BOMBARDIER TRANSPORTATION NETHERLANDS B.V.

CO_2 Management Plan

November 1, 2018

BOMBARDIER

BOMBARDIER TRANSPORTATION

Linking cities and regions

Bombardier Transportation is a global leader in rail technology and offers the broadest portfolio in the industry. It covers the full spectrum of rail solutions, ranging from trains to sub-systems and signalling. The company also provides complete transport systems, e-mobility technology and maintenance services.

As an innovation driver, Bombardier Transportation continuously breaks new ground in sustainable mobility. It provides integrated solutions that create substantial benefits for operators, passengers and the environment. Headquartered in Berlin, Germany, Bombardier Transportation employs around 39,850 people and its products and services operate in over 60 countries.

BOMBARDIER IN THE NETHERLANDS

Reduction of CO_2 emissions

The world is changing. Sustainability is becoming more important within the daily routine. Climate change is on our mind, which is also visible in the vision of our society and the vision on how we should treat the planet. We find it to be more common to behave more environmental friendly and to reduce CO_2 emissions in our daily lives. Therefore, Bombardier Transportation Netherlands B.V. has decided to act and introduce a CO_2 reduction system.

The effects of this decision are clearly visible within and outside the organization. Internally Bombardier Transportation Netherlands B.V. maximises the possibilities to prevent negative effects on the environment. In projects Bombardier Transportation Netherlands B.V. is proactive in taking measures that reduce the CO_2 emissions of its activities.

CO_2 MANAGEMENT PLAN

To make it precise and demonstrable that Bombardier Transportation Netherlands B.V. strives to limit the negative impact on the environment the company aims to reduce emissions of one of the most crusial causes of the climate change: CO_2 gas.

The first step for reducing CO_2 is insight. That's why Bombardier Transportation Netherlands B.V. calculates its so-called CO_2 footprint every half year. This brochure shows the fixed aspects of the CO_2 management plan.

The plan has been drafted in such way that it complies to the requirements of the ISO 50001 and the ISO 14064-1. It ensures that there is a Plan-Do-Check-Act system in place which ensures continual improvement.

Organization

Bombardier Transportation Netherlands B.V. is a part of the Canadian parent company Bombardier Inc. In 1937 Bombardier started their activities as a producer of snowmobiles to transport people through the rough landscape in Canada.

These days, Bombardier is a market leader in the field of production of airplanes and trains. Bombardier has 60 production locations in 27 countries all over the world. More information is available at the website:

www.bombardier.com.

Bombardier Transportation Netherlands B.V is part of Bombardier Transportation and has been based in Amsterdam since 1999. In 2017 the company has 49.5 full-time employees.

The main focus of Bombardier Transportation Netherlands B.V. is on the railroad signaling and maintenance. Dutch railroad administrator ProRail is Bombardiers biggest client in the Netherlands. Additionally, sustainability is very important to Bombardier. Based on these two factors, Bombardier Transportation Netherlands B.V. has decided to certify via the CO_2 Performance Ladder.

With a total amount of 146.3 tons CO_2 emitted in 2017, Bombardier Transportation Netherlands B.V. is considered a small company according to the CO_2 Performance Ladder*. Regarding all emissions, approximately 20 tons were caused by the office itself and 125 tons were attributable to projects of the company.

