



# DIGITAL PLATFORM FOR AGGREGATE QUARRIES

Data instead of assumptions.  
Efficiency instead of losses.

**INDUSTRY 4.0 → 5.0**

## INTRODUCTION

The industrial world is at a turning point – a new revolution known as Industry 4.0.

The implementation of digital technologies, process automation, real-time data analysis, and the use of artificial intelligence are transforming the way aggregate quarries and cement plants operate.

**Companies that embrace digital transformation gain a genuine competitive advantage.**

## THE KEY FUNCTIONS OF THE TMS PLATFORM

- Integration of all data sources (mobile machines, stationary production lines, belt weighers, fuel stations, energy meters),
- Automation of reporting and elimination of human errors,
- Adaptation to corporate reporting standards and KPI formulas,
- Real-time trend and KPI analysis,
- Support in generating optimization recommendations.



Reduction of production costs  
**up to 30%**

TMS Group Europe is a company with over 18 years of experience in implementing digital solutions for the industry sector. Our systems operate in more than 300 plants across 9 countries, serving both global leaders such as Holcim, Cemex, CRH, Dyckerhoff, Rohrdorfer Gruppe, Lhoist, and Industria, as well as smaller regional companies.

**Our proprietary platform, TMS Industry 4.0 → 5.0, is a unique and one of the most comprehensive solutions available on the market.**

## WE EMPOWER INDUSTRIES THROUGH:



Production Performance



Preventive Maintenance



Proactive Safety Management



Energy Consumption (Fuel and Electricity)



Sustainability

*“TMS has transformed our quarry. We can see every idle run, every liter of fuel consumed. We make decisions within minutes, not days. It’s an advantage we never had before.”*

*– Production Director, International building materials company*



## TRUST OF INDUSTRY LEADERS

The TMS system operates in hundreds of locations across Poland, Austria, Germany, Slovakia, the Czech Republic, Romania, the United Kingdom, and Hungary.



### WHY DO CLIENTS CHOOSE TMS?

- Proven effectiveness – average cost reduction of 20–30%,
- Fast return on investment – typically under 4 months,
- Comprehensive implementation and service support,
- Adaptability to corporate standards and ESG/CSRD requirements.



## RESULT-ORIENTED APPROACH



Return on investment:  
**on average**  
**< 4 months**



Production cost reduction:  
approx. **20–30%**



Savings in quarries:  
**up to EUR 0.42**  
**million per**  
**year**

**TMS is not just a technology provider.**  
**You gain a partner who, thanks to a flexible system**  
**and deep industry know-how, will help you achieve real,**  
**measurable results in your quarries.**



**PRODUCTION PROCESS OPTIMIZATION PLATFORM**

**FACTS (IOT) AND DATA SOURCES**

The TMS system collects data directly from machines, conveyor belts, belt weighers, and energy meters — tracking how many hours each production plant unit and mobile machine operates, how long idle periods last, how many tons are produced, transported, and how much fuel and electricity are consumed.

This eliminates the need for manual data collection and note-taking — everything is recorded automatically and objectively, removing inaccuracies caused by human error, rounding, or simplified manual reporting.

**BUSINESS REPORTS**

These reports are generated from collected data. Thanks to the flexibility of the TMS Platform, they can be fully adapted not only to corporate standards but also to the needs of individual departments and positions. Reports can vary in their level of detail and time range, depending on the management level. Supervisors can immediately see where losses occur, while foremen can quickly check what happened during a shift and identify the causes of downtime.

**PROCEDURES**

The preparation of a set of Business Reports tailored to individual needs is based on a concept agreed upon with the Client regarding their use. The procedures define who uses which reports, how often, and for what purpose, ensuring that every TMS functionality has a clear application and serves well-defined operational and strategic goals.

**RECOMMENDATIONS**

All TMS Platform users, thanks to real-time data updates and comprehensive analytics, can quickly identify deviations from set goals, determine the cause, location, and timing of a problem, and define corrective measures — in other words, recommendations for improving production processes.

