

**Agriculture and Rural Development
Directorate-General**

Evaluation of the CAP measures related
to hops

Final report - 7 December 2009

Deloitte.



Table of contents

<u>1</u>	<u>INTRODUCTION</u>	<u>7</u>
1.1	STRUCTURE OF THIS REPORT	7
<u>PART I – OVERVIEW OF THE HOP SECTOR</u>		<u>8</u>
<u>2</u>	<u>OVERVIEW OF THE HOP SECTOR</u>	<u>8</u>
2.1	THE EU HOP SECTOR	8
2.2	THE WORLD MARKET FOR HOPS	10
2.3	THE MAIN EU HOPS PRODUCTION SYSTEMS	15
2.4	THE FARM STRUCTURE	17
<u>PART II – METHODOLOGY AND INTERVENTION LOGIC</u>		<u>18</u>
<u>3</u>	<u>METHODOLOGY AND INTERVENTION LOGIC</u>	<u>18</u>
3.1	BACKGROUND AND CONTEXT OF THIS EVALUATION	18
3.2	INTERVENTION LOGIC: THE CAP MEASURES AND OTHER INTERVENING FACTORS	22
3.3	THE ANALYTICAL FRAMEWORK OF THIS EVALUATION	37
3.4	DATABASES AND ECONOMIC MODELS	37
3.5	TOOLS USED FOR DATA COLLECTION	43
<u>PART III – ANSWERS TO THE EVALUATION QUESTIONS</u>		<u>47</u>
<u>4</u>	<u>THEME 1 – EFFECTS ON PRODUCTION</u>	<u>47</u>
4.1	INTRODUCTION	47
4.2	EVALUATION QUESTION 1.1.: TO WHAT EXTENT HAVE THE CAP MEASURES SUPPORTING HOPS AFFECTED THE PRODUCTION DECISIONS OF FARMERS IN TRADITIONAL AREAS?	52
4.3	EVALUATION QUESTION 1.2.: TO WHAT EXTENT HAVE THE CAP MEASURES SUPPORTING HOPS CONTRIBUTED TO SUPPORT THE INCOME OF HOPS PRODUCERS?	79
<u>5</u>	<u>THEME 2 – EFFECTS ON PRODUCTION STRUCTURE</u>	<u>87</u>
5.1	EVALUATION QUESTION 2.1.: TO WHAT EXTENT HAVE THE CAP MEASURES SUPPORTING HOPS INDUCED STRUCTURAL CHANGES OF PRODUCING FARMS AND CHANGES IN THE GEOGRAPHICAL DISTRIBUTION OF HOPS PRODUCTION?	87
<u>6</u>	<u>THEME 3 – EFFECTS ON THE DOWNSTREAM SECTOR</u>	<u>97</u>
6.1	INTRODUCTION	97

6.2	EVALUATION QUESTION 3.1.: TO WHAT EXTENT HAVE THE CAP MEASURES SUPPORTING HOPS CONTRIBUTED TO ENSURING SUFFICIENT LEVELS OF PRODUCTION (QUALITY AND QUANTITY) WITH RESPECT TO THE NEEDS OF THE PROCESSING INDUSTRIES, AND TO WHAT EXTENT HAS THE SUPPORT INDUCED CHANGES IN THE GEOGRAPHICAL DISTRIBUTION OF THE PROCESSING INDUSTRIES?	98
6.3	EVALUATION QUESTION 3.2.: TO WHAT EXTENT HAVE THE CAP MEASURES SUPPORTING HOPS CONTRIBUTED TO STABILISING MARKETS AND ENSURING REASONABLE PRICES FOR SUPPLIES TO CONSUMERS?	102
6.4	EVALUATION QUESTION 3.3.: TO WHAT EXTENT IS THE OBJECTIVE OF ENSURING SUFFICIENT LEVELS OF PRODUCTION (QUANTITY AND QUALITY) IN TRADITIONAL PRODUCTION AREAS RELEVANT WITH RESPECT TO THE NEEDS OF USER INDUSTRIES (E.G. IN TERMS OF ADDED VALUE OF LOCAL PRODUCTION)?	108
7	<u>THEME 4 – EFFECTS ON RURAL DEVELOPMENT</u>	111
7.1	EVALUATION QUESTION 4.1. TO WHAT EXTENT HAVE THE CAP MEASURES SUPPORTING HOPS PROMOTED RURAL DEVELOPMENT IN TRADITIONAL PRODUCTION AREAS WITH RESPECT TO EMPLOYMENT AND ECONOMIC VIABILITY?	111
8	<u>THEME 5 - EFFICIENCY, MANAGEMENT AND ADMINISTRATION</u>	123
8.1	EVALUATION QUESTION 5.1: TO WHAT EXTENT HAVE THE CAP MEASURES APPLICABLE TO THE HOP SECTOR AFTER THE 2004 REFORM BEEN EFFICIENT IN ACHIEVING THE OBJECTIVES OF THESE MEASURES?	123
8.2	EVALUATION QUESTION 5.2: TO WHAT EXTENT HAVE THE CAP MEASURES SUPPORTING HOPS CONTRIBUTED TO (OR COUNTERACTED WITH) ACHIEVING A SIMPLIFIED AND EFFECTIVE ADMINISTRATION AND MANAGEMENT	127
9	<u>THEME 6 – OVERALL COHERENCE WITH CAP OBJECTIVES</u>	130
9.1	EVALUATION QUESTION 6.1.: TO WHAT EXTENT ARE THE CAP MEASURES SUPPORTING HOPS COHERENT WITH THE OBJECTIVE OF A MORE COMPETITIVE AND MARKET-RELATED AGRICULTURE PROMOTED BY THE 2003 CAP REFORM?	130
9.2	EVALUATION QUESTION 6.2.: TO WHAT EXTENT HAVE THE CAP MEASURES SUPPORTING HOPS AFFECTED THE ENVIRONMENT?	139
	<u>PART IV: CONCLUSIONS AND RECOMMENDATIONS</u>	144
10	<u>CONCLUSIONS</u>	144
10.1	THEME 1: EFFECTS ON PRIMARY PRODUCTION	144
10.2	THEME 2: EFFECTS ON PRODUCTION STRUCTURE	145
10.3	THEME 3: EFFECTS ON THE DOWNSTREAM SECTOR	145
10.4	THEME 4: EFFECTS ON RURAL DEVELOPMENT	146
10.5	THEME 5: EFFICIENCY, MANAGEMENT AND ADMINISTRATION	146
10.6	THEME 6: OVERALL COHERENCE WITH THE CAP POLICY	147
11	<u>RECOMMENDATIONS</u>	148

Table of tables

Table 1 - Development of surface of hops in European Union (EU-27)	8
Table 2 – Evolution of new hops hectares in the European Union (EU-27).....	8
Table 3 - Evolution of hops yield and alpha-acid content in the European Union (EU-27).....	8
Table 4 – Trend in area and production volumes in EU hops producing MS (2001-2008)	9
Table 5 - World beer production 2001-2009	11
Table 6 - Main brewers market shares based on 2007/2008 volumes estimates	11
Table 7 - Average hopping rate (grams alpha acid/hectolitre)	12
Table 8 - Estimation of the evolution of the demand for alpha acids (1,000 tonne).....	12
Table 9 - Development of surface and yields of hops worldwide.....	13
Table 10 - Production of alpha acid by continent (in tons).....	13
Table 11 - Export of hops (in tons).....	14
Table 12 - Import of hops (in tons)	14
Table 13 - Net- exports of hops (in tons)	14
Table 14 - Estimation of the world demand and supply of alpha acid (in tons)	15
Table 15 - Evolution of number of holdings and average acreage per holding in major hops producing countries (2002-2008).....	17
Table 16 – CAP reform implementation in the Member States for hops	30
Table 17: Subsidies per Ha in the Czech Republic in 2008	35
Table 18 – Database features	42
Table 19 - Selected countries/regions for the case studies	45
Table 20 - Basis of the 4 mirror groups	50
Table 21 - Estimation of the world demand and supply of alpha acid (in tons)	52
Table 22 – Evolution of hops area in 2001-08 worldwide (ha)	53
Table 23 – Evolution of new planted hops area in 2001-08 worldwide (ha)	53
Table 24 – Share of world hops area by continent in 2001-08	54
Table 25 – Share of the EU-27 hops area by Member State in 2001-08 (ha).....	54
Table 26 - Production of alpha acid by continent (in tonnes).....	55
Table 27 – Share of world production of alpha acid by continent.....	55

Table 28 – Share of EU production of alpha acid by Member State	56
Table 29 – Gross margin of hops and some alternative crops (€/ha) in 2004	59
Table 30 – Structure of the hops producing farms in Germany and the four mirror groups.....	62
Table 31 – Financial results of the hops producing farms in Germany and the four mirror groups.....	63
Table 32 – Structure of the hops producing farms in Czech Republic and the four mirror groups	65
Table 33 – Financial results of the hops producing farms in Czech Republic and the four mirror groups	65
Table 34 - Development of the hops area in 2001-2008 (in ha) by extent of decoupling	73
Table 35 – Production sold through forward contracts.....	76
Table 36 – Total net farm income (in €) on German hops growing farms in 2013 in three scenarios.....	81
Table 37 – Total net farm income on Czech hops growing farms in 2013 in two scenarios	82
Table 38 – The development of the average difference of net farm income between hops farms and their mirror groups (in euro) and of the percentage of hops farms with a better income compared to their mirror groups in Germany.....	84
Table 39 – Hops farm structure by class size - 2003	88
Table 40 – Hops farm structure by class size - 2007	88
Table 41 – Changes 2003-2007 in relative population of size classes for hops farms	88
Table 42 – Number of holdings growing hops	91
Table 43 – Acreage variation in the period 2001-2007 in traditional production areas of Germany and Czech Republic	95
Table 44 - Beer and alpha acid production (Europe) Table 45 - Beer and alpha acid production (world)	98
Table 46 – Price in EUR for 100Kg of hops and price variance.....	102
Table 47 – Top 15 brewers worldwide in 2007 and comparison with 2004	105
Table 48 – Breweries in the Member States (2006) and hops trade figures in 2004.....	108
Table 49 – AWU for Germany in 2003-2007	112
Table 50 – AWU for France	113
Table 51 – AWU for Slovenia.....	113

Table of figures

Figure 1 - Average prices of hops in the EU (€/tonne) – 2000-2007 period	10
Figure 2 – Worldwide demand and supply of alpha acid in the latest brewing years (in tons)	15
Figure 3 – Intervention logic for hops before the 2003 CAP reform.....	25
Figure 4 – Intervention logic – CAP 2003-09.....	27
Figure 5 – Tri-dimensional evaluation approach.....	43
Figure 6 – Development of yield (alpha acid in kg/ha) in Czech Republic, Germany, Spain and United Kingdom	56
Figure 7 – Distribution of the difference of net farm income between hops farms and their mirror groups (in euro) in Germany before and after the CAP reform	85
Figure 8 – Evolution of the average size of European hops’ farms by Member State (logarithmic scale).	90
Figure 9 – Evolution of the relative average size of hops farms in the EU by Member State.....	91
Figure 10 – Relative decrease in European growers.....	92
Figure 11 – European farmers by age class.....	93
Figure 12- Spot price vs. contract price (2000-2007).....	103
Figure 13 - Breweries, acreage and hops production per country (Logarithmic scale)	109
Figure 14 – Estimate of the number of seasonal workers required.....	114
Figure 15 – Producer Price of hops in EUR per ha	117
Figure 16 - Producer prices for hops in relative terms.....	118
Figure 17 – Trend in electricity costs for holdings	119
Figure 18 – Increasing fuel costs in Europe.....	119
Figure 19 – EU acreage share compared to main competitors.....	131
Figure 20 – Alpha acid production trends.....	132
Figure 21 - Acres need to obtain a tonne of alpha acid	132
Figure 22 – Yield for aroma hops	134
Figure 23 – Yield for bitter hops.....	135
Figure 24 – Percentage of fallow land on UAA	140
Figure 25 – Cost of most common fertilizers for hops.....	141

1 Introduction

Deloitte, supported by Arcadia International and LEI Wageningen University and Research Centre, were appointed by the European Commission to undertake an evaluation of the CAP measures related to hops. This specific contract is under framework contract **No 30-CE-0219319/00-20** and was signed by Deloitte on 31 December 2008.

This study pays particular attention to the effects of the CAP reform (decoupled aid as established by Council Regulation 1782/3003) on the hop sector. The objective of the study is twofold: first, to provide a general descriptive overview of the current state of play in the EU hop sector and the main trends that can be observed worldwide and second, to answer the evaluation questions proposed and grouped in six main themes.

1.1 Structure of this report

This final report presents our response to all evaluation questions.

In accordance with the Terms of Reference, the report is structured as follows:

- **Part I** includes a description of the EU hop sector, the world market for hops, the main EU hops production systems. When presenting the descriptive part we take into careful consideration the objectives of the study and therefore we make a distinction between the time periods before and after the reform;
- **Part II** describes our methodological approach and our understanding of the intervention logic of the CAP reform;
- **Part III** presents our answers to the evaluation questions;
- **Part IV** presents our conclusions based on the answers to the evaluation questions and our recommendations by theme.

Part I – Overview of the hop sector

2 Overview of the hop sector

2.1 The EU hop sector

The European Union is the main player in the world hops market. Total production was about 57,000 tonnes in 2008, a share of over 50% of world hops production. The largest producer within the EU is Germany. The area sown to hops is decreasing steadily in the EU, with a reduction of 16% since 2001. About one third of the area is grown with bitter varieties. This percentage has been constant throughout the last eight years.

Table 1 - Development of surface of hops in European Union (EU-27)

		2001	2002	2003	2004	2005	2006	2007	2008
acreage (aroma varieties)	Ha	21,554	20,817	19,462	20,172	19,711	19,603	19,579	19,756
acreage (bitter varieties)	Ha	11,015	11,215	11,075	11,027	10,208	9,525	9,317	9,949
total acreage	Ha	32,569	32,032	30,537	31,199	29,919	29,128	28,896	29,705

Source: IHGC

The increase in new hops area decreased year on year over the 2001-2005 period before stabilising in 2006. The trend was upward in 2007 and 2008. Preliminary data published by IHGC in August 2009 indicate that fewer new hectares have been planted in 2009 in Germany (706 ha in 2009 compared to 1,135 ha in 2008).

Table 2 – Evolution of new hops hectares in the European Union (EU-27)

		2001	2002	2003	2004	2005	2006	2007	2008
acreage (new)	Ha	1,845	1,455	1,241	1,113	550	724	1,271	1,594

Source: IHGC

Yield, and in particular alpha acid content, shows a large increase over the 2001-2008 period. The average yield was 1,630 kg hops per ha with an alpha acid content of 7.8% during these years. The average alpha acid yield was 127 kg/ha. However, only 87 kg of alpha acid per hectare was harvested in 2003 as a result of very low alpha acid contents. In contrast, 2008 was a very good year with an average yield of 173 kg of alpha acid per hectare. This trend is the consequence of an increase in yield from bitter varieties (see Table 3) and the planting of new bitter varieties with higher alpha-acid content.

Table 3 - Evolution of hops yield and alpha-acid content in the European Union (EU-27)

		2001	2002	2003	2004	2005	2006	2007	2008
yield (aroma varieties)	Kg/ha	1,373	1,46	1,14	1,466	1,68	1,341	1,545	1,74
yield (bitter varieties)	Kg/ha	1,852	1,784	1,734	2,011	2,106	1,786	1,934	2,291
yield (all varieties)	Kg/ha	1,453	1,505	1,617	1,604	1,792	1,485	1,67	1,924
yield of alpha acid	Kg/ha	109	120	87	136	148	107	132	173
alpha acid content	%	7.5	8.0	5.4	8.5	8.2	7.2	7.9	9.0

Source: IHGC

Hops are produced by fourteen EU Member States although together Germany and the Czech Republic account for over 80% of total EU production by volume. Poland is the only other Member States to account for more than 5% of total EU production (3,256 tons in 2008). Traditional hops production areas can be found within each producing Member State, including Bavaria, Saxony and Bitburg in Germany, Bohemia in Czech Republic, Lublin in Eastern Poland, Kent in the United Kingdom, León in Spain and Alsace in France.

Table 4 – Trend in area and production volumes in EU hops producing MS (2001-2008)

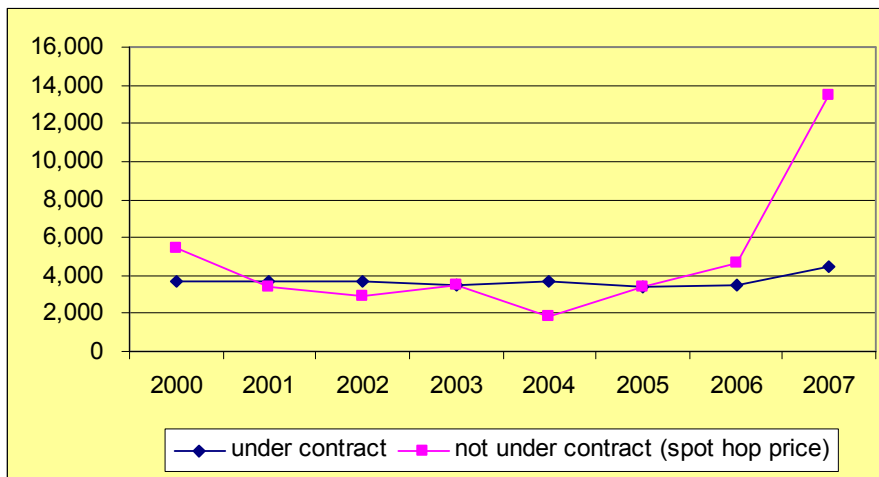
	2001				2008				2001-2008 Change		
	Acreage		Production		Alpha acid content		Acreage		Production		Alpha acid volumes
	<i>in ha</i>	<i>in tons</i>	<i>in %</i>	<i>in tons</i>	<i>in ha</i>	<i>in tons</i>	<i>in %</i>	<i>in tons</i>	<i>in %</i>	<i>in %</i>	<i>in %</i>
Austria	220	337	6.10	23	210	382	8.00	31	-4.55%	13.35%	34.78%
Belgium	250	416	9.30	39	186	325	8.30	27	-25.60%	-21.88%	-30.77%
Bulgaria	380	295	9.60	31	221	342	9.50	33	-41.84%	15.93%	6.45%
Czech Republic	6,075	6,621	4.00	213	5,125	6,700	4.20	300	-15.64%	1.19%	40.85%
France	816	1,212	2.70	30	773	1,469	2.50	39	-5.27%	21.20%	30.00%
Germany	19,021	31,739	8.40	2,726	17,510	39,510	10.00	4,100	-7.94%	24.48%	50.40%
Hungary	34	34	5.00	2	23	35	9.40	3	-32.35%	2.06%	50.00%
Poland	2,250	2,200	5.50	122	2,141	3,256	7.40	256	-4.84%	48.00%	109.84%
Portugal	38	52	10.20	5	37	57	10.60	6	-2.63%	9.62%	20.00%
Romania	100	50	5.00	3	278	246	6.90	17	178.00%	392.00%	466.67%
Slovakia	350	300	3.40	10	261	328	3.90	13	-25.43%	9.33%	30.00%
Slovenia	1,657	2,149	7.20	129	1,652	2,430	7.00	138	-0.30%	13.08%	6.98%
Spain	730	1,668	11.90	167	465	810	12.60	109	-36.30%	-51.44%	-34.73%
UK	1,997	2,518	9.10	209	1,100	1,350	6.60	89	-44.92%	-46.39%	-57.42%
Total EU	33,918	49,591		3,709	29,982	57,240		5,161	-13%	15.42%	39.15%

Source: IHGC annual reports

Most of hops acreage is sold by forward contracts by the merchants (95% in Germany¹ in 2009). The remainder is sold on the spot market. The forward contract rates in the EU-27 for the coming four years are well below 50% with the exception of Poland and Slovenia. Prices are significantly different for these two markets with the forward contract price quite stable over time and the spot price more volatile and generally higher.

¹ Source : The Barth report 2008-2009.

Figure 1 - Average prices of hops in the EU (€/tonne) – 2000-2007 period



Source: DG AGRI

The hops processing and transformation industries act at the international level. The hops supply chain is characterised by a small number of large merchants that own the majority of the world's pelletising and extract machines. There has been significant consolidation in the industry over the past four decades with many hops trading companies going out of business; in the 1960s there were more than 90 companies in Germany alone. The four largest merchants today are German or American conglomerates (John Barth and Sohn, S S Steiner, Hops Union, and Lupotresh). There are two other international hops merchants, Magma from the Czech Republic and Morris Harbury Jackson & E May from United Kingdom. Other operators exist, but they do not sell significant volumes of hops. The transnational merchants currently hold about 90% of forward contracts with breweries. However, opportunities exist for niche markets to be exploited.

2.2 The world market for hops

2.2.1 Demand

The majority of the hops produced is used in the beer brewing industry and therefore the demand for hops worldwide is dependent on beer consumption. The beer market is changing. In East Asian countries beer consumption is increasing, but it is falling in Europe (especially in western countries), America and Africa. Beer production in 2009 reached 1,817 million hectolitres, an increase of 396 million hectolitres since 2001. With the beer market stagnating in several important markets, competition between brewers actors is increasing.

Table 5 - World beer production 2001-2009

		2001	2002	2003	2004	2005	2006	2007	2008	2009
Germany	Mio hl	109	108	106	106	105	107	104	101	100
	% of world Production	7.7	7.5	7.0	6.8	6.5	6.3	5.8	5.6	5.5
Rest of Europe	Mio hl	384	389	411	426	439	466	485	495	500
	% of world Production	27.0	27.4	27.4	27.4	27.3	27.3	27.2	27.0	28.0
North America	Mio hl	254	255	263	258	25	255	257	260	270
	% of world Production	17.9	17.6	19.9	16.6	15.8	15.0	14.5	14.5	14.9
South America	Mio hl	221	225	226	226	243	263	273	278	280
	% of world Production	15.6	15.5	15.1	14.6	15.1	15.5	15.4	15.4	15.4
Asia	Mio hl	369	380	415	449	475	514	558	560	562
	% of world Production	26.0	26.2	27.7	28.9	29.5	30.1	31.4	31.1	30.9
Africa	Mio hl	63	64	65	67	73	79	78	82	83
	% of world Production	4.4	4.4	4.3	4.3	4.5	4.6	4.4	4.5	4.6
Australia	Mio hl	21	22	21	21	21	21	22	22	22
	% of world Production	1.5	1.5	1.4	1.4	1.3	1.3	1.2	1.2	1.2
Total	Mio hl	1421	1451	1497	1552	1611	1704	1779	1799	1817
	Evolution (100 in 2001)	100.0	102.1	103.2	103.9	104.2	106.5	105.3	101.4	101.3

Source: 2008 Hopsteiner, Guidelines for hops buying

It has to be highlighted that the hops downstream market is today extremely concentrated as the number of traders and the number of brewers have significantly decreased over the last 20 years. Some niche players remain, often local suppliers, but they have a tiny impact on demand. The top three global brewers produce over 50% of the world's beer and have a 70-80% market share in developed countries².

Table 6 - Main brewers market shares based on 2007/2008 volumes estimates

	World Share
ABI	26%
Miller/Coors	17%
Heineken	10%
Top 3 share	51%

Source: Beer Institute

Additionally, due to changing consumer preference, hopping rates are falling year after year: the figure calculated for 2008 is 4.6 grams of alpha acid per hectolitre, a decline from 5.5 grams alpha acid per hectolitre in 2001. Consumer taste is moving towards less bitter beers requiring lower hops content. This is another factor explaining the decrease in the demand for hops. It is interesting to note that hops accounts for about 0.3% of beer production costs, taxes excluded (source: HOPS USA, June 2003).

² Source; Beer Institute, 2009. This data takes already into account the effects of the Anhauser Busch-Inbev merger.

Table 7 - Average hopping rate (grams alpha acid/hectolitre)

	2001	2002	2003	2004	2005	2006	2007	2008
Hopping rate	5.5	5.3	5.2	5.1	5.0	4.9	4.8	4.6

Source: *The Barth report, 2007-2008*

The demand for hops exceeded the available supply in 2005-2007 resulting in a reduction of stocks held by brewers. The shortage was mainly due to bad climatic conditions. As stocks were insufficient to fully meet demand, spot prices (non-contracted) for hops reached extremely high prices – even three times higher than contracted hops (see Figure 1). But after the good global hops harvest in 2008, in 2009 there is likely to be another surplus of alpha-acids. This is evidenced by spot market demand, (see Figure 2) where compared with years 2007/08 the spot prices of hops from autumn 2008 are much lower than contracted ones.

A preliminary estimate for the 2009 brewing year shows that the alpha acid production of 2008 exceeds the needs of the brewing industry by at least 1,500 tons as a result of a very good harvest and a global increase in area. Thus, global stocks are likely to be increased.

Table 8 - Estimation of the evolution of the demand for alpha acids (1,000 tonne)

	2001	2002	2003	2004	2005	2006	2007	2008
Europe	2,627	2,621	2,644	2,647	2,640	2,669	2,705	n.a.
America	2,555	2,506	2,458	2,489	2,507	2,426	2,402	n.a.
Asia	1,911	1,913	1,962	2,163	2,223	2,392	2,352	n.a.
Africa	346	363	380	391	401	372	371	n.a.
Oceania	118	115	112	108	109	106	106	n.a.
World	7,557	7,518	7,556	7,799	7,880	7,965	7,936	7,450
Barth report	7,834	7,649	7,664	7,916	8,103	8,313	8,580	8,500

Source: *FAO; adoption LEI and the Barth Report 2007-2008*

2.2.2 Supply

Acreage and production

Hops are grown in approximately 30 countries worldwide, the majority of which are in the Northern Hemisphere. World production is dominated by two countries, Germany and the USA, who jointly represent more than half of the world hops production (59.2% in 2009³). In 2008 global hops area amounted to almost 54,000 hectares, of which the EU-27 accounted for about 55%, the United States for 30% and China for more than 10%⁴. In the US the bulk of production is provided by Washington state (Yakima area) whilst other important areas can be found in Idaho and Oregon.

The global area under hops declined from 57,967 ha in 2001 to 53,865 in 2008 (-6%). On the other hand, world production in tons has increased from 98,705 tons in 2001 to 111,140 tonnes in 2008, a rise of 13%. The 2008 harvest was exceptionally high, due to the choice of varieties and to exceptionally good weather. The increase in acreage of about 4,000 ha from the previous year,

³ Source: *2008 Hopsteiner, Guidelines for hops buying*

⁴ Source: *International Hops Growers' Convention, 2008*

mainly in the US, Germany and China, was also important and shows a change in the tendency towards a reduction in acreage. In all other countries changes in acreage were (less than) zero or not relevant. The following table shows the global development of hops area and yield.

Table 9 - Development of surface and yields of hops worldwide

		2001	2002	2003	2004	2005	2006	2007	2008
acreage (aroma varieties)	Ha	28,069	27,000	25,595	25,903	25,879	25,862	25,583	27,105
acreage (bitter varieties)	Ha	27,460	25,725	25,064	24,197	22,565	20,212	23,940	26,759
total acreage	Ha	57,967	55,348	52,203	51,408	48,995	46,095	49,523	53,865
% bitter varieties	%	47.4	46.5	48.0	47.1	46.1	43.8	48.3	49.7
acreage (new)	Ha	2,438	2,623	1,544	1,362	586	844	1,551	5,420
yield (aroma varieties)	Kg/ha	1,361	1,448	1,233	1,486	1,636	1,338	1,559	1,706
yield (bitter varieties)	Kg/ha	2,203	2,911	2,116	2,238	2,265	1,846	2,171	2,426
yield (all varieties)	Kg/ha	1,703	2,059	1,812	1,802	1,907	1,766	1,815	2,063
yield of alpha acid	Kg/ha	149	155	135	164	167	151	165	194
% alpha acid	%	8.8	7.5	7.4	9.1	8.7	8.5	9.1	9.4
production (aroma varieties)	Tons	38,212	39,090	31,566	38,504	42,336	34,594	39,893	46,228
production (bitter varieties)	Tons	60,494	74,892	53,024	54,160	51,106	37,306	51,974	64,912
total production	Tons	98,705	113,983	94,590	92,655	93,445	81,401	89,866	111,140
total production of alpha acid	Tons	8,639	8,596	7,023	8,452	8,158	6,956	8,161	10,468

Source: IHGC, adaptation LEI

The ratio between aroma varieties and bitter varieties has changed over the years. Since 2001 the share of bitter varieties in the total acreage has been approximately 48%. The share of bitter varieties increased over the decade to 2001 from a share of 37% in 1991. Table 10 shows the production of alpha acid by continent. Europe is the largest producer with a share of 50%, closely followed by America with a share of 40%. Asia produces only 8% of world production with Oceania contributing 2% and Africa only 1%.

Table 10 - Production of alpha acid by continent (in tons)

	2001	2002	2003	2004	2005	2006	2007	2008
Europe	3,672	4,064	2,847	4,469	4,562	3,191	3,847	5,187
America	3,450	3,140	2,900	2,900	2,584	2,929	3,280	4,150
Asia	907	862	921	727	644	550	717	860
Africa	90	118	111	134	127	95	121	79
Oceania	370	412	244	222	241	192	196	192
World	8,489	8,596	7,023	8,452	8,158	6,956	8,161	10,468

Source: IHGC, adaptation LEI

2.2.3 Trade

The FAO provides import and export data of hops worldwide until 2006. The total trade between countries is about 40,000 tons, or about 40% of annual production. Europe exports far more hops than it imports with a share of about 80% of world exports (Table 11), although this figure does include intra-EU trade. The second largest exporter is America, while exports from Asia, Africa and Oceania are of minor importance.

Imports are reported in Table 12. Importing continents are again Europe and America, but Asia is also a significant importer. The import figures in Africa are very variable. The net exports in Table 13 show in most years a general trend in hops movements from Europe and Oceania to Asia and

America. Of course net exports worldwide should add up to zero, but unfortunately the FAO statistics are not quite consistent and a statistical correction has been made.

Table 11 - Export of hops (in tons)

	2001	2002	2003	2004	2005	2006
Europe	27,821	27,723	27,298	27,156	29,268	28,715
America	6,712	5,143	6,551	6,895	5,784	6,071
Asia	1,170	1,258	1,070	200	500	738
Africa	189	721	1,025	771	205	297
Oceania	1,820	1,538	935	789	923	486
World	37,712	36,383	36,879	35,811	36,680	36,307

Source: FAO

Table 12 - Import of hops (in tons)

	2001	2002	2003	2004	2005	2006
Europe	20,638	30,929	21,527	20,657	20,920	20,083
America	8,704	7,236	8,837	7,333	7,092	8,446
Asia	8,096	8,565	6,685	6,257	8,217	9,167
Africa	910	792	1,640	805	4,053	2,363
Oceania	53	92	209	64	107	150
World	38,401	47,614	38,898	35,116	40,389	40,209

Source: FAO

Table 13 - Net- exports of hops (in tons)

	2001	2002	2003	2004	2005	2006
Europe	7,183	-3,206	5,771	6,499	8,348	8,632
America	-1,992	-2,093	-2,286	-438	-1,308	-2,375
Asia	-6,926	-7,307	-5,615	-6,057	-7,717	-8,429
Africa	-721	-71	-615	-34	-3,848	-2,066
Oceania	1,767	1446	726	725	816	336
Statistical correction	689	11,231	2,019	-695	3,709	3,902
World	0	0	0	0	0	0

Source: FAO

2.2.4 Stocks

It is very difficult to obtain robust data on present stocks as this is considered commercially sensitive by brewers because stocks contribute to spot price formation and as a result are not normally disclosed. We therefore present an estimation of the changes in stock following the demand/supply trend.

Table 14 shows the stock changes of alpha acid over the last 9 years. Demand figures are based on the Barth Report while supply figures are based on IHGC data under the assumption that the harvest of the former year is available for the current brewing year. The supply is not easy to calculate for several reasons. First, the alpha acid content in hops is not stable; during storage it is vulnerable to oxidation, despite measures such as refrigerated and frozen storage. Approximately 10% of the alpha content disappears during storage, but this percentage is only a best guess. Another uncertainty is the amount of hops used for other purposes. The Barth Report mentions that around 200 tons of alpha acid is not used for brewing annually. This amount is not included in the table. A third aspect worth mentioning is a fire in an American warehouse in 2006, which destroyed about 200 tons of alpha acid. This is also excluded. For these reasons the estimations of stock changes are probably optimistic.

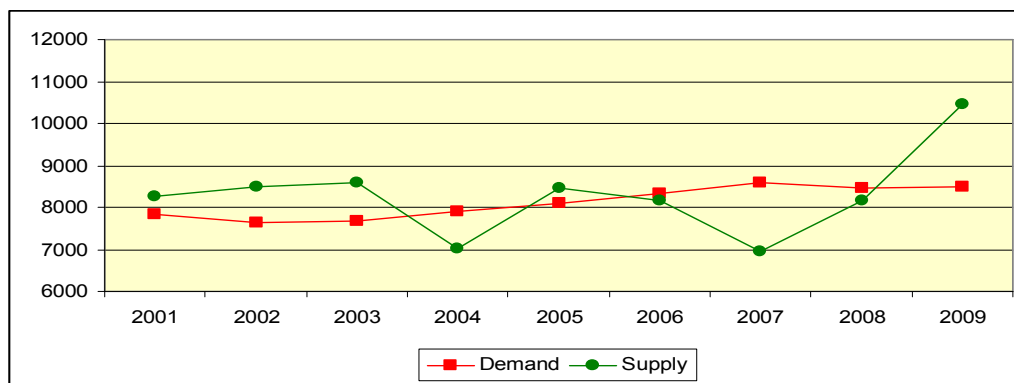
Table 14 - Estimation of the world demand and supply of alpha acid (in tons)

Brewing year	2001	2002	2003	2004	2005	2006	2007	2008	2009
Crop year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Demand	7,834	7,649	7,664	7,916	8,103	8,313	8,580	8,469	8,500
Supply	8,250	8,489	8,596	7,023	8,452	8,158	6,956	8,161	10,468
Stock changes	416	840	932	-893	349	-155	-1,624	-308	1,968

Sources supply: IHGC, adaptation LEI (supply), the Barth Report (demand)

Stocks increased significantly in the years 2001, 2002 and 2003, but then fell rapidly between 2004 and 2008. Because of the extremely high production in 2008 a substantial increase in stocks is expected for 2009. Figure 2 presents supply and demand graphically.

Figure 2 – Worldwide demand and supply of alpha acid in the latest brewing years (in tons)



Sources supply: IHGC, adaptation LEI (supply), the Barth Report (demand)

2.3 The Main EU hops production systems

A peculiar aspect of hops growing is the necessity to offer the plant the possibility to vine. For this purpose a trellis system is built. A hops planting follows the rows with a planting distance of about 1.5 metres, depending on farmers' equipment, and a density of about 2,600 plants/ha. Pruning is an annual spring cultural practice which holds back the vigorous new growth until the proper training date for the variety. This cultural practice also removes early hops shoots that may be infected with overwintering diseases and limits the use of fungicide during the growing season. In May the three most developed sprouts from each hops stump are wound around the leading wire; the other sprouts are cut off. Harvest takes place from the end of August through September. The hops vines are cut at the bottom and the top, together with the leading wires. The vines are brought to the farm to reap, clean, dry and store the hops cones. The cones are dried soon after the harvest to prevent loss of valuable components.

2.3.1 Fertilisation

2.3.2 Fertilising hops improves yield and quality by supplying the crops with adequate nutrient in advance of demand. The yield of hops cones depends on production system and weather conditions, especially in terms of nutrient supply. Mineral nitrogen (N) fertilising is one of the treatments that can influence yield. Hops require about 180 to 200 Units of N per ha with applications starting in the spring as most of the N uptake takes place in the early summer (June). A large variation is observed throughout the EU. Taking into account the differences in climatic conditions and production system, in Germany 270 kg N/ha in more than one split dose is recommended (Rossbauer and Zwack 1983), in the Czech Republic 65 to 135 kg N/ha, in the UK 150-225 kg N/ha and far less in the USA with 160 kg N/ha (Neve 1991). In general, calcium-ammonium nitrates (partly slow release fertiliser) are used at the beginning of vegetation, when urea that is directly available for the plants is used during the vegetative period.

The hops plant phosphorus (P) requirement is small when compared to the plant's need for N and potassium (K). Phosphorous and potassium rates amount to about 100-150 kg P₂O₅/ha and 200 kg K₂O/ha. Additional nutrients e.g. calcium (Ca), magnesium (Mg), manganese (Mn) are required in low quantities. Application rates are region specific and are largely dependent on the soil pH that should be kept between 5.0 and 7.0 for maintaining optimal growing conditions.

2.3.3 Crop protection

Hops gardens are subject to attacks of a large number of plant diseases and pests. The main diseases are downy mildew (*Pseudoperonospora humuli*) and powdery mildew (*Podosphaera macularis*) that find favourable development conditions in hops gardens during summer time. Major pests are the damson-hops aphid (*Phorodon humuli Schrank*) and the two-spotted spider mite (*Tetranychus urticae*). Pests of minor importance are the European corn borer (*Ostrinia nubilalis*) which is largely present in maize, alfalfa snout beetle (*Otiorhynchus liquisti L.*), and the flea beetle (*Psylliodes attenuate Koch*). Changes in weather conditions are the cause of higher occurrence of these pests in Central Europe. In some specific areas some diseases are of key importance, but with a limited spread e.g. Verticillium wilt in the UK.

Crops are protected by systemic fungicides e.g. azoxystrobin, fosetyl-al, metalaxyl M, and a combination of active substances e.g. metalaxyl M associated with folpet. Previously, copper fungicides were used in preventive spraying. Organophosphates, carbamates, and pyrethroids are the most popular insecticides in use. Since 1993, some resistance to imidachloprid has appeared. New, efficient insecticides, with improved environmental profiles, are now available for farmers, e.g. flonicamid (novel systemic insecticide with selective activity against aphids and whitefly), and spirotetramat (efficient against a broad spectrum of sucking insects). The two-spotted spider mite is commonly controlled using several miticides, although their use is quite limited (e.g. restriction of fenpyroximate in Germany in 2008). New miticides are undergoing the registration process (acequinocycle, bifenazate, etoxazole). These new active substances are leading to the registration of plant protection products that are more environmentally-friendly and better for the growers. In terms of weed management, few herbicides are available for hops, and weed control is largely carried out through cultivation.

Integrated Pest Management (IPM) is also under development in hops gardens. As examples, releases of ladybird *Harmonia axyridis* succeeded in controlling damson hops aphid in Alsace several years ago⁵ and new techniques are under development; quessia extracts have been rediscovered to protect hops plants against pests⁶. These solutions should be considered as alternatives to chemicals, but they cannot be used alone.

Breeding efforts are devoted to developing new cultivars with improved resistance against diseases e.g. Verticillium wilt. Moreover, a precise typing of hops pathogens is necessary to select the right and appropriate control strategy for use within an IPM approach. Finally, it should be noted that in the USA, the hops industry has received a Pesticide Environmental Stewardship Program (PESP) grant from the Environmental Protection Agency (EPA) and is in the process of collecting information for the purposes of building an industry-wide IPM programme.

2.4 The farm structure

The number of holdings growing hops has declined significantly during the 2000-2008 period in the main producing countries where comparable data are available. In the most important producing countries, the reduction ranges between 10.92% in Poland to 37.69% in Spain. In Germany holdings have decreased by 22.95% with the loss of 446 holdings.

Table 15 - Evolution of number of holdings and average acreage per holding in major hops producing countries (2002-2008)⁷

Country	Indicators	2002	2003	2004	2005	2006	2007	2008	2000/2008 change (in %)
Germany	Nb of holdings	1,943	1,710	1,698	1,611	1,554	1,510	1,497	-22.95%
	Average acreage/holding	9.5	9.7	10.3	10.7	11.1	11.7	12.5	31.58%
Czech Republic	Nb of holdings	185	165.0	162.0	145.0	145.0	139.0	131.0	-29.19%
	Average acreage/holding	40	36.0	36.0	39.0	37.0	39.0	41.0	2.50%
Poland	Nb of holdings	1191	1129	1121	1144	1113	1066	1061	-10.92%
	Average acreage/holding	1.9	1.9	2.0	2.0	2.0	2.0	2.1	10.53%
Slovenia	Nb of holdings	189	186.0	176.0	176.0	150.0	140.0	140.0	-25.93%
	Average acreage/holding	9.6	8.9	8.8	8.8	10.1	11.0	11.0	14.58%
UK	Nb of holdings	85	76.0	60.0	60.0	60.0	60.0	58.0	-31.76%
	Average acreage/holding	21.4	19.0	22.6	17.9	17.4	17.7	18.5	-13.55%
France	Nb of holdings	111	100.0	96.0	96.0	96.0	90.0	89.0	-19.82%
	Average acreage/holding	7.4	8.2	8.2	8.4	8.3	8.8	9.3	25.68%
Spain	Nb of holdings	398	400.0	395.0	353.0	325.0	248.0	248.0	-37.69%
	Average acreage/holding	1.7	1.7	1.7	1.9	1.9	2.0	2.0	17.65%
Belgium	Nb of holdings	52	49	47	45	44	42	29	-44.23%
	Average acreage/holding	4.8	4.7	4.4	4.6	4.5	4.4	5.8	20.73%
Portugal	Nb of holdings	14	12	12	12	7	4	4	-71.43%
	Average acreage/holding	2.6	3.1	3.1	3.3	2.6	5.3	5.0	89.19%
Austria	Nb of holdings	72.0	73.0	70.0	70.0	67.0	65.0	63.0	-12.50%
	Average acreage/holding	3.1	3.0	3.0	3.0	3.0	3.1	3.3	9.61%
USA	Nb of holdings	n.a.	n.a.	52	52	56	62	74	
	Average acreage/holding	n.a.	n.a.	195.0	200.0	200.0	200.0	224.0	

Source: Barth report

While the number of holdings has decreased, the average area per holding has increased in all the listed countries (but the UK) from +2.50% in the Czech Republic to +31.58% in Germany. These data

⁵ Source: Weissenberger, 1999.

⁶ Source: Weihrauch at al., 2007.

⁷ 2001-2007 period for Belgium, Portugal and Austria.

series show a large variability in average area across Member States. The largest holdings are in the Czech Republic (40.7 ha per holding in 2008) when the smallest are in Spain and Poland (around 2 ha per holding).

Part II – Methodology and intervention logic

3 Methodology and intervention logic

3.1 Background and context of this evaluation

This evaluation concerns the impacts of the implementation of the provisions of Council Regulation (EC) No 1782/2003 relating to hops production and the downstream sector. Council Regulation (EC) No 1782/2003 on decoupled payments under a Single Payment System is the main regulatory provision concerning the reform of the CAP. The 2003 reform completely changed the way the EU supports its farm sector. The CAP has historically been endowed with five overall objectives, which were included in Article 33 of the Treaty of Rome and can be summarized as follows:

- To increase productivity, by promoting technical progress and ensuring the optimum use of the factors of production, in particular labour;
- Ensure a fair standard of living for farmers;
- Stabilise agricultural markets;
- Secure availability of supply (food security);
- Ensure reasonable consumer prices.

During the 1960s and 1970s, the CAP led to increased agricultural production in Europe. However by the 1980s negative environmental effects of increased production and structural overproduction became clear. Besides, the CAP became increasingly expensive. The EU was forced to reform its agricultural policy in order to deal with overproduction, negative impacts on the environment, budgetary pressures and to respond to the discussions on agricultural trade during the Uruguay round of the GATT.

Reform of the CAP started in the 1990s with the aim of increasing the competitiveness of European agriculture, integrating environmental goals and the development of a rural development policy. One of the main aims of the CAP reform adopted by the Berlin Summit under Agenda 2000 was to establish a model for European agriculture that would be closely linked to the balanced development of rural areas, which cover 90% of the Community's territory. Agricultural and rural policy plays a key role in the territorial, economic and social cohesion of the Union and in the protection of the environment. Alongside **market measures** and direct payments (first pillar), **rural development policy** (second pillar) became an essential component of the European agricultural model.

3.1.1 The 1992 MacSharry reform and the Agenda 2000 reform

The MacSharry reform in 1992 marked the beginning of direct payments to farmers in order to compensate for a one off decrease in price support, which had to this point constituted the main form of income support. Before the 1992 reforms, high guaranteed prices (intervention prices), often set above world prices were paid to EU farmers for any amount of product not sold on the market. As a result, the EU became a large stockholder of several agricultural products, including wheat, barley, beef, butter, dry milk powder and wine. Price support had three main drawbacks from an economic point of view: (i) Consumers were implicitly taxed by higher price levels and lost welfare, (ii) producers were provided with an incentive to increase the intensity of production above optimal levels and (iii) the production mix was distorted as the relative price support was not uniform over all products. The 1992 reform reduced, amongst other things, beef intervention prices by 15 percent and cereal intervention prices by 30 percent. EU farmers were compensated for the price cuts, as long as they continued to produce, with direct payments based on historic yields and livestock numbers. Several rural development measures were introduced, notably to encourage environmentally sound farming. Setting production limits helped reduce surpluses. Farmers had become more market-oriented, while receiving direct income aid, and able to respond to the changing demand.