Reference year

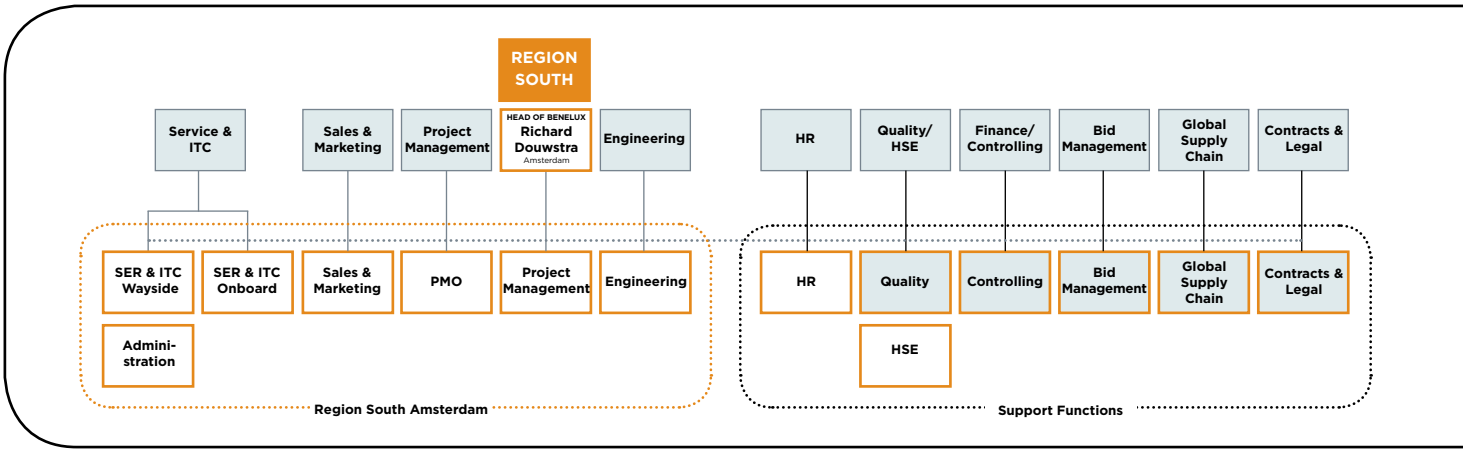
This is the first time that Bombardier Transportation Netherlands B.V. composes an emission inventory according to the GHG protocol. This report concerns the fiscal year 2017. The reference year for the CO_2 reduction objectives is 2016.

Person responsible

The person responsible for the management cycle CO_2 reduction including all the underlying activities, such as the achievement of the objectives, is Richard Douwstra. He reports directly to the Head of Region South.

* Description of small companies according to the CO_2 Performance Ladder:
Services: Total CO_2 emissions have a maximum of (≤) 500 tons per year.
Projects: Total CO_2 emissions of the offices have a maximum of (≤) 500 tons per year, and the total CO_2 emission of all the projects have a maximum of (≤) 2.000 tons per year.

ORGANIZATION



Organizational Boundary

The starting point of the Organizational Boundary is the legal entity Bombardier Transportation Netherlands B.V. The exact Organizational Boundary is determined on the basis of a supplier analysis of the entity. Bombardier Transportation Netherlands B.V. is the only entity that qualifies as an organizational boundary for the certificate of the CO_2 Performance Ladder. Sister companies are hereby excluded.

Lateral iterative analysis (AC-analysis)

The overview is based on the purchase data of the largest suppliers. Together these suppliers represent at least 80% of the total purchasing turnover (A suppliers). The purpose of this analysis is to determine whether there are concern companies that are also A suppliers. These are called AC relationships. These must be removed from the list of A-suppliers and included in the Organizational Boundary.*

SUPPLIER	SPENDING	PERCENT SPENDING	% CULMUTATIVE
VANGELDER	5.718.122,56	27,65%	27,65%
VRS	1.202.096,90	5,81%	33,47%
TKF	1.060.077,82	5,13%	38,60%
ELETTROMIL	1.050.500,00	5,08%	43,68%
ZOLLNER	1.003.745,28	4,85%	48,53%
RAIL ENG	885.024,00	4,28%	52,81%
SPOORIJZER	770.198,67	3,72%	56,54%
VOSCON	703.108,25	3,40%	59,94%
VOESTALP	638.384,21	3,09%	63,02%
JP TECH	453.830,71	2,19%	65,22%
YER	449.717,21	2,17%	67,39%
BEACON RAI	415.006,00	2,01%	69,40%
AMERS	370.613,44	1,79%	71,19%
SOLYNE	351.770,77	1,70%	72,89%
CROSSRAIL	341.475,00	1,65%	74,54%
ARCADIS	340.354,85	1,65%	76,19%
DTZ	299.056,94	1,45%	77,64%
BAM INFRA	264.658,70	1,28%	78,92%
BRUNEL CAR	235.649,99	1,14%	80,06%

