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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 46330-2025

**Earth-moving machinery - Guideline for operational energy
consumption optimization**

土方机械 运行能耗优化指南

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed by the China Machinery Industry Federation. This document was prepared by the National Technical Committee on Standardization of Earthmoving Machinery (SAC/TC334) and the National Technical Committee on Standardization of Green Manufacturing Technology. (SAC/TC337) jointly under the jurisdiction of the State Administration of Taxation. This document was drafted by: China Machinery Productivity Promotion Center Co., Ltd., Jiangsu XCMG Construction Machinery Research Institute Co., Ltd., and Xuzhou XCMG Excavator Co., Ltd. Excavating Machinery Co., Ltd., Chongqing Technology and Business University, Tianjin Engineering Machinery Research Institute Co., Ltd., Taian Aerospace Special Vehicle Co., Ltd., Jiangsu XCMG Group Co., Ltd. Chongqing Laboratory Technology Co., Ltd., Chongqing University, Hebei Beijing-Tianjin-Hebei Remanufacturing Industry Technology Research Co., Ltd., and China Power Construction Railway Construction Investment Group Group Co., Ltd., Jiangsu Huizhi High-end Engineering Machinery Innovation Center Co., Ltd., China Construction Eighth Engineering Bureau First Construction Co., Ltd., China Railway 19th Bureau Group Limited Liability Company, Guangdong Jiangda Construction Engineering Co., Ltd., Guangdong Yuefeng Construction

Engineering Co., Ltd., Hefei University of Technology. The main drafters of this document are. Sun Tingting, Wu Rui, Xu Yubing, Tuo Junbo, Chen Baoqing, Yu Dongfang, Chen Xinchun, Li Congbo, Wei Min, and Cao Yuxin. He Ting, Sun Zhonghua, Han Yuran, Kong Shuping, Tan Qinghe, Huang Haihong, Li Haiyi, Lü Lei, Zhang Chunhui, Jiang Yongtao, Li Lei, Peng Bingzhou. Guidelines for Optimizing Energy Consumption in Earthmoving Machinery Operation

1 Scope

GB/T 46330-2025 is the Chinese national standard covering cutting the fuel an excavator or loader burns in service - the machine and attachment matched to the work, the operating technique and the idling that wastes much of it, the maintenance that keeps the hydraulics efficient, and the measurement that shows whether any of it worked. First edition, with the excavator efficiency evaluation standard GB/T 46633-2025. In force from 1 May 2026. Issued on 5 October 2025, it has been in force since 1 May 2026.

This document establishes the basic principles for optimizing the energy consumption of earthmoving machinery and describes the implementation steps for optimizing the energy consumption of earthmoving machinery. This document is applicable to guiding the optimization of energy consumption in earthmoving machinery powered by internal combustion engines.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 44049 Basic Data Testing and Calculation Methods for Energy Consumption in the Operation of Engineering Machinery

3 Terms and Definitions

The terms and definitions defined in GB/T 44049 apply to this document.

4 Basic Principles

The following principles should be followed in the formulation and implementation of energy consumption optimization schemes for earthmoving machinery.

---Safety principle. The safety of earthmoving machinery and personnel should be fully considered during the formulation and implementation of optimization plans.

---Economic principle. In the process of formulating and implementing optimization plans, economic benefits and energy-saving effects should be considered holistically, striving to achieve the goal of minimizing costs. The input of energy and resources has yielded significant economic benefits.

---Environmental protection principle. In the formulation and implementation of optimization plans, the resulting environmental burden should be fully considered, including waste generated during implementation. We strive to minimize the environmental burden by reducing water and waste gas emissions.

5 Implementation Steps

5.1 Optimizing the energy consumption of earthmoving machinery generally includes, but is not limited to, the following steps.

- a) Needs confirmation, i.e., establishing objectives;
- b) Development of a preliminary optimization plan, including identifying the optimization target, collecting information, and generating a preliminary optimization plan;
- c) Preliminary evaluation of the optimization plan, including energy consumption evaluation, technology evaluation, environmental evaluation, and economic and social benefit evaluation;
- d) Optimization plan established;
- e) Optimize the implementation and verification of the plan;
- f) Solution tracking and continuous optimization.

5.2 See Appendix A for an example.

6.Requirements Confirmation Energy consumption optimization should be performed when the following conditions exist or when it is deemed necessary.