This dramatic policy change in the CAP was reinforced by the agreement in 1999 on the so-called 'Agenda 2000' reforms. These reforms reinforced the move to make farmers more reliant on the market and improved incentives to farm in an environmentally sensitive way. They added a major new element – a comprehensive rural development policy encouraging many rural initiatives while also helping farmers to diversify, to improve their product marketing and to otherwise restructure their businesses. The budget available to the CAP was set out and capped for the period 2000 to 2006.

The main objectives of the CAP reforms prior to 2003 can be summarized as follows:

- Cut prices by the introduction of compensatory payments schemes to farmers. From price support to direct payments;
- Promote free-market agriculture by limiting surpluses. This was accompanied by measures aimed at rationalising production through the introduction of set-aside schemes;
- Ensure a fair standard of living for farmers;
- Promote better environmental conditions and the maintenance of the rural environment.

3.1.2 The 2003 CAP reform

The June 2003 CAP reform is a logical continuation of the Agenda 2000 reforms and was designed to step up decoupling and to prepare the EU for enlargement to include 12 new Member States. The 2003 reform introduced a Single farm Payment Scheme (SPS) to replace most of the direct subsidy payments to farmers offered under Agenda 2000. The new single payment is in principle no longer related to farmers' production. However, there are some exceptions where the aid is still coupled either within SPS or in other aid schemes⁸.

⁸ This was the case for hops, as provided for by Art.68a of Council Regulation (EC) No.1782/2003.

A primary goal of the introduction of the Single Payment Scheme was to allow farmers to become more market-oriented (as the new system is production neutral) and to encourage farmers' entrepreneurship. Management and production decisions should not be influenced any longer by CAP subsidies.

According to the European Commission⁹ Communication on the Mid-term review of the Common Agricultural policy the **strategic objectives** behind the 2003 Reform package remained that of providing a clear, long-term perspective for the future development of the CAP by:

- **Enhancing the competitiveness of EU agriculture** by setting intervention as a real safety net measure, allowing EU producers to respond to market signals while protecting them from extreme price fluctuations;
- **Promoting a market oriented, sustainable agriculture** by completing the shift from product to producer support with the introduction of a decoupled system of payments per farm, based on historical references and conditional upon cross-compliance to environmental, animal welfare and food quality criteria;
- **Strengthening rural development** by transferring funds from the first to the second pillar of the CAP via the introduction of an EU-wide system of compulsory dynamic modulation and expanding the scope of currently available instruments for rural development to promote food quality, meet higher standards and foster animal welfare.

The main CAP measures were introduced by Council Regulation (EC) No 1782/2003 which is not specific to hops. Specific provisions relevant for hops can be found under Commission Regulations No 1952/2005, 1557/2006 and in Council Decision No 281/2004. The main CAP measures are briefly described below; a more detailed description of the measures concerning the hop sector can be found in Section 4.2.2.1.

Decoupled aid: Under this framework farmers receive direct income payments to maintain income stability, but the link to production has been gradually severed. The new CAP thus shifted the emphasis from support for production to the promotion of competitiveness of European agriculture. Severing the link between subsidies and production ("**decoupling**") enables EU farmers to be more market-oriented as they will be free to produce according to what is most profitable for them whilst still enjoying stability of income due to direct income support. The Single Payment Scheme is not based on current production levels or on market conditions, therefore it does not influence farmers in terms of what to produce, or indeed in terms of whether to produce or not. Decoupled aid was not introduced in one go as some sectors remained under partial implementation and others under "other aid schemes".

Cross-compliance: in order to benefit from income support, farmers have to respect environmental, food safety, phytosanitary and animal welfare standards. Farmers who fail to comply face reductions in their direct payments. The competent national authorities provide the farmer with the list of statutory management requirements and good agricultural and environmental condition to be respected.

Modulation: according to this principle all farmers receiving more than €5,000 in direct aid have their payments reduced each year by: -3% in 2005, -4% in 2006 and then -5% annually onwards until 2012.

⁹ COM (2002) 394.

The sums saved in accordance with this principle are to be divided among the Member States and allocated to rural development measures supported by the European Agricultural Fund for Rural Development. Each Member State retains at least 80% of its modulated funds. One percentage point (i.e. 33 % in 2005, 25 % in 2006 and 20 % in the following years) of the modulation money generated in a particular Member State will be allocated to the Member State concerned. The remaining amounts will be re-distributed among Member States according to objective criteria:

- Agricultural area;
- Agricultural employment;
- GDP per capita (Purchasing Power Parity).

Modulated reductions in direct payments will not apply in the accession countries until direct payments reach EU levels (scheduled for 2013). Council Regulation (EC) No 1782/2003 required the adoption of implementing rules that are included in the Commission Regulations mentioned below:

- **Commission Regulation (EC) No 796/2004 – “Cross-compliance, controls and modulation”** covers the provisions concerning cross-compliance, controls and modulation. The provisions with regard to cross-compliance as a sanction mechanism were one of the new key elements in the CAP reform. Cross-compliance makes Single Farm Payment conditional on the farmers respecting public health, animal health, environmental and animal welfare, EU norms and good agricultural practice.
- **Commission Regulation (EC) No 795/2004 – “Single Farm Payment”** embodies the key element in the reform of introducing a Single Farm Payment, where the payment is no longer be linked to production (decoupling), allowing the farmers to have their incomes guaranteed while allowing the freedom to produce according to market signals. In this way the production choice will be driven by the needs of the markets and the demands of the consumers, assuming that farmers want to maximize their income. Payments will, however, only be paid in full if the above cross-compliance provisions are respected.
- **Commission Regulation (EC) No 1973/2004 – “Direct Support Schemes”** covers those areas of support, which are still product specific, or where the Member States have the option to retain a certain element of coupled support.

Furthermore, **Council Regulation (EC) No 1952/2005** will be the object of this evaluation. This regulation contains the provisions on the common organisation of the market in hops. The regulation contains provisions on the role of producers’ organisations, the certification process, marketing and trade with third countries. The Regulation was repealed by Council Regulation (EC) No 1234/2007 on the “Single CMO” that provides a single legal framework governing the domestic market, trade with third countries and rules regarding competition. This regulation, however, did not contain any changes in the policy instruments for hops.

3.1.3 The Health Check of the CAP reform¹⁰

The so-called 'Health Check' of the CAP built on the approach which began with the 2003 reforms. The Health Check of the CAP aims at evaluating the instruments the policy is currently endowed with, to test whether they function as they should, to identify any adjustments needed to meet its stated objectives, and to be able to adapt to new challenges. The main measures of the Health Check include the abolishment of the arable set-aside, an increase in modulation and the extension of the Single Area Payment Scheme (SAPS) until 2013. Concerning the decoupling of support, most of the remaining coupled payments will now be decoupled and moved into the Single Payment Scheme (SPS)¹¹. Hops will be fully decoupled from 1 January 2010. However the German producer groups will receive an annual amount of EUR 2.277 million as of 2011.

Under the Health Check efforts are made to simplify the implementation of the CAP and budgetary discipline was reinforced.

The EU agriculture ministers reached a political agreement on the Health Check on 20 November 2008. The objectives can be summarized as follows:

- Making the Single Payment Scheme simpler and more efficient;
- Adjusting market support instruments to make them relevant for an EU of 27;
- Responding to new challenges, from climate change, to bio-fuels, water management and the protection of biodiversity.

The Health Check is regulated by:

- Council Regulation (EC) No 72/2009 of 19 January 2009 on modifications to the Common Agricultural Policy;
- Council Regulation (EC) No 73/2009 of 19 January 2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers;
- Council Regulation (EC) No 74/2009 of 19 January 2009 amending Regulation (EC) No 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD).

3.2 Intervention logic: the CAP measures and other intervening factors

In this section we present the intervention logic concerning the policy framework for hops before and after the 2003 reform. An intervention logic is a methodical and articulate picture of the causal links existing between the measures that compose a policy and their specific, operational and global objectives. The aim of this section is to set out an intervention logic that includes the main functioning mechanisms, drivers and theoretical effects of the two policy frameworks, in order to be able to capture the differences caused by policy change and to conduct this evaluation in an

¹⁰ The so-called Health Check is not part of the scope of this evaluation study.

¹¹ With a few exceptions like suckler cow, goat and sheep premia, where Member States may maintain current levels of coupled support.

appropriate way. This framework will serve as a basis for answering the evaluation questions in a coherent manner.

3.2.1 Intervention logic – before the 2003 reform

3.2.1.1 Production aid

Since the 1992 MacSharry reform direct payments have played an increasing role in supporting the EU farmers, replacing price support. Their importance was confirmed by the Agenda 2000 reform. Before the 2003 CAP reform direct payments to farmers were coupled to production of the respective crop. This led to the situation that for the production of different crops different levels of direct payments were paid, thus influencing production decisions.

Production aid was the cornerstone of the CMO for hops until the 2003 CAP reform¹². Each year the Council set a direct aid per hectare that could be differentiated by variety group. The rate was set with reference to the market situation, projected trends, prices on the external market and costs. The aid was paid in the year following harvest. In 1996 a single aid rate was set at 480 €/ha and this was not changed until 2003.

3.2.1.2 Producers' groups

The function of the producer groups within the CMO for hops had already been defined by Council Regulation (EEC) No 1696/71 and was reinforced by Council Regulation (EC) No 1554/97, which amended the former. In particular, amendments to Article 7.1 boosted **the role of producer groups** in order to pursue the aim of encouraging adjustment of production quality to market trends. The producer groups have acquired a dual role over time.

They carry out the **product marketing**. Council Regulation (EEC) No 1696/71 - as amended by Council Regulation (EC) No 1554/97 Art. 7.1. (a) - provides that the aim of the producer groups is **“concentrating supply and stabilizing the market by marketing all the produce of the members or, if necessary, by purchasing hops at a higher price than the market price”**. Some flexibility is however permitted at group level: a group can authorise its members to market some of their production themselves. In such cases it has a right to monitor the level of selling prices. In the event of disagreement on the prices proposed the group is obliged to buy the hops itself at a higher price and find a new buyer.

They ensure **product quality** by a **package of structural measures** which was financed by means of a deduction on the production aid up to a maximum of 20%¹³. This resource is managed at producer group level. The financial allowance is for pursuing the objectives provided for in Art. 7.1. (b), (c) and (d) of amended Council Regulation (EEC) No 1696/71 and was used to support conversion of varieties and for rationalisation and mechanisation of cultivation (notably harvesting), adoption of common production methods (cultivation techniques, fertiliser use, varieties, etc), marketing and accompanying market measures, quality improvement, research, etc. It can also be used to provide additional support for resting and grubbing-up. Art. 7.1. (b) of Council Regulation (EEC) No 1696/71 stated that an objective of the producer groups was: **“adapting such production jointly to the requirements of the market and improving the product by converting to other varieties, by**

¹² In Figure 15 we include production aid under the specific measures for hops. We are aware that at the time production aid was not directed only to hops, but we assess it here in relation to hops.

¹³ This amount varied from a Member State to another and depending on the year. It ranged from a compulsory 20% for Germany to 0% for France where the entire amount is given to growers.

reorganizing hops gardens, by carrying out promotion, and by conducting research into production, marketing and integrated protection”.

3.2.1.3 Certification procedure

Before the adoption of Council Regulation (EC) No 1952/2005 and Council Regulation (EC) No 1850/2006, the certification procedure was regulated by Council Regulation (EEC) No 1696/71 and Council Regulation (EEC) No 890/78 laying down detailed rules for the certification of hops. Council Regulation (EEC) No 1696/71 in Article 2 provided that all the hops-related products *“harvested within the Community or prepared from hops harvested within the Community, shall be subject to a certification procedure in respect of the designation of origin. The certificate may be issued only for products:*

- *harvested in recognised production areas or prepared from such products;*
- *belonging to varieties on the Community list of varieties, or prepared from such products;*
and,
- *of quality standards satisfying the minimum marketing limits valid for a specific stage of marketing.”*

The aim of these provisions is to ensure that a minimal common quality threshold in terms of content of alpha acid and other organic features was met by hops commercialised within the Community. The certificate includes information on the harvest year, the location where the hops were grown or where the hops-derived products were produced.

3.2.1.4 Provisions on trade

The provisions on trade for hops are included in Commission Regulation (EEC) No 1295/2008 on importation of hops from third countries. The Common Customs Tariff also applies to hops imported in the EU, while no provisions are in force on exports.

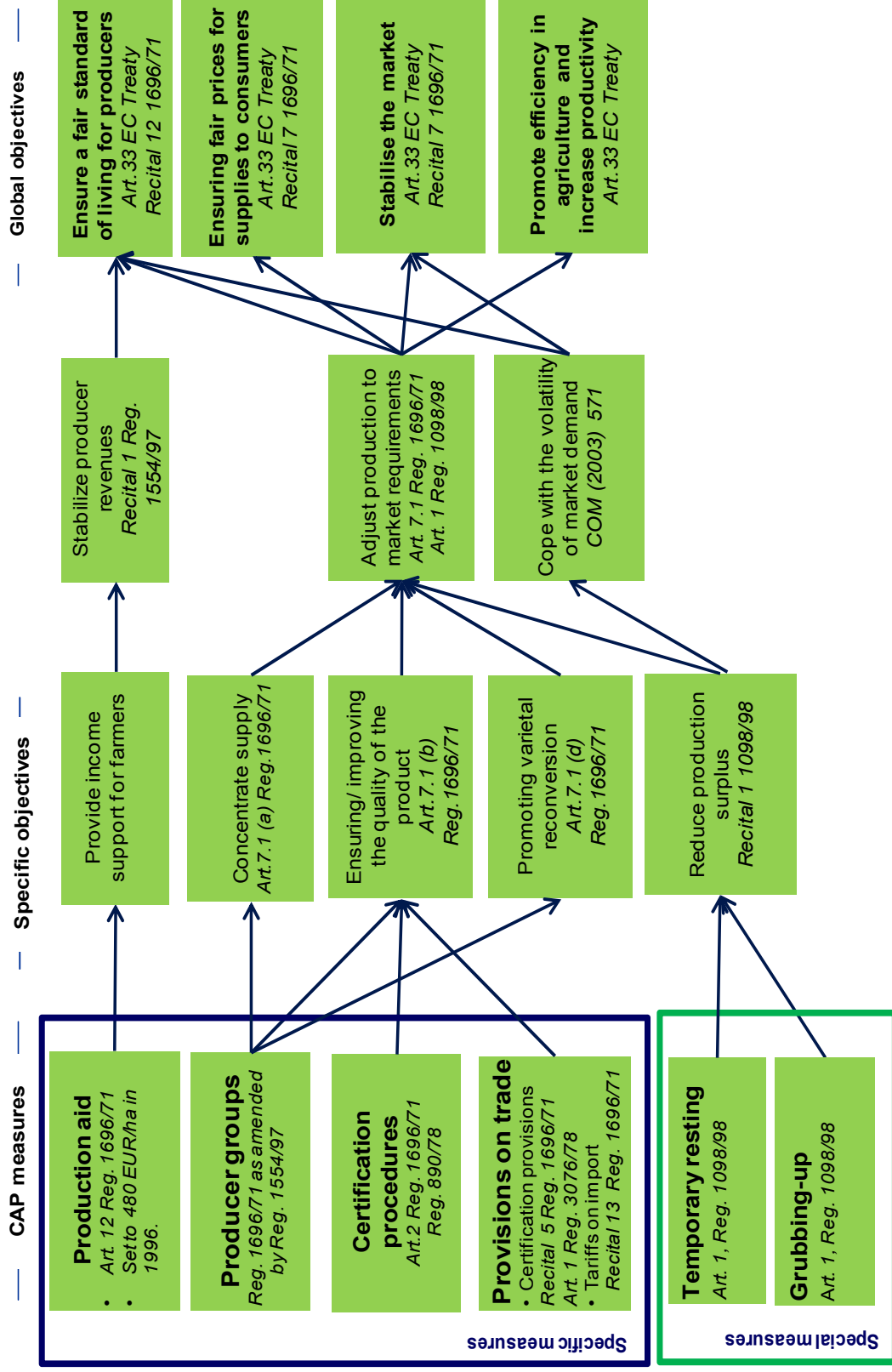
3.2.1.5 Special temporary measures

Special temporary measures were adopted for hops for five years (1998-2002) and then extended to include the 2003 harvest. These measures consisted of **temporary resting** and **grubbing-up** of hops plants and were regulated by Council Regulation (EC) No 1098/98. These measures were optional for both Member States and producer groups and participation by individual growers was voluntary. For both the measures, compensation of €480 /ha was granted (the production aid rate), and was conditional on good agricultural practice requirements for the fields being rested.

Resting was decided one year at a time, the decision whether to keep in rest or return the hops field to production depending on the market situation and outlook.

For **grubbing-up** there was a requirement that the area concerned cannot be replanted with hops before the end of 2003.

Figure 3 – Intervention logic for hops before the 2003 CAP reform



3.2.2 Intervention logic – after the 2003 CAP reform

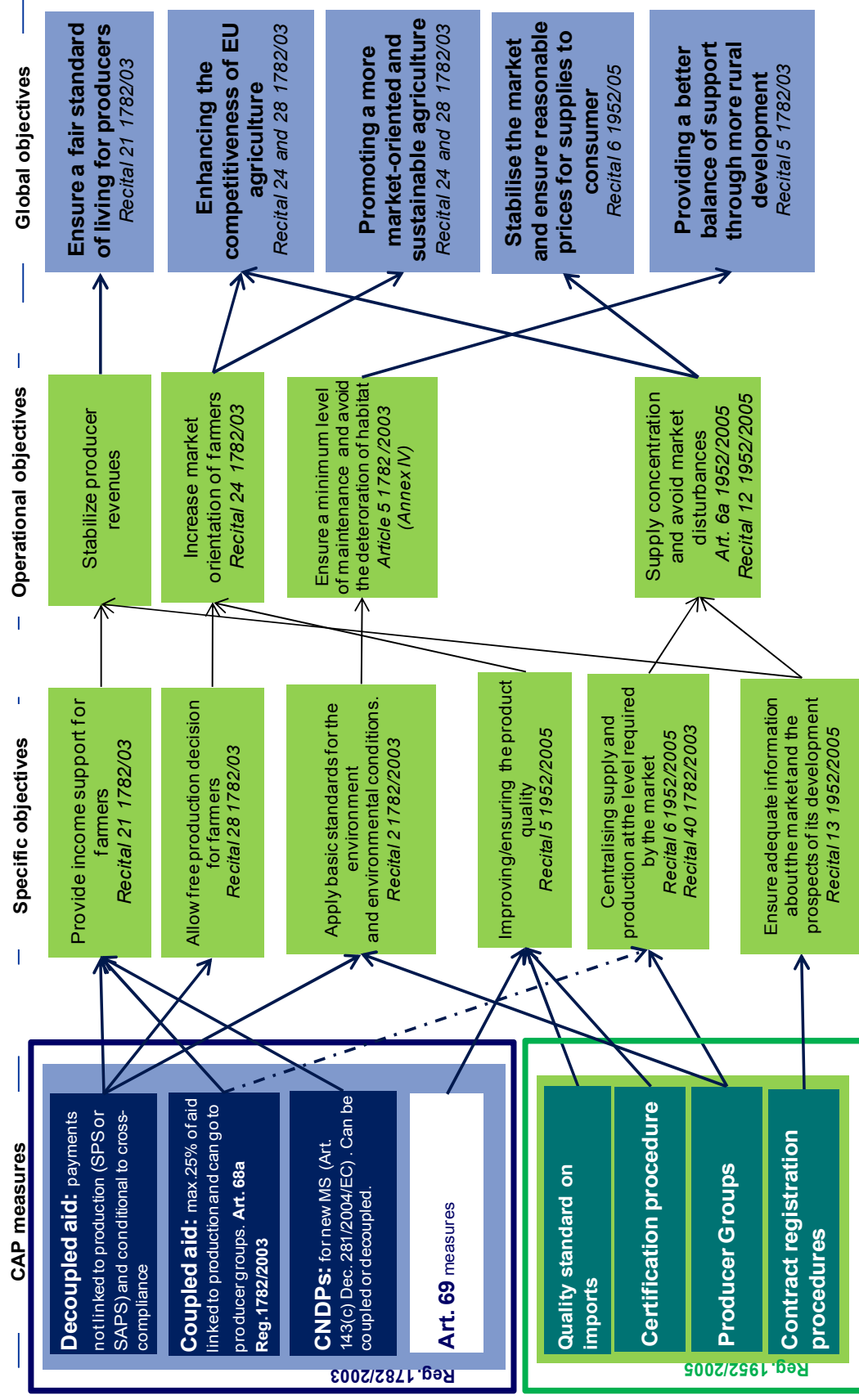
In this section we analyse the CAP measures that are relevant for the hop sector post-2003 reform.

As mentioned above, the 2003 reform constitutes a step towards income support for farmers that is not linked to production (**decoupling**); there should also be no, or at most minimal, effects on trade and production. Thus, European agriculture will become more market oriented; the old system of price support is gradually being replaced by direct payments organized around a Single Payment Scheme (SPS) introduced by Council Regulation (EC) No 1782/2003. The main aim of the single payment is to guarantee farmers more stable incomes. Farmers can decide what to produce in the knowledge that they will receive the same amount of aid, allowing them to adjust production to suit demand.

The new CAP therefore relies on two pillars: the first concerns income support and direct payments to farmers. It also contains measures regulating the CMOs. The second pillar covers rural development. The rural development policy for 2007 to 2013 is focused on three themes: 1) improving the competitiveness of the agricultural and forestry sector; 2) improving the environment and the countryside; 3) improving the quality of life in rural areas and encouraging diversification of the rural economy.

Figure 4 presents a synthetic view of the intervention logic, linking the CAP measures to the specific, operational and global objectives of the intervention.

Figure 4 – Intervention logic – CAP 2003-09



3.2.2.1 CAP Measures considered

Council Regulation (EC) No 1782/2003 of 29/09/03 established common rules for a reformed CAP. In addition to Council Regulation (EC) No 1782/2003 the present evaluation also covers the provisions from Council Regulation (EC) No 1952/2005 of 23 November 2005 concerning the common organisation of the market in hops. The main CAP measures introduced by these Regulations can be summarized as in the following sub-sections.

3.2.2.1.1 Decoupled aid

The June 2003 CAP reform, as introduced by Council Regulation No 1782/2003, was a logical continuation of the Agenda 2000 reform, and introduced **fully decoupled support** integrated into a **Single farm Payment Scheme (SPS)** together with the **Single Area Payment Scheme (SAPS)**. The new single payment is not related to what a farmer produces. The payment is neutral with respect to current and future production levels. However, in 2003 decoupled aid was not fully implemented for all sectors. Countries that wish to could keep some subsidies linked with production. These subsidies are called “partial decoupling payments.” (see below). Farmers receiving the SPS have in principle the flexibility to produce any commodity on their land. In addition, they are obligated to keep their land in good agricultural and environmental condition (cross-compliance).

In the new framework farmers receive direct income payments to maintain income stability, but the link to production has been severed. This enables EU farmers to be more market-oriented as they are free to produce according to what is most profitable for them whilst still enjoying income stability.

The total amount that can be paid under SPS is set at the Member State level and is called the “**National Ceiling**”. This is calculated in relation to the total of direct aids (and equivalent payments) paid in a historic reference period in each Member State. Entitlements only go to farmers in Member States which have introduced the scheme. Farmers are allotted **payment entitlements** based on **reference amounts**. Each entitlement is calculated by dividing the **reference amount** by the **number of eligible hectares** which gave rise to this amount in the reference years. Eligible hectares normally include all types of agricultural land, except land used for permanent crops and forestry. Farmers can submit a claim for each year based on their land and their entitlements. SPS is managed under IACS (Integrated Administration and Control System). The Member States can decide how to organize payments according to the following three options:

- **Historic model:** *each farmer is granted entitlements corresponding to the payments he received during the reference period (reference amounts) and the number of hectares he was farming during the reference period and which gave right to direct payments in the reference period;*
- **Regional (flat rate) model:** *reference amounts are not calculated at individual farmer level but at regional level - the sum of the payments received by the farmers in the region concerned during the reference period. Regional reference amounts are then divided by the number of eligible hectares declared by the farmers of the region in the year of SPS introduction, to establish the value of a single entitlement in that region. Finally, each farmer receives a number of (flat rate) entitlements equal to the number of eligible hectares declared in the year of SPS introduction. This approach entails some redistribution of payments between farmers;*

- **Mixed models:** Member States may, in justified cases, apply different calculation systems in different regions of their territory. They may also calculate SPS payments using a part-historic/part-flat rate approach. Such '**hybrid**' systems can further vary over the period between first application of the SPS and full implementation, giving rise to **dynamic** as well as to **static** hybrid systems. '**Dynamic hybrid**' systems can act as a vehicle to transit from the basic (historic) to the regional (flat) rate approach.

The main objective of the decoupled aid is to provide the farmer with income support that is independent of any production decision (farmers may also decide not to produce at all). Recital 21 of Council Regulation (EC) No 1782/2003 states that "*support schemes under the common agricultural policy provide for **direct income support** in particular with a view to ensuring a **fair standard of living for the agricultural community***". Ensuring a fair standard of living to farmers is therefore a paramount objective as indicated in Article 33 of the Treaty.

Another important objective pursued by decoupled aid is to allow farmers to produce according to market demand. Recital 28 of Council Regulation (EC) No 1782/2003 states that "*in order to **leave farmers free to choose what to produce** on their land, including products which are still under coupled support, thus increasing market orientation, the single payment should not be conditional on production of any specific product*". Allowing farmers to produce what they want means that – assuming farmers are profit maximizers – they should produce what is most profitable for them, which will be closely matched to market demand. Increasing market-orientation of farmers is therefore a way to increase efficiency and to make EU agriculture more competitive. Recital 24 to Council Regulation (EC) No 1782/2003 states that: "***Enhancing the competitiveness of Community agriculture** and promoting food quality and environment standards necessarily entail a drop in institutional prices for agricultural products and an increase in the costs of production for agricultural holdings in the Community. To achieve those aims and promote more market-oriented and sustainable agriculture, it is necessary to complete the shift from production support to producer support by introducing a system of decoupled income support for each farm*". This recital acknowledges the importance of a system of decoupled income support for achieving the global objectives that are marked in bold in the text.

The new Member States can opt for **Single Area Payment Schemes** (SAPS) which involves payment of uniform amounts per hectare of agricultural land in the Member State concerned, up to a national ceiling. Slovenia and Malta decided to adopt the SPS at once. Under the Health Check, Member States applying the simplified Single Area Payment Scheme will be allowed to continue to do so until 2013 instead of being obliged to opt into the Single Payment Scheme by 2010, and by 2012 in the case of Bulgaria and Romania.

The following table provides an overview of the way the CAP reform was implemented in the different Member States.

Table 16 – CAP reform implementation in the Member States for hops

Country	Start	Model	Payment Scheme	CNDP	Coupling/CNDP
Austria	2005	Historic	SPS	No	Hops payments 25% coupled ¹⁴
Belgium	2005	Historic	SPS	No	
Bulgaria	2007		SAPS	NO	
Czech Republic	2004		SAPS	Yes	
France	2006	Historic	SPS	No	Hops payments 25% coupled
Germany	2005	Dynamic hybrid moving to a flat rate model	SPS	No	Hops payments 25% coupled ¹⁵
Hungary	2004		SAPS	Yes	
Poland	2004		SAPS	Yes	
Portugal	2005	Historic	SPS	No	
Romania	2004		SAPS	Yes	
Slovakia	2004		SAPS	No	
Slovenia	2007	Mandatory regional model	SPS	Yes	Hops payments 25% coupled
Spain	2006	Historic	SPS	No	
United Kingdom	2005	Historic in Wales and Scotland Dynamic hybrid moving to a flat rate model in England Static hybrid in Northern Ireland	SPS	No	

Source: DG AGRI

3.2.2.1.2 Partial coupling

Direct aid for hops has been decoupled from production since 1 January 2005 (except in countries which applied a transitional period until 31 December 2005). However, in order to deal with “specific market situations or regional implications”, Member States may retain a certain percentage of coupled aid (corresponding to a maximum of 25% of their national ceiling. This is provided for by Council Regulation (EC) No 864/2004 (the so-called “Mediterranean package”) that amended Council Regulation (EC) No 1782/2003.

According to article 68a of Council Regulation (EC) No 1782/2003 (as amended) “*In the case of hops payments, Member States may retain up to 25 % of the component of national ceilings (...) corresponding to the hops area payments and the temporary resting aid (...)*”. Concerning hops the

¹⁴ The retention of a 25% of aid coupled to production will end on 31.12.2009

¹⁵ Germany opted for system whereby the coupled 25% of the aid is allocated to producer groups.

article continues as follows *“In this case and within the limit of the ceiling fixed (...) the Member State concerned shall make, on a yearly basis, an additional payment to farmers and/or a payment to **producer groups**”*. The reference amount for the calculation of the aid is EUR 480 per hectare for which aid was granted during the reference period 2000 to 2002.

Article 68a provides that “the payment to recognised producer groups shall be granted to finance the activities referred to in Article 7(1)(a) to (d) of Council Regulation (EEC) No 1696/71.”. The provision of payments to producer group aims therefore at fulfilling the objectives of the producer groups, such as concentrating supply and stabilising the market by adapting the production to market needs.

In the case of hops, Council Regulation (EC) No 1782/2003 allowed Member States to grant part of the hops area payments to recognized producer organisations¹⁶. In order to allow the producer organisations to continue their activities as before, Council Regulation (EC) No 1234/2007, provides for equivalent amounts to be used in the Member State concerned for the same activities. Such amounts should therefore be deducted from the national ceilings provided for in this Regulation for affected Member State.

3.2.2.1.3 Complementary national direct payments

Complementary national direct payments (CNDPs) are foreseen by Art. 143 (c) of Council Decision 281/2004. These provisions are valid for the new Member States only. These additional payments to SAPS (*top-ups*) are financed by the national budgets of the new Member States and in some countries they were co-financed from Rural Development Regulation funds. This opportunity was provided because direct subsidies will be phased in over 10 years from accession in the new Member States. They received 25 % of the full EU rate in 2004, rising to 30 % in 2005, 35 % in 2006 and 40% in 2007, then 10% per year till 2013. This time schedule differs for Bulgaria and Romania which will have to wait until 2016. The granting of CNDPs permit new Member States to raise the level of direct support received by their farmers in application of the “phasing-in” closer to the level of support applicable in the EU-15. The new Member States had the opportunity to top up the all direct payments in order to reach to 55 % of the EU-15 level in 2004, 60 % in 2005 and 65 % in 2006 and up to 30 percentage points above the ceiling established in Article 143a for the new Member States as from 2007.

3.2.2.1.4 Measures ex. Article 69

According to article 69 of Council regulation (EC) No 1782/2003 *“Member States may retain up to 10 % of the component of national ceilings referred to in Article 41 corresponding to each sector referred to in Annex VI”*. This optional implementation measure was granted for specific types of farming. As stated in Article 69 *“The additional payment shall be granted for specific types of farming which are important for the protection or enhancement of the environment or for improving the quality and marketing of agricultural products”*. No Member State applied this provision for hops.

3.2.2.1.5 The Common Market Organisation and the related measures

The Common Market Organisation for hops was introduced by Council Regulation No 1696/71 and amended by Council Regulations (EEC) No 1037/72, (EEC) No 879/73 and (EEC) No 1981/82 and (EC) 1554/97 and was regulated by Council Regulation (EC) No 1952/2005. The CMO for hops finally passed under the umbrella of the single CMO as defined by Council Regulation (EC) No 1234/2007.

¹⁶ Council Regulation 1782/2003 has been repealed by the Health Check. However, partial coupling for hops applies for 2009.

The core activity of the CMO after the 2003 CAP reform switched from production aid to marketing. The producer groups are the mainspring of the CMO for hops and deal with the provision of technical assistance and guidance on growing and marketing. For the purpose of this evaluation we will consider the following measures:

- **Certification.** Recital 5 of Council Regulation No 1952/2005 provides that *“a quality policy should be followed throughout the Community by implementing provisions concerning certification together with rules prohibiting, as a general rule, the marketing of products for which a certificate has not been issued or, in the case of imported products, those which do not comply with equivalent minimum quality characteristics”*. Certification is therefore used as a quality instrument, making sure that hops commercialised in the EU have a minimum content of alpha acid. The final aim is to put on the market a competitive product that can be easily sold to the downstream sector, and can therefore maintain European agriculture competitiveness.
- **Producer groups** are constituted in order to “stabilise markets and ensure reasonable prices for supplies to consumers, centralisation of supply and the joint adaptation by growers of their produce to the requirements of the market should be encouraged” as stated in recital 6 to the same regulation. The producer group can also influence supply, for instance by promoting resting for resolving short-term market disposal difficulties. Producer groups are also in charge of **product marketing**. Some flexibility is permitted at group level: a group can authorise its members to market some of their production themselves. In such cases it has a right to monitor the level of selling prices. In the event of disagreement on the prices proposed, the group is obliged to buy the hops itself at a higher price and find a new buyer. The money directed to producer groups (also by the coupled payments system) is used to support varietal conversion and for rationalisation and mechanisation of cultivation (notably harvesting), adoption of common production methods (cultivation techniques, fertiliser use, varieties, etc), marketing and accompanying market measures, quality improvement, research, etc. It can also be used to provide additional support for resting and grubbing-up.
- **Registration of contracts.** Commission Regulation (EC) No 1557/2006 provides for all the contracts concerning hops to be registered. Art.2 reads that producer groups or other bodies appointed by the Member States *“shall register all deliveries made, distinguishing between contracts concluded in advance (...) and other contracts”*. Articles 3 and 4 provide that a copy of each contract concluded in advance shall be communicated by the producer or recognised producer group and that the registration of contracts other than those concluded in advance shall be on the basis of a duplicate of the receipted invoice to be sent by the seller to the body in charge. The rationale for contract registration can be found in Recital 13 of Council Regulation (EC) No 1952/2005 that provides that: *“Adequate information is needed about the present state of the market within the Community and the prospects for its development. Provision should therefore be made for the registration of all contracts to supply hops produced within the Community”*. Furthermore, Recital 3 to Commission Regulation (EC) No 1557/2006 states that: *“Deliveries under those contracts must therefore also be registered so as to have accurate information on the disposal of hops”*. The provision of information is therefore deemed instrumental to ensure the smooth implementation of the policy for hops.

3.2.2.1.6 Provisions on trade

- **Quality standards.** Quality standards are set to ensure that the quality of hops imported into Europe is, according to Art. 9 (1) of Council Regulation (EC) No 1952/2005 “at least equivalent to those adopted for like products harvested within the Community or made from such products”. Art. 9 (2) states that imports have to be “accompanied by an attestation issued by the authorities of the country of origin and recognised as equivalent to the certificate.”
- **Import duties.** *Ad valorem* customs tariff duties are levied on imports. According to Art. 11 of Council Regulation (EC) No 1952/2006 safeguard measures can be adopted if, on account of imports or exports, the Community market is “affected by, or is threatened with, serious disturbance likely to jeopardise the achievement of the objectives set out in Article 33 of the Treaty”. In this case “appropriate measures may be applied in trade with non-member third countries of the World Trade Organisation until such disturbance or threat of it has ceased”. There are no provisions on exports.

3.2.3 The global objectives of the intervention

In this section we link the CAP measure identified above with the overall objectives of the 2003 CAP reform. In doing so, it is relevant to present a brief overview of the logical link between the CAP measures adopted and the overall objective of the intervention.

Enhancing the competitiveness of European agriculture is one of the paramount objectives of the last reform. This objective is stated in recitals 24 and 28 to Council Regulation (EC) No 1782/2003 and aims at bringing the prices of European agricultural products down to the world price. This implies a gradual restructuring of the European farm structure. Farmers in Europe have for a long time based their production decision on subsidies and not on market demand. In order to be competitive they have to become more market oriented and produce according to market needs. Decoupling the income support from production is a step forward in this sense, because a decoupled aid does not influence the production decisions of farmers. Allocation efficiency is therefore encouraged as income support does not influence production decision. It is worth mentioning that the first victim of allocation inefficiency and higher prices generated by coupled support is the European consumers and the downstream sectors, as they have to pay a higher price for agricultural goods. In the case of hops this effect could hit the downstream sector and final consumers. Only a few Member States have used the option of maintaining 25% of the payments coupled, an opportunity that was removed following the Health Check.

Promote a market-oriented and sustainable agriculture. Completing the shift from production to producer support will help to make European agriculture more market-oriented. Over-production, generated by the link with coupled support, also had a dramatic impact on the environmental sustainability of European agriculture as it provided an incentive to over soil and water resources, thus generating pollution and contamination. The 2003 reform linked the provision of income support to compliance with a certain number of statutory EU environmental, food safety and animal health standards and mechanisms were to be introduced to achieve a better balance of support between agricultural income support and rural development initiatives.

Stabilising the market is a global CAP objective laid down in Article 33 of the Treaty. Market stabilization can be achieved by policy instruments or by market instruments. An example of a policy instrument is the role of producer groups as recalled by Art. 6 (a) of Council Regulation (EC) No 1952/2007 that refers to “helping stabilizing the market by marketing all the produce of their members or if necessary, by purchasing hops to a higher price”. The same effect can be achieved by a market instrument such as forward contracts and other market mechanisms for hedging price volatility, thus ensuring market stability.

Providing a better balance of support through more rural development. Following the Agenda 2000 reform, rural development has become the second pillar of the CAP, accompanying and complementing changes in market and price policy. Council Regulation No 1257/99 set the basis for the inclusion of rural development under the CAP umbrella. Rural development targets areas such as investments in competitiveness, rural viability, quality of life and sustainable agriculture that are vital to ensure the economic viability of European agriculture. As rural areas become more multifunctional, farmers become more and more rural entrepreneurs. Improving the competitiveness of rural areas therefore means creating new income and employment opportunities for farmers and their families, on-farm as well as off-farm, as employment possibilities in agriculture itself decline.

Ensuring a fair standard of living for farmers is one of the global objectives established in Article 33 of the Treaty and is recalled in Recital 21 of Council Regulation (EC) No 1782/2003. This objective is justified by the structural downward pressure that exists on agricultural incomes in relative terms. This is determined by the lower increase in capital and labour productivity that the agricultural sector has experienced in the last century. Without any safety net there are fears that the European countryside would be abandoned and many farms closed, with serious impacts on the European environment and cultural heritage. Another justification for income support is the high volatility of supply due to unpredictable weather conditions. This generates volatility in short-run prices for several agricultural goods and ultimately in farmers’ income¹⁷. Income support is still the main means for the ensuring a fair standard of living for farmers in Europe.

3.2.4 Intervening factors

In this section we list intervening factors that might have played a role in the hop sector and affect production levels and/or structure. **Cross-compliance** and **modulation** are two CAP measures that will be considered as intervening factors for the purposes of this evaluation. A description of these two measures can be found in section 5.1.2.

3.2.4.1 Overview of national legislation

The provisions coming from national legislation can influence the way the 2003 reform is implemented in a particular country. This could lead to an uneven playing field within the EU. For this reason it is considered to be an intervening factor.

Germany. The hop sector legislation in Germany (global hops market share of over 30%) is probably the most complex mixture of CAP measures and their national legislation policy. Furthermore, the evolution of legislation is based on annual changes. A number of measure proposals in a draft or final form are currently waiting to be published officially. On average, the individual German hops

¹⁷ Strictly speaking this is not a market failure as market instruments against volatility exist (e.g. an insurance scheme or forward contracts).

growers' SPS payment entitlement equals to €299. This amount can vary from one Lander to another with a maximum of €340. No other direct hops related payment is in place for the producers. In addition, German producers' organisations, such as HVG Hallertau, receive from the EU budget financial support, which is used to support common professional activities such as plant protection measures, investment in irrigation of hops fields and hops research. A very recent measure for 2009 is to support with 1.000 EUR/ha the grubbing up of 700 ha of the hops variety Hallertauer Mittelfrüher¹⁸. This hops variety lost its market position in 2008 as a result of the concentration process in the brewing industry (AB-InBev merger). No other hops varieties can be produced on this area before 2011.

Czech Republic: In the Czech Republic the payments should gradually come close to former EU-15 payments according to the following schedule: 2005 - 30%, 2006 - 35%, 2007 - 40 %, 2008 – 50 %, 2009 - 60 %, 2010 - 70 %, 2011 - 80 %, 2012 - 90 % and 2013 – 100%. In 2008 the following payment forms were available¹⁹:

Table 17: Subsidies per Ha in the Czech Republic in 2008

Subsidies	Amount CZK/ha	Amount € ²⁰ /ha
SAPS (payment for all agricultural land)	3.072,70	125.5
CNDP (coupled with hops production)	2.959,20	120.7
CNDP (decoupled)	3.680,80	150.2

In 2009 the hop sector system in Czech Republic will be similar, but the payment rates should be a little bit higher, which depends on the exchange rate in October (1 € for 24,29 – 24,93 CZK). From 2010 the CNDPs will only be decoupled (for area registered to 31.3.2007). There will be no payment linked to production.

Other national legislation measures affect the Czech hop sector. For example, there is a scheme in place under which the state gives the farmers half of the money for insuring their crops against flooding or other exception calamities.

United Kingdom: The national legislation on hops in the UK is The Hops Certification (Amendment) Regulations 1991 (Statutory instrument 2198). These Regulations amend the Hops Certification Regulations 1979 ("the principal Regulations") following amendment of the applicable European Community provisions. They apply throughout the United Kingdom and came into force on the 5th November 1991. Rural Payment Agencies are responsible for compliance with this legislation. This legislation will be updated to take account of changes in European legislation since 1991, principally

¹⁸ The measure is financed by the producers group to adjust the latest market situation – to reduce the effects from the AB-Inbev merger. The new company changed its strategy of hops purchasing (its priority switched from aroma towards alpha (=bitter) hops varieties. As a consequence – the German aroma hops varieties became less interesting for AB-Inbev (similar happened in France with their Strisselspalt, in USA with their Willamette, etc.).

¹⁹ We present in the Czech case study the different subsidies from 2004 to 2008.

²⁰ These calculations are indicative and were made at an average exchange rate of 1 EUR = 24.5 CZK. CNDP should not exceed €120.

the introduction of the Single Farm Payment. This update should be completed before the end of 2010.

Spain: According to Real Decreto 1470/2007 hops payments are included 100% under the single payment scheme.

National legislation has a limited scope of action in this field, but Member States sometimes implement European legislation in different ways. The registration of contracts in Germany for instance differs from what is prescribed under Commission Regulation (EC) No 1557/2006. Also, the role of the producer groups is not the same everywhere. National legislation will be taken into account where interviewees suggest that this is relevant and in any case for the countries covered by case studies.

3.2.4.2 *Others*

- **Agronomic practices improvement**, varietal innovation and machinery development are key factors for profitability and differ throughout Member States. This might result in different yields and different returns on investment. The state of technology can be inferred from data on productivity and from employment data as more mechanized farms are more likely to be less labour intensive. This factor will be analysed in Theme 6, but its effects will be dealt with also in Theme 1 and Theme 2;
- **Rural development measures** may influence the production structure of the hop sector, especially as far as employment is concerned. These measures, amongst others, envisage the creation of off-farm jobs that can retain population in rural areas and thus avoid depopulation, without hindering the process of restructuring which aims to make European farmers more competitive. Rural development therefore aims at making rural areas attractive places to live, fostering the socio-economic development of these areas;
- **Technical development of the downstream sector** also plays a role as new processing technology may require a lower quantity of input to brew the same amount of beer;
- **Weather conditions** are an external factor that affects every agricultural activity. This factor contributes to the volatility of production;
- The general **economic outlook** affects every market and is reflected in the consumption decisions of end users. A general economic downturn can affect all the markets and drive price down as supply exceeds demand.

We will take due account of all these factors when carrying out interviews and case studies and when analyzing the datasets.

3.3 The analytical framework of this evaluation

The evaluation is structured and conducted by using an analytical framework based on the evaluation themes and questions and tasks identified in the ToR. The analytical framework organises the following elements by evaluation theme and question:

- Judgment criteria that will allow us to answer each evaluation question;
- Key indicators (qualitative²¹ and quantitative) that will be used to feed the judgment criteria and that assess effectiveness, efficiency, coherence and relevance of the measures;
- The sources we propose to use to address the question/issue and collect the necessary information and the key sources of data and other inputs.

The use of a structured analytical framework allows us to conduct robust, logical and solid evaluation work and to elaborate conclusions and recommendations based on the evaluation findings.

3.4 Databases and economic models

We present below a list of the main databases and economic models used in the course of the analysis

3.4.1 Databases

Databases that we have used include:

FADN (Farm Accountancy Data Network): For the study it is one of the most relevant sources considering that it has time series data available up to year 2006. FADN provides data at the microeconomic level, especially for Czech Republic and Germany. On hops, FADN provides information on the distribution of income of hops growers, share of subsidies in farm income and/or revenue of different crops in a region and over time. These data provide the opportunity to analyze the importance of subsidies for hops growers in relation to their income, the profitability of alternative crops, average amount of subsidies per farm and so on. However FADN time series have some limitations given the fact that farm samples vary over the years, and hence it is not possible to track them longitudinally in terms of income or production. Thus some assumptions and/or estimations have been made when undertaking trend analysis with this dataset. FADN is complemented with data from other EU and regional sources where there are gaps in hops farm data geographically (for instance for Spain and the UK).