The Sister companies of Bombardier Transportation Netherlands B.V. are filtered out of the list. It concerns the following companies:

- Bombardier Transportation Poland
- Bombardier Transportation Signal GmbH
- Bombardier Transportation United Kingdom
- Bombardier Transportation Sweden
- Bombardier Transportation Germany
- Bombardier Transportation Switzerland

These companies are excluded from the Organizational Boundary because they are foreign entities. Bombardier Transportation Netherlands B.V. has no authority and/or control over these companies.

COMPANIES	SPENDING	PERCENT SPENDING
Bombardier Transportation Poland	3.733.714,49	12,09%
Bombardier Transportation Signal GmbH	2.380.323,32	7,71%
Bombardier Transportation United Kingdom	2.263.142,71	7,33%
Bombardier Transporation Sweden	897.291,46	2,90%
Bombardier Transportation Germany	625.377,57	2,02%
Bombardier Transportation Switzerland	253.662,55	0,82%

* According to the requirements, it is mandatory to include all AC suppliers in the Organizational Boundary. However, if properly substantiated and in consultation with the Certifying Authority, it may be decided that certain AC suppliers will not be included in the Organizational Boundary. A number of arguments that could make this possible are:

- "The AC supplier operates in countries where the CO_2 Performance Ladder does not apply;
- "The AC supplier is many times larger than Bombardier Transportation Netherlands B.V. and only delivers a small part of its turnover to Bombardier Transportation Netherlands B.V.;
- "The activities of the AC supplier concern only a small part of the CO_2 footprint of Bombardier Transportation Netherlands B.V. The opportunities for savings lie with other activities;
- "There is no operational impact on the AC supplier.

EMISSION INVENTORY

Calculated GHG emissions

The direct and indirect GHG emissions of Bombardier Transportation Netherlands B.V. in 2017 are 146.3 tons CO_2.

From this total amount 91.6 tons CO_2 were caused by direct GHG emissions (scope 1 *) and 54,6 tons is due to indirect GHG emissions (scope 2*). The table underneath shows the exact usage per energy flow.

Combustion of biomass

No combustion of biomass took place at Bombardier Transportation Netherlands B.V. in 2017.

GHG removals

There has not been any greenhouse gas removal or compensation at Bombardier Transportation Netherlands B.V.

Exceptions

There are no remarkable exceptions to mention on the GHG protocol.

CO_2 emissions 2017

Scope 1	Amount	Unit	Emission factor	Tons CO_2
Gas consumption	1.302,57	m^3	1887	2,46
Fuel consumption (diesel)	4.665,66	liters	3230	15,07
Fuel Consumption (petrol)	27.044,11	liters	2740	74,10
				91,63

Scope 2	Amount	Unit	Emission factor	Tons CO_2
Electricity usage (grey)	35.140,19	kWh	649	22,81
Electricity usage electric cars (gray)	2.548,16	kWh	649	1,65
Public Transport km driven	62.833,00	km/s	36	2,26
Short-haul flights < 700	1.934,00	km/s	297	0,57
Medium-haul flights 700-2500	96.856,00	km/s	200	19,37
Long-haul flights > 2500	54.087,00	km/s	147	7,95
				54,62

Total scope 1 and 2	**Total 146,25**

* In the document we speak of the emissions in scope 1, 2 and 3. These are originally form the GHG-protocol. For the CO_2 Performance Ladder the implementing company SKAO sees business travel and kilometers driven in private cars as part of the scope 2 indirect emissions instead of scope 3. Because these reports are specifically for the CO_2 Preformance Ladder we will follow the categories of the scope 1 and 2 defined by SKAO.

Key influencers

Within Bombardier Transportation Netherlands B.V. there are no individuals to specify who have such an impact on the CO_2 footprint that a behavioral change of this individual person could ensure a meaningful change in the CO_2 footprint.

