

30. Impact of the EC proposal for the EU ETS review on the steel sector in Sweden

30.1. Key findings

The following key findings are related to a benchmark reduction flat rate of 1.0%/year for all the benchmarks of the steel sector in Sweden. The results related to the other BM flat rates will be discussed in the paragraph “parameter variation”.

Figure 30.1 illustrates with blue bars the gross direct and indirect carbon costs and with green bars the compensation for carbon costs (free allocation for direct costs as well as financial compensation for indirect costs). The difference between the blue bars and the green bars represents the shortage of direct and indirect cost, which is to up 47% in 2030. The total (net) carbon costs for the steel sector in Sweden will be **0.87 billion EUR over the period 2021-2030**.

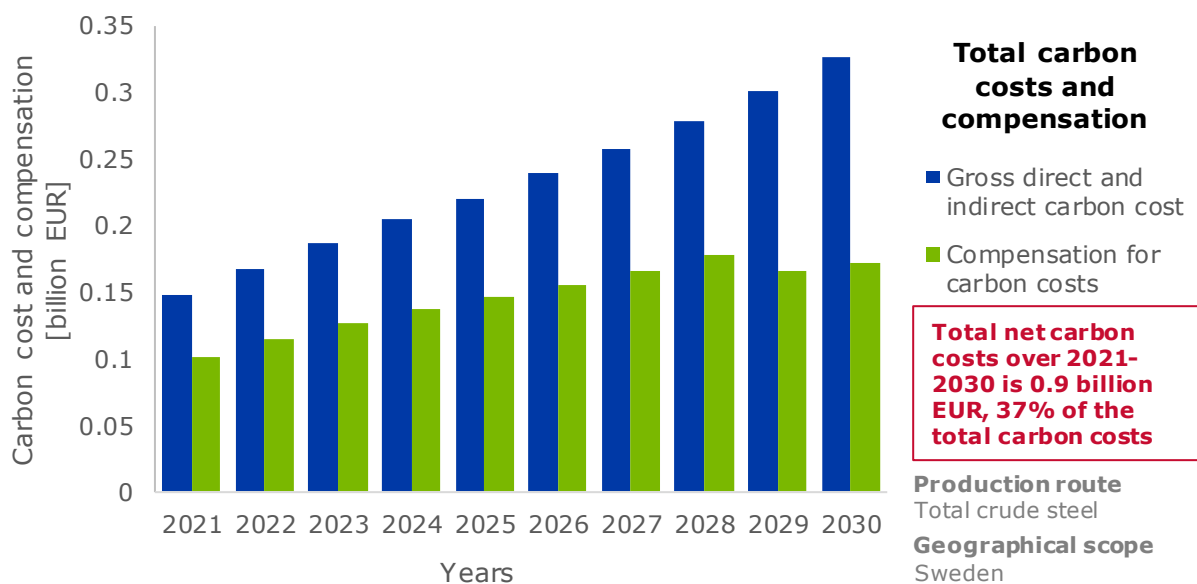


Figure 30.1: Total carbon costs of the steel sector in Sweden (BM reduction flat rate of 1%/year)

Figure 30.2 shows the total carbon costs (bleu bars) and the compensation (green bars) of the steel sector in Sweden expressed in million tonnes of CO₂ equivalent. The shortage in terms of CO₂ equivalent is the difference between the total costs (bleu bars) and the compensation (green bars). This shortage in compensation for both direct and indirect carbon costs would be equivalent to **28 million tonnes of CO₂ over the period 2021-2030**.

Table 30.1 summarises the carbon costs of the steel sector in Sweden from 2021 to 2030 in case a benchmark reduction flat rate of 1.0% per year is considered.

