



4.4 Horizontal Issues

This section deals with some actions which should be promoted to create a cultural and operative environment where the main topics in the previous sections can find a more general consensus and therefore an easier path to their implementation.

What follows focuses on sustainability, which is definitely one of the main drivers of the SusChem Platform as well as of the related Italian SusChem Platform (IT-SusChem). The ultimate goal of all the research actions proposed within the thematic sections of this vision document is progress towards a more sustainable society.

Today "Sustainability" and "Sustainable Development" are very common and often abused words, but their use in the context of chemical activities is appropriate since chemistry and chemical productions play an unquestionable and essential role in meeting an impressive variety of needs in our everyday life. Nevertheless, the crucial contribution of chemistry and chemistry-related activities to a good quality of life is not generally recognized. Conversely, a sort of distrust towards anything to which the label chemistry can be attached is the prevailing current attitude with public opinion. This trend must be reversed and, at the same time, a more concerned attention to the social and environmental implications of their productions have to be reinforced among chemical operators.

Therefore, it is necessary to promote actions aimed at developing a widespread culture of sustainability. Sustainability means a process of continuous evolution and innovation for meeting shared needs of welfare, equity and environmental protection in a financially satisfactory way. This culture must be promoted among both chemical insiders and laymen with the final aim of establishing a positive interaction between these two worlds.

The implementation of actions aiming for the promotion of a new positive and motivated attitude towards chemistry is definitely the main goal of this section of the document. In order to make concern for sustainability customary and to avoid the risk of self-reference, the following actions will be carried out:

- a) finding criteria for a quantitative evaluation of progress towards sustainability which can be associated with any given initiative;
- b) developing an attitude towards focusing attention on societal needs for orienting activities and products;
- c) increasing attention to proper communication, where benefits and risks are clearly presented in such a way as to provide the chemical community with accreditation as a reliable entity.

These points may be better detailed as follows:

- 1) Processes and products must be considered within the framework of their life cycle through a Life Cycle Assessment (LCA) procedure or a lifecycle thinking approach.

These procedures are becoming quite common but are currently limited to considering environmental impact only; therefore, they must be modified to include societal and economic impact as well. Furthermore, in order to guarantee reliable inputs to the Life Cycle Inventory (LCI) phase, a database focused specifically on particular Italian and European situations should also be prepared. A close connection with the activities developed within the European Platform on Life Cycle Assessment is recommended.

- 2) Support must be given to SMEs through the development of simplified tools for sustainability assessment and the implementation of systems for environmental and risk assessment and management

The upcoming enforcement of REACH regulations will provide a unique opportunity to guarantee the reliability of both risk assessment and safety information, thus contributing to improving public confidence in chemical productions.

- 3) The enforcement of new and stricter environmental regulations must be seen as an opportunity for promoting innovation, and not as a heavy constraint. National and local institutions and agencies (APAT, ARPA, ISS,...) must be involved in promoting a management of authorization and control procedures focusing on substantial technical aspects rather than formal ones.

- 4) Due to the "pervasive" role of chemistry, some attention has to be paid to the activities of other platforms which are active in the framework of EU 7th WP, in order to integrate research efforts and maximize technological opportunities.

A crucial point is the establishment, with public opinion and the authorities, of a shared perception that chemistry is a vital element of our lives and that chemical productions play a propulsive role in guaranteeing and innovating products and services of current use.

The creation of a mutual trust among citizens, decision-makers/competent authorities, and industry is essential not only for the development of new productions, but also for maintaining ongoing activities. This entails due attention to an effective communication characterized by completeness, reliability and attention to the needs and

concerns of the those concerned. This, in turn, requires the improvement of the public's basic chemical culture in order to make its role effective, in compliance with the Aarhus convention.

Particular attention must be paid especially to communication with decision-makers, in order to make them aware of the central role of chemistry and its great innovation capacity. They must become actively involved in promoting actions of support to all the components of this sector (research, industry, education) with a vision not limited to local situations but comprising broader scenarios, at least at the EU level, in order to avoid drawbacks to the national industrial system .

It should be noted that, even if all the above-mentioned actions are successfully performed, the practical exploitation of the huge innovative potential of chemistry cannot be made real if there are not enough skilled people working on it. Attention to education is therefore crucial, due to its fundamental role in the early stages of the formation of concerned citizens, as well as in the preparation of technical experts and the upgrading of their skills throughout their whole professional life.

As a matter of fact, all European universities are now experiencing a decline in enrollment in the scientific/technical areas in general, and in chemistry and chemistry-related subjects in particular.

This trend must be reversed and appropriate actions must be promoted by the different players who are aware that chemistry is an essential component of the European knowledge-based society envisaged by the EU Lisbon process. At universities the specific curricula must be promoted by emphasizing the role of chemistry and chemical technologies as prime drivers for innovation and progress towards a more sustainable society.

The role of research institutions must be reinforced through a concrete recognition of their mission, on the basis of a reliable allocation of human and financial resources.

Companies, too, are expected to improve their employees' education through an extensive use of life-long learning; once again, a specific organization must be devised for SMEs in order to keep them on or close to the leading edge of innovation.

A sound system of relations must be promoted among these actors to link scientific approaches with technological ones and, lastly, with production, as well as to identify strategic themes where research efforts should be concentrated.

As previously stressed, the main activity within this Platform should be focused on value creation, while taking care of environmental performance. Additionally, all factors that will strongly affect any successful innovation, such as economic barriers and social acceptances, should be better defined.

Several scientific and technical organizations within the chemistry, chemical engineering and biotechnology communities are engaged in activities aiming to achieve these goals.

Among these organizations, the Italian Chemical Society (SCI) definitely occupies a leading position and can play an important role in this regard. It currently has approximately 5,000 members, most of whom from academia, but with a growing proportion coming from industry as well as from high school, and with an important part played by young people. It should be remembered that the fundamental objective of the SCI is the spreading of chemical science and its applications in order to stress its importance in the modern society. Within the SCI it is possible to find many kinds of expertise that will improve partners' cooperation, technology transfer from academia to industry, societal consensus and well-focused communications, optimization of regulatory issues and, most important, strong support for chemical education and recognition of world-class skills within the new generations. In other words, SCI can be the landmark for any interactivity between the production-linked issues of the IT-SusChem, namely Materials, Reaction Processes and Biotechnology, while dealing with specific problems such as the connection between different complementary expertises, the setting up of a proper campaign to improve the image of Chemistry, and the stimulation of a correct teaching-to-learning relationship to aid the recruiting of future chemists.

In conclusion, this horizontal issue of the IT SusChem Platform must achieve specific results in:

- Identifying an effective coordination structure
- Agreeing on common objective, results and strategies
- Measuring results to track performances
- Using information to improve performances
- Reporting performances effectively

Additionally, there are two emerging themes within the horizontal area that need to be specifically developed: i) the proper social concerns and stimulation for the proper support for innovation, with special attention to a fruitful development of the appropriate skill set, and ii) the enhancement of the skills that will underpin these goals.