FAO-stat (Food and Agriculture Organization): the FAO-stat database contains data on over 200 countries worldwide. It is used to gather data at the macroeconomic level concerning production trends, acreage and other macroeconomic variables. The database is provided by the United Nations. There is a wide range of hops indicators available within it for European countries up to 2007. Among them are for instance indicators on the area of hops grown, production of hops, trade in hops (both in quantities and values), and supply balance sheets. These data can give insight into the role EU hops production plays in the world. The advantage of this database is that it contains data on all countries, so data should be consistent.

IHCG: The International Hops Growers Convention regroups all the main hops producing countries worldwide and its database includes figures on hops acreage, crops, alpha acid production, hops

²¹ Qualitative indicators in italics

varieties produced and price levels of hops in member countries. Information is used for analysis and estimations of world hops industry supply.

The **Barth Report** and the **Hopsteiner guidelines for hops buying report, and the Brewers for Europe** website as well, provide several statistics and in particular an estimation of the total demand for hops and the demand for alpha acid.

Eurostat: Eurostat data are used to complement the analysis from other sources. On hops there are for instance indicators on the area of hops grown, trade in hops, and supply balance sheets. The database provides insight in terms of who are the main hops producers in the EU, the main traders, etc. Eurostat also provides information on Standard Gross Margins (SGM), providing insight into crop profitability. The SGM is calculated on the basis of at least three accounting years and is provided by the member states to the Commission. The most recent year the SGM's are published by the EU is 2004. The data can be used to compare the profitability of hops and alternative crops within a Member State. This provides information on the possibilities for hops growers to switch to alternative crops and the effects on profitability. The extent to which hops could compete with other enterprises in the absence of subsidies can also be assessed. In addition, Eurostat also publishes structural surveys. To complement the Eurostat data, we also used data directly collected from DG AGRI on payments and subsidies, prices, etc.

National and/or regional databases: these are used to complement the data gathered from the above mentioned database. The aim is produce comparable statistics from different countries that will feed our country sheet. These can include German market institute data sources, databases from the ministries of agriculture and data from previous studies done by our country experts.

3.4.2 Economic tools

Two economic models were used in the course of this evaluation.

The first one is the **Financial Economic Simulation** tool (FES). The use of this tool makes it possible to judge the effects of the CAP reform at the farm level for the most critical indicators, such as cash flow, the extent to which equipment can be replaced in time and the perspectives to continue the farm for financial reasons.

The other tool to be used is the **Face-IT** tool, originally a benchmark tool but very useful to judge the relative profitability of hops growing farms compared to farms growing alternative crops. The tool provides information on gross margin as well as the farm structure, including the fixed costs. The benchmark is done by comparing indicators of the individual hops farms with similar farms. The characteristics on which the similarity is based can be chosen by the researcher.

3.4.2.1 The FES-tool

The **FES-tool** is a financial micro-economic simulation tool to evaluate the impact of policy measures and external developments on the financial and economic situation of individual farms. The tool has been used extensively to evaluate policy measures (both *ex-post* and *ex-ante*) for the Dutch Ministry of Agriculture. It simulates at the individual farm level the impacts of the policy measures in question and it provides detailed information on profitability and on continuity perspectives of the farm. The individual farm results are aggregated at the Member State level or regional level. The tool allows estimating long-term impacts of policy measures or other external influences in terms of financial results, possibilities to renew farm equipment in time and continuation perspectives of the farms.

Using the data of individual farms makes it possible to provide not only information about the average situation, but also about the variation in the sample.

In the study on the hop sector, we use the FES tool to analyse the effects of CAP measures on the income of hops farmers and the effects on continuity perspectives. It is therefore used to answer a part of evaluation questions 1 and 2.

As far as relevant, we compare a baseline scenario (the pre-reform situation) to (1) a scenario without support measures, (2) the after-reform situation and (3) a full decoupling situation. FES uses FADN data as an input. Therefore the FES tool can only be used if enough hops farms are included in the FADN database. This is the case in Germany and in the Czech Republic, the largest hops producers in Europe. In other Member States the number of hops growing farms is lower than 15, so their results cannot be used in FADN.

Scenario 1: Before the reform

This scenario is based on the 2004 situation in Germany with fully coupled aid for hops. We run a simulation based on unchanged policy during a nine-year period (until 2013). This would entail the maintenance of coupled aid until 2014. Total support will decrease because of increased modulation. The percentage of modulation in 2013 is not known yet, so the assumption is made that the percentage of modulation in this year equals the percentage in 2012. As FES assumes an unchanged continuation of the farm with the same size and activities at the same location as in the beginning of the simulation period, this scenario gives insight in the income situation given unchanged policy. The FES tool does not take into account the possibility of a discount on total support received when a farm does not meet cross compliance requirements. For the Czech Republic this scenario is calculated as fully coupled premiums have never been implemented in this Member State.

Scenario 2: No EU-support

In this scenario, all the EU support received in 2004 is set to zero; modulation is also set to zero. This is the baseline for a simulation over nine years without hops subsidies. The net effects of aid on income can thus be assessed under the hypothesis of farm continuation. The average income of hops growers in this scenario can be compared with the income situation in scenario 1. This scenario will be calculated both for Germany and the Czech Republic.

Scenario 3: After the reform

In this scenario, we forecast the situation after the reform, based on the introduction of decoupled aid. However, we allow partial coupling for hops and some other products, in accordance with the real implementation in the Member State in question.

Germany introduced a dynamic hybrid tool in 2005. The consequences of this introduction on the income of hops growers are analyzed in this scenario. The 2005 situation of the hops growing farms is the starting situation for this simulation. The period until 2013 will be simulated taking into account the shift towards a flat rate. Like in scenario 1, modulation is taken into account, in contrast to any cross-compliance reductions. For the Czech Republic the SAPS model (including CNDPs) will be the base for this scenario.

The results of income forecasting can be compared to the results of scenario 1. This provides insights on the effects of the CAP reform on German hops growers. Comparison with scenario 2 leads to the effects of the adoption of the EU support for Germany and the Czech Republic.

Scenario 4: Full decoupling scenario: Germany and Czech Republic

This scenario equals scenario 3, but assumes a full decoupling of EU support for hops in Germany (based on the current dynamic hybrid model) and Czech Republic. This scenario is added to quantify the effects of partial decoupling (scenario 3) compared to full decoupling. The results are given for the year 2013. For Germany the support given to producer is completely excluded because FADN only includes subsidies directly paid to the farmers.

Output

The final output will be a comparison between the different scenarios. The comparison of income results for hops growers in scenarios 1 and 2, allows us to draw conclusions on the importance of aid in relation to farmers' income and their degree of dependence on aid for long-term farm sustainability. Based on farms' liquidity and the modernity of their equipment, FES is able to classify farms into continuity classes. The distribution of farms along the classes provides insights into the change in perspectives for the future as a result of policy changes.

A comparison between scenario 1 and 3 provides a good insight into the effects of the reform of the CAP. Only the direct effects of the changing measures concerning hops production, the so called first order effects, are given. The second order effects (price changes due to possible changes in hops supply as a result of the CAP measures) will not be taken into account.

The support provided to producer groups in Germany are not included in the results as the FADN database does only take into account the subsidies directly paid to farmers. The indirect effects of the activities of the producers groups are not taken into account in the results. In reality positive effects for the farmers' income would be achieved through successful activities conducted by the producers groups. Promotion activities could lead to higher prices for hops; technical research could lead to a better quality, a higher yield or lower production costs.

3.4.2.2 The Face-IT tool

The SGM-approach and the FES-tool both have their limitations in answering the evaluation questions. By using the SGM approach only the gross margins of hops growing on the one side and alternative crops on the other side are compared. The gross margin is calculated by subtracting the direct variable crop costs from the crop returns. As a consequence, differences in labour requirements, capital investments and other non-direct costs are not taken into account. Hops are a very capital and labour intensive crop compared to most arable crops, so the farmers' decisions are not based on the SGM only, but also on the integral comparison of the financial (and technical aspects) of hops growing and of its alternative.

The FES-tool provides us with the developments of the financial farm results over time under the condition that the farm structure does not change. However, growing alternative crops is an example of a farm structural change. This makes the FES-tool insufficient to judge the possibilities and the results of alternative crops in comparison to hops growing. Face-IT is a tool to overcome this problem.

The **Face-IT** tool is a micro economic tool that has been developed as a benchmark tool to compare the economic and the more technical performances of a company with the average of a comparable group of companies. Such an external comparison can be made based on the desired set of classification factors. The consequence of different strategies for the company can be explored. An application with accounting data has been successfully used in several projects in the agricultural sector. To find a suitable or even optimal group of companies out of numerous different combinations, a generic algorithm was developed and implemented as a search mechanism. The objective is to find companies that are comparable, both individually and as a group. As a generic comparison tool, Face-IT can also be applied in surveys, or as a marketing instrument or for exploring success factors. Although the tool was originally meant to facilitate the entrepreneur and his advisor or accountant, the tool is also successfully used in research work. In this project, we use Face-IT to find for each hops-producing farm a comparable set of farms taking into account the farm structure, such as region, size, family labour supply and farm type. The comparison between the two groups (specialized hops farms versus a mirror group containing non-specialised hops farms) provides very useful information in terms of profitability, added value, economic drive to grow hops and valuation of available family labour. We therefore use the tool to answer questions 1 and 2.

Goal for the use of Face-IT

The main purpose for the use of Face-IT is to examine whether CAP reform influences the position of hops in the farm structure. The question that will be answered is whether hops has become a relatively more or less profitable crop as a result of the reform.

Database

- FADN

Years analysed for the evaluation

- 2000 to 2006

Structure characteristics

For every hops farm a (sub) optimal group of similar farms will be generated by the Face-IT tool based on the following structure characteristics:

- Region;
- Farm type;
- Farm surface;
- Family labour;
- Total balance sheet value.

Of course the mirror group will not include any farms growing hops.

Output

We perform the analysis by defining two groups: the first group includes the hops growing farms; the other group consists of the comparison groups.

For every hops growing sample farm it is possible to see whether the hops farm itself or the mirror group is more profitable. The financial result at the farm level will be used as the main indicator for relative profitability. The comparison with alternatives may fall short regarding some unique characteristics of hops growing. Therefore special attention will be paid to fixed costs and in particular to possible losses in capital when exiting the hops-growing sector.

There are two main reasons for choosing 2006 as the base year for the calculations. First, this is the year in which the CAP reform was implemented in all countries. Second, 2006 is the most recent year for which data are available in the FADN database.

However, to make a proper comparison between hops growing farms and non-hops growing farms the returns of all the products have been corrected at the farm level. This is done because a farmer bases his strategic decisions on the results of more than one year. The correction factor is calculated for every crop and every animal product. For crops the correction factor is based on total returns per ha (yield * price); for animal production only the price is considered in the correction factor.

The correction factor is based on the average returns per ha (for crops) or price per kg (for animal products) in the period 2004-2006. The correction factors are calculated at the regional level and are used for correction at the farm level.

In another set of runs of the tool the percentage of hops growing farms will be calculated for which the alternative would have been more profitable, taking into account the considerations just mentioned. This is done for the years 2000 to 2006. In this way an answer will be given to the question to what extent CAP reform influenced the relative profitability of the hops growing farms. The following table contains the limitations of the databases we have used. When visiting the Member States, we collected additional data if available.

Table 18 – Database features

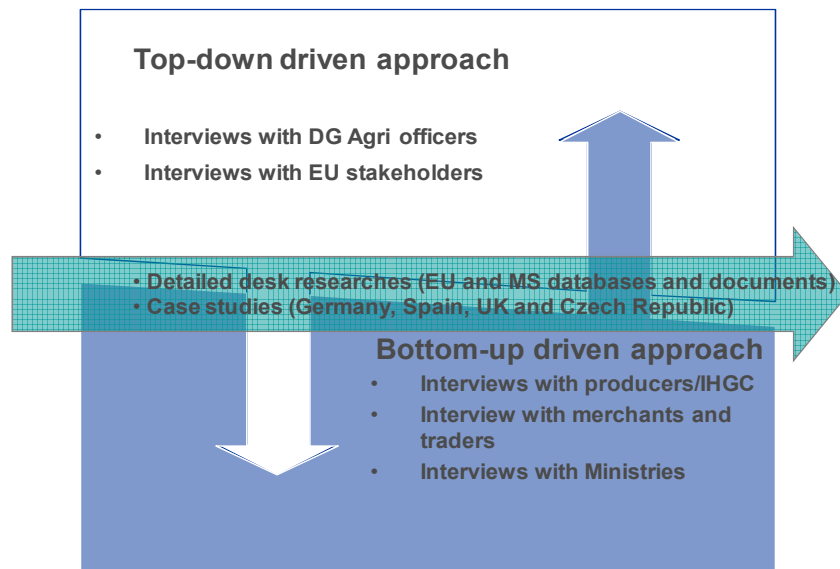
Database	Quality	Years available
FADN	Every Member State is obliged to deliver a set of data of a sample of farms to the EC. The minimum size of the sample per Member State is decided by the EC. The quality of the data depends on the way the Member State collects it. Only data for Germany and partly for Czech republic concern hops farms	2000-2006
FAO-stat	FAO stat is generally accepted as a good dataset. However, in detail some inconsistencies can be found. The quality depends on the data supply by the countries. If the most recent data are not available FAO assumes that latest known data is the best guess.	2001-2007

Database	Quality	Years available
Eurostat	A good database, quality depends on supply by the Member States. It contains mainly data related to production and production structure.	2001-2007 Part of data on a two years basis
IHGC	Depends of the supply of the participants of the convention. Generally quality is tolerable, but sometimes LEI had to make adaptations in case data are clearly not correct.	2001-2008
Barth report	Good quality data	2001-2008

3.5 Tools used for data collection

In order to collect primary and secondary data, we use different sources (desk research, interviews and visits in the Member States as case studies). The range of sources allows us to triangulate the data in order to lead to robust conclusions. The figure below illustrates our tri-dimensional approach to this evaluation (the data collection tools are further developed in this section).

Figure 5 – Tri-dimensional evaluation approach



We report collected information from all information sources in a single **reporting template** (following the structure of the analytical framework (questions, judgement criteria and indicators). This reporting allows us to identify missing data in the course of the evaluation and to aggregate the information in order to respond to the evaluation questions.

3.5.1 Desk research

Desk Research is the first task we undertake in order to identify all the contextual elements, issues and existing studies related to all relevant CAP measures. Desk research consists of identifying, reading and analysing secondary data information sources such as:

- **CAP Regulations** post and pre-reform and specific for hops as basis of this evaluation. As presented in the Intervention logic section, the main regulations are:
 - Council Regulation (EC) 1952/2005 concerning the common organisation of the market in hops;
 - Council Regulation (EC) 1782/2003 establishing common rules for direct support schemes under the common agricultural policy and establishing certain support schemes for farmers.
- **General policy papers** concerning the economics of the CAP and the policy drive behind the latest CAP reform. The review of these documents allows us to understand the background of the study and the rationale for CAP measures that we evaluate in relation to the hop sector. Example of general policy papers include:
 - OECD- Agricultural policies in OECD countries- a positive agenda reform (2002);
 - Centre for European Policy Studies- The EU CAP at fifty (2007);
 - DG ECFIN – Economics of the CAP (2004).
- **Policy documents**, evaluations and other relevant European Commission reports, minutes of relevant meetings (CMO Hops management committees), available monitoring. Examples of policy documents include:
 - Commission report to the Council on the evolution of the hop sector (2004);
 - CAP reform: accomplishing sustainable agriculture: the tobacco, olive oil, cotton, sugar and hop sectors outline of the Commission proposals (2004).
- **Policy papers** produced by the IHGC, COPA or other growers associations together with production and farming structural data from the Member States. We use these data as a basis for further analysis and for the case studies.
- **Databases** provided by the European Commission (FADN and Eurostat, DG AGRI internal data), Market actors (the Barth reports) and state bodies.

In order to maximise the value of the research, we capture all the relevant information in a reporting template. Structuring the relevant information in a comparable format allows the evaluator to identify missing information, gaps in the analysis and risks that could occur during the evaluation process.

3.5.2 In-depth interviews

As a classic way of conducting interviews during evaluation and social research projects, we always favour semi-structured interviews that allow the respondent to express him/herself freely, rather than being confined to a strict template. During the interview, the respondent is invited to develop the relevant topics in his/her own way. In this context, the interviewer does not ask questions in a fixed order but leads the interview following the way of thinking of the interviewee.

The objective of the interviews is to collect mainly **qualitative** information and, indirectly, **quantitative** information if the interviewed person has data to share with us. For each theme, we collect qualitative information directly from the hops stakeholders in order to:

1. validate our quantitative data;
2. collect their perception that could supplement the secondary data collected so far;
3. guide us to the most relevant data and documents (or other person) that could illustrate the situation in the Member States.

For the interviews, we use interview guidelines that list the different themes to be discussed. However, interviewers and interviewees are also free to discuss additional topics they consider as important or interesting for the purpose of the study. We have drafted four interviews guides according to the different profiles of interviewees:

1. **Producers** (association) at national level;
2. **Traders and merchants** at national level;
3. **Ministries/Administrations** at national level;
4. **Stakeholders at EU level.**

In total, we have interviewed **43 people**.

3.5.3 Fieldwork and Case studies

As far as the case studies are concerned, they are mainly based on the interviews we conducted in the Member States and other sources of evidence collected during the evaluation. Case studies were conducted in: Germany, Czech Republic, Spain, and the United Kingdom. In some of the countries such as in Czech Republic and Spain, hops growing is concentrated in one single region. The table below provides an overview of the fieldwork we conducted in April-May 2009.

For this evaluation we have put together a team of hops experts who are familiar with the four countries where fieldwork took place and who speak fluently the country language and have already conducted research, data gathering and analysis on policy and the hop sector. The experts were assisted by one evaluator during the country visits.

Table 19 - Selected countries/regions for the case studies

	Country	Regions
1	Spain	León province
2	U.K.	Kent
3	Czech Republic	Zatec Ustecky region
4	Germany	Hallertau

We have designed the case studies in order to provide empirical evidence and input to all evaluation themes from different contexts, perspectives and choices. They provide us with a detailed description of the impact of the CAP for each of the four main production areas considering their

specific context. Cases studies are particularly useful in this evaluation as they provide concrete illustrations on the innovation of the CAP reform in the hop sector.

All evaluation themes are covered by the case studies. Indeed, interviews with national stakeholders are the cornerstone of the evaluation as they illustrate the implementation of the CAP in the main hops producer countries and supplement our quantitative indicators.

Part III – Answers to the evaluation questions

We present in this section of the report the answers to each evaluation question by theme. We have structured the answers to each evaluation question as follows:

1. An introduction that presents the judgment criteria that have been used to answer the question. These are elements of the evaluation question on which we can draw a judgement that is part of the answer on the evaluation question. We provide our findings on each judgment criterion in a grey box;
2. Our analysis and the findings we have made by judgment criterion;
3. The conclusion to the question.

4 Theme 1 – Effects on production

Theme 1 concerns the extent to which the provisions of Council Regulation (EC) No 1782/03 affected hops production. The adoption of decoupled payments reduced the link to production; as a result income support is now directed to the producer and not to the product. This might affect the production decisions of farmers in traditional areas in different ways: they might decide to shrink hops production and switch to other kinds of crops, to increase hops production, to stabilize or they could even exit the sector.

The theme is divided into two sub-questions:

- To what extent have the CAP measures supporting hops affected the production decisions of farmers in traditional areas?
- To what extent have the CAP measures supporting hops contributed to support the income of hops producers?

4.1 Introduction

In order to answer the evaluation questions for theme 1, we have compared the gross margins of hops and of alternative crops, analysed possible additional decision factors, e.g. investments, knowledge and experience levels, contracts and farm profitability and continuation perspectives.

As explained in the methodological part of the report²², the Face-IT tool (acronym for **F**arm **A**ccounts **C**ompared by **E**volutional **I**mproving to **T**op-combination) was used to compare the farm results of hops farms to other similar farms in the same region. The use of this tool was necessary because analysis of the gross margin contains only the direct crop costs and does not take into account differences in inputs like labour and investments in buildings, machinery and the trellis system. The Face-IT tool implicitly includes all costs. The farmer bases his production decisions not only on the gross margin, but on the feasibility and attractiveness of regional alternatives using the same production factors and (in the longer-term) considerations including all costs and revenues. The Face-

²² In section 4.4.2.2., we describe the Face-it tool. The use of this tool is particularly relevant for this evaluation as Hops is a very capital and labour intensive crop compared to most arable crops. So the farmers' decisions are not based on the SGM only, but also on the integral comparison of the financial (and technical aspects) of hops growing and of its alternative.

IT tool forms so called mirror groups, based on the three classical primary production factors (land, labour, and capital) in the same region. In this way the question *“How (growing which crops) can the farmer make the best profit out of his input of labour, capital and land?”* can be solved. By comparison of the results of the hops farms and their mirror groups we are able to analyze the production decisions of the farmer in a more realistic way.

In order to examine the influence of EU support itself and the decoupling of EU support on the farmer’s income we used the FES-tool. This tool estimates the effects until 2013. In this way not only the short-term effects of the CAP reform for the farmers’ income are calculated, but also the longer-term effects since the foreseen CAP measures for the next years are built in to the FES-tool.

Both the FES and the Face-IT tool are based on the FADN datasets for Germany and Czech Republic. The effects of CAP reform for the other Member States are based on the analysis of the Standard Gross Margins of hops and other crops and the interviews with local stakeholders because FADN does not contain enough observations to allow its use outside Germany and Czech republic (see above). We present the methods used for building the mirror groups, while we will refer to the results obtained when answering the evaluation questions.

In order to explain these quantitative effects, we complete the analysis with primary quantitative and qualitative data collected during our fieldwork in four Member States (Czech Republic, Germany, Spain and United Kingdom) and our desk research.

4.1.1 Method: Practical explanation of how Face-it uses data and produces results in this evaluation

In order to analyze the production decisions of hops farmers this evaluation uses an analysis of profitability measured by profit margins excluding all other costs and revenues.

The limitation of the gross margin approach is that it does not include all the information on which a farmer bases decisions. Analyzing the alternatives only on the basis of the Standard Gross Margin does not include the requirements of farm labour or the costs of farm equipment.

The use of the Face-IT tool solves this problem by creating so called mirror groups with feasible alternative uses of the production factors of the hops producing farm. The Face-IT tool is basically a tool that is capable of generating the optimal alternative production decisions (called mirror groups of farms) under the conditions such as region, farm surface etc.

This paragraph presents an explanation how the Face-IT tool works and how the tool can provide useful results for this evaluation by deepening the analysis of alternative production decisions.

The goal of the Face-IT tool can be easily summarized: it is built to find companies that are comparable, both individually and as a group. This so called ‘mirror group’ is assembled out of a comprehensive database of companies. The characteristics on which the mirror group is based can be given to the tool. Usually these characteristics are chosen in such a way that the structure of a company and its mirror group are similar. The profit margin and income results the mirror group – calculated as the simple average of the individual company results in the group of the specified year – can be used for benchmark purposes. No other data manipulation is carried out in this analysis, unless it is indicated in the section concerned.

In this evaluation study we compare hops producing farms with their mirror groups. The use of the Face-IT tool in this study is described below.

The Face-IT tool has been applied to FADN data for 2006. However, the prices (for animal products and crops) and the yields (for crops only) in the farm returns data have been corrected for the average values during the years 2004-2006. This is done because farmers' decisions are generally not based on the results of one year, but on a multi annual base. On the other hand, in the Face-IT tool, the EU-support on farm level is not corrected but simply taken over from the FADN database of 2006 because it does not change each year as yields for instance.

The Face-IT tool is also used to analyze the effects of decoupling in Germany by comparing the average farm income of the hops farms and their mirror groups before and after the CAP reform.

The FADN database is divided into two groups: the hops producing farms (or hops farms) and the farms that do not produce hops (the non-hops farms).

The size of the mirror group is set to 10. So, for every hops farm in the FADN-database a mirror group is assigned, containing exactly 10 non-hops farms.

With this setting all the mirror groups are formed. For example, in 2006 the accounts of 77 German hops farms were available. For every run the tool created a non-hops mirror group for each of these farms. In this way the total of all mirror groups consists of 770 non-hops farms (some double counting being possible).

For every hops farm a (sub) optimal group of similar farms has been generated by the Face-IT tool, based on the following structure characteristics:

- Region (this variable has been given extra importance in the tool);
- Farm type^[1] (1 digit);
- Farm area;
- Family labour;
- Total balance sheet value.

As already mentioned in section 3.4.3.2 the mirror groups do not include any farms with hops growing. In the table below, the conditions for the construction of the four different mirror groups are set out. The first mirror group is built on farms of similar type, area and located in the same region; the second group is based on similarity in region, farm type and family labour and the third group has been assembled based on region, farm type and total assets. The fourth mirror group is constructed as the combination of all the mentioned conditions. In practice, this turns out to be an almost impossible combination. The reason is that hardly any non-hops growing arable farms could be found which fulfil the conditions of being located in the same region and having the same area, the same family labour input and the same total assets. To solve this problem one condition had to be cancelled: the farm type is left open.

Table 20 - Basis of the 4 mirror groups

		Mirror group I	Mirror group II	Mirror group III	Mirror group IV
Region		Yes	Yes	Yes	Yes
Farm type (1 digit)		Yes	Yes	Yes	No
Farm area	Ha	Yes	No	No	Yes
Total assets	Euro	No	No	Yes	Yes
Family labour	Hours	No	Yes	No	Yes

4.1.2 Influence of the CAP reform on the income of hops growers

The Face-IT tool has also been applied to determine whether the relative profit and income position of hops growers has changed since the CAP reform.

For every hops growing farm a mirror group of ten farms is constructed, based on similarity on four farm characteristics: region, farm type (1 digit), farm area and family labour. The mirror group does not contain any hops growing farms.

The tool is run for the years 2001 until 2006 for German hops farmers. It was not possible to carry out this exercise for Czech farms because of the lack of FADN data before 2004. For every individual farm the family income is compared to the average income of the farms in the mirror group. Subsequently the difference in the average income of the hops growers is compared to the income of the mirror group. Finally, the percentage of hops growers with a better family income compared to the mirror group is calculated.

4.1.3 Method: explanation of how the FES tool uses data and produces results in this evaluation

The analysis of profit and income carried out with profit margins and Face-IT has the limitation that this marginal analysis is only valid in the short run to calculate farm profit and income. In the long run, when all choices are open for the farmer, all components of income and cost for the farmer have to be taken into account.

The evaluation study uses the FES tool for this long-term analysis of farm income following the CAP reform. The FES tool is a calculation spreadsheet for calculating income over time; in this approach only one behavioural equation is needed: the assumed investment function in order to calculate capital cost.

The FES tool uses individual farm data as well. However, whereas Face-it only provides information about the actual situation in the current year, FES calculates the results over time. For this study the accounting year 2004 is used, the last year before the CAP-reforms were implemented. We made the calculations for the period 2004-2013,

As a consequence of the aim of the analysis with FES this tool includes by definition all the farm inputs and revenues, including all pillar one EU-support, as far as it is directly paid to the farm regardless of the form in which it is paid (coupled, decoupled or partly decoupled), and exactly according to the system that is current in the particular Member State and year.

The only exception is the EU support that is paid to producer groups in Germany. The reason is that this support is not paid to the farmer, but is used for financing research, advisory and promotion projects. Whilst in the opinion of the interviewees the indirect revenues of these projects are substantial they are nevertheless not included in the tool as it is impossible to assign these indirect revenues adequately to the individual farms. As a consequence the farm results are underestimated if the producer groups actually manage to provide a better profitability for hops growing. The extent of this underestimation, however, is very uncertain. Furthermore, the results for German farms cannot be generalised for Member States with partial decoupling, as in the model only decoupled aid is considered.

For the purpose of this study and in order not to make the analysis too complex, it is assumed that the farm structure does not change during the period 2004-2013. All the technical characteristics remain stable. The market price of all the inputs and outputs is assumed to be stable as well. The only farmers' decision is to renew depreciated buildings, inventory, machinery and land improvements (like the hops trellis system), as far as possible given liquidity.

FES runs on the FADN data of the year 2005, while in Germany the system was reformed in 2005. The 2004 premiums for hops growers are calculated on the basis of the 2005 FADN results, in order to simulate a "before the reform" scenario. Premiums received in 2004 are calculated on a per hectare basis for individual farms. The "before the reform" 2005 situation is thus calculated by multiplying the 2004 premiums per hectare by the 2005 area. These new, fictitious, premiums are used in the simulation. Several changes in policy which occurred until 2009 are taken into account as well. For example, the implementation of the sugar premium as a compensation for declining minimum beet prices is included. From 2009 onwards the obligation to set land aside is abolished, this means that farmers can use former fallow land for growing crops. A rather complex issue is the deferment of the set aside regulation. For FES, this issue is pragmatically solved by the assumption that 50% of the set aside area on a farm in 2008 will be used for wheat growing from 2009 onwards. The other 50% remains set aside. The increase in revenue because of the transition from set aside land towards wheat is assumed to be equal to the Standard Gross Margin of wheat for the region Bayern (an important hops producing area).

4.1.4 Limitations and assumptions

In assessing theme 1 most of our findings are based on Germany and Czech Republic. This is because the FADN database contains farm-level data only for those two countries. These data are crucial for a micro-level analysis; therefore we take them into adequate account. Where data are not available for other countries, we draw our conclusions based on these two Member States. The fact that Germany and the Czech Republic are responsible for more than 80% of the EU alpha acid production (see Table 28) makes us confident about the soundness of this extrapolation.

4.2 Evaluation question 1.1.: To what extent have the CAP measures supporting hops affected the production decisions of farmers in traditional areas?

The first question concerns the effects that the CAP measures had on the production decisions of farmers producing hops and on possible market entry of new growers. In order to reply to this question, we base our judgement on the following criteria that we develop one by one in the next sections:

- Extent to which the reform has influenced the profitability of hops;
- Extent to which production is likely to be switched to alternative crops;
- Extent to which effects on production vary from countries adopting fully decoupled support to countries adopting partial coupling;
- Extent to which producer groups manage to stabilize markets.

As background information we present in the Overview section the estimation of the world demand and supply of alpha acid. We present again this information below.

Table 21 - Estimation of the world demand and supply of alpha acid (in tons)

Brewing year	2001	2002	2003	2004	2005	2006	2007	2008	2009
Crop year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Demand	7,834	7,649	7,664	7,916	8,103	8,313	8,580	8,469	8,500
Supply	8,250	8,489	8,596	7,023	8,452	8,158	6,956	8,161	10,468
Stock changes	416	840	932	-893	349	-155	-1,624	-308	1,968

Sources supply: IHGC, adaptation LEI (supply), the Barth Report (demand)

Once we take into account the fact that fewer hops are now required for brewing the same amount of beer (due to declining rates of hops usage) and that fewer hops are required to get the same quantity of alpha acid (due to the introduction of super bitter varieties) the pattern of production becomes clear. World demand for hops is slightly increasing due to an increasing production of beer although the demand for hops and acid alpha per hl of beer is decreasing.

We will use indicators based on area as a proxy for profitability. If growing hops becomes more profitable compared to other crops, area will increase, assuming that farmers want to maximise their profits. For Czech Republic and Germany we will use the family income as an indicator for the profitability (source: FADN database).

4.2.1 Judgment criterion 1: Extent to which the CAP reform has influenced the profitability of hops

As already mentioned we will start from the trend of area and alpha acid production to get some information on the profitability of growing hops. First the share of the EU in the world hops production is analyzed, then we make an analysis of the gross margin of hops and alternative crops, the influence of the capital invested in hops and the influence of the contracts. These data will be complemented by the results from analysis of the FADN database and the information gathered during fieldwork.

4.2.1.1 Area and alpha acid production

The first (rough) indicator of profitability is the development of the area grown with hops. As hops are a multi-annual crop which requires high initial investments, it is not likely to see great variation in area in short periods of time. The investments in hops are made for a production period of 20 years or more; the CAP reform was implemented only a few years ago. This means that in the short period since the implementation of CAP reform only relatively small effects will be visible.

The global area under hops declined from 60,405 ha in 2001 to 59,285 in 2008 (-2%). 2008 saw a sharp increase in area after years of decline. This increase was driven by the high prices reached in 2007 and by the introduction of new varieties. The increase in area of about 8,000 ha from the previous year, mainly in the US, Germany and China shows a reverse in the previous trend of decline. In all other countries changes in area were (less than) zero or not relevant. The following table shows the development of the surface worldwide.

Table 22 – Evolution of hops area in 2001-08 worldwide (ha)²³

	2001	2002	2003	2004	2005	2006	2007	2008
Europe (EU-27)	36,259	34,942	33,019	33,370	31,020	29,881	30,167	31,300
Europe (other countries)	3,004	3,346	2,404	2,308	1,886	1,884	1,373	1,452
America	14,536	11,776	11,314	11,232	11,817	11,912	12,509	15,889
Asia	4,918	6,109	5,642	4,400	3,486	3,544*	5,796	9,369
Africa	512	510	503	503	506	438	438	444
Oceania	1,176	1,288	865	957	852	717	791	831
World	60,405	57,971	53,747	52,770	49,581	48,376	51,074	59,285

Source: IHGC, adaptation LEI ; *Barth Report

Table 23 – Evolution of new planted hops area in 2001-08 worldwide (ha)

	2001	2002	2003	2004	2005	2006	2007	2008
Europe (EU-27)	1,845	1,455	1,241	1,113	550	724	1,271	1,594
Europe (other countries)	476	675	303	249	36	0	114	228
America	NA	NA	NA	NA	NA	NA	NA	NA
Asia	105	467	0	0	0	120*	166	3,573
Africa	12	6	0	0	0	0	0	0
Oceania	0	20	0	0	0	0	0	25
World	2,438	2,623	1,544	1,362	586	844	1,551	5,420

Source: IHGC, adaptation LEI ; *2006: Xinjiang region only

The two tables have to be read simultaneously. The former gives an idea of the production capacity that is already deployed, while the latter anticipates the production trends of the future by considering first year hops that were planted, but which are not yet in production. The exception is the US where the first-year hops are already included in the overall production. The responsibility for the significant area increase lies mainly with the U.S. and China, while in the EU the picture is mixed. Within the EU, Germany increased its area significantly (more than 2,000 ha if the new hops area is also considered). Slovenia followed the same pattern. The rest of the EU countries instead saw their hops area shrinking or remaining stable. The new hops area is given in Table 23, with the remark that the USA figures are not available. We see a sharp increase in 2008, especially in Asia. In Europe (EU-27) almost 1,600 ha are new.

²³ These figures include the new area of the year. This was necessary as in the U.S. this data is already included in the total area.

The industry should be now concerned about the opportunities to **absorb the additional hops** that in a few years will come on the market. The peaking prices on the spot market in 2007 convinced several farmers to plant new hops gardens. As it can be seen from Table 8, Table 9 and Table 11 in the Overview section, the increase in the area was more marked in bitter varieties than in aroma varieties. This follows market demand which has recently favoured super bitter varieties of hops that have a higher content of alpha acid. The following table shows the same data as above, but in percentage form.

Table 24 – Share of world hops area by continent in 2001-08

	2001	2002	2003	2004	2005	2006	2007	2008
Europe (EU 27)	59.4%	60.5%	60.9%	62.7%	62.2%	63.3%	58.3%	55.1%
Europe (other countries)	4.4%	4.8%	4.0%	4.0%	3.8%	4.1%	2.5%	2.3%
America	25.1%	21.3%	21.7%	21.8%	24.1%	25.8%	25.3%	29.5%
Asia	8.3%	10.2%	10.8%	8.6%	7.1%	4.3% ¹	11.4%	10.8%
Africa	0.9%	0.9%	1.0%	1.0%	1.0%	1.0%	0.9%	0.8%
Oceania	2.0%	2.3%	1.7%	1.9%	1.7%	1.6%	1.6%	1.5%
World	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: IHGC, adaptation LEI, Deloitte; 1) 2006: Xinjiang region only

The **decline in the European share of world area** is visible. The decline has been sharper in the last two or three years, led by sharp decreases in minor producing countries such as the UK and Spain, but also in Czech Republic and Poland. The table below considers the situation in the EU by Member State. In a context of declining area, Germany is gaining ground mainly at the expenses of small producers.

Table 25 – Share of the EU-27 hops area by Member State in 2001-08 (ha)

	2001	2002	2003	2004	2005	2006	2007	2008	2008 in in%	2008 in % 2004
Austria	220	215	209	207	196	197	200	210	95%	101%
Belgium	250	250	209	194	191	181	176	186	74%	96%
Bulgaria	380	239	221	221	221	221	221	221	58%	100%
Czech Rep.	6,075	5,968	5,942	6,116	5,672	5,305	5,193	5,125	84%	84%
France	816	816	816	732	801	757	771	773	95%	106%
Germany	19,021	18,354	17,563	18,194	17,167	16,692	16,744	17,510	92%	96%
Hungary	34	34	37	37	37	37	18	23	68%	62%
Poland	2,250	2,197	2,172	2,239	2,291	2,234	2,179	2,141	95%	96%
Portugal	38	37	37	37	37	37	37	37	97%	100%
Romania	100	200	200	100	400	400	429	278	NA*	NA*
Slovakia	350	350	350	350	350	350	300	215	61%	61%
Slovenia	1,807	1,856	1,652	1,665	1,511	1,460	1,456	1,620	90%	97%
Spain	730	730	730	680	680	600	492	492	67%	72%
UK	1,997	1,982	1,499	1,376	1,187	1,056	1,060	1,100	55%	80%
EU-27	34,545	33,639	31,981	32,307	30,750	29,437	29,336	29,706	86%	92%

Source: IHGC and Barth Reports for Hungary and Romania, adaptation LEI, Deloitte. * Romanian figures are rough estimates and do not allow calculating accurate differences between years.

The main reason for the decrease in area in most of the EU Member States is the small farm size that is no longer competitive in the global market. In that context Czech Republic can be seen as an exception because the average hops farm area is very large – 40 ha – by European standards²⁴.

²⁴ However, this remains well below the US average size of around 200 hectares per holding.

Interviewees in the Czech Republic noted that the decline in area here results from low yields per hectare when compared to Germany and Poland.

The reasons for a lower yield per hectare are related to the aroma varieties, and mainly Saaz, grown in the three traditional areas of Czech Republic.

The Saaz²⁵ is very much appreciated by national breweries as well as by many foreign breweries, such as for instance in Japan, which is a result of their long term quality and promotion. Thus, because of its known lower yields, the price is higher in comparison to other varieties. However, Czech breweries have also been bought by foreign ones (in Prague for example two of three breweries). Foreign breweries practice their own purchasing politics and have also different view on the Czech hops industry tradition. This is also a reason why Saaz is still an important Czech hops variety, but also slowly losing its acreage.

If we consider the **production of alpha acid** the situation is slightly different. These results are of course affected by yearly weather and agronomic conditions, but some conclusions can be drawn.

Table 26 - Production of alpha acid by continent (in tonnes)

	2001	2002	2003	2004	2005	2006	2007	2008
Europe	3,672	4,064	2,847	4,469	4,562	3,191	3,847	5,187
America	3,450	3,140	2,900	2,900	2,584	2,929	3,280	4,150
Asia	907	862	921	727	644	550 ¹	717	860
Africa	90	118	111	134	127	95	121	79
Oceania	370	412	244	222	241	192	196	192
World	8,489	8,596	7,023	8,452	8,158	6,956	8,161	10,468

Source: IHGC, adaptation LEI; 1) 2006: Xinjiang region only

After the shortages in 2006-2007, the production of alpha acid increased in 2008 and exceeded demand. All the forecasts for 2009 indicate that supply will exceed demand again.

Table 27 – Share of world production of alpha acid by continent

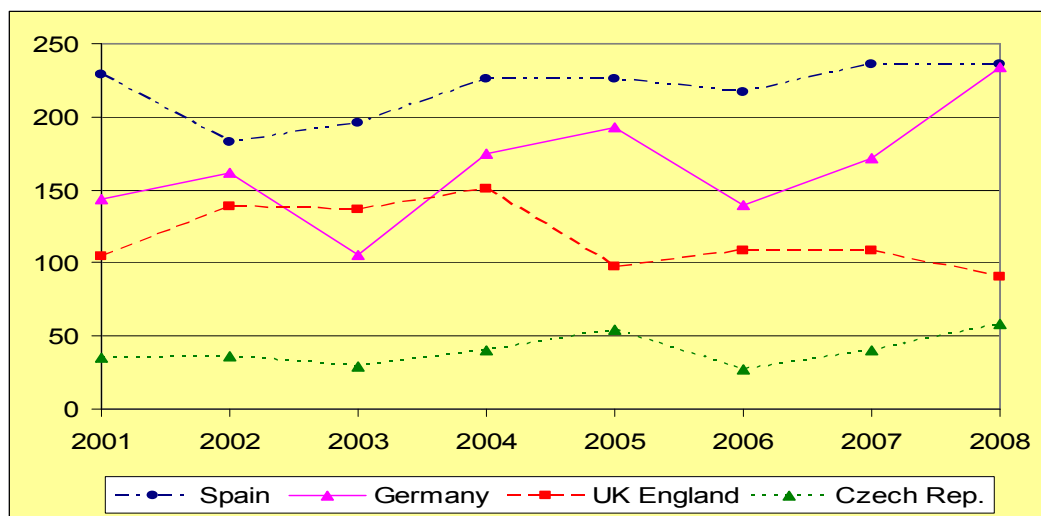
	2001	2002	2003	2004	2005	2006	2007	2008
Europe	43.26%	47.28%	40.54%	52.88%	55.92%	45.87%	47.14%	49.55%
America	40.64%	36.53%	41.29%	34.31%	31.67%	42.10%	40.19%	39.64%
Asia	10.68%	10.03%	13.11%	8.60%	7.89%	7.91% ¹	8.79%	8.22%
Africa	1.06%	1.37%	1.58%	1.59%	1.56%	1.37%	1.48%	0.75%
Oceania	4.36%	4.79%	3.47%	2.63%	2.95%	2.76%	2.40%	1.83%
World	100%	100%	100%	100%	100%	100%	100%	100%

Source: IHGC, adaptation LEI, Xinjiang region only

Here the EU has managed to maintain its competitive position. However, this is challenged by the sharp increase in American hops area that took place in 2008, production from which will reach the market mostly in 2009-2010.

²⁵ The variety Saaz (a German name for the town Zatec – a centre of Czech hops industry) represents more than 80% of the Czech production and is the most appreciated fine aroma hops variety. The Saaz is comparatively low yielding variety with a crop between 1.0 and 1.25 tons/ha and with alpha-acids from 2.1% up to approx. 3.8%. For the sake of a portfolio necessity (offering of several hops products, not only fine aroma hops) in a variety supply its acreage is declining – to be replaced by other two aroma varieties Sladek (5.5-6.5% of alpha-acids) and Premiant (7-9.5%) – both with higher yields of alpha-acids per ha. However, as stated in the IHGC national report statistics the replacement is taking place very much stepwise. On the other hand, the Agnus (11-12%) hops variety is a super alpha one and is thus not meant to be a substitute for the Saaz.

Figure 6 – Development of yield (alpha acid in kg/ha) in Czech Republic, Germany, Spain and United Kingdom



Source: IHGC

The figure shows the development of the yield in kg alpha acid per ha in four Member States. The Spanish hops fields produce the most alpha acid per ha, due to the general growing of high alpha varieties. The average yield in the last 8 years in Spain was 218 kg per ha. The trend is upwards, climbing by about 5 kg per year.

In Germany the average yield was 166 kg alpha acid per ha and grew by about 10 kg/year. The average yield in the United Kingdom was 117 kg/ha and has declined by 5 kg/year. In the last four years the yield varied by around 100 kg per ha. In Czech Republic mostly aromatic varieties are grown. The average yield was 40 kg of alpha acid and showed a slight upwards trend of 2 kg/year.

In Table 28, we present the production of alpha acid within the EU by Member State. The German share of total alpha acid production increased to almost 80% in 2008. Due to the high alpha acid yield per ha this is a greater share than German hops area, which only is 59%. On the contrary, the Czech Republic has 17% of the EU hops area, but produces less than 6% of the EU alpha acid production. According to these data, German farms demonstrate that they are able to produce more alpha acid with less area than the majority of the other Member States.

Table 28 – Share of EU production of alpha acid by Member State

	2001	2002	2003	2004	2005	2006	2007	2008
Austria	0.6%	0.6%	0.7%	0.5%	0.5%	0.7%	0.6%	0.6%
Belgium	1.0%	1.1%	1.2%	0.9%	0.8%	0.9%	0.8%	0.5%
Bulgaria	0.8%	0.7%	1.0%	0.7%	0.8%	1.1%	0.5%	0.6%
Czech Rep.	5.7%	5.4%	6.3%	5.6%	6.8%	4.7%	5.5%	5.8%
France	0.8%	1.1%	1.1%	0.7%	0.7%	1.1%	1.4%	0.8%
Germany	72.8%	73.9%	67.0%	72.4%	73.7%	74.7%	75.7%	79.9%
Hungary	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Poland	3.2%	2.7%	6.2%	4.9%	5.3%	5.2%	5.8%	4.3%
Portugal	0.1%	0.1%	0.2%	0.1%	0.1%	0.2%	0.2%	0.1%
Romania*	0.3%	0.6%	0.6%	0.3%	1.3%	1.4%	1.5%	0.9%
Slovakia	0.3%	0.2%	0.4%	0.3%	0.4%	0.3%	0.2%	0.2%

	2001	2002	2003	2004	2005	2006	2007	2008
Slovenia	3.4%	3.1%	2.8%	5.2%	4.6%	2.9%	3.0%	2.7%
Spain	4.5%	3.3%	5.1%	3.5%	3.4%	4.2%	3.1%	2.3%
United Kingdom	5.6%	6.8%	7.4%	4.7%	2.6%	3.7%	3.0%	1.9%
Europe (eu-27)**	99.20%	99.70%	100.10%	99.90%	101.10%	101.20%	101.40%	100.70%

Source: IHGC and Barth report. * Romanian figures are rough estimates. ** As we data sources are mixed the total is not 100%.

