

# ALL THAT THE NRMM REGULATION ISN'T AND WHAT IT COULD BE

July 2020

## SUMMARY

The NRMM Regulation goes far in terms of air pollution, but does nothing to meet the climate goals. It is clearly inadequate to fully address the full scale of the human health and climate challenge with which we are faced. It goes far, but not nearly far enough.

Therefore, Bellona calls for:

- EU policy to **regulate greenhouse gas emissions from non-road mobile machinery**.
  - As such, EU Policy should set **targets for reducing CO<sub>2</sub> emissions towards 2025 and 2030** by 2021.
- EU policy must be in line with its commitment to become net-zero by 2050, and phase out diesel engines by mid-century, meaning the absolute last date to sell CO<sub>2</sub> emitting engines will be in the 2030s, depending on the average lifetime of each NRMM. Accordingly, EU policy should push and incentivise only engines which have the **potential to bring NRMMs to zero emission**, such as batteries and fuel cells.
- **EU Policy to introduce economic means for zero emission NRMM like empowering and pushing public authorities to use their procurement power** and thus create more demand for emission free machines.
- EU Policy to ensure that the delay of the implementation of Stage V of the NRMM Regulation due to COVID-19 would not hamper the long term decarbonisation of the sector. The EU is being offered the opportunity to be a first-mover in this field and to drive innovation.

## 1. Background

The Non-Road Mobile Machinery Regulation is applicable since January 1<sup>st</sup> 2017 and covers a vast spectrum of machinery, not covered by other regulations. The vehicles and equipment it covers are: small gardening and handheld equipment,

agricultural & farming machinery, railcars, locomotives, inland waterway vessels, construction machinery and more. The regulation's purpose is to reduce air pollutant emissions from NRMMs with the target of

‘stimulating innovation, improving air quality reducing health costs and increasing life expectancy.’

In total, there were 5 stages for the regulation, with the NRMM entering its last phase on January 1<sup>st</sup> 2019. This stage requires for all sales to reduce PM limits by 97% and HC and NO<sub>x</sub> limits by 94% compared to the Stage I rules from 1997 (Figure 1). The new regulations demand engines of NRMMs between 19kW and 560kW to be equipped with diesel particle filters.<sup>i</sup>

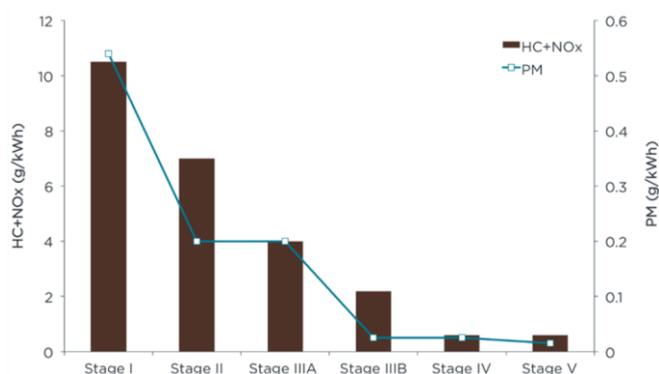


Figure 1: Emission limits from Stage I to Stage V for HC+NO<sub>x</sub> and PM; Source: ICCT

The regulation had foreseen 2020 to be the transition phase for engines >56kW and <130kW to comply with Stage V rules. The deadline gives manufacturers until June 30<sup>th</sup> 2020 to produce machinery, equipped with corresponding transition engines. By December 31<sup>st</sup>, these machines should be made available on the EU market. In the same manner, transition engines for engines between 56kW and 130kW should be produced until June 2021 and should be available on EU markets by December 2021.

The extent to which the NRMM Regulation introduced more stringent emission targets throughout its various phases, it is clear that the next logical step would be to demand an elimination of pollutant greenhouse gas emissions. However, the Commission does not plan to do this.<sup>ii</sup>

On the 2<sup>nd</sup> of June 2020, the European Commission proposed to delay the implementation of the NRMM Regulation’s Stage V for 12 months due to

COVID-19. This proposal will fall under the responsibility of the Environment, Public Health and Food Safety Committee and will be voted on in plenary on Wednesday, 8<sup>th</sup> of July.

## 2. A Missed Opportunity

The NRMM regulation claims to be regulating emissions from engines with the aim of reducing emissions and to eventually ‘phase out equipment with the most polluting engines’.<sup>iii</sup> In order to ban the most polluting engines, all polluting particles should be taken into consideration, especially CO<sub>2</sub>, the largest contributor to global warming. However, only carbon monoxide (CO), total hydrocarbons (HC), oxides of nitrogen (NO<sub>x</sub>) and particulate matter (PM) are being addressed.

Not taking the impact of fossil fuels into consideration when regulating emissions from non-road mobile machinery is a quite big and significant omission, especially given the large approximate number of CO<sub>2</sub> being emitted but not accounted for.

It is estimated that non-road mobile machines emit a total of 100 MtCO<sub>2</sub>e in the EU.<sup>iv</sup> In terms of construction NRMM emissions in the EU, currently, only 16 of the 28 EU Member States (MS) report their emissions from construction machinery. Emissions from these 16 MS added up to 20 MtCO<sub>2</sub>e, which is more than the annual national emissions of 5 MS<sup>v</sup> (Figure 2).

