Losing active substances in plant protection: impacts on farm level
The cases of some agricultural and horticultural crops cultivated in selected Eastern and Central European countries

HFFA Research GmbH

(corresponding authors: Steffen Noleppa and Juliane Kaufmann)

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Acknowledgements

This research was initiated and financed by BASF SE. We would like to thank Anja Klatt as well as the entire steering group from BASF SE for the continuous and valuable feedback throughout the research phase. However, the results of this study are the sole responsibility of the authors and have never been influenced by the initiator and financial supporter of the study.

List of abbreviations

BAB	–	Bundesanstalt für Agrarwirtschaft und Bergbauernfragen
BAES	–	Bundesamt für Ernährungssicherheit
BFSA	–	Bulgarian Food Safety Agency
BMEL	–	Bundesministerium für Ernährung und Landwirtschaft
BVL	–	Bundesamt für Verbraucherschutz und Lebensmittelsicherheit
CfS	–	Candidate(s) for Substitution
CNV	–	Constructed Normal Value
DLR	–	Dienstleistungszentrum Ländlicher Raum
EC	–	European Commission
EU	–	European Union
FSDN	–	Farm Sustainability Data Network
KTBL	–	Kuratorium für Technik und Bauwesen in der Landwirtschaft
LfL	–	Bayerische Landesanstalt für Landwirtschaft
MADR	–	Ministerul Agriculturii și Dezvoltării Rurale
MZE	–	Ministerstvo Zemědělství
OSR	–	Oilseed Rape
PPP	–	Plant Protection Product(s)

Executive Summary

Farm profitability—not just production—is the cornerstone of European Union (EU) food sovereignty. As the number of approved plant protection substances declines significantly, earlier studies already point to risks for production levels, self-sufficiency, and trade balances. Building on this, the report highlights that reduced availability of key substances will directly undermine farm-level profitability, with average farm profits collapsing by more than three quarters. This threatens the economic viability of agriculture and the long-term resilience of the EU food system.

The working hypothesis of this report is that the continuous loss of numerous active substance this 2030 would significantly reduce the profitability of producing key crops in Bulgaria, Czechia, Poland, Romania in Austria.

To verify this working hypothesis, a standardized full-revenue-full-cost calculation approach is applied to 20 representative case studies covering the cultivation of agricultural and horticultural crops in the five selected EU member states. For each case, a reference situation reflecting the currently existing availability of active substances is compared to an analytical "Scenario", which assumes that, by 2030, active substances classified as Candidates for Substitution (CfS) and applicable emergency authorizations will not be re-approved and that second-best solutions still available to the typical farmer will have to be used instead. On this basis, the impacts on market revenue, gross margin, net margin and economic profit are determined at farm level, thus capturing the short-term, medium-term and, above all, long-term economic competitiveness of typical producers.

A central feature of this approach is that yield losses translate non-linearly into profit losses: even moderate yield reductions of some percent can lead to very large drops in net margins and economic profit, because costs at farm level remain largely unchanged.

Across all 20 case studies, the analysis reveals a remarkable decline in economic competitiveness. Economic profit would deteriorate most severely, with reductions ranging between 22 and more than 280 percent, while the market revenue would decrease by eight to 18 percent. The gross margin would decline by approximately ten to 34 percent and the net margin by some 13 to 50 percent. Using the unweighted average of all 20 case studies:

- the market revenue would decline by more than one sixth,
- the gross margin would already decrease by about one quarter and
- the net margin by approximately one third, leading to
- the economic profit being reduced by more than three quarters.

In other words, most of the farmer's long-term income would disappear without CfS and applicable emergency authorizations.

A particularly important finding concerns the situation of currently profitable farms. The case study results show that even typical producers who today operate at a comfortable margin would see their long-term economic performance turning marginal or fully negative, i.e., a profitable business would turn into an almost non-profitable or loss-making endeavor for a typical farmer:

- For a typical wheat farmer in Czechia, the economic profit would decline from currently EUR 161 per hectare to minus EUR 71 per hectare, corresponding to a relative loss of 144 percent.
- The barley case studies in Austria and Czechia exhibit the same pattern, with reductions of 284 percent and 135 percent of economic profit, respectively, and corn in Czechia (–92 percent) and Romania (–70 percent) follow a comparable trajectory.

- High-value horticultural crops are not exempt from this development: the economic profit of a typical farmer would decrease by 91 percent for tomato in Romania, by 58 percent for hops in Czechia, by 37 percent for vine (grapes) in Austria and by 34 percent for vine (grapes) in Romania, while apple in Poland (–22 percent) and onion in Bulgaria (–24 percent) display somewhat smaller, but nevertheless considerable losses.

These and the other study findings reframe the current policy debate in at least the following three important ways:

- First, farm profitability emerges as the actual bottleneck for food sovereignty: yield losses can often be managed technically, but once full costs are considered, they become economically devastating, and without profit, production can neither be maintained nor expanded or modernized.
- Second, declining economic profits would directly erode the investment and transition capacity of farms, making it harder to finance precisely the structural shift toward more sustainable agriculture that policymakers expect.
- Third, the avoided monetary losses can, vice versa, be considered the economic benefit of still using all currently available PPP in the production of the selected key crops at farm level. Keeping an effective toolbox available in the EU is therefore not a cost factor, but a tangible economic gain.

Policymakers should enable rather than hinder farmers by broadening access to existing innovations, by prioritizing research and development for future solutions, and by establishing regulatory and administrative frameworks that foster the next cycles of innovation. A sufficiently broad and diversified toolbox, encompassing chemical-synthetic solutions as well as advances in plant breeding and plant nutrition, is essential for allowing farms to respond effectively and flexibly to the wide range of demands placed on them.

In summary: without key plant protection active substances, many EU farms would remain technically productive but become economically non-viable, with average farm profits collapsing by more than three quarters — directly undermining the very food sovereignty that European policy seeks to strengthen.

1. Introduction

1.1 Context of the study

Food sovereignty and, more specifically, food self-sufficiency have become increasingly important topics of political debate – not only globally, but also within the European Union (EU). After decades of prioritizing global markets, the EU and its member states are once again confronting the question of whether they can ensure sufficient supplies from domestically produced agricultural commodities and food for their own populations. In parallel, attention has turned to the foreign agri-food trade balance as a core indicator of resilience, competitiveness, and external vulnerability. Reliable domestic supply is now widely viewed as essential for economic stability, political independence, and sustainable development as recent disruptions have highlighted the fragility of global supply chains. The COVID-19 pandemic (see Arita et al., 2022; Bai et al., 2022) and Russia's war of aggression against Ukraine (see Osendarp et al., 2022; Alexander et al., 2023; Zhang et al., 2023) demonstrated the risks of overreliance on imports and exposed imbalances in agri-food trade flows and reignited public debate about maximizing food self-sufficiency (see Hutton, 2022; Terpitz, 2025).

Alongside these crises, other factors are contributing to the growing recognition of food sovereignty and a sound agri-food trade balance as a cornerstone of stability, security and risk prevention, including accelerated climate change, new environmental goals, shifting geopolitical and trade dynamics, slow innovation and poorly designed regulatory mechanisms (see Noleppa and Capri, 2022). This recognition is reflected in the European Preparedness Union Strategy (EC, 2025b) and the newly published Vision for Agriculture and Food (EC, 2025c), both of which identify food security and a competitive agri-food sector with a sustainable trade position as a political priority in building a resilient EU agricultural sector. This raises the question of how well individual EU member states can meet their own food demand and reduce external dependencies. Indeed, maximizing domestic production and productivity is one of the key factors for securing stable supply and reducing external dependencies. For agriculture, and crop production in particular, this translates into efficiently securing the highest possible yields.

Plant protection products (PPP) are still a cornerstone of stable and high-yield crop production in the EU and its member states. A key factor in this debate is the EU's stringent regulatory framework for the approval of PPP. Active substances must undergo multi-year approval and authorization processes before entering the market and once approved are subject to repeated and extensive re-evaluations. Decisions on their continued use increasingly reflect a difficult balance between promoting sustainable farming and ensuring adequate protection of crops. Regulatory developments are central to this trend and the EU's portfolio of active substances is undergoing profound change. Efforts to reduce PPP use combined with evolving evaluation criteria and future policy requirements raise questions about which substances will remain available in the medium term.

In the last 15 years, the placing of PPP on the market has been governed primarily by Regulation (EC) No. 1107/2009, which introduced provisions that particularly have narrowed the spectrum of approved active substances significantly. In 2011, around 280 chemical active substances were authorized in the EU; by 2022, this figure had fallen to about 220 – a reduction of more than 20 percent (Marchand, 2023). Looking ahead, projections suggest the portfolio may shrink to roughly 150 active substances by 2030, implying a further decline of over 30 percent (Marchand, 2023). Similarly, Chapelle and Malet (2022) expect up to one quarter of active substances to disappear over this period. This trend is reinforced by additional political strategies aimed at further reducing PPP use, driven by both European institutions (see, e.g., EC, 2022) and national governments (see, e.g., BMEL, 2024).

In addition, and to make things worse, no new synthetic-chemical active substance has been authorized for market entry in the EU. At the same time, the number of emergency authorizations has been rising (see, e.g., BVL, 2026), indicating increasing pressure on the system to maintain food production under tightening regulatory constraints. Against this backdrop, public debate reinforces that emergency approvals should not become a permanent instrument.

Public debate also questions how Candidates for Substitution (CfS) are handled. These CfS are active substances with specific hazard profiles which remain approved in the EU only until safer alternatives are available – and their substitution would not cause disproportionate significant economic or practical disadvantages. Some argue their approvals should end quickly because of their hazard profiles (PAN Europe, 2020), although, by rule, CfS stay approved only until clearly safer alternatives exist and substitution would not cause unacceptable production losses. In practice, public pressure and the time, cost, and complexity of renewals reduce planning certainty, so some CfS are not even re-applied for. Combined with fewer emergency authorizations, these developments point to a steady erosion of the chemical toolbox available to farmers.

This trend raises fundamental questions about the future of European agriculture: How can stable and sustainable domestic food production be guaranteed under such strict regulatory conditions. And what role should national self-sufficiency play in a highly regulated and globalized, i.e. trade-dependent agricultural market. Assessing the potential consequences of a loss of active substances due to regulatory restrictions is therefore essential.

Against this overall background, a set of altogether four studies (HFFA Research 2025 a; b; c; d) already assessed how a substantial reduction in available plant-protection options would affect domestic agricultural production, food self-sufficiency and the agri-food trade balance in selected EU member states, namely Bulgaria, Czechia, Poland, and Romania. A scenario in which, by 2030, all active substances classified as CfS and applicable emergency authorizations are not reapproved, was modeled and it could be shown that there are risks to the current food availability situation and foreign agricultural net trade balance as all the self-sufficiency rates would decline.

1.2 Objective and structure of the study

The research documented hereafter builds on this set of studies. Based on latest data from official statistics and advanced models in agricultural economics, namely a full-revenue-full-cost calculation approach, it is the particular aim of this study to additionally test the following working hypothesis: The loss of numerous active substances would significantly reduce the farm profitability of producing key crops in selected EU member states, namely in the four countries already listed above (Bulgaria, Czechia, Poland, Romania) and, in addition, Austria.

This report is meant to provide insights into the question at hand, i.e., to verify (respectively falsify) the above-mentioned working hypothesis, and is structured as follows:

- Chapter 2 discusses methodological issues to better understand and interpret the analytical results.
- Chapter 3 examines the potential impacts of losing active substances under regulatory restrictions as regards altogether 20 analyzed case studies in the following order: (01) wheat in Austria, (02) wheat in Bulgaria, (03) wheat in Czechia, (04) wheat in Poland, (05) wheat in Romania, (06) barley in Austria, (07) barley in Czechia, (08) corn in Czechia, (09) corn in Romania, (10) oilseed rape (OSR) in Bulgaria, (11) OSR in Poland, (12) potato in Austria, (13) potato in Poland, (14) sunflower in Bulgaria, (15) vine (grapes) in Austria, (16) vine (grapes) in Romania, (17) apple in Poland, (18) tomato in Romania, (19) onion in Bulgaria, and (20) hops in Czechia.
- Chapter 4 finally summarizes these findings and additionally offers some recommendations.

2. Methodological considerations

Per case study, a reference scenario is calibrated first. It is mainly based on Farm Sustainability Data Network (FSDN) information for the selected EU member states and crops as provided by EC (2026) and adjusted to KTBL (2026), BAB (2026), Ilie et al. (2025) and LfL (2026) data. The approach used to do so – and also applied to calculate impacts on costs and returns of agricultural production at farm level – is basically a standardized full-revenue-full-cost calculation method of farm economics consistent with the concept of the "constructed normal value" (CNV) (see Eidman et al., 2000; von Witzke and Noleppa, 2012; Hahn and Noleppa, 2013; Noleppa and Lüttringhaus, 2016; Mußhoff, 2017).

The used CNV-based approach allows for a precise determination of the market revenue, which basically reflects the price and yield situation in agricultural production, and of production costs consisting of (1) operational costs such as costs related to seeds, fertilizers and PPP, (2) other variable costs such as depreciation and wages paid as well as (3) fixed costs, i.e. fixed machinery, (family) labor and capital costs. In essence, this allows the calculation of various margins, i.e. (a) the gross margin, (b) the net margin, and (c) the economic profit. Thereby, the following definitions apply:

- The gross margin is the (market) revenue minus the operational costs,
- The net margin is the gross margin minus the other variable costs, and
- The economic profit is the net margin minus the fixed costs.

In the introduction of this report, it has been noted that regulatory restrictions will presumably lead to the non-approval of several active substances, namely CfS and applicable emergency authorizations, in the coming years. Against this backdrop, the "Scenario" assumes that by 2030 significantly fewer active substances – and thus PPP – will be available for crop production. To implement this assumption, two important aspects must be addressed: identifying which active substances would be affected, and estimating the yield and production effects of their potential loss. Accordingly, the methodological approach applied to identifying the active substances to be affected (potentially withdrawn) is as follows:

- Active substances currently authorized for each of the selected crops were identified generally using DLR Rheinpfalz (2025) and more particularly BAES (2025) in the case of Austria, BFSA (2025) in the case of Bulgaria, MZE (2025) in the case of Czechia, Ministerstwo Rolnictwa i Rozwoju Wsi (2025) in the case of Poland, and MADR (2025) in the case of Romania.
- Next, these active substances were cross-checked against the EU Pesticides Database (EC, 2025a) to determine which ones are classified as CfS.
- The identified active substances were then finally reviewed by BASF country representatives to account for possible national specificities, e.g. applicable emergency authorizations, which are not captured by the below approach.

As a result of this process, a specific number of fungicidal, herbicidal, and insecticidal active substances were identified that are under threat to be withdrawn from the market and per crop in the five selected EU member states by 2030. The specific "Scenario" findings can be obtained from HFFA Research (2025a; b; c; d), which also provide the necessary methodological background information as regards the estimation of the yield and production effects of losing a specific number of active substances in the "Scenario". Accordingly, the 20 case study results are as discussed in the following[1].

[1] The following 20 case study texts can be read as stand-alone versions and follow a similar structure with repetitive content.

3. Case study analyses

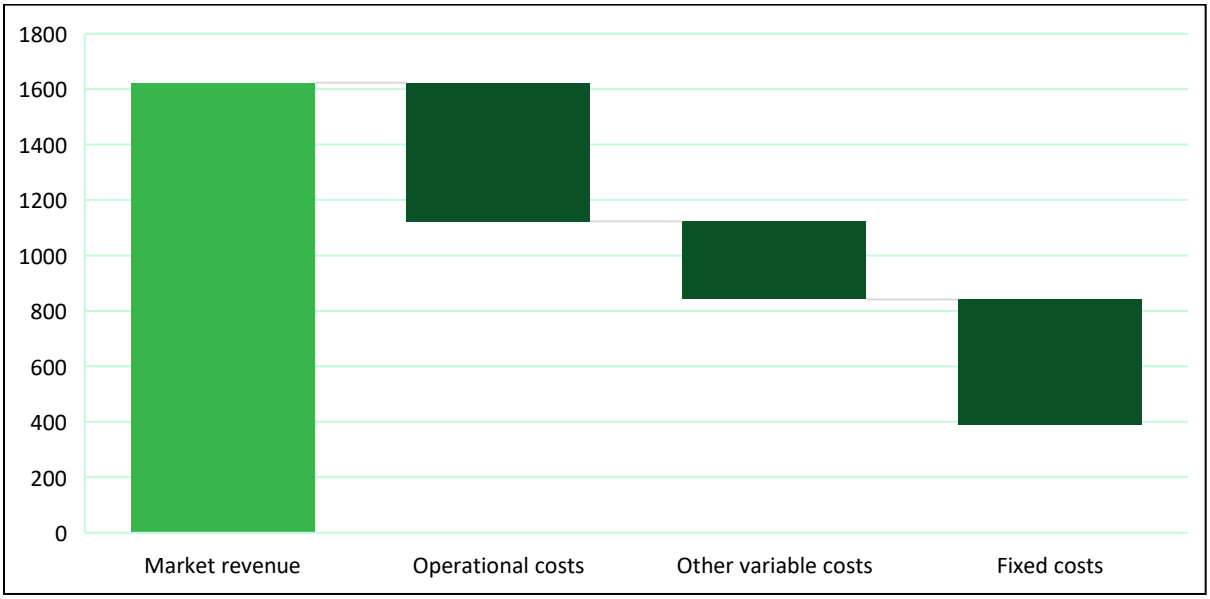
3.01 Wheat in Austria

In the following, the full-revenue-full-cost calculation approach is applied to a typical wheat producer in Austria. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Austrian farmer will have to be used instead.

In the reference scenario, this typical wheat farmer in Austria has the following economic calculations, which are also shown in Figure 3.1:

- The farmer achieves a market revenue of EUR 1,623 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 501 per hectare.
- The resulting gross margin of EUR 1,123 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 282 per hectare.
- This results in a net margin of EUR 841 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 453 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing wheat in Austria is EUR 388 per hectare.