We found the following relevant findings:

- As a first rough indicator we looked at the development of the hops production and the area grown with hops. The share of the EU-27 hops area increased over the period 2001-06, but started a sharp decline in 2007, mainly owing to new hops gardens brought into production in the USA.
- Within Europe the share of the German area grew; UK and Spain lost share. This is an indication that the profitability in the latter Member States could be insufficient to prevent loss of area. As analysed further in the report, other factors such as the discrepancies between the hops varieties produced and the brewers' demands or the lack of technological researches in some countries could also be an explanation;
- Because of the shrinking hops area the alpha acid production share of Europe has declined, in spite of yield improvements;
- In future the European share in world hops production will probably decline as a result of recent planting of new USA hops gardens.

4.2.1.2 Influence of the CAP reforms on the gross margin of hops and alternative crops

Table 29 presents the standard gross margins (SGM) of hops and some other crops as published by the EU in 2004. The level of the premium for hops in 2004 is separately provided by DG AGRI in their SGM-calculations. 2004 is the last year for which data are available, so that it is not possible to have a counterfactual after the reform. The direct effects of full decoupling can easily be calculated by subtracting the premium from the SGM in the case of hops. Besides, in this year all SGMs were published by Eurostat. In the case of the alternative crops, we also take into account the situation in 2004, including the changes brought by the reform. We chose the hops producing NUTS-1 or NUTS-2 regions given the availability of data.

The SGM is calculated by subtracting the specific variable product costs from the returns of the crop. The product returns include the revenues from the by-products and coupled subsidies; for crops the variable costs are seeds and plant goods, fertilizers, crop protection and other variable costs. Returns and costs can vary between years and regions. That is why the returns and costs are calculated on a multi-annual base and the SGM is calculated for different regions where necessary.

For the farmer the gross margin is one of the factors on which he/she decides which crop(s) he/she will grow in the year to come. Other factors are labour requirement, crop rotational limits, available machinery and buildings, knowledge etc. The SGM is – after adding the fixed returns and subtracting the fixed costs - an indicator for the farmers' income. The SGM is provided by the member states and based on at least three accounting years.

From the table below, it appears that the SGM of hops is very high compared to possible alternatives. In almost all production regions hops is the most profitable crop in terms of gross margin. Only in a few regions there are crops with higher SGMs than hops. The cultivation of fresh vegetables in Austria, Czech Republic and Germany, quality vineyards in Austria, Czech Republic, France and Germany and potatoes in the UK are worth mentioning. These are generally (hired) labour intensive crops requiring a high level of specific knowledge to grow and which require high capital investments. A possible exception is the growing of potatoes in the UK, because of the higher SGM of potatoes. The high SGM for potatoes in the relevant region in the UK (East Kent) is caused by the specific regional potato market. The potato growing is characterized by producing for fresh ware potatoes of high quality. In most other relevant Member States the potato growing is less intensive due to production of starch potatoes or potatoes for the processing industry. Moreover, the fresh potato market is more isolated in the UK compared to the other Member States due to the fact that UK is an island. The production is focussed on the local market and on the specific demands of that market. These specific circumstances are highly advantageous for the price determination.

In 2004 EU support for crops was still coupled on the production and therefore it is included in the SGM. For hops this support is only a small part of the SGM. In all considered regions this part is 15% at the most. For comparison: for cereals this percentage was in some regions more than 30% and for starch potatoes EU support exceeds 50% of the SGM. It should be noted that seed and ware potatoes have never been supported by the EU.

The relative small entity of EU support (under a SPS or SAPS scheme, according to countries) makes hops more profitable than almost all the alternatives. This is even the case if the premium on the alternative crops would remain coupled to production. However, for crops like cereals, sugar beets and starch potatoes the coupled premium had been (fully or partially) decoupled as well. This makes these crops even less attractive to switch to. Moreover, when switching crops, sunk costs for machinery have to be considered, so that if the SGM is close enough farmers will decide not to change.

Another indicator could be the gross margin per labour hour²⁶. The required labour per ha of crop is not easy to retrieve, but an attempt is made in theme 4. For hops the total marginal required labour is estimated to be 350 hours per ha, of which 175 hours is casual (paid) work (to a value of about €1,200). For wheat the marginal labour requirement is estimated as 15 hours per ha, for sugar beet 30 hours per ha and for potatoes 35.

Decoupling the EU support for hops would decrease the marginal family income per ha by about 2 euro's per hour (€400 divided by about 200 hours of family labour per ha). For wheat this figure is about €25 (€380/15) per hour of labour. For sugar beet it is not very easy to calculate because the EU support is paid to the sugar company rather than the producer. Because of the sugar reforms the market price for sugar went down by about €125 per tonne of sugar. A yield of 8 tonnes means a decrease of €1,000 per ha of marginal family labour income. This is about €35 per hour of labour. For ware potatoes no EU support is paid. For starch potatoes the marginal family income due to partial decoupling can be estimated as about €18 per hour of labour (€540/30 hours per ha). The conclusion is that decoupling decreases the gross margin per hour of family labour by about €2 per ha, but that

²⁶ To calculate this figure we have to keep in mind that for hops a large part of the labour is done by (low paid) casual workers. This is not generally the case for wheat, sugar beet and potatoes.

the CAP reforms for some important competitive crops influence their gross margins per labour hour a lot more. The competitiveness of hops compared with 'free' crops, like ware potatoes, fresh vegetables, fruits and wine has declined over the last years. However, this will hardly change the area of hops for several reasons. Usually these crops require a high level of investments and crop specific knowledge. Some crops, like vegetables or vineyards require specific soil and climate conditions.

Table 29 – Gross margin of hops and some alternative crops (€/ha) in 2004

Member State	Region	Hops		Common wheat and spelt	Sugar beet	Potatoes	Fresh vegetables, melons, strawberries	Citrus	Vineyards quality wine
		Incl.	Excl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.
	EU Support	Incl.	Excl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.
Austria	Nieder-österreich	4,139	3,659	478	1,933	2,512	6,168		10,482
Belgium	Vlaams gewest	4,425	4,022	1,183	2,336	2,733	2,302		
Czech Republic	Ceska Republika	3,660	3,210	394	1,005	1,946	3,987		4,494
France	Alsace	6,290	5,900	810	1,780	3,210			19,840
Germany	Nieder-bayern	3,562	3,178	636	2,676	1,625	10,869		7,479
Poland	Mazowsze i Podlasie	1,966	1,566	276	1,152	824	567		
Slovakia	Zapadne Slovensko	2,880	2,439	257	839	1,586	1,792		1,056
Spain	Castilla y Leon	6,292	5,892	348	1,953	2,419	4,619	4,425	3,340
UK	East Kent	4,444	3,991	927	1,695	5,946	3,250		

Source: Eurostat, adapted LEI

The main findings for the evaluation question are:

The EU-support appears to be only a minor part of the Standard Gross Margin²⁷ for hops. Decoupling the EU-support has therefore a relative small influence on the gross margin of hops and on the possible behaviour of producers. Before the decoupling, there were hardly any arable crops with a higher gross margin than hops. Some crops (vineyard, horticultural crops) have a higher gross margin, but high capital and knowledge requirements make switching to these crops unlikely. Decoupling does hardly influence the switch to arable crops for two reasons. Firstly the Standard Gross Margin of arable crops is usually smaller than the margin of hops. Secondly the difference between the Standard Gross Margin of hops and most arable crops did not change much though the CAP reform, since the support on these crops is decoupled as well²⁸.

²⁷ In line with the Eurostat definition, we consider the SGM for year X as the result of a moving average of year x, year X-1 and year X-2.

²⁸ Except for Spain and France where it is partially decoupled.

The decoupling of the EU-support of hops reduces the gross margin of hops, but the reduction is too small to have any significant influence on the farmers' decision about discontinuation of hops growing. An exception is a possible switch from hops to potato growing in the UK or to fresh vegetables growing in Austria, Czech Republic and Germany.

4.2.1.3 Influence of the capital invested in hops

Starting a new hops garden requires big investments. Fuß, Schätzl and Portner (2007)²⁹ derive a total investment for a 25 ha hops farm of €47,000 per ha, comprising the trellis system (€18,000/ha), the buildings (€6,000), the field equipment and the installations (€17,000) and – if necessary – the irrigation system (€6,000).

Such a big investment is only carried out when the hops farmer has the strong intention to continue the production for a long period. The authors mention a yearly depreciation³⁰ percentage for the planting and trellis system of 3.5%; this implies a depreciation period of 30 years.

Quitting hops production before the investment has depreciated and grubbing up the hops garden implies a huge loss of capital. Not only is the trellis system worthless in that case, but also part of the buildings and the specific hops harvesting equipment. Moreover, the farmer has to allow for costs for grubbing up the field and removing the posts and wires. Grubbing up a 25 ha hops garden after 15 years instead of 30 adds up to a capital loss of at least €250,000, which makes premature grubbing up very unlikely. Not only is the capital loss of importance, but the necessary investments in a new crop should also be considered. If a farmer would - for instance – switch to the cultivation of fresh vegetables he has to invest in crop specific knowledge, machinery, buildings, marketing, etc.

When a farmer stops growing hops him/herself, he/she usually sells or rents the hops garden to another grower, who will continue hops production. This makes it possible for the new owner or user to start a new farm or enlarge his current farm.

In the section above, it is explained that decoupling EU support means a decrease of the gross margin of about €400 per ha. In principle a loss of gross margin could be a reason for a hops farmer to grub up his garden in spite of a capital loss. This could be considered if another crop would have much better financial perspectives than continuing hops production. That said, €400 per ha is far too low to play a decisive role in the decision to grub up the garden. The main reasons for this are that untimely grubbing up would imply a big loss of capital, the good profitability of hops compared to alternative arable crops (even after decoupling) and all kind of barriers to start high margin horticultural crops.

The findings for the evaluation question are:

- The capital invested in hops production is very high. To start up a hops garden needs an investment up to €47,000 per ha. Once planted the hops garden usually produces 15 to 20 years. Untimely grubbing up of hops gardens is unlikely due to big capital loss.
- On the other hand switch to other crops with similar gross margins as hops (horticulture or

²⁹ Fuß, Schätzl and Portner (2007) Entwicklung und Erprobung der Sensortechnik bei frühen Pflanzenschutzapplikationen

³⁰ Depreciation is a noncash expense that reduces the value of an asset as a result of wear and tear, age, or obsolescence.

vineyards) requires high investments in farm equipment and knowledge as well.

- The decoupling of the EU-support has in this matter hardly any influence. The main reasons for this are that untimely grubbing up would imply a big loss of capital, the good profitability of hops compared to alternative arable crops (even after decoupling) and all kind of barriers to start an alternative high margin crop.

1.1.1.1 Profitability of hops production on different groups of farms: a Face-IT simulation

In this section the profitability of hops producing farms will be compared with similar farms using the Face-IT tool. As explained in 3.4 this tool compares hops farms with so called mirror groups, based on the FADN database. In this way the profitability of hops and alternatives is not only compared on the basis of the gross margin, but also the fixed costs are taken in consideration.

4.2.1.3.1 Germany

The next table shows the farm structure and the financial results of the hops producing farms in Germany according to the FADN database for 2006. However, as explained in paragraph 4.1.1 the prices (for animal products and crops) and the yields (for crops only) in the farm returns data have been corrected for the average values during the years 2004-2006. In the Face-IT tool the support on farm level is taken over from the FADN database.

The database contains data for 77 German hops growing farms. To calculate the average results the farm data have **not** been weighted. The reason is that the results of the mirror group would become unbalanced in case of weighting. The results of the four mirror groups are given in Table 30. The German hops farms have an average size of 100.7 ha, of which 12.3 ha are planted to hops. Most of the farms grow other arable crops besides hops. The majority (64%) of the hops farm sample is of farm type³¹ 1000 (specialist field crops), 14% of type 8000 (mixed crops and livestock), 9% of type 6000 (mixed cropping), 6% of type 3000 (specialist permanent crops) and 5% of type 7000 (mixed livestock).

Hops are a capital and labour intensive crop. That is why the average total assets on the hops farms add up to €1,075,000 and the total labour requirement to almost 11,000 hours, of which 3,325 labour hours are provided by the farmer and his family. The financial results are realistic: the total returns exceed the total costs by €3,600. The average family income on the German hops farms, once all subsidies are included, comes to €47,700. Table 30 provides an overview of the mirror groups and their classification criterions.

Mirror group I is constructed under the condition that the mirror group is of the same farm type, lies in the same region and has approximately the same area. It is clear that the capital and labour intensity of the mirror group is significant lower. Although the mirror group has the same area, the capital needed is 17% lower and the required labour input is 40% lower. The family income is €22,400. This is €25,300 lower than the hops farms.

Mirror group II is formed to equalize the region, the farm type and the family labour input. The result is that on average the farms are almost 70% larger and that the total assets are almost 20% smaller.

³¹ Eurostat classification of European farms (see footnote 24).

The average family income in the mirror group is €37,100. This is €10,100 less than the average income on the hops farms.

Mirror group III has approximately the same capital input. It is clear that this mirror group operates 60% more land and needs 25% less labour input. The average family income in this mirror group is €32,200. This is €15,500 lower than the average income on the hops farms.

Mirror group IV is constructed as a combination of similarity in region, farm area, family labour and total assets. The average family income in the mirror group is €40,200. This is €7,500 lower than the average income on the hops farms.

The conclusion is that the average family income on the hops farms is significantly higher compared to the mirror groups.

Table 30 – Structure of the hops producing farms in Germany and the four mirror groups

		Hops farms	Mirror group I	Mirror group II	Mirror group III	Mirror group IV
Hops	Ha	12.3	0.0	0.0	0.0	0.0
Cereals	Ha	37.4	44.8	85.9	76.6	49.4
Potatoes	Ha	0.5	2.6	3.3	3.7	1.9
Sugar beets	Ha	3.0	3.3	5.2	5.2	2.4
Other arable crops	Ha	13.1	16.1	31.7	28.9	19.7
Horticulture in the open	Ha	1.6	1.2	1.4	1.2	1.9
Horticulture under glass	Ha	0.0	0.0	0.0	0.0	0.1
Grass/pasture	Ha	6.7	11.5	17.9	17.2	25.2
Fodder crops	Ha	16.1	9.6	10.7	14.5	16.1
Woodland	Ha	0.00	0	0	0	0
Fallow	Ha	2.6	4.5	9.8	9.0	4.5
Not specified	Ha	7.1	4.0	3.4	3.6	4.5
Total production area	Ha	100.7	97.5	169.2	159.9	125.7
Total assets	€	1,075,000	895,000	894,000	1,061,000	1,101,000
Total unpaid labour	Hours	3,325	2,734	3,327	3,045	3,325
Total paid labour	Hours	7,596	3,857	3,784	5,066	5,561

Source: FADN, adaption LEI

Table 31 – Financial results of the hops producing farms in Germany and the four mirror groups

	Hops farms	Mirror group I	Mirror group II	Mirror group III	Mirror group IV
Total output	294,100	205,200	263,200	299,200	336,300
Of which:					
Hops	82,000	0	0	0	0
Other crops	56,400	82,900	123,200	115,700	110,400
Animal products	65,300	28,400	24,300	38,100	72,200
Other returns	4,800	6,700	9,600	12,100	8,600
Returns not specified	85,700	87,300	106,100	133,300	145,200
Total inputs	290,500	220,600	284,700	324,700	346,000
Of which:					
Specific costs crops	41,200	33,800	52,500	50,400	48,600
Specific costs livestock	31,700	35,000	38,900	51,000	61,700
Motor fuels	14,800	11,400	16,900	17,500	15,500
Heating fuels	7,800	2,100	1,900	2,500	4,600
Electricity	4,300	4,200	4,700	5,500	6,400
Water	1,100	1,300	1,300	1,500	1,900
Upkeep	24,200	12,600	17,200	18,800	20,600
Depreciations	40,100	27,600	39,400	42,000	44,000
Contract work	6,200	6,600	12,200	13,100	11,700
Other expenses	39,200	32,600	33,900	48,700	54,700
Paid interest + rents	20,300	16,300	30,300	29,000	23,900
Paid wages	59,700	37,100	35,600	44,600	52,600
Total output-total inputs	3,600	-15,400	-21,400	-25,500	-9,700
Subsidies	43,800	38,100	59,000	58,100	49,300
Taxes	-300	200	500	400	-600
Family farm income	47,700	22,400	37,100	32,200	40,200
Family farm income per unpaid labour hour	14.30	8.20	11.20	10.60	12.10

Source: FADN, adaption LEI

In this section, we compared the profitability of German hops farms with similar farms in the region on base of the FADN dataset.

We showed that the family income (both in absolute terms as expressed per unpaid labour hour) on hops growing farms is higher than on other farms with the same structure regarding the three primary production factors (ground, labour and capital input). This implies that, regarding farm profitability, it is for the majority of farms not an advantage to put in ground, labour or capital to grow other crops. In other words and as main finding: there is no reason to switch production for profitability reason.

On most hops growing farms also other farm activities take place. The incidence of hops in the hops producing group is 12.2% of the area, but the share of income that is due to hops growing is in percentage higher than the share of hops on the total area of the farm 27.8% of the income of the farms.

4.2.1.3.2 Czech Republic

The tables below show the average farm structure and the average financial results of the hops producing farms in the Czech Republic and their mirror groups. The database used is FADN 2006. However, as explained in paragraph 4.1.1 the prices (for animal products and crops) and the yields (for crops only) in the farm returns data have been corrected for the average values during the years 2004-2006. In the Face-IT tool the support on farm level is taken from the FADN database.

As was the case for Germany, the first mirror group is based on the three variables: region, farm type and farm area; the second group is based on region, farm type and family labour and the third group has been assembled based on region, farm type and total assets. Finally, the variables region, farm area, family labour and total assets are used to form the fourth mirror group. Table 21 provides an overview of the mirror groups and their classification criteria.

The Czech hops farms have an average total size of 1,278 ha, of which 59 ha are planted with hops. All the hops farms grow other arable crops besides hops. The majority (64%) of the hops farms are of farm type 1000 (specialist field crops), 21% of type 6000 (mixed cropping) and 14% of type 8000 (mixed crops and livestock).

The average total assets on the hops farms amounts to €4,081,000 and the total labour requirement over 93,000 hours, of which only 1,647 labour hours are provided by the farmer and his family. The financial results are shown in table 34: average family income on the hops farms, including subsidies, comes to €50,600.

Mirror group I is constructed under the condition that the mirror group is of the same farm type, lies in the same region and has approximately the same area. It is clear that the capital and labour intensity of the mirror group is significantly lower. Although the mirror group has the same area, the capital requirement is 15% lower and the required labour input is 13% lower. The family income is €29,500. This is €21,000 lower than the hops farms.

Mirror group II is formed to equalize the region, the farm type and the family labour input. The result is that on average the farms in this mirror group are a little larger and the total assets are about 15% smaller. The average family income in the mirror group is €33,300. This is €17,300 lower than the average income on the hops farms.

Mirror group III has approximately the same capital input. This mirror group works the same area of land and requires the same labour hours. The average family income in the mirror group however is only €27,500; this is €22,000 lower than the average income on the hops farms.

Mirror group IV is constructed as the combination of all the above mentioned conditions. The average family income in this mirror group is €44,400. This is €6,200 less than the average income on the hops farms.

The conclusion is that the average net farm income on the hops farms is significantly higher compared to the mirror groups.

Table 32 – Structure of the hops producing farms in Czech Republic and the four mirror groups

		Hops farms	Mirror group	Mirror group	Mirror group	Mirror group
Hops	Ha	58.9	0.0	0.0	0.0	0.0
Cereals	Ha	691.7	685.4	721.4	675.8	568.2
Potatoes	Ha	1.0	16.4	21.3	19.3	12.6
Sugar beets	Ha	56.6	45.7	50.6	54.4	27.2
Other arable crops	Ha	196.0	232.3	250.7	221.4	187.5
Horticulture in the open	Ha	9.1	11.5	7.0	11.4	10.2
Horticulture under glass	Ha	0.0	0.0	0.0	0.0	0.0
Grass	Ha	55.3	124.1	118.3	120.3	215.9
Fodder crops	Ha	198.8	130.9	142.8	151.5	218.5
Woodland	Ha	0.0	0.0	0.0	0.0	0.0
Fallow	Ha	0.0	1.5	2.7	3.6	9.0
Not specified	Ha	10.7	13.4	11.4	15.6	14.9
Total production area	Ha	1278.0	1261.1	1326.1	1273.4	1263.9
Total assets	€	4,081,000	3,482,000	3,477,000	3,970,000	4,175,000
Total unpaid labour hours	Hours	1,647	2,412	1,647	1,729	1,654
Total paid labour hours	Hours	91,963	79,340	81,804	90,451	91,524

Source: FADN, adaption LEI

Table 33 – Financial results of the hops producing farms in Czech Republic and the four mirror groups

	Hops farms	Mirror group I	Mirror group II	Mirror group III	Mirror group IV
Total output	1,444,700	1,304,500	1,466,000	1,477,100	1,526,100
Of which:					
Hops	282,500	0	0	0	0
Other crops	521,100	619,000	729,000	691,900	462,500
Animal products	265,900	239,700	270,900	266,200	413,400
Other returns	15,700	44,700	52,800	55,800	39,100
Returns not specified	359,600	401,200	413,300	463,300	611,100
Total inputs	1,681,800	1,566,400	1,725,700	1,745,800	1,806,800
Of which:					
Specific costs crops	321,500	312,000	367,900	339,400	251,900
Specific costs livestock	292,400	306,200	318,500	340,800	491,500
Motor fuels	123,100	114,400	123,300	119,800	118,700
Heating fuels	15,500	12,000	9,100	12,200	10,800
Electricity	30,100	28,700	30,900	32,200	36,300
Water	6,400	3,600	4,600	5,100	5,100
Upkeep	82,100	89,100	108,400	104,000	101,600
Depreciations	130,800	128,000	127,900	140,900	137,700
Contract work	74,600	69,000	75,000	67,000	62,700
Other expenses	143,400	112,000	133,800	134,100	124,700
Paid interest + rents	80,900	69,000	72,400	77,900	71,600
Paid wages	381,100	322,500	353,800	372,400	394,300
Total output-total inputs	-237,100	-261,900	-259,800	-268,600	-280,600
Subsidies	311,000	312,800	316,600	319,300	344,600
Taxes	23,300	21,400	23,500	23,200	19,600
Net farm income	50,600	29,500	33,300	27,500	44,400

Source: FADN, adaption LEI

The Czech Republic is the only country where interviewees admitted the importance of CAP support for their income and for the viability of their farms. This is explained by the lower returns that Czech farmers have per hectare. The simulations run above show that a German farm of 12 hectares generates a net farm income only slightly lower than a Czech farm 10 times as big. The reasons put forward by Czech growers for this difference compared to their German colleagues are explained in the Czech case study and can be synthesized as follows:

- Lower yields, because of the varieties grown and a lack of irrigation systems (in Czech Republic rainfall is much lower than in Germany);
- Lower degree of mechanization;
- Consultancy and administration costs are higher. In other countries instead the producer groups fill the applications on behalf of their members;
- Fewer funds available for research and development of new, more efficient varieties.

In this context the difference between costs and revenues is positive but tiny, and several growers would have a negative income without the EU and national support and would be driven out of the market.

We compared the profitability of Czech hops farms with similar farms on base of the FADN dataset.

- We showed that the average net farm income (all subsidies included) on hops growing farms is higher than on other farms with the same structure regarding the three primary production factors (ground, labour and capital input);
- This implies that regarding farm profitability it is for the majority of farms not an advantage to put in land, labour or capital to grow other crops. In other words: there is no reason to switch production for profitability reasons;
- The share of income that is derived from hops production is, in percentage terms, higher than the share of hops on the total area of the farm. Hops account for 5% of total area, but 20% of income;
- Without subsidies for hops the income of hops growing holdings is not always higher than the 'mirror' farms. The subsidies are more important for the economic viability of Czech than for German holdings.

4.2.1.4 *Analysis of the changes of the cost structure – FADN data*

In this paragraph the FADN dataset is used to provide the average (subdivisions of) costs and returns of farm groups. The groups are formed by country (Germany and Czech Republic based on the data available in FADN), area of hops and rate of specialisation. In this way we are able to analyze the profitability of hops farms for different groups. We will also calculate all the different cost items for hops growing (without the influences of other farm activities).

The FADN is a stratified sample; that is why the individual farm data are weighted to calculate the averages. For the purpose of the evaluation, no other relevant data are available to conduct an analysis that would allow us to draw conclusions at a macroeconomic level viz. all German or European hops farms.

4.2.1.4.1 Results for Germany

Table 33 shows the financial results of German hops farms between 2000 and 2006. For most farms, hop growing represents only a part of the total production. The average area of hops increased steadily from 8.8 ha in 2000 to 10.9 ha in 2006. The specialisation rate (hops revenues / total revenues) varies annually, but increased by 12% over the period considered. A full comparison of data between years is complicated by the fact that the sample is not stable, moreover the number of farms changes every year.

The average net farm income over the observed seven years was €31,500. The financial results were poor in 2001 and 2002, but improved in the years 2003, 2004 and 2005. In 2006 an average net farm income of €33,600 was obtained.

Table 33 – Results in €/ha and net farm income on hops farms (2000-2006, Germany)

	2000	2001	2002	2003	2004	2005	2006
Sample farms							77
Hops area	8.8	9.5	9.8	10.2	10.4	11.1	10.9
Total area	33.3	64.1	64.2	63.8	60.0	66.7	39.5
Specialisation rate (%)	47%	43%	45%	42%	49%	52%	59%
Family labour (hours)	3,368	3,251	3,290	3,347	3,213	3,390	3,248
Hops returns per ha	5,400	5,800	5,500	5,500	6,600	7,300	6,800
Hops-returns	1,437	855	841	874	1,152	1,212	1,885
Other returns	2,089	1,586	1,459	1,578	1,597	1,694	1,824
Total output	3,525	2,441	2,300	2,452	2,748	2,906	3,709
Seeds	58	44	48	63	52	250	65
Crop protection	221	196	227	204	212	192	275
Fertiliser	128	109	96	113	127	115	148
Other crop spec. costs	97	46	45	58	77	66	108
Heating fuels	89	58	44	38	54	94	146
Gross margin	2,931	1,989	1,841	1,975	2,226	2,189	2,967
Electricity	32	30	33	37	43	48	59
Motor fuels	180	140	145	138	154	177	211
Water	17	10	11	12	11	12	15
Depreciations	595	392	380	379	366	335	561
Upkeep	220	163	160	137	162	148	238
Paid labour	420	442	413	405	416	402	460
Rents and interest	187	217	233	221	208	202	205
Other costs	728	576	602	618	605	554	777
Total inputs	2,973	2,422	2,436	2,424	2,487	2,593	3,267
Total output-total inputs	552	19	-136	28	261	312	442
Subsidies/taxes	368	365	393	410	442	353	410
Net farm income	920	385	258	438	704	665	852
Net farm income at farm level	30,600	24,600	16,500	28,000	42,200	44,400	33,600
Net farm income per unpaid labour hour	9.10	7.60	5.00	8.40	13.10	13.10	10.30

Source: FADN

Table 34 shows the results of hops farms in groups sub-divided by area of hops. The second column from the left in the table shows the average results on all the hops farms in 2006. The average farm in the sample grows almost 11 ha of hops in addition to cultivating another 29 ha of land. Total returns amount to € 3,709 per hectare, of which € 1,885 is accounted for by hops sales. Total inputs

were € 3,221 per hectare, leaving a € 488 per hectare net farm result. Coupled and decoupled subsidies amounted to € 420 per hectare. However, the FADN data do not include the subsidy paid to the hop producer groups.

The average net farm income was € 33,600 in 2006. Group 1 contains 19 farms growing between 1 and 6 ha of hops. On average these holdings total 28.3 ha, of which 4.1 ha is hops. The specialisation rate is low: only 39% of total sales come from the hop enterprise. Total net farm income is low; despite almost 3,000 hours of family labour input into the farm, the net farm income is only € 10,400. The farms in the second group, growing 6 to 12 ha of hops, are more profitable. Their income is almost € 39,000. This is about the same income as the average in group 3, where between 12 and 18 ha of hops are grown. The farms in group 4 grow more than 18 ha of hop, with an average of 23 ha of hops in addition to another 73 ha of other crops. The specialisation rate in this group is 52%. The average net farm income of these larger farms is € 56,400.

Table 34 – Results in €/ha and net farm income on hops farms, subdivided into groups based on area of hops per farm (2006, Germany)

	All farms	Group 1	Group 2	Group 3	Group 4
Sample farms	77	19	23	19	16
Hops area	10.9	4.1	8.6	14.5	23.3
Total area	39.5	28.3	28.9	31.5	96.5
Specialisation rate (%)	59%	39%	66%	75%	52%
Family labour (hours)	3,248	2,939	3,151	3,598	3,481
Hops returns per ha	6,800	5,300	7,400	6,700	7,000
Hops-returns	1,885	764	2,194	3,081	1,685
Other returns	1,824	2,043	1,829	1,437	1,900
Total output	3,709	2,807	4,023	4,519	3,585
Seeds	65	71	61	32	81
Crop protection	275	168	274	431	254
Fertilizer	148	133	176	174	123
Other crop spec. Costs	108	73	95	196	90
Heating fuels	146	71	152	234	138
Gross margin	2,967	2,291	3,265	3,452	2,897
Electricity	59	66	67	72	43
Motor fuels	211	192	218	248	199
Water	15	20	19	15	8
Depreciations	561	663	541	600	495
Upkeep	238	222	207	256	259
Paid labour	460	107	285	462	769
Rents and interest	205	200	180	178	238
Other costs	731	806	762	606	733
Total inputs	3,221	2,792	3,037	3,504	3,432
Total output-total inputs	488	15	987	1,015	153
Subsidies	420	465	390	389	432
Net farm income	852	368	1,345	1,267	585
Net farm income at farm level	33,600	10,400	38,900	39,900	56,400
Net farm income per unpaid labour hour	10.30	3.50	12.30	11.10	16.20

Source: FADN

From the table above, it is clear that bigger farms are more profitable per hectare than smaller farms, and provide a higher income to farmers. This also entails a decrease in the marginal cost of production, but this is due to the changes in the production structure rather than to the introduction of decoupled aid. In table 35, the group subdivision is based on specialisation rate. The first group include farms with hops sales that are less than less than 50% of the total sales. In the second group the specialisation rate varies from 50% to 75%, in the third group 75% to 90% and in the fourth group 90% - 100%. There is a strong correlation between the specialisation rate and total returns, the total costs and the net farm income per ha. On the other hand, less specialised hop farms tend to be the largest farms in terms of area. This explains the absence of a relation between specialisation rate and total net farm income.

Table 35 – Results in €/ha and net farm income on hops farms, subdivided into groups based on specialisation rate (2006, Germany)

	All farms	Group 1	Group 2	Group 3	Group 4
Sample farms	77	23	21	16	17
Hops area	10.9	6.0	10.5	13.4	13.8
Total area	39.5	80.0	31.0	28.9	22.0
Specialisation rate (%)	59%	18%	65%	85%	94%
Family labour (hours)	3,248	3,271	3,121	3,678	2,986
Hops returns per ha	6,800	5,700	6,500	6,900	7,400
Hops-returns	1,885	429	2,192	3,202	4,641
Other returns	1,824	2,406	1,783	1,348	531
Total output	3,709	2,835	3,975	4,549	5,172
Seeds	65	88	41	41	56
Crop protection	275	150	360	348	459
Fertilizer	148	118	144	180	213
Other crop spec. costs	108	45	120	158	238
Heating fuels	146	48	171	234	325
Gross margin	2,967	2,385	3,140	3,587	3,880
Electricity	59	39	69	84	79
Motor fuels	211	163	249	233	284
Water	15	12	21	15	13
Depreciations	561	428	695	677	641
Upkeep	238	232	239	226	274
Paid labour	460	467	368	483	560
Rents and interest	205	222	228	192	127
Other costs	731	757	733	789	574
Total inputs	3,221	2,769	3,436	3,660	3,843
Total output-total inputs	488	66	539	889	1,329
Subsidies	420	424	401	425	435
Net farm income	852	498	825	1,219	1,635
Net farm income at farm level	33,600	39,800	25,600	35,200	36,000
Net farm income per unpaid labour hour	10.30	12.20	8.20	9.60	12.00

Source: FADN

The last group is formed by highly specialised hop farms. It is interesting to have a closer look at this group.

In table 36, an attempt is made to calculate the costs per ha of hops. However, even on these highly specialized farms there are some other agricultural activities. Therefore an estimation is made of the costs associated with those other activities by multiplying the non-hop area by the estimated costs of these activities per ha (based on farms not growing hops in Germany). These costs are subtracted from the total costs at farm level. This is done for all the cost items. The remaining costs are imputed to the hop production enterprise. A similar approach is applied the labour input.

Table 36 – Results in €/ha and net farm income for hops production (based on specialized hops farms) and for non hops farms (Germany, 2006)

	Hops	Non hops
Total outputs	7,431	2,244
Seeds	31	98
Crop protection	682	88
Fertilizer	279	103
Other crop spec. costs	356	42
Electricity	99	45
Motor fuels	377	130
Heating fuels	504	27
Water	12	14
Depreciations	641	303
Upkeep	274	137
Paid labour	776	202
Rents and interest	127	219
Other costs	516	785
Total inputs	4,673	2,192
Total outputs-total inputs	2,757	52
Subsidies	435	416
Net farm income	3,192	428
Labour family	194	39
Labour paid	245	22
Total assets	39,900	9,100
Net farm income per unpaid labour hour	16.50	10.90

Source: FADN

Total hop sales are € 7,431 per ha, the calculated inputs amount to € 4,673 per ha and the net farm result is € 2,757 per ha. The main input is paid labour (€ 776/ha), followed by crop protection (€ 682/ha), depreciation (€ 641/ha), motor and heating fuels (€ 377/ha and € 504/ha). Including subsidies the net farm income is € 3,192/ha. This is 7.5 times greater than the average net farm income per ha on non-hop growing farms. On the other hand: hop growing has a higher labour demand. For hops, 440 hours of labour is used, of which 194 hours is provided by the farmer and his family. The average income for hop growing is € 16.50 per hour of family labour; this is considerably

more than the average net farm income per hour on other farms, where only € 10.90 per hour is earned.

Hop growing is a capital intensive activity: the total assets per ha are much higher compared to other farms. On average almost € 40,000 per ha is invested in the hop garden, the equipment and the farm buildings. On other farms capital investment amounts to around € 9,000 per ha.

The analysis of the cost structure of German hop farms can be summarised as follows.

Most hop farms also produce other agricultural products. Around 40% of hop farms are specialized, receiving more than 75% of total returns from the hop enterprise. These 40% of farms supply between 75% and 80% of total German hop production.

Hops are a very capital and labour intensive activity. In Germany the average total capital investment for hop growing is € 40,000 per ha and some 440 labour hours are required. The revenues per ha are high: in Germany on average about € 6,800 per ha. In specialized hop farms revenue is even higher at € 7,400/ha, whereas the total inputs for hops on these farms amounts to € 4,700. These figures are net of subsidies.

The total net farm income on highly specialized hop farms (excluding other activities) was estimated at € 3,192 per ha in 2006, or € 16.50 per hour of family labour (including subsidies). Net farm income on German non-hop farms was €430 per ha (including subsidies); this is equivalent to € 10.90 per hour of family labour.

The average income in 2006 for all German hop farms was € 34,000, including all subsidies. The conclusion is that, in general, there is no need to switch to other crops for income reasons.

4.2.1.4.2 Results for Czech Republic

Table 37 shows the financial results for Czech hop farms from 2004 to 2006. For most farms, hop growing is only a small part of the agricultural activities of the farms. The average area of hops in the FADN sample increased from 28.1 ha to 50.9 ha. According to the Eurostat database, the average area of hops per farm is around 40 ha. The specialisation rate (hops sales / total sales) is around 20%. A full comparison of the data between years is complicated by the fact that the sample is not stable, but grows every year.

The average net farm income on the hop farms over the three years observed was € 62,000. Unlike in Germany it was not possible to express the income per unpaid labour hour. The reason for this is that on many Czech hop farms all hours are paid.

Table 37 – Results in €/ha and net farm income of hops farms (2004-2006, Czech Republic)

	2004	2005	2006
Sample farms			28
Hops area	28.1	42.6	50.9
Total area	892.7	1,129.1	1079.8
Specialisation rate (%)	16%	21%	25%
Family labour (hours)	2,230	2,417	2,237
Hops returns per ha hops	4,200	5,300	4,800
Hops-returns	133	201	226
Other returns	964	974	904
Total output	1,097	1,175	1,129
Seeds	53	58	60
Crop protection	79	90	93
Fertilizer	60	82	85
Other crop spec. Costs	10	11	14
Heating fuels	9	11	12
Gross margin	887	922	864
Electricity	18	20	23
Motor fuels	60	79	98
Water	2	2	5
Depreciations	71	101	103
Upkeep	57	74	63
Paid labour	250	288	292
Rents and interest	50	70	63
Other costs	437	383	393
Total inputs	1,156	1,270	1,305
Total output-total inputs	-58	-95	-176
Subsidies/taxes	123	161	225
Net farm income	65	65	50
Net farm income at farm level	57,800	73,900	53,700

Source: FADN

Due to FADN data limitations, it is not possible to sub-divide the 28 Czech farms in two groups.

The findings regarding the financial structure of Czech hops farms are:

The average area grown with hops on a Czech holding is higher than in Germany. The average Czech hop farmer grows about 40 ha. Nevertheless, in the Czech Republic hop farms tend to be less specialized than in Germany. Hop growing is a very capital and labour intensive activity. A rough estimation for Czech Republic (based on FADN data) results in a total assets of € 10,000 per ha hops and about 350-500 labour hours per ha.

The revenues per ha are high at around € 5,000, but are much lower than in Germany. On the other hand, inputs are also lower accounting for between € 3,000 and € 3,500 per ha. The main factor in lower costs in the Czech Republic is lower depreciation and other general farm costs. This is probably partly the result of much larger farm size, resulting in a much more efficient use of the general farm equipment. The average farm income in 2006 on Czech hop farms was € 54,000, including all subsidies.

4.2.2 Judgment criterion 2: Extent to which effects on production vary from countries adopting fully decoupled support to countries adopting partial coupling

As mentioned in section 4, some Member States opted for a full decoupling of the CAP support, while others maintained the maximum allowed coupling of the support for hops of 25%. The four Member States with partial decoupling (Austria, France, Germany and Slovenia) have all succeeded in maintaining a more or less stable area of hops. In 2008 the area sown to hops was 20,113 ha. This represents a decline of only 3% compared to the last year before the CAP reform (2004). They even managed to extend their area since 2006.

The German hop area remained stable during this period. According to our case study, this is mainly due to the significant role played by the producer groups, the farm size, the favourable climate, the technological development (supported by projects started by the producer groups and partly financed by the partial decoupling), the high concentration in one region and the farm specialisation.

On the contrary, and on average, the EU-15 Member States with full decoupling showed a sharp decline in the area sown to hops; the total hop area in these Member States declined by 22%. Over the same period in the New Member States the hop area shrank by 16%. It is, however, not likely that the extent of decoupling (which was limited for Czech Republic, Poland and Slovakia) would be the only explanation for these developments. Regarding the factors mentioned below we can conclude that decoupling only played a minor role.

The declining trend was underway before the implementation of CAP reform. This can be clearly seen in the last two columns of Table 34: for almost every country the decrease in acreage in the period 2004-2008 is lower than the decrease over the period 2001-2008, thus confirming a downward trend and thus confirming that the decrease cannot be attributed to policy reform.

Table 34 - Development of the hops area in 2001-2008 (in ha) by extent of decoupling

	2001	2002	2003	2004	2005	2006	2007	2008	2008 in % 2004	2008 in % 2001
AUT	220	215	209	207	196	197	200	210	101%	95%
FRA	816	816	816	732	801	757	771	773	106%	95%
GER	19,021	18,354	17,563	17,477	17,167	16,692	16,744	17,510	100%	92%
SLO	1,807	1,856	1,652	1,665	1,511	1,460	1,456	1,620	97%	90%
Partially decoupled	21,864	21,241	20,240	20,798	19,675	19,106	19,171	20,113	97%	92%
CZE	6,075	5,968	5,942	6,116	5,672	5,305	5,193	5,125	84%	84%
POL	2,250	2,197	2,172	2,239	2,291	2,234	2,179	2,141	96%	95%
SLK	350	350	350	350	350	350	300	215	61%	61%
NMS 2004	8,675	8,515	8,464	8,705	8,313	7,889	7,672	7,481	84%	86%
BEL	250	250	209	194	191	181	176	186	96%	74%
POR	38	37	37	37	37	37	37	37	100%	97%
SPA	730	730	730	680	680	600	492	492	72%	67%
UK	1,997	1,982	1,499	1,376	1,187	1,056	1,060	1,100	80%	55%
Fully decoupled	1,018	1,017	976	911	908	818	705	715	78%	70%

Source: IHGC

The analysis on the effects of full or partial decoupling can be summarised as follows:

To answer the question on whether the degree of decoupling influenced production we analysed the development of the production area in three groups of Member States since the introduction of the CAP reforms. EU-15 Member States who chose partial decoupling are Germany, France, Austria and Slovenia. EU-12 Member States in 2004 are Czech Republic, Poland and Slovakia. The third group contains Member States who have chosen full decoupling: Belgium, Portugal, Spain and the United Kingdom.

The area grown with hops has declined both in Member States who have chosen partial decoupling and in Member States with full decoupling, but on average the Member States with full decoupling showed since 2003 a sharper decrease in area. However, it is not considered likely that there is a direct link between the extent of decoupling in a Member State and the trend in hop area. In the previous paragraphs we saw that the relatively low level of support does not have any influence on production decisions. Other external conditions, such as market demand, price and local production circumstances, played a significant role in the decline of hop area.

4.2.3 Judgment criterion 3: Extent to which producer groups contribute to stabilise markets

The role played by producer groups is different³² among the Member States and the extent to which they manage to stabilise the market and to contribute to the stability of income for their members varies considerably according to the country. Producer groups have very different budgets; some of them have no fixed staff (partly contracted). In general, producer groups' power is related to their

³² In the EU, there are different types of hops producers' groups' organisations. Most of them are officially recognized as "producer group" as defined in the Council Regulation (EEC) n° 1696/71 on the CMO of the market in hops but some are not, such as in the Czech Republic. existing producers' groups in EU hop sector have objectives to support hops growers towards enlarging their economic sector competitiveness. According to their members' organisation their tasks include similar activities, such as hops products promotion, technical advisory service in a hops production and hops processing, quality management within the hops certification procedure, EU subsidies transfer assistance, farm management with costs analysis, information to global market situation (International hops growers' convention - IHGC),...

However, since there is a significant difference between EU national hops industries according to their size – there is also a difference in the amount and quality of the activities of the various producers' groups.

The German producer group could be seen as an exception compared to the other Member States. The producer group is well structured, accompanied by several other hops growers (national, regional and local) organisations in the areas of R&D, quality control, trade, promotion,... The German growers also decided to put 25% of the EU aid (the coupled part) in common and use it for joint activities according to their common plan.

Even if not recognised as a producer group, Czech growers have also a very well established organisation to support growers in all vital activities. Size of the German and Czech hop sectors allows the setting up of such well organised producer organisations (approx. 18.000 ha of hops in Germany, 5000 ha in Czech Republic).

French, Polish, Slovene, British and Spanish growers organization structures are also active in supporting their members in different business activities – giving technical and business advisory support – but their small size does not allow them to provide the same number of resources as the German ones.

Slovaks are still very much linked to their Czech neighbours and have a benefit of their (in the past) common organisations. Austrian growers are spread in three areas. They use to sell their hops to local breweries and benefit from Slovenian and German R&D - using also their hops varieties.

In Belgium there are two producers groups in the national hop sector but growers are not connected to other European organisation for R&D activities and hops selling.

We should also note that, after 2004, there is no need any more for growers to be member of a producers' group to obtain the EU subsidies.

size and number of members. Also, having access to the 25% of coupled payments, as in Germany, gives producer groups' certainty about future income, so that they can engage in long-term commitments such as fostering R&D. The producer groups make life easier for small farmers as they provide administrative assistance and concentrate supply by the stipulation of forward contracts for quantities of hop that cannot be provided by a grower alone. In Germany, the role played by the producer groups is certainly more important than in other countries, but it should be considered as an exception. It is mainly due to the financial endowment from the producers rather than the kind of CAP scheme they use.

A decisive advantage is that producer groups are able to organise **forward contracts** on behalf of their members; this represents their most significant contribution to the financial stability of their members and the market as a whole. Having a forward contract with a merchant guarantees a source of income for growers. The contracts usually contain agreements about the quantity of hops to be delivered, price, quality and delivery schedules. For hop farmers the contract system provides them with an income guarantee. In this way producers are more independent of the unpredictable movements of the spot market and this provides the farmer with more income certainty.

