



THE IMPORTANCE OF ORGANIC SOLVENT RECYCLING TO INDUSTRIAL BUSINESSES IN THE EUROPEAN COMMUNITY

AN UPDATE ON EU POLICIES, THE LEGISLATIVE FRAMEWORK AND A MODERN APPROACH TO MANAGING A VALUABLE RESOURCE

Purpose of this note

Significant changes to European Union (EU) legislation in respect of chemicals and waste should be encouraging solvent users to consider the associated impacts of efficiently managing their material usage.

As many organic solvents are derived from crude oil, there is invariably a direct energy relationship in respect of the sourcing and the production of solvents that has a link with climate change and its associated cost of carbon.

The European Solvent Recyclers Group (ESRG) wish to keep solvent users informed and to encourage an understanding of the benefits that solvent recycling can bring to their businesses while helping them to meet EU law.

Legislative Background

Since the 1970's European chemicals and environment policies have become ever more complex in demanding high performance from users of solvents.

In the 1990's the introduction of the Integrated Pollution Prevention and Control Directive (IPPC) became an important piece of legislation with a primary aim of the prevention of pollution to air, water and soil. It applied to over 55,000 different EU based industrial installations in their management and use of energy, water and raw material consumption. The principle of the IPPC Directive rests in a permitting scheme supported by the concept called Best Available Technology (BAT) and its associated Reference Documents, called BREFs.

International chemicals legislation has also evolved but in a different manner. Key Directives focused on information on chemical hazard and packaging for supply, alongside controls on the carriage of dangerous goods, imports and exports. It also aimed to reduce the risks involved at major operational sites where an incident had a high propensity to bring with it a catastrophe, for example at a major oil or chemical works.

There are also sector specific pieces of chemical legislation, for example those covering food, medicines and pesticides. Then there are areas of chemical type including for example persistent organic pollutants, asbestos and heavy metals etc. Market sector controls have also been placed on the use of chemicals in product



usage, for example in respect of electrical and electronics, vehicles and children's toys.

The list is not exhaustive and the solvents industry has itself had to adjust to the Solvents Directive legislation which seeks to dramatically reduce both usage and emissions from the application of volatile organic solvents and thus aims to improve both the environment and worker welfare.

Hence there is a complex situation before the issue of managing waste solvents arises. Within the EU, waste law is largely delivered by the Waste Framework Directive and the 1975 legislation was significantly updated in 2008. Waste law sits upon a definition of waste linked to the term "to discard", but that has a wide meaning in law. Chemical substance and waste laws are often difficult to understand as they can use different terms and definitions and often appear to be in conflict with one another. Members of ESRG can offer help here.

Changes in More Recent Times

In the last few years EU policy makers have set out a revised framework for much of the necessary legislation. In doing so they identified the need to merge both chemical hazard and environmental considerations. However, they found the size of the task and its complexity in reducing the issues to a single piece of law very difficult. It is unlikely that goal could be fully achieved particularly if the law was to be based on the setting of a highly structured approach to regulation since some parts need to reflect an individual Member State situation and others have to be directed at all EU participants.

A significant new Regulation, meaning it must apply across the EU with no derogation to Member State law makers, is known as its acronym REACH – Registration, Evaluation and Authorisation of Chemicals. Its aim is to develop information in a structured way so that the risks associated with using chemicals placed on the market can be consistently evaluated and communicated to users. Any substances identified of very high concern can thus be prioritised and specific issues about their use in the markets addressed.

It also means that the enormous costs of managing REACH will be borne by industry but over time it is projected that these will be recouped across the whole of EU society by a combination of reduced health, environmental and social welfare elements, so resulting in a greater benefit to all.

Another Regulation called the Classification, Labelling and Packaging Regulation (CLP) is designed to see that the risks identified by REACH are communicated into hazard information that can be delivered into the workplace so that chemical users are better informed.