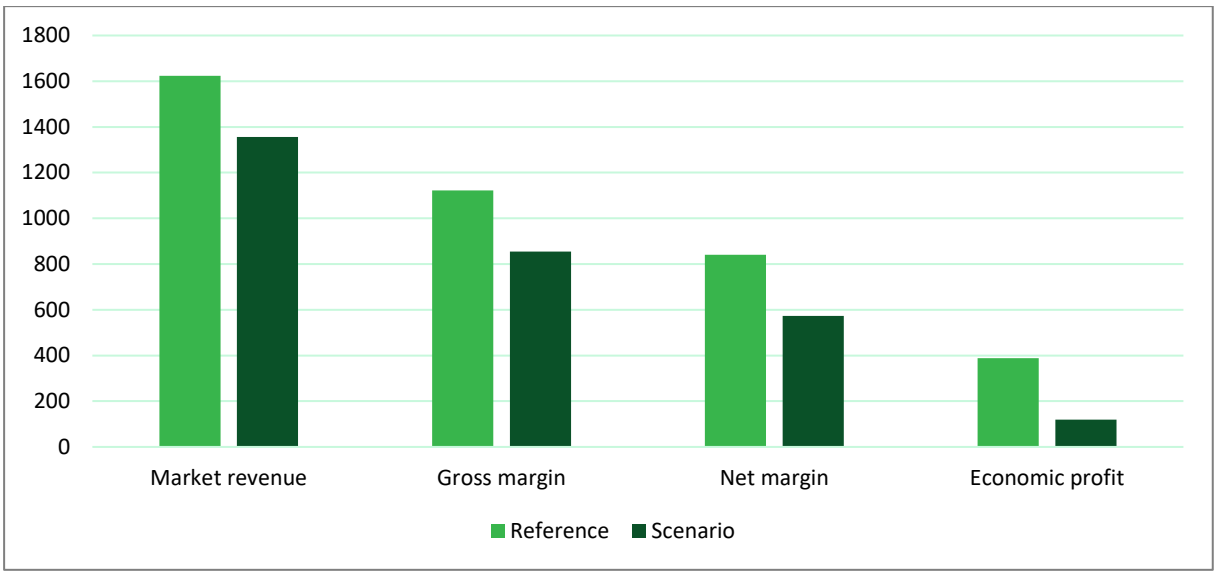
Figure 3.1: Farm economics of a typical Austrian farmer growing wheat in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved. The use of these second-best alternatives subsequently leads to a loss of the wheat yield surplus in Austria of 16.5 percent. Consequently, market revenues change, which in turn affects economic margins and profits. The results are shown in Figure 3.2.

Figure 3.2: Change of farm economics of a typical Austrian farmer growing wheat in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing wheat in Austria would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 268 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 16.5 percent, the market revenue would decrease to EUR 1,355 per hectare.
- The gross margin would decrease to EUR 855 per hectare, which is already equivalent to an economic loss of 23.9 percent.
- The net margin would subsequently fall to EUR 573 per hectare, which now corresponds to a decline in this economic performance indicator of 31.9 percent.
- The resulting economic profit would amount to EUR 120 per hectare, which finally marks a relative loss of 69.1 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Austrian wheat farmer who currently still relies on the use of these active substances. In the specific case of wheat production in Austria:

- a profitable business would turn into
- an almost non-profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Austrian farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only wheat farmers but also other farmers in Austria and at the larger European scale currently must deal with.

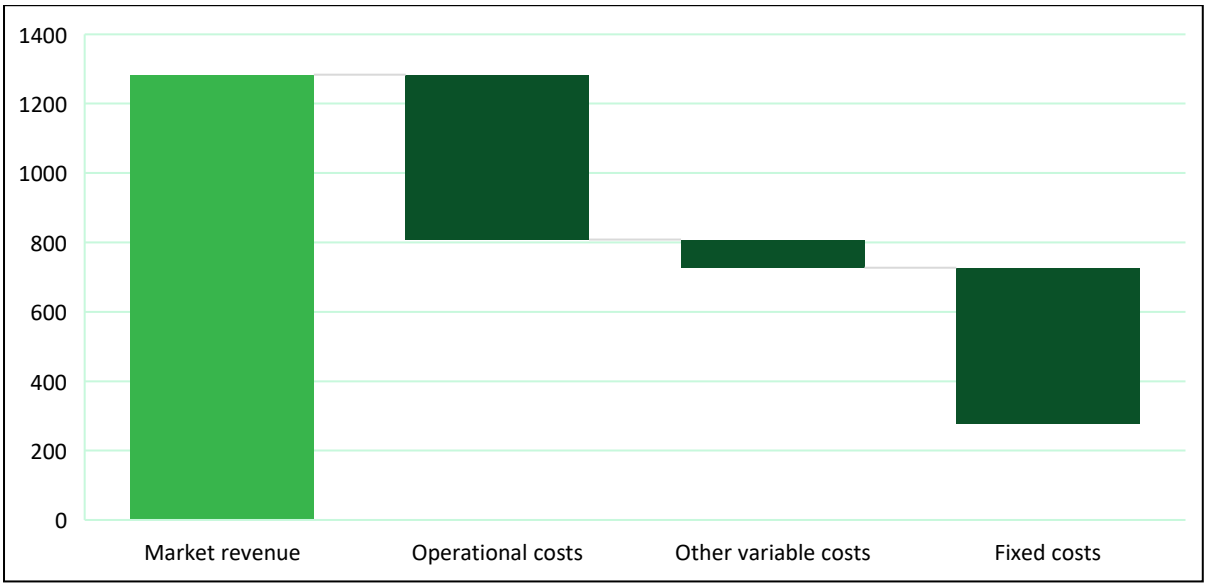
3.02 Wheat in Bulgaria

In the following, the full-revenue-full-cost calculation approach is applied to a typical wheat producer in Bulgaria. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Bulgarian farmer will have to be used instead.

In the reference scenario, this typical wheat farmer in Bulgaria has the following economic calculations, which are also shown in Figure 3.3:

- The farmer achieves a market revenue of EUR 1,283 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 575 per hectare.
- The resulting gross margin of EUR 809 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 82 per hectare.
- This results in a net margin of EUR 727 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 448 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing wheat in Bulgaria is EUR 278 per hectare.

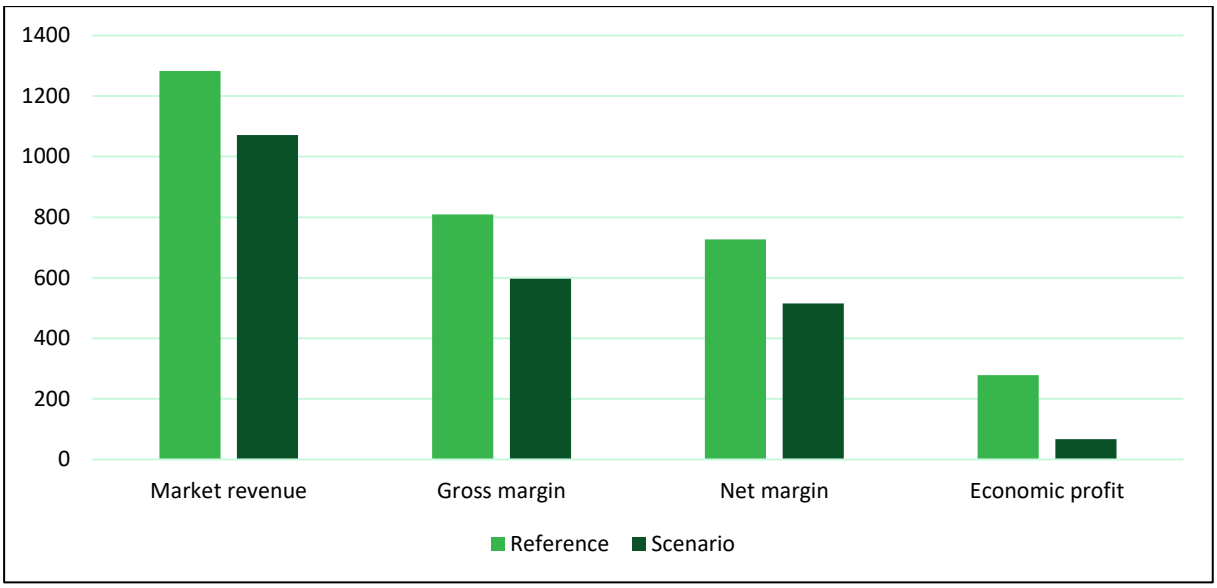
Figure 3.3: Farm economics of a typical Bulgarian farmer growing wheat in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Bulgaria. The use of these second-best alternatives subsequently leads to a loss of the wheat yield surplus in the country of 16.5 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.4.

Figure 3.4: Change of farm economics of a typical Bulgarian farmer growing wheat in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing wheat in Bulgaria would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 212 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 16.5 percent, the market revenue would decrease to EUR 1,071 per hectare.
- The gross margin would decrease to EUR 597 per hectare, which is already equivalent to an economic loss of 26.2 percent.
- The net margin would subsequently fall to EUR 515 per hectare, which now corresponds to a decline in this economic performance indicator of 29.1 percent.
- The resulting economic profit would amount to EUR 67 per hectare, which finally marks a relative loss of 76.0 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Bulgarian wheat farmer who currently still relies on the use of these active substances. In the specific case of wheat production in Bulgaria:

- a profitable business would turn into
- an almost non-profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Bulgarian farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only wheat farmers but also other farmers in Bulgaria and at the larger European scale currently must deal with.

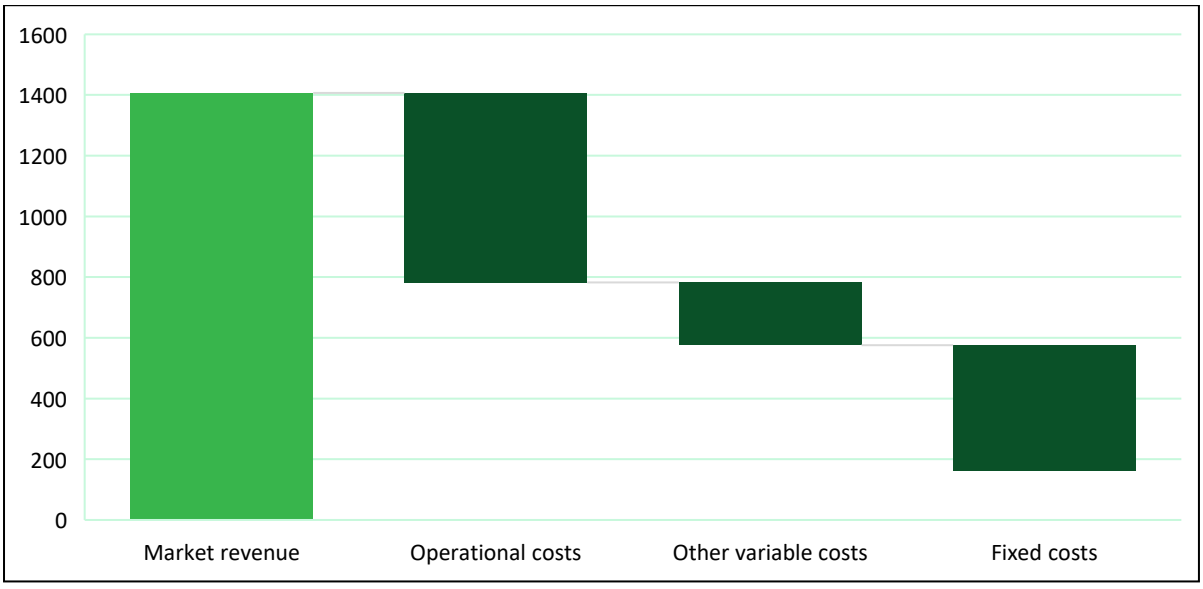
3.03 Wheat in Czechia

In the following, the full-revenue-full-cost calculation approach is applied to a typical wheat producer in Czechia. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Czech farmer will have to be used instead.

In the reference scenario, this typical wheat farmer in Czechia has the following economic calculations, which are also shown in Figure 3.5:

- The farmer achieves a market revenue of EUR 1,407 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 624 per hectare.
- The resulting gross margin of EUR 783 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 207 per hectare.
- This results in a net margin of EUR 576 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 415 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing wheat in Czechia is EUR 161 per hectare.

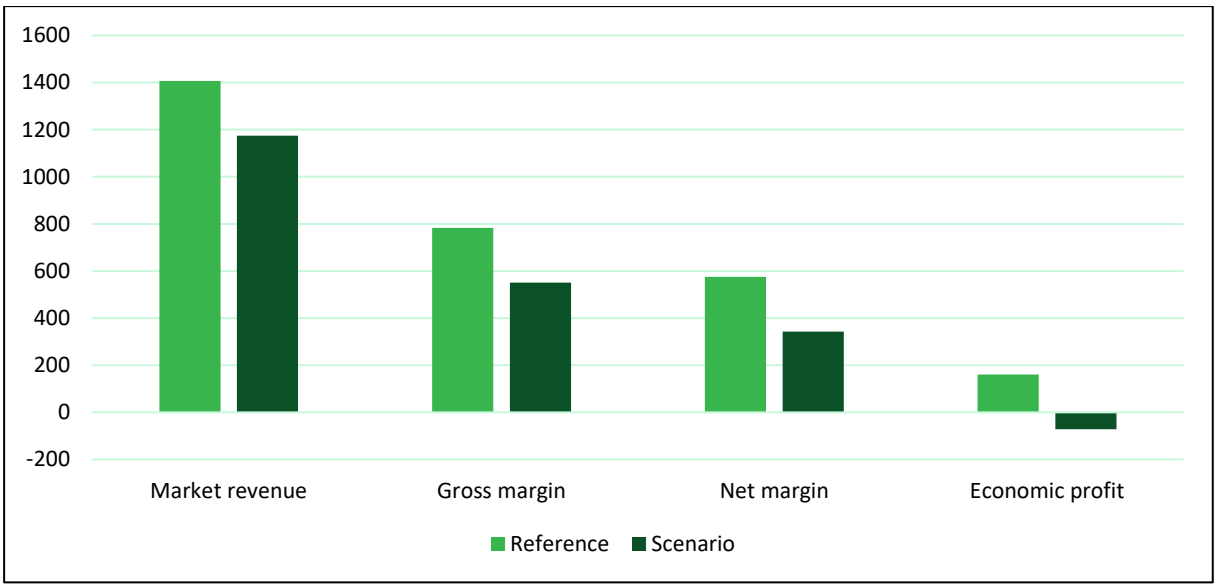
Figure 3.5: Farm economics of a typical Czech farmer growing wheat in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Czechia. The use of these second-best alternatives subsequently leads to a loss of the wheat yield surplus in the country of 16.5 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.6.

Figure 3.6: Change of farm economics of a typical Czech farmer growing wheat in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing wheat in Czechia would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 232 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 16.5 percent, the market revenue would decrease to EUR 1,175 per hectare.
- The gross margin would decrease to EUR 551 per hectare, which is already equivalent to an economic loss of 29.7 percent.
- The net margin would subsequently fall to EUR 343 per hectare, which now corresponds to a decline in this economic performance indicator of 40.3 percent.
- The resulting economic profit would amount to minus EUR 71 per hectare, which finally marks a relative loss of 144.1 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Czech wheat farmer who currently still relies on the use of these active substances. In the specific case of wheat production in Czechia:

- a profitable business would turn into
- a loss-making endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Czech farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only wheat farmers but also other farmers in Czechia and at the larger European scale currently must deal with.

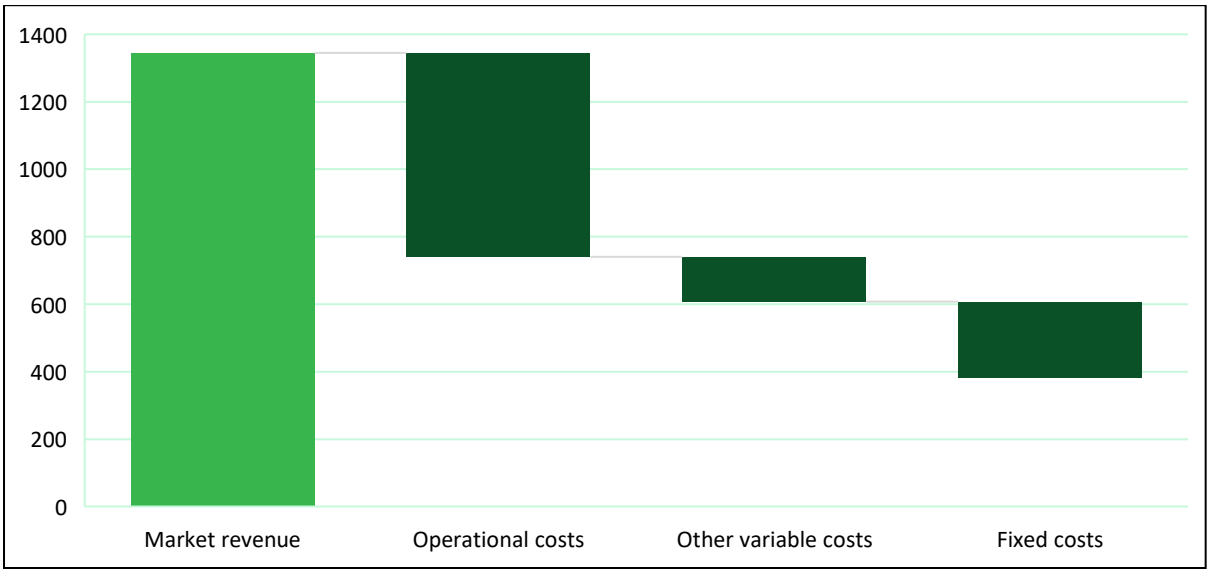
3.04 Wheat in Poland

In the following, the full-revenue-full-cost calculation approach is applied to a typical wheat producer in Poland. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Polish farmer will have to be used instead.

In the reference scenario, this typical wheat farmer in Poland has the following economic calculations, which are also shown in Figure 3.7:

- The farmer achieves a market revenue of EUR 1,345 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 605 per hectare.
- The resulting gross margin of EUR 741 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 133 per hectare.
- This results in a net margin of EUR 608 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 227 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing wheat in Poland is EUR 381 per hectare.