The varieties of hops grown are *de facto* influenced by the brewers' demand. When Anhauser-Busch was taken over by InBev, several forward contracts for the provision of aroma hops were cancelled (with compensation). Alsace, France was one of the regions affected the most by this change of purchasing policy. As a result, in 2009 many French aroma hop gardens were grubbed up and the total area reduced by 40%. Growers preferred to grub-up their hops because there was no other demand for aroma varieties.

Structural over-capacity is a primary feature of the global hop market. In this framework, more efficient producers can offer better prices and they tend to have easier access to forward contracts. This over-capacity, coupled with variable producer efficiency results in instability. In the last IHGC meeting of April 2009 the merchants warned the growers that: *"after the under-supply crisis of the last years, the hops industry is now facing an over-supply situation again after a very short time. Should hops area remain unchanged at approximately 58,500 hectares, a normal crop 2009 would produce another approximately 10,500 mt of alpha acid. A stagnating beer output would cause an additional oversupply of 2,500 mt in alpha acid in the market"*.³³

In this context, forward contracts have great importance. In the table below we provide an indication of the production covered by forward contracts from 2008 to 2011. Data for China are estimates and at this point, Chinese data should be considered very approximate. According to the Barth report: *"The figures presented show the willingness of the brewing industry on the one hand and the producers on the other to conclude forward contracts. The volume of forward buying in the main hop growing countries for the coming four years is at a historically high level considering the time period"*³⁴.

³³ Market Report, April 2009 presented to the IHGC economic committee.

³⁴ The Barth Report, Hops 2007-2008, Barth-Haas Group, p. 9.

Table 35 – Production sold through forward contracts³⁵.

	2008	2009	2010*	2011*
Germany	95%	95%	90%	80%
U.S.A.	100%	100%	95%	80%
China	75%	75%	75%	75%
Czech Republic	100%	95%	90%	50%
England	80%	80%	70%	50%

Source: Barth Report, * provisional data.

The rationale for producers' group success is, in our judgment, not linked to the existence of a partially coupled scheme, but to the critical mass that larger producer groups can mobilise. Their large membership provides better economies of scale. If partial coupling were to be suddenly scrapped in Germany, several German producers would probably "tax" themselves to endow the producer groups to obtain the same kind of autonomy they currently have, or producer groups would simply be not able to provide the same level of service to their members, which could negatively affect the growing of hops in Germany. There are two main reasons for this:

- The benefits from belonging to a large and powerful producer group are easy to understand for members: we refer primarily to the minimum price granted by hops pooling and by the stability of income due to forward contracts. These benefits influence farmers in the short to medium term and are consequently well perceived.
- The relative cost of membership compared to the services provided by the producer groups is not high. As an indicator of this, we can point out the fact that producers continue to join the producers groups voluntarily even though it is no longer a prerequisite for receiving subsidies.

Findings for the evaluation question are:

- Between the Member States we see a variable contribution of the producer groups to stabilise the market³⁶. The level of organisation of the producers groups, as well as their capability to provide their members with substantial assistance varies throughout the countries;
- The fact that producer groups or similar bodies are able to sell hops and to stipulate forward contracts on behalf of their member represents their greatest contribution to market stability and to income stability for farmers. Other mainstream services offered by the producer groups include:
 - the long-term contracts provide the growers with a certain guarantee in terms of price and sales (buy-backs and hops-pooling);

³⁵ The contract figures were calculated on the basis of the acreage expected to be farmed in 2008 and a long-term average yield.

³⁶ This finding is also based on the analysis performed under theme 3, where figures on price volatility are provided

- Contribution to modernization of hops gardens (loan facilitation) and to the introduction of new varieties;
- Contribution to R&D to control diseases.

4.2.4 Conclusions to the question: To what extent have the CAP measures supporting hops affected the production decisions of farmers in traditional areas?

Production in the hop sector is driven by profitability. We consider two levels of profitability in our analysis: profitability at crop level and profitability at farm level. At crop level we found hardly any suitable alternative crops which could provide the farmer with a higher income. The considered alternatives imply: 1) lower margins per ha or/and 2) higher capital investments, 3) crop specific knowledge and 4) different soil characteristics. Profitability at farm level should be sufficient to provide the farmer and his family with a reasonable income to secure the economic viability of the farm.

Profitability in general depends on returns and costs. The costs of hop growing can hardly be influenced in the short-term. The majority of the costs are fixed and are incurred when the hop garden is first established. In establishing a hop garden, producers are committed to growing hops in the long-term. On the return side producers cannot significantly influence yield or quality, since these are mainly determined by the weather conditions and the variety grown which is fixed with the planting. As a result, profitability mainly depends on price, which is determined by supply and demand. If there is a surplus, prices fall and growers/producer organisations have to cut prices to sell hops. The relative share of EU support in total hop returns is low and hop production was already strongly market driven before the CAP reform. The European hop sector is extremely market focused, even given the family-based production structure that still prevails in several Member States. Alpha acid is totally dependent on world price and is treated as a commodity by most end users. The market for aroma is slightly different and production can be influenced by specific brewery requirements.

In summary, there is no evidence that CAP measures introduced after the reform had a significant influence on the production decisions of farmers in the traditional hop production areas in the short period between 2004 and 2008. In the long-run, however, there could be some influence on traditional areas. In theory, a relatively lower margin compared to other alternatives causes farmers to switch to that alternative production. Theoretically the relative profitability of hops declines as a result of decoupling, in particular in comparison with field horticulture. However such a switch would be hindered by the following reasons, as noted above:

- EU-support is only a contributor to the gross margin of hops. This implies a relatively small impact on the profitability of hop growing;
- Generally, the gross margin of arable crops is (much) smaller than the gross margin of hops. A switch to a low margin crop is not likely, because in that case the farm could not generate similar added value;
- Moreover, most arable crops (such as cereals, sugar beets and starch potatoes) were also supported before the CAP reform. Their support is (fully or partially) decoupled too. As a result, the relative gross margins have not been substantially altered;

- The gross margins of some horticultural crops are comparable, or even higher, than that of hops. Generally horticulture crops are not supported by the EU, so decoupling the support for hops will reduce the profitability of hops compared to those crops. However, there are other barriers to substitution: horticulture requires large investments in farm equipment and a high level of crop specific knowledge which is not available on most hop farms. Moreover, accessing the market for horticultural products is difficult;
- The high capital investment in hop gardens and in hop-specific equipment will prevent a switch because the untimely grubbing up of hop gardens will imply a large capital write-off;
- There is no real rationale to switch crops. The financial results of hop farms are relatively good. The average farm income on hop farms is significantly higher than on farms with a comparable farm structure. The remuneration for the input of the three primary production factors (land, labour and capital) on most hop farms is favourable compared to other farms. This is the case for Germany, as well as for the Czech Republic;
- The net farm income for hop growing in Germany reached €16.50 per unpaid labour hour in 2006. The average net farm income on all German farms was €10.90 per unpaid labour hour. For comparison: the total EU support for hops (before the CAP reform) was €384 per ha, amounting to about €2.00 per hour of family labour.

In some Member States, the hop area is declining. In particular in the UK this development could be accelerated by the decoupling measure because in there the gross margin of hop production compared to alternatives such as potato (for fresh ware) growing is relatively small. Generally, the volume of hop production would not be influenced by policy measures, but is to a large extent influenced by the market.

In Member States with full decoupling a sharper decrease in the hop area has occurred compared to Member States with partial decoupling. We do not have any evidence of a causal link between this development and the extent of decoupling.

The existence of producer groups is mainly justified by the fact that they are able to contribute to market stability by concentrating supply and concluding forward contracts on behalf of their members. Moreover they provide administrative assistance and a wide range of services. German producers groups seem particularly active in stabilising revenue for their members due to their large size. In the next evaluation question, we analyse the role of the producer groups in the support of producer income.

4.3 Evaluation question 1.2.: To what extent have the CAP measures supporting hops contributed to support the income of hops producers?

The second question concerns income support which is one of the main objectives of the CAP. In this section we assess to what extent the income of farmers depends on CAP income support. In 2003 (before the reform) production aid accounted for around 8% of farmers' average gross returns³⁷. Although small, this support may nevertheless play a role in hop production decisions. We analyse whether the CAP measures applicable to hops have managed to guarantee adequate income support.

In order to answer this evaluation question we base our judgment on the following criteria:

- Extent to which CAP measures manage to support farmers' income;
- Extent to which fully decoupling or partial decoupling influences farmers' income.

4.3.1 Judgment criterion 1: Extent to which the CAP measures manage to support farmers' income

In order to test the relative importance that the CAP measures have on the income of hops farmers, we run a simulation using the FES tool on the FADN database. Once again the simulation is possible only for Germany and the Czech Republic. The sample of hop farms in Spain and the UK is too small for analysis.

4.3.1.1 Profitability of hop production in different scenarios: a FES Simulation

The FES tool, fed by the FADN data can provide some useful insights on profitability, without having to use proxy variables such as area. Because of database limitations, this exercise can be carried out only for Germany and the Czech Republic. In the FES tool, pillar I premiums are implemented at farm level in accordance to the measures as they are chosen by the Member State. It is assumed that the farm structure does not change over time, i.e. farm area, crops grown, etc. remains the same as in the base year. Only the direct support is allocated to the farm. This implies that any support provided to the producer groups (as in Germany, for example) is not taken into account. The analysis will therefore take into account only the income support that is directly conveyed to the farm, without considering the indirect benefits that farmers get from being a member of producer groups. These advantages have been described under the previous evaluation question.

4.3.1.1.1 Germany

Three scenarios are simulated within the FES tool in order to shed some light on the effects that changes of policy have on hop grower income. The three scenarios are 'before the reform', 'no EU support' and 'after the reform'. The first scenario simulates the situation with aid coupled to production, as it was until the last reform. This scenario serves as the baseline scenario. It gives insights on the expected income situation of hop growers in 2013 according to the old system. The second scenario is one where all direct income support (pillar one premiums) is abolished. The purpose of this scenario is to analyse whether hop growers are dependent on support in order to earn a positive income. The third scenario simulates the actual German system of a transition

³⁷ EC COM (2003) 571 final

towards a flat rate. This scenario gives insight in the expected income situation of hop growers in 2013.

Scenario 1 - Before the reform

FES runs on base year 2005, while in Germany the system was reformed in 2005. The 2005 premiums for hop growers are calculated on the basis of the 2004 FADN results in order to simulate a “before the reform” scenario. Premiums received in 2004 are calculated on a per hectare basis for individual farms. The “before the reform” 2005 situation is thus calculated by multiplying the 2004 premiums per hectare by the 2005 area. These new fictitious premiums are used in the simulation. Several changes in policy which occurred until 2009 are also taken into account. From 2009 onwards the obligation to keep set aside land is abolished, this means that farmers can use former fallow land for growing crops. For FES, the assumption is made that 50% of the fallow land on a farm in 2008 will be used for wheat growing from 2009 onwards. The other 50% remains fallow land. The increase in revenue because of the transition from fallow land towards wheat is assumed to be equal to the Standard Gross Margin of wheat for the Bayern region (an important hop producing area). In this scenario the average income of hops growers in 2013 will be €35,100.

Scenario 2 - No EU support

In this scenario, all pillar one premiums are set to zero, regardless if they are related to hop growing or not and whether they are coupled or decoupled. Without the pillar one premiums the hop growers in Germany have an income of a little less than €13,000 in 2013. This implies a severe decline in comparison with scenario 1. The resulting average income is so low that farmers whose income is below or equal to the average will make structural adjustments to their farm to stay in business in order to be able to survive. Some 25% of the hop area is grown on farms with an income below average. Whether the adjustments have an effect on the hop area depends on the profitability of hop growing in comparison with other crops. This, however, is not very likely.

Scenario 3 - After the reform

Scenario 3 gives information on the income situation of hops growing farms in the new implementation model chosen by Germany. In this scenario all support, partially coupled as well as decoupled, is included in the farm results, except the support paid to the producer groups. The premiums per hectare may differ by federal state (Bundesland). In this situation the calculated 2013 farm income amounts to €35,500 on average. The average income is almost equal to the average income in scenario 1. Despite this, at the farm level there are farms which are confronted with a large decline in pillar 1 revenues and others with an increase compared to the 2013 before reform situation. Five percent of the farms will suffer a decline of at least 20% of pillar one premiums. One quarter of all hop growers will experience an increase of 20% or more on pillar one premiums. The reason for the difference is the diversity in cropping plans. Farms with a high area of non subsidized crops in the base scenario will be better off in a situation with a flat rate. The average premium per hectare in the base situation is lower than the flat rate premium. On the other hand, there are farms with a high area of subsidized crops in the base situation. These farms will lose some revenues because the flat rate is lower than the average premium per hectare in the old situation. This variety at the individual farm level also occurs with respect to income. Twenty percent of the hop growers are faced with an income decline of 20% or more. The group with an increase in income is very small.

Table 36 – Total net farm income (in €) on German hops growing farms in 2013 in three scenarios

Scenario	Income
Before reform	35,100
No EU support	13,000
After the reform	35,500

Source: FES

Summary of the contribution of CAP support in different scenarios in Germany:

The different scenarios show that a significant part of income for the German hops growers consists of premiums. In the situation without support, the average income declines from €35,000 to €13,000. Some 25% of the hop area belongs to farms with an income below this average. These farms have to make adjustments in the farm structure in order to stay in business. The calculated income change is not only caused by the abolishment of hop premium but other premiums as well. The result of the simulation gives information on the change in profitability for hop growers.

The average income before the reform and after the reform was almost equal for the German hop growers. Thus, on average, income hardly changes between scenario 1 and 3, but on an individual level there are changes due to the German implementation model. Twenty percent of the hop growing farms are faced with an income loss of 20% or more. The support provided for the producer groups is not included in this forecast. The majority of hop growing farms do not face large income losses because of the new implementation model in Germany.

4.3.1.1.2 Czech Republic

For the Czech Republic two scenarios are run. The before reform scenario is not provided because FADN data do not exist before 2004 for this country. Scenario 2 provides insight in terms of the expected income situation of hops growers without any income support (so without CNDP as well). Scenario 3 simulates the actual situation until 2013. The number of farms suited for simulation is limited for the Czech Republic, so the results of the simulations give only an approximate insight on the expected effects of the policy reform.

Scenario 2 – No EU support

If support, for hops as well as other crops, is totally abolished the average income falls drastically in comparison with the situation with support and is well below zero. This effect is found without taking into account a possible increase in hop market prices in this scenario due to possible lower supply. Despite this, some fifty percent of hop growers are able to realise a positive income. This means that in the long-run, half of the hop growing farms will face viability issues in a situation without support, given the assumption in FES that the farm structure remains the same. In order to stay in business these farms would have to make adjustments, for instance by changing the area of crops grown. Clearly this might lead to changes in the area of hops grown. With the FES tool it is not possible to estimate the extent to which changes might occur.

Scenario 3 – After the reform

The Czech Republic applies a system with SAPS (Single Area Payment Scheme) which will be transferred to a SPS (Single Payment Scheme). Towards 2013, premiums per hectare will gradually increase. The CNDP's will be decoupled after 2010. This situation is simulated by the FES tool. In 2013 the average income calculated for hop growing farms amounts to €250,000. The Czech holdings producing hops are relatively large in comparison with the EU average. Since payments are based on the number of entitlements, absolute total premiums received are high for Czech hop farms.

Table 37 – Total net farm income on Czech hops growing farms in 2013 in two scenarios

Scenario	Income
No EU support	-280,000
After the reform	250,000

Source: FES

Summary regarding the contribution of CAP support in different scenarios in Czech Republic:

Due to the size of Czech hop farms the absolute support is very high. On average, the Czech farms cultivate about 1,000 ha, of which about 40 ha are hops. The total support (EU support incl. CNDPs) adds up to over € 500,000. Roughly half of the Czech hop growers are dependent on EU premiums to earn a positive income. The hop farmers in the Czech Republic are highly dependent on EU support (incl. CNDP's).

In a situation with support the average income is enough to continue farming and to keep on producing hops. Large income changes might lead to changes in production structure, which is not the case in this scenario.

4.3.1.2 Support to the income of producers: illustration with case studies

In the four countries that composed our case study sample we have raised specific questions to producers about the support provided by the CAP to their incomes. We present below the results for each country.

4.3.1.2.1 Germany

Gross revenue per hectare in Germany is about € 7,000³⁸. This makes the hops related CAP subsidy of about € 400 per ha in 2004³⁹ a minor source of farmers' income. The income support granted to farmers by the CAP measures is seen by most of the interviewees as a secondary factor in the economic viability of hop farms, less relevant than satisfying the demand needs of brewers.

Indirectly, the interviewees consider that the following technological developments have had more influence over their incomes than the SPS:

- (i) beer production (automatic dosage, additives and hops portion, the time of malt brewing, frequent use of hops products);

³⁸ Source : FADN

³⁹ Source : FADN; due to sample reasons the mentioned support per ha can show some variation in this report.

- (ii) hops processing (hops extract, isomeric hops products);
- (iii) hops breeding;
- (iv) quality analytical methods;
- (v) ecological aspects.

The producer groups' role is also particularly important as they contribute to the technological development. They manage 25% of the partially coupled aid related to hop growers (around €2 million) through a number of focused projects (e.g. research, marketing, storage, etc.).

4.3.1.2.2 Czech Republic

Interviewees are aware that the current **farm income support scheme** (referring to the CAP, including the CNDPs) is not sufficient to ensure the economic viability of small-scale Czech hop producers and that a change in the production structure is inevitable. Small growers are the most likely to stop growing hops as their fixed costs are spread across a lower production.

Data for a typical large Czech hop farm shows four different sets of subsidies for the hop sector. These are: (1) the general SAPS (1.4% of the total returns), (2) CNDPs per ha of hops (1.3% of the total returns), (3) national subsidies in form of 50% rebate on the crop insurance premium (2.1% of the total returns), (4) pay back of 50% for replanting costs (0.6% of the total revenue)⁴⁰. Overall, subsidies for these farms amount to 5.3% of total returns, not including EAFRD funds⁴¹. CAP measures account for less than 3% of turnover. These data are also consistent with the statement that CAP measures account for about 5% of production costs (assuming that they are lower than turnover).

Interviewees consider that the CAP support (including the CNDPs) represents an **important additional source of income** for growers and a main factor in a decision to stay in a sector during downturns and difficult periods.

4.3.1.2.3 Spain

The role played by the single payment is deemed positive, but not significant. Hops are known for providing good monetary yield and the SPS (€480 per ha) amounts to around 5% of the gross income per hectare, which can be estimated at around €9,000 per ha. The impact on net farm income decreases even more once one takes into account that in the León region 60% of hop farmers are part-timers. So the CAP payment is seen as a good additional income, but does not affect major production decisions.

4.3.1.2.4 The United Kingdom

The proportion of producer income that is derived from the CAP in the UK is very small. The CAP used to provide around £247 per hectare in support. The growers in the Producer Group we interviewed have an average of 10.93 hectares and would therefore have typically received £2,700 per year. In the context of 37 zentners⁴² to the hectare and a price of £200 a zentner, i.e. a return of £7,413 per hectare, the support would have amounted to around 3% of total returns which is not decisive for producers' income.

⁴⁰ Subsidies under (3) and (4) are the heritage of the old Czech support system, and will be phased out gradually.

⁴¹ We choose not to consider EAFRD funds to make comparison possible throughout countries.

⁴² 1 zentners = +- 50 kilos

We have illustrated the support to producer income with examples from our case studies.

In the United Kingdom, Germany and Spain, interviewees do not generally consider the CAP support as decisive to maintaining their income at an acceptable level. In the Czech Republic, the average area of hops per farm is much bigger than in Germany, the United Kingdom and Spain. Czech farmers consider the CAP as an important source of revenue. The findings from the interviews are fully in line with the findings from the analysis in the former paragraphs.

4.3.2 Judgment criterion 2: Extent to which full decoupling or partial decoupling influences farmers' incomes

In this section we investigate the influence that the 2003 CAP reform and the two main aid schemes (fully decoupled aid and partially decoupled aid) have had on hop farmers' incomes.

The Face-IT tool is used to examine if the net farm income situation on hop farms changed since the CAP reform in comparison to similar farms not producing hops. Table 38 shows that, on average, in most of the examined years the profitability of the hop growing farms was better than their non-hops growing equivalents. Before the CAP reform (2000-2004) the average net farm income on the hop farms was €7,500 higher than the comparator group, there were however, exceptions in 2001 and 2002. Throughout the period considered (2000-2006) at least half the hop farms achieved a better profitability than the non-hop farms. This position did not change substantially post-reform with the income on 57% of the hops farms remaining higher than the comparator group. This calculation could not be done for the Czech Republic because of a lack of data before 2004.

Table 38 – The development of the average difference of net farm income between hops farms and their mirror groups (in euro) and of the percentage of hops farms with a better income compared to their mirror groups in Germany

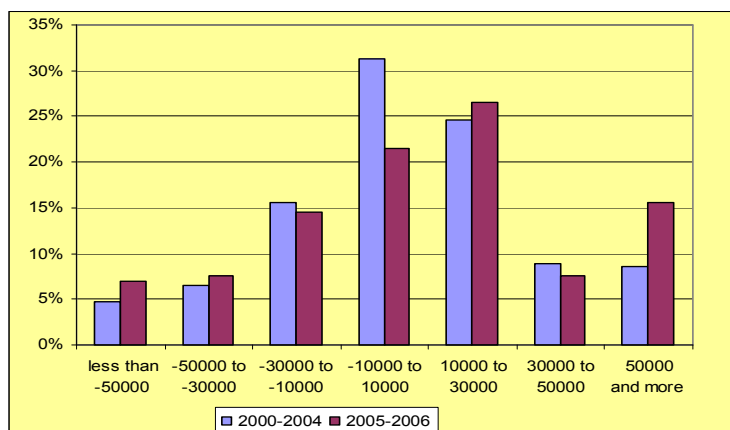
Year	Average difference of net farm income between hops farms and the mirror group	Percentage of hops farms with a better income compared to their mirror group
2000	+34,000	58%
2001	-9,000	52%
2002	-23,000	50%
2003	+10,000	51%
2004	+25,000	74%
2005	+7,000	57%
2006	+15,000	58%
2000-2004	+7,500	57%
2005-2006	+11,000	57%

Source: FADN, adaption LEI

Figure 7 shows the distribution of the income difference between hop farms and the mirror groups before and after the CAP reform. The reader has to be aware that hop growing is not the only source of income for the average German farmer. Most of them have other agricultural and/or non-agricultural activities. Two developments are illustrated in the figure. In the first place, the distribution shows a shift to the left which means that the relative income on hop farms has improved. Secondly, income variability has increased. A possible explanation for this development is

the shift from EU support for crops to a more market driven production, which might result in more price variation. This increasing variation implies an increase in the number of farms with both a relative low income and with a relative good income, i.e. there is greater income disparity in the sector.

Figure 7 – Distribution of the difference of net farm income between hops farms and their mirror groups (in euro) in Germany before and after the CAP reform



Source: FADN, adaption LEI

If this trend continues a sharp increase in the average hop area per farm might be expected because the farms with a relative low income may exit the sector while those with good profitability might expand their hop production.

The discussion above is based on Germany, a Member State which has chosen to implement partial decoupling. Moreover, Germany has decided to provide the coupled part of the premium to the producer groups for specific services to their members. There is insufficient data to assess the situation in fully decoupled Member States. We therefore answer the question by analysing the different implications of full decoupling. Simply decoupling payments should not make any difference to the total support the average farmer receives: for the average farm the total EU support is equal in both systems.

Differences could, however, occur due to the decoupling model implemented in the Member State: the historic model, the flat rate model or a mixed model. In a **historic model** the single payment is based on payments made in the past. Most 'old' Member States opted initially for this model to prevent undesirable large differences in support as a result of CAP reform. In a full decoupling situation the total payment remains the same, independent of developments in the hop area of the farm (unless the farmer sells or buys single payment rights). In a (partially) coupled situation, however, the payment will depend on the hop area. In this situation hop growing is (slightly) stimulated and decreasing the hop area is discouraged.

In a **flat rate model** the single payment is linked to the total farm area. This model has been implemented mostly in the new Member States. In the case of fully decoupled support the single

payment is independent of the hop area on that farm. (Partially) coupled support in a flat rate situation means that a surplus will be paid for every hectare of hops on top of the general flat rate.

In a **mixed model** (as implemented in Germany or in the UK) both models are combined. This usually implies a smooth transition from the historic model to a flat rate model. In this model partial decoupling works out the same as for the other two models.

For hop farms whose size is not changing, (partial) decoupling works out equally for the three models in terms of farmer income. However, for farms which enlarge their hop area the impact of decoupling works out differently. In all three models a larger farm would be better off in a Member State with (partially) coupled support rather than in a Member State with fully decoupled support. Enlarging a farm with 5 ha of hops and coupled support of €120 per ha results in a (minor) supplementary income for the farmer of €600.

The reasoning above is not dependent on the support provided to the producer groups which is unrelated to the support model. Support for the producer groups allows them to finance research, special projects and advisory systems. In this way the support allocated to the producer groups is (indirectly) profitable for all hop farmers, more or less in proportion to their hop production.

Summary on the extent to which decoupling influences farmer income:

According to the simulations, the average hop grower in Germany had, in the period 2000 to 2006, a higher income compared to other farmers with similar farm and location characteristics. In the first two years after the CAP reform this difference remained. However, variation in income differences tends to increase, which might imply pressure for consolidation and an increase in production scale. In general, decoupling of the support for hops did not have a negative influence on farmer income.

(Partial) coupling of the support in a flat rate or a mixed system provides a supplementary payment where the area of hops on an individual farm is expanded, but is likely to be economically distortive and detrimental to the entitlements of other agricultural activities and farms.

4.3.3 Conclusions for evaluation question 1.2.: To what extent have the CAP measures supporting hops contributed to support the income of hops producers?

The EU support for hops is not a primary income source for European hop farms as it only constitutes around 5% of the total returns according to our simulation. This relatively small support has no significant influence on the decision to continue growing hops or to exit the sector as the relative profitability of hops is still high without the support. However, the support is of importance for farmer income, regardless of whether this support is coupled or not. The total support on the average German hop farm at the end of the evaluation period (2013) amounts to €22,000. For the Czech Republic in 2013, the support and subsidies (including the CNDPs) amounts to around €530,000 per average hop farm. This large amount is due to the scale of Czech hop production where the average farm size is around 1,000 ha, of which 38 ha of hops. The farmers' income in 2013 is estimated at €250,000 on average. So, support for hops makes up for about 15% of the total income.

Overall, the support for hops is a welcome addition to farmer income, but it is not a decisive factor in the continuation or otherwise of most farms.

In principle, for the farmers' income, it does not make a significant difference whether the EU support is coupled or decoupled from production. What does matter is the total support at farm level. The way the CAP reform is implemented can influence the support. Germany has chosen a mixed model, working towards a flat rate. The results of the FES tool show that, for the average hop farm, decoupling does not cause any significant changes in farm income. The relatively high net farm income on hop farms before the reform remains high. For individual farms, on the other hand, the reform causes some (minor) changes in their income position depending on the farm structure, as a result of the implementation model. Due to the transition towards flat rate payments, farms will be faced with declining income.

5 Theme 2 – Effects on production structure

5.1 Evaluation question 2.1.: to what extent have the CAP measures supporting hops induced structural changes of producing farms and changes in the geographical distribution of hops production?

Theme 2 explores the effects on production structures in the EU as a result of the new CAP measures⁴³. The question asks to what extent the CAP measures supporting hops have induced structural changes on producing farms and changes in the geographical distribution of hop production. The number of holdings producing hops is in decline as well as total acreage: it remains to be seen whether in the EU this is due to a structural downward pressure on relative agricultural incomes, or to the CAP reform, or to other factors such as the development of market demand, development of new varieties, etc.. The decline in the number of hops growers in Europe is compensated by the increase in the average area of hops per farm. Larger farms are less exposed to income volatility and can spread their fixed cost across higher production. Furthermore, larger holdings tend to be more capital intensive and to have easier access to borrowed capital. In theme 1 we also showed that larger hop holdings tend to have higher profitability. In this section we will analyse data before and after the CAP reform on the average size of hop areas in European farms, the trend over time and the number of growers in Europe. The issue of specialisation of hops' farms is also discussed below, as is the size of traditional geographic areas. The effects of production structure on employment will be dealt with under theme 4. Finally, when observing the changes in the production structure, one has to take into account the nature of hop production; it takes three years before new plantings come into production. So, some of the effects of the CAP reform may not be visible yet.

5.1.1 Judgement criterion 1: Extent to which the farming structure has changed as a result of the reform

The farm structure varies greatly across the EU Member States. The trend in farm structures apparent prior to CAP reform has continued after it: European hops holdings are becoming larger. The difference in the average size of European farms depends on historical and agronomic reasons. In the Czech Republic the present large size of farms results from the enormous communist collective farms. In Western European Member States hops is only one of the products grown by mixed farms.

⁴³ We mainly refer to the adoption of decoupled aid under SPS or a SAPS scheme, but also other measures may play a role on the production structure, such as CNDPs (coupled or decoupled).

The tables below present in more detail the information synthesised, and provide a distribution on class size for hops farms in both 2003 and 2007⁴⁴.

Table 39 – Hops farm structure by class size - 2003

2003	< 2 Ha	2<Ha<5	5<ha,10	10<Ha<20	20<Ha<30	30<Ha<50	50<Ha<100	>100 Ha	TOTAL
Belgium	0.0%	0.0%	0.0%	25.0%	25.0%	50.0%	0.0%	0.0%	100%
Czech Republic	0.0%	0.0%	0.0%	6.3%	12.5%	6.3%	12.5%	62.5%	100%
Germany	0.0%	3.3%	11.5%	31.7%	20.8%	23.0%	7.1%	2.7%	100%
Spain	31.6%	57.9%	10.5%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
France	0.0%	0.0%	16.7%	16.7%	8.3%	25.0%	25.0%	8.3%	100%
Austria	0.0%	0.0%	11.1%	33.3%	33.3%	22.2%	0.0%	0.0%	100%
Poland	8.7%	26.1%	41.7%	17.4%	2.6%	1.7%	0.9%	0.9%	100%
Slovenia	6.3%	6.3%	25.0%	25.0%	25.0%	12.5%	0.0%	0.0%	100%
United Kingdom	0.0%	0.0%	0.0%	6.3%	6.3%	12.5%	25.0%	50.0%	100%

Source: Eurostat, adaptation Deloitte

Table 40 – Hops farm structure by class size - 2007

2007	< 2 Ha	2<Ha<5	5<ha,10	10<Ha<20	20<Ha<30	30<Ha<50	50<Ha<100	>100 Ha	TOTAL
Belgium	0.0%	0.0%	0.0%	25.0%	25.0%	50.0%	0.0%	0.0%	100%
Czech Republic	0.0%	0.0%	0.0%	7.7%	0.0%	7.7%	15.4%	69.2%	100%
Germany	0.0%	3.2%	10.9%	28.2%	19.9%	23.1%	12.2%	2.6%	100%
Spain	30.8%	53.8%	15.4%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
France	0.0%	0.0%	0.0%	16.7%	8.3%	50.0%	25.0%	0.0%	100%
Austria	0.0%	0.0%	50.0%	25.0%	0.0%	25.0%	0.0%	0.0%	100%
Slovenia	0.0%	10.0%	20.0%	20.0%	30.0%	20.0%	0.0%	0.0%	100%

Source: Eurostat, adaptation Deloitte

The following table provides an overview of the main changes which occurred in the period 2003-2007⁴⁵. We divide the agricultural holdings by size class then we subtract the percentage of the holdings in that class in 2007 from the percentage of the holdings in that class in 2003.

Table 41 – Changes 2003-2007 in relative population of size classes for hops farms

	< 2 Ha	2<Ha<5	5<ha,10	10<Ha<20	20<Ha<30	30<Ha<50	50<Ha<100	>100 Ha
Belgium	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	0.0%
Czech Republic	0.0%	0.0%	0.0%	0.0%	-12.5%	1.4%	2.9%	6.7%
Germany	0.0%	-0.1%	-0.6%	-3.5%	-0.9%	0.1%	5.1%	-0.2%
Spain	-0.8%	-4.0%	4.9%	0.0%	0.0%	0.0%	0.0%	0.0%
France	0.0%	0.0%	-16.7%	0.0%	0.0%	25.0%	0.0%	-8.3%
Austria	0.0%	0.0%	38.9%	-8.3%	-33.3%	2.8%	0.0%	0.0%
Slovenia	-6.3%	3.8%	-5.0%	-5.0%	5.0%	7.5%	0.0%	0.0%

Source: Eurostat, adaptation Deloitte

⁴⁴ In this section we provide quantitative data for the countries for which these data exist and the time series are complete.

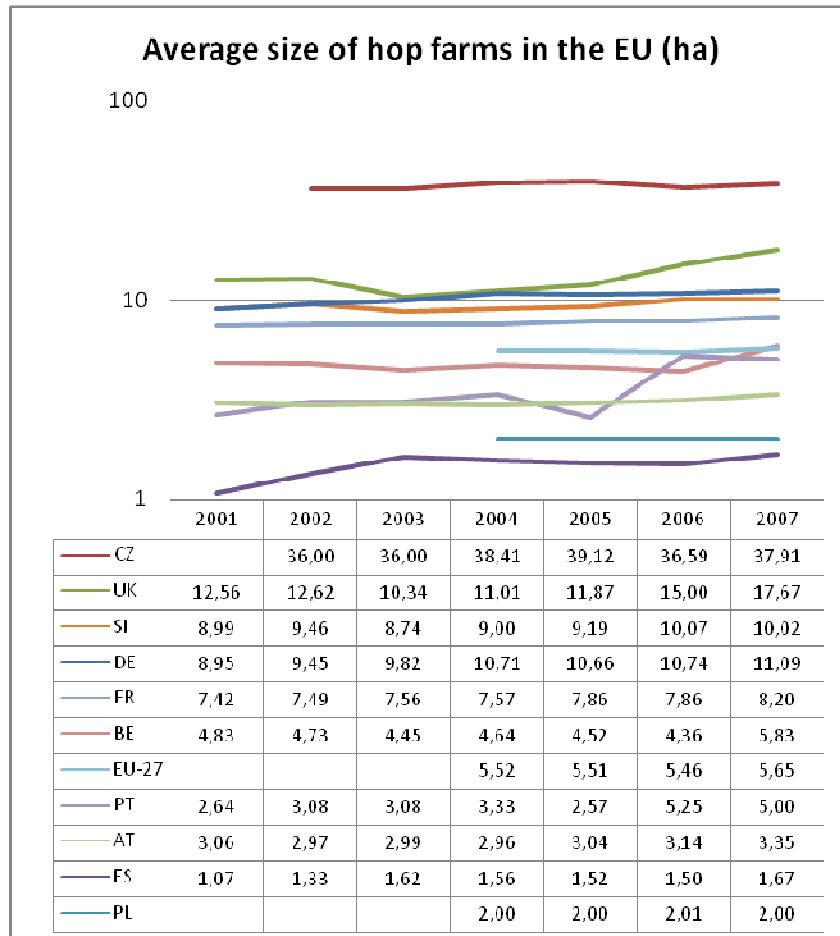
⁴⁵ Due to the lack of data, it is not possible to draw a comparison for Poland and the UK so they are not included in the table.

From the traffic-light table above it is clear that the large size classes are gaining more holdings through time. In Belgium the class composition is unchanged, while Austria seems not to be in line with the main trend. This may be due to the fact that the database for Austria in 2007 is incomplete, as it reports only 40 of the 63 farms growing hops in Austria in that year. For the remaining Member States, the trend emerges clearly in Germany, Czech Republic, Spain, Slovenia and to an extent France.

The **average farm size** increased in almost all the Member States as a result of several farmers leaving the hop sector. This is, according to interviewees, most likely the result of farmer age rather than for economic reasons. However, the economic component might be more relevant than suggested by interviewees and still not entirely visible. Some growers in the countries adopting full decoupling may remain in the hop sector until they face the next substantial investment (for instance, for renewing the hop gardens) and exit at this point, keeping the decoupled support. There are no figures available at the national level on the causes of exit from the sector, so our estimates are based on personal assumptions by interviewees. Where producers leave the sector, the hop gardens were mainly sold to other farmers who stayed in business. The following table provides an overview of the increase in the average size of European farms⁴⁶. The average EU-27 farm size did not change dramatically over the period 2004-2007 and is currently around 5.65 hectares (compared to 5.49 in 2004).

⁴⁶ Data for UK in 2006 are based on our extrapolation of the number of growers to 80.

Figure 8 – Evolution of the average size of European hops’ farms by Member State (logarithmic scale).



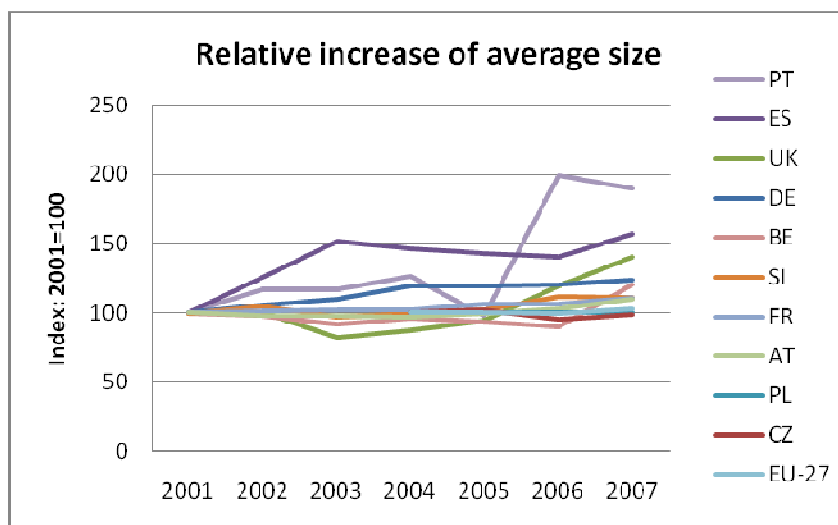
Source: IHGC and Barth report, adaption Deloitte

Figure 9 presents the trend of increase in the average farm size in relative terms. Interviewees have confirmed that the trend of increasing farm size and increasing specialisation pre-dated the reform; the stakeholders we visited link this restructuring to market pressure (mainly greater competition and to the cost structure of hop farming that can be extremely onerous) rather than to the CAP reform⁴⁷. Hop farmers are slowly becoming entrepreneurs, so that most of them try to attain a farm size which makes production more profitable. The main concern of farmers, according to data gathered in the interviews, is to be able to spread the high fixed costs generated by hop growing across a sufficient number of hectares, so that they can make profits per hectare. When this is not possible, hop growers are slowly stopping hop production, according to interviewees. Spain is a good example here. Most Spanish and Polish holdings are extremely small (1.7 ha) so that farmers do not find it economically sensible to invest significantly in machinery and in new technology. In the long-term farmers will either exit the sector or will expand their business to become specialised. The size threshold that makes a farm profitable varies across countries. In Theme 1 we have seen that in

⁴⁷ To have an idea of the difference in the United States in terms of production structure, the 12,510 ha devoted to hops in 2007 in the US were spread over 62 farms. This makes 201.7 ha per farm, 18 as big as the average German farm and more than five times the average Czech farm

Germany, a holding having 10 ha of hops starts being economically viable (once one takes subsidies into account).

Figure 9 – Evolution of the relative average size of hops farms in the EU by Member State



Source: IHGC, adaption Deloitte

The **rate of specialisation** of hop farms is generally increasing. In answering Evaluation Question 1.2 we have seen that hop farms tend to become more specialised in both Germany and the Czech Republic. This is shown in theme 1 for Germany and the Czech Republic. In Germany the specialisation rate (defined as the proportion of revenue derived from hops in the total farm revenue) for hop producing farms increased from 42% in 2003 to 59% in 2006. A similar trend can be observed in the Czech Republic where the specialisation rate increased from 16% in 2004 (the first year for which we have data) to 25% in 2006. As these data come from the FADN database they are limited to these two countries. However, a number of interviewees in other Member States have confirmed this trend. Interviewees also linked the increased level of specialisation to the high revenues available from hop enterprises of sufficient scale.

Table 42 – Number of holdings growing hops ⁴⁸

Country	2002	2003	2004	2005	2006	2007	2008	2004-08
Germany	1,943	1,710	1,698	1,611	1,554	1,510	1,497	201
Czech Republic	185	165.0	162.0	145.0	145.0	139.0	131.0	31
Poland	1191	1129	1121	1144	1113	1066	1061	60
Slovenia	189	186.0	176.0	176.0	150.0	140.0	140.0	36
UK	85	76.0	60.0	60.0	60.0	60.0	58.0	2
France	111	100.0	96.0	96.0	96.0	90.0	89.0	7
Spain	398	400.0	395.0	353.0	325.0	248.0	248.0	147
Belgium	52	49	47	45	44	42	29	18
Portugal	14	12	12	12	7	4	4	8
Austria	72.0	73.0	70.0	70.0	67.0	65.0	63.0	7
Others	n.a.	n.a.	15	10	12	4	4	11
EU-27								528

Source: Barth report

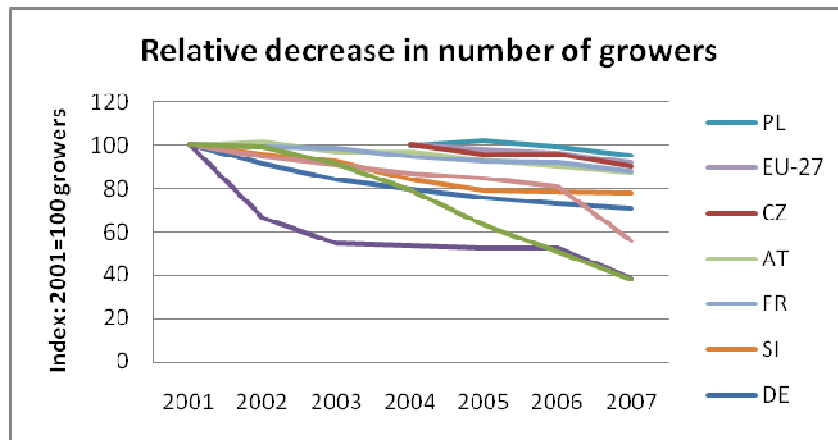
⁴⁸ Include data for Slovakia, Romania and Bulgaria WHAT INCLUDE DATA FOR ... ? THE CAT OTHERS I GUESS. PLEASE BE PRECISE ON THIS

The **number of holdings** is in **sharp decline** in all the EU countries concerned. This trend is not new and was well established before the reform. The table above provides an overview on the number of holdings growing hops, and its decrease in absolute terms.

In the period 2004-08 for which we have data for all the EU Member States, 528 farms abandoned hop production. We do not have comparable data for the period 2002-08. However, if we keep constant the number of farms abandoning hop growing in the new Member States (which is a conservative estimate), we estimate that about 1,000 farms in the EU-27 have stopped producing hops in the period 2002-08

Figure 10 shows the decrease in growers in relative terms. If the number of growers in 2001 is set equal to 100, we see dramatic changes in farm structures, with more than half of the farmers lost in Spain and the UK.

Figure 10 – Relative decrease in European growers



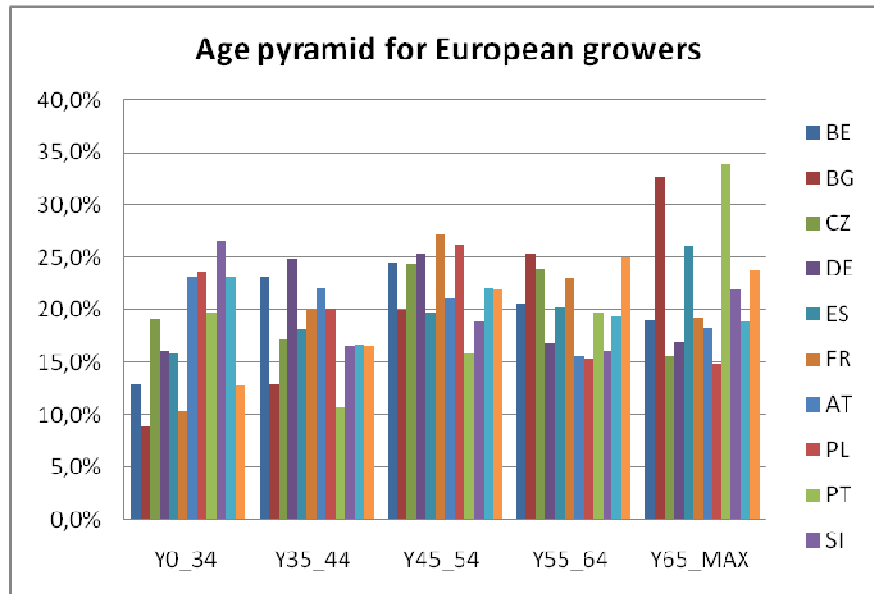
Source: IHGC, adaption Deloitte

It is worth noting that the three countries that experienced the sharpest decrease in the number of growers opted for a Single Payment System with fully decoupled aid. However, interviewees did not link the decrease to the CAP measures, but rather to market forces and an ageing grower population. Indeed the trends appear to be already set before the 2003 reform and do not vary significantly after 2004.

