

« Review and evaluation of the existing European and national legal framework for Occupational Health and Safety, in the extractive industry»

by

K. Tsihla*, C. Kavalopoulos**, K. Adam***

Introduction

The aim of the present article is to review the major provisions of the prevailing European legal framework for Occupational Health and Safety (OHS), as applied in the extractive industry. The evaluation of the implementation of this regulatory framework in the EU Member States, given in this article, was based on European Health & Safety studies (COWI report, stemmed from official statistics of the European Working, Conditions Survey (EWCS), enterprises' Survey on New and Emerging Risks (ESENER), European Labour Force Survey (EU-LFS) and hoc accidents at work and other work-related health problems and finally Euromines' and Stakeholders reports (National authorities, Labour Inspectorates, workers' representatives, employers' representatives, research institutes, academia, OSH professional bodies)).

The recent EU legislation, on Health and Safety, developed along the framework set in the "OSH Frame Directive (89/91/EEC)" and relevant (sector, hazard and type of worker- specific) Directives subsequently issued, is summarized. The incorporation of goal oriented Directives and several key points of EU Strategy for Occupational Health and Safety along with regulations on occupational exposure limits, are presented, providing for new restrictions and responsibilities, which can greatly affect the mining industry.

In addition to that, the implementation of the European Legal Framework and its relevant, incorporation in the national legal framework of member states, is evaluated, providing a special reference and analysis of the Greek legal framework.

The article focuses on the specific problems encountered regarding the compliance of SMEs (Small Medium Enterprises) and contractors' staff with the Health and Safety legislation of the extractive industry, including proposals on suitable measures for the implementation and incorporation of the legal framework through building of health and safety systems and health and safety culture respectively.

1. EU legal framework of Safety and Health at Work - compliance of EU member states (at national level)

European directives set out the minimum standards for safety and health in the workplace. The EU directives are implemented through the national legislation of Member States. Member States may adopt stricter rules to protect workers but their legislation must comply with the minimum standards. As a result, national safety and health legislation varies from member to member, across Europe.

Concerning the main structure of the core body of the relevant legal framework, the EU general frame for Occupational Safety and Health in Member States, is set by the Framework Directive (89/391/EEC), which describes the General Principles, and the 23 individual Directives which cover many areas of the working environment, focusing on specific aspects of safety and health at work. The individual Directives tailor the principles of the Framework Directive to: specific tasks, specific hazards specific workplaces and sectors specific groups of workers and specific work related aspects (osha, european directives of safety and health at work (osha site)). The individual directives define how to assess these risks and, in some instances, set limit values for certain substances or agents.

The legal framework for Safety and Health at Work can be structured into 4 categories (OHSa WEBSITE...)

Reference (European Agency of Safety and Health at Work, European directives on safety and Health at Work)

.	1 General Directives
.	2 Sector specific Directives
.	3 Hazard -specific Directives
.	4 Type-of-worker Directives

Below the structure of the European Legal Framework of Safety and Health at Work is depicted (figure 1)

General & mining sector specific directives

First and foremost, the major and most crucial general directive, which set the fundamentals of the legal framework of Occupational Health and Safety was **Directive 89/391/EEC** on the introduction of measures to encourage improvements in the safety and health of workers at work (Framework directive).

The European Framework Directive on Safety and Health at Work (Directive 89/391 EEC) adopted in 1989, was a substantial milestone in improving safety and health at work. It guaranteed and safeguarded minimum safety and health requirements for employees, throughout Europe, while Member States were allowed to maintain or establish more stringent measures.

In 1989 some provisions of the Framework Directive brought about considerable innovation including the following:

- The term '**working environment**' was set in accordance with International Labour Organisation (ILO) Convention No. 155 and defines a modern approach taking into account technical safety as well as general prevention of ill-health.
- The Directive aimed to establish an equal level of safety and health for the benefit of all workers (the only exceptions are domestic workers and certain public and military services).
- The Directive obliges employers to take appropriate preventive measures to make work safer and healthier.
- The Directive introduced as a key element the principle of risk assessment and defines its main elements (e.g. hazard identification, worker participation, introduction of adequate measures with the priority of eliminating risk at source, documentation and periodical re-assessment of workplace hazards).
- The new obligation to put in place prevention measures implicitly stressed the importance of new forms of safety and health management as part of general management processes.

The Framework Directive had to be transposed into national law by the end of 1992. The repercussions of the transposition on national legal systems varied across Member States. In some Member States, the Framework Directive had considerable legal consequences due to inadequate national legislation, while in others no major adjustments were necessary, due to the fact that the already existing national framework was more stringent and very prescriptive

When it comes to the sector specific directives, the most important that greatly affected and concerned the mining industry, was **Directive 92/104/EEC** which set and defined the minimum health and safety requirements for improving the safety and health protection of workers in surface and underground mineral extracting industries (Mines and Quarries Directive).

