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温室气体核查意见书

授予

连云港振江轨道交通设备有限公司

必维认证（北京）有限公司（以下简称“必维”）受连云港振江轨道交通设备有限公司的委托，对连云港振江轨道交通设备有限公司报告的温室气体排放量进行独立的第三方核查，本核查意见适用于下文所述工作范围内的相关信息。

核查边界：

- 核查场所名称：连云港振江轨道交通设备有限公司
- 核查地址：中国江苏省连云港市灌云县经济开发区镜花缘路 58 号 2-2,2-4,2-5,2-6,2-8,2-9,2-10
- 温室气体报告期限：2023 年 01 月 01 日 - 2023 年 12 月 31 日
- 基准年：2022

组织边界：连云港振江轨道交通设备有限公司实施运营控制的活动和设施

报告边界：连云港振江轨道交通设备有限公司组织边界内，钢结构件制造和相关管理活动过程中产生的温室气体排放及其重要的间接温室气体排放

经核查的排放量：

- 类别1：直接温室气体排放：136.43 吨二氧化碳当量
- 类别2：输入能源的间接温室气体排放：1077.66 吨二氧化碳当量
- 类别3：运输的间接温室气体排放：1467.53 吨二氧化碳当量
- 类别4：组织使用产品的间接温室气体排放：110727.55 吨二氧化碳当量
- 类别5：与使用组织产品有关的间接温室气体排放：非重要间接排放，未量化
- 类别6：其它来源的间接温室气体排放：非重要间接排放，未量化

经量化的总排放量（基于位置）：113409.17 吨二氧化碳当量

限制性叙述：排除其他非重要间接温室气体排放

温室气体核查依据：

- ISO 14064-1:2018 温室气体 - 第1部分：组织层面温室气体排放和移除的量化和报告的要求及指南
- ISO 14064-3:2019 温室气体 - 第3部分：温室气体声明核查和审定规范及指南

保证等级：

- 合理保证

核查方法：

- 访谈相关人员；
- 评审提供的文件证据；
- 评估用于数据收集、汇总、分析和检查的量化方法和信息系统；
- 核查抽样场所和数据源。

核查结论：

认证机构地址：中国北京市东城区东长安街1号东方广场西一办公楼9层902室，邮编：100738
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基于核查工作实施过程和核查发现，连云港振江轨道交通设备有限公司在盘查报告中提供的温室气体排放量数据，与ISO 14064-1:2018 温室气体 - 部分1：组织层面温室气体排放和移除的量化和报告的要求及指南是相符的。

独立、公正和胜任能力声明：

必维集团是一家拥有190多年历史，在质量、环境、职业健康安全和社会责任领域提供独立验证服务的机构。必维核查团队与连云港振江轨道交通设备有限公司及其管理人员不存在其它的商业关系，核查团队的核查活动是独立的、公正的，不存在任何利益冲突。必维集团在整个业务范围内实施商业道德准则，以确保员工在日常业务活动中保持最高的道德标准。