A quick look to the age pyramid of European agriculture workers⁴⁹ in 2005 seems to confirm that ageing is a serious problem, especially in Spain.

⁴⁹ These data are not available for hops growers, so we refer to the entire population of European growers. Therefore we assume that hops growers have the same age structure than other growers, which is in our opinion a fair assumption. For this reason we omit the EU-27 data as this would include countries not producing hops.

Figure 11 – European farmers by age class



Source: Eurostat, adaptation Deloitte

Available statistics do not take into account market entry by new growers. However, no evidence of market entry was obtained during our fieldwork. The only example that was pointed out to us was in the UK where a new farm was set up in Suffolk. The other changes in the sector seem to be due to inter-generational transfer. However, in small farms the continuation by young farmers is more problematic as the income potential is lower than alternative jobs outside the agricultural sector.

The number of permanent workers on hop farms who abandoned production is not available in the statistics; in fact, hop farmers typically also grow other crops. In Germany (but also Belgium, France and Spain) hop farms are normally family-run, and permanent workers are family members. Family members (usually several generations living together) in technologically-advanced farms can manage to do necessary permanent work on hop areas of up to 25 ha. In the new Member States the picture is different. There was no private farming in the Czech Republic (in common with the other former Soviet bloc nations) between 1945 and 1990 as all land was “state owned”. Agricultural land was subsequently privatised and previous employees (some of them are now owners) became the new farms’ permanent staff. In Poland and Slovenia, the farming land was already partially privately owned. There, hop production can be the main or additional farming activity, but is not usually the only one.

To conclude, the 2003 CAP reform did not trigger the trends observed in the increase in the average size of European hop farms that had already been ongoing since the beginning of the decade. However, the reform probably played a role in increasing the specialisation of farms. Depending on the patterns observed we can divide the Member States into four categories:

- **Countries with an increase in average size mainly due to the decreasing number of growers:**
The increase in the average size of hop enterprises in Germany, Slovenia and Belgium is mainly

due to the sharp decline in the number of growers. This effect outweighs the reduction of the acreage –that also exists – and thus results in a larger average area for hop farms.

- **Countries with a steady average size due to a reduction in area that accompanied the reduction of the number of growers:** In Czech Republic and Austria the relative decrease in acreage has been of the same magnitude as the decrease in the number of growers. The average size is therefore more or less unchanged. However, the production structure is changing and the hop sector is shrinking.
- **Countries whose production structure is more or less unchanged:** This is the case in Poland and in France. In Poland it is probably too early to see any change in production structure, but the production structure is likely to be affected in the following years as a significant part of the Polish production is currently unsold. France's production structure will change in 2009-2010 as a result of the Anheuser-Bush Inbev merger that involved the cancellation of contracts worth almost 40% of the French production. Several farmers will probably exit the sector as a result.
- **Countries that are experiencing a sharp decrease in both acreage and number of growers:** Spain and the UK have seen both their acreage and number of growers decrease by 40% or more in the period 2001-2007. If this trend is not reversed, hop growing may disappear in both countries in the long-term.

Findings for the evaluation question are:

- The production structure in the EU-27 is changing, but this is due to market-driven structural adjustment aimed at increasing competitiveness. We have gathered no evidence regarding the influence of the CAP reform;
- The average hop farm size is increasing in all the Member States. The growth in the average size is due mainly to the reduction in the number of growers, while the reduction in hop area is less pronounced;
- The smaller number of remaining farms are increasing their specialisation in hops;
- Other things being equal, small producing countries have seen a sharper decrease in area and in the number of farmers;
- In some countries, such as Spain, Belgium, and the UK the reduction in the number of growers and the area endangers the very existence of the hop sector.

5.1.2 Judgement criterion 2: Extent to which the reform has modified the geographical areas of production

The trend of acreage in traditional areas has followed more or less the national trend of acreage reduction. Interviewees have ruled out any link with the CAP reform or with the CAP as a whole. According to them, the CAP has not had a role, either in terms of stimulating new interest or in maintaining planting in traditional areas. Instead they are clear that the reduction in acreage is a response to market conditions as already explained in Theme 1.

Since the market for hops is organized at the national level (when not at the international level) the responses of production are homogeneous as well as the effects on traditional production areas. At the European level, we only have production-district data for Germany and Czech Republic. However, in several Member States there is a single production district. The following table gives an overview of the evolution of production area in Germany and the Czech Republic.

Table 43 – Acreage variation in the period 2001-2007 in traditional production areas of Germany and Czech Republic

	2001	2007	%
Hallertau	15,510	14,754	-4.9%
Tettnang	1,547	1,193	-22.9%
Elbe-Saale	1,395	1,321	-5.3%
Spalt	455	384	-15.6%
Others	116	19	-83.4%
Total Germany	19,023	17,671	-7.1%
Zatec (Saaz)	4,553	3,891	-14.5%
Ustek (Auscha)	850	713	-16.1%
Trsice (Tirschtitz)	672	1,025	52.5%
Others	13	0	-100%
Total CZ	6,088	5,389	-11.48%

Source: IHGC, adaptation Deloitte

The decrease in acreage in Germany has been spread across the main production areas. The sharp decrease in the Tettnang region is due to the fact that this region was specialized in aroma hops, which have lost market share in the last years. In the Czech Republic, the main Saaz producing region lost some area because old hop gardens were not renewed. The Trsice region (Moravia) instead saw its acreage increase sharply. It is in this area that Czech newly-bred bitter varieties were planted. The rainfall is also higher than in Bohemia and so irrigation is not necessary.

In the United Kingdom the Hereford and Worcestershire area has expanded relative to the Kent and Sussex area, partly because of the increasing use of hedgerow (dwarf) varieties. There were grants in 1997/98 (probably under Objective 5b) for growing hops in the Marches (border area between England and Wales) which resulted in an increase in plantings. This has stabilised the Hereford and Worcestershire area while the area in Kent and Sussex has declined, partly as a result of verticillium wilt damages.

As far as other Member States producing hops are concerned, the data on acreage is presented in the overview of the hop sector. Small producers have struggled to cope with the more challenging market conditions and have paid a high toll in terms of area and number of growers. This is especially the case in Spain, Belgium and the United Kingdom, as shown in the previous section. In Ireland production was terminated in 2004⁵⁰. Traditional production areas in Poperinge, Belgium lost almost half of their production and growers. Alsace, France has managed to keep production as all its hop harvest was contracted. Due to the cancellation of these contracts by the new Anheuser Inbev conglomerate, several holdings will suffer and may have to exit the sector in the coming years. The merger affected contracts worth between 25% and 40% of French production (some are currently being renegotiated). Production structure in Poland is unaffected so far, although that in Slovenia has

⁵⁰ In 2006, Ireland is excluded from the list of hops producing countries, according to the Report of the EU hop sector, DG AGRI, 2006 harvest.

been. In other countries such as Portugal, Bulgaria⁵¹ or Slovakia hop production is generated by a handful of holdings and it is inappropriate to speak about “districts”. Often, changes in production structure reflected by the statistics in those countries are the result of production decisions taken by a few growers (even 1 or 2).

Findings for the evaluation question are:

- The CAP reform did not affect the traditional production areas, which are still the same in the EU-27;
- Following the worldwide trend, hop area is decreasing in the traditional production areas of the EU-27. The main production area, the Hallertau has been stable in the last years in terms of acreage. Conversely, the Trsice area in the Czech Republic saw a large increase in area. Smaller areas are suffering more, especially in small producing countries.

5.1.3 Conclusions for the evaluation question: to what extent have the CAP measures supporting hops induced structural changes of producing farms and changes in the geographical distribution of hops production?

The European hop production structure does not seem to be affected by CAP measures related to hops as it continues to follow the same trends which were ongoing before the reform. The production structure is characterized by the following main trends:

- An estimated number of more than 1,000 growers abandoned hops in the period 2002-2008 in the EU-27, 528 growers stopped producing hops in the years 2004-2008.
- **Some growers are exiting the hop sector.** This phenomenon is affecting older farmers, whose farms are typically consolidated into larger units. Land abandonment is judged scarce, but no figure exists for hops. Farmers who stop growing hops without retiring normally sell their gardens to other hop producers, who continue to grow hops.
- As a result, the **average area of hops per farm in Europe is increasing.** This is the other notable structural change in the sector.
- The **acreage in Europe is declining** as well, following the world trend. This is due to the launch of new bitter varieties that provide a higher yield per hectare so that less acreage is needed to have the same amount of alpha acid. However, this reduction is not sufficient to prevent oversupply.
- **Traditional production areas** are mostly shrinking, but **are not changing.** Production areas in the Member States not covered by the case studies are also following similar patterns.

The CAP measures did not affect the trends mentioned above, decoupling may have a small role in encouraging crop changes, but it is certainly not the decisive factor. The time series presented show that the trends in the sector were already ongoing before 2004 and have continued at a similar pace.

⁵¹ We did not include statistics for these countries as the number of holdings is below 5.

6 Theme 3 – Effects on the downstream sector

6.1 Introduction

In this chapter we assess the effects that the 2003 CAP reform had on the downstream sector. The brewing industry is reducing its requirement for alpha acid as consumer demand is increasingly for beer that requires a lower hopping rate. However, the volume of hop production was extremely low in 2006 and 2007 due to extraordinary bad climatic conditions. Spot prices increased dramatically as a result and brewers have tried to secure a larger part of their hop supplies by forward contracts.

We review the factors that influence the demand for hops and see how they are affected by the CAP measures. It will be interesting to understand whether the level of production generated by a fully-decoupled scenario (as in the UK) is ensuring an adequate level of production, and what the effect of this is on price. This is complemented by an analysis of the situation in the case of partial decoupled aid (such as in Germany). This is also linked to the role of producer groups that can use the coupled aid (or part of it, depending on the country) for activities that entail redistribution to farmers.

We compare the impact on price that arises where producer groups are financed by coupled aid, in order to check whether organizational differences lead to different outcomes for the downstream market. The legal provisions that define the role of the producer groups are aimed to make sure that the level of production is fine-tuned to market demand. Producer groups can concentrate supply and reduce price volatility. This can be a benefit for brewers, but producer groups also have a market power that may drive prices up. We investigate the relation between sellers and buyers (mainly merchants) to understand the mechanisms that underpin price formation.

However, there are also market mechanisms that can ensure market stability and hedge price volatility as a risk. Therefore, we will take into account the role played by the spot/forward contract system in satisfying the needs of the processing industry. In order to answer the question on location of the processing industry we analyse the reasons that link the brewing industry to production areas. The main point here seems to be that market demand is declining and therefore producers, which are driven by returns from the market, have to cope with it by reducing production.

6.2 Evaluation question 3.1.: To what extent have the CAP measures supporting hops contributed to ensuring sufficient levels of production (quality and quantity) with respect to the needs of the processing industries, and to what extent has the support induced changes in the geographical distribution of the processing industries?

In order to answer this question, we collected information on the one hand on the demand and supply of hops and on the other hand, on the spot/forward system compared to the needs of the processing industry.

The brewing industry is reducing its requirement for alpha acid as consumer demand is increasing for beers requiring a lower hopping rate, as noted above.

Even though the quantity of beer production has increased with time, the changes in the hops demand from the brewers at a global level have resulted in a shift towards increased alpha acid content in Europe. This impacted hop cultivation in traditional areas that grow aroma varieties⁵². Moreover, the hopping rate (grams of alpha acid used per hl of beer) decreased with time, from 5.5 in 2001 to 4.6 in 2008. Nevertheless, the demand for hops exceeded the available supply over the last three years, assuming that the breweries have used the harvest of the previous year leading to a reduction of the stock. In general, breweries hold sufficient stocks of hops to carry out around 6 months production. Around a decade ago, stocks held were equivalent to 12 months production. The undersupply of hops in 2006-2007 impacted the stocks (and the price) and the 2008 oversupply was absorbed to rebuild stock levels.

6.2.1 Judgment criterion 1: extent to which the demand for hops is met by supply

The tables below show (using a logarithm scale) that the beer production in Europe has increased annually following a worldwide upwards trend. In parallel, the alpha acid production trend is more variable due to the changing agro-climatic conditions, but is overall stable⁵³.

Table 44 - Beer and alpha acid production (Europe)

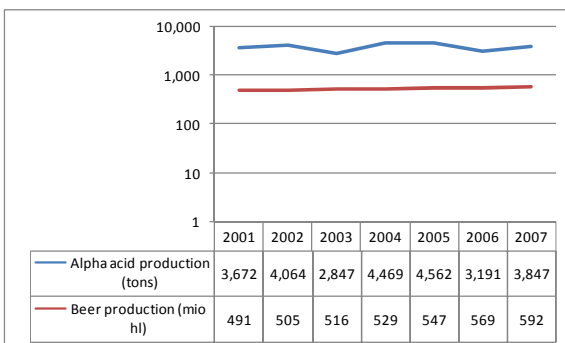
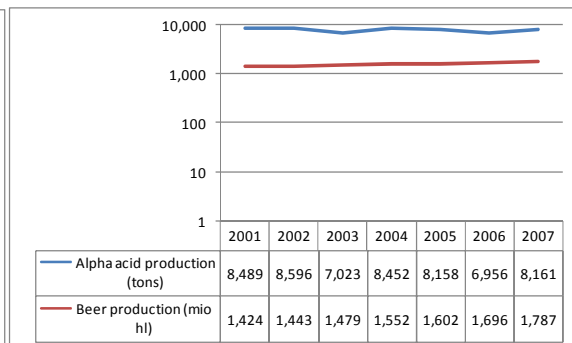


Table 45 - Beer and alpha acid production (world)



Source: Barth Reports and IHGC

⁵² Figures presented in the overview of the hop sector show a relative decrease of aroma varieties.

⁵³ Worldwide data for 2007 are affected by a fire that destroyed 5% of the US production; figures would have been higher without this accident. In 2008 the amount of alpha acid produced worldwide was already above the 2001 levels.

Hop production and **supply** are related to the beer market situation and are influenced by total hop areas under cultivation, hop varieties portfolio, research and development results (breeding program), as well as production quantities of hops and alpha acids. Indeed, the trends in alpha acid production pre-existing the CAP reform have continued and the introduction of decoupled aid does not seem to have any significant impact⁵⁴. The interviewees confirmed the figures above, by saying that decoupled aid does not have a significant influence on the downstream sector.

According to the downstream sector stakeholders, the CAP measures hardly affect them. **Hop demand** is mainly influenced by the quantity of beer production (which is driven by beer consumption), usage of hops in the process of brewing (grams of alpha acids used per hl of beer) and storage capacities of merchants and brewers. When considering demand for hops, it has to be kept in mind that hop provision represents less than 1% of the brewers' total production costs⁵⁵.

Although the decoupling measures were perceived as not having a significant impact on the brewers, interviewees from the downstream sector stressed the value of the quality requirements. The **quality certification regime** is a well established procedure and aims to control quality and the geographical origin of hops within the EU. The 2003 CAP reform has not amended this measure. Quality of production is important to brewers, who are satisfied with the current quality level ensured by the CAP. Introducing the HACCP system (Hazard Analysis Critical Control Point) into the hop industry enables very efficient quality control as far as the protection of consumer health is concerned. The HACCP is a preventive system of quality control which not only ensures the quality of the final product, but also the quality of raw material.

Findings for this evaluation question are:

- Quality certification is important for the brewers and the current regime (that has not been adapted by the reform) seems to match their requirements;
- The introduction of decoupled aid does not seem to have a significant impact on the downstream sector. Adverse climatic conditions had a much greater impact on the supply of hops and thus obviously price.

6.2.2 Judgment criterion 2: extent to which the spot/ forward system meets the needs of the processing industry

As was discussed under theme 1, forward contracts contribute to the stability of the hop market. Producer groups play a significant role by facilitating this system. The contracts usually contain agreements about the amount of hops delivered, price, quality and delivery time. For the processing industry, the contract system provides them with a supply guarantee at a fixed price, even in a period of undersupply.

⁵⁴ The time series are in fact not long enough: decoupling allows farmers with more freedom to change crops. They could therefore decide to switch, but some of them will not do it right away. They will probably wait for the moment of renewing the hops gardens. This happens every 10-15 years, so that part of the effect may not be entirely visible.

⁵⁵ This is the average figure we got from interviewees. Official cost structures are not disclosed by brewers for confidentiality reasons.

Forward contract are nevertheless not the ultimate guarantee. We have noticed cases of unilateral contract breach on the producer side when the spot price was much higher than in the contracts. In 2006-2007, the spot price was 2.5 times higher than the contract price.

On the other hand, mergers in the brewing sector can cause the cancellation of contracts, thus affecting entire hop producing regions. Hop producers consider mergers as a risk factor for their possibility of selling their production, and do not have any means to avoid losses when mergers occur⁵⁶. In this context, forward contracts have considerable importance for both growers and brewers. The attitude of brewers is that they prefer to use forward contracts to secure supply, rather than running a risk on the spot market for something that represents only 1% of their costs, but without which they cannot produce.

In 2009, forward contracts cover between 90% and 95% of the Spanish and German hop production, between 80% and 90% of Czech hops and 82% of UK hops production. In terms of supply, Spain is a special case. Spanish hop production is sold entirely through Fomento del Lupulo to national customers like San Miguel Mahou or other large players. Spanish brewers tend to purchase the bulk of their hops under forward contracts, but the national production manages to cover only 20% of their needs. Establishing a preferential channel between the Spanish brewers and producers is meant as a contribution to the viability of the hop sector in Spain.

In the other Member States, the percentage of estimated production sold under contracts is more or less the same (in Belgium between 70% and 80 %, France 100% and Austria 90%). In Poland, the situation is different with only 30%-50% of production sold under contract. One reason for this is the lack of enforceability of contracts in Poland.

Findings for this evaluation question are:

- Forward contracts are an important system for both brewers and producers because they secure the supply of hops in terms of quantity and price;
- The system sometimes falters as some producers do not respect the forward contracts when the spot price is much higher than contract price. This could create a gap in supply for brewers.

6.2.3 Judgment criterion 3: extent to which the geographical distribution of the downstream sector is affected by hops cost

According to the interviewees, the cost of hops does not affect the geographical distribution of the downstream sector. The decision on location of large brewers does not depend on the location of

⁵⁶ As an example, when Anheuser-Busch was taken over by InBev, several forward contracts for the provision of aroma were cancelled (with a cancellation clause inducing compensations). Alsace, France was one of the regions affected the most by this change of purchasing policy. As a result in 2009 the French aroma hops gardens were mostly grubbed up and the area went down by 40%. In the last IHGC meeting of April 2009 the merchants warned the growers that: *“after the undersupply crisis of the last years, the hops industry is now facing an oversupply situation again after a very short time. Should hops area remain unchanged at approximately 58,500 hectares, a normal crop 2009 would produce another approximately 10,500 metric tons of alpha acid. A stagnating beer output would cause an additional oversupply of 2,500 mt in alpha acid in the market.* (Market Report, April 2009 presented to the IHGC economic committee).

hops, whose cost is only a tiny percentage of the operational costs of the industry (around 1% as reported previously). If anything, large industrial-scale brewers choose proximity to the market. In the case of small brewers, some long-established breweries are located close to rivers that provide water that is rich in Calcium and Magnesium (this is the case in Southern Belgium for instance). These two elements add the hardness in water and they are crucial when it comes to brewing beer. This is because of the taste the beer acquires, but also hard water enables many of the biochemical processes to take place during brewing.

This being said top-quality brewers are very conservative about the varieties of hops they use to make beer. Across the EU-27 a large part of production is processed by national industries. In Spain, the entire production is used by national brewers. In the Czech Republic around 80% of Czech hops are processed in the Chmelarstvi co-operative, the remaining 20% - controlled by German merchants – are processed in the Hallertau region in Germany.

In the UK, hop growers are facing difficulties due to the switch of the main brewers to bitter rather than aroma varieties. British growers continue to grow aroma varieties for niche markets (micro breweries), but decided to grow bitter varieties for their national brewers. In the UK there is a consumer trend for less mass-produced products.

In Germany, breweries predominantly defend their conservative position in terms of the hop varieties used in their beers. Thus, they prefer not to change varieties, quality and regions of their hops used – unless they are forced to do so.

Findings for the evaluation question are:

- The geographical distribution of the downstream sector is not affected by hop costs that only account for 1% of total beer production cost.

6.2.4 Conclusions to the evaluation question:

The introduction of decoupled aid did not modify the trend in beer and alpha acid production and no significant effect (either in terms of volume or quality of production) on the needs of processing industries can be ascribed to it. The geographical distribution of the downstream sector is not affected by the hop sector at all, irrespective of the CAP reform.

In the EU-27, the demand for hops is mainly driven by breweries, the largest of which act at the global level. The CAP measures do not influence the downstream sector.

The provisions of the quality certification regime were left untouched by the 2003 reform, which therefore does not have any direct effect on quality. Quality is an important element for brewers and the current CAP provisions are deemed satisfactory. The variety of hops used in many cases is not the prior concern for brewers. The exceptions are micro-breweries that build their market position on high quality hops and malt. Hop demand is mainly influenced by the quantity of beer produced, usage of hops in the process of brewing and storage capacities of merchants and brewers.

Forward contracts contribute to ensure sufficient level of production with respect to the needs of the processing industries but, in some cases, were broken and created breach in the supply.

Finally, no tangible elements demonstrated that CAP measures induce changes in the geographical distribution of the processing industries. Large brewers continue to buy hops through merchants and are neutral to the origin of these hops as far as they comply with the EU quality requirements and their own demands. However, some micro-brewers are emerging and these are more linked to the territory and to the denomination of origin for product attribute reasons.

6.3 Evaluation question 3.2.: To what extent have the CAP measures supporting hops contributed to stabilising markets and ensuring reasonable prices for supplies to consumers?

In order to reply to this question, we mainly base our judgment on the following criteria:

1. Extent to which the producer groups have managed to concentrate supply and to reduce price volatility;
2. Extent to which the price formation mechanism ensures market stability;
3. Extent to which stocks held influence the price formation mechanism.

6.3.1 Judgment criterion 1: extent to which the producer groups have managed to concentrate supply and to reduce price volatility.

Producer groups were established, amongst other things, to increase market stability for hop growers. The producer groups achieve this through a variety of means, from hop pooling to the promotion of forward contracts. Large producer groups can stipulate bigger contracts on behalf of their members as they leverage on higher quantities of hops. However, producer groups cannot overrule the market and eliminate volatility entirely. The evidence is in fact that volatility of hop prices has increased recently due to the undersupply problems of 2006 and 2007. The following table shows the main price trend in some countries of the EU-27. In the last two columns we compare the variance in prices between 2000-2003 and 2004-2007.

Table 46 – Price in EUR for 100Kg of hops and price variance

	2000	2001	2002	2003	2004	2005	2006	2007	Coeff. Of Variation 2000-2003	Coeff. Of Variation 2004-2007
BE	441.85	338.82	318.8	298.91	298.91	298.91	298.91	298.91	0.18196	0
BG	678.94	884.33	598.54	487.43	345.84	241.27	257.18	420.29	0.25298	0.26345
CZ	368.99	390.42	410.58	347.26	412.68	454.18	417.95	538.51	0.07196	0.12751
DE	358.31	369.15	339.09	338.34	341.66	287.26	287.26	393	0.04302	0.155808
ES	299.3	322.31	281	536.28	536.28	303.92	310	336	0.33057	0.29794
AT	473.39	455.15	441.67	457.38	412.47	442	441	487	0.02846	0.06911
PL	296.14	297.03	268.91	268.92	256.22	228.16	280.34	264.98	0.05651	0.0286
PT	199.52	299.28	320	300	250	300	300	400	0.19417	0.20133
SI	315.03	321.16	320.06	281.28	290.27	328.63	388.63	n.a.	0.06117	0.14761
SK	282.1	303.83	304.16	312.42	346.83	357	325.7	377.29	0.04316	0.06104
UK	633.49	567.96	450.36	448.56	394.75	472.07	469.69	467.9	0.17395	0.08337

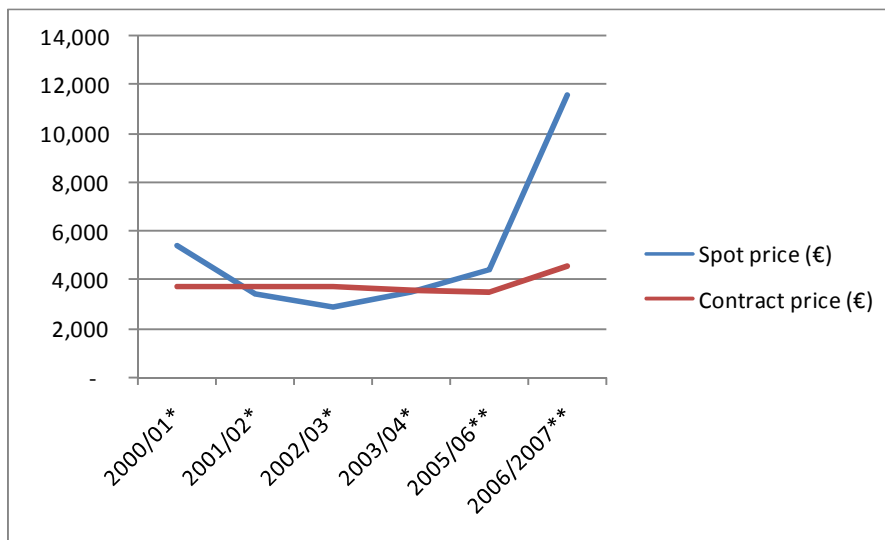
Source: Eurostat, adaptation Deloitte, n.a. Not available.

Two trends can be highlighted:

- The coefficient of variation⁵⁷ is higher in the period 2004-2007 because of the 2006-07 shortage, the only significant exception to this seems to be Spain and the UK where in the last years forward contracts have managed to stabilise prices and have stopped their descent. The figures for Belgium in 2004-2007 do not seem reliable, while for Bulgaria the movement depends of a small number of contracts.
- Other things being equal, the coefficient of variation tends to be lower in countries where the role of the producer groups is strong and where they represent the majority of producers. This is the case in Germany, Austria and the UK. If producer groups are perceived by the brewers as solid and law-abiding, forward contracts are more likely to be stipulated. On the contrary, countries where producer groups are small (Spain or Bulgaria) or where forward contracts have not been enforced in the past (Poland) tend to experience higher price volatility.

Producers are of course risk averse and prefer to engage in forward contracts, as they already have to deal with uncertainty caused by climatic and agronomic conditions. The following figure gives a straightforward idea of the fact that the price under forward contracts is much less volatile than price on the spot markets.

Figure 12- Spot price vs. contract price (2000-2007)



Source: European Commission, DG AGRI, *EU-15, **EU-25

Moreover, we have to consider that under normal conditions the supply of hops exceeds demand. Producer groups are seen by growers as the linchpin for marketing their production and conveying production to merchants and brewers. This is less important for large farms (above 150 hectare) that have the capacity to deal directly with merchants and brewers (in some cases they act as merchants as well).

⁵⁷ In statistics, the **coefficient of variation (CV)** is a normalized measure of dispersion. It is defined as the ratio of the standard deviation σ to the mean μ .

In order to arrange good deals for growers, producer groups have to concentrate supply. This depends on the production that the growers can guarantee to the producers group they belong to. Single farmers would not be able, in most cases, to meet the quantity obligations of a forward contract. The higher the production the producer groups rely on, the better they will manage to promote their members' interests by concluding forward contracts. The introduction of hop pools and the buy-back of unsold hops in some cases has also created a sort of buffer the producer groups can rely on, in case contracted production turns out to be lower than expected.

According to the latest data in our possession⁵⁸ in the EU-27 the following producer groups per country are actually operating:

- UK: 4;
- Poland: 3;
- Belgium, Germany, France, Austria, Spain: 2;
- Portugal, Slovakia, Slovenia: 1.

In these countries, producer groups are representing all producers and they thus manage to concentrate supply, as much as their scale allows them. In the Czech Republic, 95% of the growers are grouped in the Union of Hops Growers (UHG), which is not an official producer group, but concludes forward contracts. The UHG is linked to the national co-operative and acts to concentrate supply as well (through hop pools, minimum prices or buy-back agreements). The room for stand-alone growers is therefore extremely limited in Europe.

The German HVG is the largest producer group in Europe, active since 1953. Although in some countries there are no recognised producer groups, for example, in the Czech Republic or Bulgaria, this does not prevent the use of forward contracts. Demand is less likely to be volatile, but a changing economic market characterised by mergers and acquisitions can nonetheless generate price volatility. From the demand side price volatility can be generated through:

- Structural change of brewers' purchase policy;
- Changes in the demand of beer;
- Changes in the hopping rate.

Supply instead can generate price volatility through:

- Agronomic condition (plant disease, etc.);
- Climatic conditions.

Producer groups manage to limit supply-driven price volatility through hop pools and forward contracts and, to a certain extent, protect growers from changes in the brewers' purchase policy through forward contracts. In the latter case however, the contract can be interrupted by paying a fine.

⁵⁸ List of recognized producer groups and associations (2008/C 97/08)

Findings for the evaluation question are:

- The producer group manage to limit price volatility mainly through the use of forward contracts and through hop pooling and buy-backs. However, price volatility is intrinsic to the agricultural activity and to the dynamic of supply and demand;
- The extent to which the producer groups manage to protect the interest of their members depends on the volume of production that they represent. The impact of producer groups on the reduction of price volatility is indirect as it passes through forward contracts, but important.

6.3.2 Judgment criterion 2: extent to which the reduction in the number of buyers has influenced the price formation mechanism

The concentration process that the sector is undergoing had an impact on the hops industry. The concentration process in the brewing industry is inevitable and has the main aim of reducing production costs and increasing economies of scale. The following table shows the structure of the beer industry in 2007. It does not yet take into account the effects of the Anheuser InBev merger.

Table 47 – Top 15 brewers worldwide in 2007 and comparison with 2004

Brewer	Country	Prod volume in ml. HI (2007)	Prod volume in ml. HI (2004)	Percentage of beer production (2007)	Percentage of beer production (2004)
SABMiller	UK	239	148.3	13.40%	9.60%
InBev	BE	233.1	193.4	13%	12.50%
Anheuser-Busch	USA	189.1	159.7	10.60%	10.30%
Heineken	NL	139.2	112.6	7.80%	7.30%
BBH	RUS	55.3	36	3.10%	2.30%
Carlsberg	DK	52.9	92	3.00%	5.90%
Modelo	MEX	51	42.8	2.90%	2.80%
Tsingtao	CHN	50.6	36.9	2.80%	2.40%
Molson-Coors	US/CAN	49.2	59.4	2.80%	3.80%
Yanjing	CHN	40.1	28.5	2.20%	1.80%
Femsa	MEX	39.4	25.7	2.20%	1.70%
Scottish & Newcastle	UK	28	30.2	1.60%	1.90%
Asahi	JPN	23.8	25.9	1.30%	1.70%
Kirin	JPN	23.7	22.5	1.30%	1.50%
Efes	TUR	20.9	n/a	1.20%	n/a
Total top 15 brewers		1235.3	1013.9	69.20%	67.30%
World		1787	1552.1	100.00%	100.00%

Source: Barth report

In 2007 the top 15 brewers worldwide were responsible for 69.2% of world beer production. In 2004, the top 15 brewers accounted for 67.3% of total production. This consolidation has increased the market power of buyers worldwide and has brought the price of hops down and probably that of alpha acid as well, although there is no real evidence of this. Although the brewers are keen to say

that they do not change the flavour and the hopping rate of their beer, some producers are worried by the trend of consolidation⁵⁹.

Aroma producers seem to be more affected by consolidation in the brewing sector and several of them have started trading directly with micro-brewers, which are often more interested in the quality of hops in order to distinguish themselves from the larger brewers. In fact, in contrast with the process of concentration ongoing at the top-tier level, the overall number of brewers in Europe is actually increasing. In 2002 there were 1,692 brewers operating in the EU-27, in 2004 there were 1,736 and the trend is still upward⁶⁰. This adds number of players (although of much smaller scale) in the market and may logically have an upward pressures on prices. Micro-brewers are now also common in the US and some parts of Europe like Germany, Czech Republic and the UK.

This counter-effect could create upward price pressure to the benefit of producers which might partially mitigate the effects of mergers. Another factor that makes it hard to quantify the effect on prices due to the changes in production structure is that price modifications are also absorbed by the intermediaries in the supply chain, notably the merchants. The use of merchants is still the rule more than the exception and producer groups are in close contact with them. Sometimes merchants and producer groups are legally linked or represented by the same person (this is often the case in smaller operations). Personal trust is important in this area and the contract relationships are evolving towards long-term forward contracts. Interviewees have predicted that from the average length of forward contract coverage of 3-4 years that can be observed nowadays, contracts will evolve to 5 -8 or even 10 years in the near future. The trend is for brewers to secure their hops sources and to do it through merchants. Hops represent only around 1% of brewers' total costs, and, as a result, only large brewers have a specialised hops sales manager who follows the trends in the hop industry. amongst mid-sized brewers, the sales department is normally in contact with hop merchants.

The interviewees have not reported any direct effect from mergers on prices. The formation mechanism of price is seen as dependent on agronomic conditions and on the alpha acid content rather than on the number of buyers in the market.

Findings for the evaluation question are:

- There are two opposite processes ongoing in the brewing sector. Concentration is ongoing at the top-tier of the industry, but new brewers are founded every year and their total number is increasing. This could create two opposing effects on price formation;
- The extent to which the change in the processing sector's structure has an effect on price seems to be limited according to the main actors in the sector. However, there is not enough evidence for a clear conclusion on this point.

⁵⁹ A side-effect of mergers is the fact that the purchase policy changes and the "losing" strategy determines for growers that a lot of hops will go unsold. After mergers, brewers can put an end to forward contract. Although some compensation is usually paid, if a variety is suddenly not wanted by the market anymore the hops gardens have to be re-planted with new varieties. This process is costly and time consuming for hops producers.

⁶⁰ Source: Brewers of Europe http://stats.brewersofeurope.org/stats_pages/employees.asp

6.3.3 Judgment criterion 3: extent to which stocks detained influence the price formation mechanism

The amount of stocks detained by brewers is generally not disclosed to merchants and producers. This is certainly the case for large breweries that have several suppliers in different countries while for small local brewers that use a single merchant it is easier to say. The trend in the brewing industry is towards the reduction of stocks due to cost cutting practices (hop stocks in warehouses are accounted for as costs). The merchants have noticed this trend and they perceive that costs are passed on to them. Large brewers used to hold stocks for 18 months, now between six and nine months of stocks are held. Small brewers cannot afford to tie up such large amounts of capital in stocks, so they keep hops for between three and four months. The reduction in stocks for budgetary reasons partially explains why brewers are keener to use forward contracts.

Merchants are therefore aware of the approximate amount of stock held by brewers in most cases. Another way of perceiving pressure on the buyers' side is time of delivery asked for by brewers. If they insist on delivery in 30 days instead of the usual 60 or 90, merchants receive a clear signal that their stocks are running out. However, these signals are not always sufficient for merchants to quantify the amount of hops they need to buy from growers, so an element of uncertainty is introduced. It is not possible to say whether this uncertainty is translated into costs, and eventually who bears these additional costs. The European scenario differs from the American one where a stock registration system is in place. The introduction of a similar system might also be contemplated in Europe.

Brewers are currently trying to rebuild the stocks that were almost depleted after the shortages of 2006-07. The 2008 crop was therefore sold at good price levels, even though it exceeded the immediate demand from the brewing industry. The fact that the amount of hops held as stocks by the brewers is not known generates uncertainty in the upper reaches of the supply chain; merchants and producers do not know precisely what quantity of hops will be requested and cannot fine-tune their own stocks (in the case of the merchants). Uncertainty results in a cost and is therefore reflected in the formation of price, to an extent that is not quantifiable. However, it is intuitive that - other things being equal - EU producers will receive less for hops than in the States, as merchants have to recover larger costs.

Findings for the evaluation question are:

- The level of stocks held by brewers in Europe is not known. However, the trend is to keep lower stocks than in the past and to reduce costs;
- Merchants obtain market signals from brewers on their need for stocks and can estimate with a reasonable margin the amount of stocks held by small brewers;
- The overall effect of uncertainty might be higher prices charged by merchants to brewers or lower prices paid to growers, both resulting in higher margins needed by merchants to compensate for the higher risk. However, figures on industry margins are commercially confidential, so it is not possible to quantify this.

6.3.4 Conclusions to the evaluation question

The current CAP measures play a role in ensuring the stability of the markets, especially through producer groups. Producer groups were not affected by the 2003 CAP reform. Decoupling does not seem to have any appreciable effect on the downstream sector and on market stability in particular. Producer groups manage to reduce the effects of price volatility on growers, although they cannot eliminate it. The producer groups' main tool to limit volatility is a market instrument, i.e. forward contracts that they conclude on the behalf of their members.

The process of concentration amongst the largest brewers can affect the purchasing strategy of several breweries, but no effect on price can be distinguished. This is probably because the price formation mechanism is affected by counter-effects such as the proliferation of smaller breweries, so that a net effect on prices cannot be singled out. However, the structure of the downstream sector does not seem to be a primary aspect of price formation.

The level of stocks held by growers, dealers and brewers in Europe is not known.

6.4 Evaluation question 3.3.: To what extent is the objective of ensuring sufficient levels of production (quantity and quality) in traditional production areas relevant with respect to the needs of user industries (e.g. in terms of added value of local production)?

To answer this question, we have investigated whether brewers source hops from the same areas or whether they are geographically diversified. We present below the main answers collected through interviews in the Member States and our desk research.

6.4.1 Judgment criterion 1: extent to which the location decision of the industry are related to hops availability

The hops market is a global market and the location of breweries is not generally influenced by the cost of hops as explained previously. The need of user industries in most European countries is satisfied by domestic production as far as it is possible. This is shown in the table below. Only Germany exports a large part of its production, but in proportion imports a small quantity of hops.

Table 48 – Breweries in the Member States (2006) and hops⁶¹ trade figures in 2004⁶²

Country	Breweries	Direct employment (breweries)	Acreage (ha)	Hops production (tons)	Hops import	Hops export	Production+ import-export
Austria	64	4,000	201	287	0	50	237
Belgium	115	6,025	183	282	1,607	471	1,418
Czech Republic	48	7,400	5,414	5,453	56	2,886	2,623
France	64	3,853	795	1,188	12	122	1,078
Germany	1,284	31,121	16,692	28,500	828	19,966	9,362
Poland	57	15,000	2,234	2,889	133	45	2,977
Portugal	8	1,687	27	57	50	65	42
Spain	21	8,180	680	1,537	80	81	1,536
U.K.	570	15,000 ⁶³	1,056	1,693	1,797	2,496	994

Source: *Brewers of Europe, Eurostat*

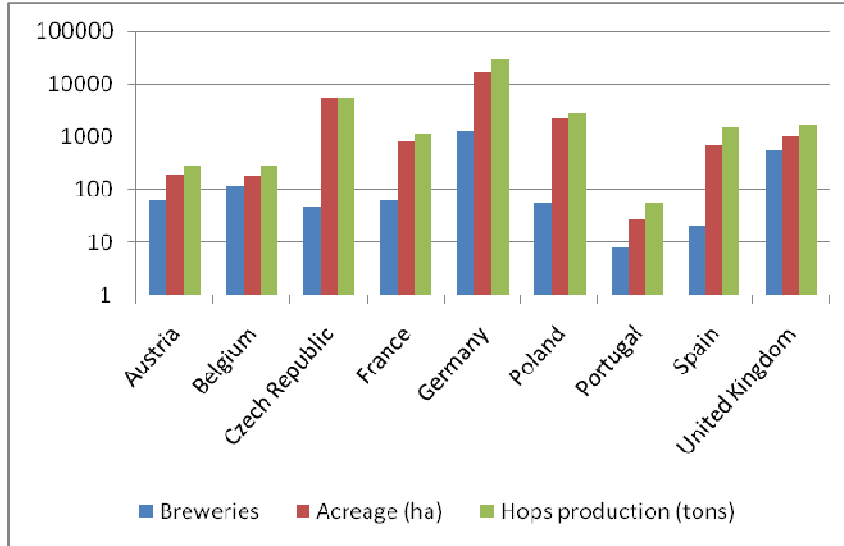
⁶¹ In hops equivalent cones.

⁶² This is the last year for which brewers of Europe has figures.

⁶³ 2007 data.

According to this table and the figure below, we can also make a parallel with the number of breweries in the Member States, area and hop production.

Figure 13 - Breweries, acreage and hops production per country (Logarithmic scale)



Source: *Brewers of Europe, Eurostat*

The picture that emerges is that there are three main categories of Member States:

- **Large producer countries** (Germany, UK and the Czech Republic) who satisfy national demand and export the surplus;
- **Small producer countries** (Belgium, Spain, France and Portugal) where national production is devoted mainly to the national brewing industry with possible import top-ups or small quantities of exports;
- **Non-producing countries** that have a significant brewing industry (the Netherlands, Denmark, Lithuania, Sweden and Italy) that import the entire amount of hops needed.

The existence of this third category that accounted for more than 250 breweries in 2006, provides another piece of evidence in the direction of location neutrality to hops. Also, according to our case studies, despite the fact that many breweries are located in the countries that produce hops, it appears that breweries do not deliberately decide to stay in the countries due to the availability of hops. In general, alpha acid processors are located near the production for economic reasons (transport, modern industry concentration, industrial relations, etc.); brewers are located near water supplies.

There are certain varieties (such as Saaz) and territories which command a premium, but generally the location where hops are grown is not important. Price is usually determined by the alpha content, then the variety and only after these considerations might location be a factor. However, brewers may sometimes specify a variety which implies a location, for example, Fosters is brewed using some Pride of Ringwood hops and this variety is only produced in Tasmania. Where producers do mention the location from which the hops are sourced it is usually as a marketing tool. This is likely to be an increasing trend in an effort to engage more with the consumer.

Hops producers are starting using the Protected Designation of Origin (PDO) as a means to capture a premium from the market. EC Regulation No. 2081/92 on the Protection of Geographical Indications and Designations of Origin for agricultural products and foodstuffs regulates two particular groups of protected geographical names: designations of origin and geographical indications. This strategy was adopted by the Czech growers that managed to have the Saaz variety declared a PDO in 2007. However, we did not gather any evidence concerning an effect of PDO on the location choice of brewers, as new breweries appear also in non-producing areas.

Findings for the evaluation question are:

- Many breweries are located in countries that produce hops and use hops from national origin;
- Availability of hops is not decisive in terms of downstream sector location; processing industries are located near to the production area for economic reasons, but breweries can be located much further away as hops constitute only a small part of their beer's components.

6.4.2 Judgment criterion 2: Extent to which the production decision of the industry are related to hops availability in traditional production area

As for the previous judgment criterion about the location decisions of the industry, production decisions are generally not related to the availability in hops in traditional areas. The fact that specific hops are used is due mainly to historic reasons. If hops were not available in traditional areas, or if consumers' tastes evolve towards other beers, brewers can easily buy hops from other regions or countries (e.g. USA, China) rather than traditional areas.

Brewers express their demand for specific hop varieties directly to the producers during, for instance, the International Hops Grower Convention. It is in the advantage of both parties to start growing requested hops as soon as possible considering the time needed to produce mature plants (3 years) and to allow matching between demand and supply. This is particularly important for brewers as if hops do not match their needs they have to draw on their stocks.

Findings for the evaluation question are:

- Brewers can easily switch from one hop variety to another according to their needs and the consumer's taste;
- There is no evidence that the brewer's location choices are affected by the availability of hops. Location could, however, be more important for micro-breweries that use certain hop varieties to distinguish themselves from the large breweries.

6.4.3 Conclusion

The location of the hops processing industry is not linked to the traditional production areas. For marketing reasons, brewers, and more particularly micro-breweries can in some specific cases (particular flavour, national origin, etc) order their hops from a specific area, but this is not the case for the vast majority of the hop supply.

Indeed, the majority of the beer market is produced using hop varieties that could come from different regions in order to ensure continuous supply. Specific hop flavour is not the most significant component for these beers.

Price and quantity are the first elements determining the origin of hops for the large brewers. The objective of ensuring a sufficient level of production in traditional areas seems not to be considered to be relevant to the needs of the processing industry.

7 Theme 4 – Effects on rural development

7.1 Evaluation question 4.1. To what extent have the CAP measures supporting hops promoted rural development in traditional production areas with respect to employment and economic viability?

This evaluation question concerns the effect that the CAP measures have had on rural development with respect to employment and economic viability. The 2003 reform boosted the importance of rural development by developing the second pillar of the CAP, together with income support. We now assess to what extent the CAP measures supporting hops promoted rural development in traditional production areas with respect to employment and economic viability.

With respect to employment, two kinds of employees can be affected: permanent workers and seasonal workers. Variation in the number of the former type of workers is due to farms exiting the sector. The latter can be associated with the farmers hiring fewer seasonal workers for the most labour-intensive activities. In order to conduct analysis on employment, we mainly use simulations as Member States provide few figures on employment in the hop sector.

Economic viability can be defined as the assumption that increases in output produced by a farm will recover costs, provide an additional rate of return, and sustain effective production in the face of uncertainty and risk intrinsic to the activities carried out. It concerns the ability to maintain hop production as a profitable activity, able to re-pay the farmer and her/his family for their work, and to replacing obsolete machinery. If farming is no longer profitable, land could be kept uncultivated or even abandoned.