The key points and the main goals of this directive were the following:

- ❖ This Directive laid down the minimum requirements for improving the safety and health protection of workers in surface and underground extractive activities (except for the mineral extracting industries through drilling which is covered by Directive 92/91/EEC).
- ❖ The terms **surface**, **underground mineral-extracting industries** and **workplace** are defined
- ✚ Employers must take the following measures to safeguard the health and safety of workers by ensuring that:
 - ❖ Workplaces are designed, constructed, equipped, commissioned, operated and maintained to allow workers to perform the work assigned to them without endangering their own and others' health or safety;
 - ❖ Operation of workplaces takes place under the supervision of a person in charge;
 - ❖ Work involving a special risk is only carried out by competent staff in accordance with employers' instructions;
 - ❖ All safety instructions are comprehensible to workers;
 - ❖ Appropriate first-aid facilities are available;
 - ❖ Any relevant safety drills are performed regularly.
- ✚ Employers must ensure that a Safety and Health document is drawn up and kept up to date. The relevant Health and Safety document, must be drawn up before work starts, and demonstrate in particular that:
 - risks to which workers are exposed, have been determined and assessed;
 - adequate measures will be taken to attain the aims of this Directive;
 - the design, use and maintenance of the workplace and equipment ,are safe.
- ✚ Where workers from several undertakings are present in one workplace, each employer must be responsible for all matters under his control. The employer who is in charge of the workplace must coordinate the implementation of measures
- ✚ Employers must take measures and precautions to avoid, detect and combat the starting and spread of fires and explosions, and prevent the occurrence of explosive or health-endangering atmospheres.
- ✚ The employer must also provide and maintain appropriate means of escape and rescue in order to ensure that workers have adequate opportunities for leaving workplaces in the event of danger.
- ✚ The employer must take measures to provide warning and other communication systems to enable assistance, escape and rescue operations if the need arises. Workers and their representatives must be informed of all measures taken concerning safety and health in workplaces. This information must be comprehensible to the workers concerned.

FRAME DIRECTIVE (89/391/EC)

Figure 1

General Directives

- **Directive 89/654/EEC** concerning minimum safety and health requirements for the workplace (Workplace Directive)
- **Directive 89/656/EEC** on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace (use of PPE directive)
- **Directive 92/58/EEC** on the minimum requirements for the provision of safety and health signs at work (osh signs Directive)

Mining Sector Specific Directives

- **Directive 92/104/EEC** on the minimum health and safety requirements for improving the safety and health protection of workers in surface and underground mineral extracting industries (Mines and Quarries Directive)
- **Directive 92/91/EEC** concerning minimum requirements for improving health and safety protection of workers in the mineral extracting industries through drilling (Drilling Directive)
- **Directive 2009/104/EC** on the minimum safety and health requirements for the use of work equipment by workers at work (Work Equipment Directive)

Hazard Specific Directives

- **Directive 90/269/EEC** on the minimum health and safety requirements for the manual handling of loads where there is a risk particularly of back injury to workers (Manual handling Directive)
- **Directive 98/24/EC** on the protection of workers from the risks related to chemical agents at work (Chemical Agents Directive). A further analysis in this directive focus on its great impact on the extractive industry, will follow in the next chapters
- **Directive 2000/54/EC** on the protection of workers from risks related to exposure to biological agents at work (Biological Directive)
- **Directive 2002/44/EC** on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (Vibration Directive)
- **Directive 2003/10/EC** on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (Noise Directive)
- **Directive 2004/37/EC** on the protection of workers for the risks related to exposure to carcinogens or mutagens at work (Carcinogens or Mutagens Directive). A further analysis in this directive focus on its great impact on the extractive industry, will follow in the next chapters
- **Directive 2004/40/EC** on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (Electromagnetic Directive)
- **Directive 2006/42/EC** on Machinery and amending Directive 95/16/EC (traceability of explosives)
- **Directive 2009/148/EC** on the protection of workers from the risks related to exposure to asbestos at work (Asbestos Directive)

Type of Worker Directive

- **Directive 91/283/EEC** supplementing the measures to encourage improvements in the safety and health at work of workers with a fixed-duration employment relationship or a temporary employment relationship (temporary workers directive). This directive concerns especially the contractor's staff of extractive industry

- ◆ Employees should receive health surveillance appropriate to the risks they incur at work. Each worker is entitled to health surveillance before being assigned to duties and subsequently at regular intervals.
- ◆ New and existing workplaces must meet the minimum requirements for safety and health described in this directive. When workplaces undergo changes, the employer should ensure that those changes comply with the minimum requirements of this Directive.

