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Austrian Agriculture and Forestry 2022 Exceptionally Successful Despite Difficult Environment

Katharina Falkner, Franz Sinabell

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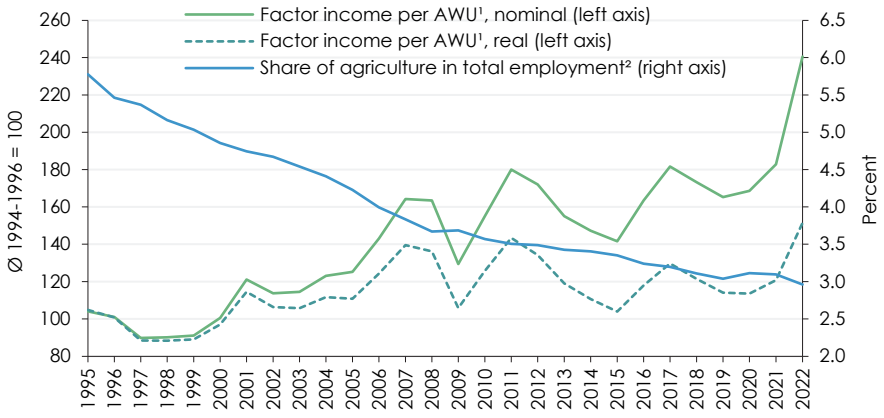
- The year 2022 was exceptionally good for Austria's agriculture in economic terms. Enormously rising input costs were outweighed by high prices for agricultural goods.
- Such a strong increase in agricultural incomes has not been seen for decades.
- In the forestry sector, timber prices rose in line with energy prices and thus value added.
- Agriculture contributes almost 10 percent to greenhouse gas emissions in Austria.
- Calculations show that emissions will decrease as a result of the CAP strategic plan implemented from 2023.
- However, a significant reduction in emissions is not possible without restricting domestic cattle farming.

Factor income in agriculture and share of agriculture in the labour force



The two time series for factor income per annual work unit show the development since Austria's accession to the EU. The basis is the average of the years 1994 to 1996. Real factor income was already particularly high in 2007 and 2011. In 2022 it was 5.6 percent higher than in 2011. The outflow of labour from agriculture, which is reflected in the declining share of the labour force, is an important factor for the increase in real income per working unit (source: STATcube – Statistical database of Statistics Austria, EAA01 Economic Accounts for Agriculture, values at current prices (in million €) as of 1995, data as of July 2023; WIFO calculations. – [1] AWU: agricultural labour input (paid and unpaid) measured in annual work units or full-time equivalents (number of employment relationships converted to normal working hours). – [2] Share in total employment measured in full-time equivalents).

"Austrian agriculture experienced an exceptional year in 2022. Since EU accession, the economic performance was never more favourably. In the past, however, upswings were always followed by phases of decline and stagnation."

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In 2021, there had been signs of an increase in agricultural prices due to the international economic upturn. Following the invasion of Ukraine by the Russian Federation, there was great uncertainty on all markets for internationally traded goods. This cause a sharp surge of prices. Agricultural goods, which were exported by Ukraine on a large scale, were affected first, then almost all other goods. The rise in prices led to high increases in the production value of Austrian agriculture in 2022, although the volume produced hardly increased. Despite the significantly more expensive production, revenues clearly outweighed costs, allowing a strong increase in income. The situation was similar in forestry. However, the favorable situation in the agricultural commodities market belies the challenges facing agriculture. According to scenario analyses, fundamental changes such as a reduction in cattle numbers are needed to reduce greenhouse gas emissions. This would be accompanied by a significant reduction in agricultural output.

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1. Factor income per worker in the domestic agricultural sector rose exceptionally strongly in 2022

After agricultural incomes in Austria had already risen in 2020 and 2021, a further, unexpectedly strong increase was recorded in 2022.

After income in domestic agriculture (Factor income per annual work unit) had already risen in previous years, it increased strongly again in 2022, as shown in calculations by Statistics Austria (2023a) on the agricultural accounts. The volume increased by 25.5 percent compared to 2021 (2021 +6.3 percent). Factor income measures remuneration based on the production factors land, capital and labour used in agriculture. Net entrepreneurial income per non-salaried annual work unit increased by 31.1 percent in real terms in 2022, after +7.6 percent in the previous year. This key figure is of particular importance in the case of Austria, where most farms are family farms.