Future

The CO_2 emissions presented above are established for the fiscal year 2017. The expectation is that these emissions will not be subject to any major changes in 2018. However, given the CO_2 reduction objectives of Bombardier Transportation Netherlands B.V., the CO_2 emissions will decrease in the next few years.

Significant changes

2016 would be considered as a base year. A description of why certain amounts of CO_2 have increased or decreased, can be found in the CO_2 Reduction Plan.

Quantification Methods

For the quantification of the CO_2 emissions a tailor-made model is used for Bombardier Transportation Netherlands B.V.

In the model, all consumptions can be filled in. The corresponding CO_2 emissions will be calculated and compared with the base year. The model uses emission factors from the CO_2 Performance Ladder that can be found on **www.co2emissiefactoren.nl.**

Emission factors

For the calculation of the CO_2 emissions of Bombardier Transportation Netherlands B.V. the emission factors of the CO_2 Performance Ladder 3.0 are used (please, see **www.co2emissiefactoren.nl**).

Because these are explicitly prescribed, it can be assumed that these emission factors are very sustainable for the conversion of the energy consumption related CO_2 emissions. All used emission factors are transparent and included in the calculation of the CO_2 footprint.

The emission factors of Bombardier Transportation Netherlands B.V. will adapt to changes in future certification schemes of the CO_2 Performance Ladder. No removal factors have been used.

Uncertainties

The presented results are an estimation of the actual values. Almost all the data used for the calculation of the CO_2 footprint is based on invoices or measured quantities. This keeps the uncertainty margin to minimum.

- The kilometers driven by public transport were requested at NS. Most of the employees of Bombardier Transportation Netherlands B.V. come to work by train. In the calculation of the CO_2 footprint, Bombardier Transportation Netherlands B.V. used the emission factor of public transport in general which has a higher emission factor than public transport by trains. This means the emissions of public transport presented in the footprint are probably higher than the actual emissions.

- Bombardier Transportation Netherlands B.V. undertakes from a shared office so the gas and electricity consumption is an estimation of the floor space used by Bombardier Transportation Netherlands B.V.

ENERGY MANAGEMENT PROGRAM

The energy management plan contains a certain number of vast components for keeping the CO_2 Management Plan up to date. This plan makes sure that all demands are followed according to the requirements of ISO50001, ISO 14064-1 and continues improvement throughout the year.

Quality plan

The quality plan ensures securing and improving the quality of Bombardier Transportation Netherlands B.V. CO_2 footprint. The objective in general is to continuously improve efficient ways to deal with energy-use and CO_2 reduction. Besides, the Quality Plan gives insight in the procedures, the measuring and reporting of the CO_2 footprint.

Energy Management Plan

The NEN- and ISO 50001 is considered as a guideline to set up an Energy Management Plan. This plan ensures a complete, reliable and actual consolidation of the energy performance of Bombardier Transportation Netherlands B.V. The core idea of the Quality and the Energy Management Plan is to continuously evaluate the activities and deviations to achieve improvements. These plans are composed according to the Plan-Do-Check-Act cycle.

Energy policy

Besides turnover and profit growth are personnel policy, safety, wellbeing and environment of essential interest for Bombardier Transportation Netherlands B.V. . These factors are also an integral part of its businesses.

Today sustainability is an important factor. In order to deal with this consciously, Bombardier Transportation Netherlands B.V. strive for a CO_2 aware management to ensure a continuous improvement of its reduction policy and a growing awareness of the employees to reduce emissions of their activities.

The energy policy is aimed at the optimal use of the machines and material so Bombardier Transportation Netherlands B.V. can exercise the work with the lowest possible energy consumption.

Lower energy consumption is good for the environment because it leads to lower CO_2 emissions. In addition, the operational costs will reduce due to the optimum use of the operating assets.

Objectives

The objective is to achieve continuous improvement of energy efficiency and reduction of CO_2 emissions. The goal is to reduce Bombardier Transportation Netherlands' emissions with 15% in 2021 compared to 2016. (It should be noted that, due to fluctuations in the amount of work, the absolute energy consumption can be higher, while the relative consumption is indeed lower.)