(European Agency of Safety and Health at Work, European Legal Framework)

Concerning the compliance, the majority of MS have implemented and incorporated the directive in their legal framework and they have further more prescriptive safety measures and specifications, especially when it comes to working conditions, processes and job description. Due to the fact that the directive is quite general, it was implemented in 82% of employees in extractive industry. It showed no overlaps between national and european level. (GMEA, 2015)

Due to the fact that the national legal framework of several member states is very prescriptive, that is to say that it is more descriptive and not based on goals (goal-oriented), it is difficult or infeasible to compare between them, concerning the special measures and obligations of health and safety.

(European Agency of Safety and Health at Work, legal framework of safety and health at work, directive 92/104/EEC)

(European Agency of Safety and Health at Work, Communication to the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of regions (Brussels, 5.2. 2004 COM (2004) 62 FINAL) at the practical implementation of the provision of Health and Safety at Work Directives 89/391 (Framework, 89/654 (Workplace), 86/655 (Work Equipment), (89/656(Personal Protective Equipment), 90/269 (Manual Handlings of Loads 90/270 (Display Screen Equipment)

Qualitative characteristics of European Legal Framework of Safety and Health at Work and its implementation by member states

The directives, (depicted in figure 1) currently represent a mix of on the one hand a goal oriented legislative approach , which establishes a requirement that Member States themselves identify the most suitable means to arrive at a certain end, and on the other hand a prescriptive approach, which specifies the means to be applied.

As far as the type of approach of the legal framework is concerned, the **goal-oriented** approach is very strongly expressed in the Framework Directive and mirrored in some individual directives as well, and the **prescriptive approach** is, for instance, reflected in the very detailed and specific requirements in the annexes of some daughter directives (sector, hazard and type of workers specific).

Some Member States place an emphasis on the goal oriented approach in their national implementation, whereas others prefer a stronger reliance on the prescriptive approach. This national preference seems, at least partially, to depend on the existing regulatory traditions on the individual Member States.

As an example of National Implementation, we place the legal framework for the mining activities Greek Extractive Industry (Regulation for Mining and Quarry Activities), which has many specifications in relation to the European and could be characterized as more prescriptive.

Most of the MSs follow a common structure whereby the main principles and requirements,

mainly from the Framework Directive, are transposed in one single act, usually the framework law on OSH, alternatively the Labour Code and/or the Public Health Act. This national framework legislation was not necessarily newly adopted after the entry into force of the Framework Directive; it is often the case that existing OSH legislation has been brought together into one main OSH Act or that an existing OSH Act has been amended to comply with the Framework Directive. For example, in Luxembourg, a significant development of the framework legislation for OSH took place with the adoption of two major laws on 17 June 1994, which transposed Directive 89/391/EEC and replaced the old framework dating back to 1924 and other scattered legislation. These are the Laws of 17 June 1994 on respectively the safety and health of workers at work and on occupational health services. As one stakeholder noted, the transposition of the Framework Directive had provided a clear boost to Luxembourg legislation and policy on OSH as it led to a regrouping of a number of pre-existing elements and added further requirements in other areas. In particular, the transposition of the EU Directive triggered a stronger focus on preventive rather than remediation measures. Furthermore, in 2006, the Framework Law on OSH was incorporated into the Labour Code, which is now the main framework legislation for OSH.

A few other Member States have adopted another approach, whereby the main principles and requirements are split between different laws. However, such instances are generally linked to the way legislation is shaped in a given country, and the main requirements and principles set in the Framework Directive are still transposed through primary legislation. Therefore, the national legislation often reflects the structure of the EU OSH legislation, with a framework law complemented with by-laws which transpose each individual Directive.

Furthermore, several Member States have transposed the two OSH Directives on the mineral extracting industry (i.e. Directive 92/104/EEC (mineral-extracting) and Directive 92/91/EEC (drilling)) through several pieces of secondary legislation or through, e.g., the national Mining Act and secondary legislation. (COWI report 2015).

2nd Chapter

Complex and inconsistent regulatory requirements for chemicals and hazardous substances, is affecting EU competitiveness.

The relevant regulatory framework for managing chemicals in respect of Chemical Agents Directive (CAD), Carcinogens Mutagens Directive (CMD) and REACH, is the key challenge. Therefore, there should be one simplified EU regulatory framework, covering both environmental and occupational health exposures to chemical and hazardous substances.

The mining industry seems to be in danger of being pushed out of Europe due to increasing administrative burdens and financial obligations which undermine competitiveness and Jobs' growth. Employers in Europe, are committed to actively contributing to a universal approach to chemical substances and achieving a harmonized EU regulatory system that protects workers without devastating industry and productivity. This will have the added value of not only certainty and predictability to businesses- a key answer of competitive growth but also ensured the continued protection of employees.