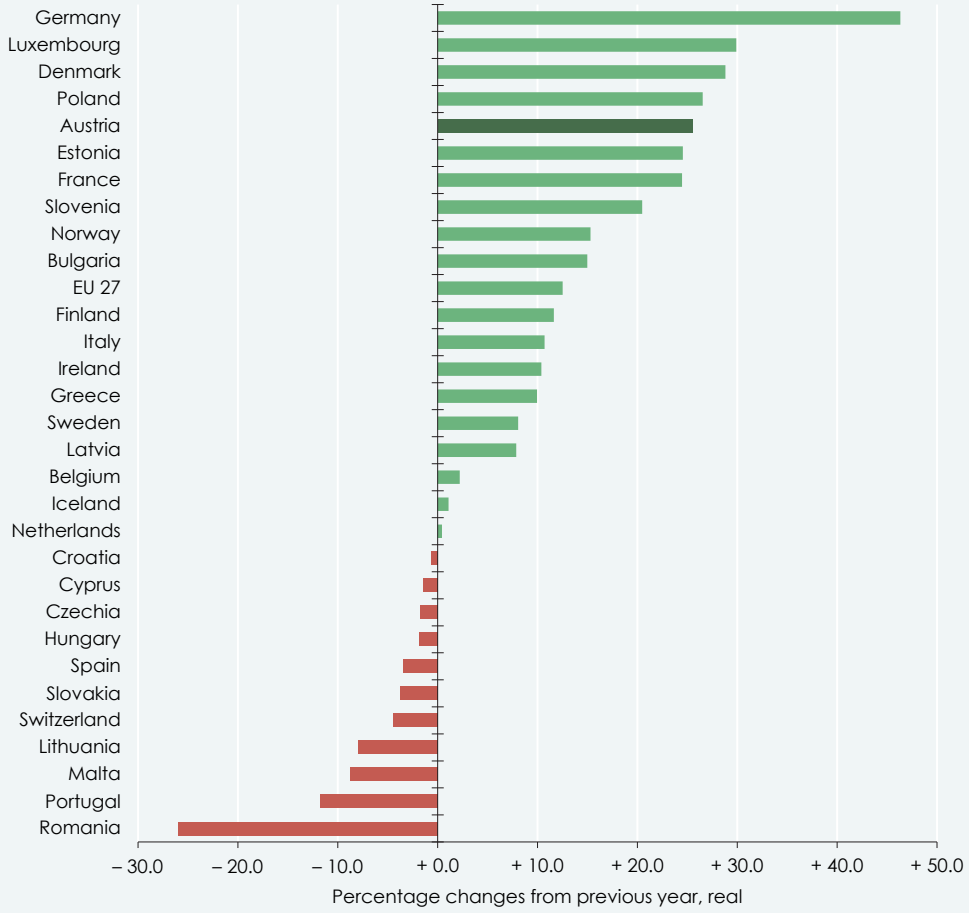
At the sector level, Statistics Austria (2023a) only shows nominal data. Nominal factor income in agriculture increased by 29.9 percent, net entrepreneurial income by 36.5 percent compared to 2021. Employment in the agricultural sector fell slightly in 2022 compared to the previous year. In 1995, just under 12,000 paid employees were employed in the Austrian agricultural sector (in annual work units, AWU). Their number steadily increased to around 21,500 by 2021 and shrank slightly to 20,800 in 2022. The number of non-salaried workers fell just below 100,000 AWU in 2019 and has stagnated at a similar level since then. Total employment in agriculture had reached its all-time low of 120,300 AWU in 2019. In 2022, there were about 400 more employees. Compared to 2021, employment in agriculture decreased by 1.3 percent, with a larger decrease for paid workers (–3.6 percent) than for non-paid workers (–0.8 percent). The share of agriculture in total employment in Austria was 3.0 percent in 2022, slightly below the level of the previous year (2021: 3.1 percent).

In the European Union, agricultural incomes – measured by Indicator A, the index of real factor income per annual work unit – developed very differently, as in previous years.

On average in the EU 27, income rose by 12.5 percent. Above-average increases were recorded in Germany, Luxembourg, Denmark, Poland, Austria, Estonia, France, Slovenia and Bulgaria. By contrast, incomes fell significantly in Romania, Portugal, Malta and Lithuania. Such different developments within the EU can be observed almost every year. The national agricultural sectors differ considerably in their structure and are thus affected differently by similar developments.

Figure 1: **Indicator A – index of real factor income in agriculture per AWU**

2022



Source: Eurostat, Economic Accounts for Agriculture – Income of the agricultural sector (indicators A, B, C; online data code: AACT_EAA06), data as of May 2023; for Austria: STATcube – Statistical database of Statistics Austria, LGR01 Economic Accounts for Agriculture, values at current prices (in million €) as of 1995; WIFO calculations. AWU: agricultural labour input (paid and unpaid) measured in annual work units or full-time equivalents (number of employment relationships converted to normal working hours).

2. Agricultural production again significantly higher than in previous years

At 10.6 billion €, the production value of Austrian agriculture exceeded the 10 billion € mark for the first time in 2022 and was 22.8 percent higher than in the previous year (in nominal terms). While the production volume increased by only 0.1 percent, producer prices rose strongly (+22.7 percent). At 48 percent, crop production had the highest share of the total production value in 2022, ahead of livestock production at 42 percent. In 2020, the ratio had been reversed, but the strong increase in the price of plant products increased the weight of plant production. The remaining 10 percent is accounted for by the production of agricultural services and ancillary agricultural activities (Table 1).

The production value of domestic agriculture in 2022 was 22.8 percent higher than in the previous year (in nominal terms). Producer prices increased by 22.7 percent, production volume by 0.1 percent.

The production volume in crop cultivation in 2022 remained slightly below the previous year's level (–0.1 percent). As prices again increased by more than 20 percent (+27 percent), the production value rose by almost 27 percent to 5.1 billion €, to which the cultivation of cereals (production value +37.9 percent), oilseeds and oil crops (+16.2 percent) and protein crops (+22.2 percent) contributed in particular.

The production volume of sugar beet was significantly lower in 2022 (–10.2 percent). However, as sugar beet prices rose by more than 95 percent, there was a 7.3 percent increase in value compared to 2021. This meant that the domestic sugar industry was able to cope well with the difficult transitional phase following the abolition of the quota system. The production volume of potatoes decreased again in 2022 (–14 percent). As in sugar beet cultivation, pest pressure led to high losses. However, as potato prices increased by 36.1 percent, the production value increased by 16 percent compared to 2021. In vegetable production, the crop volume also decreased (–2.3 percent), while prices increased by 15.6 percent and the production value grew to 442 million € (+13 percent). Wine and fruit production expanded in 2022 (+7.9 percent and +24 percent respectively). In fruit and wine production, yields and also prices have fluctuated strongly for several years. This is mainly due to the changing weather conditions. In 2022, prices increased by 5 percent each compared to the previous year.