Execution

The first step is to provide insight into the energy consumers of the organization and the chain in which the organization is active. Based on this, it is possible to look on aspects which help to achieve CO_2 reduction. These insights will be incorporated into the various reports. Once every 6 months this list is assessed and tested for its actuality.

Reference year

It has been decided to use the footprint of 2016 as the reference year. The reliability of the footprint is controlled by an internal audit. Based on the identified opportunities, we decide which parts will be eligible for the formulation of objectives. Ultimately, the management determines the objectives.

Reduction targets

The general objective should be finalized in the year of 2021. Based on this general objective, annual measures to reduce CO_2 are formulated to achieve the target. All objectives will be recorded in the annual reduction plan. This plan specifies measures which are needed to achieve the objective. In addition, this document states which departments are responsible for realization of the measures.

Organization of the CO_2 footprint

In 2016 Bombardier Transportation Netherlands B.V. started to structurally chart its CO_2 emissions. This has led to the introduction of a CO_2 reduction system in the context of the CO_2 Performance Ladder.

For this system, responsibilities (administration, work preparation, KAM coordinator, department execution and workshop department) have been appointed within Bombardier Transportation Netherlands B.V. under final responsibility of the management.

The KAM-coordinator is responsible for the preparation and execution of the annual reports, the monitoring of the emission data and reporting to the management. In addition, he is responsible for the communication about the CO_2 reduction system, the objectives and the progress that has been made.

The management is responsible for opportunities to reduce CO_2 regarding commuting traffic of employees, use of private vehicles for business trips, more efficient and effective logistical movements at the worksites and other ways of working.

The administration is responsible for the purchase of energy, waste processing and other things. In addition, he assists the KAM-coordinator with his responsibilities regarding accountability, monitoring and communication about the CO_2 reduction system.

The execution department is responsible for the optimal use of machines and personnel on the work. Furthermore, they are responsible for supervising the project locations regarding putting the CO_2 reduction measures in practice.

Energy consumption

Every six months Bombardier Transportation Netherlands B.V. charts its energy consumption. The implementation of this inventory is in accordance with ISO 14064-1, the GHG-protocol for scope 1 and 2 and the possible requirements from the CO_2 Performance Ladder. It is also confirmed whether the Organizational Boundary is still up-to-date.

The KAM-coordinator is responsible for carrying out the inventory, assisted by the administration. For the inventory, a datasheet is used in which the conversion factors are included. After the inventory has been made, the KAM-coordinator performs a quality check of the data. He/she assesses whether the Organization Boundaries are still correct, the data are processed under the right scope and whether the correct conversion factors have been used.

Energy reduction opportunities

Everyone at Bombardier Transportation Netherlands B.V. can suggest ideas for energy/CO_2 reduction via mail or informal consultation. In addition, toolbox meetings with CO_2 and reduction as main subject are held periodically. These CO_2 reduction opportunities are discussed in the CO_2 meetings and weighted from the point of view of effectiveness. If they are possibly effective, they will be added to the energy audit report.

Monitor and Evaluate

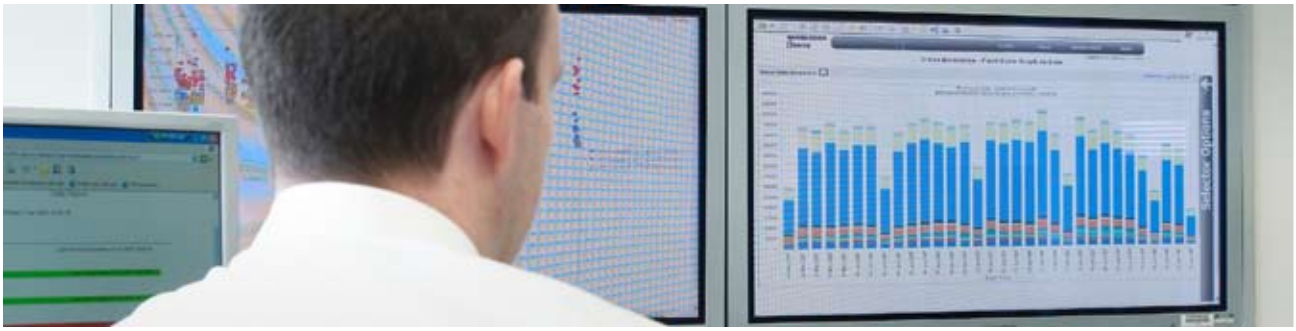
Twice a year, the progress of the reduction objectives and the annual plan are determined. The KAM coordinator reports the results to participants of the CO_2 consultation.
This report includes at least:

- An overview of energy consumption and CO_2 emissions per scope
- A comparison of energy consumption in accordance with the reference year
- An analysis of noticeable increases and decreases in consumption and CO_2 emissions
- Progress and prognosis for achieving the reduction objective and any recommendations for preventive or corrective measures
- The status of previous preventive or corrective measures
- General developments

Based on this report, the management decides whether adjustment of the objectives and/or adjustment of the annual plan is necessary.

TR MATRIX - OVERVIEW OF TASKS AND RESPONSIBILITIES

	Task (t) - Authority (a) Responsibility (r)	Frequency	Dé CO_2 Adviseur	Web Admin	Assistant Director	Richard Douwstra
Insight						
Collect data emission inventory	t	Half-yearly			x	
Check on emission inventory	t	Half-yearly				x
Accordance of emission inventory	r	Annual				x
Set up emission inventory report	t	Annual	x			
Evaluation on insight: Energy assessment	t+a	Annual	x		x	x
Reduction						
Research to energy reduction opportunities	t+a	Half-yearly				
Determine CO_2 reduction measure	t	Half-yearly			x	x
Determine CO_2 reduction objectives	t	Annual			x	x
Accordance of objectives	r	Annual				x
Realisation of CO_2 reduction objectives	a	Continuously			x	x
Monitoring and evaluation of progression CO_2 reduction	t+a	Half-yearly	x			x
Communication						
Submitting information news items	t	Half-yearly			x	x
Update the website	t+r	Half-yearly		x		
Update SKAO page	t+r	Annual		x		
Keep up with internal communication	t+r	Half-yearly			x	x
Approve internal communication	r	Half-yearly				x
Approve external communication	r	Half-yearly				x
Participation						
Inventory of possible initiatives	t	Half-yearly	x		x	x
Decision to participate initiatives	r	Annual				x
Participation of sectior initiatives	a	Continuously				x
Additional						
Final editing CO_2 dossier	a	Continuously				x
Meet CO_2 Performance Ladder requirements	a	Continuously	x			
Execution of internal audit	t	Half-yearly	x			
Report to management	r	Half-yearly			x	x
Decision about CO_2 reduction policy	r	Half-yearly				x



Securing the quality and energy management plan

Bombardier Transportation Netherlands B.V. has a safety management system based on VCA **/ISO. Responsibility for this lies on the KAM coordinator. The quality and energy plans are different from the safety management system. Both parts will be reviewed in internal and external audit and at the annual management review.

Internal audits

An internal audit is performed every year. These audits are aimed at testing the effective and efficient implementation of the energy policy. In addition, it aims to increase the quality of the CO_2 footprint and obtain a reliable picture of the progress of the reduction objectives of Bombardier Transportation Netherlands B.V. The internal audit focuses on the way in which the data has been collected and processed. The internal auditor draws up an audit report containing the findings from the internal audit. An increased attention is paid to the following issues:

Increased attention is paid to the following issues:

- The CO_2 emission inventory can be verified with at least a limited degree of certainty
- Does the inventory meet the requirements set in ISO 14064-1
- Has the correct data been used in the inventory
- Which level of the CO_2 Performance Ladder is met
- Recommendations from audits are included in the annual plan to improve the system

External audit

Annually, Bombardier Transportation Netherlands B.V. will be examined by an external auditor whether it meets the requirements of the CO_2 Performance Ladder for the level of which Bombardier Transportation Netherlands B.V. is certified.

