EU And EPA Target Rail Engine Emissions

year	stage	power (kW)	g/kWh			
			NO_x	HC	PM	CO
2007	3a	130 to 560	4.0		0.2	3.5
2009	3a	> 560 to 2000	6.0	0.5	0.2	3.5
2009	3a	> 2000	7.4	0.4	0.2	3.5
2010	3b	> 130	4.0		0.025	3.5

Fig. 1. Stage 3a and 3b emissions standards for locomotives.
Source: EU Directive 2004/26/EC

The environmental benefit demonstrated by railways over other modes of transport is a vital precondition in ensuring social and political support. The railways have shown that on specific consumption of resources and specific emissions of carbon dioxide, their values are much lower than those obtained by their main competitors on the road, in particular due to the higher passenger densities.

Although road transport continues to be considered the main source of harmful mobile emissions, exhaust emissions from diesel-powered locomotives and railcars, despite their small numbers, are increasingly attracting the attention of authorities — not just on a local level, but also on a European and international scale.

In 2004, EU Directive 1997/68/EC on exhaust emissions from nonroad mobile machinery (NRMM) has been extended to cover all new diesel engines for railway vehicles. Directive 2004/26/EC sets Stage 3a limit values for NO_x and PM10. These limits came into force at the beginning of 2006 for railcars and will come into force by 2009 for all types of locomotives. Stage 3b will come into force in 2012 for railcars and locomotives and particularly tightens PM10 emissions by around 90% relative to the previous stage.

A technical review of the Stage 3b limit values is currently carried out (see Euromot News, May-June 2007, *Diesel Progress International Edition*) to examine progress made in developing reliable and cost-efficient technology for this niche where high-power locomotive engines are derived from other applications and, if necessary, propose exemptions and derogations. The railway industry especially asks for greater flexibility in the types of engines that can be fitted to existing rail vehicles when they are re-engined. Directive 2004/26/EC requires that any existing traction unit that is re-engined as of January 2006 must be fitted with new engines that meet either Stage 3a or 3b.

An important step forward to reduce harmful emissions has been achieved in Europe with the proposed directive for transportation fuel EC COM(2007)18 including nonroad diesel fuel and reducing the sulfur content of nonroad fuel to 10 ppm by 2010 (see Euromot News, March-April 2007, *Diesel Progress International Edition*).

In the U.S., EPA has slashed the sulfur content of diesel fuel for trains, ships and nonroad equipment by June 1, 2007. Under a 2004 clean air regulation, refineries had to reduce sulfur from current levels of about 3000 ppm in nonroad diesel fuel to a maximum of 500 ppm. In 2012, the sulphur level of locomotive fuel will have to be further reduced to meet the ultra-low requirement of 15 ppm.

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year	stage	power (kW)	g/kWh			
			NO_x	HC	PM	CO
2006	3a	> 130	4.0		0.2	3.5
2012	3b	> 130	2.0	0.19	0.025	3.5

Fig. 2. Stage 3a and 3b emissions standards for railers.
Source: EU Directive 2004/26/EC

vehicle type	investment costs	fuel consumption	additive consumption	engine maintenance costs
railcars	+3% to +7%	> 0%	0%	0% to +5%
locomotives	+3% to +15%	+4% to +6%	0%	+5% to +10%

Fig. 3. Estimated changes in life-cycle costs (%) for technical measures to meet the Stage 3a limits.
Source: EC DG Transport and Energy Rail Diesel Study 2006

In addition, the agency has proposed a new Clean Air Locomotive (and Marine) Diesel Rule that would, when fully implemented, cut PM emissions by 90% and NO_x emissions by 80%. The proposal consists of a three-part emissions control strategy:

- EPA is proposing to adopt more stringent standards for existing locomotives when they are remanufactured. These standards would take effect as soon as certified remanufacture systems are available — which the agency said could be as early as 2008 but no later than 2010 or 2013 for Tier 2 locomotives.
- EPA is proposing near-term Tier 3 emissions standards for newly built locomotive (and marine) diesel engines. These standards would reflect the application of technologies to reduce engine-out PM and NO_x emissions and would be phased in starting in 2009.
- EPA is proposing long-term Tier 4 emissions standards for newly built locomotives (and marine) diesel engines. These standards are based on the application of high-efficiency catalytic aftertreatment technology and would phase in beginning in 2014 for marine diesel engines and 2015 for locomotives. These standards are enabled by the availability of ultra-low sulfur diesel.