In livestock production, the production value, the quantities produced and the prices developed somewhat weaker than in crop production. The production value increased by 19.6 percent compared to 2021. While less beef was produced (–4.9 percent), the volume of milk produced increased slightly (+3.4 percent). As the production volume of pigs also decreased significantly (–7 percent) and other animal production hardly expanded (+1.7 percent), there was a slight decrease of 1.2 percent in total animal production in 2022. The prices of cattle rose by 16.5 percent, those of milk by 25.1 percent. The price of pigs increased by 23.7 percent and that of other animals by 1.8 percent. In total, the nominal price index for animal products in 2022 was 21 percent higher than in the previous year.

3. Strong increase in gross value added at basic prices despite sharply rising production costs

The agricultural sector was able to increase its production value again in 2022 (+22.8 percent). Gross value added at basic prices rose by 22.3 percent, and expenditure on intermediate inputs by 23.2 percent. Net value added at basic prices increased by almost 34 percent, although Fixed capital consumption increased by 13.6 percent, twice as much as in 2021.

The production value of the domestic agricultural sector increased by almost 2 to 10.5 billion € in 2022 (+22.8 percent). Of the 6.1 billion € spent on intermediate inputs (Table 1), more than 40 percent was spent on animal feed. A large part of this is produced by the agricultural holdings themselves and valued at production costs. Expenditure on animal feed increased by 38.2 percent in 2022, while expenditure on other important intermediate inputs developed differently. Expenditure on seeds increased comparatively moderately (+12.5 percent), that on the maintenance of machinery and equipment only slightly (+3.6 percent), while expenditure on the maintenance of buildings fell (–9.8 percent). Expenditure on veterinary services and medicines (+4.1 percent), plant protection (+12.2 percent) and agricultural services (+10.8 percent), on the other hand, also increased. The costs for fertilisers (+65.2 percent) and energy (+35.0 percent) increased enormously.

As expenditure on intermediate inputs (+23.2 percent) increased almost to the same extent as production value (+22.8 percent), gross value added in agriculture grew by 22.3 percent compared to the previous year (after +16 percent in 2021). As fixed capital consumption increased by 13.6 percent in 2022, net value added at basic prices increased disproportionately (+33.7 percent). Such a strong increase has not been seen in the last three decades.

The year 2022 still fell within the period of the Multiannual Financial Framework 2014-2020 and the Rural Development Programme for the same period, which was extended until the end of 2022. The subsidy volume of the Common Agricultural Policy (CAP; Table 2) usually changes little within a period, as the multi-annual programmes are implemented. Subsidies paid out to domestic agriculture increased by 14.3 percent in 2022 (to 1.7 billion €), to which nationally financed discretionary measures to cushion the rise in energy prices contributed, among other things. The burden from taxes and production levies was 27.6 percent lower in 2022 than in the previous year. The balance of other taxes, other subsidies on production amounted to 1.52 billion € (Table 1) and was thus significantly lower than the net value added of 2.11 billion €.

The factor income (also called net value added at basic prices) could thus be increased by 29.9 percent to 3.6 billion €. As mentioned, the increase in nominal factor income per annual work unit was somewhat higher (+31.6 percent compared to 2021) due to the slight decrease in employment volume.

In summary, the year 2022 was an exceptionally good one for Austria's agriculture. Since EU accession, the economic success factors had never developed so favourably. In the past, however, upswings were always followed by phases of decline and stagnation.

Table 1: **Production, value added and income in Austrian agriculture**

	Nominal value				Volume	Nominal price
	2020	2021	2022	2022	2022	2022
	Million €			Percentage changes from previous year	Index, 2021 = 100	
Production value at producer price						
Crop output[1]	3,294	4,028	5,109	+ 26.8	99.9	126.9
+ Animal output	3,594	3,728	4,458	+ 19.6	98.8	120.8
= Agricultural goods output	6,888	7,755	9,567	+ 23.4	99.4	124.0
+ Agricultural services output	341	348	415	+ 19.4	109.7	109.7
= Agricultural output	7,229	8,103	9,982	+ 23.2	99.8	123.4
+ Secondary activities (inseparable)	448	498	580	+ 16.5	105.6	110.9
= Output of the agricultural "industry"	7,677	8,602	10,563	+ 22.8	100.1	122.7
Production value at basic price						
Crop output	3,287	4,020	5,102	+ 26.9	99.8	127.1
+ Animal output	3,585	3,718	4,447	+ 19.6	98.7	120.9
= Agricultural goods output	6,872	7,738	9,549	+ 23.4	99.4	124.0
+ Agricultural services output	341	348	415	+ 19.4	109.7	109.7
= Agricultural output	7,213	8,086	9,964	+ 23.2	99.7	123.5
+ Secondary activities (inseparable)	448	498	580	+ 16.5	105.6	110.9
= Output of the agricultural "industry"	7,661	8,584	10,545	+ 22.8	100.2	122.7
– Total intermediate consumption[1]	4,522	4,933	6,078	+ 23.2	96.8	126.4
= Gross value added at basic prices	**3,139**	**3,651**	**4,467**	**+ 22.3**	**104.7**	**117.7**
– Fixed capital consumption	1,923	2,070	2,352	+ 13.6	103.6	110.0
= Net value added at basic prices	**1,216**	**1,581**	**2,114**	**+ 33.7**	**106.2**	**127.5**
± Balance of other taxes or other subsidies on production	1,349	1,216	1,520	+ 25.0		
= Factor income	**2,565**	**2,797**	**3,634**	**+ 29.9**		
Factor income per annual work unit (1,000 €)[2]	**21.09**	**22.87**	**30.10**	**+ 31.6**		

Source: STATcube – Statistical database of Statistics Austria, EAA01 Economic Accounts for Agriculture according to ESA 2010, at current prices, revision status July 2023; WIFO calculations. – [1] Including on-farm produced and consumed feed. – [2] Agricultural labour input (paid and unpaid) measured in annual work units or full-time equivalents (number of employment relationships converted to normal working hours).

