

# Economic and Regional Importance of the Lenzing Group in 2023

Effects on value-added, income, and employment

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# EXECUTIVE SUMMARY

This study is an update of the study of the year 2016 as well as its former updates from February 2017, 2018, 2019, 2020 and 2023. The study covers the year 2023.

## *The Lenzing Group secures jobs and income in Austria...*

Overall, the activities of Lenzing Group create 9,065 jobs in Austria. Besides the employees at the sites in Lenzing and Heiligenkreuz, this figure includes the indirect and induced effects as well. The company's contribution to the gross domestic product amounts to approximately EUR 888 mn (Upper Austria) and EUR 75 mn (Burgenland) respectively.

## ...and abroad

The calculations conclude that the global activities of the Lenzing Group create 25,282 jobs in all those countries where the Lenzing Group runs production sites (including Austria). Again, this figure comprises the direct (employees at the respective sites), the indirect and the induced effect.

Accordingly, every job directly created by the Lenzing Group at its plants creates more than two additional jobs in other business sectors.

Economic and regional economic effects of Lenzing´s activities: Summary

	Additional gross domestic product	Additional income	Created employment <sup>§</sup>
Lenzing AG (Austria)	EUR 887.5 mn	EUR 551.0 mn	8,136
Heiligenkreuz (Austria)	EUR 75.0 mn	EUR 54.1 mn	929
Paskov (Czech Republic)	EUR 131.9 mn	EUR 59.5 mn	1,434
Grimsby (United Kingdom)	EUR 64.9 mn	EUR 34.0 mn	606
Purwakarta (Indonesia)	EUR 77.0 mn	EUR 60.2 mn	3,603
Nanjing (China)	EUR 142.3 mn	EUR 68.3 mn	3,456
Mobile (USA)	EUR 61.5 mn	EUR 44.9 mn	650
Prachinburi (Thailand)	EUR 45.8 mn	EUR 29.0 mn	1,300
Indianópolis (Brazil)	EUR 562.1 mn	EUR 179.8 mn	5,167

Source: GAW, 2024.

<sup>§</sup> Yearly full-time equivalents.

The effects also do include effects of the year 2023 onwards, as the activities of the Lenzing Group in 2023 do not only provoke economic effects in 2023 but in following years as well.

## Revenues for the public sector

The public sector also benefits from Lenzing's business activities, from increasing local taxes to income tax receipts and social security contributions. At the two Austrian sites, taxes on wages, income and profits generated by Lenzing as well as municipal taxes totalled EUR 8.7 mn in 2023.



# Chapter 1

## DATA BASIS

The calculation of the economic and regional effects of the Lenzing Group is based on the activities of the nine Lenzing's locations (production sites).

Table 1-1: The Lenzing Group and its sites

Lenzing Group	Lenzing AG, Lenzing (Austria)
	Lenzing Fibers GmbH, Heiligenkreuz (Austria)
	PT. South Pacific Viscose, Purwakarta (Indonesia)
	Lenzing Fibers Inc., Mobile (USA)
	Lenzing Fibers Grimsby Limited, Grimsby (United Kingdom)
	Lenzing (Nanjing) Fibers Co., Ltd., Nanjing (China)
	Biocel Paskov a.s., Paskov (Czech Republic)
	Lenzing (Thailand) Co., Ltd., Prachinburi (Thailand)
	LD Celulose S.A., Indianópolis (Brazil)

Source: Lenzing AG, 2024.

The macroeconomic importance is triggered by the so-called stimulation of demand that is causally related to the business operations of the individual production subsidiaries. For this reason, the stimulation of demand also comprises the data basis for quantifying the macroeconomic importance of the Lenzing Group subsidiaries. So, in

this study the macroeconomic importance of the Lenzing Group is presented by showing the economic effects arising from the activities of the individual companies (sites) with respect to the parameters of value-added, income and employment (full-time equivalents, FTE). Several inputs are incorporated as the stimulus for these effects.

On the one hand, the quantification of the economic effects includes intermediate inputs which the Lenzing Group subsidiaries require from their respective suppliers. In this case, it is important to note that not all the intermediate inputs carried out in the region in which the subsidiary is based are considered. For this reason, the input data is adjusted for any imports. For example, in the case of the Czech site, the region under consideration is the Czech Republic itself. All intermediate inputs derived outside of the Czech Republic represent imports which are not included in the calculations, as they have no economic effects in the Czech Republic.<sup>1</sup> From the standpoint of regional economic importance, which is presented for the sites in Upper Austria and Burgenland, all intermediate inputs outside of the respective federal province must be deducted in addition to imports.

On the other hand, but like adjustments made for imports, the income directly derived from Lenzing Group subsidiaries is used in quantifying the effects of the company's business operations on the economy. This is because a large percentage of this disposable income is used for consumption, which means that quantifiable economic effects are derived from this income.

The following sections will present separate descriptions of the individual subsidiaries (production sites) of the Lenzing Group, making use of all the indicators which stimulate demand. Thereby, the focus will be on the cost of material (intermediate inputs), the personnel expenses, and the revenue made by the Lenzing Group subsidiaries.

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<sup>1</sup> Feedback loops are not considered in this study. They arise because higher domestic demand also leads to higher demand for imports. In turn, this growing demand for imports increases income abroad, which in turn raises demand for imports again. Part of the foreign demand for imports is for the domestic export sector, which in the related sector leads to higher income and thus the related rise in demand.

## 1.1 Lenzing AG, Lenzing (Upper Austria, Austria)

The company has its headquarter in Lenzing (Upper Austria) which is by far the largest site within the Lenzing Group with respect to the number of employees and revenue – not only in Austria but worldwide.