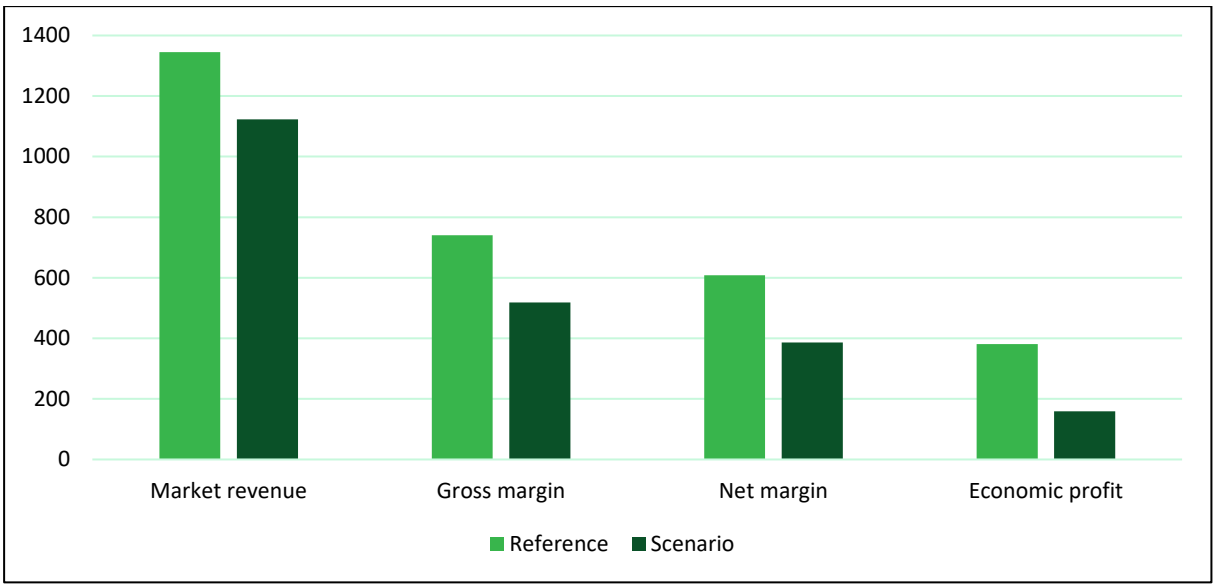
Figure 3.7: Farm economics of a typical Polish farmer growing wheat in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Poland. The use of these second-best alternatives subsequently leads to a loss of the wheat yield surplus in the country of 16.5 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.8.

Figure 3.8: Change of farm economics of a typical Polish farmer growing wheat in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing wheat in Poland would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 222 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 16.5 percent, the market revenue would decrease to EUR 1,123 per hectare.
- The gross margin would decrease to EUR 519 per hectare, which is already equivalent to an economic loss of 30.0 percent.
- The net margin would subsequently fall to EUR 386 per hectare, which now corresponds to a decline in this economic performance indicator of 36.5 percent.
- The resulting economic profit would amount to EUR 160 per hectare, which finally marks a relative loss of 58.2 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Polish wheat farmer who currently still relies on the use of these active substances. In the specific case of wheat production in Poland:

- a rather profitable business would turn into
- a much less profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Polish farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only wheat farmers but also other farmers in Poland and at the larger European scale currently must deal with.

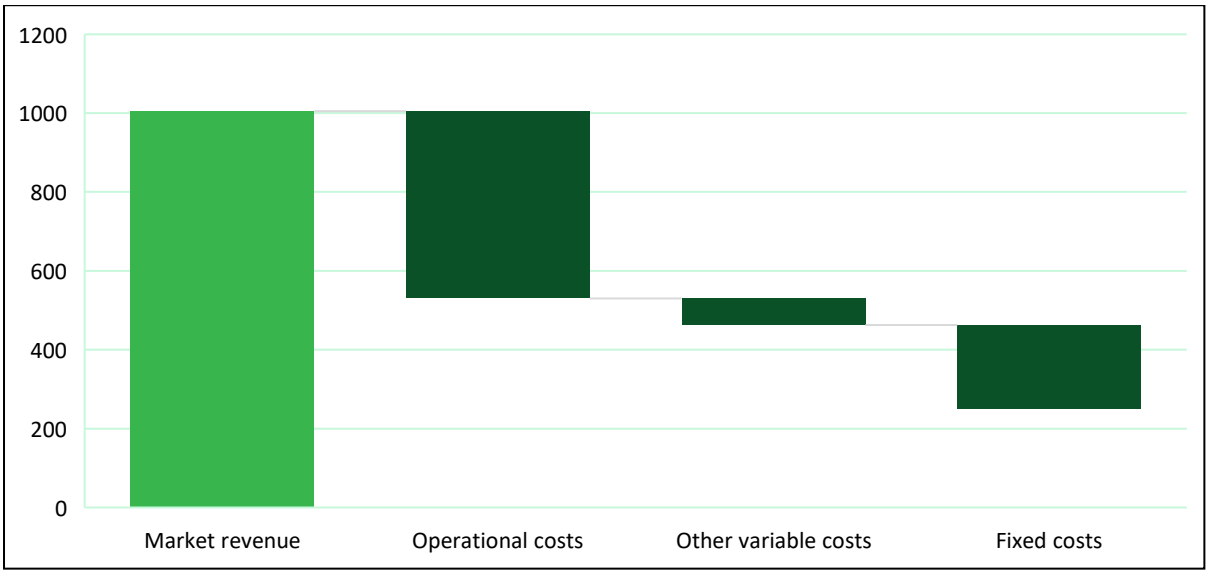
3.05 Wheat in Romania

In the following, the full-revenue-full-cost calculation approach is applied to a typical wheat producer in Romania. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Romanian farmer will have to be used instead.

In the reference scenario, this typical wheat farmer in Romania has the following economic calculations, which are also shown in Figure 3.9:

- The farmer achieves a market revenue of EUR 1,005 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 475 per hectare.
- The resulting gross margin of EUR 530 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 67 per hectare.
- This results in a net margin of EUR 463 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 212 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing wheat in Romania is EUR 251 per hectare.

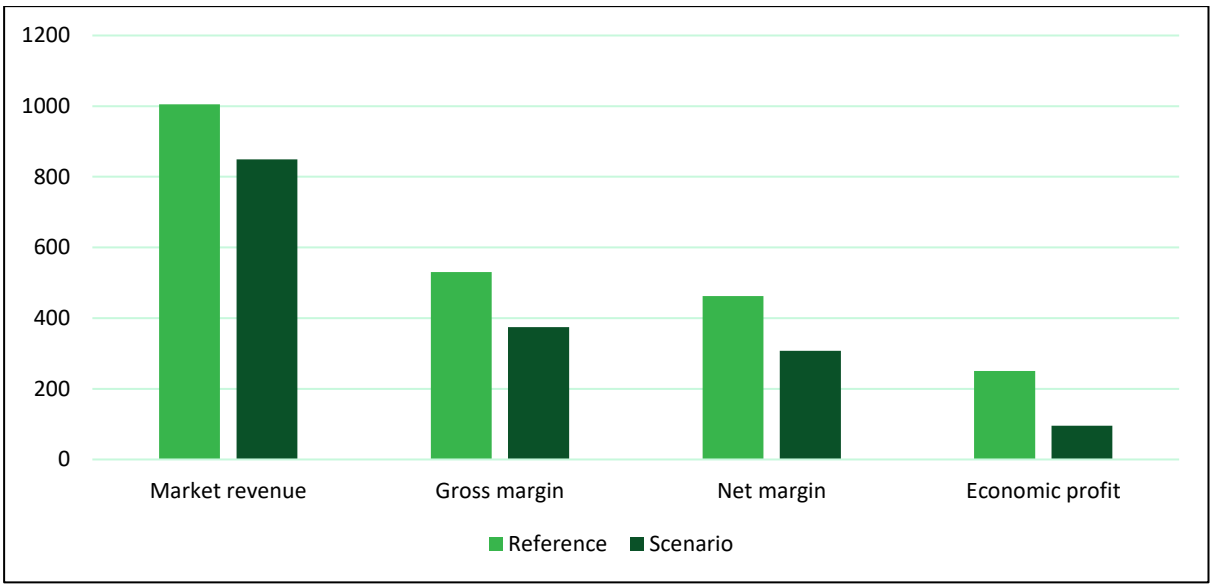
Figure 3.9: Farm economics of a typical Romanian farmer growing wheat in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Romania. The use of these second-best alternatives subsequently leads to a loss of the wheat yield surplus in the country of 15.5 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.10.

Figure 3.10: Change of farm economics of a typical Romanian farmer growing wheat in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing wheat in Romania would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 156 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 15.5 percent, the market revenue would decrease to EUR 849 per hectare.
- The gross margin would decrease to EUR 375 per hectare, which is already equivalent to an economic loss of 29.4 percent.
- The net margin would subsequently fall to EUR 307 per hectare, which now corresponds to a decline in this economic performance indicator of 33.6 percent.
- The resulting economic profit would amount to EUR 95 per hectare, which finally marks a relative loss of 62.1 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Romanian wheat farmer who currently still relies on the use of these active substances. In the specific case of wheat production in Romania:

- a profitable business would turn into
- an almost non-profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Romanian farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only wheat farmers but also other farmers in Romania and at the larger European scale currently must deal with.

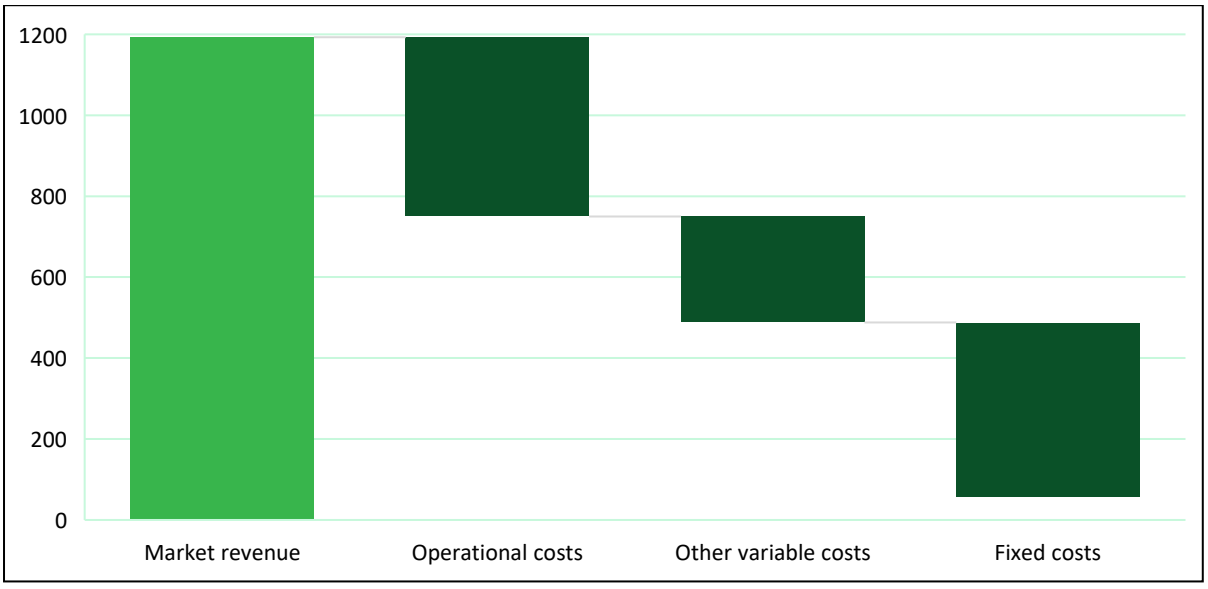
3.06 Barley in Austria

In the following, the full-revenue-full-cost calculation approach is applied to a typical barley producer in Austria. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Austrian farmer will have to be used instead.

In the reference scenario, this typical barley farmer in Austria has the following economic calculations, which are also shown in Figure 3.11:

- The farmer achieves a market revenue of EUR 1,193 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 443 per hectare.
- The resulting gross margin of EUR 750 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 262 per hectare.
- This results in a net margin of EUR 488 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 431 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing barley in Austria is EUR 57 per hectare.

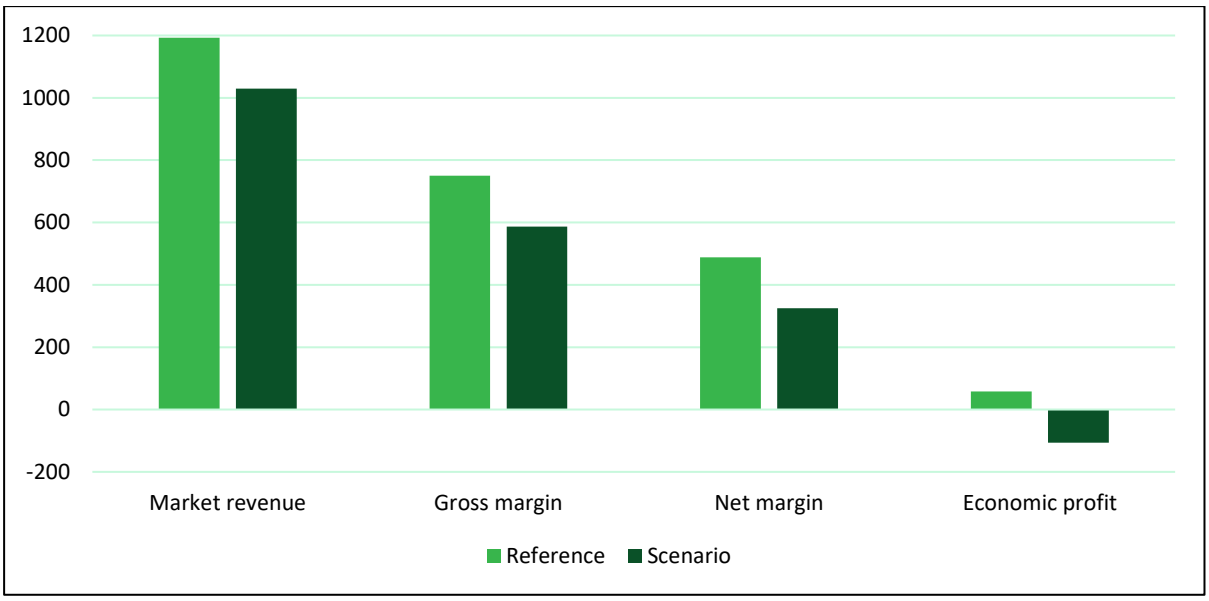
Figure 3.21: Farm economics of a typical Austrian farmer growing barley in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Austria. The use of these second-best alternatives subsequently leads to a loss of the barley yield surplus in the country of 13.7 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.12.

Figure 3.12: Change of farm economics of a typical Austrian farmer growing barley in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing barley in Austria would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 163 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 13.7 percent, the market revenue would decrease to EUR 1,029 per hectare.
- The gross margin would decrease to EUR 587 per hectare, which is already equivalent to an economic loss of 21.8 percent.
- The net margin would subsequently fall to EUR 325 per hectare, which now corresponds to a decline in this economic performance indicator of 33.5 percent.
- The resulting economic profit would amount to minus EUR 106 per hectare, which finally marks a relative loss of 284.4 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Austrian barley farmer who currently still relies on the use of these active substances. In the specific case of barley production in Austria:

- a profitable business would turn into
- a loss-making endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Austrian farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only barley farmers but also other farmers in Austria and at the larger European scale currently must deal with.

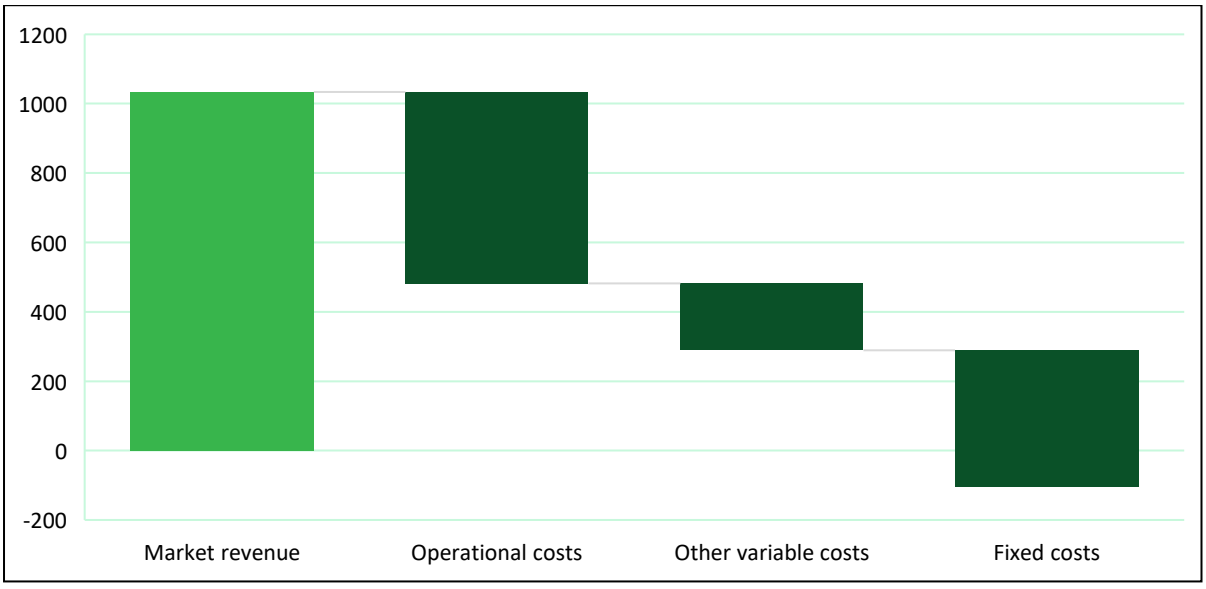
3.07 Barley in Czechia

In the following, the full-revenue-full-cost calculation approach is applied to a typical barley producer in Czechia. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Czech farmer will have to be used instead.

In the reference scenario, this typical barley farmer in Czechia has the following economic calculations, which are also shown in Figure 3.13:

- The farmer achieves a market revenue of EUR 1,034 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 552 per hectare.
- The resulting gross margin of EUR 482 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 193 per hectare.
- This results in a net margin of EUR 289 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 394 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing barley in Czechia is minus EUR 105 per hectare.