7.1.1 Judgment criterion 1: extent to which employment in traditional hops producing areas was affected by the CAP reform

The hop sector is undergoing a gradual but substantial change in the production structure (see Theme 2) that is reflected also on employment. In this section, we build on the fact that the changes in the production structure are driven by profitability and not by the introduction of decoupled aid, as stated under theme 2. The extent to which this is happening cannot be precisely calculated as the Member States do not collect homogeneous figures on employment in the hop sector. Therefore we base our conclusions on the data collected during fieldwork bearing in mind that this may sometimes be qualitative and subjective. We will distinguish the trend of permanent workers from the trend of seasonal workers. As far as our analysis with regard to employment is concerned, we have

considered the creation/loss of jobs, modifications in the flows of seasonal workers and finally the perceptions of the interviewees on the effect of decoupling on employment. These analyses have to be considered carefully as 1) comparable actual data are rarely available; 2) we therefore have worked on simulations based on various assumptions; and, 3) no data regarding a baseline (or “starting”) situation was available. These limitations need to be taken into account when looking at our conclusions.

7.1.1.1 Number of jobs created/lost after 2004, distinguishing permanent workers vs. seasonal workers

Full-time workers in the hop sector normally comprise the farmer and another member of his/her family. It is difficult to get an estimate on the AWU (Annual Work Units) required by hops. The Eurostat and FADN databases do not provide figures for hops (except for Germany); moreover, several hop farms are still growing other crops, so that it would be difficult to distinguish the number of hours devoted to the different crops. In the case of Germany, the FADN database provides data for all farms growing hops (so not only specialised farms), so it is possible to produce figures on AWU needed for primary production, as reported in the table below.

Table 49 – AWU for Germany in 2003-2007

AWU per 1,000 ha		AWU (2003)	AWU (2007)	Diff.
Unpaid, regular	94	1,650	1,574	-76
Paid, regular	94	1,650	1,574	-76
Unpaid, casual	4	70	67	-3
Paid, casual	116	2,047	1,942	-105
Total AWU	308	5,417	5,157	-260

Source: FADN

We can therefore estimate the loss in permanent AWU in Germany to 152 and the loss in temporary AWU to 108. This estimation takes into account the fact that in the years 2003-2007 the acreage in Germany reduced from 17,563 to 16,744. However, this loss in employment is also due to the change in production structure. As small farms (that use seasonal workers proportionally less than large farms) stop growing hops, permanent employment is more affected. This does not necessarily mean higher unemployment as most of the farmers who exit the hop sector either switch to other crops or retire, according to interviewees⁶⁴.

As a simulation, we use the German AWU coefficients to estimate job losses in France and in Slovenia, as these two countries have a production structure similar to the German one in terms of average farm size and in the distribution of farms in size classes. Furthermore, the technological level is comparable. We use the figures for acreage reported in the overview on the EU hop sector. These cannot be taken as actual figures.

⁶⁴ Again, there is no quantitative data neither on the activity undertaken by farmers who stop growing hops, nor an estimation on number of hops growers who retired.

Table 50 – AWU for France

AWU per 1,000 ha		AWU (2003)	AWU (2008)	Diff.
Unpaid, regular	94	76	72	-4
Paid, regular	94	76	72	-4
Unpaid, casual	4	3	3	0
Paid, casual	116	94	89	-5
Total AWU	308	249	236	-13

Source: FADN

Table 51 – AWU for Slovenia

AWU per 1,000 ha		AWU (2003)	AWU (2008)	Diff.
Unpaid, regular	94	155	152	-3
Paid, regular	94	155	152	-3
Unpaid, casual	4	7	6	-1
Paid, casual	116	191	188	-3
Total AWU	308	508	498	-10

Source: FADN

Once we assume that one seasonal worker is employed only for three months a year (two months for spring works and one month for harvesting) and we assume that one AWU therefore corresponds to four workers, we can estimate the number of seasonal workers. Assuming that the ones that do the spring works and those who harvest are not the same people we get to 16,000 seasonal workers for Germany, 720 for France and 1,560 for Slovenia.

The estimation for the other countries is more problematic, as permanent workers are not a linear function of farm size. Moreover, in countries where larger farms dominate, the AWU for paid permanent workers is likely to be higher than the AWU for unpaid permanent workers, of whom there are few or none.

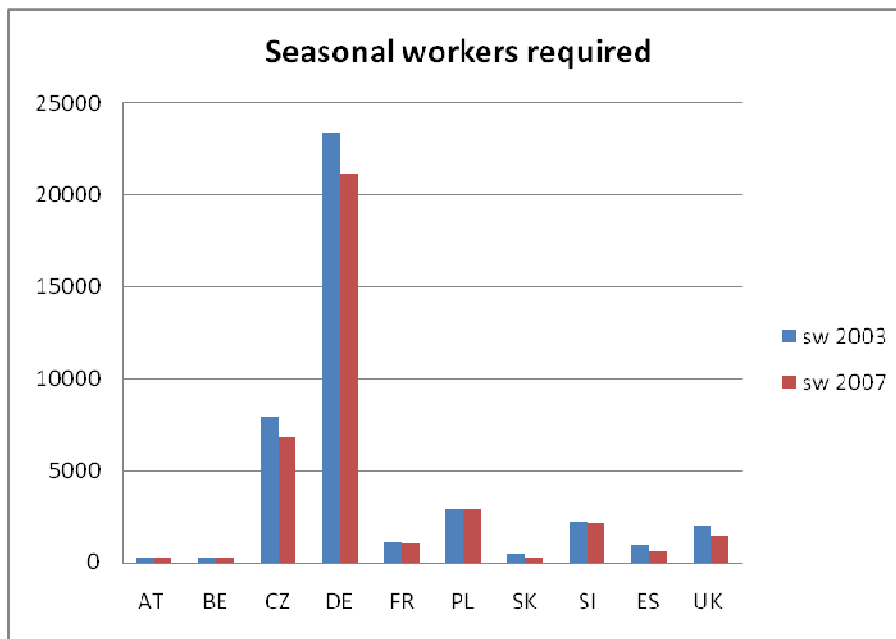
If we cross-check with the figures presented under Theme 2 concerning the reduction in the number of holdings growing hops, it is straightforward to assume that permanent jobs are being lost: however these are not net figures; it was not possible to estimate net job losses as there are no figures on the number of growers stopping every farm activity or laying off employees because of the change in crop.

For the Czech Republic, we know from fieldwork that the hop industry employs around 600 permanent workers. No dramatic changes were reported on permanent employment in the Czech Republic as job loss due to small farms exiting the sector are mostly offset by large farms hiring personnel. Furthermore, about 10,000 seasonal workers are required in the Czech Republic for spring work and about 4,000 for harvesting. After 2004, a slight decrease in seasonal worker numbers was noted.

According to IHGC, two permanent workers can cultivate – with reasonable mechanisation (such as in Western and Central Europe) - up to 30 ha of hops. Hop gardens smaller than 5 ha normally need only one permanent worker. Interviewees stressed the fact that the process of restructuring of the production structure is also creating jobs as large farms that are run as agricultural enterprises tend to hire staff. For instance, a large Czech farm increased its number of permanent staff by 37.5% from around 40 up to 55 in the latest years.

Estimations for seasonal workers are more reliable as the number of seasonal workers is generally proportional to the acreage. IHGC estimates that one seasonal worker every 1.5 ha is needed on a yearly basis in Western and Central Europe, or 0.66 workers per hectare. We can multiply this coefficient by the number of hectares to calculate the number of full-time seasonal workers needed in one year. This figure refers to a full working year, but we should note that spring work and harvest occupy respectively two months and one month i.e. one quarter of the year only. With these figures, we make the assumption that producers have to make two recruitment wages: one for the harvest and one for spring work. We have then multiplied the results by two.

Figure 14 – Estimate of the number of seasonal workers required



Source: Own calculations.

These figures provide an overall picture, but should not be considered as actual numbers. Indeed, the number of seasonal workers who work on hop farms depends on the structure of these farms. The coefficient of 0.66 could be valid for Slovakia, but could be invalid for Germany for instance.

7.1.1.2 Modifications in the flows of seasonal workers

Seasonal workers coming to Western Europe tend to be drawn from New Member States⁶⁵. The exchange rate is a key variable for fostering or discouraging seasonal labour mobility. The continuous appreciation of Central European countries' currencies⁶⁶ resulted in reduced immigration figures in all sectors in 2003-2008, and agriculture is no exception⁶⁷.

In Germany and other **Euro area** countries such as Austria, Belgium, France and Slovenia, work in the hop sector has been very attractive for workers coming from new Member States. According to our interviews, seasonal workers are mainly drawn from Poland, the Czech Republic and Slovakia. In Slovenia, workers come from Croatia, Romania and to a lesser extent from other former Yugoslav Republics. A partial exception is Spain where work is still done mainly by Spaniards, as the hop growing region in Spain is almost untouched by immigration.

In the **UK** it has become more difficult to attract workers for two reasons: on the one hand the falling exchange rate has discouraged workers coming from Poland or the Czech Republic, while on the other hand tougher immigration rules and a reduced threshold of allowed SAWs (Seasonal Agricultural Workers) have made it extremely difficult to employ workers from Belarus and Ukraine, even on a temporary basis. English producers foresaw serious labour shortages for this year.

In the **Czech Republic**, hop growers traditionally rely on Czech students for harvesting. This created problems since 2006 when a new law⁶⁸, prohibited –among other things- using minors for agricultural activities. This principally affected harvesting, which is done during the summer period. After consultations with the government, students of the agricultural secondary schools are now allowed to do “field trainings”. For spring works, seasonal workers mainly come from Slovakia (60% according to one of the interviewees) and to a lesser extent from Poland and Ukraine.

Most of the seasonal workers involved in hop work stay in the host country only for the time that is needed to carry out the job. This arrangement seems to be satisfactory for both parties, as worker can continue living in their own countries and move only on a seasonal basis. This is made possible by the geographic proximity and the liberalisation of work visas.

7.1.1.3 Perception of the interviewees of effect of decoupling on employment

Most interviewees considered the CAP measures to have had a positive impact on seasonal workers as they helped to maintain employment levels, especially in the difficult year of 2006-07. However, we believe that this impact is due more to perceptions of market stability rather than decoupling. Growers that are backed by producer groups know that at worst their hops will be pooled (or held as stocks) and that a minimum price will be paid in any event. Even in the worst market conditions,

⁶⁵ This is based on the interviews we had, but figures can be found at more aggregate levels (not for the hop sector alone).

⁶⁶ This trend was sharply inverted after the financial crisis broke out in late 2008

⁶⁷ See for instance:

<http://www.timesonline.co.uk/tol/news/politics/article5192706.ece>

<http://www.timesonline.co.uk/tol/news/uk/article3378851.ece>

⁶⁸ National legislation No. 262/2006 from 21st April 2006.

http://portal.gov.cz/wps/portal/s.155/701/cmd/ad/c/313/ce/10821/p/8411?PC_8411_number1=262/2006&PC_8411_number2=262/2006&PC_8411_ps=10#10821

hops are harvested and seasonal workers hired. In some regions such as Northwestern Czech Republic or the Midlands, the security of permanent and seasonal jobs linked to the hop sector prevents the depopulation of rural areas, according to interviewees.

Given that the majority of farmers who stop growing hops simply switch crop or retire, there is not a high incidence of direct job losses. Large hops farms are not laying workers off, according to interviewees; it is rather family-run farms that are responsible for the decrease in permanent jobs.

Findings for the evaluation question are⁶⁹:

- Based on the Member States for which we have figures, the CAP did not seem to affect permanent employment in the hop sector. The process of restructuring of the sector is the main factor explaining the number of growers leaving the sector. However, some large farms are hiring permanent staff, but there are no figures on this;
- The main flows of seasonal workers come from the new Member States. These flows have been maintained even in the most difficult years for the hop sector;
- Several migrant workers come on a temporary basis thanks to job agencies and stay in the country only for the time required to do the job. This arrangement satisfies both growers and workers;
- Labour shortage may become a problem for Western European farms if the exchange rate with the euro is not favourable.

7.1.2 Judgement criterion 2: extent to which the CAP measures ensure economic viability of hops growing

Although all the producers interviewed during fieldwork have expressed their appreciation of the CAP payments as a helping hand, they were extremely clear in pointing out that the economic viability does not depend on it. The perception we found is that economic viability of hop farms is endangered by the market dynamics and by the ever-increasing level of competition. This is confirmed by the reduction of the number of growers that is dealt with under theme 2. However, we do not know to what extent this reduction is due to the ageing of producers rather than to competitive pressure. The fact that the average size of hop holdings is increasing (also shown under Theme 2) hints that smaller producers leave the sector at a higher rate than larger entities.

From Theme 1 on the effects on production, we have seen that the income of hop farms is higher in both Germany and Czech Republic compared to a control group. In the latter country, even if the revenues per ha are high, the subsidies play a more significant role in maintaining farmer income at a sufficient level. Moreover, our analysis led to the conclusions that the reform had no real impact on the situation of farmers in terms of income.

The high revenues deriving from the hop sector are balanced, according to interviewees, by high operational and structural costs. As a result, hops seem to become less and less attractive for new comers and for holdings that have to make significant renewals. Evidence of the low attractiveness of hops is the fact that almost no new farms have emerged in the last few years. This has been

⁶⁹ These findings are based on the Member States for which figures are available.

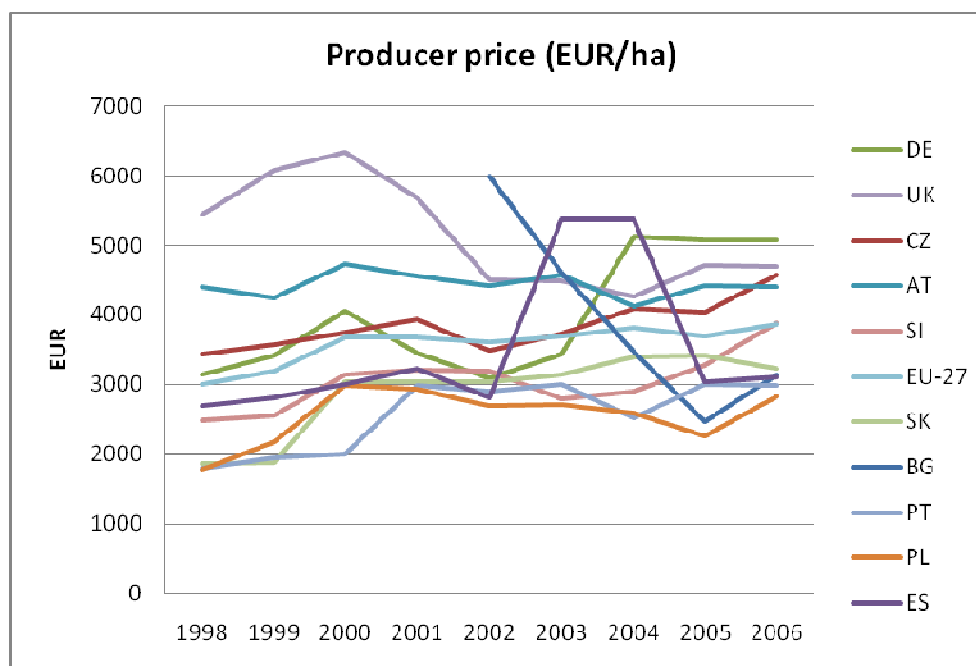
confirmed by interviewees in Austria, Belgium, Czech Republic, Germany, France, Poland, Slovakia and Spain. Only in the UK was a new hop farm established and this was with support from structural funds.

Eurostat does not provide any figures on value added for farms growing hops. We have shown under theme 1 that the relative profitability of hops is in almost all cases higher than other crops', implying that hop growers have no economic incentives to leave the sector. However, these data are partial as FADN only covers Germany and the Czech Republic. As a structure of costs is not available for hop farms in other Member States we have considered in our analysis two major cost factors: electricity (1% of total costs in Germany) and fuel (motor and heating fuel constitute about 8% of the total cost in Germany). Our analysis in theme 1 shows that hop farms consume up to three times more heating fuel than farms for mirror groups. Electricity and motor fuel consumption are more or less the same.

7.1.2.1 Quantitative data concerning hops price and cost

In order to shed some light on the economic viability of farms (especially for those countries for which we do not have any evidence) we present the following figure, extracted from Eurostat, that shows the trend over time in terms of money received at producer price per hectare of hops.

Figure 15 – Producer Price of hops in EUR per ha⁷⁰



Source: Eurostat, adapted by Deloitte

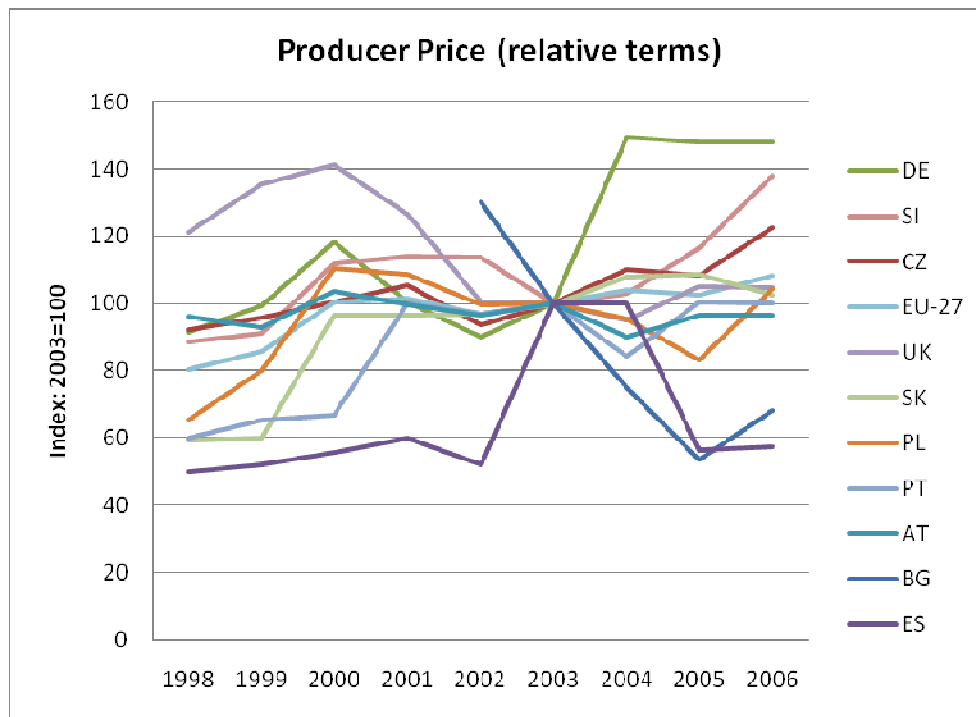
This figure is far from being a stand-alone piece of evidence for the economic viability of farms and has to be complemented with the figures concerning costs presented below. Nevertheless, this figure shows some interesting findings. Poland, Portugal and Spain (if we exclude values for 2003 and 2004 that seems either suspicious or not representative of the average price for Spain) seem to have by far the lowest revenues in the EU-27. In Spain which is a case study for this evaluation, this is probably

⁷⁰ No trend for the EU-27 is present as data for some Member States are missing (e.g. France or Belgium)

due to the unsustainable Spanish production structure and confirms the sharp decrease in the number of producers that Spain has experienced. Moreover, Spanish producers have only one single selling channel (the producer group only sells to a small number of Spanish brewers). This is also in line with the findings from fieldwork in Spain where interviews reported that several farmers were abandoning hops, even for less profitable crops.

Figure 16 shows the same data in relative terms with 2003 as a base. Once we exclude Germany, the Czech Republic and Slovenia, producer prices for the other countries are either stable or have been decreasing since 2003. On the fair assumption that costs are increasing, (see figures below) the gross margin⁷¹ is very likely to have decreased in almost all the EU-27 Member States in the last five years.

Figure 16 - Producer prices for hops in relative terms⁷²



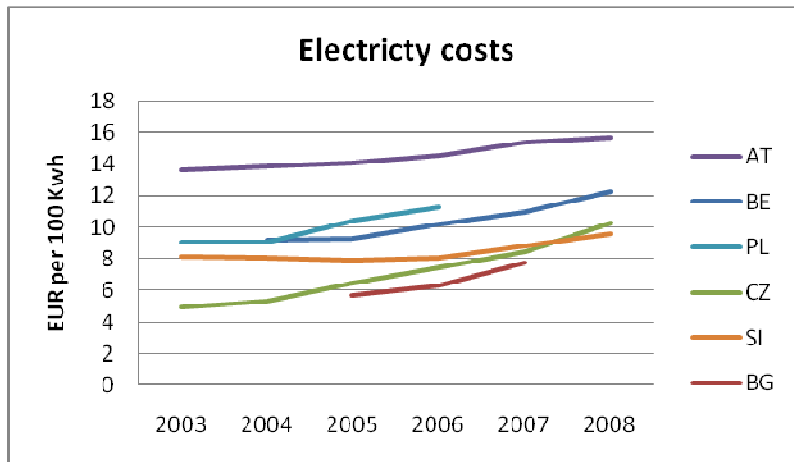
Source: Eurostat, adapted by Deloitte

This figure synthesises the main concerns of several producers who perceive their revenues as stable while their costs increase, especially fuel, energy and labour costs. The following figure sheds some light on the increase in one of the main costs the farms incur: electricity.

⁷¹ There are some figures available on Eurostat on gross margin, but they stop in 1996 and are only for some former EU-15 countries. Because of these reasons we decided not to include them.

⁷² No trend for the EU-27 is present as data for some Member States are missing (e.g. France or Belgium)

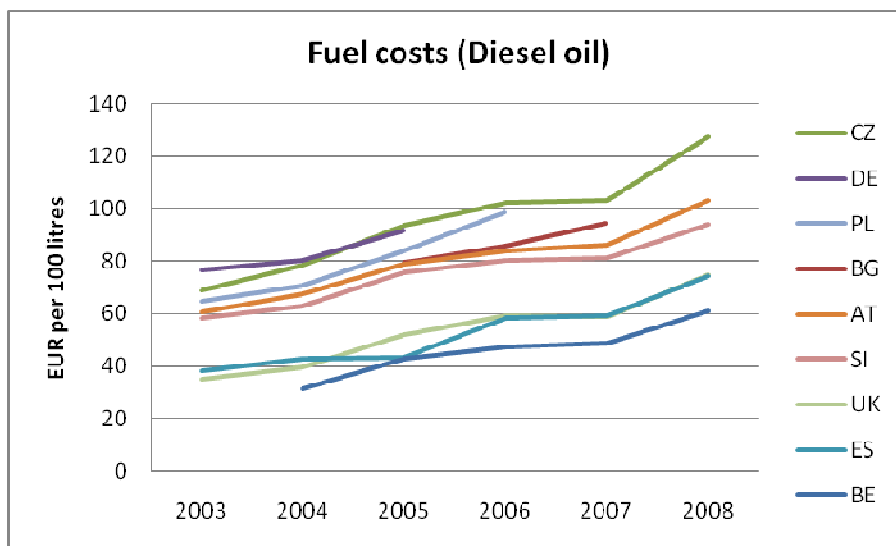
Figure 17 – Trend in electricity costs for holdings⁷³



Source: Eurostat, adapted by Deloitte

Unfortunately, the time series available through Eurostat are incomplete and only cover some countries: however the data give a good idea of the increase in costs that have squeezed the economic viability of farms. In some cases, such as the Czech Republic, the cost of electricity more than doubled, climbing from 4.96 EUR/100Kwh in 2003 to 10.26 EUR/100Kwh in 2008. Another cost factor that was often mentioned by interviewees was diesel fuel for agricultural machines (tractors, etc.). In this case the time series are more complete.

Figure 18 – Increasing fuel costs in Europe⁷⁴



Source: Eurostat, adapted by Deloitte

⁷³ No trend for the EU-27 is present as data for some Member States are missing or incomplete

⁷⁴ No trend for the EU-27 is present as data for some Member States are missing or incomplete (e.g. France or Portugal)

Two trends clearly emerge: first, the increase in fuel costs affected all the EU-27 countries with no exception: the price doubled in the Czech Republic, the United Kingdom and Belgium over the period, but sharp increases were generalised. The other important finding is that there is no major gap in price between new Member States and old Member States. When it comes to fuel costs, the Czech Republic and Poland are among the most expensive countries for farmers. Some of the cost could be reduced as the farms become larger and more energy efficient, but this effect is unlikely to reverse the main trend.

7.1.2.2 Perception of the interviewees of effect of decoupling on economic viability

Decoupling is perceived by the interviewees as having accelerated the inevitable ongoing process of change in production structures, but has not affected the economic viability of farms as such. In this sense, whether coupling is partial (that is perceived as a transitory measure towards decoupling) or full seems to make little difference to stakeholders. Decoupling makes all the agricultural sectors more inter-dependent. If a sector is not economically viable, this could have an effect on other sectors since the new system makes it easier to switch crops. However, we did not gather any evidence that farmers are leaving the hop sector due to a lack of economic viability. Likewise, no new holdings (with the exception of one in the UK) have started producing hops, even though existing hop farms are becoming more specialized⁷⁵. Several stakeholders see the future as an environment where small farms will be unable to compete against more efficient enterprises producing hops.

Interviewees did not challenge the principle of decoupling, but some feel that decoupling and competition have been applied zealously by some countries, while some others continue to legally support their agricultural sector by providing subsidies available outside the framework of the CAP (for instance, subsidies for fuel during the fuel crisis).

Germany has been named by several interviewees as continuing to subsidise hops farms via, for instance, state supports to reduce the weight of specific costs such as fuel (all Member States cannot provide this support to all enterprises). This opinion is due to the widespread perception that German producers have been the “winners” of the internal market for hops. The German producer groups play a major role in ensuring the competitiveness of their industry and are certainly better organised and financed than any other. This is not due to the SPS with partial decoupling *per se* (other countries have it in the EU), but rather to the critical mass on which the Germans can rely. This allows their producer groups to be able to organize bigger hop pools, and to provide more services to their members as they enjoy better economies of scale. Another example in this sense is the capacity of producer groups to conclude forward contracts with large international merchants. Forward contracts are more and more vital to the stability of income, especially in a trend of expanding acreage and stable demand for alpha acid. In this sense it is undeniable that smaller producers with weaker producer groups are less protected.

⁷⁵ See Theme 1 for the analysis on specialisation.

Findings for the evaluation question are:

- There are no European-wide data on economic viability of farms producing hops. However, we can see that the revenue side in Europe has not improved much recently. The prices paid to the producers have in some cases even declined. This is not the case in Germany where producers succeed in selling hops at a higher price in 2004-2006;
- The main cost factors for holdings have increased sharply. This has eroded farm margins. All Member States have been affected by increasing fuel costs;
- The perception of the interviewees can be summarised by the fact that the financial endowment from the producers to their producer groups seems to make a difference within the European market and penalises smaller producer groups.

7.1.3 Conclusions for evaluation question 4.1.

The CAP measures in force after the 2003 reform did not play a primary role on the hop market, as this is market driven and is not dependent on the CAP. The CAP measures accompanied the natural evolution of the hop sector towards a more competitive production structure.

Concerning employment we can draw the following conclusions:

- Several (around 528) farmers stopped hop production in the EU in the last five years. This would have happened irrespective of the CAP reform and the introduction of decoupling.
- As no figures are available it is not possible to know if farmers stopped farming altogether or switched to other crops. Thus, it is difficult to calculate the net effect on permanent jobs. The lack of data undermines the analysis, but there is little evidence of net job losses in the hop sector, especially since some of the larger farmers that are now present in Europe have started hiring permanent staff.
- There has been little impact on jobs for seasonal workers as their number is more related to the hop area than to the number of farms. The main flows of seasonal workers are directed from central Europe to Western Europe and are on a temporary basis. In the last years other factors have also contributed to this process, for example, the falling exchange rates of western countries' currencies and the convergence in labour cost. In the Czech Republic a seasonal worker is today paid almost as much as in Germany. Moreover, tougher immigration rules make it difficult for farmers to recruit seasonal workers from non-EU countries.

The economic viability of European farms has come under continuous strain in recent years due to increased international competition and the extraordinary volatility of the hop market during the last few years. Increases in costs also played a role on in terms of profitability while prices have remained relatively stable (but for the spot market). This is clear from looking at fuel and electricity prices (but they do not only concern the hop sector). One of the solutions to this pressure on profitability, and thus on the economic viability of hop farms, has been consolidation in order to gain economies of

scales. If we add the seasonal labour costs, which also seem to be converging, we can state that the gap between the EU-12 and the EU-15 Member States is quickly closing, at least in terms of costs.

Nevertheless, we have concluded in theme 1 that growing hops is profitable in terms of revenue compared to other crops and, as a result of the subsidies, provides, on average, a sufficient level of revenue for farmers. Farmers would not switch to other crops for this reason, but on the other hand the hop sector does not benefit from the entry of new producers because if these want to be profitable they have to reach a sufficient scale and make significant investments. Moreover, international competition (mainly from the US and China) in this sector becomes more and more important.

Producer groups have played an important role in sustaining the competitiveness of their members, especially in uncertain times, according to interviewees. The problem, from a European perspective seems to be that the efficiency of the producer groups in defending the interests of their members depends on the financial endowment received from their members. This is defined by the number of producers associated with each producer group.

According to these elements, we can conclude that large hop farms in countries with producer groups that provide significant support to their members seem economically viable. German producers are in this situation. Czech producers, thanks to their large size (and the economies of scale created) and the subsidies received, are viable but proportionally their costs are increasing more than in Germany and are converging on the German level. As returns for Czech farms are proportionately lower, future investments could be problematic for Czech producers in the coming years. For the producers in the other Member States, we could consider that their economic situation would become problematic in the coming years if they do not succeed in reducing costs. Moreover, international competition (US and China) continues to grow and puts pressure on price. We assume that the current trend of growers exiting the sector will probably continue until those remaining are of a sufficient size to compete efficiently. In countries with a small hop area, hop production will probably disappear when the current hop growers retire.

8 Theme 5 - efficiency, management and administration

Theme five concerns the efficiency of the CAP measures related to the hop sector, its management and administration. The theme is articulated in two questions. The first question entails an analysis of the efficiency associated with the CAP measures related to the hop sector. Efficiency is related to the financial, organisational or regulatory means that were used to implement the new CAP measures.

The second question deals with the administrative burden and compliance costs associated with the CAP measures. In answering this question, we will pay attention to the provisions on contract registration from Articles 3 and 4 of Commission Regulation (EC) No 1557/2006. We will assess, on the basis of the information collected, the evolution in compliance costs that are associated with the adoption of the Single Payment Scheme for farmers and national authorities.

8.1 Evaluation question 5.1: To what extent have the CAP measures applicable to the hop sector after the 2004 reform been efficient in achieving the objectives of these measures?

In order to answer this question, we have based our judgment on the following criteria:

- Extent to which the new CAP measures attained their objective of ensuring a fair standard of living for producers in an efficient way;
- Extent to which the new CAP measures attained their objective of enhancing the competitiveness of EU agriculture in an efficient way;
- Extent to which the new CAP measures attained their objective of stabilising the markets and ensuring a reasonable price for supplies to consumers in an efficient way;
- Extent to which the new CAP measures attained their objective of promoting a more market-oriented and sustainable agriculture in an efficient way.

8.1.1 Judgment criterion: Extent to which the new CAP measures attained their objective of ensuring a fair standard of living for producers in an efficient way

The cost structure of farms that can be associated with the implementation of decoupled aid or other measures of income support are not known. The lack of data on the cost structure of hop farms (except for Germany and parts of the Czech Republic) constitutes a hindrance to the analysis of efficiency. The evidence on the beneficiaries' side is based only on perception due to the lack of data on the cost structure of hop farms. This is reported under the following evaluation question. On the side of the national authorities, the way the CAP measures are channelled to beneficiaries are generally deemed efficient and all the administrations acknowledge the efficiency gain by having the payments decided and co-ordinated at the European level, in line with the subsidiarity test for European agriculture. On the other hand, we can state, thanks to the interviews we have conducted

with national actors, that the administrative burden on farmers was widely reduced; this issue is developed under the next evaluation question.

Under theme 1, we have concluded that in the case of hops, on average, CAP support is not decisive as the subsidies represent less than 5% of the revenue per hectare (see evaluation question 1.2). The average support given to hop growers before and after the reform remains more or less the same. Moreover, we also showed that the average net farm income (all subsidies included) on hop growing farms is higher than on other farms with the same structure. The costs for hop farms has increased over the years (e.g. fuel and electricity), but these factors are not specific to the hop sector.

The attainment of a stable income does not seem to be linked to the introduction of decoupled aid. The same can be said for the CNDPs for the new Member States. Growers and other stakeholders we met in the Czech Republic, Poland and Slovenia highlight that several cost components are already aligned with the old Member States. Considering this alignment, CAP support (including CNDPs) as well as former national support is necessary for them to gain sufficient income.

Findings for the evaluation question are:

- Hop growing is on average profitable and does provide a sufficient income, but the CAP reform has not had an impact here;
- The current CAP measures and the adoption of decoupled aid seem to ensure a fair standard of living in terms of stable income to European farmers;
- The CAP measures are said to operate and have been channelled in an efficient way compare to the pre-reform scheme.

8.1.2 Judgment criterion: Extent to which the new CAP measures attained their objective of enhancing the competitiveness of the EU agriculture in an efficient way;

The hop sector has been market-oriented for some time. One of the main aspects of the competitiveness of the hop sector is price. Hop prices are set on the world market and CAP measures, as they are decoupled, do not intervene in the price formation mechanism. The trend in terms of producer prices does not seem to have any link with the adoption of the decoupled payments.

Producer groups may increase efficiency in the sector by bringing producers and end users together. The existing producers' groups in the EU hop sector have, among their objectives, to support hop growers in terms of enlarging their economic sector competitiveness.

According to our investigation, the producer groups (or similar organization in the Czech Republic) are quite effective depending on their size and thus budget. A partial evidence of the efficiency of the producer groups could be associated with the fact that their members are willing to pay for the producer groups' services supporting the competitiveness of the hop sector. Nevertheless, we can also state that they already existed before the reform and that their costs are the same as previously.

Findings for the evaluation question are:

- The adoption of direct payment does not seem to have a significant influence on competitiveness. The hop sector is already oriented towards a global market, therefore it is not possible to provide a judgement on its efficiency;
- Producer groups support the competitiveness of the hop sector to a different degree depending on the size of the national industry they represent, but we cannot say *per se* that all producer groups are either efficient or inefficient.

8.1.3 Judgment criterion: Extent to which the new CAP measures attained their objective of stabilizing the markets and ensure a reasonable price for supplies to consumers in an efficient way

As stated earlier in the report, producer groups succeed in stabilizing the market. The producer groups manage to limit the supply and price volatility mainly through the use of forward contracts and through hops pooling and buy-backs. However, price volatility is intrinsic to agricultural activity and to the dynamics of supply and demand. The extent to which the producer groups manage to protect the interest of their members depends on the volume of production they represent. The impact of producer groups on the reduction of price volatility is indirect as it passes through forward contracts, but is nonetheless important. The reform does not play a role in this context as it did not change the existing situation. So, no conclusion on efficiency can be drawn.

Decoupled aid as such does not seem to have any effect. Furthermore, no interviewees saw the introduction of the new system as a means to increase market stability, nor to undermine it.

Provisions on hop quality⁷⁶, as defined by the regulations currently in force, are described as fair by all interviewees and in no case were reported to be a regulatory barrier to trade. As such they are seen as efficient regulatory provisions as they ensure the quality of hops (either produced in the EU-27 or imported) without hindering trade.

Findings for the evaluation question are:

- The introduction of decoupled aid is seen as neutral in terms of market stability. Producer groups could be considered as an efficient measure to stabilize the markets and reduce volatility. Hop producers are willing to pay for the producer groups in order to stabilise the market and this implies that they are efficient in doing so. Nevertheless, the CAP reform had limited effect on the producer groups so no conclusion on its efficiency can be drawn;
- The trade and quality measures are perceived as fair and do not generate any increase in costs and final prices to consumers; they therefore appear efficient.

⁷⁶ See sections 4.2.2.1.5 and 4.2.2.1.6

8.1.4 Judgment criterion: Extent to which the new CAP measures attained their objective of promoting a more market-oriented and sustainable agriculture in an efficient way

The hop sector was definitely market-oriented before the last reform and things have not changed since. Therefore we cannot say that decoupled aid promoted (nor decreased) the market orientation of the hop sector.

Sustainability encompasses three dimensions: environmental, economic and social.

1. the environmental aspect is tackled more in detail under theme 6: The development of a more environmentally friendly agriculture in the EU is noticeable. The CAP measures related to hops did not specifically play a major role in this, but the producer groups could play a role in the farmer information and R&D.
2. the economic aspect is tackled under themes 1 and 4: The CAP measures related to hops did not particularly affect the production decisions of farmers. The CAP reform did not play a primary role on the hop market, as this is market driven and is not dependent on the CAP.
3. the social aspect is tackled under theme 1.2.: According to our analysis and simulations on the employment in the hop sector, the CAP does not seem to significantly affect employment in the hop sector.

As the CAP measures related to the hop sector have no particular effects on the sustainability of agriculture, we cannot draw a conclusion on its efficiency.

Findings for the evaluation question are:

- The CAP measures are neutral in terms of the market orientation of the hop sector as the sector was already market-oriented;
- Sustainability is hardly affected by the CAP measures.

8.1.5 Conclusion to the evaluation question

As far as the effectiveness of the CAP measures is concerned, we can conclude that the CAP measures related to hops have in general no major impact on the hop sector. The sector was market-oriented for a while and the CAP measures such as producer groups have been in existence for several years. Nevertheless, the CAP measures such as decoupling, producer groups and quality standards could be considered as efficient because they do not create additional costs that are not balanced by sufficient benefits for the growers.

In particular, decoupling can be considered as particularly efficient compared to the previous financial support (i.e. coupled to production) as farmers receive about the same amount of money, but do not have to provide the same amount of information to the EU.

As far as the producer groups are concerned, we can also consider that they are efficient as they provide their members with different services and have a limited, but positive influence on the hop market as a whole. As a potential rough indicator of their efficiency, we noted that their members continue to financially support their producer groups even if they are not obliged to do so. Nevertheless, the CAP reform did not increase (nor decrease) their efficiency.

8.2 Evaluation question 5.2: To what extent have the CAP measures supporting hops contributed to (or counteracted with) achieving a simplified and effective administration and management

In answering this question we focused on the perception of the administrative burden before and after the CAP reform. Unfortunately there is no EU-wide information on the costs generated by compliance with administrative procedures and payments, so that any estimation is country-based and founded mainly on perceptions.

8.2.1 Judgment criterion: Extent to which the administrative burden has increased or decreased after the new measures came into force

8.2.1.1 Administrative burden for producers

According to our interviews within the EU-15 countries, the administrative burden has decreased significantly under the new CAP regime. This is explained by the reduced amount of data that has to be gathered under the decoupled aid regime, whereas previously the Producer Group had to record a range of details on the varieties grown, areas grubbed up and areas resting. Some exceptions can be found in countries that are applying a partially coupled aid scheme with 25% of payments linked to production and going straight to growers. In these countries, for example France, controls on holdings and on production are still carried out and producers may lose the payment if the actual production is lower than the one declared.

In EU-12 Member States such as the Czech Republic or Slovakia, the administrative burden associated with compliance with the new regime (i.e. application for grants) was mostly passed on to growers. Before 2004, under the national aid scheme, the Czech growers' union helped producers with compliance and with filing aid requests. Following accession to the EU, the growers had to apply by themselves for direct payments. Very soon additional external administrative services performed by newly formed companies (mainly consultancies) were required to fulfil all the administrative tasks generated by the CAP including applications for the EAGGF⁷⁷. These services are paid for by the growers and are especially burdensome for small holdings. The UHG⁷⁸ provides only general CAP explanations to growers, but no services.

8.2.1.2 Administrative burden for national authorities

There are no EU-wide statistics or analysis on the administrative burden generated by the management of the administrative procedures related to hops⁷⁹. The government officials we met highlighted that the current regime has reduced radically the costs associated with compliance with the EU regulations and informative needs.

The administrative burden has decreased significantly under the new regime. As an example, in a Member State, the national authorities in charge of data collection and payments employed up to 2 Full Time Equivalents (FTE) during peak times solely to deal with the hop sector. After the reform, the

⁷⁷ These costs are estimated in EUR 2,000 - 5,000 for small holdings, but they may vary according to the number of EAGGF projects farmers apply for. As such it was not possible to obtain a more detailed estimation.

⁷⁸ The Czech Union of Hops Growers, a parallel body of the Czech national cooperative

⁷⁹ We include herein the procedures carried out by the payment agencies and those for statistical data gathering, as requested by the EC.

FTE required was reduced to just 25%. However, this reduction was also facilitated by the digitalization of the entire aid application process with the data which is now gathered by the banks directly from producers⁸⁰.

Within the new system in the Member States where a full decoupling system was adopted, the amount of data to be collected has been largely reduced. However, this could create some gaps in information needed by decision makers in the hop sector.

Findings for the evaluation question are:

- As far as producers as concerned, the bulk of administrative procedures is carried out by producer groups (with the notable exception of the Czech Republic). The administrative burden is perceived as decreasing and producers are generally satisfied with it. When no producer group is active or does not offer consultancy services, the cost of compliance⁸¹ is passed directly on the final users.
- The administrative burden for the public administrations involved in payment management and data gathering was considerably reduced. The procedures are never perceived as cumbersome or problematic by the administrations. However, this could create some gaps in information needed by decision makers on the hop sector.

8.2.2 Judgment criterion: Level of costs generated by the registration of the contracts

Registration of contracts is provided for by article 14 of Regulation (EC) No 1952/2005 which requires any contract to supply hops produced within the Community concluded between a producer or an association of producers and a buyer to be registered. Also, the registration of contracts other than those concluded in advance shall be on the basis of a duplicate of the receipted invoice. The specific provisions related to registration are laid down by Regulation (EC) No. 1557/2006. This Regulation stipulates that a copy of each contract concluded in advance shall be communicated by the producer to the bodies indicated by Member States, within one month of its conclusion. Also, the registration of contracts other than those concluded in advance shall be on the basis of a duplicate of the receipted invoice. The seller may send such duplicates either as and when deliveries are made or all together, but must in any event send them by 15 March of each year. Moreover, for each harvest the Member States shall send the Commission information on the quantity of hops covered by contracts concluded in advance and under other contracts and the quantity of hops remaining unsold by electronic means by 15 April of the year following the harvest concerned.

Registration of contracts is conducted by national authorities or state agencies for payments; we do not have data on the cost incurred for the registration. It is generally seen as a way to obtain hop market statistics by the industry stakeholders; it remains to be seen whether there is any value added from this provision in a system that is neutral to production choices.

Registration of contracts was first introduced in 1973. From the merchants' point of view this is obviously not an optimal solution - since it entails the disclosure of business data. This is especially

⁸⁰ The problem that was flagged by several interviewees is that the new system creates information deficiencies as it is not easy to know the exact area which is cultivated with hops. This is the case in contexts where payments rely on historic payments.

⁸¹ Mainly application filing for obtaining the subsidies.

the case now that the number of players in the market, both on the buyers and sellers' side,-has been reduced. The industry is striving to come up with a solution accepted by all. Meanwhile the regulation is unevenly applied: for instance, in some Member States sellers send their contracts three times a year, and not within one month of conclusion; the level of control by state agencies of the provided information varies according to the Member State. The EU market report based on the actual harvest is the main source of data for the industry. These returns are based on the hop industry in a Member State as a whole, with data differentiated by hop variety and by producers/traders. A report of this kind gives complete information on quantities⁸², but only a partial account of price.

Findings for the evaluation question are:

- Even if we do not have data on the cost, the registration of contracts is not perceived as being especially burdensome, but it is perceived as highly sensitive, especially by merchants;
- The procedure seems to be carried out unevenly across the Member States; It remains to be seen whether there is value added from this provision in a system that is neutral to production choices.

8.2.3 Conclusion to the evaluation question

The 2003 CAP reform reduced consistently the administrative burden for the national authorities and generated savings in terms of time and human resources devoted to the process. The burden on producer groups is perceived as being reasonable and does not entail any significant cost. In cases where producer groups do not provide their members with help on how to file the request for subsidies to farmers, farmers incur additional costs that vary across the EU, as they have to outsource to external consultants.

As such contract registration is not seen as burdensome but the current regulation on the registration of contracts is perceived by merchants as breaching commercial confidentiality because the information has to be reported to national authorities. If the only purpose of the registration is to provide "informative" statistics, we can consider this provision as inefficient. It remains to be seen whether there is value added from this provision in a system that is neutral to production choices.

⁸² As stipulated by Appendix I of Regulation (EC) No. 1557/2006

9 Theme 6 – Overall coherence with CAP objectives

Theme six explores the coherence between the CAP measures supporting the hop sector and the overall CAP objectives of making the CAP more market oriented and respectful of the environment. The theme is addressed through two questions.

- To what extent are the CAP measures supporting hops coherent with the objective of a more competitive and market-related agriculture promoted by the 2003 CAP reform?
- To what extent have the CAP measures supporting hops affected the environment?

9.1 Evaluation question 6.1.: To what extent are the CAP measures supporting hops coherent with the objective of a more competitive and market-related agriculture promoted by the 2003 CAP reform?