At the end of 2023, there was a workforce of 2,785 people (full-time equivalents, FTE) employed at the Lenzing site. This is a decrease of 146 people compared to the comparable figure for 2022. The entire personnel expenses in 2023 totalled to EUR 284.3 mn (2022: EUR 275.1 mn), of which wages and salaries paid to the employees came to EUR 134.5 mn.

Revenue generated in 2023 amounted to EUR 949.6 mn after EUR 1,084.0 mn in the year before, which is a decrease of 12.4 percent. The cost of material amounted to EUR 462.1 mn (2022: EUR 509.3 mn) with EUR 110.4 mn derived from domestic sources.

In addition, investments of EUR 72.6 mn were made in 2023 (2022: EUR 81.0 mn).

Table 1-2: Key indicators: Lenzing, Austria

	2023	2022	2019	2018
Number of employees <sup>§</sup>	2,785	2,931	2,653	2,547
Personnel expenses (EUR mn) <sup>§§</sup>	284.3	275.1	252.0	242.4
Thereof wages and salaries paid	134.5	107.4	122.0	119.1
Thereof retirement benefits and severance payments	7.5	21.2	7.7	7.0
Revenue (EUR mn)	949.6	1,084.0	928.4	937.6
Cost of material (EUR mn)	462.1	509.3	368.9	383.9
Thereof from Austria	110.4	197.5	194.1	207.9
Investments (EUR mn)	72.6	81.0	126.6	115.1
Thereof from Austria	61.6	11.5	123.1	100.6

Source: Lenzing AG, 2024.

<sup>§</sup> Full-time equivalents, excluding foreign labor. End of period numbers.

<sup>§§</sup> Includes wages, salaries, severance payments and retirement benefits as well as statutory and voluntary social contributions.

## 1.2 Lenzing Fibers GmbH, Heiligenkreuz (Burgenland, Austria)

Besides Lenzing there is another site of Lenzing in Austria which is in Heiligenkreuz (Burgenland).

In 2023, in Heiligenkreuz 320 people were employed which is a decrease of 4 people to the year 2022. The company generated a revenue of EUR 96.0 mn (2022: EUR 161.8 mn). The cost of material decreased by more than 40 percent to EUR 49.1 mn (2022: EUR 87.9 mn).

After investments of EUR 5.5 mn in the year 2022, the investments increased to EUR 19.7 mn in 2023.

Table 1-3: Key indicators: Heiligenkreuz, Austria

	2023	2022		2019	2018
Number of employees <sup>§</sup>	320	324		293	264
Personnel expenses (EUR mn) <sup>§§</sup>	24.6	23.3		21.1	19.5
Thereof wages and salaries paid	12.6	11.7		11.2	10.3
Thereof retirement benefits and severance payments	0.6	0.4		0.1	0.0
Revenue (EUR mn)	96.0	161.8		166.7	152.0
Cost of material (EUR mn)	49.1	87.9		61.8	58.6
Thereof from Austria	24.3	62.0		57.3	51.4
Investments (EUR mn)	19.7	5.5		6.9	31.5
Thereof from Austria	19.2	1.1		5.4	24.5

Source: Lenzing AG, 2024.

<sup>§</sup> Full-time equivalents, excluding foreign labor.

<sup>§§</sup> Includes wages, salaries, severance payments and retirement benefits as well as statutory and voluntary social contributions.

### 1.3 Biocel Paskov a.s., Paskov (Czech Republic)

In Europe, in addition to Austria, the Lenzing Group is also represented in the Czech Republic and in the United Kingdom. In Paskov, Czech Republic, the company is the largest employer in town (less than 4,000 inhabitants). In 2023, 520 people were employed by Lenzing in Paskov (2022: 489).

The facility generated a revenue of EUR 254.6 mn which is approximately the same revenue as in 2022 (EUR 251.4 m). The cost of material amounted to EUR 153.6 mn (2022: EUR 150.0 mn). Nearly 75 percent thereof (EUR 115.2 mn) originated in the Czech Republic. In 2023 Lenzing´s investments in Paskov totalled EUR 18.9 mn (2022: EUR 18.8 mn).

Table 1-4: Key indicators: Paskov, Czech Republic

	2023	2022		2019	2018
Number of employees <sup>§</sup>	520	489		414	403
Personnel expenses (EUR mn) <sup>§§</sup>	19.8	18.5		13.1	12.4
Thereof wages and salaries paid	12.4	10.6		7.2	6.8
Thereof retirement benefits and severance payments	0.3	0.8		0.3	0.4
Revenue (EUR mn)	254.6	251.4		195.2	199.8
Cost of material (EUR mn)	153.6	150.0		100.0	105.1
Thereof from the Czech Republic	115.2	125.2		79.2	79.0
Investments (EUR mn)	18.9	18.8		13.2	9.9
Thereof from the Czech Republic	13.0	1.1		7.9	5.9

Source: Lenzing AG, 2024.

<sup>§</sup> Full-time equivalents, excluding foreign labor.

<sup>§§</sup> Includes wages, salaries, severance payments and retirement benefits as well as statutory and voluntary social contributions.

## 1.4 Lenzing Fibers Grimsby Limited (United Kingdom)

At the plant in Grimsby, the total number of employees kept on increasing to 231 in 2023 (2022: 220). The personnel expenses totalled EUR 17.1 mn in 2023, which is a decrease by approximately EUR 1.1 mn compared to the year 2022.

The revenue in 2023 was EUR 134.6 mn (2022: EUR 133.3 mn). The cost of material decreased to EUR 45.8 mn after EUR 50.1 mn in 2022. In 2023, the investments increased to EUR 12.9 mn after EUR 7.0 mn in the year 2022.