Leveraging industry expertise and advanced artificial intelligence algorithms, both TMS consultants and AI-based system modules actively participate in formulating data-driven recommendations and corrective actions.



The foundation of effective optimization lies in automatically collected data — complete, reliable, and up to date. The TMS Platform integrates information from multiple sources — from mobile and stationary machines to belt weighers, fuel stations, SCADA/ERP systems, and energy or gas meters.

As a result, the entire production process becomes transparent, and management decisions can be made based on facts rather than assumptions.



**MOBILE MACHINES**  
Data collected from various brands and types of equipment. Automatic calculation and reporting of transports carried out by haul trucks.



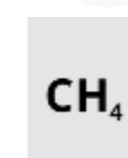
**INTERNAL PETROL STATIONS**  
Balancing the fuel consumed with the fuel refueled.



**BELT WEIGHERS AND TMS DIGITAL BELT WEIGHERS**  
Measurement and accounting of material mass and equipment working time. Automated KPI and OEE calculations.



**REFULERS**  
Control of deposit exploitation, efficiency analysis, and safety monitoring.



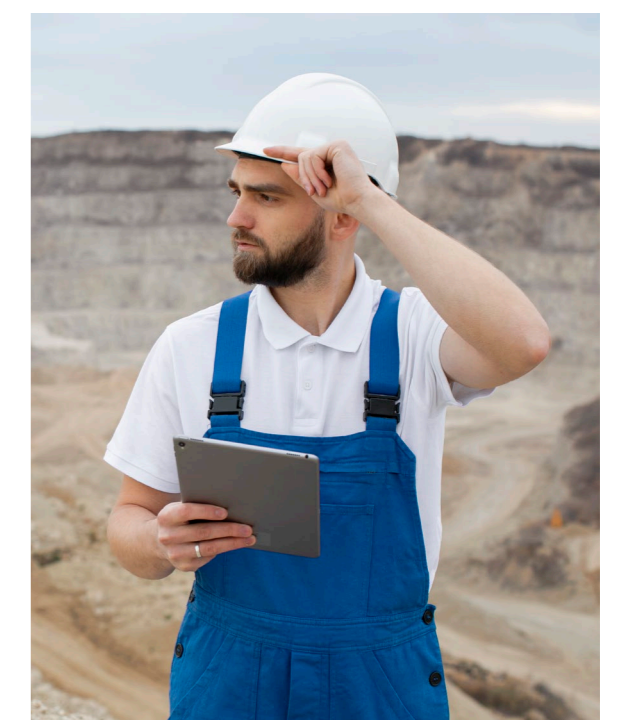
**NATURAL GAS METERS**  
Monitoring gas consumption in key processes, such as sand dryers.



**ENERGY METERS**  
Analysis of electricity consumption, carbon footprint, and overall process energy intensity.



**SCADA/ERP SYSTEMS**  
Integration with existing control and resource management systems.



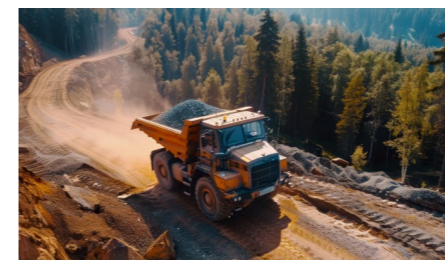
**CUSTOMIZED REPORTS FOR MANAGEMENT LEVELS**

**EXECUTIVE MANAGEMENT**  
Strategic reports containing financial and environmental data (e.g., carbon footprint) that support investment decisions and long-term strategic planning.

**MANAGERS AND DIRECTORS**  
Consolidated KPI and OEE reports across different time frames, trend analyses, and recommendations for improvement actions.

**SITE MANAGERS, FOREMEN, AND MAINTENANCE TEAMS**  
Detailed daily and shift reports, reasons of stoppages and breakdowns reports, and practical tools supporting daily production meetings.