Directive 2004/37/EC (Carcinogens or Mutagens at Work Directive of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work (Sixth individual Directive within the meaning of Article 16(1) Directive 89/391/EEC) (CMD) and their correlation to the extractive industry and Chemical Agents Directive (CAD)

The directives mentioned above, greatly affect the sector and their relevant consequences can influence the future of the whole industry at a tremendous extent, taking into account that they set new limitations and restrictions that are not affordable for the companies.

The most fundamental characteristic of both directives, is the determination of Occupational Exposure Limits (OELs) of hazardous substances in the working environment.

OELs are the major tools for the risk assessment of respiratory exposure. They serve two main functions: the design of control measures as they define the minimum level of protection and the assessment of effectiveness of control measures applied as they give the resulting exposure level (reference: Carcinogens that should be subject to binding limits on workers' exposure, Henning Wriedt, report 136)

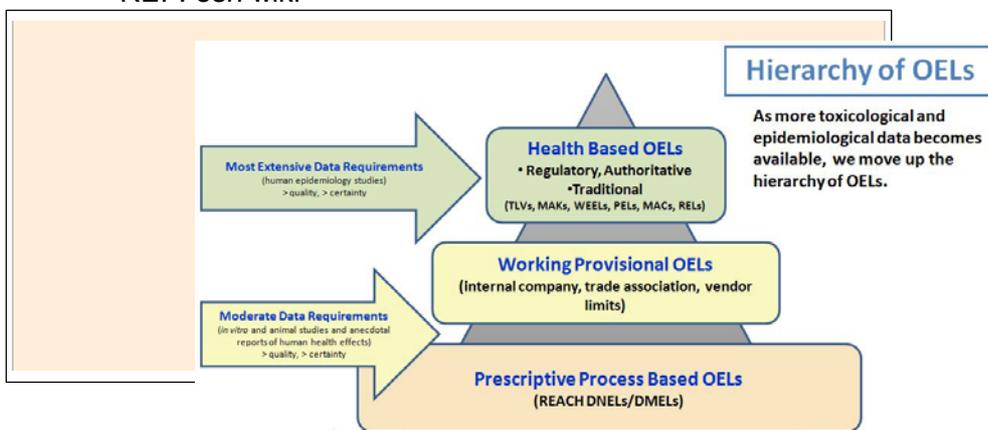
Proposals for health-based limits are made by the EU Scientific Committee on Occupational Exposure Limits (SCOEL), which focuses on the hazards of the substances and makes its proposals to the EU Working Party on Chemicals (WPC). If the WPC endorses implementation of the limits proposed, its Opinion is submitted to the EU's Advisory Committee on Safety and Health at Work (ACSH). If ACSH adopts the opinion, then, from experience, it is anticipated about two years from the inclusion of the agreed limits in a European Directive and their implementation as Workplace.

(Reference: πίνακας: the formal Legislative Procedure for developing EU OELs)

There are three main types of limit values:

- **Indicative Occupational Exposure Limit Values (IOELVs)** 'Indicative' OELs are health-based limits conventionally established only for substances for which it is possible to establish a "threshold" or a "no effect level", considered to be protective of health. To establish OEL, a thorough assessment of the available scientific information is essential as a first step. This is undertaken by the European Commission's Scientific Committee for Occupational Exposure Limits (SCOEL). These limit values should be established or revised taking into account the availability of measurement techniques. For any chemical for which an IOELV is established at a Community level, Member States should establish a national occupational exposure limit value, taking into account the Community limit value
- **Binding Occupational Exposure Limit Values (BOELVs)** 'Binding' OELs (BOELVs) may be drawn up at a Community level and, in addition to the factors considered when establishing IOELVs, socio-economic and technical feasibility factors should be taken into account and intend to provide a level of minimum protection for all workers in the Community. For any chemical agent for which a BOELV is established, Member States should establish a corresponding national binding occupational exposure limit value based on, but not exceeding the Community limit value.
- **Biological Limit Values (BLVs)** Biological Limit Values (BLVs) are reference values for the evaluation of potential health risks in the practice of occupational health.

REF: osh wiki



Concerning the relevant legal process, DG EMPL consults with the Advisory Committee of Safety and Health at Work (ACSH) in developing OELs. When an OEL is proposed by DG Employment, the legislative procedure for its adoption, can take one of two rules:

If proposed OELs are based only on Scientific Considerations, then there is an adaptation to Technical Progress Procedure route Article 17 of Directive 98/24/EC and then Indicative Exposure Limit Values are set. Then there is an Incorporation of values into proposals for Commission Directives in accordance with Chemical Agents Directive and finally there is the adoption of the directive and the member states introduce National OELs based on Directives.