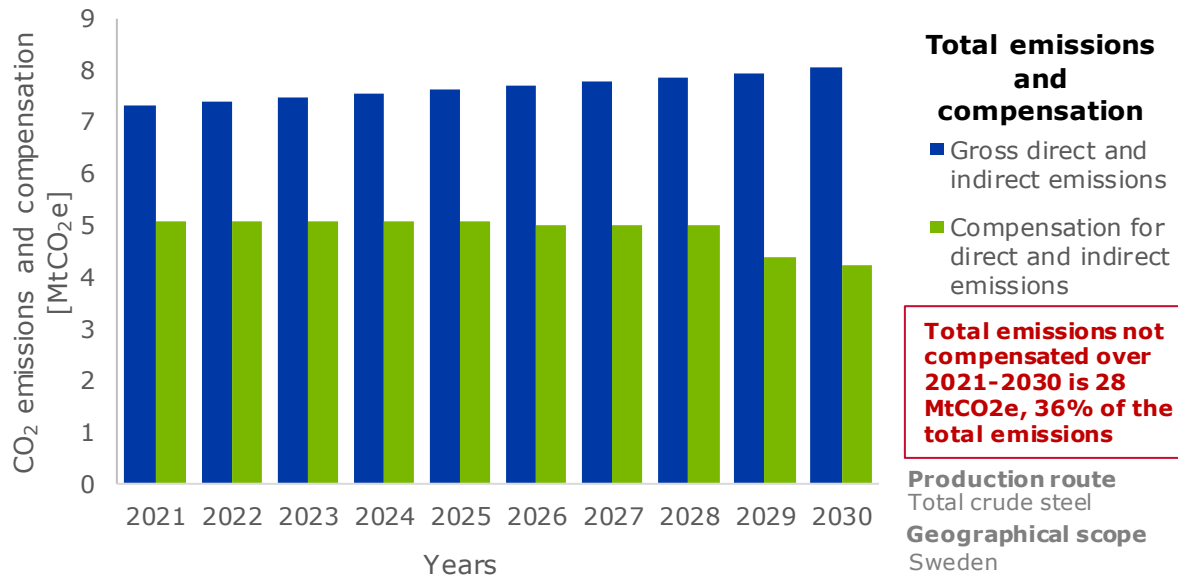


Figure 30.2: Total carbon costs of the steel sector in Sweden in million tonnes CO₂ equivalent (BM reduction flat rate of 1%/year)

Table 30.1: Summary of the carbon costs of the steel sector in Sweden for a benchmark reduction flat rate of 1.0% per year

	Impact assessment of ETS in terms of costs										
Direct carbon costs [billion EUR]	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Gross direct carbon cost											
Value of free allocation											
Net direct carbon cost											
Annual direct compensation shortage (%)											
Indirect carbon costs [billion EUR]	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Gross indirect carbon cost											
Amount of compensation											
Net indirect carbon cost											
Annual indirect compensation shortage (%)											
Total carbon costs [billion EUR]	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Gross direct and indirect carbon cost	0.15	0.17	0.19	0.20	0.22	0.24	0.26	0.28	0.30	0.33	2.33
Compensation for carbon costs	0.10	0.11	0.13	0.14	0.15	0.16	0.17	0.18	0.17	0.17	1.46
Net total carbon costs	0.05	0.05	0.06	0.07	0.07	0.08	0.09	0.10	0.14	0.15	0.87
Annual total compensation shortage (%)	31%	32%	32%	33%	34%	35%	36%	36%	45%	47%	37%
Net cost impact per tCS (EUR/tCS)	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Average
Gross total carbon cost per tonne crude steel	29.92	33.60	37.12	40.20	42.82	45.88	48.93	52.27	55.89	59.95	44.96
Carbon cost compensation per tonne crude steel	20.66	22.97	25.12	26.92	28.38	29.86	31.52	33.25	30.80	31.56	28.22
Net total carbon costs per tonne crude steel	9.25	10.63	12.01	13.28	14.44	16.02	17.41	19.02	25.09	28.40	16.74
Annual total compensation shortage (%)	31%	32%	32%	33%	34%	35%	36%	36%	45%	47%	37%

Figure 30.3 gives a summary of the cumulative carbon costs and compensation for the steel sector over the period 2021-2030. Out of the cumulative total carbon costs of 2.33 billion EUR only 1.46 billion EUR will be compensated (in form of free allowances for direct costs and financial compensation for indirect carbon costs). **The balance of 0.87 billion EUR represents the net carbon costs that the steel sector in Sweden will be faced with if a benchmark reduction factor of 1%/year is considered.**

Figure 30.4 shows the net direct and indirect carbon costs in EUR/t crude steel for the period 2021 to 2030. Considering a benchmark reduction flat rate of 1%/year, **the steel sector will be faced with net carbon costs of up to 28.4 EUR/t crude in 2030.**

These EU ETS compliance costs of 28.4 EUR/t are very high compared to the EBITDA of 39 EUR/t crude steel of the EU steel sector.