核查组长：王进

核查日期：2024年07月16日

编号：EMI22558073-003

签发日期：2024年08月11日

版本号：No.1

必维认证（北京）有限公司授权代表



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温室气体核查意见书附件

连云港振江轨道交通设备有限公司委托必维认证（北京）有限公司对其的报告边界范围内的温室气体排放进行第三方核查，核查的关键信息如下：

GHG清单类别	GHG排放源	温室气体	排放因子		数据来源
			数值	单位	
直接温室气体排放	发电机柴油	CO ₂	74100	kg CO ₂ /TJ	IPCC 2006
		CH ₄	3	kg CH ₄ /TJ	
		N ₂ O	0.6	kg N ₂ O/TJ	
	食堂、车间液化石油气	CO ₂	63100	kg CO ₂ /TJ	
		CH ₄	1	kg CH ₄ /TJ	
		N ₂ O	0.1	kg N ₂ O/TJ	
	食堂、RTO天然气	CO ₂	56100	kg CO ₂ /TJ	
		CH ₄	1	kg CH ₄ /TJ	
		N ₂ O	0.1	kg N ₂ O/TJ	
	切割机丙烷	CO ₂	3	kg CO ₂ e/kg	质量平衡方法
	公务用车汽油	CO ₂	69300	kg CO ₂ /TJ	IPCC 2006
		CH ₄	3.8	kg CH ₄ /TJ	
		N ₂ O	5.7	kg N ₂ O/TJ	
	货车柴油	CO ₂	74100	kg CO ₂ /TJ	
		CH ₄	3.9	kg CH ₄ /TJ	
		N ₂ O	3.9	kg N ₂ O/TJ	
	叉车柴油	CO ₂	74100	kg CO ₂ /TJ	
		CH ₄	4.15	kg CH ₄ /TJ	
		N ₂ O	28.6	kg N ₂ O/TJ	
	制冷设备/空调制冷剂	R407C	1908	kg CO ₂ e/kg	IPCC AR6
		R410a	2255.5	kg CO ₂ e/kg	
		R22	1960	kg CO ₂ e/kg	
		R32	771	kg CO ₂ e/kg	
	灭火器CO ₂	CO ₂	1	kg CO ₂ e/kg	质量平衡方法
	保护焊CO ₂	CO ₂	1	kg CO ₂ e/kg	
输入能源间接温室气体排放	外购电力	CO ₂	0.5703	kg CO ₂ e/kWh	关于做好2023-2025年发电行业企业温室气体排放报告管理有关工作的通知
运输的间接温室气体排放	道路货运（中型货车）	CO ₂	0.042	kg CO ₂ e/(t·km)	中国分省道路交通二氧化碳排放因子
	道路货运（重型货车）	CO ₂	0.049	kg CO ₂ e/(t·km)	
	海上货运	CO ₂	0.0161	kg CO ₂ e/(t·km)	UK Government GHG Conversion Factors for Company Reporting-2022
	航空货运（With RF）	CO ₂	1.0189	kg CO ₂ e/(t·km)	
	铁路货运	CO ₂	0.0109	kg CO ₂ e/(t·km)	CLCD
	航空客运	CO ₂	0.0925	kg CO ₂ e/Pkm	Emission_Factors_from_Cross_Sector_Tools_March_2017
	小轿车客运	CO ₂	0.0410	kg CO ₂ e/Pkm	中国分省道路交通二氧化碳排放因子
	铁路客运	CO ₂	0.0202	kg CO ₂ e/Pkm	中国高速铁路运营减碳及经济环境互馈影响研究
	自驾油车	CO ₂	0.1847	kg CO ₂ e/km	UK Government GHG Conversion Factors for Company Reporting-2022
	自驾电车	CO ₂	0.2311	kWh (Net)/km	

认证机构地址：中国北京市东城区东长安街1号东方广场西一办公楼9层902室，邮编：100738

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GHG清单类别	GHG 排放源	温室 气体	排放因子		数据来源
			数值	单位	
组织使用产品的 间接温室气体排 放	热轧钢板	CO ₂	2.40	kg CO ₂ e/kg	GBT 51366-2019 建筑碳 排放计算标准
	碳钢	CO ₂	2.05	kg CO ₂ e/kg	
	油漆	CO ₂	0.86	kg CO ₂ e/kg	Ecoinvent Version 3.9.1 (2022) Database
	废弃物处理	CO ₂	21.2802	kgCO ₂ e/t	UK Government GHG Conversion Factors for Company Reporting-2022
	机械设备	CO ₂	4.2530	kg CO ₂ e/USD	GHG Protocol Scope 3 Evaluator tool
	WTT-电力	CO ₂	0.1639	kg CO ₂ e/kWh	UK Government GHG Conversion Factors for Company Reporting-2021
	外购电传输损失	CO ₂	0.0091	kg CO ₂ e/kWh	
	WTT-天然气	CO ₂	0.3459	kg CO ₂ e/m ³	
	WTT-丙烷	CO ₂	350.4556	kg CO ₂ e/t	
	WTT-液化石油气	CO ₂	347.0093	kg CO ₂ e/t	
	WTT-柴油	CO ₂	0.6099	kg CO ₂ e/L	
	WTT-汽油	CO ₂	0.6133	kg CO ₂ e/L	



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Greenhouse Gases Verification Opinion

is awarded to

LIANYUNGANG ZHENJIANG RAIL TRANSIT EQUIPMENT CO.,LTD

Bureau Veritas Certification (Beijing) Co., Ltd. was engaged to conduct an independent verification of the greenhouse gases (GHG) emissions reported by Lianyungang Zhenjiang Rail Transit Equipment Co., Ltd. for the period stated below. This verification opinion applies to the related information included within the scope of work described below.