In more serious cases, the proposed OELs also take into account socio-economic and technical feasibility factors, then the Council and European Parliament route Article 16 of Directive 89/391/EC and article 3(4) of directive 98/24/EC set Binding OEL values and later there is an incorporation of values into proposals for Council in accordance with the chemical agents directive or the carcinogens and mutagens directive. At the end comes the adoption of the directive and the introduction of National OELs based on directives, by member states.

For any chemical agent for which an indicative OEL value is established at EU level, Member States must establish a national exposure limit value, taking into account the Community indicative limit value, determining its nature in accordance with national legislation and practice (ART 3 (3) Council Directive 98/24/EC)

When selecting candidate priority substances for setting OELs, the following criteria are taken into account:

- Epidemiological evidence including reported cases of ill-health in the workplace
- Availability of toxicological data
- Severity of effects
- Number of person exposed
- Availability of data on exposure
- Availability of measurement methods

For those reasons, the inclusion of substances used in processes of the mining industry in the carcinogens' list (crystalline silica) or an infeasible occupational exposure limit of diesel exhaust and diesel particulate matter (dpm) and also the inclusion of NO_x, CO in OELs of CAD directive for underground because of the explosives of vehicles and mobile machines, especially in a binding character of the directive, could be very crucial for the evolution of the mining industry. Therefore, a detailed analysis on the latest restrictions in the before mentioned directives, follows below.

First and foremost, concerning the legal background, the CAD Directive, was set in order for it to lay down minimum requirements for the protection of workers from risks to their safety and health arising, or likely to arise, from the effects of chemical agents that are present at the workplace or as a result of any work activity involving chemical agents. In the directive "chemical agent", "hazardous chemical agent" (with reference to Regulation (EC) No 1272/2008), "activity involving chemical agents", "occupational exposure limit value", "biological limit value", "health surveillance", "hazard" and "risk" are defined for the first time. (commun. Document Of Commission on definition of CAD)

The Directive provides for the drawing up of indicative and binding occupational exposure limit values.

The specific protection, prevention and monitoring measures listed below must be applied if the assessment carried out by the employer reveals a risk to the safety and health of workers.

- ✓ The employer must ensure that the risk is eliminated or reduced to a minimum, preferably by substitution (replacing a hazardous chemical agent with a chemical agent or process which is not hazardous or less hazardous).
- ✓ The employer must regularly measure chemical agents which may present a risk to workers' health, in relation to the occupational exposure limit values and must immediately take steps to remedy the situation if exceeded.
- ✓ The employer must take appropriate technical and/or organizational measures of fire safety.
- ✓ Work equipment and protective systems must comply with the relevant Community provisions, in particular with Directive 94/9/EC. He/she must also establish procedures (action plans) which can be implemented in the event of an accident, incident or emergency related to the presence of hazardous chemical agents at the workplace
- ✓ Workers have to be informed about: emergency arrangements, the results of the risk assessment, the hazardous chemical agents present at the workplace with access to safety data sheets;
- ✓ They must also be trained on the appropriate precautions and on the personal and collective protection measures that are to be taken.

The Directive also specifies limits above, which certain chemical agents and activities involving chemical agents are prohibited. Member States may permit derogations from these prohibitions in special circumstances.

Member States must introduce arrangements for carrying out appropriate health surveillance of workers for whom the results of the assessment made by the employer reveal a risk to health. Health surveillance is compulsory for work with a chemical agent for which a binding biological limit value has been set. Individual health and exposure records must be made and kept up-to-date for each worker who undergoes health surveillance. The individual worker must have access to his personal records. Where, as a result of health surveillance, a worker is found to have a disease or adverse health effect associated with exposure at work to a hazardous chemical agent or a binding biological limit value is found to have been exceeded, the worker must be informed by the doctor, who will provide him with information and advice regarding any health surveillance which he should undergo following the end of the exposure.

The employer must review the risk assessment that he made and the measures provided to eliminate or reduce these risks. (βλεπτε Osha ως reference european legal framework CAD directive)

On the other hand, the Directive 2004/37/EC (Carcinogens or Mutagens at Work and the protection of workers from the risks related to exposure to carcinogens or mutagens at work) ,concerns the protection of workers against health and safety risks from exposure to carcinogens or mutagens at work. This Directive does not apply to workers exposed to radiation covered by the Euratom Treaty.

In this directive the definition of "limit value", "carcinogen" and "mutagen, according to Regulation (EC) No 1272/2008, are introduced.

According to the provisions of CMD directive:

Exposure shall not exceed the limit value of a carcinogen set out in Annex III.