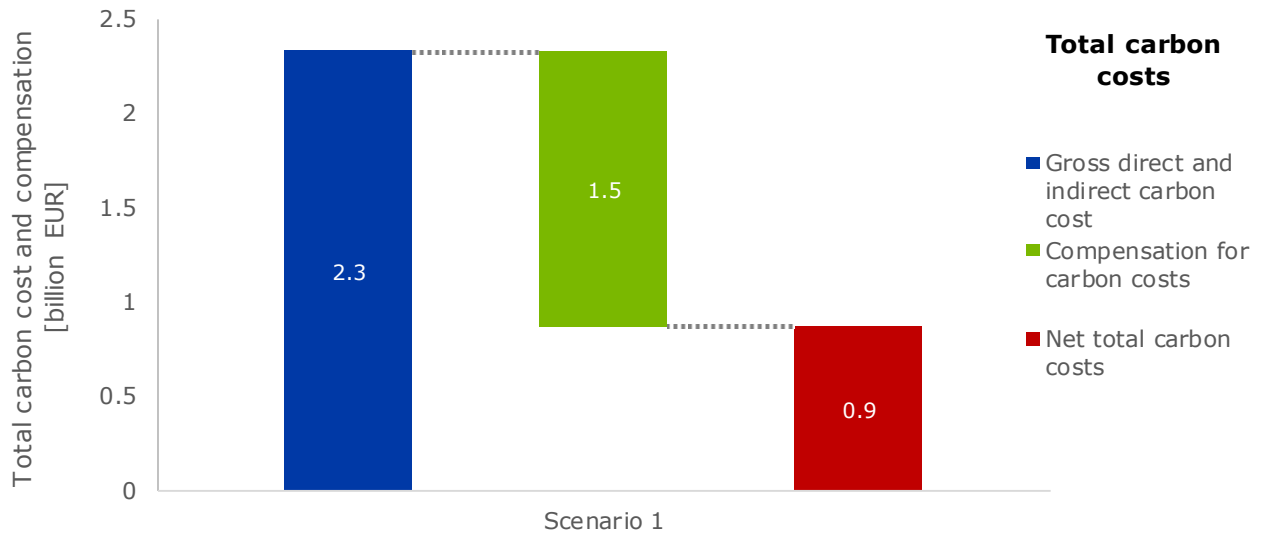


Figure 30.3: Total cumulative carbon costs of the steel sector in Sweden (BM reduction factor of 1%/year)

