The Use of Construction Equipment Data

USE CASE AND BENEFITS
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Digital transition: what's at stake for the construction sector?

The construction industry faces significant challenges: firstly, a substantial carbon footprint accounting for 18% of global CO₂ emissions (IEA, 2020), productivity growth limited to 1% over the last two decades (Deloitte, 2021), issues around revenue and cost optimisation, and finally, the constant need to improve safety on construction sites.

Digital transformation, based on the data generated by connected equipment, offers a solution to address these challenges. Although construction equipment has been generating data for a decade, less than 5% is currently being used (BCG, 2022).

Leveraging this data is key to improving productivity, cutting costs, and reducing the carbon footprint of equipment. For example, PwC (2022) reports that construction companies that have adopted digital technologies have reduced their CO₂ emissions by 15% and their operational costs by 20%.

Faced with increasingly complex projects and shorter lead times, integrating digitisation into the construction industry has become a necessity. It’s an opportunity to improve operational efficiency, environmental performance, and competitiveness in this key sector.
Construction equipment emits data on its utilisation and exploitation. This aggregated data can be used to monitor key indicators for improving the productivity and energy efficiency of equipment fleets.
Why is equipment data not used?

The CECE (Committee for European Construction Equipment) states that the main obstacle to the digitisation of the sector is data collection, due to the multiplicity of sources and the lack of standardisation.

There are many sources of data, but also many applications and processes for accessing it. In addition, each equipment manufacturer offers an application dedicated to its brand, making it difficult for operators who are not digital experts to access and understand the data.

56% of contractors feel they have an insufficient ability to fully explain or capture data

47% of contractors cite a lack of clarity of captured data for later analysis

37% of companies that manage to collect fleet data experience difficulties setting up key performance metrics

Source: Construction Data Standards: New Research Highlights Challenges & Opportunities
On average, of all Hiboo's customers, companies operating or leasing equipment have more than 8 different data sources (Caterpillar, Volvo, Bell, Trackunit, etc.), making access to data massively more complex.
Why is data a strategic asset?

In a sector such as construction, marked by the exponential growth of connected equipment, we now have a major opportunity to measure performance and create a standard. This is a key step towards meeting the challenges outlined above.

The data emitted by all connected equipment is therefore a major opportunity for players in the sector, whether they are operators, hirers or others, and should not be limited to the major groups. Exploiting the information communicated by connected assets is an essential tool for all sizes of company and all types of business.

For example, in the field, maintenance teams need immediate visibility of the health and use of equipment. Meanwhile, operations managers are looking to optimise productivity while reducing costs. On a more global scale, managers of large sites or regions need to understand the efficiency of one site compared to another, or to analyse the carbon impact of different areas. Whatever their role, these players share a common need: to have reliable information to make informed decisions. Data analysis is the key to meeting this need, making it an essential tool for the construction sector.
The construction sector generates the largest amount of data compared with other sectors. Yet 95% of this data is not used.

Source: Big Data, Big Questions for the Engineering & Construction industry [FMI]
The 6 key challenges addressed by equipment data
Improving visibility
Accessing all data emitted by various equipment enables construction companies to get a digital inventory of their fleet and to have a complete overview of the equipment they own and the ones they rent.

This view of the fleet can be segmented to analyse activities at company, site, regional, or other levels.

CO₂
Measuring carbon impact
Equipment usage data can also be used to measure carbon impact. Consumption and idling are key data transmitted by the equipment to address this issue.

On average, construction equipment idles 30% of the time and consumes 1,800 litres of diesel per year at idle. This is the equivalent CO₂ of 5 light cars, or nearly 5.7 tonnes per year.

Maximising productivity
In the mining sector, for example, equipment productivity depends on the quarry manager’s ability to analyse the production effort made by the equipment using the cycle concept.

Data on equipment movements, speed, loading and unloading times, etc. is fed into productivity reports to identify areas for improvement or bottlenecks.

Generating more income
For rental companies, the use of equipment data is key to adjusting invoicing. One of Europe’s leading rental companies estimates that it loses 7,000 days of invoicing per month due to non-contractual use or over-use of equipment.

Digital and dynamic access to equipment hours represents a major revenue gain for this company.

Improving safety
Usage, geolocation, and geofencing data provide greater visibility of the activities of equipment and alert us to any abnormal usage.

In the case of ENGIE, the use of data has reduced the disappearance of sensitive equipment by 95%. Other concepts also play a part in safety, such as monitoring the speed of trucks/vehicles.

