A new way for construction companies to take real control over urban site pollution

Air pollution is one of the UK's big public health challenges, and urban construction plays a major part.

As the conversation around sustainable development becomes louder, construction companies and their clients are eager to make a positive difference.

The problem is, previous solutions for improving air quality simply have been too expensive or too complex to have a real impact.

Until now.

Site pollution is a major problem.

40,000

Early deaths caused by air pollution in the UK each year

230

The number of UK construction workers who die annually from cancers caused by exposure to diesel fumes

Outdoor air pollution is an expensive problem, for everyone

Outdoor air pollution causes 40,000 early deaths each year in the UK. [1]

Short- and long-term exposure to NOX, PM10 and PM2.5[2] has been directly linked to serious health conditions like cancer, asthma, stroke, heart disease, diabetes, infertility, obesity and lung infection. It's also been linked to adverse birth conditions,[3] and can stunt children's lung growth by double-digit percentage points.[4]

The financial costs of exposure are more than £20bn each year.[5]

And these negative health costs have been thrown even more into the spotlight recently, with a recent Harvard University study finding an increase of only 1 µg/m 3 (microgram per cubic metre) in PM2.5 is associated with an 8% increase in COVID-19 death rate. [6]

The UK construction industry plays a major part

Urban construction sites are responsible for some 7.5% of NOX emissions, 8% of PM10 emissions and 14.5% of PM2.5 emissions[7] (largely thanks to site traffic and on-site generators and machinery).

And some 230 construction workers die annually from cancers caused by exposure to diesel fumes.[8]

The uncomfortable truth is, urban construction contributes to unintended negative health consequences and early deaths. For construction workers and local communities, these are unacceptable costs.

Construction companies and their clients are eager to take control over their site emissions their emissions from their site supply chains and many have taken positive steps.

But there's never been a truly effective way to take action. Pressure to drive change grows but good intentions mean little, and initiatives stall.

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Current investments to reduce urban construction pollution don't go far enough.

Construction companies across the UK are embracing sustainable development, with ambitious pledges to reduce pollution and minimise impact. But delivering against those promises is hard, because tactics to reduce construction pollution don't have enough impact.

A holistic approach to reducing construction air pollution to protect workers and the local community is needed. But every measure has limitations and, so far, there's been a major missing link that hinders constructors' ability to drive change.

Providing PPE

Personal protective equipment – like helmets, gloves, eye protection, high-viz clothing, safety footwear - and respiratory protective equipment - like respirators and breathing devices – helps protect workers against health and safety risks on-site, including exposure to construction pollution.

PPE is important to protect workers from exposure but does little to solve the root problem of construction pollution. As UK HSE government guidance highlights, "only use PPE as a last-resort".[9]

PPE is a sticking plaster solution to reduce risk, not a replacement for other site controls and safety measures. "Don't automatically opt for personal protective equipment (PPE) as a control measure. It is not as reliable or effective as other measures".[10]

PPE plays a critical role in keeping workers safe, but construction companies know they can't only rely on PPE to reduce exposure; they must take action to reduce site pollution.

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Dust control measures

Some construction dust can be controlled, most often by using sprays or sprinklers to prevent dust becoming airborne.[11] For instance, maintaining surface moisture on vehicle waiting areas, washing down vehicles before they leave the site, and damping down chutes, skips and conveyor transfer points.

These measures are helpful for reducing dust associated with site activities like demolition, especially within the local community, but dust from these activities only accounts for around 1% of total construction pollution.[12]

The vast majority of construction pollution comes from site traffic and on-site generators and machinery. Mitigating construction and demolition dust is laudable but doesn't have a huge impact on the bigger picture. Dust control measures are a valid piece of the pollution control puzzle but aren't a standalone solution.

Plus, water pollution is its own problem. Pollution control tactics that risk turning one type of pollution into another aren't ideal.

Sourcing local materials

Where possible, construction companies may give preference to local suppliers and locally sourced materials, to limit travel times and reduce fuel emissions impact. The fewer miles suppliers travel, the lower construction's overall emissions impact.

