

# Carbon Emission Reduction

Nordic Timber Co. simulated case study|

## Report Objectives

- Assess the company’s carbon footprint using the GHG Protocol (Scopes 1–3).
- Quantify emissions and identify major emission sources.
- Apply targeted strategies to reduce CO<sub>2</sub>e emissions.
- Measure the impact of each strategy.
- Align with sustainability and certification goals.

## 1. Project Overview

This report presents a carbon footprint analysis and reduction strategy for a forestry and timber processing company, Nordic Timber Co.

To begin, I categorised all operational activities into Scope 1, Scope 2, and Scope 3 emissions following the GHG Protocol, ensuring a structured and transparent approach to data processing. I applied official emission factors to convert fuel consumption and energy use into CO<sub>2</sub>e equivalents, enabling the calculation of the company's total carbon footprint.

A custom-built Carbon Accounting Table was developed to organise and quantify the emissions data from raw company inputs, improving both clarity and accuracy.

The company’s primary objective is to reduce its greenhouse gas (GHG) emissions by at least 30%, in alignment with its corporate sustainability commitments and certification goals (e.g., FSC, PEFC, ISO 14064).

## 2. Baseline Emissions Summary:

The Original GHG emissions of the company were calculated using the GHG Protocol methodology, with emissions factors from verified sources. The total baseline emissions were:

Activity	Original CO <sub>2</sub> e (kg)
Diesel (Scope 1)	32040,00
Electricity (Scope 2)	30000,00
Transport (Scope 3)	44860,00
Flights (Scope 3)	3792,00
Packaging (Scope 3)	11000,00
<b>Total</b>	<b>121692</b>

## 3. Reduction Strategy and Results:

To achieve the targeted emission reductions, I implemented five strategic measures across Scopes 1, 2, and 3. These included switching to renewable electricity, reducing diesel consumption, optimising logistics operations, minimising business air travel, and adopting more sustainable packaging materials.

The table below provides a detailed overview of the emission savings achieved in kilograms of CO<sub>2</sub>e for each activity.

Activity	Original CO <sub>2</sub> e (kg)	Reduction Strategy	% Reduced	New CO <sub>2</sub> e (kg)
Diesel (Scope 1)	32040	Use biodiesel mix	0,30	22428,00
Electricity (Scope 2)	30000	Buy 100% renewable electricity	1,00	0
Transport (Scope 3)	44860	Use local suppliers	0,50	22430
Flights (Scope 3)	3792	Replace with Zoom	0,70	1137,6
Packaging (Scope 3)	11000	Recycled cardboard	0,30	7700
<b>Total</b>	<b>121692</b>	-	-	<b>53695,60</b>

### 4. Final Emissions:

After applying the reduction strategies:

- New total emissions: 53,695.6 kg CO<sub>2</sub>e
- Total reduction: 67,996 kg CO<sub>2</sub>e (- 56%)
- Goal exceeded: Yes (original goal was 30%)

The total CO<sub>2</sub>e dropped from 121,692 kg → 53,695.6 kg, which represents a 44% total reduction, far above the original 30% company goal.

### 5. Key Insights:

Based on the results, the largest contribution to total emission reductions came from electricity, accounting for 44% of the overall CO<sub>2</sub>e savings due to the complete switch to renewable energy. The transition to local suppliers and greener transport also played a significant role, leading to a major reduction in Scope 3 emissions. Additionally, although air travel represented a relatively small portion of the company’s carbon footprint, replacing flights with virtual meetings achieved the highest individual reduction rate at 70%.

Activity	Original CO <sub>2</sub> e (kg)	Reduction Strategy	% Reduced	New CO <sub>2</sub> e (kg)	Reduced amount	% of Total Reduction
Electricity (Scope 2)	30000	Buy 100% renewable electricity	1,00	0	30000,00	44,12%
Transport (Scope 3)	44860	Use local suppliers	0,50	22430	22430,00	32,99%
Flights (Scope 3)	3792	Replace with Zoom	0,70	1137,6	2654,40	3,90%
Packaging (Scope 3)	11000	Recycled cardboard	0,30	7700	3300,00	4,85%
Total	121692	-	-	53695,60	67996,4	100,00%

## 6. Next Steps:

- Continue evaluating low-emission machinery and electrified transport options.
- Expand packaging sustainability to all product lines.
- Begin supplier engagement to improve upstream Scope 3 data quality.
- Publish this reduction report in ESG/CSR documentation.

## Conclusion:

The visual summary highlights the effectiveness of the implemented carbon reduction strategies. Electricity accounted for the largest share of CO<sub>2</sub>e savings due to the complete switch to renewable energy, followed by logistics and fuel-related reductions. While business flights and packaging had smaller overall impacts, their high reduction rates demonstrate valuable opportunities for operational efficiency. This analysis confirms that with targeted interventions, Nordic Timber Co. can achieve and even exceed its emission reduction goals, laying a strong foundation for future sustainability reporting and certification.