Table 2: **Subsidies and taxes in Austrian agriculture**

	2020	2021	2022	2022
	Million €			Percentage changes from previous year
Total subsidies	1,537	1,513	1,730	+14.3
Subsidies on products	7	7	7	+ 0.3
Crop output	0	0	0	
Animal output	7	7	7	+ 0.3
Other subsidies	1,530	1,507	1,723	+14.4
Basic payment scheme	451	445	450	+ 1.0
Agri-environmental programme[1]	446	437	478	+ 9.6
Compensatory allowance for permanent natural handicaps	257	255	252	– 1.2
COVID-19 Aid to agriculture and forestry	52	203	142	–30.2
Relieving measures[2]	–	–	208	–
Taxes and duties	204	315	228	–27.6
Taxes on products	23	24	25	+ 3.3
Other taxes on production	181	291	203	–30.1

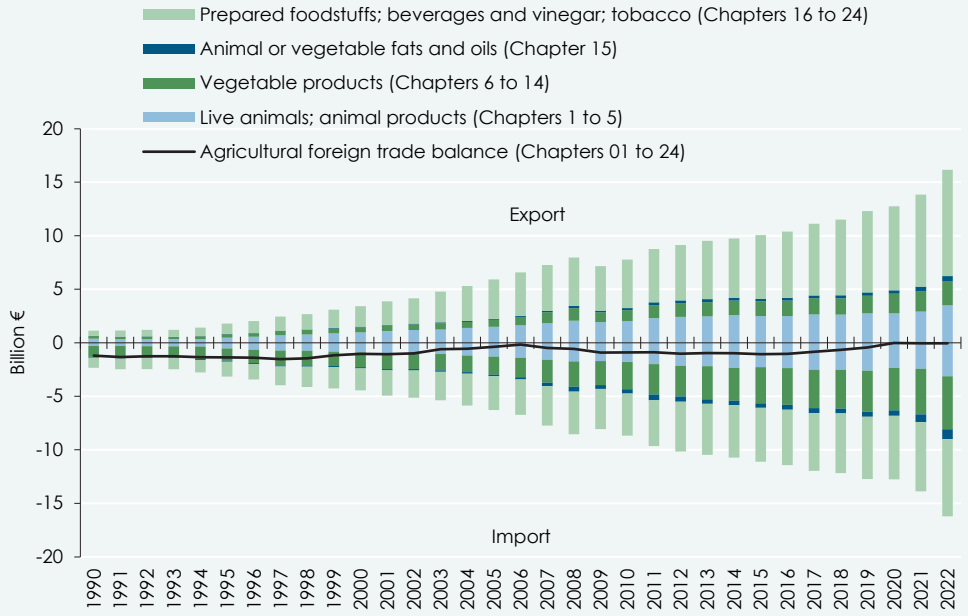
Source: STATcube – Statistical database of Statistics Austria, EAA01 Economic Accounts for Agriculture according to ESA 2010, at current prices, revision status July 2023 (https://www.statistik.at/statistiken/land-und-forstwirtschaft/land-und-forstwirtschaftliche-oekonomie-und-preise/landwirtschaftliche-gesamtrechnung/landwirtschaftliche-gesamtrechnung-auf-nationaler-ebene); Federal Ministry of Agriculture, Forestry, Regions and Water Management, Green Report 2023, Table 26; WIFO calculations. – [1] According to the Austrian Programme for Environmentally Sound Agriculture (ÖPUL) including top-up. – [2] Cost-of-living adjustment, electricity subsidy (federal funds) and payments for protected cultivation (EU funds) to cushion high input prices (especially energy).

4. Foreign trade balance in agricultural goods and food almost balanced again

As in previous years, both exports and imports of agricultural goods increased in 2022. The foreign trade balance for agricultural goods and food was again almost balanced.

The volume of Austrian foreign trade in agricultural goods and food grew again in 2022. The expansion was once again significantly stronger than in the previous year (exports +17 percent, imports +17 percent) and primarily reflects the increase in the price of agricultural goods and foodstuffs. In addition to agricultural raw materials according to the Combined Nomenclature (CN), agricultural goods also include highly processed foodstuffs such as beverages and fruit preparations. In 16 of the 24 items, more goods were imported than exported in 2022 (Table 3). Notable export surpluses again occurred in the areas of meat and edible meat offal, milk and milk products, milling products and, above all, beverages. In 2019, the surplus of imports over exports still amounted to 0.44 billion €. In 2020, on the other hand, an almost balanced foreign trade balance was achieved for the first time. In 2022, imports again only just exceeded exports (by around 57 million €; 2021: 44 million €).

Figure 2: **Austrian agricultural foreign trade by commodity section of the Combined Nomenclature (CN)**



Source: WDS – WIFO Data System, Macrobond. The Combined Nomenclature (CN) is the main classification of goods used by the European countries. The CN is based on the harmonised commodity description and coding system classification (HS) managed by the World Customs Organisation (WCO).

As the long-term development of the agricultural trade balance shows (Figure 1), integration into the Common Market generated a strong dynamic from which both exporters and importers benefitted in the form of an ongoing increase in trade volume. In 2006, exports had still been almost equal to imports. Since then, imports have usually risen somewhat faster than exports. Since 2015, however, the volume of exports has been approaching that of imports again.