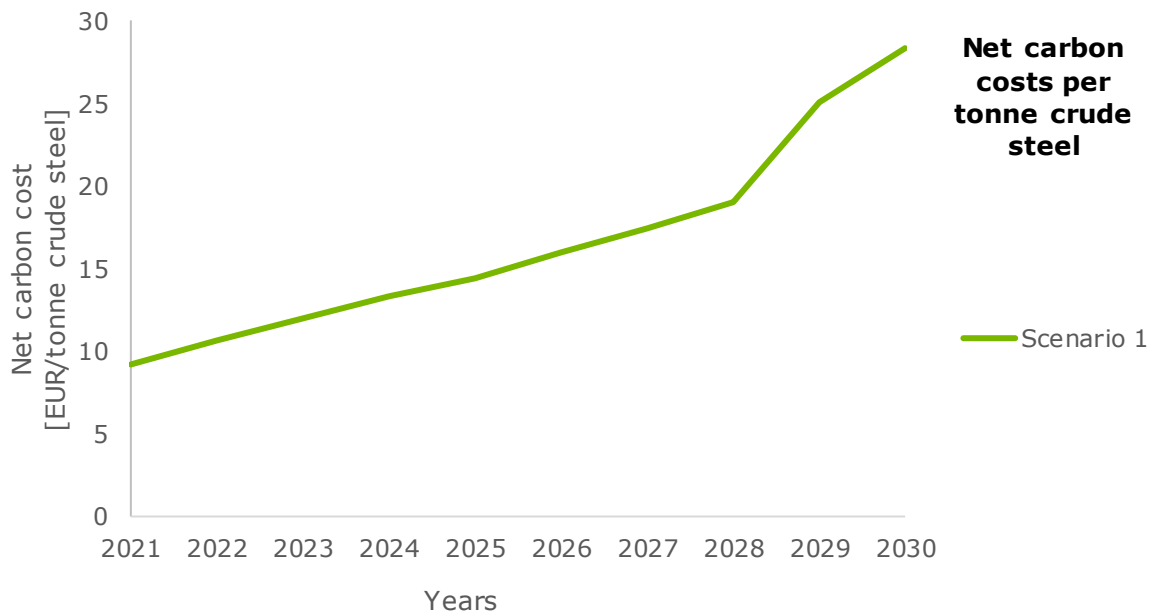


Figure 30.4: Net carbon costs (direct and indirect carbon costs) of the steel sector in Sweden in EUR/t crude steel (for benchmark reduction flat rate of 1%/year)

30.2. Parameter variation

30.2.1. Variation of the benchmark flat rates

With the assessment model different reduction flat rates can be considered for the different benchmarks of the steel sector. **Figure 30.5** and **Figure 30.6** show the results for a benchmark reduction flat rate of 0.5%/y (scenario 1), 1.0%/y (scenario 2) and 1.5%/y (scenario 3) for all the benchmarks of the steel sector.

Higher benchmark reduction flat rates would lead to higher costs for the steel sector. The net carbon costs would be about 0.75 billion EUR for BM reduction flat rate of 0.5%/y, 0.87 billion EUR

for BM reduction flat rate of 1.0%/y or 0.98 billion EUR for BM reduction flat rates of 1.5%/y, Figure 30.5.

Figure 30.6 shows that **higher the BM reduction flat rates lead to higher the carbon cost per tonne of crude steel**. In 2030 the steel sector would have net carbon costs of about 25.5 EUR/t for BM reduction flat rate of 0.5%/y, 28.4 EUR/t crude steel in 2030 for BM flat rate of 1.0%/y and 28.5 EUR/t crude steel for BM flat rate of 1.5%/y.

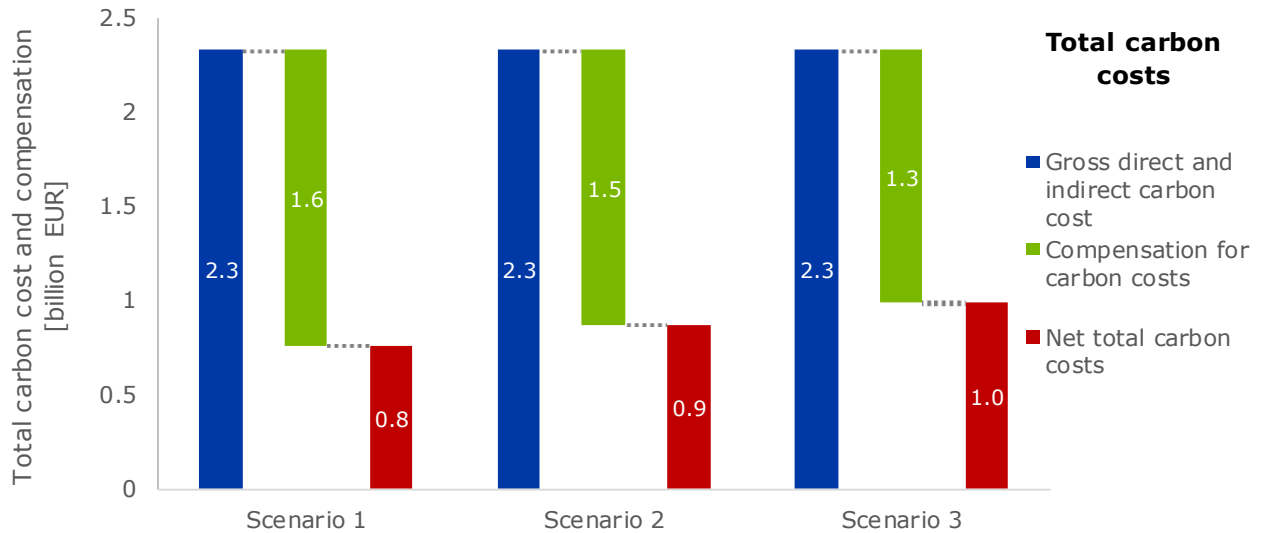


Figure 30.5: Total cumulative carbon costs of the steel sector in Sweden - for a benchmark reduction flat rate of 0.5%/y (scenario 1), 1.0%/y (scenario 2) and 1.5%/y (scenario 3)