Wherever a carcinogen or mutagen is used, the employer shall:

- limit the quantities of a carcinogen or mutagen at the place of work;
- keep as low as possible the number of workers exposed;
- design the work processes so as to minimise the substance release;
- evacuate carcinogens or mutagens at source, but respect the environment;
- use appropriate measurement procedures (especially for early detection of abnormal exposures from unforeseeable event or accident);

- apply suitable working procedures and methods;
- use individual protection measures if collective protection measures are not enough;
- provide for hygiene measures (regular cleaning);
- inform workers;
- demarcate risk areas and use adequate warning and safety signs (including "no smoking");
- draw up emergency plans;
- use sealed and clearly and visibly labelled containers for storage, handling, transportation and waste disposal.

In addition to that, for substances which are included in the CMD list, must be treated according to the following priority list (hierarchy of preventive measures):

- 1. The first priority is the substitution of hazardous substances, with other less harmful**
- 2. The second priority, if immediate substitution is not feasible, is the use of closed systems, in all the phases of the production process, where dangerous substances do not circulate outward in the working environment**
- 3. The third step, if the second step is partially or totally infeasible, is the less possible exposure of the workers in dangerous substances in combination with Personal Protective Equipment**

In any case, frequent medical monitoring of employees, is imperative, in order to detect any problems at very early age

Implications in amending and merge of CAD and CMD Directives

Because of the common approach of OELs and the measures that must be taken for the protection of workers, it is obvious that we have overlaps between them. There is deep scepticism expressed among several communities, representatives of the industry, extraction, ACHS, Euromines etc, about whether the existence of two particular directives, supports the efficient and effective mitigation of risks which derive from chemicals.

The component view of the industry is that both directives cover and should cover different issues in different fields. The possibility of merge could mitigate overlaps and contradictory provisions. However, there is the risk that both could lead to stricter measures and limit values of exposure, for all the substances enlisted in the CAD, without balanced and subjective treatment.

The alternative proposal of the extractive industry is that substances with lower limit value than that which might cause cancer (such as diesel exhaust and respirable crystalline silica) should be included in CAD. Otherwise the cost for the industry will be disastrous.

Another very important issue concerning carcinogens, is the fact that there is a lack of evidence and data, at national and european level, about occupational diseases and carcinogenesis which are related with exposure to dangerous substances and exhausts. It is sometimes very difficult to eliminate the occupational cause from other factors, out of work. The lack of data and difficulties of elimination of cause leads to the collision that it is hard to absolutely define a disease as occupational or work-related.

Due to the great importance of both directives, the Commission sets the priority of amending them, proposing lists of new limits of dangerous substances.

The recent approach of SCOEL, Commission and Advisory Committee, make a serious involvement with mining activities concerning NO₂, CO in CAD and Respirable Crystalline Silica and Diesel Exhaust in CMD.

Several stakeholders considered the need to incorporate the prevention of potential risks of exposure to nanomaterials in the provisions of this Directive. The issue of nanoparticles is again discussed at greater length in the CAD report. However, it is noted that there are uncertainties regarding the health effects of nanoparticles and nanomaterials. One consequence of this is that some advocate their inclusion in the CAD, some in the CMD, some in both and some in a separate Directive.

- **New restrictions for NO₂, CO according to the proposed amendment of CAD which are very crucial for the mining sector**

After a wealth of negotiations between Commission and representatives of the extractive industry, the very first proposal of SCOEL (Scientific Committee of Occupational Exposure Limits) for a limit value of 0,5 ppm for 8h exposure and 1 ppm for 15 minutes exposure in NO₂ and for a limit value of 2 ppm for 8h exposure, were accepted by the Advisory Committee of Health and Safety (ACHS).

That proposal, was issued by the relevant officials of the Commission (DG Employment, Social Affairs/Safety and Hygiene at work), with the intervention of ACHS that it is disputable whether such limit values are feasible, visible and measurable.

The proposed limit values of NO₂, could greatly affect the extractive activities of many mining sites and many objective issues could stem from such an adoption. There are subsequent issues of mining processes and exploration methods, extent and depth of underground workings, ventilation equipment, size and type of deposits, complexity of geological model. Such limitations could prove that the extended substitution with new electrical equipment would be infeasible. On the contrary, the diesel engine equipment, has the advantages of high productivity, competitive cost and it has very efficient systems.

Concerning Carbon Monoxide (CO), the proposal is based on the SCOEL Recommendation SUM 57 setting as OEL : 8h- TWA: 20 ppm (23 mg/m³)
15 min-STEL: 100 ppm (117 mg/m³)

Those proposed OELs reduce at 1/10 the existent exposure and the extractive industry expresses doubts regarding the ability of the mining sector to comply with these limit values.