The integration into the Common Market from 1995 onwards led to a profound change in the agricultural policy framework as well as to changes in agriculture itself. Above all, the convergence of the prices of the most important agricultural goods with the lower price level on the world market resulted in far-reaching adjustments. Within agriculture, the importance of the production of cereals, cattle and pigs decreased. At the same time, milk production, fruit-, vegetables-, horticulture and viticulture gained in importance, as did agricultural services and inseparable secondary activities in the non-agricultural sector (Sinabell, 2020a).

The changed production focus is also reflected in the changed export structure of agricultural goods, food and beverages. Processed products gained significantly in volume over time (Table 4). The increase in the share of these products in total exports points to an increasing international competitiveness of the domestic food and beverage industry.

Table 3: **Agricultural foreign trade 20212**
Combined Nomenclature – CN

	Export	Import	Balance	
	Total		Total	EU 27
	Percentage shares		Million €	
I Live animals; animal products	**21.6**	**19.3**	**+ 357.5**	**+ 225.4**
01 Live Animals	0.8	1.7	– 140.6	– 162.6
02 Meat and edible meat offal	8.9	7.2	+ 267.9	+ 104.8
03 Fish, crustaceans, molluscs and other aquatic invertebrates	0.5	2.4	– 306.4	– 143.0
04 Dairy produce, birds' eggs, honey	10.9	7.2	+ 590.5	+ 440.3
05 Products of animal origin not elsewhere specified or included	0.5	0.8	– 54.0	– 14.1
II Vegetable products	**14.0**	**30.5**	**– 2,672.0**	**– 1,807.9**
06 Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	0.3	2.7	– 394.7	– 382.9
07 Edible vegetables, roots and tubers	1.1	4.1	– 485.2	– 382.8
08 Edible fruits and nuts, peel of citrus fruit or melons	1.7	7.7	– 984.9	– 452.8
09 Coffee, tea, mate and spices	1.3	3.6	– 375.8	– 231.6
10 Cereals	4.2	6.0	– 305.9	– 267.8
11 Products of the milling industry; malt; starches; inulin; wheat gluten	2.4	1.1	+ 200.1	+ 157.7
12 Oil seeds and oleaginous fruits	3.0	4.6	– 253.7	– 211.7
13 Lacs, gums, resins and other vegetable saps and extracts	0.1	0.5	– 70.0	– 36.8
14 Vegetable products not elsewhere specified or included	0.0	0.0	– 1.9	+ 0.8
III Animal or vegetable fats and oils	**2.9**	**5.8**	**– 472.9**	**– 427.2**
15 Animal or vegetable fats and oils	2.9	5.8	– 472.9	– 427.2
IV Prepared foodstuffs; beverages and vinegar; tobacco	**61.5**	**44.4**	**+ 2,730.4**	**+ 767.8**
16 Preparations of meat, fish or crustaceans, molluscs or other aquatic invertebrates	4.2	3.4	+ 128.2	+ 152.7
17 Sugars and sugar confectionery	2.3	2.4	– 16.3	– 88.2
18 Cocoa and cocoa preparations	3.2	3.6	– 58.0	– 92.1
19 Preparations of cereals, flour, starch or milk; pastrycooks' products	8.7	8.2	+ 80.1	– 35.8
20 Preparations of vegetables, fruit, nuts or other parts of plants	5.5	6.4	– 153.7	– 42.7
21 Miscellaneous edible preparations	6.9	6.2	+ 102.7	– 100.9
22 Beverages, spirits and vinegar	23.7	6.1	+ 2,840.9	+ 1,296.9
"Energydrinks"	2.0	0.3	+ 273.7	+ 235.2
23 Residues and waste from food industry; prepared animal fodder	6.9	5.8	+ 172.3	+ 27.8
24 Tobacco and manufactured tobacco substitutes	0.0	2.3	– 365.9	– 350.0
		Million €		
Total Austrian agricultural food trade by Combined Nomenclature (CN)	**16,157.86**	**16,214.91**	**– 57.1**	**– 1,241.9**
Total Austrian Agri-food trade by Standard International Trade Classification (SITC) Rev. 4	15,777.69	16,191.62	– 413.9	– 1,569.3
	Percentage changes from previous year			
Total Austrian agricultural food trade by Combined Nomenclature (CN)	**+ 16.7**	**+ 16.8**	**– 30.9**	**– 4.8**
Total Austrian Agri-food trade by Standard International Trade Classification (SITC) Rev. 4	+ 16.0	+ 16.6	– 46.0	– 13.1

Source: WDS – WIFO Data System, Macrobond. 2022: final values. Totals by CN and SITC nomenclature differ due to the respective aggregation procedure (SITC 0, 1, 21, 22, 29, 4) and the increasing number of items with secrecy in the CN foreign trade database; A positive sign of changes in balances should be interpreted as a decrease in the import surplus.

5. High energy prices favour forestry

In Austria, forestry is the sector with the greatest share of land use. Only a few areas are untouched and left to themselves. Most forest areas are intensively used in several ways: for timber extraction, for hunting, as recreational space or for the provision of other ecosystem services, e.g., for carbon storage. All these uses are influenced and increasingly diminished by climate change. Factors detrimental to forests include high pressure from pests, drought in certain locations and the associated risk of forest fires, as well as the more frequent occurrence of violent storms and ice breaks.

One consequence of the expansion of forest areas, which has been ongoing for decades, and the progressive automation of timber harvesting is the increase in logging (Table 5). Damage to the forest by natural factors often requires early harvesting and thus contributes to the increase in timber volume. The actual amount of timber harvested depends not only on the amount of timber harvested due to weather and damage events, but also on the economic framework conditions.