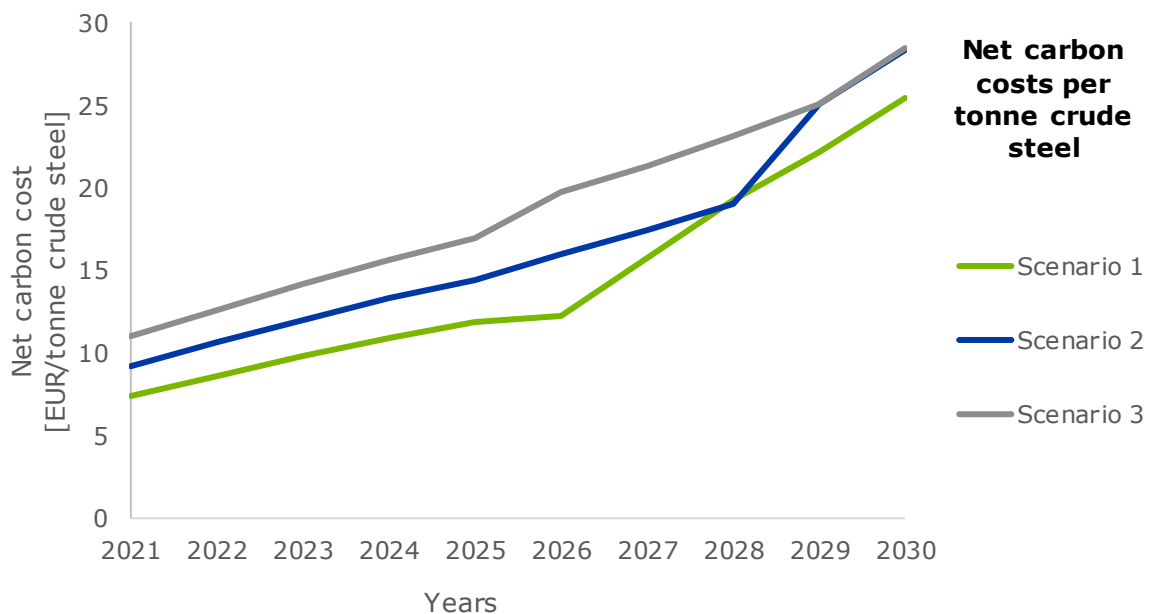


Figure 30.6: Net carbon costs (direct and indirect carbon costs) of the steel sector in Sweden in EUR/t crude steel - for benchmark reduction flat rate of 0.5%/y (scenario 1), 1.0%/y (scenario 2) and 1.5%/y (scenario 3)

Table 30.2 and **Table 30.3** summarise the carbon costs of the steel sector from 2021 to 2030 in case a benchmark reduction flat rate of respectively 0.5% and 1.0% per year is considered.

Table 30.2: Summary of the carbon costs of the steel sector for a benchmark reduction flat rate of 0.5% per year

Scenario 1	Carbon cost and compensation										Total /
Scenario results [billion EUR and EUR/tCS]	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Average
Gross direct carbon cost											
Value of free allocation											
Net direct carbon cost											
Gross indirect carbon cost											
Amount of compensation											
Net indirect carbon cost											
Gross direct and indirect carbon cost	0.15	0.17	0.19	0.20	0.22	0.24	0.26	0.28	0.30	0.33	2.33
Compensation for carbon costs	0.11	0.12	0.14	0.15	0.16	0.17	0.17	0.18	0.18	0.19	1.58
Net total carbon costs	0.04	0.04	0.05	0.06	0.06	0.06	0.08	0.10	0.12	0.14	0.75
Gross total carbon cost per tonne crude steel	29.92	33.60	37.12	40.20	42.82	45.88	48.93	52.27	55.89	59.95	44.96
Carbon cost compensation per tonne crude steel	22.48	24.99	27.33	29.29	30.88	33.59	33.17	32.94	33.68	34.51	30.41
Net total carbon costs per tonne crude steel	7.43	8.60	9.79	10.90	11.93	12.29	15.76	19.33	22.21	25.45	14.55
Total crude steel production (Sweden) in Mtonne	4.92	4.97	5.03	5.09	5.15	5.21	5.27	5.33	5.39	5.45	51.80