**OPERATORS**  
Real-time insight into process performance and elimination of manual data collection.



**TMS FOR MOBILE MACHINES**

A set of functionalities that enables complete accounting of machine and operator performance — from basic operational data to advanced efficiency and productivity analysis.

- Automatic calculation of work efficiency,
- Fuel consumption measurement,
- Integration with internal petrol stations,
- Machine location displayed on a geodetic map,
- Operator authorization and identification,
- KPI tracking,
- Accounting of loading, unloading, and transport operations,
- Identification of downtime causes and inefficiencies,
- Analysis of technological processes in the context of production,
- Alerts and notifications, daily and cross-sectional reports.



**TMS FOR PRODUCTION PLANTS**

A set of functionalities that enables production volume accounting, as well as analysis and control of its efficiency.

- Automatic production accounting,
- OEE, OOE, and REE,
- Accounting of electricity consumption by the production facility,
- Accounting of gas consumption by sand dryers,
- KPI tracking for the production plant,
- Identification of reasons of stoppages and breakdowns.



**TMS FOR TECHNOLOGICAL LINES**

A set of functionalities that enables accounting of production volume and efficiency achieved by production plants, in relation to the performance of mobile machines forming part of the technological line.

- Monitoring the achievement of production goals,
- Comparison of individual mobile machine performance with the overall plant efficiency,
- Comparison of loadings with production volume,
- Comparison of loadings with transports,
- Comparison of transports with production output,
- OEE, OOE, and REE,
- KPI for the technological process, including energy intensity (fuel and electricity consumption per ton),
- KRI indicators,
- Comparison of production with sales.



## AGGREGATE QUARRY IN POLAND



**+145 000**

Additional tons in 7 months

**-32% (kWh/t)**

Improved energy efficiency

**-16% (l/t)**

Improved fuel efficiency

**+26,5% (t)**

Increased production

### PERFORMANCE OPTIMIZATION IN A CRUSHED AGGREGATE QUARRY

**We identified the causes of low shift output.**

Thanks to TMS reports, it was possible to quickly pinpoint problem areas: prolonged and cyclical idle periods of the plant caused by dumpers stoppages, irregular equipment utilization, and numerous idle runs and unplanned shutdowns.

**The TMS Platform enabled a full cause-and-effect analysis.**

It was determined that the previously planned expansion of the plant's production capacity was unnecessary and that the observed drops in efficiency were not due to high rock blockiness but rather to organizational issues and improper use of available working time.

**We estimated the potential for achievable benefits and savings.**

Data analysis revealed the production increase potential that could be achieved by eliminating the identified root causes, along with a simultaneous reduction in fuel and electricity energy intensity.

**Together with the client, improvement actions were developed.** TMS provided specific, data-driven recommendations that improved communication and decision-making processes within the quarry.

The implementation of TMS improved financial performance and increased employee engagement. Thanks to transparent data and daily work with reports, the plant began operating as one team focused on continuous improvement.



### LOSS REDUCTION IN A GRAVEL PIT

**We eliminated excessive idle time of dumpers.**

The analysis of TMS reports enabled precise quantification of losses caused by idle periods of dumpers and loaders. Eliminating unnecessary stops and idle running increased equipment utilization and reduced fuel consumption per ton of production.

**We optimized working hours and break schedules.**

DayView reports provided detailed information on work and break times, improving planning transparency. This allowed for better use of available time across all shifts and reduced fluctuations in KPI results.

**We improved transport scheduling.**

Based on data analysis, the quarry management adjusted dumpers and machine operation schedules. Implementing these recommendations quickly delivered results — reducing fuel consumption per ton and increasing effective working time.

The implementation of TMS resulted in measurable savings and increased efficiency, but it also united the team around common goals. Transparent data and daily work with reports helped the plant operate as a cohesive, well-coordinated organization.