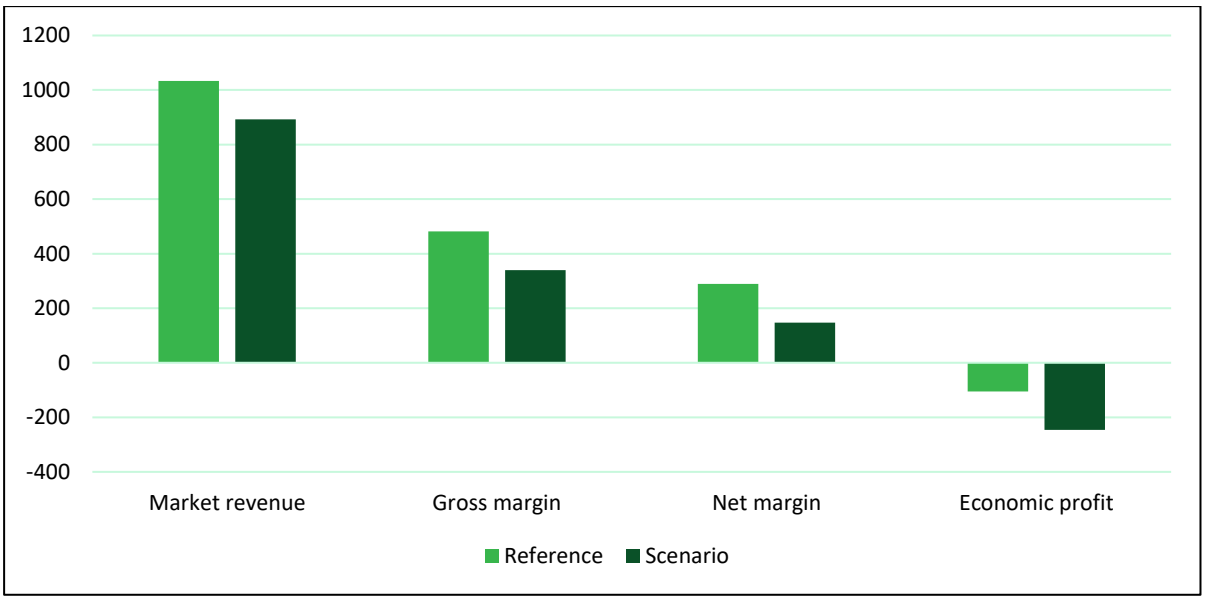
Figure 3.33: Farm economics of a typical Czech farmer growing barley in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Czechia. The use of these second-best alternatives subsequently leads to a loss of the barley yield surplus in the country of 13.7 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.14.

Figure 3.14: Change of farm economics of a typical Czech farmer growing barley in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing barley in Czechia would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 142 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 13.7 percent, the market revenue would decrease to EUR 892 per hectare.
- The gross margin would decrease to EUR 340 per hectare, which is already equivalent to an economic loss of 29.4 percent.
- The net margin would subsequently fall to EUR 147 per hectare, which now corresponds to a decline in this economic performance indicator of 49.0 percent.
- The resulting economic profit would amount to minus EUR 246 per hectare, which finally marks a further relative loss of 135.2 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Czech barley farmer who currently still relies on the use of these active substances. In the specific case of barley production in Czechia:

- an already non-profitable business would turn into
- an even larger non-profitable and potentially devastating endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Czech farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only barley farmers but also other farmers in Czechia and at the larger European scale currently must deal with.

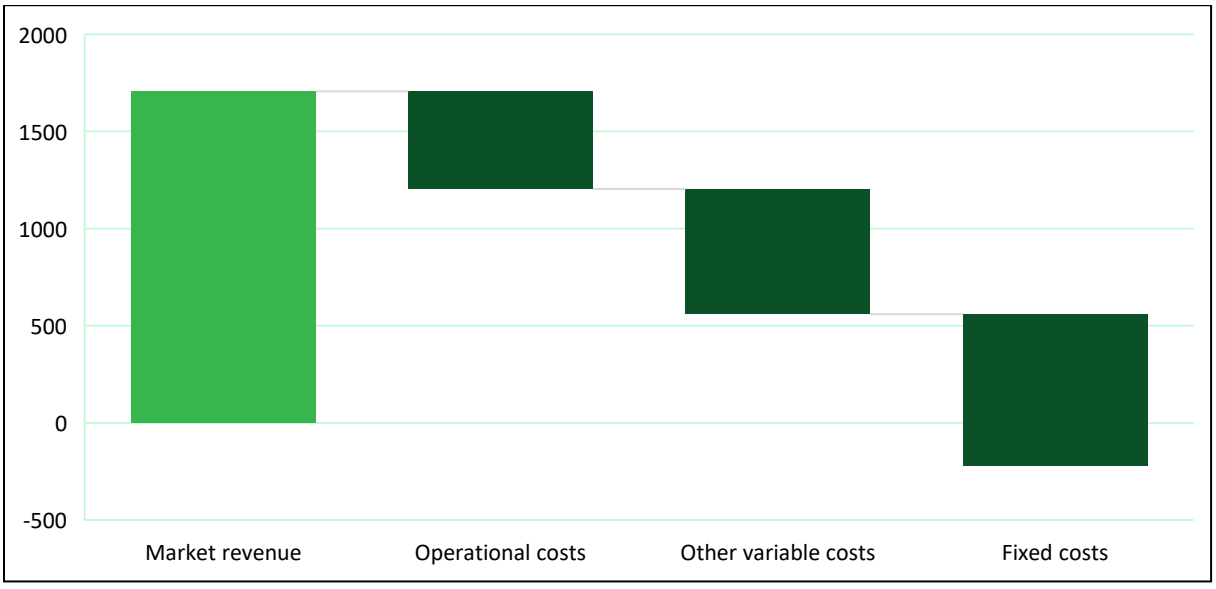
3.08 Corn in Czechia

In the following, the full-revenue-full-cost calculation approach is applied to a typical corn producer in Czechia. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Czech farmer will have to be used instead.

In the reference scenario, this typical corn farmer in Czechia has the following economic calculations, which are also shown in Figure 3.15:

- The farmer achieves a market revenue of EUR 1,706 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 503 per hectare.
- The resulting gross margin of EUR 1,203 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 644 per hectare.
- This results in a net margin of EUR 559 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 781 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing corn in Czechia is minus EUR 222 per hectare.

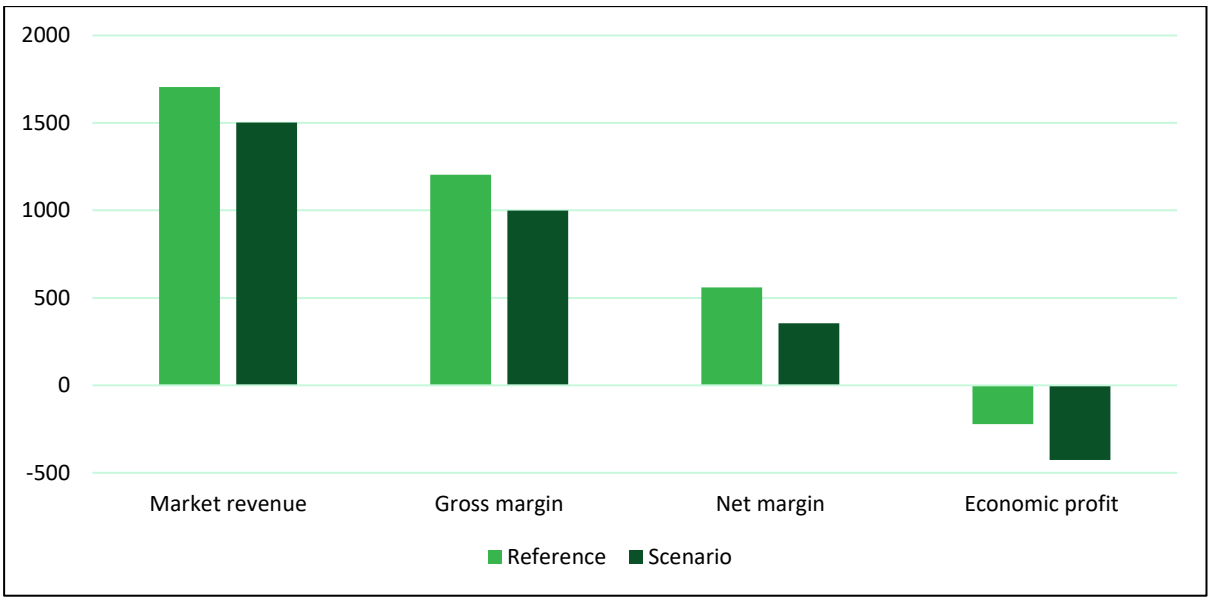
Figure 3.45: Farm economics of a typical Czech farmer growing corn in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Czechia. The use of these second-best alternatives subsequently leads to a loss of the corn yield surplus in the country of 12.0 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.16.

Figure 3.16: Change of farm economics of a typical Czech farmer growing corn in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing corn in Czechia would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 205 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 12.0 percent, the market revenue would decrease to EUR 1,502 per hectare.
- The gross margin would decrease to EUR 998 per hectare, which is already equivalent to an economic loss of 17.0 percent.
- The net margin would subsequently fall to EUR 354 per hectare, which now corresponds to a decline in this economic performance indicator of 36.6 percent.
- The resulting economic profit would amount to minus EUR 427 per hectare, which finally marks a further relative loss of 92.3 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Czech corn farmer who currently still relies on the use of these active substances. In the specific case of corn production in Czechia:

- an already non-profitable business would turn into
- an even larger non-profitable and potentially devastating endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Czech farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only corn farmers but also other farmers in Czechia and at the larger European scale currently must deal with.

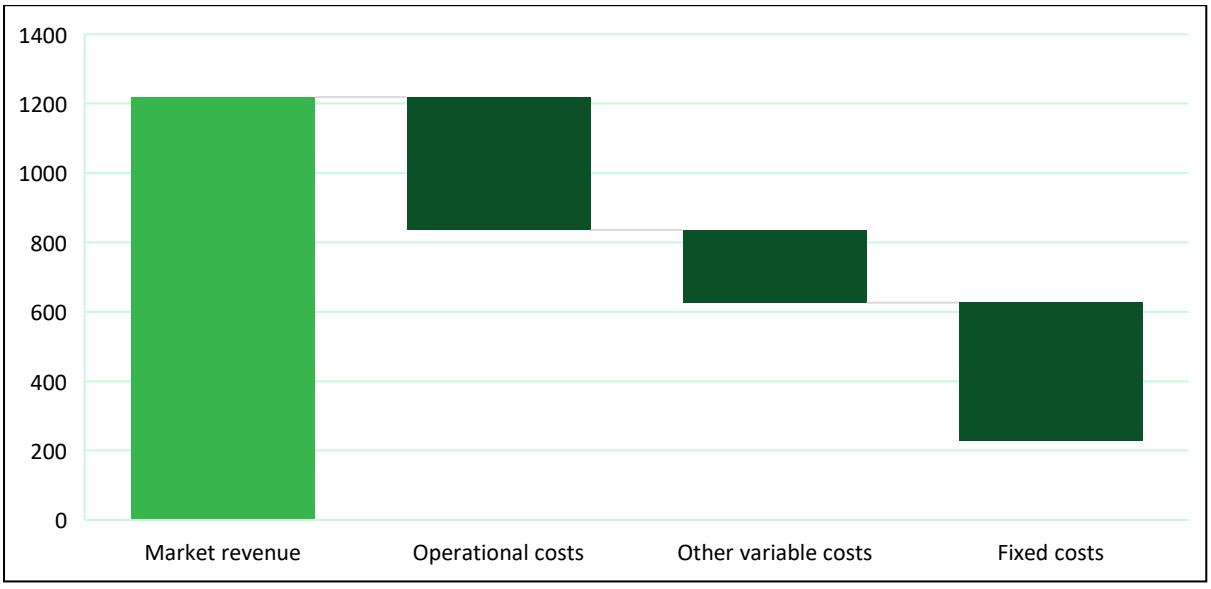
3.09 Corn in Romania

In the following, the full-revenue-full-cost calculation approach is applied to a typical corn producer in Romania. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Romanian farmer will have to be used instead.

In the reference scenario, this typical corn farmer in Romania has the following economic calculations, which are also shown in Figure 3.17:

- The farmer achieves a market revenue of EUR 1,219 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 383 per hectare.
- The resulting gross margin of EUR 836 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 210 per hectare.
- This results in a net margin of EUR 627 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 400 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing corn in Romania is EUR 227 per hectare.

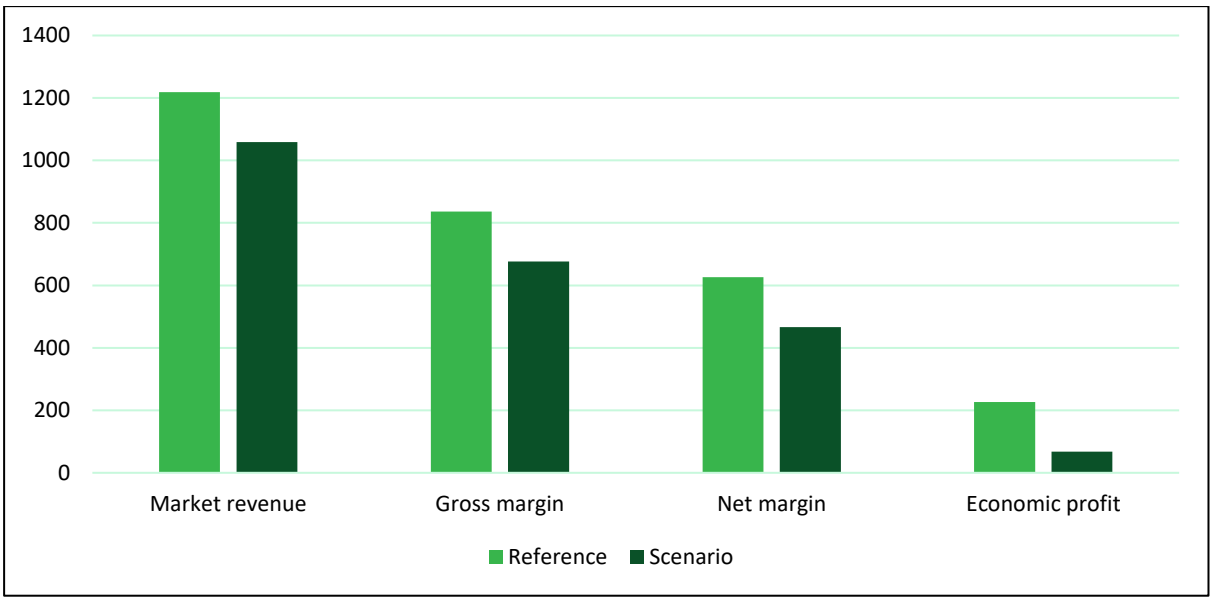
Figure 3.57: Farm economics of a typical Romanian farmer growing corn in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Romania. The use of these second-best alternatives subsequently leads to a loss of the corn yield surplus in the country of 13.1 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.18.

Figure 3.18: Change of farm economics of a typical Romanian farmer growing corn in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing corn in Romania would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 160 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 13.1 percent, the market revenue would decrease to EUR 1,059 per hectare.
- The gross margin would decrease to EUR 677 per hectare, which is already equivalent to an economic loss of 19.1 percent.
- The net margin would subsequently fall to EUR 467 per hectare, which now corresponds to a decline in this economic performance indicator of 25.5 percent.
- The resulting economic profit would amount to minus EUR 67 per hectare, which finally marks a relative loss of 70.3 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Romanian corn farmer who currently still relies on the use of these active substances. In the specific case of corn production in Romania:

- a profitable business would turn into
- an almost non-profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Romanian farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only corn farmers but also other farmers in Romania and at the larger European scale currently must deal with.

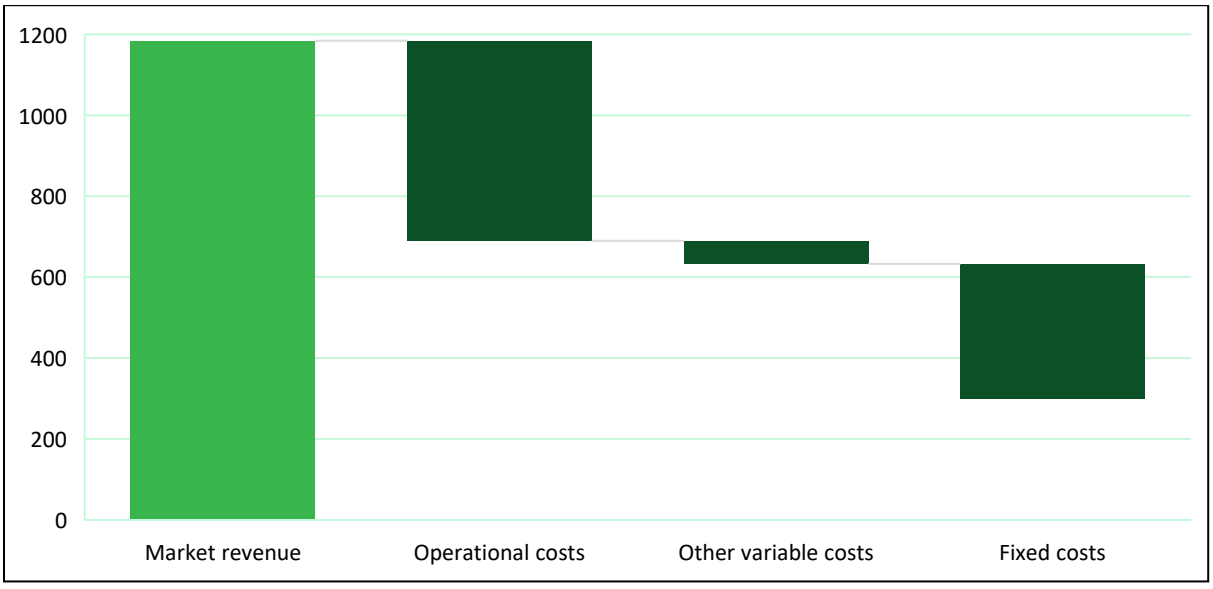
3.10 OSR in Bulgaria

In the following, the full-revenue-full-cost calculation approach is applied to a typical OSR producer in Bulgaria. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Bulgarian farmer will have to be used instead.

In the reference scenario, this typical OSR farmer in Bulgaria has the following economic calculations, which are also shown in Figure 3.19:

- The farmer achieves a market revenue of EUR 1,184 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 494 per hectare.
- The resulting gross margin of EUR 689 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 56 per hectare.
- This results in a net margin of EUR 633 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 333 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing OSR in Bulgaria is EUR 300 per hectare.