Table 1-5: Key indicators: Grimsby, United Kingdom

	2023	2022		2019	2018
Number of employees <sup>§</sup>	231	220		196	187
Personnel expenses (EUR mn) <sup>§§</sup>	17.1	18.2		13.7	12.4
Thereof wages and salaries paid	9.4	9.5		8.2	7.5
Thereof retirement benefits and severance payments	2.9	2.9		1.2	1.1
Revenue (EUR mn)	134.6	133.3		117.9	107.4
Cost of material (EUR mn)	45.8	50.1		43.0	40.6
Thereof from the United Kingdom	2.6	19.5		8.6	16.7
Investments (EUR mn)	12.9	7.0		5.2	4.6
Thereof from the United Kingdom	12.0	2.0		2.8	3.7

Source: Lenzing AG, 2024.

<sup>§</sup> Full-time equivalents, excluding foreign labor.

<sup>§§</sup> Includes wages, salaries, severance payments and retirement benefits as well as statutory and voluntary social contributions.

## 1.5 PT. South Pacific Viscose, Purwakarta (Indonesia)

In Asia, Lenzing runs three sites, one in Indonesia, one in China and a third one in Thailand.

In Purwakarta, Indonesia, Lenzing employed 1,474 persons (FTE) in 2023, which is a decrease of 3.2 percent from last year (2022: 1,523 FTE). Also, the revenue generated in this site decreased to EUR 322.0 mn in the year 2023, which is a decline by 26.3 percent.

The personnel expenses totalled EUR 24.5 mn in 2023, which is approximately the same as in 2022 (EUR 24.6 mn). The cost of material amounted to EUR 304.1 mn after EUR 395.2 mn in 2022.

In Purwakarta there have been investments of EUR 47.6 mn in 2023, thereof EUR 43.8 mn from Indonesia.

Table 1-6: Key indicators: Purwakarta, Indonesia

	2023	2022		2019	2018
Number of employees <sup>§</sup>	1,474	1,523		1,735	1,763
Personnel expenses (EUR mn) <sup>§§</sup>	24.5	24.6		27.1	25.0
Thereof wages and salaries paid	15.8	14.9		19.3	17.9
Thereof retirement benefits and severance payments	2.3	1.7		1.1	0.7
Revenue (EUR mn)	322.0	437.0		388.8	450.9
Cost of material (EUR mn)	304.1	395.2		351.9	354.1
Thereof from Indonesia	99.2	90.2		119.8	134.3
Investments (EUR mn)	47.6	99.2		21.5	17.5
Thereof from Indonesia	43.8	39.5		6.1	8.5

Source: Lenzing AG, 2024.

<sup>§</sup> Full-time equivalents, excluding foreign labor.

<sup>§§</sup> Includes wages, salaries, severance payments and retirement benefits as well as statutory and voluntary social contributions.

## 1.6 Lenzing (Nanjing) Fibers Co., Ltd. (China)

In addition to Indonesia, the Lenzing Group has another site in Asia, namely in Nanjing, China. Table 1-7 shows the key indicators of this site.

From 2012 to 2017, the number of employees decreased to 707 people. However, since then the number of employees has increased to 762 in 2022 and decreased slightly in 2023 to 723. The personnel expenses remained nearly constant with EUR 17.3 mn in 2023.

The revenue generated in this production facility totalled EUR 181.2 mn in 2023, which is less than 2022 (EUR 225.9 mn).

In 2023, Lenzing invested EUR 26.3 mn in the site in Nanjing.

Table 1-7: Key indicators: Nanjing, China

	2023	2022		2019	2018
Number of employees <sup>§</sup>	723	762		751	743
Personnel expenses (EUR mn) <sup>§§</sup>	17.3	17.2		14.8	13.2
Thereof wages and salaries paid	12.3	11.8		8.3	6.7
Thereof retirement benefits and severance payments	0.2	0.0		0.0	0.1
Revenue (EUR mn)	181.2	225.9		231.5	259.6
Cost of material (EUR mn)	128.3	163.1		171.9	192.3
Thereof from China	44.0	38.3		75.5	76.7
Investments (EUR mn)	26.3	68.1		20.8	6.1
Thereof from China	24.7	2.7		11.3	4.2

Source: Lenzing AG, 2024.

<sup>§</sup> Full-time equivalents, excluding foreign labor.

<sup>§§</sup> Includes wages, salaries, severance payments and retirement benefits as well as statutory and voluntary social contributions.



## 1.7 Lenzing (Thailand) Co., Ltd., Prachinburi (Thailand)

Besides Indonesia and China, there is another, quite new production site in Asia, namely in Prachinburi, Thailand.

At the end of 2023, there were 269 people (FTE) employed in the Lenzing's site in Prachinburi (2022: 301 FTE). The personnel expenses amounted to EUR 10.9 mn after EUR 16.9 mn in 2022. EUR 7.7 mn of those expenses included wages and salaries paid (2022: EUR 12.7 mn).

In 2022, the revenue generated in Prachinburi totalled EUR 89.6 mn. In 2023 the revenue increased by more than 50 percent to EUR 135.9 mn. Also, the cost of material increased – from EUR 59.2 mn in 2022 to EUR 82.0 mn in 2023.

The investments amounted to EUR 46.2 mn in 2022 and EUR 3.5 mn in 2023.

Table 1-8: Key indicators: Prachinburi, Thailand

	2023	2022
Number of employees <sup>5</sup>	269	301
Personnel expenses (EUR mn) <sup>5§</sup>	10.9	16.9
Thereof wages and salaries paid	7.7	12.7
Thereof retirement benefits and severance payments	0.5	0.8
Revenue (EUR mn)	135.9	89.6
Cost of material (EUR mn)	82.0	59.2
Thereof from Thailand	2.1	17.7
Investments (EUR mn)	3.5	46.2
Thereof from Thailand	3.4	0.6

Source: Lenzing AG, 2024.

<sup>5</sup> Full-time equivalents, excluding foreign labor.

<sup>5§</sup> Includes wages, salaries, severance payments and retirement benefits as well as statutory and voluntary social contributions.