Table 30.3: Summary of the carbon costs of the steel sector for a benchmark reduction flat rate of 1.5% per year

Scenario 3	Carbon cost and compensation										Total /
Scenario results [billion EUR and EUR/tCS]	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Average
Gross direct carbon cost											
Value of free allocation											
Net direct carbon cost											
Gross indirect carbon cost											
Amount of compensation											
Net indirect carbon cost											
Gross direct and indirect carbon cost	0.15	0.17	0.19	0.20	0.22	0.24	0.26	0.28	0.30	0.33	2.33
Compensation for carbon costs	0.09	0.10	0.12	0.12	0.13	0.14	0.15	0.16	0.17	0.17	1.34
Net total carbon costs	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.16	0.98
Gross total carbon cost per tonne crude steel	29.92	33.60	37.12	40.20	42.82	45.88	48.93	52.27	55.89	59.95	44.96
Carbon cost compensation per tonne crude steel	18.84	20.94	22.90	24.54	25.88	26.13	27.58	29.16	30.86	31.42	25.95
Net total carbon costs per tonne crude steel	11.08	12.66	14.22	15.65	16.94	19.75	21.35	23.11	25.03	28.53	19.01
Total crude steel production (Sweden) in Mtonne	4.92	4.97	5.03	5.09	5.15	5.21	5.27	5.33	5.39	5.45	51.80

30.2.2. Sweden granting compensation

Figure 30.7 and Figure 30.8 show the cumulative net carbon costs over the period 2021-2030 and the net carbon costs per tonne of crude steel for a benchmark reduction flat rate of 0.5%/y (scenario 1), 1.0%/y (scenario 2) and 1.5%/y (scenario 3) for all the benchmarks of the steel sector, this in case Sweden would grant compensation for indirect carbon costs at an aid intensity of 75%.

Table 30.4, **Table 30.3** and **Table 30.5** summarise the carbon costs of the steel sector from 2021 to 2030 in case a benchmark reduction flat rate of respectively 0.5%, 1.0% and 1.5% per year would be considered.

Granting compensation for indirect carbon costs at an assumed aid intensity of 75% would reduce the net carbon costs. As lower benchmark flat rates correspond to higher compensation, the net carbon cost reduction would be higher for lower benchmark reduction flat rates:

- The cumulative net carbon costs over 2021-2030 would be reduced to 0.59 billion EUR for BM reduction flat rate of 0.5%/y, 0.71 billion EUR for BM flat rate of 1.0%/y and 0.84 billion EUR for BM flat rate of 1.5%/y ;

- The net carbon costs per tonne of crude steel in 2030 would be reduced to about 21.4 EUR/t for BM reduction flat rate of 0.5%/y, 24.6 EUR/t crude for BM flat rate of 1.0%/y and 25.0 EUR/t crude steel for BM flat rate of 1.5%/y.

