

# ZERO EMISSION CONSTRUCTION SITES

## THE POSSIBILITIES AND BARRIERS OF ELECTRIC CONSTRUCTION MACHINERY

### FACTSHEET

Construction is a fundamental component of human civilisation. It lies at the heart of economic and social development. In fact, the construction industry generates roughly 9% of European GDP and accounts for 18 million jobs. In spite of this, construction sites are also a major source of environmental and human health damage throughout all aspects of the construction process. While it is well known that construction sites are the source of different forms of pollution – including material waste, visible dust, noise, and vibration – construction and demolition sites also produce less obvious pollutants which are of serious concern for human health, namely NO<sub>2</sub> and particulate matter. Combined with increasing urbanisation trends and a fast-growing global population, it goes without saying that construction is here to stay. This calls for the adoption of timely policies and measures at the local-, national- and EU levels to encourage the transition to zero emission technologies and processes across the full construction supply chain.

#### CONVENTIONAL CONSTRUCTION MACHINERY IS A MAJOR SOURCE OF POLLUTION IN VARIOUS FORMS



**AIR POLLUTION** from construction machinery is major health hazard. In London, construction sites are responsible for around **7.5% of the city's NO<sub>x</sub> emissions, 8% of large particle matter PM10, and 14.5% of fine particle matter PM2.5.** Meanwhile, air pollution is already a major problem in European countries, where around **400,000 people die prematurely every year because of dangerous air quality.** Furthermore, the WHO warns that there is no evidence of the existence of a 'safe level' of exposure at which no adverse health effects occur. This demonstrates the need to push for 'zero emissions' as opposed to simply 'low emissions'.



**GREENHOUSE GAS EMISSIONS** from construction sites come primarily from the exhaust fumes of diesel machinery and equipment onsite. **In Oslo alone, 18% of its total emissions originate from construction sites, accounting for approximately 30% of traffic emissions.** This is greater than the entirety of the city's emissions from passenger cars and light duty vehicles, while also emitting an extra 5.1 tonnes of NO<sub>x</sub>. **In Germany, these emissions exceed those derived from domestic rail and air transport combined** (see Figure 1).

**NOISE POLLUTION** from construction sites has significant impacts on the wellbeing of both the neighbourhood and the construction workers. While some of the noise is the result of so-called 'impact equipment', much of the pollution can be attributed to activities such as generating electricity through diesel pumps, heating or drying of materials, and traffic to, from, and within the site. With its health impacts often underestimated, studies have found that exposure to **environmental noise claims roughly 10,000 premature deaths each year.**

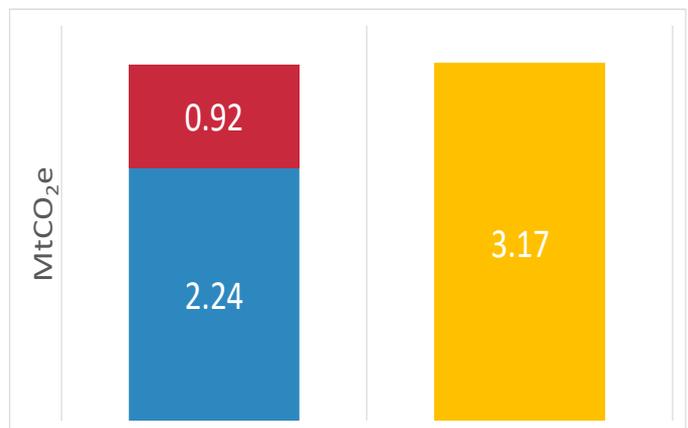


Figure 1. German CO<sub>2</sub>e emissions from construction machinery (in yellow) are higher than those from domestic air and rail transport combined (blue and red respectively). Source: UNFCCC 2015

## BELLONA'S POLICY RECIPE AT EU AND NATIONAL LEVELS

Government expenditure on works, goods and services represents around 14% of EU GDP, accounting for roughly €1.8 trillion annually (see Figure 2). This makes cities powerful actors in boosting demand for sustainable zero emission construction sites while building trust among consumers and creating certainty for industry to invest in low- and zero-emission products and processes. European and national policy must seek to capitalise on this potential through the following recommendations:



### INCORPORATING CONSTRUCTION SITE MACHINERY IN EU 'GREEN PUBLIC PROCUREMENT' LEGISLATION

The ongoing recast of the **EU's Clean Vehicles Directive (CVD)** offers a unique opportunity to mandate the procurement of clean and zero emission construction site machinery by public authorities. Amending the **CVD's scope** to include construction site machinery has already been acknowledged by members of the European Parliament and needs to be further supported by EU Member States as negotiations go ahead.

Bellona welcomes greater ambition level in the recast CVD reflected in a definition of 'clean vehicles' that is confined to '**zero emission**' vehicles only. On this basis, the procurement targets set by the CVD need to be forward-looking, necessitating that all new vehicles procured by public authorities be zero emission by 2030.

Retrofitting plays a large role in electrifying construction machinery today and helps reduce capital expenditure. Therefore, the CVD review should also envisage the inclusion of **retrofitted vehicles** within its scope and count these towards the achievement of procurement targets.

Putting in place a coherent EU policy framework governing the procurement of construction machinery is key to **lowering costs**, and **creating scale and demand for zero emission products**.

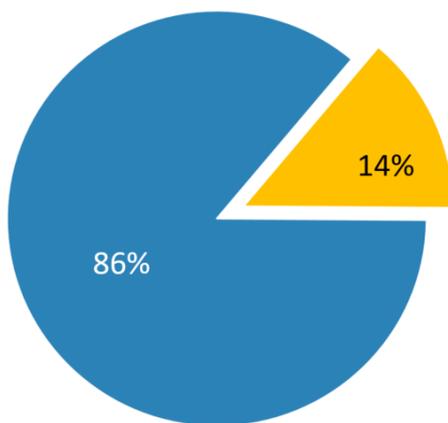


Figure 2. Public Procurement spending accounts for 14% of EU GDP.

### FINANCIAL SUPPORT MEASURES

EU financial support will be crucial in supporting public authorities, contractors and companies in making necessary vehicle, infrastructure, and staff training investments. In order to help public authorities to achieve their procurement targets, Bellona supports the establishment of an **EU platform for cross-border and joint procurement** of zero emission vehicles and machinery covered within the scope of the CVD. By providing economies of scale, this helps to bring down compliance costs while helping smaller cities reap the benefits of electrified machinery.



### NEED FOR TARGETED INVESTMENTS IN INFRASTRUCTURE

Similarly to electric vehicles on the road, the electrification of construction site machinery necessitates investments into the deployment of suitably positioned recharging infrastructure.



The **Energy Performance of Buildings Directive** offers synergies since it mandates the pre-equipping of new and renovated buildings with pre-tubing for EV charge points. The use of electric construction machinery supports the compliance of this directive in ensuring the installation of charging facilities during the construction process. All charging infrastructure installed should be capable of **modulating the charging process** in reaction to price and grid signals.

### ENSURING ENVIRONMENTAL AND SOCIAL SUSTAINABILITY ACROSS THE FULL BATTERY SUPPLY CHAIN

The reform of the **EU Batteries Directive** if properly designed could provide the necessary impetus for the implementation of an effective battery collection and recycling system. This in turn will have to be accompanied by adequate incentives, and the deployment of a comprehensive network of collection points, transport- and recycling facilities.



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