

ASSOCIATION

# **Energy Transition in** Rental

Presentation of the project

4<sup>th</sup> June 2025



## The ERA energy transition project aims at facilitating the energy transition in the rental industry and ultimately contributing to achieving European decarbonization targets

The energy transition is necessary to achieve the European Union's reduction targets set out in the "Fit for 55" package, defined under the Paris Agreement. It is defined as the shift from using fossil fuels to cleaner, renewable energy sources, aiming for a more sustainable and environmentally friendly energy system.



Non-road mobile machinery impact on climate

Non-road mobile machineries, or off-road equipment\*, is responsible for 108 Mt CO2e per year, which **represents 3.1% of the EU's Greenhouse Gas (GHG) emissions.** 



EU GHG emissions' reduction objectives

The EU "Fit for 55" package sets greenhouse gas reduction objectives of - **55% by 2030 and aims to achieve net-zero by 2050** (1990 baseline).

The Non-Road Mobile Machinery sector falls under this objective through the Effort Sharing Regulation (ESR), with a global objective of reducing **CO2e emissions by 40% by 2030** (2005 baseline).

The energy transition supports four key objectives:



Decarbonize rental activities

Comply with local, national and European regulations



Meet customers' expectations



Strengthen European energy independence

2 ERA Energy Transition in Rental | \*Non-road mobile machines included are those used in industry and construction, and ones used for mining and airport operations, machines used in commercial, agriculture and forestry, fishing, residential, inland waterways, rail and military sector. Sources: <sup>1</sup>T&E - Reducing emissions from non-road mobile machinery; <sup>2</sup> Fit for 55 – Consilium, Effort sharing 2021-2030: targets and flexibilities - European Commission

#### Work done

6 low-carbon solutions have been analyzed to identify the solutions with the highest potential to replace fossil fuel equipment

6 low-carbon alternatives to fossil fuels have been considered during this project. This analysis was conducted through:

- A comprehensive **literature review**
- ~30 interviews with rental companies, OEMs, customers and associations
- ~25 participants to the online surveys: 1 rental companies' survey, 1 OEMs' survey

#### Low-carbon solutions analyzed

Battery electric		Machines powered on electric batteries (either 100% battery or hybrid), with different charging solutions to be explored (e.g. charging standards, fast charge, swappable batteries). Although it is not the core of the analysis, cable connected solutions may also be assessed for specific use cases.
	HVO	Hydrotreated Vegetable Oil. A diesel fuel produced by hydro processing renewable feedstocks, like fats and oils, defined as a renewable diesel, that meets the European Renewable Energy Directive II criteria for biofuels.
Biofuels	Biodiesel	Diesel fuel produced by transesterification of renewable feedstocks, like fats and oils, that meets the European Renewable Energy Directive II criteria for biofuels. Using biodiesel blends higher than B7 (i.e. 7%) requires modifications on engine fuel injection systems and filters.
Hudrogon	Fuel cells	Hydrogen used in fuel cells or internal combustion engines, that meets the European Renewable Energy Directive II criteria for low
пушоден	ICE	carbon hydrogen.
Synthetic fuel (e-fuel)		Liquid synthetic fuels meeting the European Renewable Energy Directive II requirements of <b>RFNBOs</b> (Renewable Fuels from Non- Biological Origin), also called <b>e-fuels</b> (e.g. e-ammonia, e-methanol).

#### Key messages

## The rental industry can play a pivotal role in the energy transition of the equipment sector

Rental companies and original equipment manufacturers are already investing and innovating to reduce air pollutants and improve asset efficiency. In addition, the rental industry can play a decisive role in the sector's energy transition.

## The rental industry can facilitate the energy transition

with OEMs

Share **feedback** and contribute to products' continuous improvement

Facilitate **economies of scale** by increasing volumes of low carbon equipment purchase

Offer **flexibility** in the adoption of low carbon solutions and risk mitigation

Share **expertise** on the deployment of low-carbon solutions

Develop **new services** related to energy management and supply (e.g. energy as a service)

with public authorities

with clients

Express clear advocacy messages at local, national and European levels on **regulatory and incentive** frameworks evolutions Each rental company can foster the transition in its activities

 $\sim$ 

- Structure and market the low-carbon service offering for clients
- Monitor technology and regulatory evolutions to inform fleet investment decisions
- Investigate fleet financing options (sustainable finance)
- Develop new skills to adapt the workforce to the energy transition (operations & maintenance, sales)

#### Focus on regulations (1/2)

**Some national and local regulations prohibit the use of internal combustion engine** equipment or impose GHG emission caps, while **limited financial incentives** are supporting the transition

#### **Regulations limiting the use of ICE**

#### Climate and environmental requirements for the City of Oslo's construction sites (NO):

Contains standard climate and environmental requirements for the City of Oslo's construction sites, as part of the City's ambitions to have fossil-free and zero-emissions construction sites from 2025.