Most forest areas are used intensively in several ways: for timber extraction, hunting, recreation or ecosystem services, such as carbon storage. In 2022, high energy prices helped forestry to soar.

Table 4: **Structure of agricultural exports over time**

	Ø 1995-1997		Ø 2020-2022	
	Million €	Percent	Million €	Percent
I Live animals; animal products	**583.01**	**27.9**	**3,051.75**	**21.4**
01 Live Animals	75.22	3.6	124.74	0.9
02 Meat and edible meat offal	259.00	12.4	1,287.82	9.0
03 Fish, crustaceans, molluscs and other aquatic invertebrates	2.08	0.1	68.85	0.5
04 Dairy produce, birds' eggs, honey	229.25	11.0	1,504.30	10.6
05 Products of animal origin not elsewhere specified or included	17.46	0.8	66.04	0.5
II Vegetable products	**343.26**	**16.4**	**2,007.25**	**14.1**
06 Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	6.00	0.3	43.28	0.3
07 Edible vegetables, roots and tubers	39.71	1.9	168.94	1.2
08 Edible fruits and nuts, peel of citrus fruit or melons	69.67	3.3	308.23	2.2
09 Coffee, tea, mate and spices	46.59	2.2	181.53	1.3
10 Cereals	110.18	5.3	547.31	3.8
11 Products of the milling industry; malt; starches; inulin; wheat gluten	23.05	1.1	310.75	2.2
12 Oil seeds and oleaginous fruits	43.99	2.1	428.48	3.0
13 Lacs, gums, resins and other vegetable saps and extracts	2.82	0.1	16.01	0.1
14 Vegetable products not elsewhere specified or included	1.25	0.1	2.72	0.0
III Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	**33.40**	**1.6**	**396.24**	**2.8**
15 Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	33.40	1.6	396.24	2.8
IV Prepared foodstuffs; beverages and vinegar; tobacco and manufactured tobacco substitutes	**1,131.23**	**54.1**	**8,794.65**	**61.7**
16 Preparations of meat, fish or crustaceans, molluscs or other aquatic invertebrates	48.30	2.3	592.00	4.2
17 Sugars and sugar confectionery	110.63	5.3	321.47	2.3
18 Cocoa and cocoa preparations	149.26	7.1	472.92	3.3
19 Preparations of cereals, flour, starch or milk; pastrycooks' products	138.68	6.6	1,274.00	8.9
20 Preparations of vegetables, fruit, nuts or other parts of plants	189.90	9.1	786.95	5.5
21 Miscellaneous edible preparations	84.47	4.0	977.03	6.9
22 Beverages, spirits & vinegar	260.75	12.5	3,359.92	23.6
"Energydrinks"	97.39	4.7	1,008.71	7.1
23 Residues and waste from food industry; prepared animal fodder	51.85	2.5	1.66	0.0
Total Austrian agricultural food trade by Combined Nomenclature (CN)	**2,090.89**	**100.0**	**14,249.89**	**100.0**

Source. WDS – WIFO Data System, Macrobond.

In the years 2015 to 2020, however, the most important reasons for harvesting decisions were not economic considerations, but damage events (Figure 2). Otherwise, it would not be possible to explain why the harvest volume was expanded even though prices fell from 2013 to 2020 (Figure 3). In many cases, very low revenues did not cover the costs of an unplanned harvest and thus presented farms with major economic challenges. Due to the long-term production cycles, rapid adaptation to changing climate conditions is only possible to a limited extent. At the same time, the achievement of climate targets becomes increasingly difficult when the ability of forests to remove excess carbon dioxide from the atmosphere decreases due to damaging events.

The long-term trend decline in timber prices came to an end in 2021, when good construction activity in the USA led to brisk demand on the international timber markets. As a result, prices for sawn timber rose sharply. In contrast, sanding wood was even cheaper in 2021 than in the previous year. It was not until the beginning of 2022 that sanding wood prices also increased. In 2022 as a whole, they were a third higher than in 2021. Log prices rose by 12 percent.

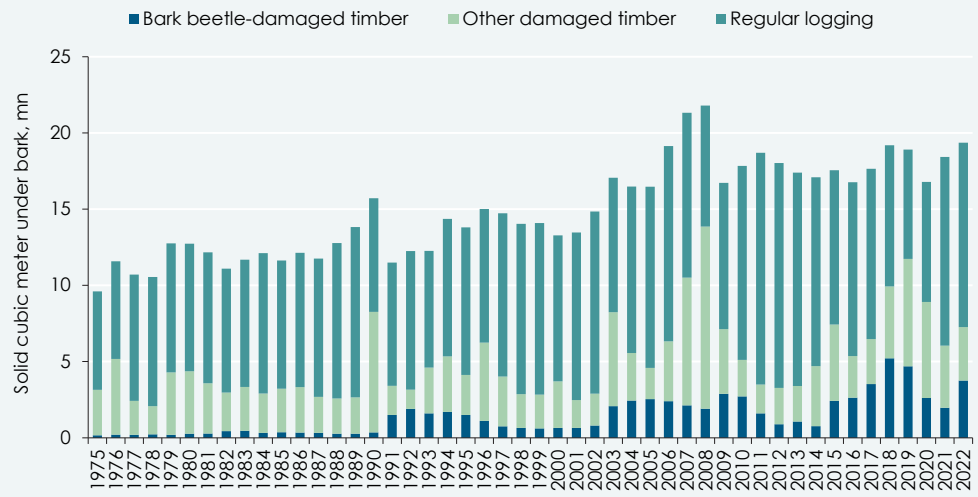
In the middle of 2022, timber prices dropped, but remained stably high until the end of the year. The pronounced increase in the production value in the forestry sector (2022 +25.1 percent to around 3 billion €) was the direct result of the high timber prices. Net value added at basic prices increased by 39.6 percent to 1.1 billion €. The net entrepreneurial profit of the forestry sector amounted to 809 million € in 2022 and was thus 53.8 percent higher than in 2021 (Statistics Austria, 2023b).