Boundaries covered by the verification:

- Verification site name: Lianyungang Zhenjiang Rail Transit Equipment Co., Ltd.
- Verification site address: 2-2,2-4,2-5,2-6,2-8,2-9,2-10, No. 58, Jinghuayuan Road, Guanyun County Economic Development Zone, Lianyungang City, Jiangsu Province, P.R.China
- Reporting period covered: January 01, 2023 to December 31, 2023
- Base year: 2022

Organizational boundaries: Activities and facilities of Lianyungang Zhenjiang Rail Transit Equipment Co., Ltd.

Reporting boundaries: GHG emissions generated in Manufacturing of steel structural components and related management activities within the organizational boundaries, as well as significant indirect greenhouse gases emissions.

Emissions data verified under reporting boundaries:

- Category 1: Direct GHG emissions: 136.43 tCO₂e
- Category 2: Indirect GHG emissions from imported energy : 1077.66 tCO₂e
- Category 3: Indirect GHG emissions from transportation: 1467.53 tCO₂e
- Category 4: Indirect GHG emissions from products used by organization: 110727.55 tCO₂e
- Category 5: Indirect GHG emissions associated with the use of products from the organization: Non-significant indirect emissions and not quantified
- Category 6: Indirect GHG emissions from other sources: Non-significant indirect emissions and not quantified

Total quantified emissions (Based Location): 113409.17 tCO₂e

Limitations and exclusions: Excluding other non-significant indirect GHG emissions

GHG verification protocol used to conduct the verification:

- ISO 14064-1:2018 Greenhouse gases - Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals
- ISO 14064-3:2019 Greenhouse gases - Part 3: Specification with guidance for the verification and validation of greenhouse gas statements

Level of assurance:

- Reasonable assurance

GHG verification methodology:

Certification body address: Room 02, 9 / F, West Office Building 1, Oriental Economic and Trade City, Oriental Plaza, No.1 East Chang'an Street, Dongcheng District, Beijing, China. 100738
Further clarifications regarding the verification scope of this opinion may be obtained by consulting the organization.
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- Interview for relevant personnel;
- Review of the documentary evidence;
- Evaluation of the methodology and information systems for data collection, aggregation, analysis and review;
- Audit of sampled sites and data to verify source.

Verification conclusion:

Based on the verification process and findings, the GHG emission data in the GHG inventory report from Lianyungang Zhenjiang Rail Transit Equipment Co., Ltd. is in compliance with ISO 14064-1:2018 Greenhouse gases - Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.

Statement of independence, impartiality and competence:

Bureau Veritas Group is an independent professional services company that specializes in Quality, Health, Safety, Social and Environmental management with over 190 years' history in providing independent assurance services.

No member of the verification team has a business relationship with Lianyungang Zhenjiang Rail Transit Equipment Co., Ltd. and its directors or managers beyond that required by this assignment. We conducted this verification independently and to our knowledge there has been no conflict of interest.

Bureau Veritas Group has implemented a Code of Ethics across the business to maintain high ethical standards among staff in their day-to-day business activities.

Lead verifier: JIN.WANG

No.: EMI22558073-003

Version No.: No.1

Verification date: 2024-07-16

Issue date: 2024-08-11

Signed on behalf of
Bureau Veritas Certification (Beijing) Co., Ltd



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Appendix for Greenhouse Gases Verification Opinion

Lianyungang Zhenjiang Rail Transit Equipment Co., Ltd. has commissioned Bureau Veritas Certification (Beijing) Co., Ltd. to conduct a third-party verification on the GHG emissions within its reporting boundary. Key information is listed below:

GHG Inventory categories	GHG Source	GHG	Factor		Reference
			Quantity	Unit	
Direct GHG emissions	Diesel of Generat	CO ₂	74100	kg CO ₂ /TJ	IPCC 2006
		CH ₄	3	kg CH ₄ /TJ	
		N ₂ O	0.6	kg N ₂ O/TJ	
	LPG of canteen& workshops	CO ₂	63100	kg CO ₂ /TJ	
		CH ₄	1	kg CH ₄ /TJ	
		N ₂ O	0.1	kg N ₂ O/TJ	
	Natural gas of canteens& RTO	CO ₂	56100	kg CO ₂ /TJ	
		CH ₄	1	kg CH ₄ /TJ	
		N ₂ O	0.1	kg N ₂ O/TJ	
	Propane of cutting machine	CO ₂	3	kg CO ₂ e/kg	Mass balance method
	Gasoline of Car	CO ₂	69300	kg CO ₂ /TJ	IPCC 2006
		CH ₄	3.8	kg CH ₄ /TJ	
		N ₂ O	5.7	kg N ₂ O/TJ	
	Diesel of Truck	CO ₂	74100	kg CO ₂ /TJ	
		CH ₄	3.9	kg CH ₄ /TJ	
		N ₂ O	3.9	kg N ₂ O/TJ	
	Diesel of Fork cart	CO ₂	74100	kg CO ₂ /TJ	
		CH ₄	4.15	kg CH ₄ /TJ	
		N ₂ O	28.6	kg N ₂ O/TJ	
	refrigerant	R407C	1908	kg CO ₂ e/kg	IPCC AR6
		R410a	2255.5	kg CO ₂ e/kg	
		R22	1960	kg CO ₂ e/kg	
		R32	771	kg CO ₂ e/kg	
	CO ₂ Fire Extinguisher	CO ₂	1	kg CO ₂ e/kg	Mass balance method
	CO ₂ Protective welding	CO ₂	1	kg CO ₂ e/kg	
Indirect GHG emissions form imported energy	Power	CO ₂	0.5703	kg CO ₂ e/KWh	Notice on Doing a Good Job in the Management of Greenhouse Gas Emission Reports for Enterprises in the Power Generation Industry from 2023 to 2025
Indirect GHG emissions from transportation	Road freight (Medium truck)	CO ₂	0.042	kg CO ₂ e/(t • km)	Carbon dioxide emission factors of road traffic in different provinces of China
	Road freight (Heavy truck)	CO ₂	0.049	kg CO ₂ e/(t • km)	
	Sea freight	CO ₂	0.0161	kg CO ₂ e/(t • km)	UK Government GHG Conversion Factors for Company Reporting-2022
	Air freight (With RF)	CO ₂	1.0189	kg CO ₂ e/(t • km)	

Certification body address: Room 02, 9 / F, West Office Building 1, Oriental Economic and Trade City, Oriental Plaza, No. 1 East Chang'an Street, Dongcheng District, Beijing, China. 100738
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	Railway freight	CO ₂	0.0109	kg CO ₂ e/ (t • km)	CLCD
	Air Transportation	CO ₂	0.0925	kg CO ₂ e/Pkm	Emission_Factors_fro m_Cross_Sector_Tool s_March_2017
	Car (passenger transport)	CO ₂	0.0410	kg CO ₂ e/Pkm	Carbon dioxide emission factors of road traffic in different provinces of China
	Railway (passenger transport)	CO ₂	0.0202	kg CO ₂ e/Pkm	Research on Carbon Reduction and Economic Environment Mutual Feedback in China's High Speed Railway Operation
	Medium car	CO ₂	0.1847	kg CO ₂ e/km	UK Government GHG Conversion Factors for Company Reporting-2022
	Medium car (EV)	CO ₂	0.2311	kWh (Net)/km	
Indirect GHG emissions from products used by organizati on	Hot-rolled steel plate	CO ₂	2.40	kg CO ₂ e/kg	GBT 51366-2019
	Carbon steel	CO ₂	2.05	kg CO ₂ e/kg	
	Paint	CO ₂	0.86	kg CO ₂ e/kg	Ecoinvent Version 3.9.1 (2022) Database
	Commercial and industrial waste electricity	CO ₂	21.2802	kgCO ₂ e/t	UK Government GHG Conversion Factors for Company Reporting-2022
	Machinery (not elsewhere classified)	CO ₂	4.2530	kg CO ₂ e/USD	GHG Protocol Scope 3 Evaluator tool
	Upstream emissions of purchased electricity	CO ₂	0.1639	kg CO ₂ e/kWh	UK Government GHG Conversion Factors for Company Reporting-2021
	Transmission and distribution (T&D) losses	CO ₂	0.0091	kg CO ₂ e/kWh	
	WTT-Natural gas	CO ₂	0.3459	kg CO ₂ e/m ³	
	WTT-Propane	CO ₂	350.4556	kg CO ₂ e/t	
	WTT-LPG	CO ₂	347.0093	kg CO ₂ e/t	
	WTT-Diesel	CO ₂	0.6099	kg CO ₂ e/L	
	WTT-Petrol	CO ₂	0.6133	kg CO ₂ e/L	