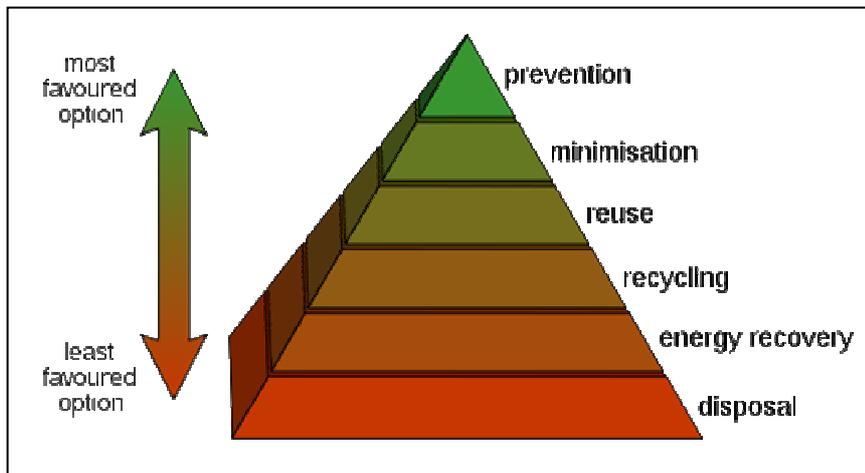
On the waste front, there is now a revised Waste Framework Directive (WFD) which Member States must enact into national laws. Its main purposes are to improve the



use of resources through waste minimisation, to encourage recovery via a waste hierarchy that has a legal basis, while protecting the environment and human health from the impact of waste.

Central to its principle is a waste hierarchy such that in descending order, waste should first be prevented or minimised, but if not possible then prepared for reuse, or recycled, or its energy recovered. Finally, if none of these are applicable, then it must be disposed of.

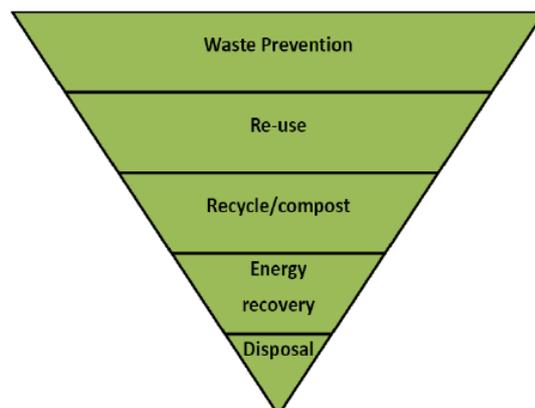
Historically the waste hierarchy is depicted as a six stage process in the triangular shape diagram below:



(Courtesy of Wikipedia)

However, a part of the revised Waste Directive's requirement is that the hierarchy's waste prevention and minimisation concepts are now *combined* to give a five stage process so that it shall apply as a priority order in waste prevention and management legislation and policy.

This waste hierarchy is now more commonly depicted in the inverted triangle diagram below so that it emphasises that disposal is the least desired outcome.





How does this Legislation Fit Together and what are the Implications for Industry?

REACH requires that when registering a substance that is to be placed on the market information must be given by the manufacturer or the importer in respect of the waste stage of that substances life cycle. This process enables onwards communication from a user (as a waste producer) to their waste managers setting out the information as to how a waste might be treated. It is important that the waste hierarchy is also respected.