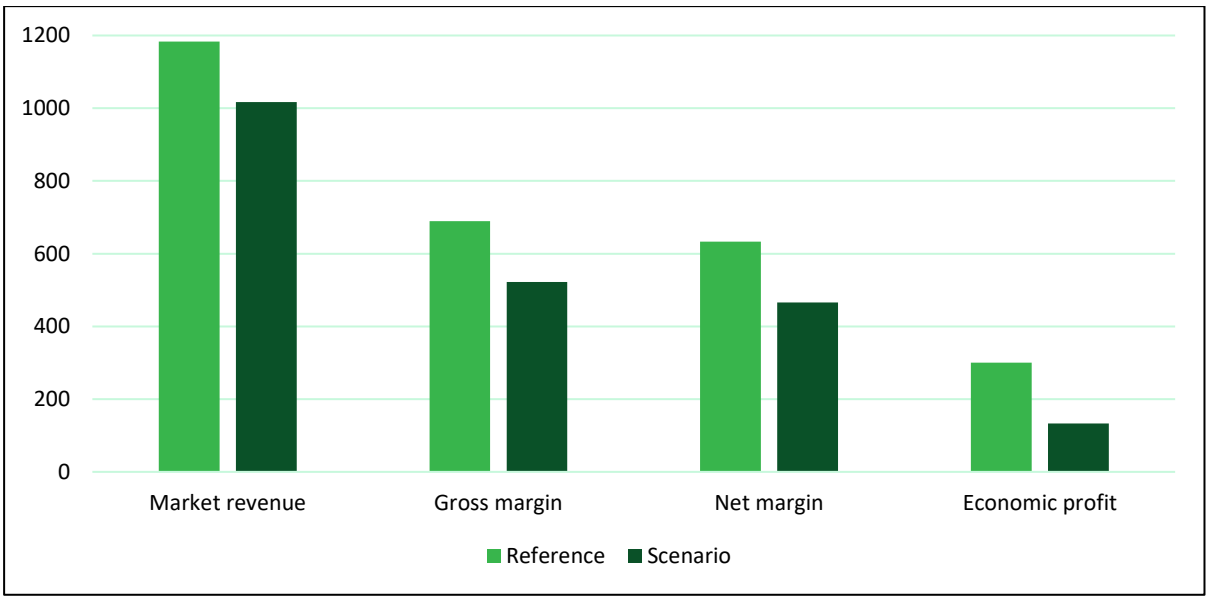
Figure 3.69: Farm economics of a typical Bulgarian farmer growing OSR in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Bulgaria. The use of these second-best alternatives subsequently leads to a loss of the OSR yield surplus in the country of 14.1 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.20.

Figure 3.20: Change of farm economics of a typical Bulgarian farmer growing OSR in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing OSR in Bulgaria would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 167 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 14.1 percent, the market revenue would decrease to EUR 1,017 per hectare.
- The gross margin would decrease to EUR 522 per hectare, which is already equivalent to an economic loss of 24.2 percent.
- The net margin would subsequently fall to EUR 466 per hectare, which now corresponds to a decline in this economic performance indicator of 26.4 percent.
- The resulting economic profit would amount to EUR 133 per hectare, which finally marks a relative loss of 55.6 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Bulgarian OSR farmer who currently still relies on the use of these active substances. In the specific case of OSR production in Bulgaria:

- a rather profitable business would turn into
- a much less profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Bulgarian farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only OSR farmers but also other farmers in Bulgaria and at the larger European scale currently must deal with.

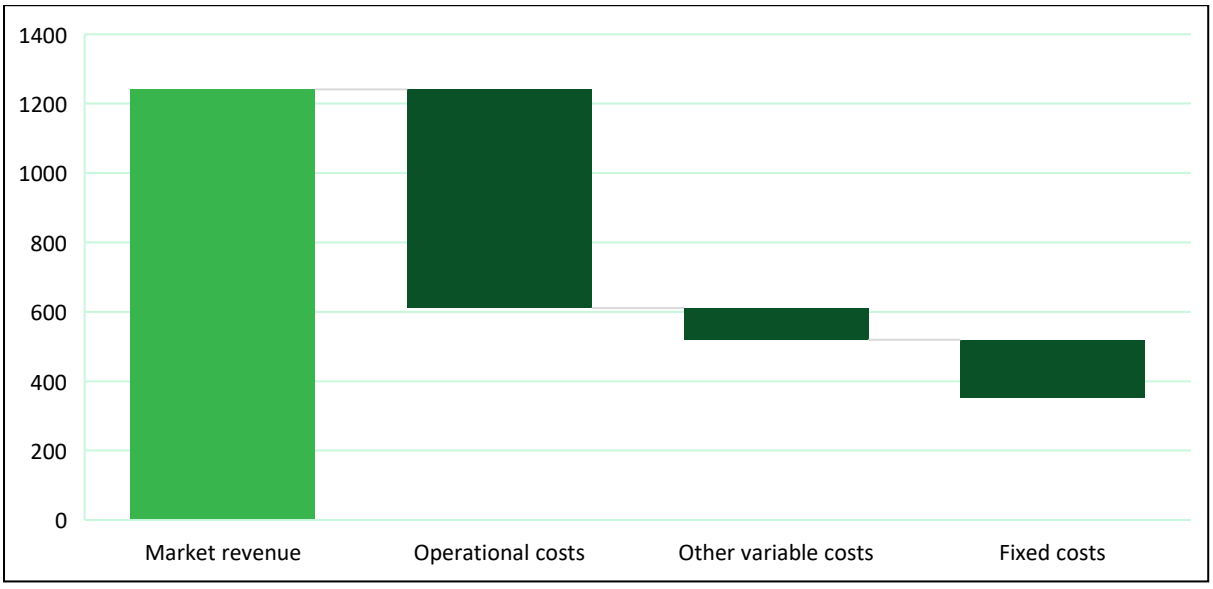
3.11 OSR in Poland

In the following, the full-revenue-full-cost calculation approach is applied to a typical OSR producer in Poland. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Polish farmer will have to be used instead.

In the reference scenario, this typical OSR farmer in Poland has the following economic calculations, which are also shown in Figure 3.21:

- The farmer achieves a market revenue of EUR 1,241 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 630 per hectare.
- The resulting gross margin of EUR 611 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 91 per hectare.
- This results in a net margin of EUR 520 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 168 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing OSR in Poland is EUR 351 per hectare.

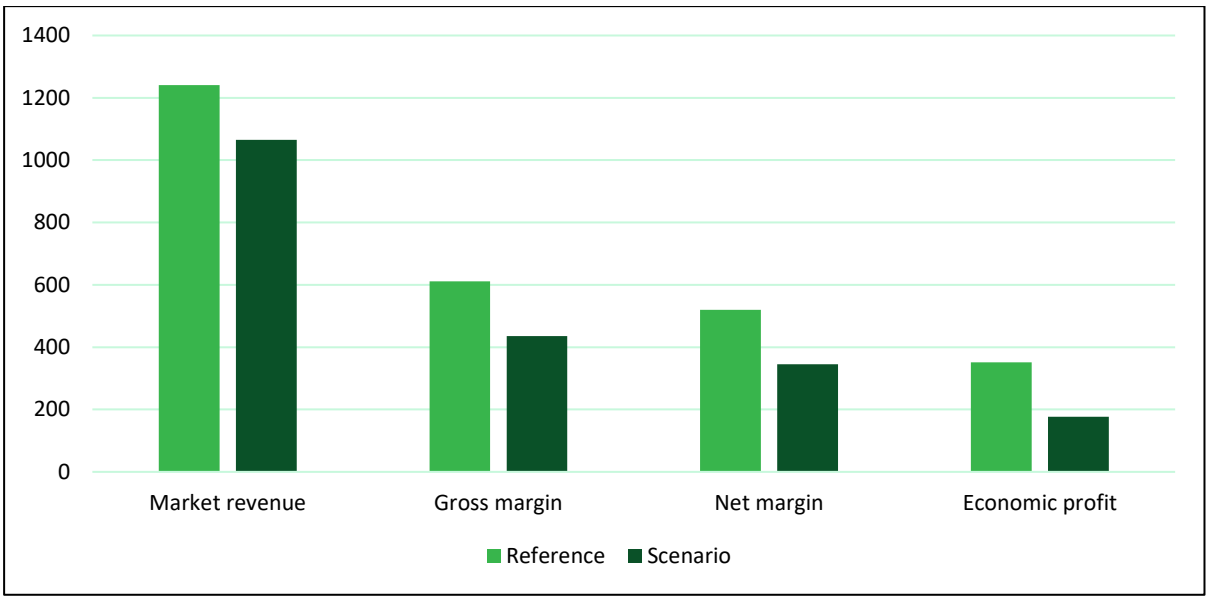
Figure 3.21: Farm economics of a typical Polish farmer growing OSR in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Poland. The use of these second-best alternatives subsequently leads to a loss of the OSR yield surplus in the country of 14.1 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.22.

Figure 3.22: Change of farm economics of a typical Polish farmer growing OSR in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing OSR in Poland would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 175 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 14.1 percent, the market revenue would decrease to EUR 1,066 per hectare.
- The gross margin would decrease to EUR 436 per hectare, which is already equivalent to an economic loss of 28.6 percent.
- The net margin would subsequently fall to EUR 345 per hectare, which now corresponds to a decline in this economic performance indicator of 33.7 percent.
- The resulting economic profit would amount to EUR 177 per hectare, which finally marks a relative loss of 49.8 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Polish OSR farmer who currently still relies on the use of these active substances. In the specific case of OSR production in Poland:

- a rather profitable business would turn into
- a much less profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Polish farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only OSR farmers but also other farmers in Poland and at the larger European scale currently must deal with.

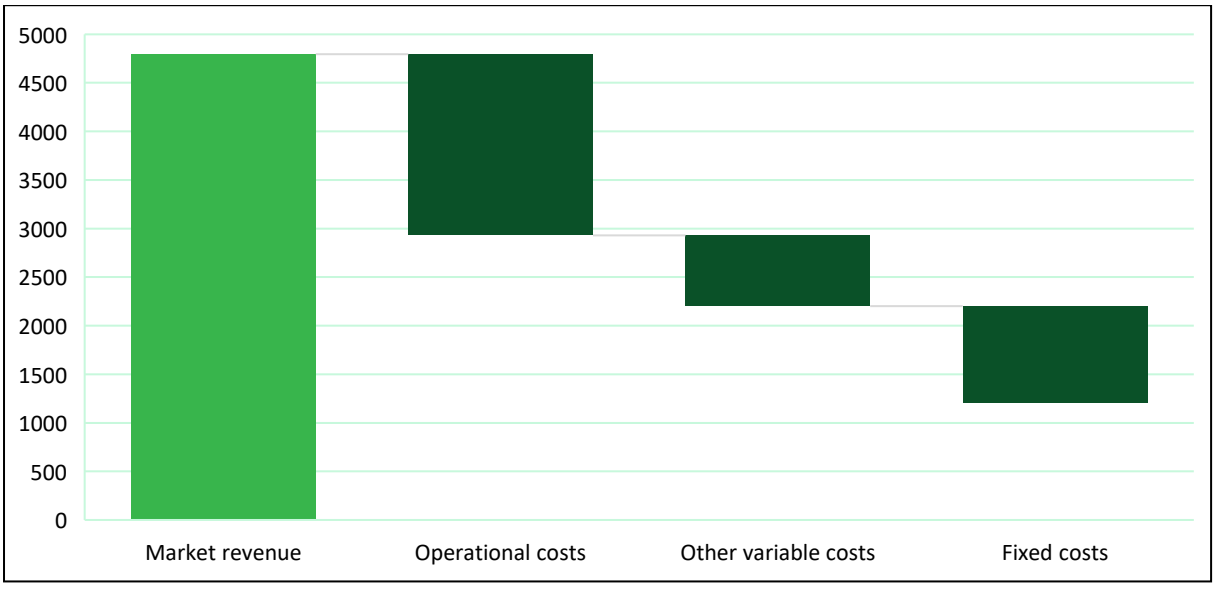
3.12 Potato in Austria

In the following, the full-revenue-full-cost calculation approach is applied to a typical potato producer in Austria. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Austrian farmer will have to be used instead.

In the reference scenario, this typical potato farmer in Austria has the following economic calculations, which are also shown in Figure 3.23:

- The farmer achieves a market revenue of EUR 4,793 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 1,864 per hectare.
- The resulting gross margin of EUR 2,929 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 727 per hectare.
- This results in a net margin of EUR 2,203 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 1,003 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing potato in Austria is EUR 1,200 per hectare.

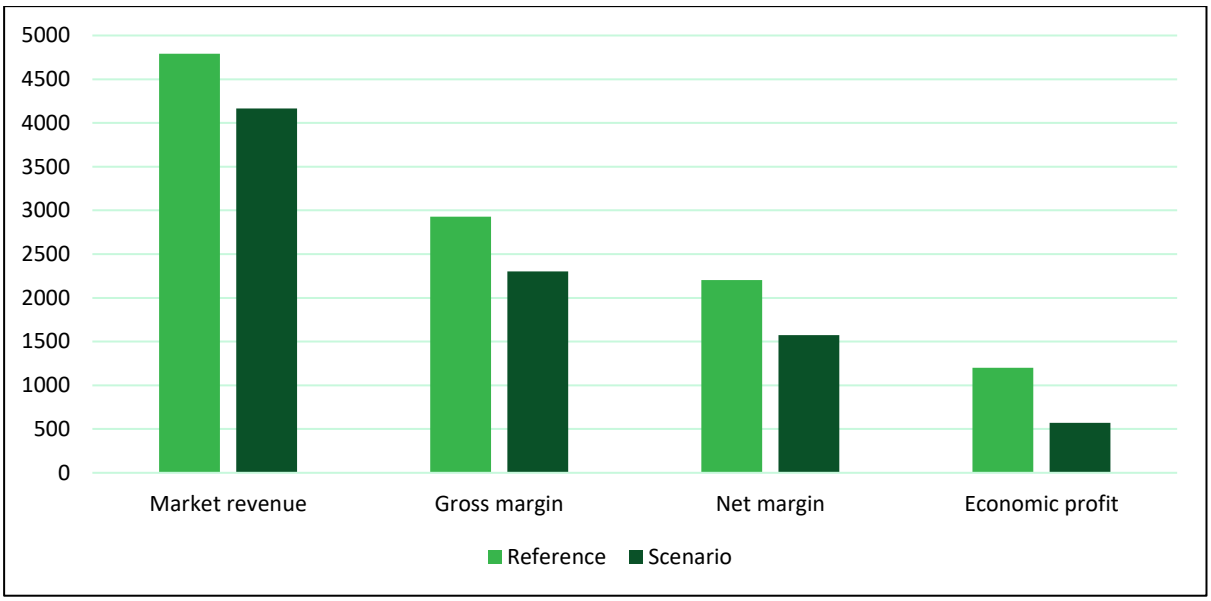
Figure 3.23: Farm economics of a typical Austrian farmer growing potato in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Austria. The use of these second-best alternatives subsequently leads to a loss of the potato yield surplus in the country of 13.1 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.24.

Figure 3.24: Change of farm economics of a typical Austrian farmer growing potato in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing potato in Austria would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 628 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 13.1 percent, the market revenue would decrease to EUR 4,165 per hectare.
- The gross margin would decrease to EUR 2,301 per hectare, which is already equivalent to an economic loss of 21.4 percent.
- The net margin would subsequently fall to EUR 1,575 per hectare, which now corresponds to a decline in this economic performance indicator of 28.5 percent.
- The resulting economic profit would amount to EUR 572 per hectare, which finally marks a relative loss of 52.3 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Austrian potato farmer who currently still relies on the use of these active substances. In the specific case of potato production in Austria:

- a rather profitable business would turn into
- a much less profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Austrian farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only potato farmers but also other farmers in Austria and at the larger European scale currently must deal with.

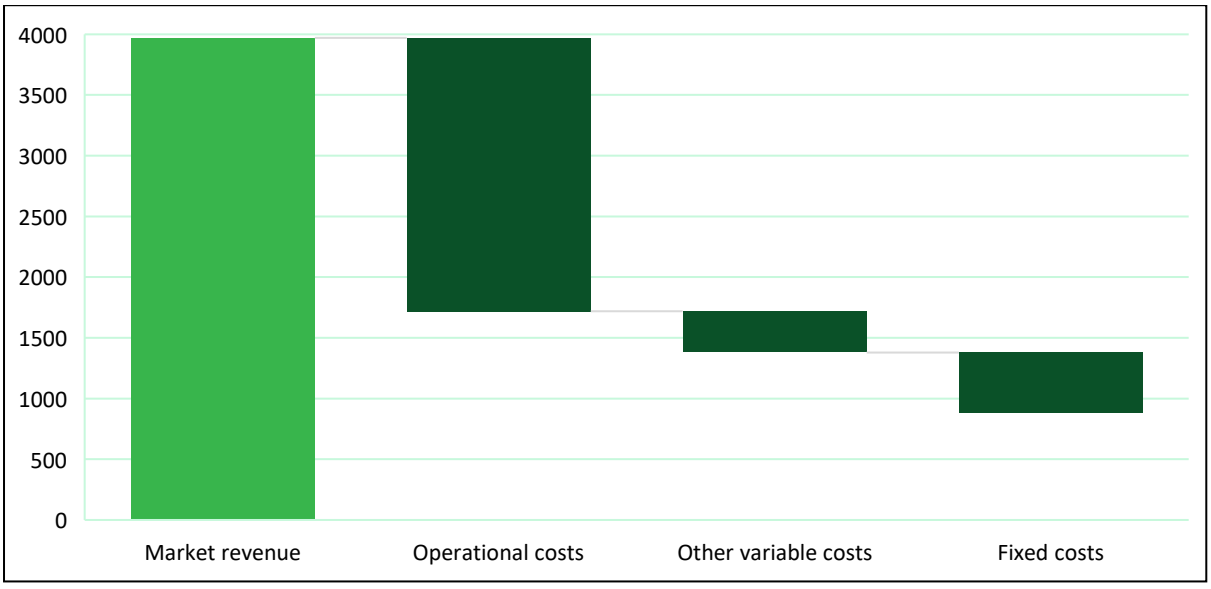
3.13 Potato in Poland

In the following, the full-revenue-full-cost calculation approach is applied to a typical potato producer in Poland. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Polish farmer will have to be used instead.

In the reference scenario, this typical potato farmer in Poland has the following economic calculations, which are also shown in Figure 3.25:

- The farmer achieves a market revenue of EUR 3,972 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 2,252 per hectare.
- The resulting gross margin of EUR 1,720 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 342 per hectare.
- This results in a net margin of EUR 1,378 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 501 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing potato in Poland is EUR 877 per hectare.