## 1.8 Lenzing Fibers Inc., Mobile (USA)

In Mobile, USA, there is the only plant of Lenzing in North America.

The number of the staff kept on increasing slightly from 2017 onwards and reached 217 people (FTE) at the end of 2022 and 214 FTE in 2023, respectively. The personnel expenses amounted to EUR 25.7 mn in 2023 (2022: EUR 25.8 mn).

The revenue in the site decreased to EUR 116.7 mn in 2023 (2022: EUR 131.8 mn). The cost of material fell slightly from EUR 59.4 mn in 2022 to EUR 57.0 mn in 2023. Again, more than 90 percent thereof (EUR 52.5 m) came from the USA.

In Mobile, the investments in 2022 were EUR 7.5 mn and EUR 6.7 mn in 2023.

Table 1-9: Key indicators: Mobile, USA

	2023	2022		2019	2018
Number of employees <sup>§</sup>	214	217		207	203
Personnel expenses (EUR mn) <sup>§§</sup>	25.7	25.8		21.0	19.3
Thereof wages and salaries paid	15.6	15.5		13.9	12.5
Thereof retirement benefits and severance payments	1.7	1.7		1.4	1.3
Revenue (EUR mn)	116.7	131.8		121.5	115.1
Cost of material (EUR mn)	57.0	59.4		53.0	48.4
Thereof from USA	52.5	55.9		21.8	20.0
Investments (EUR mn)	6.7	7.5		23.9	49.4
Thereof from USA	6.5	3.8		5.8	13.2

Source: Lenzing AG, 2024.

<sup>§</sup> Full-time equivalents, excluding foreign labor.

<sup>§§</sup> Includes wages, salaries, severance payments and retirement benefits as well as statutory and voluntary social contributions.

## 1.9 LD Celulose S.A., Indianópolis (Brazil)

Besides Prachinburi (Thailand), in Indianópolis (Brazil) there is another (quite new) production site in operation. It is the only site in South America.

At the end of 2022, 949 people (FTE) were employed in the Lenzing's site in Indianópolis. In 2023 this figure increased to 1,195. The personnel expenses amounted to EUR 24.6 mn in 2022 and increased to 32.0 mn in 2023. EUR 16.2 mn thereof include wages and salaries paid.

In 2022, the revenue generated in Indianópolis totalled EUR 164.3 mn and increased strongly to EUR 449.3 mn in 2023. The cost of material remained nearly constant with EUR 81.9 mn (2022: EUR 81.8 m)

After investments of EUR 337.9 mn in 2022, in 2023 again, EUR 44.1 mn were invested in Indianópolis.

Table 1-10: Key indicators: Indianópolis, Brazil

	2023	2022
Number of employees <sup>§</sup>	1,195	949
Personnel expenses (EUR mn) <sup>§§</sup>	32.0	24.6
Thereof wages and salaries paid	16.2	13.2
Thereof retirement benefits and severance payments	0.1	0.1
Revenue (EUR mn)	449.3	164.3
Cost of material (EUR mn)	81.9	81.8
Thereof from Brazil	68.6	81.2
Investments (EUR mn)	44.1	337.9
Thereof from Brazil	44.1	337.8

Source: Lenzing AG, 2024.

<sup>§</sup> Full-time equivalents, excluding foreign labor.

<sup>§§</sup> Includes wages, salaries, severance payments and retirement benefits as well as statutory and voluntary social contributions.

## 1.10 The Lenzing Group

In Table 1-11 the key indicators of the Lenzing Group are presented.<sup>2</sup> In the year 2023, across the globe 7,917 people (FTE) were employed by the Lenzing Group. In total, a revenue of EUR 2.5 bn (2022: EUR 2.6 bn) was generated by the Lenzing Group worldwide. The personnel expenses increased to EUR 471.2 mn in 2023 (2022: EUR 457.1 mn). The cost of material amounted to EUR 1,196.4 mn in 2023 (2022: EUR 1,434.9 mn).

In 2023, the Lenzing Group invested EUR 282.4 mn worldwide (2022: EUR 698.9 mn).

Table 1-11: Key indicators: Lenzing Group

	2023	2022	2019	2018
Number of employees <sup>§</sup>	7,917	7,934	6,685	6,506
Personnel expenses (EUR mn) <sup>§§</sup>	471.2	457.1	395.9	374.5
Thereof wages and salaries paid	257.7	226.2	210.3	198.9
Thereof retirement benefits and severance payments	17.2	29.9	11.8	10.5
Revenue (EUR mn)	2,521.2	2,565.7	2,105.2	2,176.0
Cost of material (EUR mn)	1,196.4	1,434.9	1,100.0	1,147.7
Thereof from domestic sources	455.1	633.9	536.6	568.5
Investments (EUR mn)	282.4	698.9	244.0	257.6
Thereof from domestic sites	255.5	416.8	176.6	176.7

Source: Lenzing AG, 2024.

<sup>§</sup> Full-time equivalents, excluding foreign labor.

<sup>§§</sup> Includes wages, salaries, severance payments and retirement benefits as well as statutory and voluntary social contributions.

Now the data basis for calculating the economic and regional effects of the Lenzing Group's business operations is presented. The results of the calculations will be presented in the next chapter. Before that, some remarks on the methodology underlying the GAW models are given.

<sup>2</sup> The figures for the Lenzing Group deviate slightly from the sum of the nine individual production sites, because the additional small non-operational holding companies are included. Furthermore, consolidation has been performed.

## 1.11 Methodological background

As the results of the simulations will show in the next chapter, the positive effects from ongoing operations in the production sites of Lenzing are broadly disseminated across all sectors of the economy. These operations have positive effects not only for the companies involved but also for the people employed in these companies.