This question concerns the extent to which the CAP measures in place after the 2003 reform are in line with the global CAP objectives, without prejudice to farmers' income. Market orientation and a higher degree of competition in the hop sector should result in lower prices for the downstream sector - other things being equal. Farms have to be more efficient to face competition and therefore they have to produce close to marginal cost. This entails lower prices if market entry is allowed. As prices decrease, farmers' gross margins should decrease as well, leading to the exit of the least-efficient producers. Least efficient producers can be those technologically lagging behind, but also small producers that have to distribute high fixed cost across a lower output than big farms. We examined in theme 1 and 4 the trend in price, the trend in gross margin for farmers and the number of market entrants and leavers. Also, the relative weight of the EU as a producer on the world market can give an idea of its competitiveness. We also assess whether there has been an increase in productivity, whether the producer groups managed to foster technical developments and whether stability of the markets has been promoted. In seeking to strike a balance between a market-oriented agriculture, and the stability of revenues for growers, the closer the sector gets to a free market, the more farmers are exposed to revenue volatility.

9.1.1 Judgment criterion 1: extent to which market for hops has become more competitive

The competitive position of the EU as a single hop producer has eroded. However, within the EU market some countries such as Germany have definitely gained ground and market share at the expense of others.

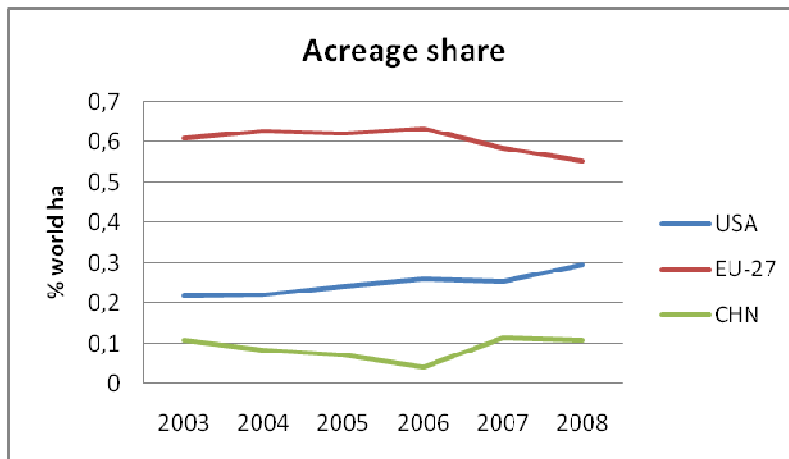
9.1.1.1 Relative position of the EU in the world market for hops

The relative position of the EU in the world market is declining. The EU-27 is still the largest hop producer worldwide, but its share is shrinking compared to the US and China. Large hop producers are aware of this trend and would like the EU to act to improve their competitive position. However, some of the competitive advantages enjoyed by the US are due to their production structure that is based on fewer, larger farms. In this respect the room for EU action is small. Within this context, decoupling makes it easy to switch crops and therefore should promote a better allocation of resources for EU agriculture, by directing farmers' efforts towards more profitable crops. Moreover,

decoupled aid is not linked to any conditions and farmers can in principle use it for the purpose they wish, including investments. The fact that they do not do so could be an explanation on the perceived future profitability of the hops' industry but, according to our analysis under theme 1 and 4, switching to other crops does not take place because of the implied write-off of capital investment and the relative profitability of hops compared to most alternative crops.

The lack of investment trends made by EU-27 hops farms does not allow us to draw strong conclusions concerning the reason why investments are not high enough to keep pace with the US industry. From the interviews it seems that the investment gap is higher for small farms than for large farms, but this scenario varies across the EU. However, the deterioration of the EU competitive position is a fact. The following figure shows the decline of the EU in global hop area.

Figure 19 – EU acreage share compared to main competitors

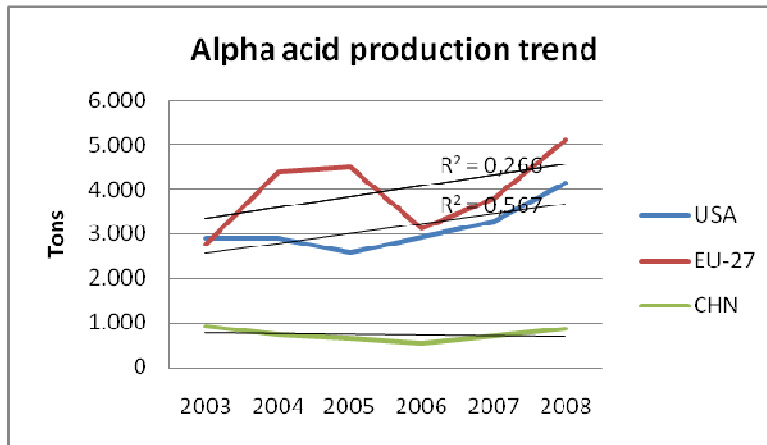


Source: Eurostat, adaptation Deloitte

This trend is accompanied by much higher alpha yields in the US (261 Kg/ha against 173 Kg/ha in the EU in 2008), and by a more competitive US production structure. The improving competitive position for the US is not yet fully reflected in production figures as the new hop areas planted in 2007-08 have still to come into production. The following figure shows the trend of alpha acid production. The EU-27 leads the way, but is tending to experience a more volatile production trend. This is due to a higher vulnerability to weather conditions in some areas and the agronomic environment. The higher volatility is shown by the higher R^2 index⁸³.

⁸³ The R-squared is a statistical measure of how well a regression line approximates real data points; an r-squared of 1.0 (100%) indicates a perfect fit.

Figure 20 – Alpha acid production trends



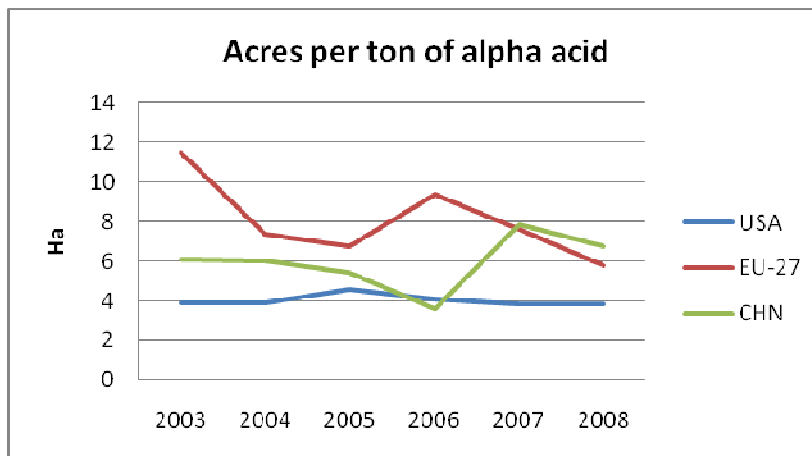
Source: Eurostat, adaptation Deloitte

However, the market share of the EU seems likely to decline, or at best stagnate, in the coming years according to most interviewees. The main structural factors that make the US more competitive than the EU are:

- Lower degree of fragmentation of hop farms in the US: the average American hop farm is as big as 200 ha against an average size of 10-30ha in Europe;
- Higher degree of mechanisation and technology; this is reflected by the economies of scale which are possible in the large American holdings. A solution has been to pool machinery amongst farmers, but this has not always worked optimally.

Another variable that may shed some light is the number of acres needed to obtain one tonne of alpha acid. This is summarised in the figure below.

Figure 21 - Acres need to obtain a tonne of alpha acid



Source: Eurostat, adaptation Deloitte

The gap in productivity still seems rather wide. However, the change in production structure ongoing in Europe is generating productivity increases. This is due to two main effects that come into play: the introduction in Europe of super bitter varieties that offer higher yield and the increase in the average size of hop holdings in Europe that makes technological innovation easier⁸⁴.

Several interviewees have expressed a desire that CAP support be directed towards efforts to improve productivity and to close the technological gap with the US. Measures suggested by the interviewees, such as tax breaks on investments in machinery or subsidies directed at the replacement of machinery, may not always be feasible. However, they point to the increasing perception that producers have of their deteriorating competitive position. With a more fragmented production structure the only way for the EU to stay competitive is to pool resources. The German industry has managed to pool their resources effectively in a number of areas (including R&D) and its competitive position has improved. This was possible because of the presence of active producer groups and the critical mass (in terms of number of holdings) that made it possible to endow the producer groups with a substantial financial envelope.

9.1.1.2 Number of market entries and exits

We showed under theme 2 that market exits greatly outnumber market entries, with more than 500 growers leaving the hop sector in 2004-2007. Only one farmer in the UK entered the market in the same period. Due to mergers and acquisition, the average area of hop farms in the EU is increasing (except in the UK), but the total cultivation of hops in the EU is decreasing (see Table 1: -3,000 ha during the period 2001-2008). The decrease in the number of producers is a direct result of the inadequate European production structure; in Europe the average size of a hop farm is too small to recover the high fixed costs. Small holdings also find it difficult to invest in innovative machinery to stay competitive. Furthermore the size of the hop sector in most countries is so small that they do not manage to find enough money to invest in R&D. Only Germany (and to a lesser extent the Czech Republic and the UK) intensively finance R&D in Europe.

Interviewees see the process of concentration of the production structure as inevitable. Likewise, the decrease in the number of producers is also due to the ageing population of growers, a phenomenon which is not going to be reversed in the short-term.

Findings for the evaluation question are:

- The EU-27 is still the leader in the hops market in absolute terms. However, the EU is lagging behind the US in terms of productivity. This could undermine the leading position of the EU in the long-run;
- The level of the technological development in the EU farms is still lower than in the US;
- European hops growers are exiting the sector partly because of the retirement of older growers who are not replaced by new entrants. Mergers and acquisitions happen, but not to such an extent to keep the cultivated surface at the same level. The total area of hops is decreasing.

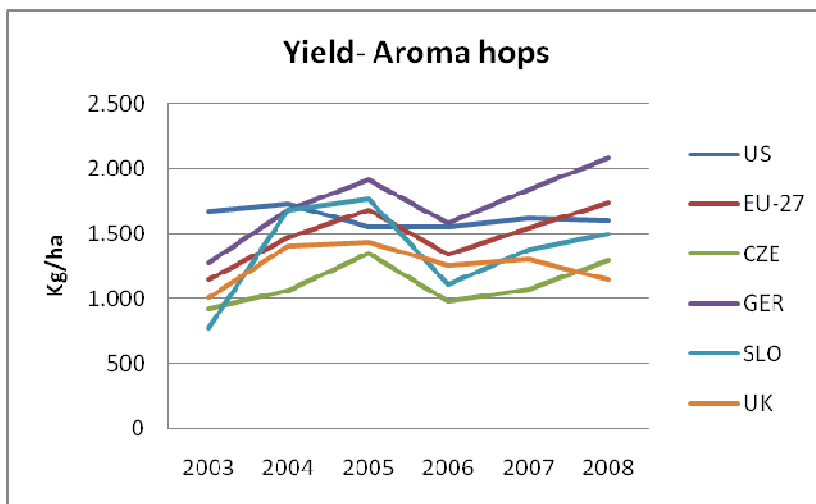
⁸⁴ We are aware that this analysis is not conclusive, as it assumes that a higher alpha production per hectare means better productivity and higher income. This is likely to be so, but it is not necessary true as some aroma varieties may be sold at higher price than bitter. However, we do not have data on income or gross margin for the US and China so that an analysis in this sense is impossible.

9.1.2 Judgment criterion 2: extent to which productivity increased

9.1.2.1 Trend in hops yield

We articulate this analysis for both aroma and bitter hops. Productivity in aroma hops has improved in the EU in the last few years. This is not due to the CAP, but rather to the European producers responding to market incentives and trying to catch up with the US. However, the picture within the EU is varied: Germany managed to catch up and surpass the US in terms of yield⁸⁵, but the Czech Republic and other main European aroma producers are still lagging behind in terms of yield. This is due sometimes to deliberate strategic choices (the Czech producers insist on growing the Saaz variety despite its low yield, because of its high quality) but also to the difficulty of investing in new hops varieties and new hops gardens.

Figure 22 – Yield for aroma hops

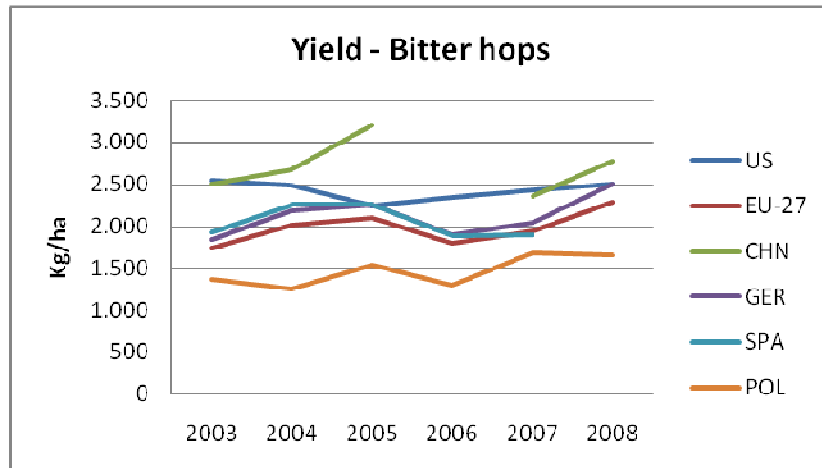


Source: Eurostat, adaptation Deloitte

As far as bitter varieties are concerned, the position of the EU seems slightly worse in terms of productivity. The following figure provides the reader with an illustration of this.

⁸⁵ The data series for yield are of course affected by the climate and agricultural conditions of a given year. Our judgment is therefore always based on the main trend calculated over the six years considered

Figure 23 – Yield for bitter hops



Source: Eurostat, adaptation Deloitte

Germany improved its yield considerably in the last five years and has closed the gap with producers in the United States. The other major European producers remain well below the American levels of productivity. This is because of the varieties grown in Europe, which tend to be less rich in alpha acid than American varieties. However, the lower degree of technological development and the lack of irrigation also explain this trend (if we draw a regression line for Spain we find out that the trend is even negative). This seems the most plausible explanation for cases such as Spain that has 90% of Nugget hops, whose yield is potentially amongst the highest (11%-13%) in terms of alpha content.

9.1.2.2 Increase of yield potential in new varieties

Several new varieties have been developed and released in Europe and the United States in the last years. For example, three new varieties were developed and have started being grown in the Czech Republic:

- **Agnus:** a high-alpha variety was released in 2001. Its alpha acid content ranges from 11% to 15%. In 2009 Agnus is already the most common bitter variety in the Czech Republic, with 58 ha devoted to it;
- **Harmonie:** a new aroma variety that has an alpha acid content of 5%-8%;
- **Rubin:** another high-alpha variety that has an alpha acid content of 10%-14%.

The **German Hops Research Centre** in Huell is the most active research centre in Europe and the result of a focused co-operation between the German Society of Hops Research (Gesellschaft für Hopfenforschung e.V., a private organisation), supported by its members — mainly breweries — and the Free State of Bavaria, represented by the Bavarian State Research Center for Agriculture (Bayerische Landesanstalt für Landwirtschaft). The aim of setting up such a centre is to develop varieties with excellent brewing quality, good agronomic performance and a high resistance towards several diseases and pests. The main rationale of research on hops is *“to meet the high demands of the hop and brewing industry it is necessary to reduce the long process of the selection and phenotypic assessments of promising breeding lines. In general, it takes 12 to 15 years to develop a*

*new hops variety*⁸⁶.” Several successful varieties have been developed in the Hops Research Centre amongst which:

- **Perle:** a common German aroma hops with high alpha content (6.5%-9%) and aroma similar to Hallertau Mittlefrüher. Germany had 3,400 ha of Perle in 2009. This makes it the most common aroma variety in the country. Perle is also grown in Austria and Poland;
- **Hallertauer Tradition:** was developed in the 1990s and it is now the second most common aroma hop with 2,700 ha (2009). It has an alpha content of 5%-7%;
- **Magnum:** a bitter aroma variety that has an alpha content of 10.0%-12.6%. It is resistant to diseases and grown in several countries, among which Germany (4,200 ha), Austria, France and Slovenia;
- **Taurus:** another common bitter hop, is extensively grown in Germany, with 1,250 hectares in 2009;
- **Herkules:** it is a recently-developed high alpha variety. Its alpha acid content ranges from 12% to 17% and it very resistant to diseases. Because of these characteristics 2,100 hectares have been planted with this variety in only a few years and it is already the second most-common bitter variety in Germany.

In addition to the varieties developed, the German R&D centre - in collaboration with the Bayern government – has also fostered academic research on hops and has sponsored the production of several seminal papers and scientific articles, as a review of the literature demonstrates.

The **Wye Hops Research Centre** (UK) has traditionally been one of the most active in Europe. However, the lack of funding has disrupted its activity in recent years. In 2007 Defra ceased its funding and since then the centre has survived on grants given by the industry and by the Institute of Brewing and Distilling. We provide more details in the UK case study. Other EU-27 countries do not perform major research activity on hops as there is a lack of state funding. The withdrawal of state funding has had an inevitable impact to the detriment of R&D as the hop sector is not big enough to attract sufficient financing from growers or the private sector⁸⁷.

Research and Development is essential to ensure the sustainability of the EU position in terms of productivity in the long-term. If the EU decides to foster R&D in the hop sector –as in other sectors – a case for subsidiarity would emerge. The literature for centralised R&D activities at the EU level is wide⁸⁸. It is mainly based on the concepts of economies of scale and policy externalities deriving from a common R&D policy. Several producers outside Germany have expressed concern at this and have called for the CAP to finance these efforts.

⁸⁶ “Genome analysis in hops- a powerful method for improving an essential raw material for brewing”
S. Seefelder, K. Kammhuber et al. (2005).

⁸⁷ There are exceptions to this. In England the Institute of Brewers and distillers provided grants to the Wye research centre after the UK government cancelled its grants. However, this does not compensate for the loss.

⁸⁸ For all, we mention “Subsidiarity and EU support for innovation” by Lejour, Koskelinska, Sluismans
http://www.proinno-europe.eu/admin/uploaded_documents/Mini-study_3-final.pdf

Findings for the evaluation question are:

- The EU is lagging behind in terms of yield per hectare. This holds true for both aroma and alpha varieties;
- The picture within the EU is rather mixed. Germany has yields which are comparable or even higher than the American standards. Other countries are seriously lagging behind;
- New varieties are still being developed in Europe, but the lack of public funding could become an issue. The German model of research funded jointly by the industry and by government seems to be the one that produced most results so far.

9.1.3 Judgment criterion 3: extent to which technological progress has been fostered

9.1.3.1 Perception of the interviewees on the improvement in agronomic practices

The introduction of **dwarf varieties** in the UK is a noteworthy technological advancement in the hop sector. Dwarf varieties were developed at Wye in the 1990s and released in the first years of the century. Their main characteristic is their height, limited to 3 metres and they are grown on 2.44 metres long wire-works. If introduced in the entire EU, these new varieties may potentially generate huge savings in terms of labour, as mechanical harvesting is easier on low wire-works. Furthermore, dwarf varieties are easier to be inspected by growers looking for diseases and pests and can be more easily treated with pesticides if necessary.

First Golding was bred in 1995 and this is nowadays the most common dwarf variety developed so far and it was grown on 173 ha in England in 2007. In a few years since its introduction, First Golding had therefore become the second most common aroma variety in England, mainly because of its high alpha acid content (8.1%) and its resistance to Verticillium Wilt.

Breeding of dwarf hops adapted to new trellis system is crucial, and efforts in breeding such kinds of varieties are ongoing in most of current breeding programs. As it takes several years to breed such varieties, their EU-wide commercial release is not expected shortly. Besides the introduction of dwarf varieties, no other technological breakthroughs were reported. Interviewees reported that significant efforts have to be made in order to deal with evolutions in pests and diseases. The ongoing climatic changes lead to the appearance of new plant pests (e.g. *Psylliodes attenuate*) which were previously not a significant problem in hop gardens. Interviewees expressed their concern that no financial aid exists to cope with such developments. Several other phytosanitary issues have been mentioned such as the resistance of aphids to Imidacloprid in the Czech Republic.

The renewal and acquisition of new harvesting and processing machines is a serious concern for small producers who have difficulties in obtaining the necessary loans from the banks. Banking conditions discourage the renewal of harvesting equipment and this sometimes condemns small producers to low productivity.

The solutions proposed by producers vary from loan guarantees given by the producer groups, to collective ownership of the means of production, to direct CAP investment support. Collective ownership is viable for processing machinery, less for harvesting and seasonal work tools because farmers need access to the machines at the same time.

Findings for the evaluation question are:

- There are models in the EU hop sector for technological innovation, but small farms are suffering from under-investment in harvesting and processing machinery;
- Dwarf varieties – more resistant to diseases and pests - may reduce the labour costs associated with hop growing in the near future, but their commercial release cannot be envisaged shortly because of the new investments that have to be made (e.g. new machines and change of infrastructures).

9.1.4 Conclusions for the evaluation question

The EU's dominant position in the hop sector is threatened by the United States where producers enjoy higher productivity and where the productive structure is more competitive. The CAP measures do not play a direct role in this. Decoupling and other CAP measures have not influenced the process of restructuring that is taking place in Europe⁸⁹. This market-driven process has obliged a number of producers to abandon hops⁹⁰, and has resulted in an increase in the average size of hops farms. Nevertheless the cultivated surface is decreasing. The new entities that have emerged should be more efficient thanks to the economies of scale. European researchers managed to develop new varieties; growers have renewed hop gardens and have recovered much of the ground lost to the US in terms of productivity. This is the case for Germany, but not for other EU countries that are still lagging behind in terms of productivity. Germany has been successful because it managed to innovate and to quickly shift to high alpha varieties.

Technological development and the low degree of mechanization of most European farms seem to be a major obstacle. According to our analysis, income subsidies have not triggered the investments needed to overcome these challenges. Greater capital intensity in hop production would require more targeted investment incentives and loan guarantees.

Research and Development is a vital variable for maintaining the competitiveness of the European hop industry. The evidence gathered shows that when the public sector withdraws from R&D, the remaining funding is not sufficient to keep the research activity at full-speed.

In the evaluation period decoupling did not have a significant positive impact on the level of competitiveness and the degree of market orientation since the hop market was already competition-based and market-oriented before the reform. However, as decoupling facilitated farmers to switch to other crops or to sell their land to other hops farmers, these enhancing effects can be expected over time and therefore the new measures related to the hop sector have been coherent with the reform objective of increasing competitiveness and strengthening market orientation.

⁸⁹ In this chapter we only presented figures on yield, which show the higher productivity of the US. Concerning the production structure, more information can be found under Theme 2.

⁹⁰ Decoupling in principle allows farmer to get subsidies even if they do not produce anything. This may have a role in some cases in causing early retirement, but we assume it is minimal due to the small entities of the subsidy compared to hops' growing costs and revenues. See Theme 1 for more information on this.

9.2 Evaluation question 6.2.: To what extent have the CAP measures supporting hops affected the environment?

In order to answer this question we analyse the extent to which the new CAP measures had an impact on the environment. Our analysis will concern the aspects that may impact the environment and will be threefold:

- Analysis of the impact of production techniques of hops;
- Analysis of land abandonment trend;
- Analysis of the usage of fertilisers and pesticides in the hop sector.

At the end we will draw common conclusions for the overall impact of the CAP measures on the environment in the extent they are linked to the reform.

9.2.1 Judgment criterion 1: extent to which rural maintenance has been promoted

9.2.1.1 *Effects from irrigation*

No new techniques have emerged in recent years beyond the emergence of the dwarf varieties we have discussed in the previous section. Breeding new varieties is part of the usual R&D process and is not due to the new CAP measures. Likewise, new varieties (both dwarf and normal varieties) generally have a positive effect on the environment as they are resistant to a higher number of diseases and parasites, and thus reduce the need for pesticides.

The adoption of modern irrigation systems is not linked to the CAP measures, but has nevertheless had positive impacts on the environment as water consumption has been reduced. The application of progressive economical irrigation systems is recommended to produce an efficient irrigation system. Drip irrigation for hops can be placed on the ceiling of a wire-work (irrigation detail is placed above rows of hop plants) or underground (in which case irrigation detail is placed 60 cm under the ground level in the space between hops plants). Drippers can be used to provide a uniform rate of irrigated water (2 l/hour).

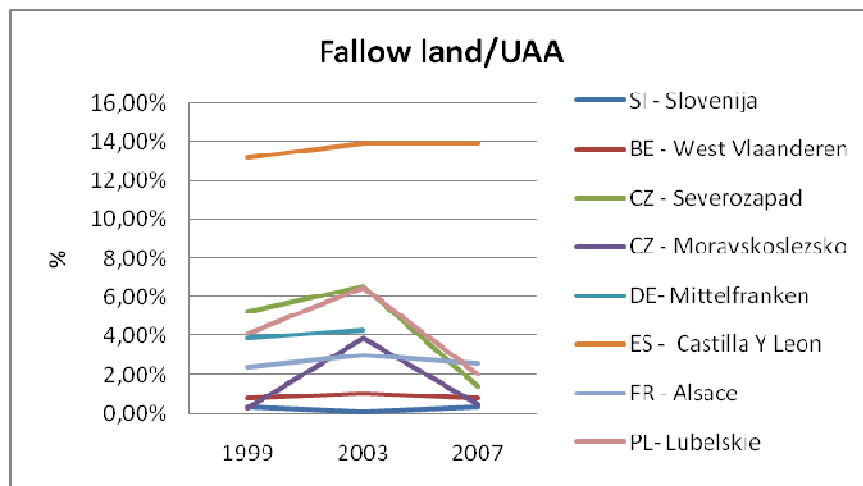
Irrigation is nevertheless a local problem as not all hop producing Member States require it. Farmers who decide to invest in better irrigation could have a positive effect on the environment, but on the other hand, farmers who start irrigating have a negative effect as they consume more water than before.

9.2.1.2 *Trend of land abandonment before and after the reform (distinguishing from set-aside)*

Land abandonment does not seem to be an issue according to the great majority of interviewees. Interviewees in the United Kingdom and Germany noted that land abandonment is not an issue in their respective Member States. The only producing region where some problems were reported was the León region in Spain. Indeed, hops are mostly grown in areas endowed with a diversified agricultural sector and buyers of land can easily switch to other crops. In the other countries, farmers who decide to stop growing hops usually sell their hop gardens to new owners, many of whom are already in the sector. Nevertheless, the total EU hop area is decreasing.

The Eurostat database does not contain regional data for land abandonment. It does so for fallow land, but no increase can be seen in the last years. The following figure shows the percentage of fallow land on the Utilised Agricultural Area (UAA).

Figure 24 – Percentage of fallow land on UAA



Source: Eurostat, adaptation Deloitte

Again, the percentage of fallow land in the hop producing regions is generally well below the European average of 6%. The only exception seems to be Castilla y Leon, thus confirming the reports of interviewees. We do not have data for the UK, but we are confident that land abandonment is not a problem here. However, it must be highlighted that the observation period is rather short and the effects of the reform may not yet be visible.

9.2.1.3 Usage of fertilisers (volumes) before and after the reform

Here we want to assess whether the CAP reform has provided an incentive in adopting less intensive production schemes.

Fertilising hops improves yield and quality by supplying the crop with ample nutrition in advance of demand. In highly intensive hop production systems, fertilisers are used in large quantities for optimising the yield. Since one-third to one-half of the nitrogen (N) in hops is found in cones, a higher yield requires more N than a lower yield. Fertiliser rates for the 3 main nutrients (Nitrogen, Phosphorus (P) and Potassium (K)) depend also on the availability of each nutrient in the soil and uptake capabilities which are based on climatic conditions.

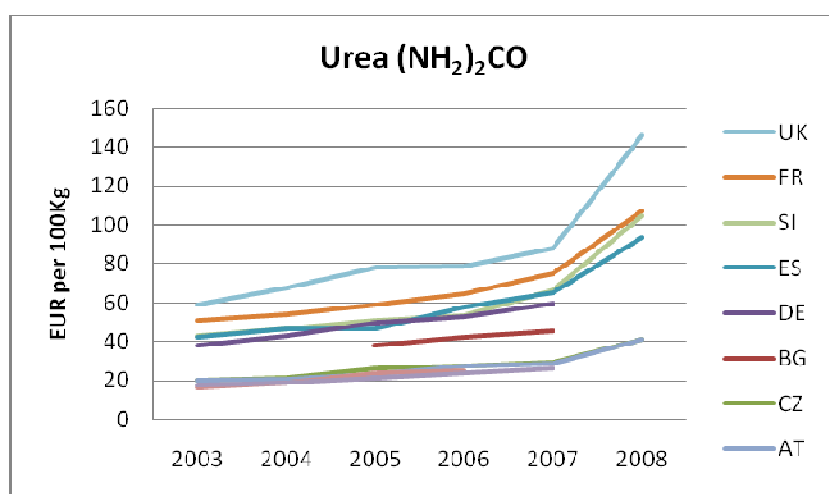
Hops require about 100-150 U/ha of N, 20-50 U/ha of P, and 80-150 U/ha of K depending on cultivar, age, and expected yield. In addition to commercial fertiliser, soil organic matter, manure, cover crops, and returned hops vines can supply substantial N for hops production. As such a large part of the yield depends on fertilisers; growers are very unlikely to reduce the amount of fertilisers consumed, irrespective of the cost.

The producers we met during fieldwork praised the effects that stringent CAP measures are having in terms of fostering a more responsible use of fertilisers. There is a widespread awareness of cross-

compliance and on the fact that farmers should comply with environmental protection requirements as a condition for benefiting from CAP payments. Concerning fertilizers we could not obtain any data on the reduction of fertilizers use per hectare. The interviewees reported that the absolute quantity of commercial fertilizers has decreased, but this could be linked to external factors, such as the reduction in area.

Hop producers also complained about the rising price of fertilizers: this is easily verifiable as Eurostat provides figures on the cost of the most common fertilizers used in hop growing and the price increase in the last few years has been dramatic. We present below a figure showing the cost trend of one of the most common fertilizers as an example⁹¹.

Figure 25 – Cost of most common fertilizers for hops



The costs of fertilisers are rising in the EU⁹². This trend is particularly marked in the UK where fertilisers are especially expensive, particularly ternary fertilisers⁹³.

⁹¹ For this graph it was not possible to build a EU-27 series

⁹² Fertiliser price per Unit of nutrient is correlated to oil prices (especially Nitrogen) Therefore increases in price follow the oil price evolution. It is expected that prices will decrease slightly in 2009..

⁹³ Loosely defined specifications, or the use of unit values, may cause considerable "unit value bias", i.e. distortions due to the fact that for instance quality or variety changes are treated as price changes. For example of ternary fertilizers, is loosely defined (i.e. 1 -1-2) and an important quality characteristic such as the concentration of N-P-K is omitted from the definition, and the price observed is the average price (unit value) of the same product with different ratio of N-P-K, then this average price may increase simply for the reason that the concentration of N-P-K was increased between the two periods.

http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/apri_pi_sm1_an1.pdf

9.2.1.4 Usage of pesticides (volume, tox and eco-tox products profile) before and after the reform

The usage of pesticides has been at the centre of policy debate in the EU. This is the aspect of environmental protection to which hop producers have been the most exposed. The decrease in the number of pesticides available to protect hops is due to the reduction of active substances included in the Annex I of Commission Directive 91/414/ authorised within the EU⁹⁴, but not particularly to the CAP measures. Several studies have been carried out on the residuals from pesticides that remain in the processed hops. A German study⁹⁶ concluded as early as 1991 that *“pesticides are partially and differently removed from the hops, however, there is no total decontamination. Primarily, only few quantities of pesticides should be used, more resistant hops varieties should be bred. In view of the possible interactions with other substances, the estimation of the toxic potential of an active substance is nearly impossible”*. More recently another study⁹⁷ examined seven agrochemicals used in hops (chlorfenapyr, quinoxifen, tebuconazole, fenarimol, pyridaben, and E- and Z-dimethomorph) to conclude that no dangerous residues from these pesticides exceeded 0.0005 ppm (parts per million) in beer except for Z-dimethomorph. This is well below the accepted threshold.

There are also no data available on the current use of pesticides. Interviewees have mentioned a substantial decrease in the use of pesticides, partly resulting from the introduction of more resistant hop varieties. In particular they have pointed out a more responsible approach towards spraying near to water courses and inhabited areas. However, without specific data collected, this information cannot be verified. Moreover, the composition of pesticides has changed as the continuous review of the active substances to be included in Annex I of Commission Regulation No. 91/414 leads to the consequence that authorised active substance have a more positive toxicity and eco-toxicity profile today than 5 years ago. Therefore it can be concluded that pesticides in use today are more environmental friendly than in the past.

Another element to be considered when talking about fertilizers and pesticides is the correct usage of these agricultural inputs. Environmental effects can be evaluated by measuring volumes and composition of each individual input, but also by the way farmers apply them. In most agricultural crops, “good farming practices” have been developed to use these inputs efficiently, thus leading to volume reduction and, for example, less leaching of fertilizers.

The interviews have not permitted us to identify any activity leading to the development of good farming practices for the cropping of hops and that could have a positive effect on the environment by a reduction of volumes of these inputs.

⁹⁴ The current list of pesticides allowed can be found in DG SANCO website:

http://ec.europa.eu/sanco_pesticides/public/index.cfm?event=commodity.resultat

⁹⁵ Council Directive 91/414/EEC concerning the placing of plant protection products on the market

⁹⁶ Forster, A., Beck, B. Gehrig, M. Pesticides remaining in hops at the production of hops products (1991).

<http://www.barthhaasgroup.com/cmsdk/content/bhg/research/scientific1/38.html>

⁹⁷ Method development and fate determination of pesticide-treated hops and their subsequent usage in the production of beer HENGEL Matt J.; SHIBAMOTO Takayuki, (2002)

Findings for the evaluation question are:

- New dwarf varieties have been bred recently. Hop producers have tried to increase profitability by increasing irrigation and by adopting more modern irrigation systems that could have a positive influence on the environment where existing irrigation systems are more water consuming ;
- Land abandonment does not seem to be a major issue in most of the areas where hops are grown. Spain is a possible exception, but the data in our possession is not conclusive in this sense as the observation period is short;
- The use of pesticide and fertilisers has become much more expensive for hop growers, mainly due to the production cost increase due to oil price increase;
- Positive effects on the environment are also observed as volumes of consumption of fertilisers have decreased but, also, because authorised pesticides have a more positive environmental profile. Toxic and ecotoxic active substances are progressively banned in the EU under Commission Regulation No. 91/414;
- The reform of the CAP measures related to hops has had no particular influence on the environment.

9.2.2 Conclusions for the evaluation question

The impact of the change from coupled production aid to decoupled aid does not seem to affect the hop sector in respect of environmental protection. Overall, the available evidence points towards better environmental practices, thus confirming what has been reported by the interviewees. However, this is not due to the introduction of the new CAP measures related to hops. The introduction of new varieties is independent of the CAP measures in force and contributes to reduce the need for fertilizers and pesticides. In the case of irrigation, better environmental practices could coincide with cost reduction (less water consumed by more efficient systems). In the case of land abandonment the trend is decreasing except for Spain, but the observation period is too short to notice any change due to the new measures.

Fertilizer use has a significant impact on yield so it is unlikely that a price increase will cause a substantial decrease in consumption. Generally, producers may well choose to use less fertilizers and to reduce their yield (and absolute production), as subsidies are not linked to production anymore. However, since hop production is driven by market demand and price it is unlikely that producers will sacrifice yield.

The development of new hop varieties with greater resistance to pests and diseases is likely to decrease the consumption of pesticides.

The fact that the list of active substances of fertilizers and pesticides allowed by the EU is getting tighter at every review has certainly had a positive effect in terms of environmental impact. Moreover, good farming practices are more and more widespread in the EU, causing a more responsible use of fertilizers and pesticides.

Part IV: Conclusions and recommendations

10 Conclusions

In this section we present the main conclusions of this evaluation report concerning the effects that the 2003 CAP reform – which is the focus of this evaluation – has had on the hop sector. With regard to the 2003 CAP reform:

- The reform introduced decoupled support not linked to production for hops growers. Some countries decided to adopt a transitory partial coupling regime, with 25% of the payments still linked to production;
- No country used the option under Article 69 that allowed aid for protection of the environment or for improving the quality and marketing of agricultural product;
- Other CAP measures – such as the producer groups and the provisions on quality certification - were left mostly untouched by the 2003 reform.

Conclusions are presented by evaluation theme⁹⁸.

10.1 Theme 1: Effects on primary production

Production in the hop sector is market-oriented and driven by profitability. There are no signs that CAP measures introduced after the reform had a significant influence on the production decisions of hops farmers in the traditional production areas; among other elements we note that:

- The EU-support is only a small part of the gross margin for hops growers. This implies a small impact on the profitability of hops growing;
- The gross margin of alternative arable crops is (normally) lower than the gross margin of hops. A switch to a lower margin crop is not likely;
- Farmers are not motivated to grow alternative crops. On average the farm results of hops farms are relatively good. The average farm income on hop farms is significantly higher than on farms with a comparable farm structure not producing hops. The remuneration for inputs of the three primary production factors (ground, labour and capital) on most hop farms is higher than other, comparable, farms. This is the case for Germany, as well as for the Czech Republic.
- Moreover, most arable crops (such as cereals, sugar beets and starch potatoes) were supported as well before the CAP reform. Their support is (fully or partially) decoupled too. As a result the difference between gross margin of those crops and of that of hops did not change much;
- The high investments in hop gardens and in hop-specific equipment will prevent hop farmers switching crops because untimely grubbing up of hops gardens will cause a large capital write-off.

It is interesting to note that in Member States with full decoupling a sharper decrease of the hop area has occurred compared to Member States with partial decoupling. Nevertheless, we do not have any evidence of a causal link between decrease of hop area and the extent of decoupling.

⁹⁸Some of the conclusions are based on information only available for Germany and Czech Republic.

Moreover, the EU support for hops is not a primary income source for European hop farms as it only accounts for around 5% of total returns according to our simulations. The subsidies are more important for income maintenance and economic viability of Czech than of German holdings. The relatively small EU support has no significant influence on farmers' decision to continue or to stop growing hops as the relative profitability of hops is still high without support.

10.2 Theme 2: Effects on production structure

The European production structure of the hops sector does not seem to be affected by the CAP measures related to hops as it continues to follow the same trends which were ongoing before the reform. The production structure is characterized by the following main trends:

- Decrease in the absolute number of growers: an estimate of 528 growers stopped producing hops in the years 2004-2008;
This phenomenon is due to farmers' retirement and small-size farms that do not provide the farmers with sufficient income;
- The area in Europe is dwindling as well, following the world trend. This is due to the launch of new bitter varieties that provide a higher yield per hectare so that less acreage is needed to produce the same amount of alpha acid;
- As the decrease in number of growers is sharper than the decrease in area, the average size per farm in Europe is increasing;
- Traditional production areas are mostly shrinking, but are not changing. Production areas in the Member States not covered by the case studies are also following similar patterns.

The CAP measures did not affect the trends mentioned above, decoupling may have a small role in encouraging crop changes, but it is certainly not the decisive factor. The time series we presented show that these trends were already ongoing before 2004 and continued at a similar pace after the reform.

10.3 Theme 3: Effects on the downstream sector

The introduction of decoupled aid did not have any significant effect on the downstream sector. The CAP reform did not modify the trend in beer and alpha acid production and no significant effect (in terms of either volume or quality of production) on the needs of processing industries can be ascribed to it.

The geographical distribution of the downstream sector is not affected at all by the hop sector, irrespective of the CAP reform. Large brewers keep on buying hops by merchants and are neutral to the origin of these hops as far as they comply with the EU quality requirements and their own demands. However, some micro-brewers are emerging and are more linked to the territory and to the denomination of origin of hops.

Price and quantity are the most important elements determining the origin of hops for the large brewers. The objective of ensuring a sufficient level of production in traditional areas seems not to be considered as relevant to the needs of the processing industry.

The current CAP measures play a role in ensuring the stability of the markets, especially through producer groups. Producer groups were not affected by the 2003 CAP reform. Decoupling does not

seem to have had any substantial effect on the downstream sector and on market stability in particular. Producer groups manage to reduce the effects of price volatility for growers. The producer groups' main tool to limit volatility is a market instrument, namely forward contracts that they conclude on the behalf of their members.

The process of concentration in the brewing sector may affect the hops purchasing strategy of brewers, but no effect on price can yet be distinguished. This is probably because the price formation mechanism is also affected by mitigating factors such as the recent proliferation of smaller breweries, so that a net effect on prices cannot be singled out. However, the structure of the downstream sector does not seem to be a primary aspect of price formation in any case.

10.4 Theme 4: Effects on rural development

The CAP measures related to hops in force after the 2003 reform did not play a primary role on rural development in terms of employment and economic viability.

Concerning employment we can draw the following conclusions:

- Due to lack of data it is not possible to know whether farmers stopped farming altogether or switched to other crops. It is therefore difficult to calculate the net effect on permanent jobs. There is little evidence of net job losses in the hop sector. However, according to the simulations conducted during the study (on Germany, France and Slovenia) and the interviews, we can assume that a small net job loss effect is taking place in the sector.
- The demand for seasonal workers remains unaltered as this is related to the area rather than to the number of farms.

The economic viability of European farms has come under continuous strain in recent years due to increased international competition and the extraordinary volatility of the hop market. Increases in costs (notably fuel and electricity) also played a role on the pressure on profitability while prices have remained relatively stable (except for the spot market).

Nevertheless, we concluded in theme 1 that growing hops is profitable in terms of revenue compared to other crops and on average provide sufficient levels of revenue for farmers on average.

Producer groups have played an important role in sustaining the competitiveness of their members, especially in uncertain times.

We can conclude that large hop farms in countries such as Germany with strong producer groups are economically viable.

10.5 Theme 5: Efficiency, management and administration

As far as the effectiveness of the CAP measures is concerned, we can conclude that decoupling has no major influence on the hop sector. The sector has already been market-oriented for some time. The measures that have the largest influence on the sector, such as producer groups and quality standards, remained unchanged by the reform. We could conclude that the CAP measures such as

decoupling, producer groups and quality standards could be considered as efficient because they do not create additional costs that are not balanced with sufficient levels of benefits for growers.

The 2003 CAP reform reduced consistently the administrative burden for the national authorities and generated savings for the farmers in terms of time and human resources devoted to the production process. The burden on producer groups is perceived as reasonable. In cases where producer groups do not provide their members with help on how to file the request for subsidies to farmers, farmers incur additional costs. Decoupling can be considered as particularly efficient compared to the previous financial support (i.e. coupled to production) as farmers receive about the same amount of money, but do not have to provide the same amount of information to the EU. Less money has to be invested in administrative activities due to decoupled support.

The rationale of the current regulation on the registration of contracts is dubious: on the one hand the structural information included therein would be available anyway to the Commission through national reporting and on the other hand, the information on contracts is disclosed without bringing any added value to the Commission. If the only purpose of the registration is to provide “informative” statistics such as those on production structures, we can consider this provision as inefficient.

10.6 Theme 6: Overall coherence with the CAP policy

The position of the EU as the main global hop producer is threatened by the United States, where producers enjoy higher productivity and where the productive structure is more competitive. The CAP measures do not play a direct role in this. Decoupling and other CAP measures have not substantially influenced the process of restructuring (mentioned under theme 2) that is taking place in Europe. Decoupling did not affect significantly the competitiveness or the orientation of a market that was already competition based and market-oriented. As such, we can say that the new CAP measures were neutral with respect to the latter objectives of the reform.

European researchers managed to develop new varieties; growers have renewed hop gardens and have recovered some of the ground lost to the US in terms of productivity. However, technological development and the low degree of mechanization of most European farms seem to hinder a complete catch up. Subsidies are not deemed high enough to fill this gap.

As far as the environment is concerned, the impact of the change from coupled production aid to decoupled aid does not seem to have had an impact. Overall, the available evidence points towards better environmental practices. This is not due to the introduction of the new CAP measures related to hops but the producers organisations may have contributed to the dissemination of better environmental practices and certainly have a potential to do so. The introduction of new varieties is independent of the CAP measures in force and contributes to reducing the need for fertilizers and pesticides. In the case of irrigation better environmental practices could coincide with cost reduction (less water consumed by more efficient systems). In the case of land abandonment the trend is decreasing, but the observation period is too short to notice any change due to the new measures.

Concerning in particular the use of fertilizers it can be said that these have a high impact on the yield of crops so it is unlikely than an increase in price will cause a decrease in consumption. Producers may generally choose to use less fertilizer and to reduce their yield (and absolute production), as subsidies are not linked to production any more. However, since hop production is driven by market demand and price, it is unlikely that producers will sacrifice yield.

Concerning pesticides, the development of new hop varieties with greater pest and disease resistance is likely to result in a decrease in the consumption of pesticides.

11 Recommendations

We recommend that:

- the EU continues the provision of income support through decoupled payments instead of coupled aid as the former is in the hops sector more efficient and allows a better orientation for investment decisions.
- in order to increase market stability and to safeguard farmers' incomes, organisations of producers keep on stimulating on behalf of their members the concluding of forward contracts.
- the sector uses and develops instruments fostering investment and innovation in order to promote the structural change needed for increased international competitiveness and productivity.
- producer groups continue making farmers aware of the environmental implications of their production decisions, such as fertilizer and pesticide use.
- the EU and the Member States continue their efforts to ensure that the administrative burden of the CAP measures relating to the hop sector is reduced in all producing EU countries.