- **New restrictions in diesel exhaust and crystalline silica limit values according to CMD**

Diesel engine exhaust fumes are a mixture of gases, vapours, liquid aerosols and particles created by burning diesel fuels. Diesel fumes may contain over 10 times the amount of soot particles that in petrol exhaust fumes and the mixture includes several carcinogenic substances, meaning they have the potential to cause cancer. Breathing in high quantities of diesel exhaust fumes can cause irritation in the respiratory tract within a few minutes of exposure, but prolonged exposure over many years may be more harmful. The health effects will depend on the type and the quality of diesel fuel, being used (for example whether it is low sulphur), the type and the age of the engine, whether and how it is maintained and whether a combination of different diesel powered engines are contributing to overall exposure. Diesel quality and emission standards vary, depending on the local situation. Diesel exhaust fumes were classified as "probable carcinogens" back in 1988 but the International Agency for Research on Cancer, part of the World Health Organisation, has recently upgraded them to a Group 1 carcinogen, so these emissions are now treated as a definite cause of cancer in humans. The IARC has said that people regularly exposed to diesel exhaust fumes at work, can be up to 40 per cent more likely to develop lung cancer. (IOSH – The Grange Highfield Drive Wigston Leicester LE18 3NN)

Scientific evidence shows that the risk of cancer is linked with the particulate emissions in the fumes - the soot, rather than the gases or vapours. These particulates are easily inhaled and drawn deep

into the lungs. Diesel exhaust exposure is now often measured by the elemental carbon concentrations in the air inhaled by workers.

At the very least, short term, high level exposures to diesel exhaust fumes, can cause long term, or chronic, respiratory ill health with symptoms including coughing and feeling breathless. At worst, if people are exposed to diesel engine exhaust fumes, regularly and over a long period, there is an increased risk of getting lung cancer. This is the same type of cancer that is caused by asbestos and some other industrial chemicals and doesn't affect people who smoke. There is limited evidence to suggest that chronic exposure is also linked to a higher chance of suffering bladder cancer.

The level of safety again depends on the standards in the country of operation. For example in Greece, years before (1973), the relevant provision of the European OSH framework, the extractive industry was obliged to follow the Regulation of Mining and Quarries that includes specific measures about the protection of workers against diesel exhaust and crystalline silica through Personal Protective Equipment, ventilation systems and very low limit values of particular substances. Every mining enterprise, apart from SMEs, which do not sometimes comply with the general obligations, has the responsibility and obligation to comply with this Regulation standards. Otherwise, legal consequences will follow.

At european level, the Commission aims to reform the existing **Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery** , proposing a great reduction in the existing limit values.

The new restrictions proposed for Diesel exhaustions set in the relevant Communication document lead in new specifications of the machinery equipment in EU or in the extended/broad substitution of existing machinery by electrical machines which in many cases (such as in tunneling and mining), is objectively unattainable.

There are great odds that diesel engines, because of the fact that they contain great amounts of soot, **might be included in the Carcinogens Directive** (Reference: European Commission Press Release: "Commission proposes better workers' protection against cancer chemicals"). Such a decision would lead in many low limit value of exposure and the obligation of substitution of carcinogens fuels and the end of use of diesel engine machinery. The proposed limit value for free carbon is 100 µg/m³.

Taking into account the existing technology on diesel engines (EURO 5 or Stage III standards) Reference (GMEA, Euromines (Health and Safety Committee), there is much scepticism by the mining industry whether such limit values are attainable with the available Technology. Should these limits be mandatory for the underground mines, this would require the substitution of the existing Diesel engines by new generation (EURO 6 or STAGE 4) engines, which are mainly used in new cars technology and present high market cost.

The extractive industry is sharp and strict that technically the substitution of diesel engines with new machinery and the relevant compliance with new standards is impossible or very difficult in a short period. The extractive industry which would be highly affected by such a decision are responsible for providing their proposals in the Committee for European Construction Equipment. It is inevitable that if such limit values are binding and not just indicative, the consequences for the industry will be very tremendous. (REFERENCE: employers group advisory committee of Safety and Health at Work, Euromines , GMEA)

- **New restrictions in Crystalline Silica according to CMD**

In order to understand the implications of the dangerous substance, it is important to define it. Crystalline silica is natural substance found in stone, rocks, sand and clay, as well as products like bricks, tiles, concrete and some plastic composites. When these materials are processed, for example by cutting or drilling, the crystalline silica is released as a very fine dust which can be breathed in. The dust is one of the oldest workplace hazards- and it still causes hundreds of thousands of deaths across the world every year (Reference). (IOSH –The Grange Highfield Drive Wigston Leicester LE18 INN_)

The minerals quartz, cristobalite and tridymite are crystalline forms of silicon dioxide that are found naturally around the world. Quartz is in most rocks, but most particularly sandstone and granite - quartz is yellow sand. There are other forms of silicon dioxide that do not have a crystal structure and these are called “amorphous silica, for example diatomaceous earth, silica gel, and synthetic amorphous silica. Exposure to amorphous silica is much-less hazardous than crystalline silica. Silica is hazardous when it’s inhaled deep into the lungs, where oxygen is taken up into the blood. (IOSH –The Grange Highfield Drive Wigston Leicester LE18 INN_) In 1996, the International Agency for Research on Cancer, reviewed the scientific evidence and concluded that crystalline silica in the form of quartz or cristobalite, is carcinogenic to humans. It is classified as group 1 carcinogens meaning it is a definite cause of cancer in humans.