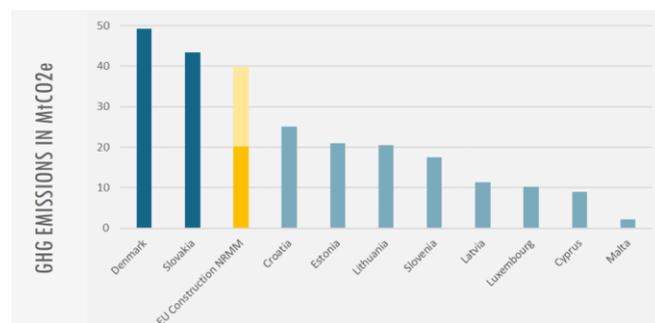


Figure 2: National Emissions relative to estimated emissions from 16 MS

Ignoring the impact of fossil fuels does not only send the signal that using conventional combustion engine powered machinery is acceptable, but could also result in a

counterproductive trade-off between reducing air pollutants and GHG emissions. At worst, reducing air pollutants from conventional construction machinery could result in higher GHG emissions.

Some European countries including Switzerland, Germany and the Netherlands have enforced more stringent regulations, namely mandatory diesel particulate filters for diesel machinery operating within their borders.<sup>vi</sup>

Furthermore, the latest stage of the NRMM Regulation is only applicable to machinery entering the market from January 2019. Most of NRMM engines however, tend to run for years, some even for decades. For the construction sector for instance, this means that it will take up to 15 years for machinery to be fully Stage V compliant, as construction equipment is used for several thousand hours before being scrapped. The same goes for other NRMM machinery. This implies that for years or decades old engines are continued to be used, while GHG emissions continue to go unregulated. In order to reach the EU net-zero 2050 target, **diesel engines will have to be phased out by mid-century.**

Hence, taking the average lifetime of NRMMs into consideration, for most NRMM engines, the absolute last date to sell CO<sub>2</sub> emitting engines will be in the 2030s. In the case of inland waterway vessels, which are also categorised as NRMM, the average lifespan lies between 20-40 years<sup>vii</sup>, meaning that a number of vessels will still be in operation even after 2050, not abiding by the EU's climate target. It has to be noted though that until that date, unregulated machines continue to contribute to air and GHG emissions in alarming amounts. The earlier GHG emissions are stopped at the source, the smaller the probability of long-lasting effects on human health and ecosystems. The EU has to communicate clear dates on when each type of engine needs to be phased out, based on comprehensive lifecycle assessments.

As it stands, the current version of the NRMM regulation is clearly inadequate in addressing the negative impact NRMM engines have on human

health and the climate. **New policy to regulate GHG emissions from NRMM is urgently needed.** Policies need to create demand for cleaner NRMM engines which will push the market to develop cleaner versions of current polluting engines while generating important health and economic benefits for society.

### 3. The Power of Public Procurement

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As a mechanism to push the market to produce emission-free NRMM engines, some relevant authorities mostly at a city level, have decided to go beyond the requirements of the NRMM Regulation and started implementing strategies which reduce air pollutant and greenhouse gas emissions. Public procurement can drive innovation in the market while also addressing the problem that emission-free alternatives are still more expensive than their diesel counterparts.

Calculations show that new zero emission equipment is approximately 20-30% more expensive than a new conventional machines, and that retrofitting of some machines can be about 3 times more cost intensive.<sup>viii</sup> Public authorities can use their role as a large buyer to set targets for the market to comply.

In the long run, as battery prices continue to fall and as higher demand increases production and sale, the upfront cost will fall. Through public procurement, authorities can also play a big role in increasing demand for non-diesel machinery while also making the emission free alternatives already available for deployment today. City authorities can drive the market through incorporating minimum environmental criteria for certain NRMM equipment in the tenders (Figure 3). As a further step, authorities can provide bonuses to tender applications which plan to use zero emission engines. Changing the tender criteria also solves the issue of external costs not being internalised, which is still a widespread issue in the EU.

**Bellona calls on the EU to empower and push public authorities to use their procurement power and thus create more demand for emission free NRMM engines.**

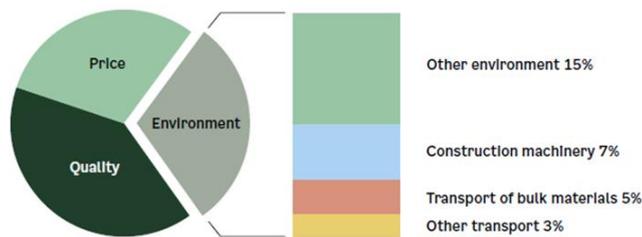


Figure 3: Oslo's Weighted Criteria for Construction Tenders. Tender applications with good environmental credentials are more likely to win ; Source: [Oslo Klimataten](#)

## 4. The Right Alternative

The next step to eliminate air pollution and GHG emissions from non-road mobile machinery will require a technological shift towards different powertrains and fuels. Electrification via fuel cells and batteries appear to offer the best alternative when it comes to air pollution and GHG emissions, with the added benefit of reductions in noise and operational costs. Over its lifetime, electric equipment emits around 40% less emissions than diesel machinery.<sup>ix</sup> With renewables expected to become the dominant form of power generation over the next decades, lifetime emissions will continue to fall. It is important to note that while it will be possible for electricity and hydrogen to bring NRMM engines to zero emission, efficiency improvements in diesel engines will never result in zero emissions. Switching to a different combustion fuel, such as specific biofuels like sustainably sourced HVO and cleanly produced biogas, offers only a somewhat viable intermediate solution, but there are significant concerns relating to the impact on the environment and the scalability of such a solution.