The European railway and IC engine industries are now considering how these new rules can be best aligned with the European legislation. However, the proposed new U.S. rules will certainly have a strong impact on the Euromot position for Stages 3b and 4 in the aforementioned technical review of the European Nonroad Mobile Machinery Engines Directive. It shall be available well in advance of the next EC stakeholders meeting, which is tentatively scheduled for September.

For more information about the U.S. Clean Diesel Locomotive Program, go to www.epa.gov/otaq/locomotv.htm. For the EU Nonroad Mobile Machinery (NRMM) Directive, go to ec.europa.eu/enterprise/mechan_equipment/emissions/direct.htm.

For further information, please visit www.euromot.info or contact the General Secretariat at: Telephone: +49 69 6603 1457 or E-mail: euromot@vdma.org.

powerlines

GGB has announced plans to begin manufacturing in China later this year. The 4000 m^2. facility will be located in Suzhou, China, and according to GGB, will be built to current Western standards. The facility is scheduled for completion in the fourth quarter of 2007 and will initially employ 25 people. All of GGB's metal-polymer and filament-wound bearings will be produced at the plant. GGB also has a sales office in Shanghai and Beijing, China.

After two and a half years operating as World Endüstriyel Lastik, Solideal in Turkey has changed its name to **Solideal Lastik Ticaret Limited Sirketi**. "In Turkey, everybody was thinking that we are the distributor of Solideal, not a member of the Solideal Group," said Ali Yetkin, general manager of Solideal Lastik. "So it will be helpful for us that we are the Solideal for Turkey." Solideal Lastik supplies the Turkish marketplace with Solideal's full range of tire, track and wheel products.

Mack Trucks Inc. has announced the 2006 Mack International Distributor of the Year as Salinas y Fabres S.A. (SALFA), Santiago, Chile. Headquartered in Santiago, Chile, with 11 other locations throughout the country, SALFA has been a Mack distributor since 1938 and currently has more than 800 employees. Within the last several years, SALFA has made significant investments, including constructing new facilities and updating current ones. SALFA has been named a Mack International Distributor of the Year seven times.

The **Agritechnica Show 2007** will be held in Hannover, Germany, from Nov. 13-17, with Nov. 11–12 as preview days. DLG, Deutsche Landwirtschafts-Gesellschaft e.V., organizer of Agritechnica announced that the show has registered 20% more exhibitors with a total of 1800 companies. The area has been increased due to the high demand, and this year's edition will see three more halls, bringing the total to 16. The number of expected visitors is 250 000. DLG attributes this significant increase to the general optimism in the farming industry, resulting from a survey in 2006 among 3000 European farmers. The show will host national pavilions for Italy, Canada, Turkey and the United States. Along with the usual showcase of machinery and innovations, this year's show will offer a focus on some key areas: climate change and soil conservation, bio-energy and robotics. In addition to these themes, the show

will offer conferences and discussions led by international specialists. More information about Agritechnica 2007 can be found online at www.agritechnica.com.

A pair of researchers from the **Bosch Group** have been recognized as "European Inventors of the Year" by the EU commission and the European Patent Office. Andrea Urban and Dr. Franz Laermer were honored for their work with micro-electromechanical systems (MEMS) technology. The two developed a special plasma etching process for silicon, which allowed a cost-effective mass production of sensors used in, among other things, electronic engine management systems. Bosch has begun utilizing the production process in its Reutlingen, Germany, plant, where more than 130 million sensors are produced a year.