The economic explanation for this sectoral broad impact is, on the one hand, that the regional economy is strongly intertwined through the provision of intermediate inputs. And thus, already a demand impulse once set, broadly spreads into the regional economy. Conceptually, in economics this circumstance is discussed under the term pair of *direct and indirect effects*. In addition, the economy is a cycle, which is why there are also feedback processes through the expenditure of directly and indirectly generated income, which in turn have a broad impact on the sectoral structure of the economy. An effect known in economics as an *induced effect*.

However, this triple effect of each demand impulse also means that the exclusive quantification of the direct and indirect effects would only incompletely reflect the overall economic impact, but above all the *breadth* of the economic impact. This is because both the direct and indirect effects do not consider the fact that in all those sectors that are directly affected by a demand stimulus or indirectly via the intermediate interdependencies, income is generated that is (partly) spent again. These incomes include not only all those incomes earned by the employees of those sectors that are directly or indirectly positively affected by the demand stimulus once set. So, it is not only the incomes of private households that are to be understood. Rather, it also means all those earned incomes that are generated by the self-employed persons (from one-person companies to new self-employed persons) in the respective sectors or capital income. Income, all of which is also spent again. Be it in the form of consumer spending or investments when companies invest more due to increased profits or cash flows.

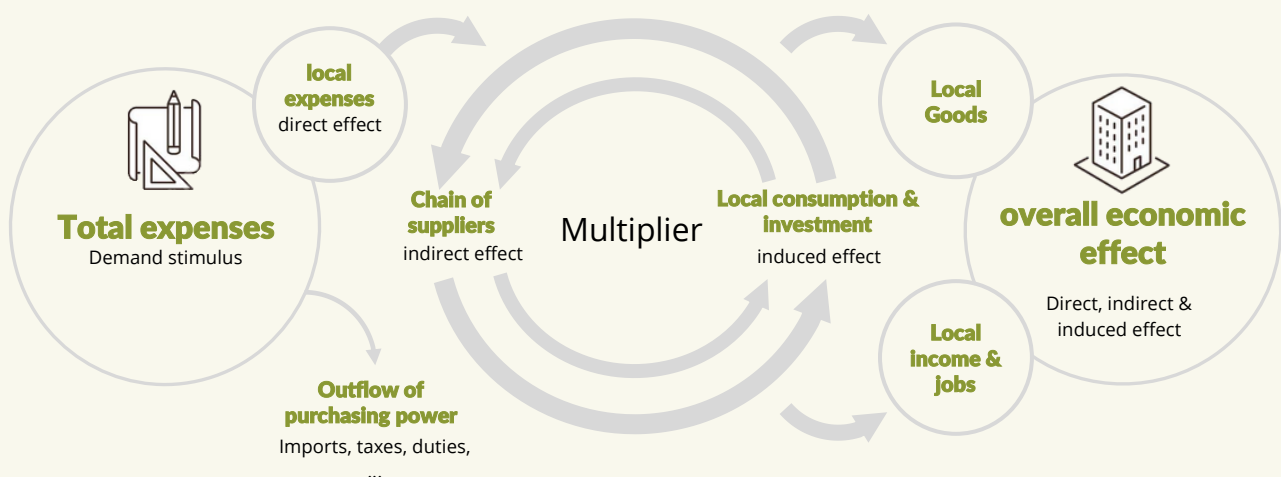
# Direct, indirect, and induced effects

Direct, indirect, and induced effects  
as tangible effects

## THE BIG THREE

Value-added analyses, also known as impact analyses, show, depending on the definition of the region under consideration, the regional or national economic effects that emanate from demand impulses on the defined region. Through the economic interdependencies of the individual economic units

within the region under consideration, but also through the interdependencies with economic units outside the region under consideration, demand impulses once set always unfold **direct**, **indirect**, and **induced** effects. Effects that are quantified by GAW's value-added models and thus made visible.



It is thanks to the indirect and the induced effect that every demand impulse, no matter how focused in sectoral terms, unfolds a broad sectoral effect and thus a broad regional economic significance.

Where the direct effect starts and thus works, is naturally different from case to case and must be clarified in advance to be able to be mapped accordingly in the calculations. The indirect effects, on the other hand, are usually derived solely from the sectoral determination of the direct effects. This is because the indirect effects result from the interconnections of inputs, as shown in the input-output tables. The indirect effects are thus ultimately the result of a fixed input-mix of intermediate goods if a limited production structure is assumed.

The induced effects resulting from the expenditure of those incomes that arise in the sectors directly affected by the demand impulse but also in the intermediate sectors are derived conclusively from the empirically estimated consumption and sectorally differentiated investment structures.

The fact that the described mechanisms of action are not a perpetual motion machine, but a resonant process, is in the nature of the matter and is primarily due to two reasons. On the one hand, this is the fact that the directly and indirectly generated incomes are not spent one hundred percent again and therefore an increase in income does not lead to an additional increase in demand 1:1. This is empirically not the case, since part of the income directly and indirectly generated flows, for example, into savings and thus does not influence consumption. On the other hand, every region, regardless of its size, is affected by income and thus value-added outflows in the form of imports. Imports represent demand for goods and services from economic areas other than those under consideration, which is why additional import demand triggers value-added and employment effects in the region concerned as described above, but not in the region of interest, i.e., not in the region in question, which is subject of the investigation. Put simply, it could be said that imports mean demand for goods and services from "economic foreign countries" and that "economic foreign countries" do not necessarily have to coincide with "political foreign countries".

It should be noted that the value-added outflows that can be determined in this way tend to correlate with the considered size of a region, so that smaller regions tend to be more affected by value-added outflows via imports. A circumstance for which, in turn, two primary reasons can be cited.