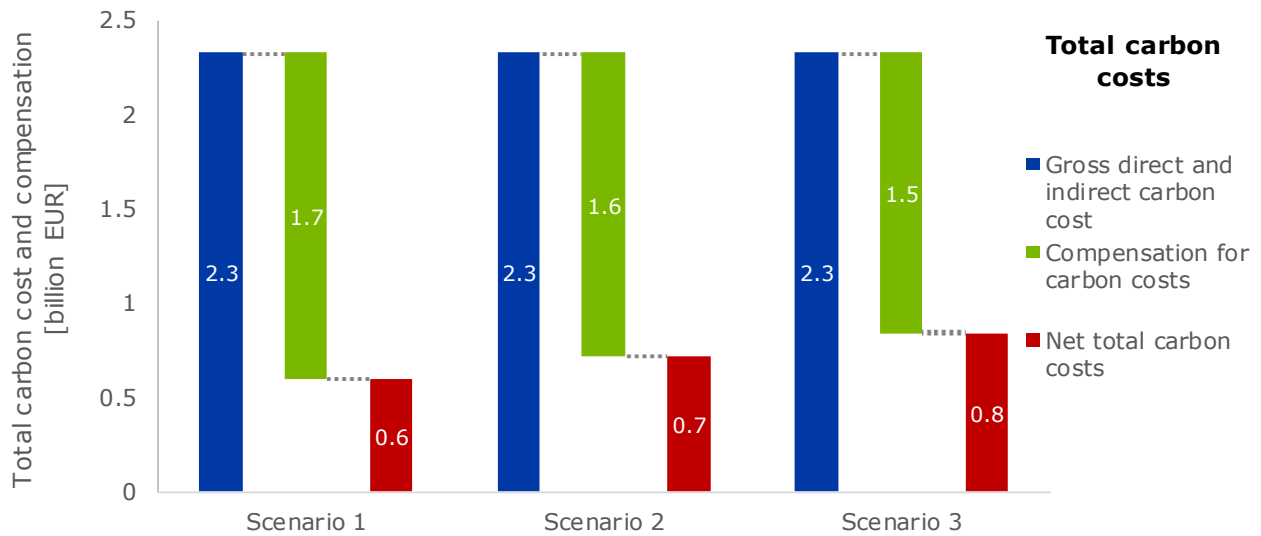


Figure 30.5: Total cumulative carbon costs of the steel sector in Sweden - for a benchmark reduction flat rate of 0.5%/y (scenario 1), 1.0%/y (scenario 2) and 1.5%/y (scenario 3)

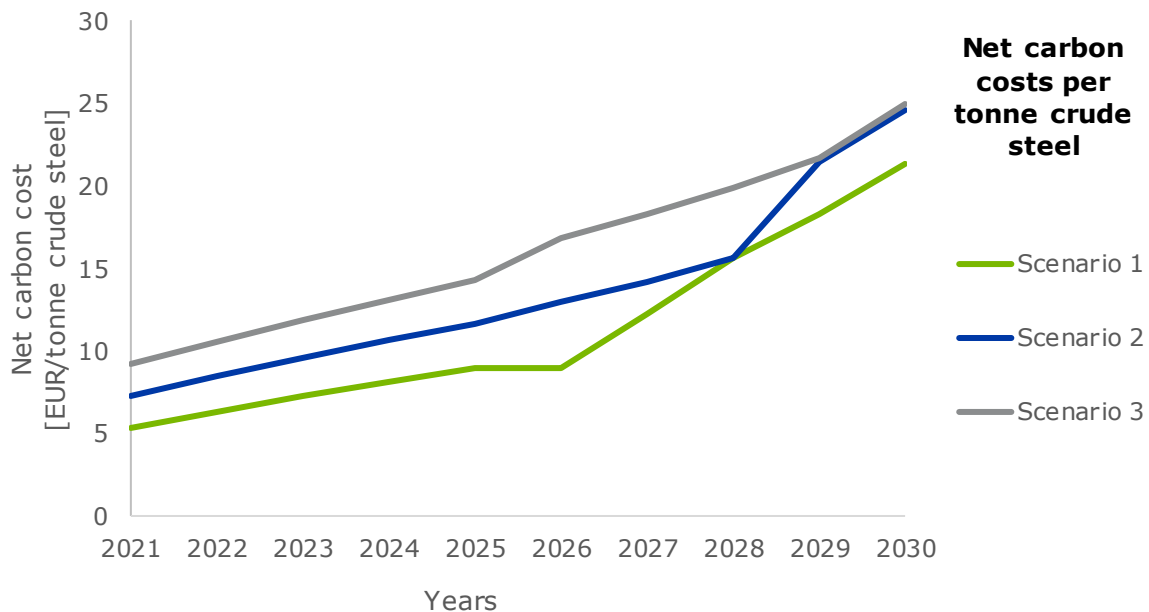


Figure 30.6: Net carbon costs (direct and indirect carbon costs) of the steel sector in Sweden in EUR/t crude steel - for benchmark reduction flat rate of 0.5%/y (scenario 1), 1.0%/y (scenario 2) and 1.5%/y (scenario 3)

Table 30.3: Summary of the carbon costs of the steel sector for a benchmark reduction flat rate of 0.5% per year

