Executive Summary

- CECE calls upon the legislator to re-introduce the replacement engine provision as contained in the present Exhaust Emission Directive 97/68/EC.
- The quantity of replacement engines sold is extremely small compared with the overall quantity of machines operating in Europe but the ability to obtain a replacement engine is critical for machine owners and operators.
- Re-manufacture of only those engines already placed on the EU market is not a feasible solution.
Introduction

The new EU exhaust emission regulation proposed by the European Commission in September 2014 does not include the existing 97/68/EC replacement engine derogation. This represents a major change compared with ‘business as usual’ and causes considerable concern among manufacturers of land-based non-road machines and engines.

Furthermore, it is apparent that existing EU emission legislation for on-highway vehicles permits without restriction the production and supply of replacement engines. For example, Article 8 of Regulation 595/2009 specifically exempts ‘replacement engines for in-service vehicles’ from the prohibition of the sale and use of new engines not complying with the (Euro VI) regulation. Non-road engine and machine manufacturers believe that this should also be the case for the proposed non-road stage V engine emission regulation.

Manufacturers seek to work with the EU legislators in order to ensure that the new non-road emission regulation continues the already highly successful reduction in emissions from the European non-road machine fleet, whilst ensuring the continued opportunity to provide replacement engines to satisfy the operation & maintenance needs of owners and operators.

1. The quantity of replacement engines sold is extremely small compared with the overall quantity of machines operating in Europe but the ability to obtain a replacement engine is critical for machine owners and operators

Non-road mobile machinery is used in a highly diverse range of applications, including earth-moving, mineral extraction, construction, materials handling, agriculture and general industrial applications such as airport operations and portable power generation. These machine fleets often represent high value capital investments which are used in time-critical applications. They create value for their respective economies as they help build and maintain infrastructure, keep airports and ports moving, extract the raw materials and produce the food crops necessary to support and grow economic development.

For example for construction equipment, the quantity of replacement engines is extremely small compared with the overall quantity of machines operating within Europe. CECE conducted a survey among its members during summer 2014, in order to substantiate the magnitude of the problem. CECE received 30 replies to the questionnaire, which is a remarkably high number. More than 70% of respondents answered that the proportion of machine population that requires the engine to be replaced within the machine’s working life within the EU is lower than 2%, for 40% it is even below 0.5%.

The vast majority of machines will retain the engine that was originally installed in the OEM’s factory for the entire European working life. However, for those machines that do require a replacement engine the need may be critical.

Owners and operators across Europe rely on engine and machine manufacturers to provide replacement engines through their spare parts and service organisations in order to resolve catastrophic failures in their machine fleets. Replacement engines are critical to the economic and operational efficiency of European businesses that depend on maximum machine “up time” to service their customers’ needs. Today’s machine owners and operators understand the value of time and seek to maximize their utilization of their machines, minimising the cost of providing goods and services to European society. The impact of the unavailability of replacement engines would be especially high for smaller businesses that cannot afford to have ‘spare’ machines in case of breakdown.

If replacement engines are not available to support machine fleet repairs and maintenance, operations will be delayed and will be more costly. The absence of a replacement engine option could cripple a business and inconvenience its customers. For example, a crushed-stone aggregate quarry operation that owns and operates one wheeled loader and fleet of ten haul trucks to move the crushed stone would come to a standstill if the engine in its wheeled loader broke down. Until the loader is repaired the haul trucks are unable to work, the quarry owner loses money paying for inactive staff and inoperable assets and the downstream recipients of the crushed-stone do not receive their goods. Similarly, a group of small farms may rely on one high-value high-productivity combine harvester to reap the entire harvest. A broken-down combine harvester means the crop cannot be harvested during the narrow window when the crop is ripe and the weather is good, with the resultant ruin of the crop and loss of income to the farmers.

2. Replacement engines are available as spare parts on a global basis

At present, engine and machine manufacturers typically maintain an inventory of replacement engines compatible with the machine fleets of their customers, in the same way that they maintain an inventory of other spare parts. These engines may be held in spare parts distribution centres in various global locations, inside or outside of the EU, ready to be shipped to customers for immediate (often overnight) delivery via the manufacturers chosen logistics supplier. Generally, a manufacturer could have its customer’s machine up and running again in 48 hours.

In contrast, if replacement engines were not allowed, the machine owner or service provider would have to remove and rebuild the failed engine. Such a re-build procedure would typically take two to three weeks. The machine owner or service provider would need to disassemble the engine, diagnose the failure mode, procure the replacement parts and then rebuild and reinstall the engine into the machine. While customers may wait a day or two to receive their crushed stone, it is unlikely that they would wait two to three weeks to receive their crushed stone. The operator’s customers would probably take their business to another quarry. In the case of the combine harvester, the delay from not having a replacement engine could mean the farmer losing an entire season’s crop. In the modern resource-efficient world the inability to expeditiously provide a replacement engine would be a major backward step.