On the one hand, this is since with the decreasing size of a region, the need for trade with other economic areas increases simply because with decreasing regional size fewer and fewer goods and services of one's own needs can be produced or provided

economically efficiently. An argument that is in the field of real foreign trade and operates there under the slogan of comparative cost advantages (Krugman et al., 2012). The argument can be reduced to the fact that there are regional differences in terms of the endowment of natural resources, human capital and or the state of technology, and these regional differences lead to differences in regional and sectoral productivity. These differences in productivity, in turn, are what can be mutually exploited through trade, with each region specializing in the production of those goods and services in which it has relative cost advantages in production, since this allows consumption opportunities to be raised above the level of regional production possibilities. This is regardless of what the regional differences in productivity are due to.

On the other hand, national borders tend to have a stronger effect on trade and thus on imports than borders between political entities of the same national territory (Anderson and van Wincoop, 2003; McCallum, 1995; Nitsch, 2000). In other words, given a certain distance between the region of origin and the destination region of imports, national borders are more restrictive for trade than borders between regions of the same political territory. With decreasing regional size, however, the proportion of political borders at the expense of international (external) borders increases.

The combination of both arguments thus leads to the fact that as the geographical size of the economic unit under consideration decreases, the extent of interregional imports tends to increase. Therefore, interregional imports are becoming increasingly important compared to international imports.

About the interpretation of the following results, the following remains to be said. The results shown are simulation results. The simulation results are to be understood as the difference to a reference scenario in which the demand stimuli have not been set – not even in other areas or sectors of the economy.

The results therefore show the sectoral effects of additional demand impulses that have been set under otherwise equal conditions. The simulations are thus conducted under the *ceteris paribus* clause customary in economics, which states that the analysis is conducted under the assumption of otherwise constant conditions. In this way, the results can also be interpreted as the effects causally associated with the analysed demand impulse.



# Chapter 2

# **MACROECONOMIC AND REGIONAL ECONOMIC EFFECTS**

The business operations of the Lenzing Group subsidiaries triggered macroeconomic and regional economic effects in the period under review, namely the year 2023.<sup>3</sup> The calculation of such effects was carried out based on the GAW models. The following section presents the results of these calculations, whereas the results include both the direct as well as indirect and induced effects.

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<sup>3</sup> Additional impetus to demand not only triggers macroeconomic and regional economic effects in the year of the business operations but in subsequent years as well, although subsequent effects quickly decrease. For this reason, the effects arising in 2023 and the following years from stimulating demand in 2023 are included in the results for 2023.

When interpreting the results, it should be taken into consideration that the calculations assume that all impetus to demand comprises supplementary demand. This means that the results are to be compared to a scenario in which there is no impetus to demand, and thus these resources are not used in another manner that could trigger domestic value-added effects. The analysis is carried out based on the so-called ceteris-paribus assumption. In other words, the reference scenario is a “world without the Lenzing Group”.

#### Excursus: Significance of induced effects

In putting together value-added studies, it is frequently the case that only the so-called direct and indirect value-added effects are quantified. This means that the focus is on the value-added effects arising directly with the provider of a product, for example, and the suppliers (responsible for intermediate inputs). The underlying methodology is that these analyses are exclusively based on input-output tables enabling the calculation of these two effects. No attention is paid to the importance of induced effects.

Induced effects are value-added effects which arise when the wages, salaries and profits arising with the providers and suppliers (and their employees) are spent again, in turn triggering additional value-added effects for the benefit of (other) companies. The amount of these induced effects is significant, and often matches the volume of direct and indirect effects combined. For this reason, ignoring induced effects leads to a clear underestimation of total value-added effects and thus the generated income and employment.

In other words, not taking account of induced effects leads to...

- a considerable underestimation of regional economic effects on the gross regional product, income, and employment and
- a considerable underestimation of the regional economic significance of a project for other business sectors which are not directly impacted by the project.

The macroeconomic and regional economic effects are presented based on the following aggregates: gross domestic product, disposable income, and employment. The calculations have been made separately for Austria, the Czech Republic, the United Kingdom, the USA, Indonesia, China, Thailand, and Brazil. The two sites in Austria are dealt with separately. In this way, regional economic effects can be quantified for the two Austrian sites i.e., effects in the federal provinces of Upper Austria and Burgenland.

## 2.1 Results: Austrian production sites

Table 2-1 shows the results of the calculations for the regional economic effects triggered by the business operations of the Lenzing Group subsidiaries in Lenzing and in Heiligenkreuz in 2023.

Table 2-1: Value-added and employment effects: Austria

	Additional Gross Regional Product (EUR mn)		Additional Disposable Income (EUR mn)		Employment <sup>§</sup>	
	Lenzing	Heiligenkreuz	Lenzing	Heiligenkreuz	Lenzing	Heiligenkreuz
2023	887.5	75.0	551.0	54.1	8,136	929

Source: GAW, 2024.

<sup>§</sup> Yearly full-time equivalents.

The values for 2023 also include effects that arise with a time delay after 2023.

These regional economic effects were distributed among several sectors. The extent of this cross-sectoral significance can be seen in the next illustrations.