Even with the best intentions, sustainability-focussed construction companies are limited by what's available. Project pressures mean suppliers must be cost-efficient and reliable – local can only matter once those boxes are ticked.

Plus, even where choosing local, sustainable suppliers is possible, you're doing little to reduce emissions in the local community. For local neighbours, the fact your materials only started their journey a few miles ago makes no difference to the end result: local pollution.

(The conversation around sustainable materials is another issue, and undeniably part of the overall sustainable construction picture – but does nothing to address the issues of local air pollution).

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Upgrading site machinery

Legacy site machinery is one of the major culprits causing construction pollution, so innovation here makes good sense. Diesel generators are responsible for around a quarter of site emissions, for example.[13]

As NRMM falls under increased legal scrutiny[14] and pressure to regulate emissions grows, manufacturers have started developing some solutions – often relying on hybrid technology - to help construction companies manage their environmental impact.

There are more options than there have ever been, but availability is still a major problem. Even giant companies – like Volvo Construction Equipment, with their LX02 electric compact wheel loader[15] – have been limited by an immature supply chain and long to-market delays.[16]

Change is slow, and mainstream machinery like diesel generators is still the norm.

For constructors pressured to deliver projects on-time and on-budget, investing in an immature market could be seen as risky. Proven track-records of machine performance, productivity and cost-efficiency are typically given preference over promises of sustainability gains.

Also, many constructors have valid concerns around power availability and recharging. Few companies will adopt change if new machinery risks disruption and delays.

Ultimately – as sustainable machinery becomes the norm – these challenges will dissipate, and these measures will play a valuable role in reducing site pollution. But right now, more immediate solutions are also needed.

Choosing green fleet operators

As with site machinery, next-generation vehicles offer possible sustainability gains – sometimes significant ones.

The growing movement towards green fleet management[17] sees some operators taking measures like upgrading fleets to meet more stringent emissions standards; investing in hybrid technology; monitoring fuel use; providing driving training; increasing maintenance and servicing schedules or installing temporary exhaust pipe monitoring systems.

Construction companies are limited by the availability of suppliers, and green fleet management is still immature.

Despite suppliers often wanting to take steps to reduce their impact, and 'do the right thing', solutions typically aren't commercially viable. As long as maintaining a green fleet involves large upfront or ongoing costs, costly disruption, or reputation-harming, delivery-damaging downtime, supplier uptake is likely to remain low.

Diesel powertrain provides proven power, resilience and cost benefits that electric vehicles struggle to compete with, for example, so diesel powertrain is likely to remain a viable medium-term solution.

Also, the move to Euro VI has been important to reduce emissions impact but these vehicles still breach pollution limits if they're performing badly. The forced upgrade to Euro VI for large urban centres was well-intentioned but ultimately loss-leading for operators given the inability to resell Euro V vehicles locally or globally.

For construction companies and their clients, choosing green fleet operators is valuable but isn't itself enough to reduce pollution. What's also needed is a systematic approach to ensuring these vehicles meet required standards and run cleanly throughout their lifetime.

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Stringent site controls and processes

Mandating how workers work can help control construction pollution. For instance, engines being switched off on-site can limit pollution from unnecessary engine idling and keeping stockpiles under sheets can help reduce dust.

Equally, traffic planning, changing delivery patterns and shift scheduling can help limit pollution build-up and exposure.

The main problem is, even if you mandate action it's hard to maintain control over contractor compliance. There's too many links in the chain and too little evidence to justify action.

Even when suppliers are aligned with sustainable practices like stopping engine idling, the message doesn't always trickle down to individuals. Individuals under huge time and cost pressure typically prioritise the fastest, most effective method; not always the most sustainable one. Real change will hinge on education, to change attitudes around sustainability.

Scheduling-based solutions are good options but they're limited by a lack of information. They're typically based on best-guesswork around what's causing pollution, when. While they aren't tethered to real-time insight, there's a limit on the positive impact they can have.

Also, during peak construction phases on complex urban sites, queues of supply chain vehicles deliver and pick up all day. Removing or reducing these vehicles isn't practical – so working within these limitations, constructors must find ways to ensure these vehicles are causing as few emissions as possible.