Apart from significantly reducing greenhouse gas emissions, the deployment of fuel cells and batteries also results in no direct air pollution and less noise pollution in the case of NRMMs like construction equipment.

## 5. The Specific Case of NRMM Construction

Out of all NRMM, Bellona specifically focuses on construction machines and equipment. There is no exact number of emissions caused through European NRMM, and there is a lack in recordings for emissions from construction machinery as well. Therefore, for our analysis we made our own calculations. Only 16 of the 28 EU Member States report their emissions from construction machinery. In these 16 EU countries, construction machinery and equipment emitted 20MtCO<sub>2</sub>e in 2017. This is higher than the total national emissions of 5 EU Member States. (Slovenia, Luxembourg, Cyprus, Latvia and Malta.) Not all countries report this data, therefore actual overall emissions of construction machinery in the EU is certainly higher. The most significant omissions from the statistics are France and Italy.

A DNV GL report commissioned by Oslo's Climate Agency, estimates that between 120 and 240 Mt of CO<sub>2</sub>e come from construction sites in the C40 cities.<sup>x</sup> The Greater London Authority reports that in Greater London alone, construction machinery accounts for 150 000 tons of CO<sub>2</sub>.

## 6. Covid-19 Regulation Amendment

On the 2<sup>nd</sup> of June 2020, the European Commission proposed to delay the implementation of the NRMM Regulation's Stage V for 12 months due to COVID-19. This proposal will fall under the responsibility of the Environment, Public Health and Food Safety Committee and will be voted on in plenary on the July 8<sup>th</sup>.

This proposal came after six industry associations representing the non-road mobile machinery sector called on the EU to postpone the deadlines for emission limits. "The co-signatories point out that the COVID-19 outbreak is causing complete interruptions of supply of parts and components," the associations wrote.<sup>xi</sup>

While these are challenging times, the current situation should not be an excuse to reduce ambition when it comes to tackling environmental issues.

Bellona calls EU Policy to ensure that there's **no room for cheating** within the delay to the implementation of Stage V of the NRMM Regulation due to COVID-19. The European Commission needs **to take leadership in decarbonising** the NRMM sector.

Constructively engaging with the market and requiring plans on how NRMM manufacturers plan on complying with the EU's target of climate-neutrality by 2050, are only some of the steps the Commission will need to take.

The development of new technologies for construction machinery opens up an opportunity for the EU to take the lead in the innovation of the sector. Many large manufacturers already exist and need to adapt to the future economy. Doing so sooner rather than later is essential and delaying such a transition will only damage EU industry. As such, the EU currently has the opportunity to be a first-mover in this field and ensure that it remains a global leader when it comes to the manufacture of construction machinery.

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- i [https://theicct.org/sites/default/files/publications/EU-Stage-V\\_policy%20update\\_ICCT\\_nov2016.pdf](https://theicct.org/sites/default/files/publications/EU-Stage-V_policy%20update_ICCT_nov2016.pdf)
- ii [https://www.europarl.europa.eu/doceo/document/E-9-2020-000679-ASW\\_EN.html](https://www.europarl.europa.eu/doceo/document/E-9-2020-000679-ASW_EN.html)
- iii [https://ec.europa.eu/growth/sectors/automotive/environment-protection/non-road-mobile-machinery\\_en](https://ec.europa.eu/growth/sectors/automotive/environment-protection/non-road-mobile-machinery_en)
- iv <https://data.consilium.europa.eu/doc/document/ST-13690-2014-ADD-2/en/pdf>
- v [https://network.bellona.org/content/uploads/sites/3/2019/10/ZECS\\_Status2019.pdf](https://network.bellona.org/content/uploads/sites/3/2019/10/ZECS_Status2019.pdf)
- vi [https://theicct.org/sites/default/files/publications/EU-Stage-V\\_policy%20update\\_ICCT\\_nov2016.pdf](https://theicct.org/sites/default/files/publications/EU-Stage-V_policy%20update_ICCT_nov2016.pdf)
- vii <https://cordis.europa.eu/project/id/285405/reporting/es> ,  
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- viii <https://www.klimaoslo.no/wp-content/uploads/sites/88/2019/06/Perspectives-on-zero-emission-construction.pdf>
- ix <https://www.klimaoslo.no/wp-content/uploads/sites/88/2019/06/Perspectives-on-zero-emission-construction.pdf>



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