## GRAVEL PIT IN THE UNITED KINGDOM



**+23 minutes**

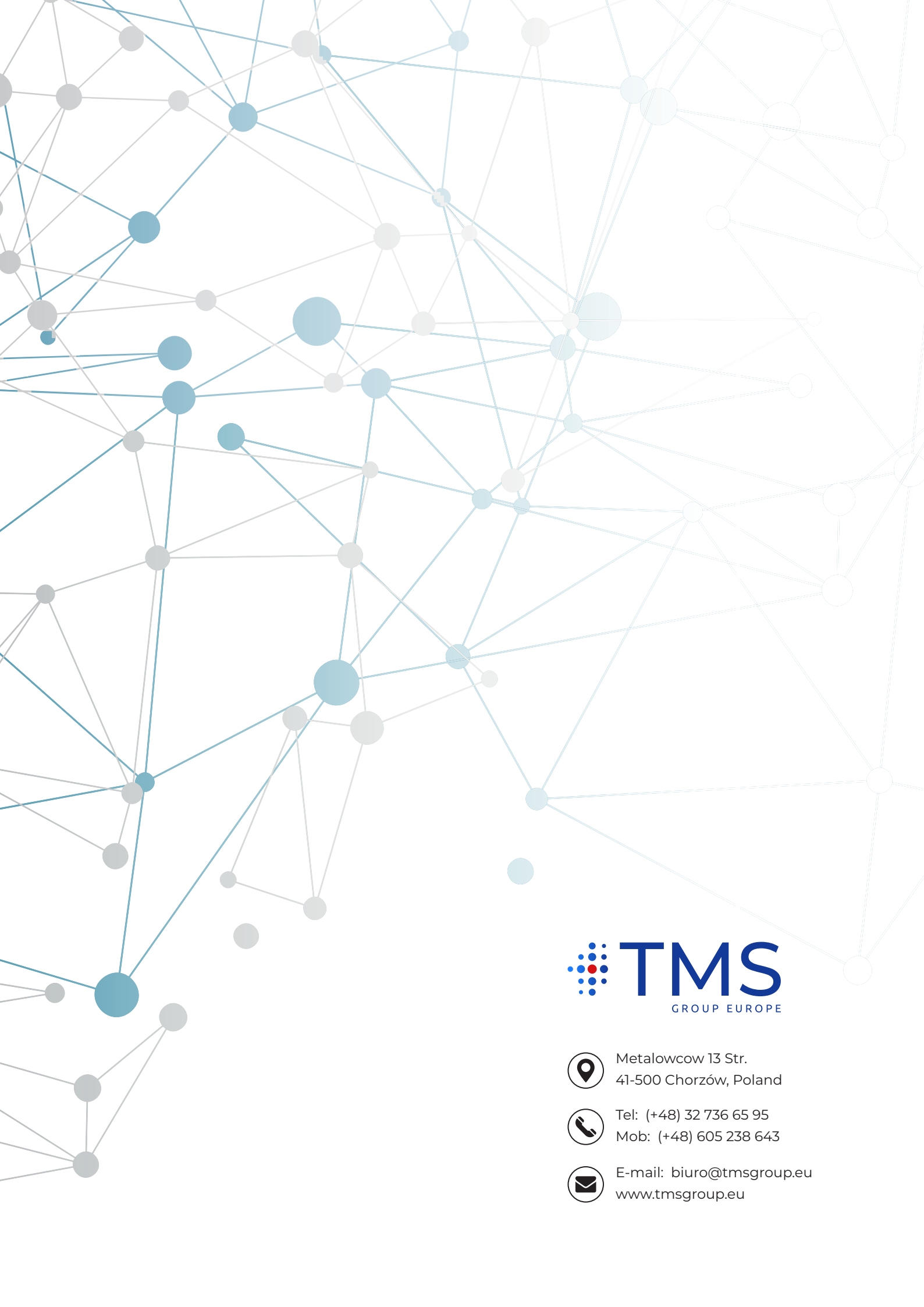
An average of additional working time per day


**a gain achieved through the reduction of idle time.**


**-10% (l/t)**


Improved Fuel Efficiency

**Achieved through optimized haul truck operation and elimination of unnecessary idle periods.**



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