Table 5: **Logging**

	2020	2021	2019	2020	2021	2022
	1,000 solid cubic meter under bark			Percentage changes from previous year		
Timber (raw wood, material use)	11,462	13,521	13,934	– 14.0	+ 18.0	+ 3.1
Saw timber (sawmill roundwood)	8,504	10,420	10,711	– 13.8	+ 22.5	+ 2.8
Industrial wood (industrial roundwood)	2,958	3,101	3,223	– 14.4	+ 4.8	+ 3.9
Woodfuel (raw wood for energetic use)	5,327	4,900	5,424	– 4.5	– 8.0	+ 10.7
Total logging (raw wood)	**16,790**	**18,420**	**19,358**	**– 11.2**	**+ 9.7**	**+ 5.1**
	Percentage shares					
Damaged timber	53.1	32.8	37.5			

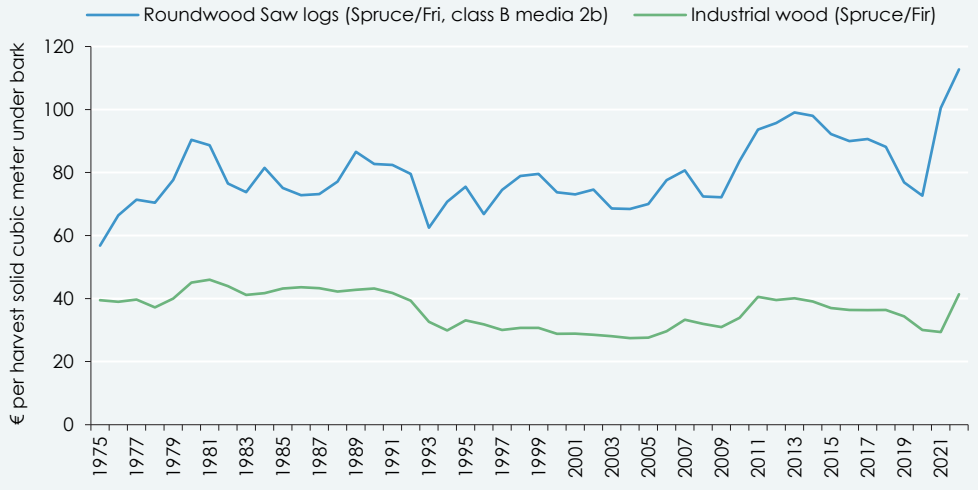
Source: Federal Ministry of Agriculture, Forestry, Regions and Water Management, Timber Felling Report (Holzeinschlagsmeldung; https://info.bml.gv.at/themen/wald/wald-in-oesterreich/wald-und-zahlen/ Holzeinschlag.html).

Figure 3: **Timber harvesting in Austria**



Source: Federal Ministry of Agriculture, Forestry, Regions and Water Management, Timber Felling Report ("Holzeinschlagsmeldungen"; https://info.bml.gv.at/themen/wald/wald-in-oesterreich/wald-und-zahlen/Holzeinschlag.html); The Austrian Research Centre for Forests (BFW), Documentation of forest damage factors (https://www.bfw.gv.at/dokumentation-waldschaedigungsfaktoren/).

Figure 4: **Development of nominal timber prices in Austria**



Source: Statistics Austria, Producer prices for agricultural and forestry products. See: https://www.statistik.at/en/statistics/agriculture-and-forestry/agricultural-and-forestry-economy-and-prices/producer-prices.

6. Greenhouse gas emissions of Austrian agriculture and their foreseeable development until 2050

Agriculture is responsible for one tenth of greenhouse gas emissions in Austria. By 2030, total emissions in Austria are to be reduced by 48 percent. If no further measures are taken, agriculture will only contribute a fraction of the reduction.

In 2022, the Austrian economy emitted 72.6 million t of CO_2 equivalents of greenhouse gases (Environment Agency Austria, 2023a). According to the IPCC inventory, the agricultural sector emitted 7.2 million t of CO_2 equivalents, i.e., was responsible for one tenth of total emissions. The majority (4.2 million t CO_2 equivalents) came from "enteric fermentation", i.e., the metabolism of ruminants, especially cattle. A further 2.8 million t CO_2 equivalents came from the application of mineral and organic fertilisers. Compared to 1990, the first year of greenhouse gas accounting, when 8.4 million t CO_2 equivalents were emitted (Environment Agency Austria, 2023b), emissions from domestic agriculture could be reduced by 14 percent by 2022. Other sectors (e.g. buildings, waste treatment) have also achieved emission reductions since then, while transportation emissions have increased by almost 50 percent since 1990.

According to Regulation (EU) 2023/857 of the European Parliament and of the Council, adopted in spring 2023, Austria's emissions in those sectors that are not part of the EU emissions trading system are to be reduced by 48 percent by 2030 (compared to 2005). These sectors also include agriculture. In the absence of an update of the national climate protection law, there are currently no binding reduction targets for the individual sectors. It is undisputed that emissions from agriculture are to be reduced significantly, even if the exact extent has not yet been determined. However, since in agriculture – unlike in other economic sectors – reducing emissions is very expensive (Fritz, 2022). The reduction targets for agriculture are likely to be lower than in sectors with lower marginal abatement costs.