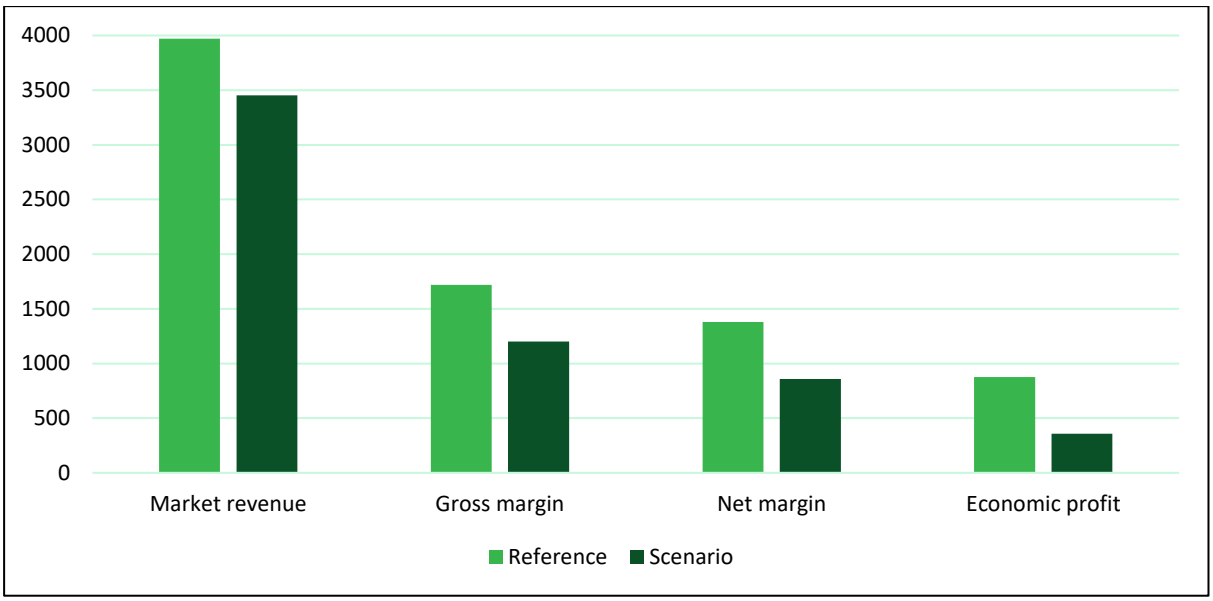
Figure 3.25: Farm economics of a typical Polish farmer growing potato in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Poland. The use of these second-best alternatives subsequently leads to a loss of the potato yield surplus in the country of 13.1 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.26.

Figure 3.26: Change of farm economics of a typical Polish farmer growing potato in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing potato in Poland would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 520 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 13.1 percent, the market revenue would decrease to EUR 3,451 per hectare.
- The gross margin would decrease to EUR 1,200 per hectare, which is already equivalent to an economic loss of 30.2 percent.
- The net margin would subsequently fall to EUR 858 per hectare, which now corresponds to a decline in this economic performance indicator of 37.7 percent.
- The resulting economic profit would amount to EUR 357 per hectare, which finally marks a relative loss of 59.3 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Polish potato farmer who currently still relies on the use of these active substances. In the specific case of potato production in Poland:

- a rather profitable business would turn into
- a much less profitable if not almost non-profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Polish farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only potato farmers but also other farmers in Poland and at the larger European scale currently must deal with.

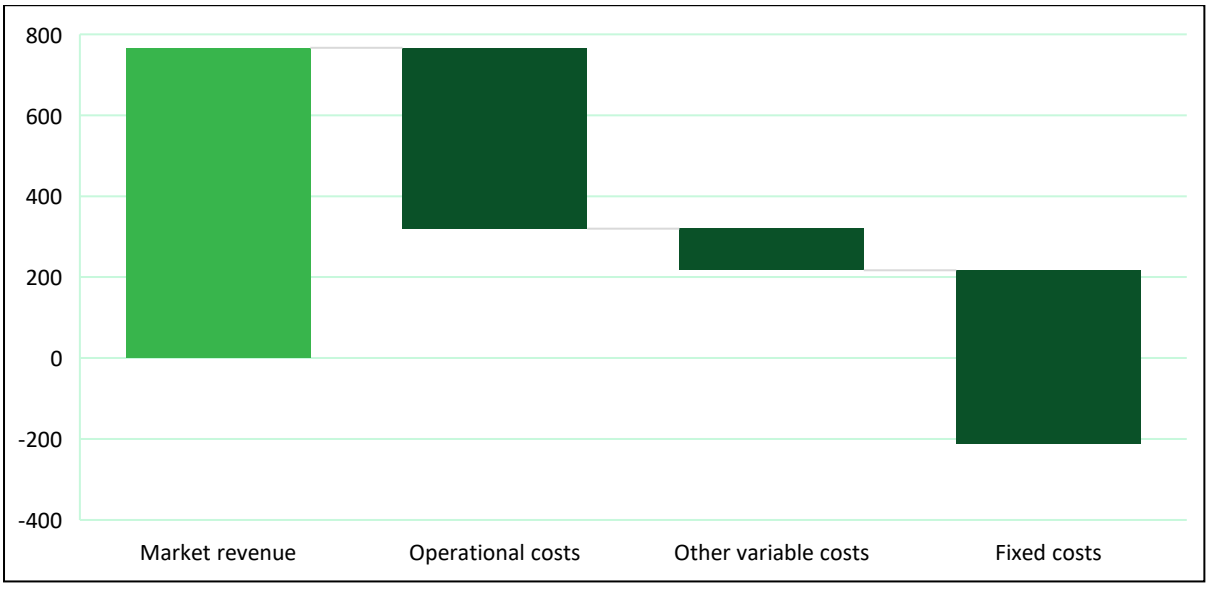
3.14 Sunflower in Bulgaria

In the following, the full-revenue-full-cost calculation approach is applied to a typical sunflower producer in Bulgaria. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Bulgarian farmer will have to be used instead.

In the reference scenario, this typical sunflower farmer in Bulgaria has the following economic calculations, which are also shown in Figure 3.27:

- The farmer achieves a market revenue of EUR 767 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 447 per hectare.
- The resulting gross margin of EUR 320 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 103 per hectare.
- This results in a net margin of EUR 217 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 429 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing sunflower in Bulgaria is minus EUR 212 per hectare.

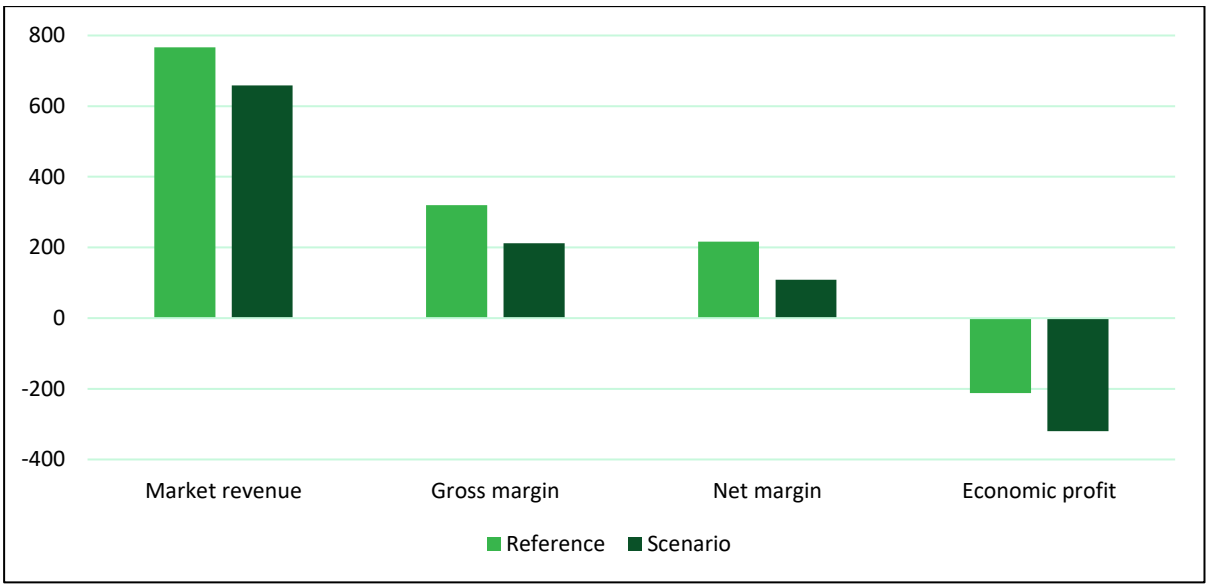
Figure 3.27: Farm economics of a typical Bulgarian farmer growing sunflower in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Bulgaria. The use of these second-best alternatives subsequently leads to a loss of the sunflower yield surplus in the country of 14.1 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.28.

Figure 3.28: Change of farm economics of a typical Bulgarian farmer growing sunflower in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing sunflower in Bulgaria would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 108 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 14.1 percent, the market revenue would decrease to EUR 659 per hectare.
- The gross margin would decrease to EUR 212 per hectare, which is already equivalent to an economic loss of 33.8 percent.
- The net margin would subsequently fall to EUR 109 per hectare, which now corresponds to a decline in this economic performance indicator of 49.9 percent.
- The resulting economic profit would amount to minus EUR 320 per hectare, which finally marks a further relative loss of 51.0 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Bulgarian sunflower farmer who currently still relies on the use of these active substances. In the specific case of sunflower production in Bulgaria:

- an already non-profitable business would turn into
- an even larger non-profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Bulgarian farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only sunflower farmers but also other farmers in Bulgaria and at the larger European scale currently must deal with.

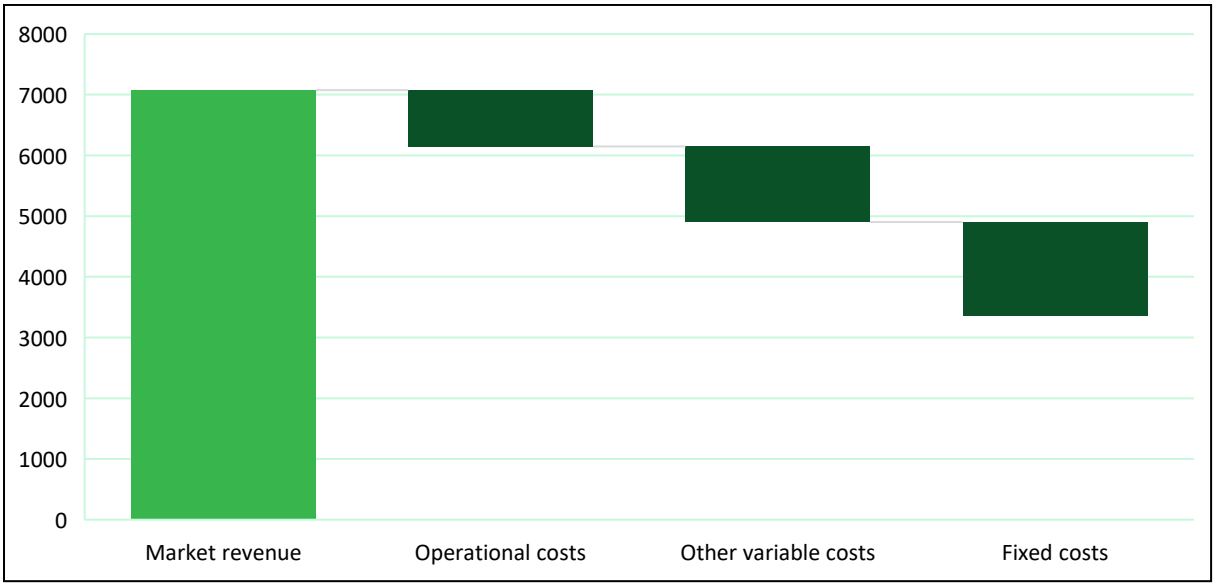
3.15 Vine (grapes) in Austria

In the following, the full-revenue-full-cost calculation approach is applied to a typical vine (grapes) producer in Austria. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Austrian farmer will have to be used instead.

In the reference scenario, this typical vine (grapes) farmer in Austria has the following economic calculations, which are also shown in Figure 3.29:

- The farmer achieves a market revenue of EUR 7,074 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 926 per hectare.
- The resulting gross margin of EUR 6,148 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 1,242 per hectare.
- This results in a net margin of EUR 4,906 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 1,549 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing vine (grapes) in Austria is EUR 3,357 per hectare.

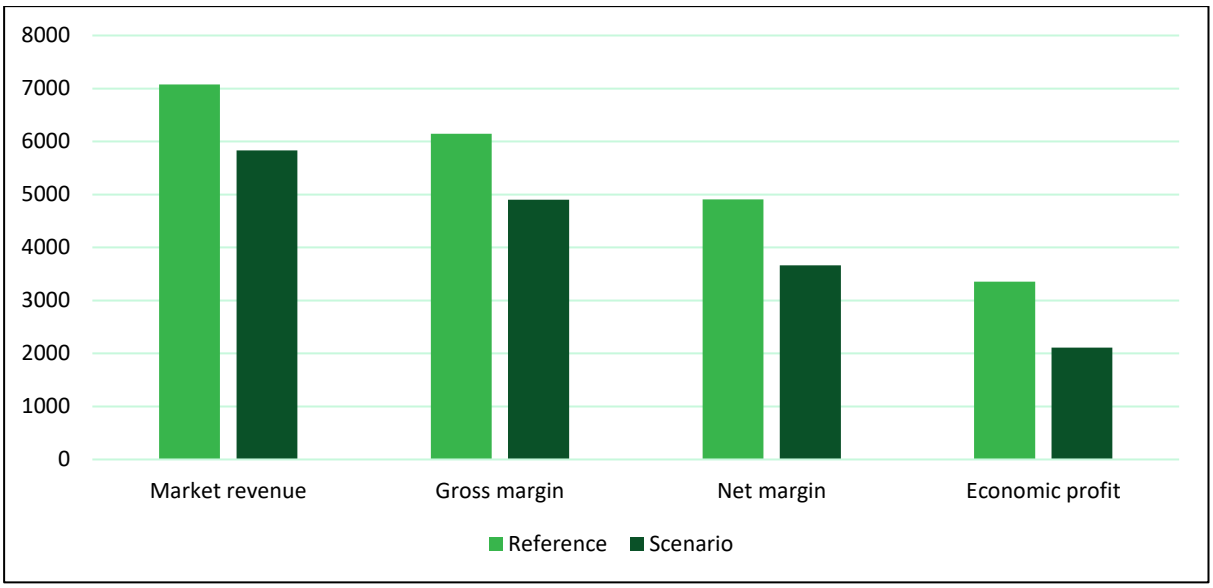
Figure 3.29: Farm economics of a typical Austrian farmer growing vine (grapes) in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Austria. The use of these second-best alternatives subsequently leads to a loss of the vine (grapes) yield surplus in the country of 17.6 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.30.

Figure 3.30: Change of farm economics of a typical Austrian farmer growing vine (grapes) in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing vine (grapes) in Austria would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 1,245 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 17.6 percent, the market revenue would decrease to EUR 5,829 per hectare.
- The gross margin would decrease to EUR 4,903 per hectare, which is already equivalent to an economic loss of 20.3 percent.
- The net margin would subsequently fall to EUR 3,661 per hectare, which now corresponds to a decline in this economic performance indicator of 25.4 percent.
- The resulting economic profit would amount to EUR 2,112 per hectare, which finally marks a relative loss of 37.1 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Austrian vine (grapes) farmer who currently still relies on the use of these active substances. In the specific case of vine (grapes) production in Austria:

- a very profitable business would turn into
- a much less profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Austrian farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only vine (grapes) farmers but also other farmers in Austria and at the larger European scale currently must deal with.

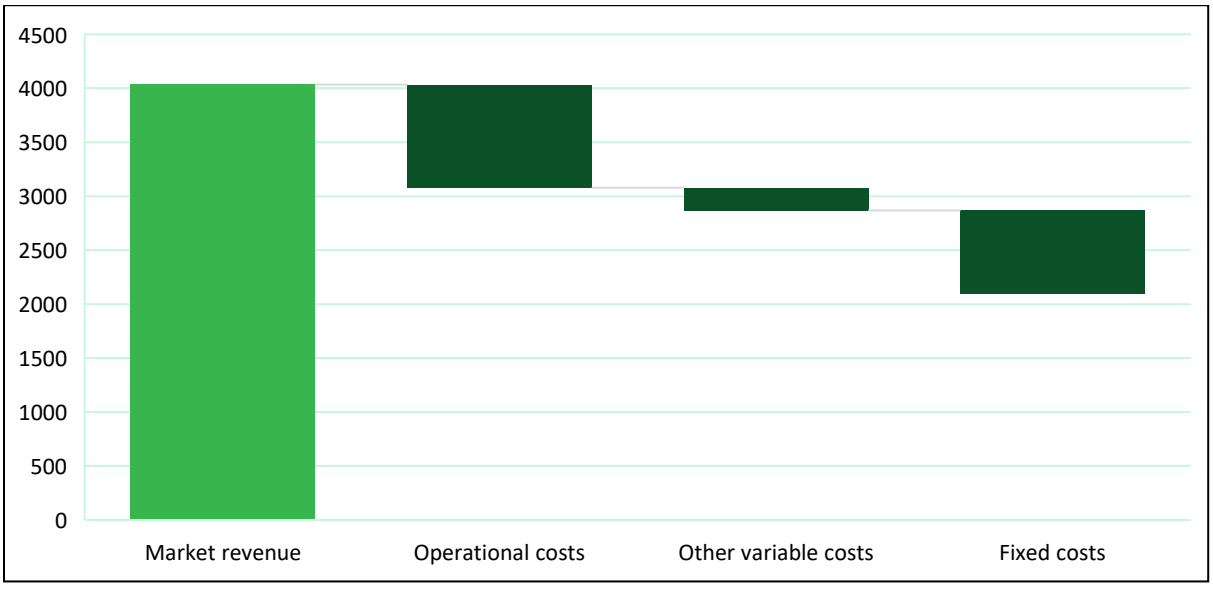
3.16 Vine (grapes) in Romania

In the following, the full-revenue-full-cost calculation approach is applied to a typical vine (grapes) producer in Romania. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Romanian farmer will have to be used instead.

