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Industrial uses of sugar from sugar beet increasing in the EU

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Sugar

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Report Highlights:

In the European Union, the 2005-08 sugar reform coincided with a push to increase bio-fuel production. Several sugar processing plants have been converted for bio-ethanol production and new dedicated bio-ethanol production plants are being constructed. This increased the use of sugar beet processing capacity for sugar processors allowing beet farmers to recover part of the 800,000 hectare lost following the reform. Bio-ethanol production and other industrial uses of sugar originate from out-of-quota sugar, as well as from contract-based sugar beet production outside the EU sugar regime. Another new phenomenon, first seen in Germany, is using sugar beet to produce biogas on farm. While reliable data are scarce, sugar beet production outside the sugar regime is estimated to reach about 100,000 hectares and is steadily increasing.

General Information:

From 2005-2008, the EU reduced its sugar production quota from 17.4 to 13.3 million MT as part of the EU [Sugar reform](#) [1] , following a WTO case brought by Brazil and Thailand against EU sugar export subsidies. This resulted in a decrease of total EU sugar production by 5 million MT from about 20 million to 15 million MT. This took over 800,000 hectares of arable land out of sugar beet production. Sugar beet processors also searched for creative ways to consolidate spare beet processing capacity. Because this sugar reform coincided with a move to increase production of renewable bio-fuels, initiatives developed in several EU Member States (MS) to convert sugar beet processing plants into bio-ethanol production plants, resulting in a rapid increase in bio-ethanol production in recent years. This report is best read in conjunction with GAIN [Sugar Annual Brussels USEU EU-27 4-8-2011](#).

EU sugar production quota and out-of-quota sugar production

EU sugar production quota in MT white sugar post the sugar reform		Out-of-quota sugar production			
		2007/08*	2008/09	2009/10	2010/11 e
Belgium	676,235	116,705	54,897	213,901	60,000
Czech R.	372,459	16,174	50,128	109,615	62,000
Denmark	372,383	0	24,713	74,063	57,600
Germany	2,898,256	591,103	818,665	1,425,578	797,000
Greece	158,702	0	0	13,085	0
Spain	498,480	0	16	108,594	52,500
France	3,004,811	1,317,462	1,160,198	1,554,533	1,123,000
Fr. overseas	432,220	0	0	19,291	0
Italy	508,379	0	0	16,359	0
Lithuania	90,252	22,710	55	15,337	3,600
Hungary	105,420	0	1,308	2,170	0
Netherlands	804,888	101,487	114,351	188,878	68,000
Austria	351,027	18,260	66,370	36,348	90,000
Poland	1,405,608	387,806	20,731	241,408	90,000
Portugal	0	0	0	0	0
Pt Azores	9,953	0	0	0	0
Romania	104,689	626	6,790	42,524	47,500
Slovak R.	112,320	1	819	52,641	47,200
Finland	80,999	14,797	12	7,165	1,000
Sweden	293,186	45,353	42,846	117,561	11,000
U.K.	1,056,474	182,173	135,189	401,783	50,000
TOTAL	13,336,741	3,162,000	2,497,088	4,640,834	2,560,400
Carry forward sugar**		693,000	413,000	561,000	245,000
Out-of-quota sugar exported		0	728,000	2,115,000	650,000
Imports of sugar under special industrial import quota		0	179,474	7,660	400,000
Net available out-of-quota		2,469,000	1,535,562	1,972,494	2,065,400

e=estimate

*: - 2007/08 out-of-quota includes remaining stocks in MS that stopped sugar production

- In MY2007/08, EU sugar exports were 1,400 MT; however, under the previous sugar regime it was not registered as out-of-quota

** : out-of-quota sugar carried over to count toward following year quota

Source: European Commission

After the implementation of the sugar reform in 2008, EU sugar production quota as defined in the single Common Market Organization (CMO) [Regulation 1234/2007](#) [1] is limited to 13.3 million MT. Sugar produced in EU MS that exceeds their individual production quota is considered “out-of-quota” sugar and cannot be sold on the EU sugar market for food purposes. Out-of-quota sugar must be sold for export or for industrial uses, traditionally the fermentation industry. The EU limits EU sugar exports through a strict export quota management, thus shielding EU out-of-quota sugar off from lucrative world market prices and offering EU industrial sugar users windfall benefits from EU sugar supplies.