The proposed by SCOEL limit value for Respirable Crystalline Silica is 0.1 mg/m³.

3rd chapter - SMEs

SMEs (Small Medium Enterprises)

The growing number of micro-firms and SMEs has particular significance from the perspective of safety and health. The vast majority of the mining companies is SMEs, providing 13 million jobs across Europe. ESAW (European Statistics on accidents at work) indicates that the incidence rate of accidents at work is higher in SMEs than companies with more than 250 employees.

One of the greatest challenges of the Strategic Framework of Safety and Health at Work, was the scope and effectiveness of OSH management in micro and small enterprises. Smaller establishments still tend to show lower levels of compliance with national and EU rules, and report fewer OSH management measures as compared with large establishments. The causes of this are multiple and range from inherent difficulty in respecting regulatory and administrative provisions, often due to a lack of directly available expertise, to a lack of awareness of obligations, absence of guidance or deficient enforcement. Compliance costs are also higher for SMEs in relative terms. In the 2014 Strategy, the Commission and the European Agency for Safety and Health at Work (EU-OSHA) developed practical guides and materials on good practice to support implementation of OSH measures in SMEs.

SMEs have more difficulties in complying with the regulatory requirements in this area. Small companies also have fewer resources than larger companies to properly manage risks. In addition to this many of these SMEs have limited rights and means of accessing information about multiple hazards (such as chemicals). The incident rate of accidents at work (according to the European Risk Observatory), relating to dangerous substances is generally higher in SMEs than in large ones. In total, SMEs for around 80 % of all occupational diseases, caused by chemical agents. This indicates that workers in SMEs are exposed to chemical substances that, due to inadequate protection and unsafe work practices, can pose a risk to their safety and health. Therefore, improving quality of guidance and providing practical tools to facilitate compliance with OSH legislation are crucial.

In the relevant actions of 2014 EU strategy of Safety and Health at Work, it was essential the need to develop guidance and identify examples of good practice, taking the specific nature and conditions of SMEs and particularly micro-enterprises into account. The promotion of exchange of good prac-

tices, the support of SMEs by larger companies. Commission and EU- should provide technical support and should promote campaigns in order to raise awareness in the issue of the implementation of OSH frame by SMEs.

It is essential and of great importance to create a national and european legal framework that is broadly understood and adaptable and to provide small enterprises guidelines and coaching in order for them to implement health and safety systems and create health and safety culture. In addition to that the role of inspections is very crucial. They have to make small enterprises understand the regulatory framework and be capable of incorporating them in their own system, in a health and Safety Culture.

National and EU stakeholders, along with a study of HSE in Britain, show that SMEs are likely to experience higher compliance costs compared to other enterprises. There might be many factors that explain why SMEs experience both higher costs and lower compliance at the same time. Firstly, the SMEs often lack specific criteria that can provide them with reassurance of their compliance that might lead to over or under compliance. Secondly, SMEs may not know where to look for guidance, including free support from local and national authorities. Thirdly, SMEs more often rely on external experts for help and often find it difficult to assess the quality of this help (e.g. external consultants might generate more costs, because SMEs are not aware of what is actually required by the law and what is not). In the UK, the third sector is one of the fastest growing sectors and its relevance in the future is therefore likely to increase (HSE, 2003).

Social Partners do not support the exemption of SMEs from legal obligation. The main challenge for EU is to incorporate SMEs in the full implementation of legislative framework of Safety and Health at Work without reduction of measures, obligations and responsibilities towards occupational Health and Safety.

Finally it is also proposed that:

- ✓ There is a further development of existing helpful tools (such as The online interactive risk assessment tool (OiRA), developed by EU-OSHA is a major contribution to facilitating SMEs' compliance with OSH requirements.
- ✓ There is a promotion of economic incentives, such as favourable insurance conditions that encourage reward and the flourishing of risk prevention strategies
- ✓ Large companies should incorporate contractors and their staff at the same Health and Safety systems established at their own company and at their permanent personnel. That is to say same requirements, obligations, , training and ways of surveillance towards Health and Safety

Additional REFERENCE: COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS , GMEA, EUROMINES, employers group of advisory Committee of Safety and Health on an EU Strategic Framework on Health and Safety at Work 2014-2020