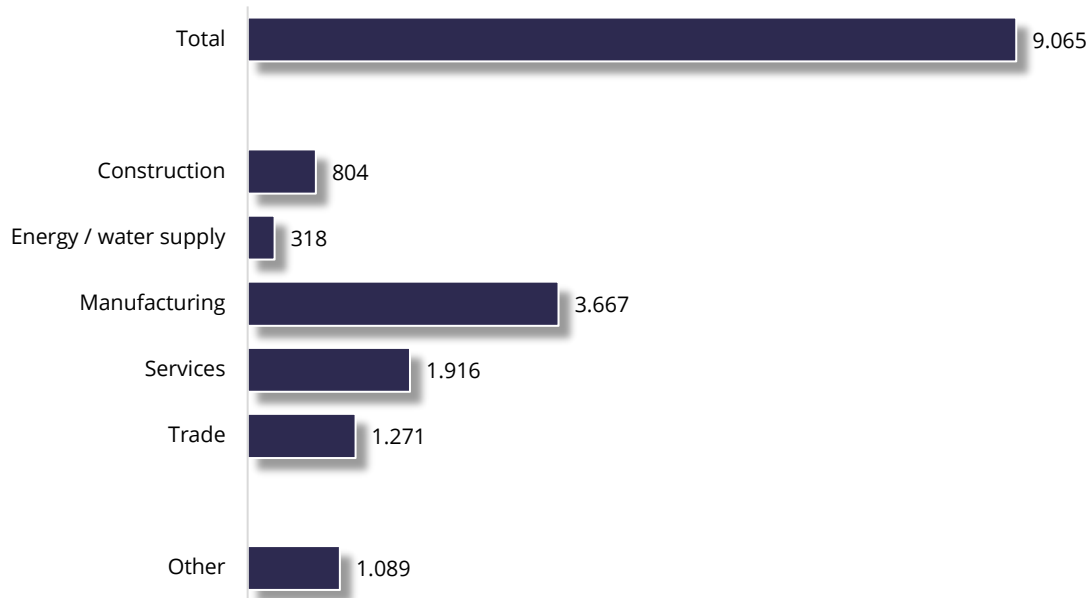
Figure 2-1: Value-added effect of activities of the Austrian production sites



Source: GAW, 2024.

As Figure 2-2 shows, the manufacturing sector benefited most from Lenzing's activities at its Austrian sites. This sector accounted for more than 25 percent of the total value-added effects in Austria (EUR 266.7 mn out of EUR 962.5 mn).

Figure 2-2: Employment effect of activities of the Austrian production sites



Source: GAW, 2024.  
Yearly full-time equivalents.

With respect to employment, more than 40 percent of the total effect related to this sector (3,667 out of 9,065 full-time equivalents).

Many other sectors such as service sectors, trade, and construction benefited from the Lenzing’s activities in Austria. While the effects in the manufacturing sector are mainly due to the direct effect, in the other sectors mentioned the indirect and induced effects are more pronounced. This applies both to the value-added and the employment effect.

## 2.2 Results: Czech Republic

The activities of the company in Paskov contributed EUR 131.9 mn to the gross domestic product of the Czech Republic in the year 2023 and EUR 59.5 mn to the disposable income.

Overall, 1,434 jobs were created in 2023 by the activities of Lenzing in the Czech Republic.

Table 2-2: Value-added and employment effects: Czech Republic

	Additional Gross Domestic Product (EUR mn)	Additional Disposable Income (EUR mn)	Employment <sup>§</sup>
2023	131.9	59.5	1,434

Source: GAW, 2024.

<sup>§</sup> Yearly full-time equivalents.

The values for 2023 also include effects that arise with a time delay after 2023.

## 2.3 Results: United Kingdom

The activities of the site in Grimsby, United Kingdom, amounted EUR 64.9 mn regarding the gross domestic product in 2023 and EUR 34.0 mn the additional disposable income, respectively.

Table 2-3: Value-added and employment effects: United Kingdom

	Additional Gross Domestic Product (EUR mn)	Additional Disposable Income (EUR mn)	Employment <sup>§</sup>
2023	64.9	34.0	606

Source: GAW, 2024.

<sup>§</sup> Yearly full-time equivalents.

The values for 2023 also include effects that arise with a time delay after 2023.

Overall, 606 jobs were created due to the activities of Lenzing's UK site.

## 2.4 Results: Indonesia

The business operations of the company at the Purwakarta site, Indonesia, made a positive contribution to the gross domestic product of Indonesia of EUR 77.0 mn. This led to an increase in the disposable income of close to EUR 60.2 mn.

This resulted in positive employment effects of 3,603 jobs in 2023 due to the activities in Purwakarta.

Table 2-4: Value-added and employment effects: Indonesia

	Additional Gross Domestic Product (EUR mn)	Additional Disposable Income (EUR mn)	Employment <sup>§</sup>
2023	77.0	60.2	3,603

Source: GAW, 2024.

<sup>§</sup> Yearly full-time equivalents.

The values for 2023 also include effects that arise with a time delay after 2023.

## 2.5 Results: China

Regarding the revenue, the site in China is fifth after Lenzing's headquarter in Upper Austria, the site in Purwakarta, the site in Paskov, and the site in Indianópolis.

Table 2-5: Value-added and employment effects: China

	Additional Gross Domestic Product (EUR mn)	Additional Disposable Income (EUR mn)	Employment <sup>§</sup>
2023	142.3	68.3	3,456

Source: GAW, 2024.

<sup>§</sup> Yearly full-time equivalents.

The values for 2023 also include effects that arise with a time delay after 2023.

The activities of the company at the Nanjing site increased the gross domestic product of China by EUR 142.3 mn in 2023 and raised disposable income by EUR 68.3 mn. These activities created 3,456 jobs in 2023.

## 2.6 Results: USA

Table 2-6 shows the results for the USA. In 2023 the company's activities contributed EUR 61.5 mn to the gross domestic product in the United States. The disposable income increased by EU 44.9 mn.

650 jobs could be created by the activities of Lenzing's site in Mobile.

Table 2-6: Value-added and employment effects: USA

	Additional Gross Domestic Product (EUR mn)	Additional Disposable Income (EUR mn)	Employment <sup>§</sup>
2023	61.5	44.9	650

Source: GAW, 2024.

<sup>§</sup> Yearly full-time equivalents.

The values for 2023 also include effects that arise with a time delay after 2023.

## 2.7 Results: Thailand

2023 was the second year of the Lenzing's site in Prachinburi in operation. Thereby, the business operations of the company at Prachinburi made a positive contribution to the gross domestic product of Thailand of EUR 45.8 mn. The disposable income increased by EUR 29.0 mn.

The Prachinburi site's activities of 2023 resulted in positive employment effects of 1,300 jobs.