According to Regulation (EU) 2018/1999 of the European Parliament and of the Council on the governance system for the Energy Union and for climate protection, member countries must regularly submit reports on the projected development of emissions. This is to ensure that action is taken if the results of these analyses indicate a possible failure to meet reduction targets. In accordance with the Regulation, the Austrian Environment Agency (2023b) developed scenarios for the development of emissions in the domestic agricultural sector up to the year 2050. In order to take account of relevant developments with emission-reducing effects in Austrian agriculture and climate and economic policy, the scenarios were defined with the involvement of stakeholders. The consequences of the defined scenarios for agricultural production were simulated with an agricultural sector model and the greenhouse gas emissions were calculated using the methodology of the Austrian Air Pollutant Inventory (OLI).

The scenarios were set as follows:

- The WEM scenario[1] models the emission development taking into account the existing emission reduction measures. The main change compared to the reference situation in 2020 is the implementation of the CAP strategic plan, whose specific objectives include the reduction of emissions (Sinabell, 2022). Among other things, greenhouse gas emissions are to be reduced by covering slurry tanks, spreading slurry close to the ground and covering the soil all year round.
- The WAM scenario additionally takes into account planned measures that had not yet been implemented by the beginning of 2023. These include the measures to reduce ammonia emissions and emissions from the use of urea fertilisers. A preliminary scenario (WAM_{vorl}) was also created to reflect the discussion at the expert level.
- The WAM+ and WAM++ scenarios are "target achievement scenarios" and show which measures could achieve a reduction in agricultural greenhouse gas emissions of 30 and 40 percent respectively by 2050. This would require a restriction of agricultural activities and a significant reduction in fertiliser use.

Assumptions on price developments are based on international price forecasts by OECD and FAO (2023) in all scenarios analysed, taking into account specific national regulations such as the CO_2 levy on fuels. In addition, more detailed assumptions on prices and technical coefficients (e.g., milk yield, livestock, crop yields) were developed in the stakeholder consultation. A key assumption is that only agricultural prices and technical coefficients (such as milk yield per cow, piglets per sow) will change after 2030. Thus, for example, on the basis of the expert assessment, an increase in milk yield per dairy cow of 11 percent by 2030, 21 percent by 2040 and 31 percent by 2050 was assumed in all scenarios (compared to 2020). With these increases, Austria will reach the current performance level of many other EU countries by 2050.

The policy framework (such as CAP payments or the agri-environmental programme) is assumed to remain unchanged after 2030. Scenario-specific assumptions

[1] WEM scenario: with existing measures, WAM scenario: with additional measures, WAM+ and WAM++ scenario: with additional measures and beyond.

such as certain tax rates for fertilisers are excluded. Premiums for agri-environmental measures are kept constant in value, while prices for outputs and inputs generally increase. The reference situation used in the model is based on the situation in 2020.

The agricultural sector model thus shows how indicators of Austrian agriculture (e.g., land use, livestock, production) change when market conditions and technologies change but policies remain unchanged. According to the results of the model calculations, greenhouse gas emissions from domestic agriculture decrease in all scenarios until 2030, 2040 and 2050. The decrease in emissions is weakest in the WEM scenario and strongest in the WAM++ scenario. The latter is mainly a consequence of the significant reduction in agricultural activities (as indicated by livestock numbers or yields) and further emission-reducing measures (e.g. feed additives with a methane-reducing effect).

- By 2030 (compared to 2005), greenhouse gas emissions will have decreased by almost 10 percent in WEM, by 15 percent in WAM_{vorl}, by 19 percent in WAM+ and by 35 percent in WAM++.
- By 2040, emissions decrease by 9.2 percent in WEM, by 18 percent in WAM_{vorl}, by 26 percent in WAM+ and by 41 percent in WAM++ compared to 2005.
- By 2050, the decline is 13 percent in WEM, 23 percent in WAM_{vorl}, 30 percent in WAM+ and 48 percent in WAM++.

The projected emission development depends strongly on the activities reported by the respective model (development of livestock, milk yield, fertiliser quantities, crop yields). The cattle population is declining in all scenarios, with the largest decline occurring by 2030. In the WAM++, the cattle population decreases the most (by 42 percent by 2050 compared to 2020). The effects of emission-reducing measures (in the areas of feeding, livestock production, manure management) also come into play. However, the emission-reducing potential of these measures was not set very high in the development of the scenarios, as it is currently unclear to what extent they will play a role in practice.

Greenhouse gas emissions from Austrian arable land and grassland decrease steadily and to a similar extent in all scenarios. Savings are greater until 2035, weaker in the following years. The main source of emissions remains the conversion of grassland into arable land. WEM and WAM_{vorl} expect unchanged emissions from land use compared to the 2020 reference situation, WAM+ and WAM++ emission reductions. Differences in the savings potential result from the assumed implementation of relevant measures in the agri-environmental programme, with intermediate greening of arable land showing some potential for the next 20 years.

As the results on greenhouse gas emissions (Environment Agency Austria, 2023c) show, emissions from Austrian agriculture are expected to fall by around 10 percent by 2030 with the existing measures of the CAP strategic plan and on the basis of the assumptions made in the WEM scenario. This is also associated with a decline in production, value added and employment. The challenges for agricultural and climate policy are therefore, on the one hand, to help reduce emissions from agriculture more than assumed in the WEM scenario by readjusting existing instruments and supplementary interventions. On the other hand, negative economic consequences must be limited or averted. In addition, emissions associated with the import of agricultural goods and food should be prevented from increasing. Otherwise, domestic emission reductions could be accompanied by an increase in emissions at the global level.

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