EU industrial sugar users

For decades, sugar has been used as a clean carbon source by the fermentation industry for the production of pharmaceuticals, mainly antibiotics, and other products for human consumption, especially yeasts. These industries have had a stable need of about 0.9 million MT of sugar per year. This sugar was sourced within the EU or from imports depending on prices. Other fermenting industries using technical, less clean carbon sources, may also source sugar when it is the cheaper carbon source.

In recent years as production of bio-fuels is increasing, several bio-ethanol plants have been co-located with or were converted from a sugar extraction unit. During the beet processing season, beet juice is directly fermented into bio-ethanol, for which bio-ethanol producers are concluding sugar beet growing contracts with farmers at fixed prices that fall completely outside of the EU sugar production quota. More recently, sugar beets have been grown for direct use in digesters for biogas production as well. This started on an experimental scale several years ago in Germany and is steadily growing since 2009; however, it has been slow to expand to other EU MS. As digesters are operated on farm, no reliable data about sugar beet acreage used for biogas generation is available. Estimates are that biogas production could reach up to 15,000 Ha in Germany in 2011.

	Bio-ethanol production from sugar/sugar beet in million liter					Bio-ethanol raw sugar equivalent in 000MT				
	07/08	08/09	09/10	10/11	11/12	07/08	08/09	09/10	10/11	11/12
Austria	24	24	25	25	25	38.4	38.4	40	40	40
Belgium	0	50	60	80	80	0	80	96	128	128
Denmark						0	0	0	0	0
Finland						0	0	0	0	0
France	600	636	706	750	780	960	1017.6	1129.6	1200	1248
Germany	172	229	279	300	320	275.2	366.4	446.4	480	512
Greece						0	0	0	0	0
Italy	0	0	0	0	0	0	0	0	0	0
Netherlands	0	0	0	0	0	0	0	0	0	0
Portugal	0	0	0	0	0	0	0	0	0	0
Spain	0	0	0	0	0	0	0	0	0	0
Sweden						0	0	0	0	0
U.K.	70	70	63	60	65	112	112	100.8	96	104

Czech R.	59	50	49	50	50	95	80.3	77.8	80	80
Hungary	36	38	40	40	40	57.6	60.8	64	64	64
Lithuania						0	0	0	0	0
Poland						0	0	0	0	0
Slovak R.						0	0	0	0	0
Romania	0	0	0	0	0	0	0	0	0	0
Total EU-27	961.4	1,097.2	1,221.6	1,305.0	1,360.0	1,571.2	1,835.2	1,876.8	2,008.0	2,096.0

FAS estimates

EU sugar beet production beyond the sugar regime

Article 3 of [Commission Regulation \(EC\) No 952/2006](#) [1] defines production of thick juice with 70 percent purity or higher as falling under the sugar regime. Sugar beet juice that falls below this concentration is not reported to the EU Commission as EU “sugar production” as defined by the EU sugar regime. Calculations about the use of sugar beet extracts for industrial purposes suggests that significant acreages of sugar beet are produced outside the sugar regime for bio-ethanol and biogas production. It appears that the acreage of sugar beet grown under contract as a renewable feedstock for bio-energy is readily increasing to a forecast 110,000 hectares for the 2011 harvest. This compares with the roughly 1.6 million hectares reported under the EU sugar regime. MY 2008/09 saw an exceptional 120,000 hectares of such contracts, probably the result of the sugar reform when sugar beet growers who lost their production quota were unable to immediately switch production to different crops. As sugar beet production contracts for industrial purposes complement EU out-of-quota sugar supplies, the price setting reflects expected average EU prices for out-of-quota sugar, which are disconnected from world markets. Sugar beet growers willing to sign beet supply contracts beyond their sugar production quota must compare the revenues from these contracts with the returns from grain production. With current world prices for grain, beet production contracts offer little incentive to farmers.

