CONSTRUCTING THE EUROPE OF TOMORROW

#WeMake2Build

OUR MISSION STATEMENT

CECE is the voice of the European construction equipment manufacturers. Founded in 1959, we are a European-level federation that engages with EU policymakers on behalf of our membership. Through our national member associations, we speak on behalf of an industry made of **1,200 companies** employing **300,000 people** and creating a value of **€40 billion** annually.

Relying on a wide network of industry experts engaged across a broad range of policy areas, we coordinate the views of our members with the aim of achieving a fair and competitive regulatory environment.

Our advocacy work addresses the broad spectrum of policies that impact the manufacturing and the construction industries in Europe.

We are committed to **Constructing the Europe of Tomorrow** by securing a globally competitive European construction equipment industry through four main goals.



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The CO2 contribution of machinery in construction

Facts and figures

Whole life cycle

• To understand the potential of decarbonisation offered by modern machinery, it is important to move from a solely machine-focussed approach to a more holistic view. For a complete understanding of the CO2 emissions from a machine, it is necessary to consider the whole life cycle of construction machinery.



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The use-phase for construction machinery

CECE's 4 pillars approach

MACHINE EFFICIENCY

Integration of optimised machine components (e.g. powertrain, hydraulics, tyres...)

OPERATION EFFICIENCY

Operators trained for intelligent machine use, skilled teamwork and effective management



PROCESS EFFICIENCY

Optimal workflow including the choice of best suitable machine or combination of connected machines

ALTERNATIVE ENERGY SOURCES

Use of bio- or synthetic fuels, electric drives, hydrogen, ammonia, etc.

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Energy carriers offering low or net-zero CO2 solutions

Technologies for net-zero energy carriers

- The choice of energy carrier plays a key role for decarbonisation.
- The available technologies with the potential of net-zero carbon emissions:
 - ✓ Internal Combustion Engine (ICE) using synthetic or bio-fuels;
 - ✓ Fuel Cell, using hydrogen, plus battery and electric motor;
 - ✓ Battery plus electric motor;
 - ✓ Off-board power supply plus electric motor

A matrix of different energy carriers for net-zero solutions

Energy density matrix

	Challenges	Converter	Examples
Electricity	Battery size, cost, raw materials and recycling Charging availability and time Connection to supply grid	Electric motor	Low, intermittent energy use; Established sites
Hydrogen & ammonia	Supply infrastructure High pressure on board storage Cost and availability	Fuel cell or combustion engine	Medium, more continuous energy use
Bio & Synthetic fuels	Efficiency of synthetic fuel production Material availability for biofuels	Combustion engine	High, continuous energy use; Remote sites

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Opportunity for battery electric and hydrogen energy carriers



Low power, low energy consumption, short intermittent use







Greatest

Limited

Fixed or long term sites



High power, high energy consumption, continuous use





Technology selection for construction machine applications and uses

Practical implementation

Taking into account those constraints in the use of the electricity and hydrogen carriers it is necessary to consider the broader range of net-zero carbon energy carriers for use in construction activities.

- A high energy consumption, continuous operation task in a remote area requires a high-density energy carrier, that can be efficiently delivered to the site. In this case the solution could be the use of an internal combustion engine with net-zero carbon high density fuel.
- A low energy consumption, intermittent operation task in an urban location could be best served by a battery electric machine using net-zero carbon generated electricity.
- A high energy consumption, continuous operation task on a confined site might need a internal combustion engine and net-zero carbon high density fuel on a remote location, but could use direct electric if the site was located close to a grid substation.
- A high or low energy consumption, continuous or intermittent operation task in multiple, short term or remote sites may still require an internal combustion engine with net-zero carbon high density fuel.

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Potential roll-out of energy carriers and converters

Possible timeline



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Recommendations

CECE's message to EU policymakers

For a positive contribution of construction machinery to the Green Deal, the EU should:

- Assess decarbonisation of the full life cycle inclusive of the operations involved
- Be developed in coordination with other regions of the world
- Ensure the availability of low or net-zero CO2 energy carriers at acceptable costs
- Incentivise fleet renewal programmes
- Facilitate decarbonisation of existing machinery by making available low or net-zero CO2 drop-in fuels
- Develop policy setting technology-independent objectives

Thank you for your attention!