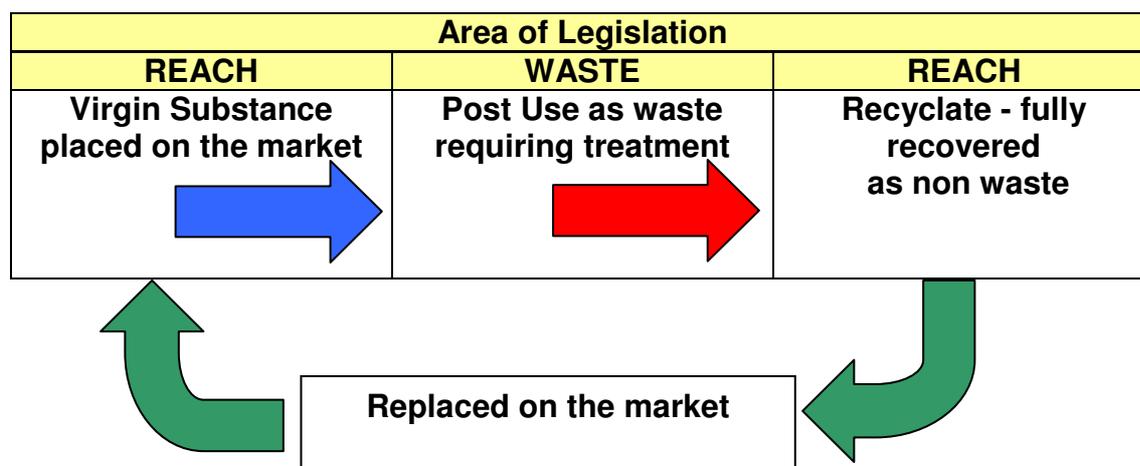
It is also important to know that once something becomes a waste it is no longer part of REACH, but then becomes subject to waste legislation.

Waste has a legal definition based on the principle of when something is discarded. Critical to the success of the waste hierarchy is to see that something can be treated in such a way as to stop it being a waste. This is often referred to as End of Waste.

This is a vital concept to understand if recyclates are to end their legal status of being a waste and so be considered as becoming a fully recovered non waste substance again. The term ‘End of Waste’ is an important legal one and has become a major issue in the delivery of the waste hierarchy.

Unfortunately although the terms reuse, recovery and disposal are defined in law, technically they can become quite subjective. Currently the Commission is working on establishing more criteria and issuing guidance as to when End of Waste may occur. This is essential knowledge if trading across the EU is to be legal, fair, transparent and not a barrier to the free movement of goods and services.

In diagrammatic form we can show this flow from substance to waste to substance as:



Industries using fully recovered materials to End of Waste status are therefore able to show that they are meeting the hierarchal concept of managing their waste while improving the efficient use of resources and reducing the potential for pollution. For



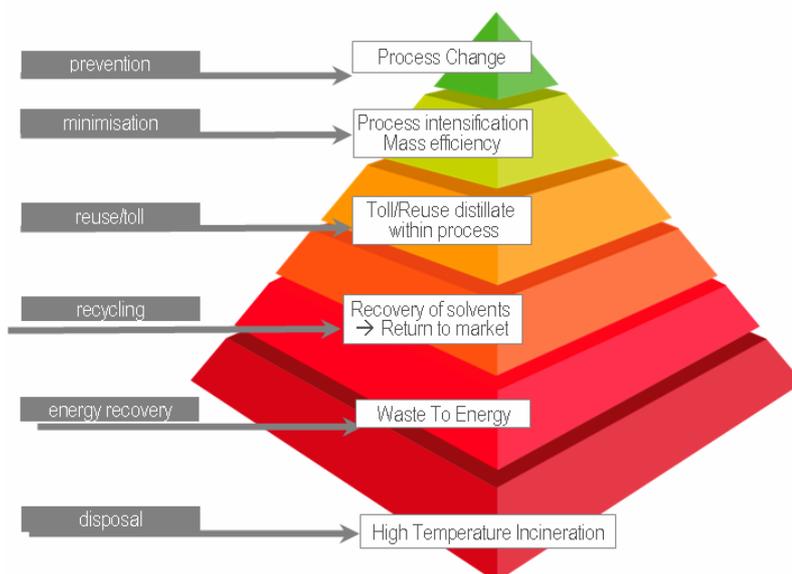
those industries subject to permitting, this has a high relevance because it furthers the use of Best Available Technology (BAT).

What are the Main Implications for Users of Solvents?