In the reference scenario, this typical vine (grapes) farmer in Romania has the following economic calculations, which are also shown in Figure 3.31:

- The farmer achieves a market revenue of EUR 4,032 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 954 per hectare.
- The resulting gross margin of EUR 3,078 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 211 per hectare.
- This results in a net margin of EUR 2,867 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 775 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing vine (grapes) in Romania is EUR 2,093 per hectare.

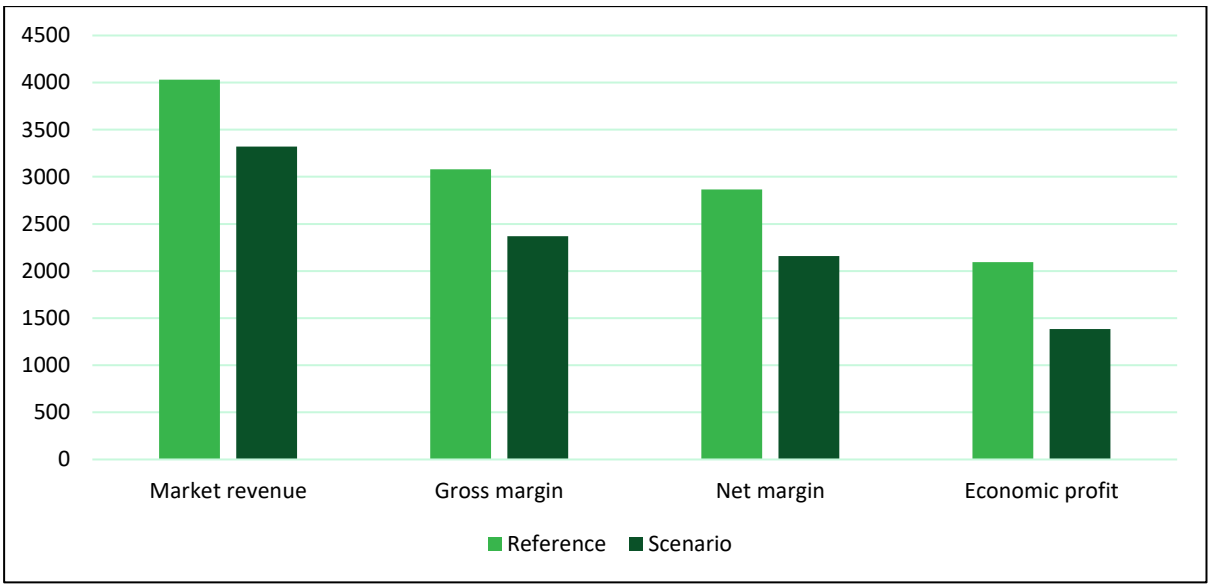
Figure 3.31: Farm economics of a typical Romanian farmer growing vine (grapes) in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Romania. The use of these second-best alternatives subsequently leads to a loss of the vine (grapes) yield surplus in the country of 17.6 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.32.

Figure 3.32: Change of farm economics of a typical Romanian farmer growing vine (grapes) in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing vine (grapes) in Romania would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 710 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 17.6 percent, the market revenue would decrease to EUR 3,323 per hectare.
- The gross margin would decrease to EUR 2,369 per hectare, which is already equivalent to an economic loss of 23.1 percent.
- The net margin would subsequently fall to EUR 2,158 per hectare, which now corresponds to a decline in this economic performance indicator of 24.8 percent.
- The resulting economic profit would amount to EUR 1,283 per hectare, which finally marks a relative loss of 33.9 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Romanian vine (grapes) farmer who currently still relies on the use of these active substances. In the specific case of vine (grapes) production in Romania:

- a rather profitable business would turn into
- a much less profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Romanian farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only vine (grapes) farmers but also other farmers in Romania and at the larger European scale currently must deal with.

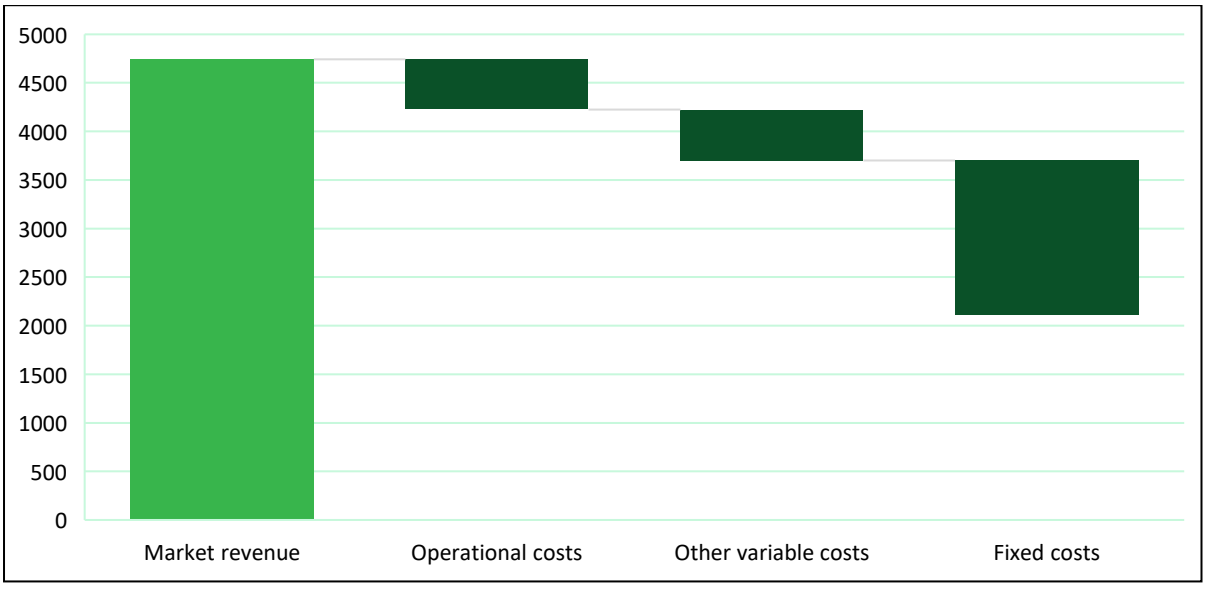
3.17 Apple in Poland

In the following, the full-revenue-full-cost calculation approach is applied to a typical apple producer in Poland. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Polish farmer will have to be used instead.

In the reference scenario, this typical apple farmer in Poland has the following economic calculations, which are also shown in Figure 3.33:

- The farmer achieves a market revenue of EUR 4,742 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 517 per hectare.
- The resulting gross margin of EUR 4,226 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 525 per hectare.
- This results in a net margin of EUR 3,700 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 1,591 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing apple in Poland is EUR 2,109 per hectare.

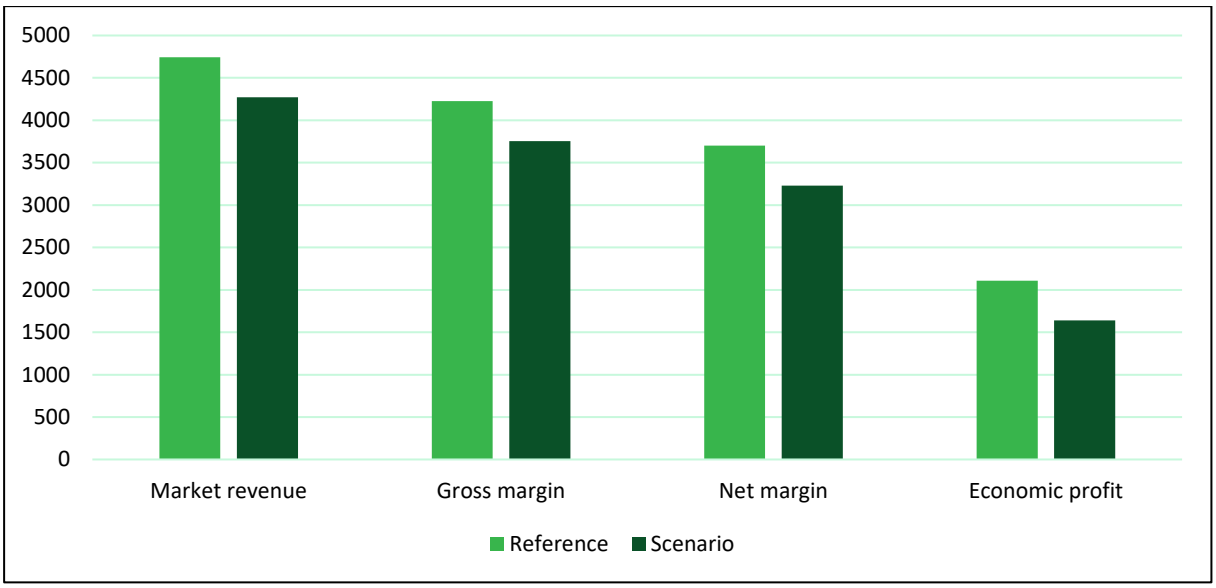
Figure 3.33: Farm economics of a typical Polish farmer growing apple in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Poland. The use of these second-best alternatives subsequently leads to a loss of the apple yield surplus in the country of 9.9 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.34.

Figure 3.34: Change of farm economics of a typical Polish farmer growing apple in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing apple in Poland would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 469 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 9.9 percent, the market revenue would decrease to EUR 4,273 per hectare.
- The gross margin would decrease to EUR 3,756 per hectare, which is already equivalent to an economic loss of 11.1 percent.
- The net margin would subsequently fall to EUR 3,231 per hectare, which now corresponds to a decline in this economic performance indicator of 12.7 percent.
- The resulting economic profit would amount to EUR 1,640 per hectare, which finally marks a relative loss of 22.3 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Polish apple farmer who currently still relies on the use of these active substances. In the specific case of apple production in Poland:

- a rather profitable business would turn into
- a less profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Polish farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only apple farmers but also other farmers in Poland and at the larger European scale currently must deal with.

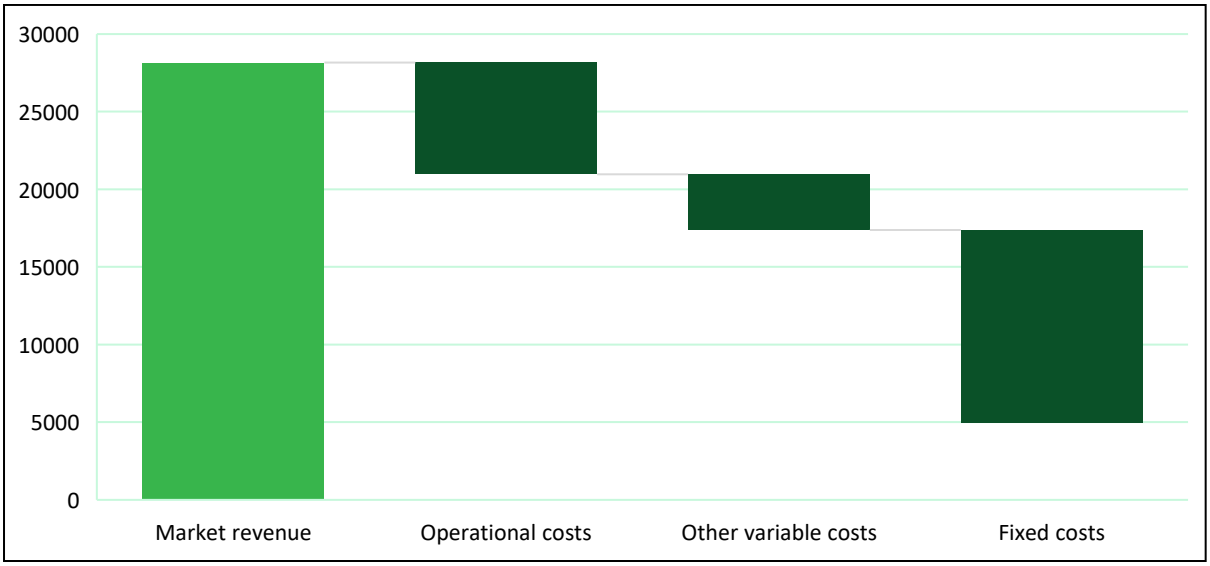
3.18 Tomato in Romania

In the following, the full-revenue-full-cost calculation approach is applied to a typical tomato producer in Romania. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Romanian farmer will have to be used instead.

In the reference scenario, this typical tomato farmer in Romania has the following economic calculations, which are also shown in Figure 3.35:

- The farmer achieves a market revenue of EUR 28,160 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 7,193 per hectare.
- The resulting gross margin of EUR 20,967 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 3,597 per hectare.
- This results in a net margin of EUR 17,370 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 12,424 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing tomato in Romania is EUR 4,946 per hectare.

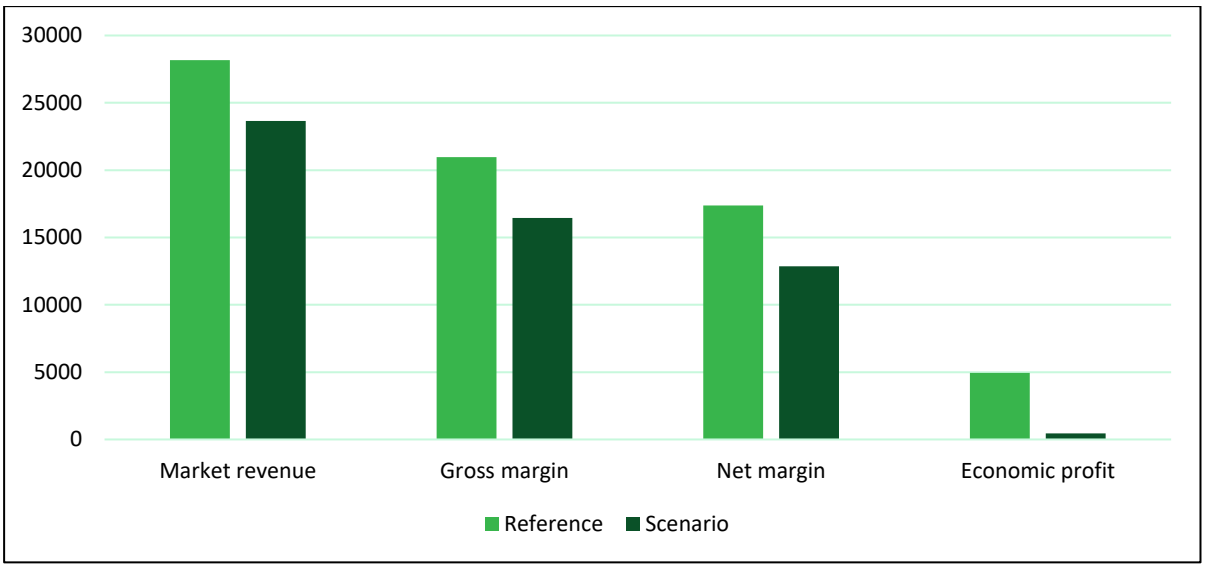
Figure 3.35: Farm economics of a typical Romanian farmer growing tomato in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Romania. The use of these second-best alternatives subsequently leads to a loss of the tomato yield surplus in the country of 16.0 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.36.

Figure 3.36: Change of farm economics of a typical Romanian farmer growing tomato in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing tomato in Romania would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 4,506 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 16.0 percent, the market revenue would decrease to EUR 23,654 per hectare.
- The gross margin would decrease to EUR 16,461 per hectare, which is already equivalent to an economic loss of 21.5 percent.
- The net margin would subsequently fall to EUR 12,864 per hectare, which now corresponds to a decline in this economic performance indicator of 25.9 percent.
- The resulting economic profit would amount to EUR 440 per hectare, which finally marks a relative loss of 91.1 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Romanian tomato farmer who currently still relies on the use of these active substances. In the specific case of tomato production in Romania:

- a rather profitable business would turn into
- an almost non-profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Romanian farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only tomato farmers but also other farmers in Romania and at the larger European scale currently must deal with.

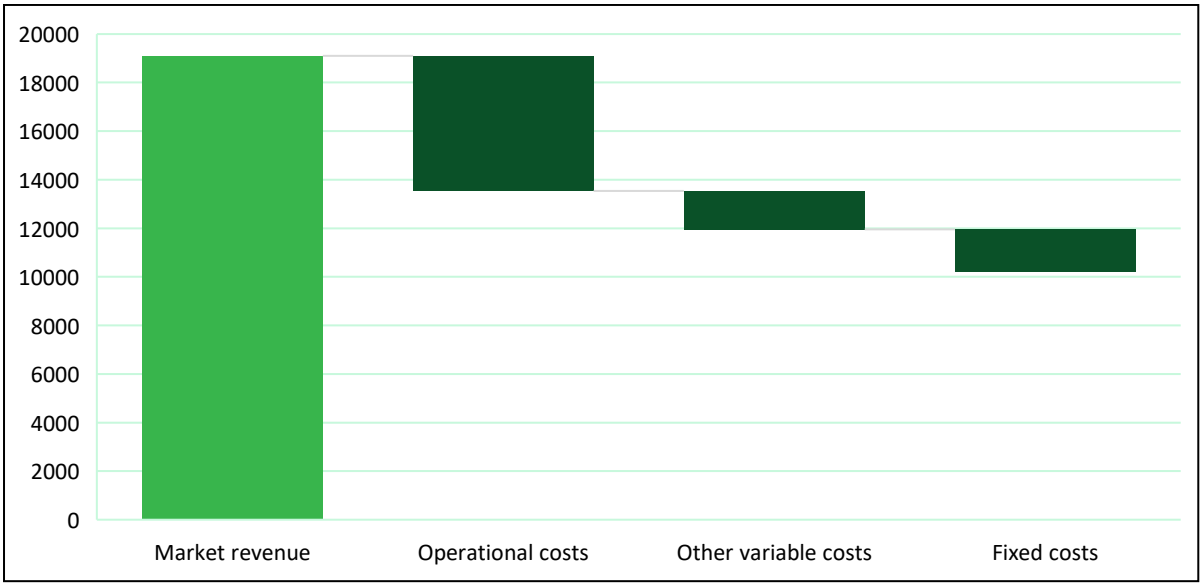
3.19 Onion in Bulgaria

In the following, the full-revenue-full-cost calculation approach is applied to a typical onion producer in Bulgaria. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Bulgarian farmer will have to be used instead.

In the reference scenario, this typical onion farmer in Bulgaria has the following economic calculations, which are also shown in Figure 3.37:

- The farmer achieves a market revenue of EUR 19,094 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 5,557 per hectare.
- The resulting gross margin of EUR 13,537 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 1,580 per hectare.
- This results in a net margin of EUR 11,958 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 1,763 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing onion in Bulgaria is EUR 10,195 per hectare.