EU production and use for industrial purposes of sugar beet in raw sugar equivalent in 000MT					
	07/08	08/09	09/10	10/11	11/12 f
Bio-ethanol	1571.2	1835.2	1876.8	2008.0	2096.0
Fermentation	900.0	900.0	900.0	900.0	900.0
Biogas - <i>estimates</i>	0.0	0.0	100.0	150.0	160.0
Total industrial use	2,471.2	2,735.2	2,876.8	3,058.0	3,156.0
Net available out-of-quota sugar*	2,469.0	1,535.6	1,972.5	2,065.4	2,000.0
Production beyond sugar regime	2.2	1,199.6	904.3	992.6	1,156.0
equivalent in hectares of sugar beet	220	119,964	82,210	94,533	110,095

f: forecast

*: see table on out-of-quota sugar production above

Conclusion

The EU sugar regime has traditionally provided special arrangements for EU industrial sugar users, while shielding off the EU food sugar market from world market prices through high EU internal guaranteed sugar prices and high tariff walls against imports. EU industrial sugar users have always escaped guaranteed EU sugar prices, allowing them access to surplus over-quota sugar at windfall prices, as well as to sugar imports at world market prices, as they must compete with competitors in a global market. The 2005-2008 sugar reform intended to provide the same facility to EU industrial sugar

users, offering access to out-of-quota sugar at reduced prices, as well as to imports from the world market. However, the sugar regime is showing its limitations at above-EU-reference world prices for sugar, as described in GAIN [Sugar Annual Brussels USEU EU-27 4-8-2011](#). When world sugar prices are above EU reference prices, traditional sugar exporters to the EU may find more lucrative markets, while EU sugar beet farmers and processors miss out on market opportunities because of the sugar regime limitations for out-of-quota sugar exports.

Extracts from sugar beet are used as feedstock for the EU fermentation industries, more recently also for bio-ethanol production. Feedstock from sugar beet competes with grain, but only if it is out-of-quota sugar sold at prices below EU sugar regime reference prices or if it is at a price fixed in contracts between farmers and processors. Normally, out-of-quota sugar is a lower cost feedstock for industrial use, because it is production beyond the quotas set for MS, such as when yields are higher. The regime induces farmers to create their own margin of safety by encouraging some production beyond the quota. The farmers know that they will get the higher sugar regime price for sugar that is within quota. The higher price within quota helps to offset the lower price on any additional sugar in those years that farmers' production exceeds quota. This development of sugar beet production for bio-ethanol on contracts outside the sugar regime emerged as a result of the 2005-08 sugar reform. However currently, farmers are not eager to expand beet production contracts outside of the sugar regime, since farmers operating under multi-annual contracts that were concluded in recent years are not benefitting from high sugar prices on the world market and they have the option of growing cereals which are also seeing high prices.

Bio-fuel production from sugar beet is gradually increasing due to new investments. Apart from the digestion into biogas, which occurs on-farm, the increase in ethanol production from sugar allows sugar beet processors to increase the use of their beet extraction capacity. As a consequence, many bio-ethanol production units from sugar beet juice are collocated with sugar processing plants, even if bio-ethanol distillation plants face stricter explosion and incendiary security measures. EU beet farmers and farm contractors also benefit, since this new use for sugar allows the EU to maintain part of the 800,000 hectare sugar beet acreage that was expected to be lost due to the sugar reform. These contracts outside of the sugar regime are estimated to already account for 7-10 percent of total EU sugar beet production. Interestingly, these recent developments in the EU sugar market do not seem to play a part in the debate on the future functioning of the EU sugar regime with or without production quota in the CAP post 2013 despite the high world market price situation of the recent two years. These high world market prices for sugar are significantly impacting the EU sugar supply situation, both for the food and the industrial users. The high world market prices have stifled EU sugar imports for food, while at the same time farmers who produce sugar beet for industrial purposes are discouraged to increase production because they are not benefitting from these high sugar prices.

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^[1] http://ec.europa.eu/agriculture/capreform/sugar/index_en.htm

^[2] <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2007R1234:20110101:EN:PDF>

^[3] <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:178:0039:0059:EN:PDF>

^[1] http://ec.europa.eu/agriculture/capreform/sugar/index_en.htm

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