Site pollution monitoring

Site monitoring solutions provide valuable data about on-site emissions levels, to help constructors better understand their impact. Using these platforms, construction companies can report on overarching site construction pollution and understand site pollution over time.

The major problem with traditional site pollution monitoring systems is they only show historic data, and don't identify the pollution source. The result is, you confirm site pollution happened but you can't drill into why.

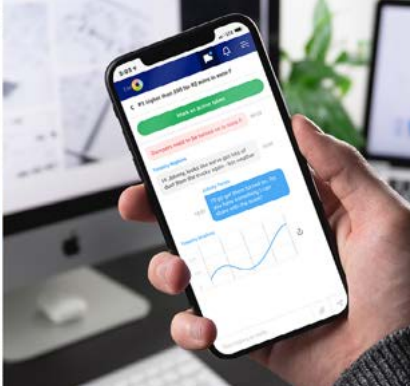
That's a major limitation because it means you can report, but without improvement or results. You can't take proactive action to solve the problem as it happens.

The result is, compliance teams are always stuck behind the data, spending hundreds of hours per year on-site on retrospective investigations (rather than targeted action to reduce pollution).

Compliance management like this represents a huge hardware and time cost – and although reporting and monitoring are crucial, alone they're fundamentally ineffective to reduce pollution.

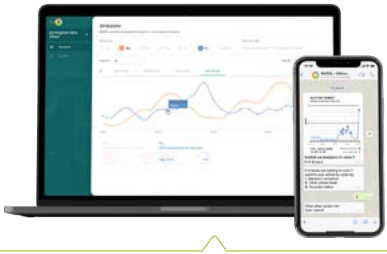
The number of solutions construction companies are exploring is testament to an industry that genuinely does want to take action. But so far, there's been no effective way to really move the needle.

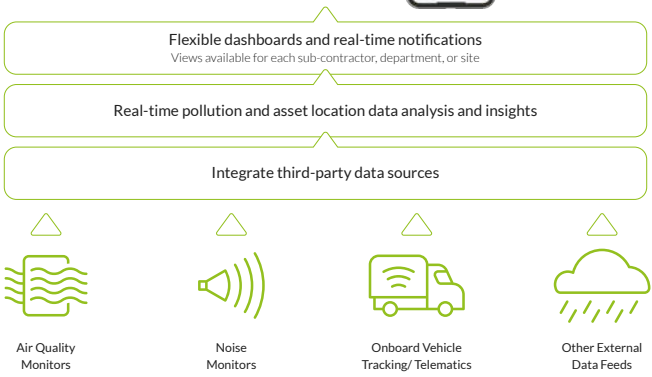
Until now.



Take control over site air pollution with EMSOL

EMSOL is a pollution intelligence platform that drives sustainable urban growth by empowering construction companies to reduce site pollution and help build local communities everyone's proud to be part of.





How EMSOL works

EMSOL combines site monitoring devices with small location tracking data from site machinery and vehicles, to give specific, real-time evidence about the sources of pollution that empowers immediate action to resolve breaches.

The relevant people are alerted via mobile in real-time when higher-than-usual emissions or breaches happen, and told which assets are causing the problem – so they can take immediate action to resolve. Like providing suppliers with evidence to mandate compliance or switching an underperforming generator.

EMSOL also gives concrete evidence to support proactive pollution mitigation tactics like evidence-based traffic planning and scheduling.

200

How many man hours EMSOL customers' typically save on pollution investigation per year on-site

EMSOL acts as a force multiplier, empowering small compliance teams to have a disproportionate impact. For example, EMSOL customers typically save around an hour per breach event and hundreds of hours per year on-site.

Ultimately, EMSOL empowers constructors to change on-site culture – not only tangibly reducing site pollution but also educating the wider supply chain, providing confidence to the local community, and becoming champions for sustainable construction.

Start making an impact on site pollution - quickly discover the cause of pollution and take targeted action.

Learn more about how EMSOL could help your business take control over your pollution impact with a short demo.

Visit our website at **www.emsol.io**
or email us at **sales@emsol.io**