3. Current stage engines cannot generally be used as replacement for prior-stage engines

As described in sections 1 & 2, in most cases the need for a replacement engine occurs at short notice and the time taken to replace the engine is critical. For this reason the vast majority of replacement engines are supplied as exact one-to-one substitutes of the same engine model
from the same engine manufacturer. Replacement with a non-identical engine in these circumstances is simply not practical. Indeed, for some applications, the engine may even be a structural part of the chassis. In this case if an identical replacement engine cannot be provided then the entire machine may need to be scrapped when the value of the engine represents a minor part of the value of the machine.

Use of a newer stage of engine, or an engine from an alternative manufacturer may be possible in a very limited number of cases, in some applications. These are often referred to as ‘re-powering’ and will typically only be in cases where the replacement is not time critical and a more extensive refurbishment of a machine is taking place over many weeks, enabling the opportunity to make modifications. However, even in this case the opportunity to use a newer stage of engine may be limited. For example, it is rarely possible to install an engine with cooled exhaust gas re-circulation (EGR) and after-treatment systems into a machine that was not designed to accommodate such systems, due to cooling system and space limitations.

4. Re-manufacture of only those engines already placed on the EU market is not a feasible solution

It has been argued that the current derogation in 97/68/EC that enables the manufacture of new replacement engines is unnecessary because it should be possible to satisfy customer needs by re-building or re-manufacturing existing engines that have already been placed on the EU market. Section 2 explains why the re-build option cannot alone satisfy market needs.

Re-manufacture of existing engines is an alternative widely used option that may be used to provide the necessary stock of engines for replacing the existing engine in the customer’s machine. In this case used engines are disassembled and separated into their component parts. Each type of component then undergoes cleaning and inspection, during which time most markings except for those that are cast or etched are usually destroyed, and the re-usable components are restored (re-manufactured) to the original specification. Any components that are not repairable are replaced by new components. The stocks of each component (blocks, heads, connecting rods, valves, fuel injection systems, turbochargers, etc.) are then used to assemble engines of various types/families according to the original type-approved specification.

However, this re-manufacturing activity may take place inside or outside of the EU and normally the supply of used engines (known as ‘cores’) for the re-manufacturing activity will also come from both inside and outside the EU. Due to the varied location of the re-manufacturing activity, varied source of cores, and the fact that the original identity of the engine is likely to be indistinguishable, re-manufacturers often use the replacement engine derogation in order to place these engines on the EU market. The proposed removal of this derogation would consequently appear to prevent the placing on the EU market of a newly built engine assembled from re-manufactured components to a previous emission stage for the purpose of replacing an engine in an existing machine.

Re-manufactured engines may be acceptable to customers when engines and machines are no longer covered by a commercial warranty. However, if a major engine failure occurs during the warranty period the customer will normally insist that a new engine is provided and fitted. For machines placed on the market at the end of an emission stage, after the deadline for the end of production of new engines to a prior stage, the commercial warranty may extend for several years into several consecutive stages. It is absolutely essential to be able to produce and place on the market new replacement engines for this purpose.
5. Continuing to enable the use of replacement engines promotes sustainability

Removal of the option to provide a replacement engine for an existing machine would result in the obsolescence of a non-current stage machine if the engine breaks down or wears out to a point that it cannot be repaired. The "resource-efficient Europe" flagship initiative is a key part of the "Europe 2020 Strategy", the EU’s growth strategy for a smart, inclusive and sustainable economy. It supports the shift towards sustainable growth and a circular economy. By including the replacement engine derogation in the proposal for a new non-road engine emission regulation, the Commission will enable owners, operators and manufacturers to preserve the value of their capital investments and provide a mechanism to preserve the intrinsic value of existing manufactured goods. Maintaining a high intrinsic value and high re-sale value of a machine is essential to enable a machine owner or operator to be able to afford to sell the existing machine and purchase a new current-stage machine.

The failure to maintain a derogation for replacement engines would instead contradict the EU's own agenda for resource efficiency, as this would lead to incurring the environmental costs of extracting, refining and fabricating new manufactured goods to replace existing goods or seriously undermine well established resource-efficient repair options such as remanufacturing, where legitimate customer expectations for up-time and cost are satisfied through complex logistical and industrial processes.

6. The impact assessment for the new non-road mobile machinery emission regulation did not appear to include an assessment of the impact of removing the replacement engine derogation

For the reasons identified in the previous sections, implementation of the proposed new non-road engine emission regulation without derogation for replacement engines would result in premature obsolescence of non-current stage equipment as it breaks down or wears out, with limited maintenance opportunity. In the absence of EU funding for owners to replace or upgrade their fleets to current stage models, such a policy could have the unintended consequence of imposing significant new capital costs on all European industries using non-road mobile machines.

Engine and machine manufacturers believe that removal of the replacement engine derogation should not be contemplated without a thorough impact assessment of the societal cost of this change. Engine and machine manufacturers believe that removal of the replacement engine derogation would represent a net cost to society and call upon the EU legislators to instead work with the industry to ensure a robust, workable replacement engine provision is provided in the proposed new regulation.

CECE is the recognized organization representing and promoting European construction equipment and related industries. CECE represents 16 national associations from 14 countries. The industry behind CECE comprises of 1,200 companies employing directly around 130,000 people with a total turnover of 25 billion Euros from European production in 2013.