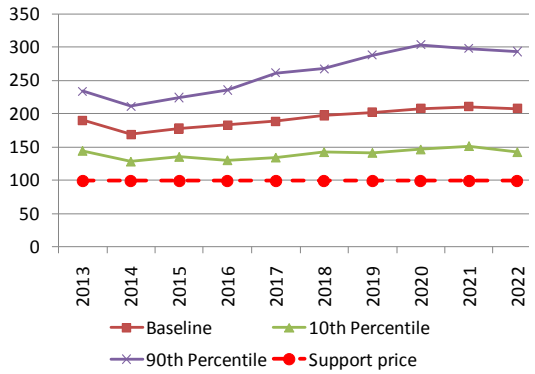


Figure 20:Barley



49. The modelling also looks at possible variation around the baseline projection. This stochastic analysis assesses how uncertainty surrounding particular key assumptions about the macroeconomic (including the oil price) setting and crop yield levels might affect the baseline projections.

50. The quantification of future uncertainty assumed for these drivers is based on their variability around expected values as observed in the recent past. Three streams of stochastic experiments were performed: (1) global macroeconomic uncertainty; (2) global arable crop yield uncertainty; and (3) global macroeconomic and global arable crop yield uncertainty.

51. The stochastic simulations show that exceptional measures may be triggered for cheese, whole milk powder and butter. No cases of exceptional measures were simulated for the grains sector. In the cheese market, the results indicate that there is nearly a 50% chance of exceptional measures between 2014 and 2016.