1. All organic solvent substances need to be registered under the REACH Regulation. Recyclates meeting End of Waste criteria will be no exception so that users of recovered substances may have the full confidence that they are meeting their legal obligations.
2. For those in the IPPC Permitting Regime solvent recycling is most supportive of the BAT concept and efficient use of raw materials.
3. In the EU the cost of energy is inevitably linked to carbon trading so recycling will be an important factor in reducing cost to the user.
4. For all waste producers it is a requirement of the Waste Directive that consideration is given to the treatment of their waste. This involves being able to demonstrate to regulatory authorities that the waste hierarchy is either being met or if not, then through life cycle thinking a deviation from that principle is justified.
5. ESRG members are able to demonstrate where solvent recovery is the best environmental option on a case specific basis and to help advise users if they are meeting their legal obligations. An analysis takes into account the complex energy requirements in originally producing a virgin solvent and compares that to the potential energy recovery if the solvent is alternatively combusted. These considerations practically take into account the recycling potential of a waste solvent examining the condition of the incoming waste stream and the extent and chemical type of any contamination present.

OPPORTUNITIES FOR MOVING UP THE SOLVENT WASTE HIERARCHY

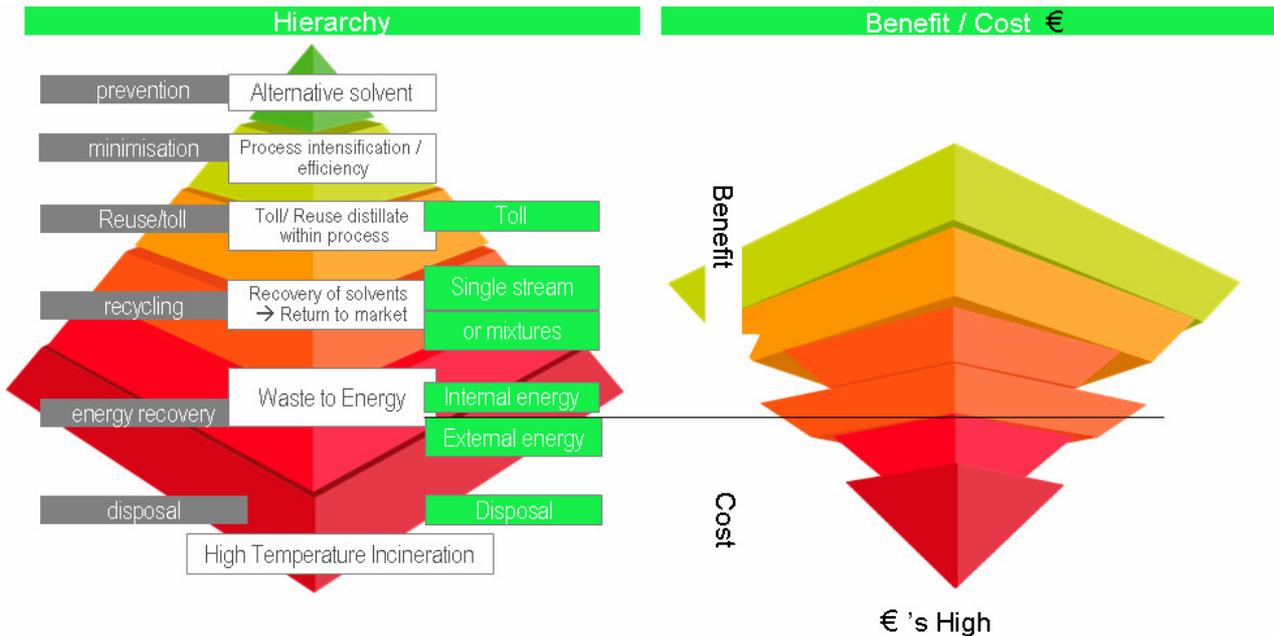
In a diagrammatic form this can be shown as:





and in terms of the costs and benefits:

**WASTE HIERARCHY
BENEFITS AND COSTS STRUCTURE**



(Schematics courtesy of SRM Ltd)

Conclusions

1. ESRG members can help solvent users to find the best solution for managing their solvent based waste streams knowing that the necessary technical, economic and organisational considerations have been taken into account and are being met within the framework of EU law.
2. This helps solvent users develop cost benefit analyses that might include using an alternative solvent, or reuse of a solvent, or toll recovery or bespoke recycling. If these solutions are not possible then an energy recovery option can be considered.
3. Solvent users will know and be able to demonstrate that they have considered their environmental obligations while having the benefit of improved resource efficiency.

(May 2010)