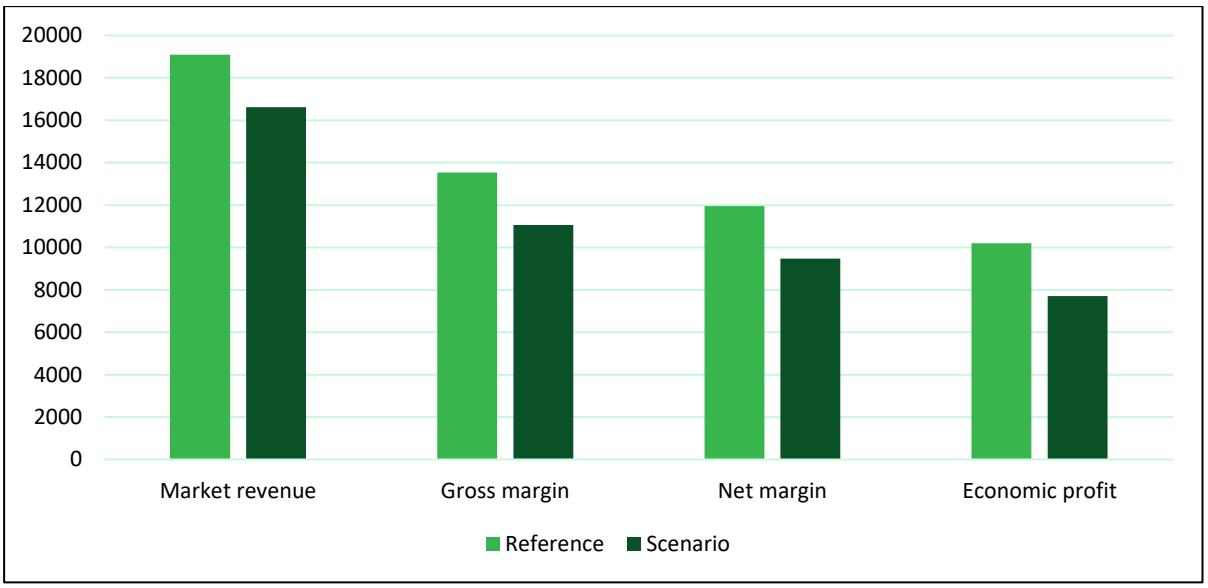
Figure 3.37: Farm economics of a typical Bulgarian farmer growing onion in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Bulgaria. The use of these second-best alternatives subsequently leads to a loss of the onion yield surplus in the country of 13.0 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.38.

Figure 3.38: Change of farm economics of a typical Bulgarian farmer growing onion in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing onion in Bulgaria would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 2,482 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 13.0 percent, the market revenue would decrease to EUR 16,612 per hectare.
- The gross margin would decrease to EUR 11,055 per hectare, which is already equivalent to an economic loss of 18.3 percent.
- The net margin would subsequently fall to EUR 9,475 per hectare, which now corresponds to a decline in this economic performance indicator of 20.8 percent.
- The resulting economic profit would amount to minus EUR 7,712 per hectare, which finally marks a further relative loss of 24.3 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Bulgarian onion farmer who currently still relies on the use of these active substances. In the specific case of onion production in Bulgaria:

- a rather profitable business would turn into
- a less profitable endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Bulgarian farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only onion farmers but also other farmers in Bulgaria and at the larger European scale currently must deal with.

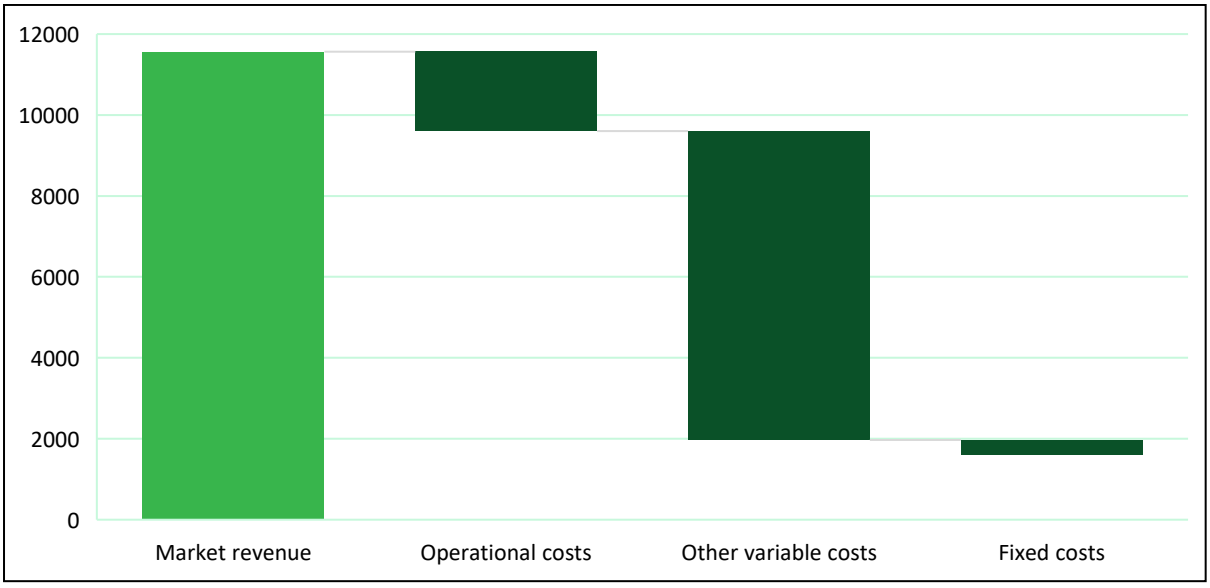
3.20 Hops in Czechia

In the following, the full-revenue-full-cost calculation approach is applied to a typical hops producer in Czechia. A distinction is made between the reference situation, which refers to the currently existing availability of active substances in PPP and their use by the farmer, and the analytical "Scenario", which assumes that active substances being CfS and applicable emergency authorizations will not be re-approved by 2030 and that other, i.e. second-best, solutions still available to the typical Czech farmer will have to be used instead.

In the reference scenario, this typical hops farmer in Czechia has the following economic calculations, which are also shown in Figure 3.39:

- The farmer achieves a market revenue of EUR 11,562 per hectare.
- To achieve this output, the farmer must incur operational costs, i.e., costs for PPP, seeds and fertilizers, among other things, amounting to EUR 1,958 per hectare.
- The resulting gross margin of EUR 9,604 per hectare is further reduced by other variable costs, i.e., mainly related to variable machinery and labor costs, which amount to EUR 7,633 per hectare.
- This results in a net margin of EUR 1,971 per hectare, which still does not exclude the fixed costs, i.e., the fixed machinery and labor costs, of EUR 363 per hectare.
- If these costs are also deducted, the current net economic profit of a typical farmer producing hops in Czechia is EUR 1,608 per hectare.

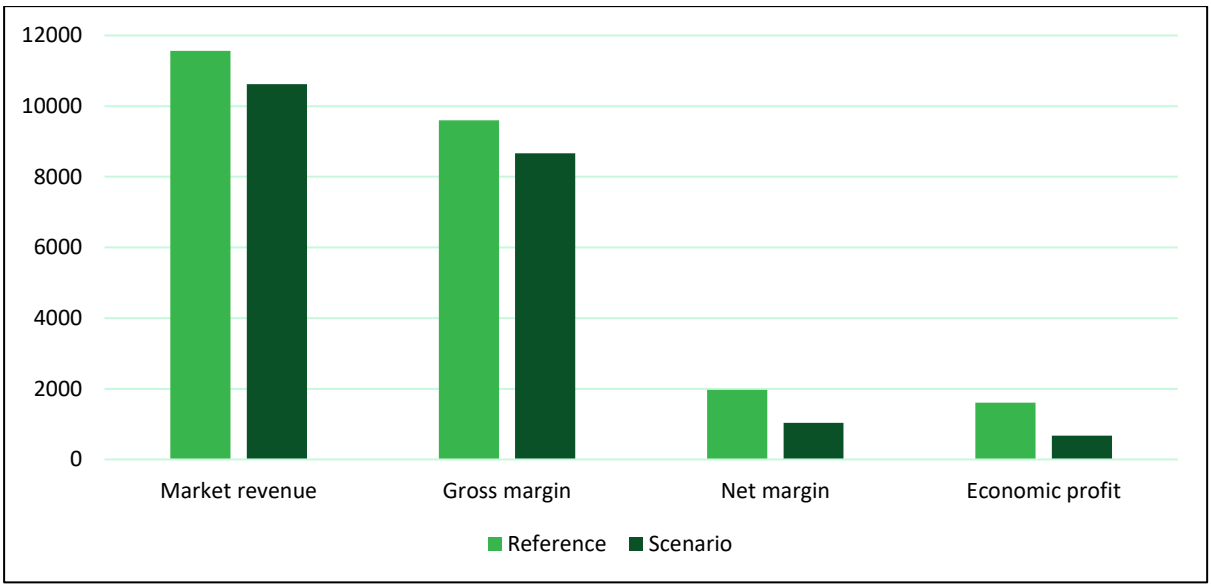
Figure 3.39: Farm economics of a typical Czech farmer growing hops in the reference situation (in EUR per hectare)



Source: Own figure.

For the "Scenario" to be analyzed, it is now assumed that this farmer, who has previously used all currently available active substances, must look for second-best alternatives, because some of these active substances would not be re-approved in Czechia. The use of these second-best alternatives subsequently leads to a loss of the hops yield surplus in the country of 8.1 percent. Consequently, market revenues change, which in turn affects the economic margins and especially the economic profit. The results are shown in Figure 3.40.

Figure 3.40: Change of farm economics of a typical Czech farmer growing hops in the analytical "Scenario" compared to the reference situation (in EUR per hectare)



Source: Own figure.

The typical farmer growing hops in Czechia would face a decline in economic performance if CfS and applicable emergency authorizations were no longer available. As the market revenue would decrease by EUR 936 per hectare, the monetary performance indicators would also deteriorate:

- Caused by the yield decrease of 8.1 percent, the market revenue would decrease to EUR 10,625 per hectare.
- The gross margin would decrease to EUR 8,667 per hectare, which is already equivalent to an economic loss of 9.8 percent.
- The net margin would subsequently fall to EUR 1,034 per hectare, which now corresponds to a decline in this economic performance indicator of 47.5 percent.
- The resulting economic profit would amount to EUR 671 per hectare, which finally marks a relative loss of 58.3 percent.

It becomes obvious that a loss of mainly CfS-based active substances would cause a significant economic loss for the typical Czech hops farmer who currently still relies on the use of these active substances. In the specific case of hops production in Czechia:

- a rather profitable business would turn into
- a much less profitable and potentially devastating endeavor for the typical farmer.

Along with that, less money that could – and should – be invested in necessary structural change and further development of such a farm will be available. This would potentially hinder the typical Czech farmer to become more sustainable. In addition, it would make it more complicated to better cope with the manifold challenges not only hops farmers but also other farmers in Czechia and at the larger European scale currently must deal with.

4. Conclusions and recommendations

The discontinuation of active substances belonging to the category of CfS and some applicable emergency authorizations would mean considerable economic loss for farmers of key crops in selected member states of the EU. In the event of a withdrawal of such PPP from the market, short-term (see gross margin), medium-term (see net margin) and above all long-term (see profit) economic competitiveness would decrease considerably. Vice versa, the avoided monetary losses can be considered the economic benefit of still using currently available PPP in the production of the selected key crops at farm level. The relative changes in the economic margins for altogether 20 case studies included here are summarized in Figure 4.1.

Figure 4.1: Changes of key economic indicators in the "Scenario" for typical farmers growing key crops in selected member states of the EU

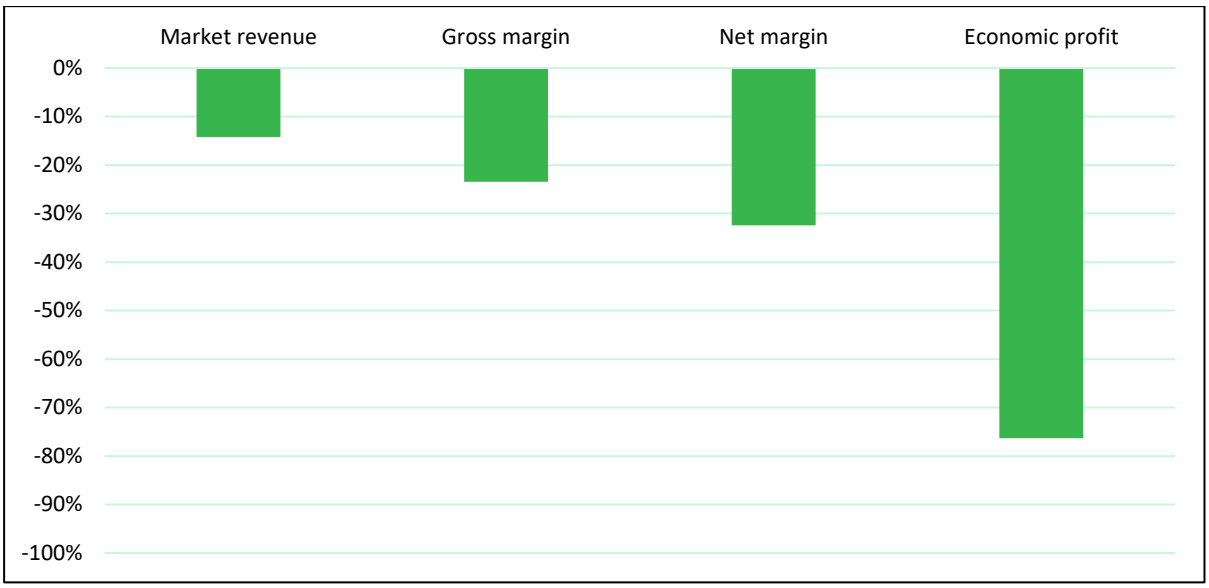
Crop	EU member state	Market revenue	Gross margin	Net margin	Economic profit
Wheat	Austria	- 16,5%	- 23,9%	- 31,9%	- 69,1%
Wheat	Bulgaria	- 16,5%	- 26,2%	- 29,1%	- 76,0%
Wheat	Czechia	- 16,5%	- 29,7%	- 40,3%	- 144,1%
Wheat	Poland	- 16,5%	- 30,0%	- 36,5%	- 58,2%
Wheat	Romania	- 15,5%	- 29,4%	- 33,6%	- 62,1%
Barley	Austria	- 13,7%	- 21,8%	- 33,5%	- 284,4%
Barley	Czechia	- 13,7%	- 29,4%	- 49,0%	- 135,2%
Corn	Czechia	- 12,0%	- 17,0%	- 36,6%	- 92,3%
Corn	Romania	- 13,1%	- 19,1%	- 25,5%	- 70,3%
OSR	Bulgaria	- 14,1%	- 24,2%	- 26,4%	- 55,6%
OSR	Poland	- 14,1%	- 28,6%	- 33,7%	- 49,8%
Potato	Austria	- 13,1%	- 21,4%	- 28,5%	- 52,3%
Potato	Poland	- 13,1%	- 30,2%	- 37,7%	- 59,3%
Sunflower	Bulgaria	- 14,1%	- 33,8%	- 49,9%	- 51,0%
Vine (grapes)	Austria	- 17,6%	- 20,3%	- 25,4%	- 37,1%
Vine (grapes)	Romania	- 17,6%	- 23,1%	- 24,8%	- 33,9%
Apple	Poland	- 9,9%	- 11,1%	- 12,7%	- 22,3%
Tomato	Romania	- 16,0%	- 21,5%	- 25,9%	- 91,1%
Onion	Bulgaria	- 13,0%	- 18,3%	- 20,8%	- 24,3%
Hops	Czechia	- 8,1%	- 9,8%	- 47,5%	- 58,3%

Source: Own figure.

Essentially, this means that a remarkable decline in economic competitiveness is to be expected without PPP based on CfS and some applicable emergency authorizations in EU member states. Using the unweighted average of the various case studies as finally displayed in Figure 4.2, it can straightforwardly be argued that:

- the market revenue would decline by more than one sixth, while
- the gross margin would already decrease by about one quarter and
- the net margin by approximately one third leading to
- the economic profit to be declined by more than three quarters.

Figure 4.2: Average change of key economic indicators in the "Scenario" for typical farmers growing key crops in selected member states of the EU



Source: Own figure.

The introductory remarks of this report referenced four studies (HFFA Research 2025a; b; c; d) examining how a substantial reduction in plant protection options would affect agricultural production, food self-sufficiency, and agri-food net trade balances in selected EU member states. These studies identified substantial risks to food availability and net trade balances. This report adds another risk dimension: beyond shrinking domestic production, decreasing food availability from own resources and growing trade dependencies, farm incomes would also decline significantly — making it harder to invest in farm maintenance, development, and the structural shift toward more sustainable agriculture. To prevent this, the private sector must act, supported by appropriate policy and regulation. Policymakers should enable rather than hinder farmers by:

- broadening access to existing innovations,
- prioritizing research and development for future solutions, and
- establishing regulatory and administrative frameworks that foster the next cycles of innovation.

Modern plant protection represents one such innovation cycle — not in the sense of quantitative growth, i.e., more plant protection, but in the sense of meaningful qualitative growth, i.e., better plant protection. Achieving this requires, above all, regulatory frameworks that are enabling rather than restrictive, particularly regarding approval and authorization procedures. Under such conditions can a sufficiently broad and effective toolbox of PPP and complementary instruments be developed and maintained. This toolbox encompasses not only chemical-synthetic solutions but also a range of additional approaches, including advances in plant breeding and plant nutrition. In fact, a well-stocked and diversified toolbox is essential for allowing farms to respond effectively and flexibly to the wide range of demands placed on them — whether arising from evolving societal preferences, environmental considerations, or other determining factors shaping modern agricultural practice. Against this background, the loss of active substances, particularly in the domain of chemical-synthetic plant protection, must be regarded as counterproductive to this broader objective. Such losses narrow the available solution space and should therefore be avoided to the greatest extent possible, as they ultimately constrain the capacity of farmers to adapt and innovate in a rapidly changing agricultural environment.

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Title: Losing active substances in plant protection: impacts on farm level

The cases of some agricultural and horticultural crops cultivated in selected Eastern and Central European countries

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Berlin, April 2026

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