Scenario 1 Scenario results [billion EUR and EUR/tCS]	Carbon cost and compensation										Total / Average	
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
Gross direct carbon cost												
Value of free allocation												
Net direct carbon cost												
Gross indirect carbon cost												
Amount of compensation												
Net indirect carbon cost												
Gross direct and indirect carbon cost	0.15	0.17	0.19	0.20	0.22	0.24	0.26	0.28	0.30	0.33	2.33	
Compensation for carbon costs	0.12	0.14	0.15	0.16	0.17	0.19	0.19	0.19	0.20	0.21	1.74	
Net total carbon costs	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.08	0.10	0.12	0.59	
Gross total carbon cost per tonne crude steel	29.92	33.60	37.12	40.20	42.82	45.88	48.93	52.27	55.89	59.95	44.96	
Carbon cost compensation per tonne crude steel	24.59	27.28	29.88	32.07	33.86	36.87	36.64	36.60	37.55	38.59	33.53	
Net total carbon costs per tonne crude steel	5.32	6.32	7.25	8.13	8.96	9.01	12.28	15.67	18.35	21.36	11.43	
Total crude steel production (Sw eden) in Monne	4.92	4.97	5.03	5.09	5.15	5.21	5.27	5.33	5.39	5.45	51.80	

Table 30.4: Summary of the carbon costs of the steel sector for a benchmark reduction flat rate of 1.0% per year

Scenario 2 Scenario results [billion EUR and EUR/tCS]	Carbon cost and compensation										Total / Average	
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
Gross direct carbon cost												
Value of free allocation												
Net direct carbon cost												
Gross indirect carbon cost												
Amount of compensation												
Net indirect carbon cost												
Gross direct and indirect carbon cost	0.15	0.17	0.19	0.20	0.22	0.24	0.26	0.28	0.30	0.33	2.33	
Compensation for carbon costs	0.11	0.13	0.14	0.15	0.16	0.17	0.18	0.20	0.19	0.19	1.61	
Net total carbon costs	0.04	0.04	0.05	0.05	0.06	0.07	0.07	0.08	0.12	0.13	0.71	
Gross total carbon cost per tonne crude steel	29.92	33.60	37.12	40.20	42.82	45.88	48.93	52.27	55.89	59.95	44.96	
Carbon cost compensation per tonne crude steel	22.67	25.15	27.54	29.56	31.21	32.92	34.76	36.67	34.41	35.37	31.16	
Net total carbon costs per tonne crude steel	7.25	8.45	9.59	10.64	11.61	12.96	14.17	15.60	21.48	24.58	13.80	
Total crude steel production (Sw eden) in Monne	4.92	4.97	5.03	5.09	5.15	5.21	5.27	5.33	5.39	5.45	51.80	

Table 30.5: Summary of the carbon costs of the steel sector for a benchmark reduction flat rate of 1.5% per year

Scenario 3 Scenario results [billion EUR and EUR/tCS]	Carbon cost and compensation										Total / Average	
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
Gross direct carbon cost												
Value of free allocation												
Net direct carbon cost												
Gross indirect carbon cost												
Amount of compensation												
Net indirect carbon cost												
Gross direct and indirect carbon cost	0.15	0.17	0.19	0.20	0.22	0.24	0.26	0.28	0.30	0.33	2.33	
Compensation for carbon costs	0.10	0.11	0.13	0.14	0.15	0.15	0.16	0.17	0.18	0.19	1.49	
Net total carbon costs	0.05	0.05	0.06	0.07	0.07	0.09	0.10	0.11	0.12	0.14	0.84	
Gross total carbon cost per tonne crude steel	29.92	33.60	37.12	40.20	42.82	45.88	48.93	52.27	55.89	59.95	44.96	
Carbon cost compensation per tonne crude steel	20.75	23.01	25.20	27.05	28.56	28.97	30.59	32.34	34.22	34.98	28.71	
Net total carbon costs per tonne crude steel	9.17	10.59	11.93	13.15	14.26	16.90	18.33	19.93	21.67	24.98	16.25	
Total crude steel production (Sw eden) in Monne	4.92	4.97	5.03	5.09	5.15	5.21	5.27	5.33	5.39	5.45	51.80	