Management review

Every year an assessment is made by the management of the quality management system for suitability and efficiency. A report is prepared and serves as quality registration. The output of the management review is an annual plan with stated objectives and/or improvements for the new year.

Feedback

On the basis of the input from the previous phases and the evaluation report of the management, objectives can be adjusted if necessary and follow-up actions can be set out to realize improvements of the quality management system. The feedback of the results is provided to people involved both verbally and in writing.

Management cycle

The CO_2 policy has a management cycle that has actions each half-year and each year. The following aspects will be analyzed:

- The CO_2 emissions data needs to be collected
- Verify if the CO_2 emission factors are still up-to-date
- Verify if there are significant changes in the organization which have a significant impact on the footprint
- Determine if a recalculation of the footprint with regard of these changes needs to be done
- Determine if the reduction objectives and measurements are met

Sequentially it needs to be determined if modifications of the goals and the CO_2 management system need to be made. It could be that the reduction objective can be modified or when certain measures appear to be unavailable or inaccessible. These modifications have to be communicated internally and externally. An inventory must be made if the sector initiative is still up to date and meets the requirements of the company.

Communication Plan

It is defined what and when will be communicated regarding the CO_2 reduction system of Bombardier Transportation Netherlands B.V. External stakeholders have an interest in reducing CO_2 emissions. They are also potential partners to collaborate with on CO_2 emissions reduction. Communication with them will take place via the website.

Supplier: Van Gelder Groep
Certified, therefore, they have extensive knowledge and involvement in CO_2 reduction.

Supplier: VRS Railway Industry B.V.
VRS is a subsidiary of Vialis. Vialis is certified on the CO_2 Performance Ladder. Therefore, they have a lot of knowledge and a high level of engagement.

Supplier: TKF, Twentsche Kabelfabriek
TKF is certified on the CSR Performance Ladder but not on the CO_2 Performance Ladder. Knowledge level is quite high as they also implement a reduction policy.

Promoter ProRail
ProRail is Bombardier Transportation Netherlands' largest promoter. ProRail is certified and also requires that of its customers.

CO_2 Performance Ladder webpage

A dynamic separate webpage is designed and kept up to date about the CO_2 reduction system of Bombardier Transportation Netherlands B.V. containing following content:

- CO_2 footprint
- CO_2 reduction objectives
- CO_2 reduction sub-objectives
- CO_2 reduction measures
- Participation in activities

Also, on this page the most up-to-date versions of the following documents are available:

- CO_2 Reduction Plan 2020
- CO_2 Management Plan
- Communication memos

Communication plan

What	Who	How	Target group	When	Why
CO_2 footprint of the company and projects with award advantage	Responsible Person CO_2 reduction	Internal server and mail and "coffee and cake meetings"	Internal	Half-yearly	Internally increase awareness of the CO_2 footprint
CO_2 footprint of the company and projects with award advantage	- " -	Website and external mailing	External	Half-yearly	Externally increase awareness of the CO_2 footprint
CO_2 reduction objectives and progress and measures for company and projects with award advantage	- " -	Internal mailing and "coffee and cake meetings"	Internal	Half-yearly	Increase awareness of the objectives and measures among employees
CO_2 reduction objectives and progress and measures for company and projects with award advantage	- " -	Website	External	Annual	Increase awareness of the objectives and measures among external parties
Possibilities for individual contribution, current energy use and trends whitin the company	- " -	Internal mailing and "coffee and cake meetings"	Internal	Half-yearly	Encourage employee involvement and encourage employees to reduce CO_2
Communication	- " -	Website	External	Half-yearly	Encourage involvement external interested parties
Update website	- " -	Website	External	Half-yearly	Update documents
Publication obligation SKAO	- " -	Website SKAO	SKAO	Annual	Publish documentation belonging to requirement 3.D.1 and annually update the list of measures

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www.bombardier.com/en/worldwide-presence/country.netherlands.html

For more detailed information on this topic, please, visit skao.nl

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