

Introduction

In 2003 the KNCV has celebrated its 100th anniversary. It was a reason to celebrate and an opportunity to look back on one hundred years of chemistry in the Netherlands. But it was even more a reason to look towards the future.

From meetings with our members we learned that chemists and other interested people have all sorts of questions about the future of the chemical sector. How can we improve the industry's image? – what are the consequences of the declining numbers of students? – what will be the impact of developments in the global economy? – will the trend towards sustainability continue? The answers to these questions will to a large extent depend on factors outside the chemical sector. Societal development will have great influence on the chemical sector, research and education. But conversely, advances in chemistry and chemical technology will also influence society. We may wonder what role chemistry and chemical companies will play in science and business in 2030. And especially which societal needs chemistry will fulfil with respect to ageing and other developments.

The question we asked at the beginning of the scenarioproces was “how does the Dutch chemical sector look like in 2030?” We gave four answers to this question by means of multi-coloured pictures of the future. What do these pictures mean? – do they hold any lessons for the present?

What is notable about the pictures of the future is that certain developments seem to appear in all. In the vision of the scenario panel these are the ‘robust elements’. They appear in all the fairly diverse scenarios. They are ‘messages’ from the future that today's policymakers, managers and educators should take into account. What are these messages? Below are some of the messages that were selected by the panel in a consideration at the end of the scenario proces. However, readers will possibly be able to discover more messages in the scenarios:

- *Chemistry fulfils an important societal role.* In all scenarios, chemistry plays an important role in life. Chemistry is necessary for the technological and scientific breakthroughs that *preserve* the economy and improve the *quality of life*. Thus chemistry makes an important contribution towards the improvements that we think necessary in the year 2030. Thanks to chemistry, future materials will be stronger and more sustainable, processes will consume less raw materials and energy, and our life expectancy will increase as a result of improved detection and therapy in health care, fewer safety and health risks and improved food.
- *Chemistry focuses on the molecular level and system level.* In most scenarios, chemistry becomes more limited in focus, size and visibility as a separate scientific discipline. Chemistry focuses on the analysis and modification of molecules. In addition, thinking in systems is an important aspect of chemistry. In all scenario's chemistry disappears as a separate subject in school and in three scenarios also as a separate subject in university.
- *Chemistry becomes part of multidisciplinary research.* At the same time we see that the *application* of chemistry becomes broader. Together with subjects like physics, biology, mathematics, cognitive science, chemistry is an important basic subject for all sorts of multidisciplinary research fields. These ‘interfaces’ are now for instance Life Sciences, nanotechnology, etc. We do not know what they will be in the future, but the scenarios suggest that chemistry remains important as one of the basic suppliers of these research fields.
- *Also in shools and universities chemistry becomes part of multidisciplinary subjects.* In primary education and in secondary schools, chemistry becomes embedded in “science” and will be focussed on understanding the physical (and social) environment. In higher education, students do not select ‘chemistry’ as a monodisciplinary subject, but as multidisciplinary research fields. They then compose a personal, customised, international package of subjects.

- *New skills become important.* As a result of the multidisciplinary approach, skills like setting up an informal research network and being able to manage large quantities of information become important.
- *The innovative power of the Netherlands is an issue.* In all scenarios the innovative power of the Netherlands is an issue. What will be the influence of China and South-East Asia? In many scenarios, Dutch education and business must make harsh decisions to be able to maintain a lasting advantage in a specialism within chemistry. In most scenarios bulk chemistry disappears from the Netherlands.
- *A number of social trends are important.* In all scenarios ageing, internationalisation, a divide in society and the pursuit of more security and a better quality of life play a role.

On several occasions we will in the comments on the topics hereafter make a connection to the scenario-report. (By the way we will provide each delegate with this report at the meeting).