Reducing costs
The data emitted by construction equipment, whether or not natively, makes it possible to (1) understand how machines are used (diesel consumption, idling time, CO₂, etc.), and (2) identify abnormal usage (over-use of equipment, prolonged inactivity, etc.) but also (3) anticipate maintenance operations (hours of use of equipment, engine anomalies).
Use case for the NGE Group
Utilising data to reduce carbon emissions

Industry
Construction
Roads
Recycling

Connected sources
Trucks
Heavy Equipment
TPMS
Telematics
IoT

Fleet size
+ 2,500 equipment

Regions
13 countries

NGE’s initial challenge is common to all large companies owning and/or renting large fleets of assets: most of their equipment is connected, but they have dozens of data sources and applications, and no way of centralising all this information.

The NGE Group called on Hiboo to retrieve and use data from all its equipment in order to measure and reduce the idling rate of its fleet and thus:

- reducing fuel consumption
- reducing CO₂ emissions

Thanks to the data collected by Hiboo, NGE can also accurately geolocate equipment or analyse equipment fault codes to implement preventive maintenance.
How was this challenge addressed?

NGE has centralised data from 29 different sources (IoT, telematics, trucks, etc.) on Hiboo. Today, 2,570 multi-make equipment are connected to the Hiboo platform. The aim is to have a centralised view of all the data for the group’s fleet to identify areas for improvements.

**Connect**
NGE called on Hiboo to recover and use data from all its equipment. The first step was to collect and centralise all their equipment data on a single platform, then process it to provide a standardised and comprehensible set of data.

**Analyse**
To measure the performance of its fleet, it was essential for NGE to have access to data on the equipment — not only the assets they own but also the ones they rent, which they were able to do through Hiboo’s data sharing platform.

**Reduce**
To address downtime, NGE started to measure closely their idling rate, segmenting data by equipment, zone, sites, company, etc on Hiboo’s platform. Through this analysis, an action plan was put in place and the company was able to reduce idling from 34% in 2019 to 28% in 2022.
Results obtained

**NGE is cutting CO₂ emissions from its equipment by 850 tonnes.**

Thanks to the integration of Hiboo, the NGE Group has been able to harness essential data to meet its day-to-day operational challenges. One of the main objectives was to minimise excessive idling of equipment and reduce greenhouse gas (GHG) emissions.

The Hiboo platform provides key information such as equipment utilisation rates, idling rates, geolocation, fuel consumption and CO₂ emissions. This information has enabled the NGE Group to take corrective action to reduce the carbon footprint of its fleet, by optimising the use of equipment.

"Measuring the CO₂ emissions of our equipment is an important step that enables us to work on real scenarios. Through this approach, we are totally in tune with the expectations of customers, who want tangible proof that we are reducing our environmental footprint.

Thierry Robert, NGE Equipment Director

The partnership with Hiboo has been a key element in achieving the Group’s objectives. Following the implementation of the platform, the idling rate of 620 equipment decreased from 34% in 2019 to 28% in 2022, representing a total saving of 45,000 idling hours.

This resulted in annual fuel consumption savings of around 270,000 litres, equivalent to 850 tonnes of CO₂e saved, and a total saving of €1.8M.
Reducing downtime from 34% to 28% in two years saved NGE 850 tons of CO₂.
Conclusion

The digital transition in the construction sector is a crucial step towards meeting the major challenges of the environment, productivity, costs and safety. Projects are becoming increasingly complex and lead times are getting shorter, making this transition absolutely necessary. The increasing connectivity of construction equipment offers an unprecedented opportunity for the sector. All equipment now communicates, whether natively or not, and the messages they generate constitute a set of key information for informed decision-making based on reliable elements.

However, this transformation is hampered by the lack of data norms and standards between manufacturers. Less than 5% of equipment data is currently used, mainly because of the difficulties involved in collecting and standardising information from multiple sources.

Despite these challenges, solutions are emerging, such as the one proposed by Hiboo, which proposes to take control of the flow of equipment data in order to meet the challenges faced by the sector and remain competitive. It is this innovative and fundamental approach that will guide the construction sector towards a more sustainable and efficient future.
About Hiboo

Hiboo is the hub for data emitted by equipment. Our mission is to improve the productivity and energy efficiency of all mobile industrial equipment fleets.

Hiboo’s job is to collect, centralise and retrieve the data emitted by multi-brand equipment. We deliver the data to end-users in their business software or on our fleet management platform. Our solution solves the challenge of opaque operations and disconnected systems to provide complete visibility of the activities and performance of industrial fleets. Hiboo currently integrates with over 80 sources and processes data from more than 50,000 assets in 50 countries.

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With the earth in mind

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