## Prohibition on the use of mineral oil for heating and drying on construction sites for buildings (NO):

From January 1, 2020, use of mineral oil (oil from fossil sources) for heating buildings has been prohibited.

#### London's Low Emission Zone for Non-Road Mobile Machinery (UK):

Initiative aiming at reducing air pollution from construction equipment and other non-road machinery operating within the city. The zone sets strict emission standards for NRMM used on construction sites, requiring machinery to meet specific criteria for particulate matter (PM) and nitrogen oxides (NOx) emissions.

It is important that regulations are effectively enforced to ensure a fair level playing field.

#### **Financial incentives for low-carbon solutions**

#### Enova Support Scheme (NO):

Enova, a company owned by Norway's Ministry of Climate and Environment, aims to facilitate the country's transition to a low-emission society by managing the Climate and Energy Fund, providing grants to the adoption of low-carbon equipment through its "Emission-free construction machinery" program.

#### Klimasats Financial Support Scheme (NO):

Support scheme for municipalities and county authorities to help developing lowcarbon projects. It has provided funding for zero-emission construction sites and zeroemission machinery.

#### Financial support from the Swedish Energy Agency (SE):

Possibility of applying for aid from the Swedish Energy Agency: 20-50% of the investment cost for machines with an output of more than 15 kW.

#### Subsidy for Clean and Zero Emission Construction Equipment (SSEB) (NL):

Construction companies in the Netherlands, that own equipment, and/or rent out construction equipment can apply for this subsidy if they retrofit or buy zero-emission equipment.

#### Accelerated depreciation of investments in less polluting non-road machinery (FR):

The exceptional deduction scheme allows companies to invest in non-road vehicles using alternative fuels to non-road diesel. Companies can deduct 40% of the original value, SMES can deduct 60%. This scheme applies to companies in construction, public works, and other sectors, for vehicles acquired new between January 1, 2024, and December 31, 2026. The vehicles must meet emission criteria and not be intended for road use.



NOx (nitrogen oxides), PM (particulate matter) and HC (hydrocarbon). No emission limits fixed by Stage IV for 19 to 55kW engines.

#### **Coming next: EU ETS 2 implementation**

The upcoming EU ETS2 will introduce a carbon price to non-road fuels used by industry and construction, starting in 2025. This will become fully operational in 2027.

### Potential impact on OPEX

+10%

## EU ETS2 will increase diesel fuel OPEX by ~10%, from 2028

when considering a price of  $\leq 45/t$ CO2e for allowances (price cap announced by the EU for the 2027-2029 period)

Although they both refer to 'Non-Road Mobile Machinery' and aim to reduce emissions, the EU ETS focuses on greenhouse gases from specific sectors (such as manufacturing industries and construction), while the NRMM regulation targets pollutant emissions from off-road machinery. These regulations also apply to handheld equipment and power generation sets.

6 ERA Energy Transition in Rental |\*NRMM include equipment such as construction machinery (excavators, bulldozers), agricultural equipment (tractors, combine harvesters), material handling machines (forklifts, cranes), generators, as well as gardening and landscaping machines. | Sources: Regulation (EU) 2016/1628; European Stage V non-road emission standards; NRMM Guide – Pages.; ETS2: buildings, road transport and additional sectors, Emission Standards: Europe: Nonroad Engines

## Focus on energy transition solutions While the optimal choice of low-carbon solution mainly depends on the local context, electric batteries and HVO emerge as two high potential solutions

The appropriate choice of low carbon solutions mainly depends on local criteria at site and city levels

Furopean &	To date, construction equipment regulations require non-GHG pollutions	_
national levels*	reduction	C
	The implementation of EU-ETS in the construction sector will impose a price on	C
	GHG emissions from 2027	C
		E
	Some European cities are pioneering the	E
Region & city level	energy transition by imposing decarbonization or electrification mandates on construction sites, both as buyers (contractual clauses) and regulators, as well as by providing grant schemes	P fc r
		A
	Client requirements, ease of access to a nower grid, and temperature conditions	Co
Site	are to be assessed at the project level	Ø
level	This determines <b>low carbon solution</b> choices	C

Electric batteries and HVO are the two low-carbon solutions with the highest potential to fossil fuel consumption reductions in the equipment sector

	Fossil	Battory	Biof	uels	Hydr	ogen	Synthetic
	fuels	electric	HVO	Biodiesel	Fuel-cell	ICE	fuel (e-fuel)
CAPEX					$\bigcirc$		
OPEX					$\bigcirc$	$\bigcirc$	$\bigcirc$
Operations							
Energy supply					$\bigcirc$	0	0
Environment	$\bigcirc$						
Potential for fossil fuel consumption reductions	-						
ACTIONS**		Installation of charging infrastructure, safety provisions	Installation of HV0 branches	D fuel tanks in			