Table 2-7: Value-added and employment effects: Thailand

	Additional Gross Domestic Product (EUR mn)	Additional Disposable Income (EUR mn)	Employment <sup>§</sup>
2023	45.8	29.0	1,300

Source: GAW, 2024.

<sup>§</sup> Yearly full-time equivalents.

The values for 2023 also include effects that arise with a time delay after 2023.

## 2.8 Results: Brazil

Besides Prachinburi, in Indianópolis, Brazil, there is another new Lenzing site in operation for two years. In 2023, the activities of this site had a positive effect on the gross domestic product of Brazil of EUR 562.1 mn and on the disposable income of EUR 179.8 mn.

By those activities in total 5,167 jobs have been created in Brazil.

Table 2-8: Value-added and employment effects: Brazil

	Additional Gross Domestic Product (EUR mn)	Additional Disposable Income (EUR mn)	Employment <sup>§</sup>
2023	562.1	179.8	5,167

Source: GAW, 2024.

<sup>§</sup> Yearly full-time equivalents.

The values for 2023 also include effects that arise with a time delay after 2023.

## 2.9 Overview of value-added and employment effects

The following figures present a summary of the effects on the gross domestic product and employment for the Lenzing Group production sites.

Figure 2-3: Contribution to Gross Domestic Product by production site



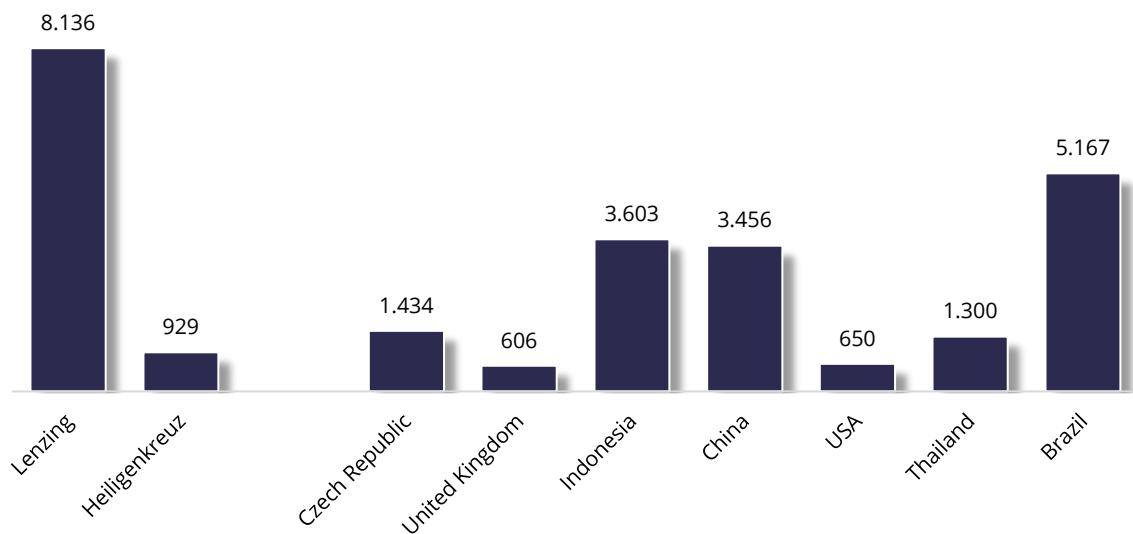
Source: GAW, 2024.

Figure 2-3 shows that by far the biggest value-added effect is triggered by the Lenzing Group's plant in Upper Austria (EUR 887.5 mn). This is followed by the facility in Indianópolis, Brazil (EUR 562.1 mn), Nanjing, China (EUR 142.3 mn) and Paskov, Czech Republic (EUR 131.9 mn). These results are the consequence of the fact that the level of business operations differs from site to site. But also, the economic interdependencies



in each region (supply chains, share of imports) and other economic conditions (like elasticities of employment, i.e., how sensible does employment react to a change in value-added) have an impact on the economic effects. The latter can be seen in Figure 2-4, when the employment effects in China, Indonesia and Brazil are relatively higher when compared to the value-added effects. This is since an additional Euro of value-added has a larger effect on the employment in those regions than in Austria, the Czech Republic, UK, and USA.

Figure 2-4: Contribution to employment by production site



Source: GAW, 2024.  
Yearly full-time equivalents.

## 2.10 Tax revenue

In addition to the value-added and employment effects that were calculated and discussed above, the business operations of the Lenzing Group also have fiscal consequences since they result in considerable tax receipts for the public sector.

On a Group level in 2023, the business activities of Lenzing led to tax receipts of EUR 73.9 mn, with taxes on wages (EUR 51.0 mn) comprising the biggest proportion. Taxes on income and profits totalled EUR 7.3 mn, municipal taxes EUR 6.9 mn, and other corporate taxes EUR 8.8 mn in 2023.

Table 2-9: Lenzing Group and its sites: tax revenue in 2023 (EUR mn)

	Austria	Czech Republic	United Kingdom	Indonesia	China	USA	Thailand	Brazil	Group
Taxes on wages	38,5	1,3	2,2	2,0	0,3	4,0	1,1	1,0	<b>51,0</b>
Taxes on income and profits	-37,0	3,9	0,9	-0,5	13,1	-0,5	0,0	23,4	<b>7,3</b>
Municipal taxes	6,8	0,0	0,0	0,0	0,0	0,0	0,0	0,0	<b>6,9</b>
Other corporate taxes	0,4	0,6	1,3	0,1	1,2	0,4	0,1	3,0	<b>8,8</b>
<b>Total</b>	<b>8,7</b>	<b>5,8</b>	<b>4,5</b>	<b>1,6</b>	<b>14,5</b>	<b>4,0</b>	<b>1,2</b>	<b>27,4</b>	<b>73,9</b>

Source: Lenzing AG, 2024.

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