Competitivity and availability trends:

- Battery electric: currently higher TCO but positive perspectives on battery cost
- Solutional CAPEX compared to diesel, moderate OPEX premium) but faces a supply shortage risk



7 ERA Energy Transition in Rental | \* more initiatives take place at the city level than at national level, this is the reason why region & city level is a dedicated category; \*\* examples only, more details to be found in the report | Sources: EY analysis from literature research, OEMs data, interviews
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The assessment can vary across countries (e.g. some countries have a strong hydrogen development policy and thus faster infrastructure development and cost reduction)

#### Focus on electric batteries

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## Electricity prices and carbon impact per kwh greatly vary from one country to another

Electricity carbon intensities in Europe vary by more than x100 while electricity prices vary by x3.



Additional information

Electricity prices and carbon intensity in Europe <sup>1,2,3</sup>

ERA Energy Transition in Rental| Sources: <sup>1</sup> Eurostat, Electricity prices for non-household consumers, including taxes and levies, Average price between 2022 and 2024; <sup>2</sup> IEA Emissions database, 2021; <sup>3</sup> For UK: <u>UK: non-domestic prices for</u> electricity 2023 | Statista; <sup>4</sup> European Environment Agency

#### Main challenges

The **3 main energy transition challenges** identified are the CAPEX premium, the access to energy infrastructure, and the standardization and practicality of use

1	2	3
CAPEX premium	Energy infrastructure	Standardization & practicality of use
Battery electric and hydrogen powered (fuel cells) machines' investment premium is in a 30% - 100% price premium range	Electricity supply in operations is a challenge, with grid connection times ranging between several months and a year in urban areas and being rare in remote locations*	This category encompasses both the lack of harmonization in charging protocols and the impact of refueling / charging (time and frequency)
"clients do not want to pay a <b>price premium</b> " " <b>CAPEX</b> are up to x2-2.5 today depending on the products"	"power needs for the construction site is <b>larger than</b> <b>the building's needs</b> after construction" <b>"infrastructure is not there</b> to provide this kind of equipment." (hydrogen)	"every machine must have its <b>own onboard charger</b> " "the challenge is for <b>fast charge where the lack of</b> <b>standardization</b> is an obstacle"
economics	opera	ntions

#### Overview of the 3 use cases analyzed

## The project analyzed the **energy transition solutions across 3 use cases for 4 equipment types**: power generators, telehandlers, mini excavators, boom lifts



## TCO impact The Total Cost of Ownership is significantly impacted by the energy transition, due to both CAPEX and OPEX changes

#### Low-carbon solutions bring cost structure changes

"there is a **communication difficulty on TCO aspects** regarding the benefits of electrical solutions"

"presentation of the daily rental cost including the total rental with energy works well with customers"

"TCO is very critical point, solution needs to have **economical** advantage at the end of the lifespan"

> "the significant CAPEX of electric machines is passed on to the customer, who does not always benefit from the OPEX gain"

"alternative equipment is used when **incentives and OPEX gains are superior to CAPEX**"

"customers are willing to pay more for low carbon technologies with clear economical benefit" An accurate TCO model will allow to precisely factor them in to...

cases	Advocate
	To clients
Conduct sensitivity analysis to key assumptions, such as	<ul> <li>On the economic benefits beyond upfront cost (rental fee or CAPEX)</li> </ul>
► CAPEX	To policy makers
<ul> <li>Energy OPEX</li> </ul>	<ul> <li>Build robust fact-based arguments to</li> </ul>
<ul> <li>Utilization rate</li> </ul>	support your policy advocacy
<ul> <li>Resale value</li> </ul>	<ul> <li>Highlight the fossil vs. low carbon solutions cost gap</li> </ul>
based on the above listed factors,	Share knowledge
(ck	
	With sales teams
prioritize the right clients and use cases	<ul> <li>With sales teams</li> <li>On cost optimization levers (e.g. utilization rate, proper battery sizing)</li> </ul>
prioritize the right clients and use cases	<ul> <li>With sales teams</li> <li>On cost optimization levers (e.g. utilization rate, proper battery sizing)</li> <li>On how to appropriately advise clients based on their use cases</li> </ul>
prioritize the right clients and use cases develop your low-carbon offer at a lower risk, based on informed	<ul> <li>With sales teams</li> <li>On cost optimization levers (e.g. utilization rate, proper battery sizing)</li> <li>On how to appropriately advise clients based on their use cases</li> <li>With clients</li> </ul>



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