



National Institute for Public Health
and the Environment
Ministry of Health, Welfare and Sport

**Sino-Dutch cooperation in the field of
risk assessment of chemicals**

Project G2G11/CH/6/8 completion report

RIVM report 601048001/2013

Z. Dang | T.G. Vermeire



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RIVM Report 601048001/2013

Colofon

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Rapport in het kort

Samenwerking tussen China en Nederland bij de risicobeoordeling van stoffen

Het RIVM is op verzoek van het ministerie van Economische Zaken een samenwerkingsverband aangegaan met China om kennis over te dragen over de risicobeoordeling van chemische stoffen en de bijbehorende wetgeving. Het doel is dat bedrijven beter kunnen voldoen aan de wettelijke eisen in Europa en in China voor de productie en het gebruik van chemische stoffen. Op termijn kan dat eraan bijdragen om de handelsbarrière tussen China en Europa te verminderen. Ook stimuleert het beide handelsblokken om veilig met chemisch stoffen om te gaan.

Voor de overdracht van kennis en ervaring hebben het RIVM en diens Chinese zusterorganisatie, Chinese Research Academy Environmental Science (CREAS), op twee activiteiten georganiseerd. In november 2012 is een delegatie van het RIVM naar Beijing afgereisd voor een workshop om de risicobeoordeling van chemische stoffen in China op te zetten. De overeenkomsten en verschillen besproken tussen de stoffenverordening REACH, die sinds 2007 in Europa van kracht is, en recente Chinese wetgeving voor nieuwe en bestaande stoffen kwamen hierbij ook aan bod. In maart 2013 zijn enkele medewerkers van CREAS naar Nederland gekomen voor een training van een week om praktische ervaring met risicobeoordelingen op te doen.

Aanbevolen wordt de contacten en kennisoverdracht voor te zetten. Het is vooral van belang de Europese beoordelingsinstrumenten in China te implementeren en meer Chinese casestudies uit te voeren. Daarnaast is aanbevolen samen te werken bij de keuze van zeer schadelijke stoffen die als eerste aan banden moet worden gelegd en hoe deze het beste geleidelijk kunnen worden vervangen door veiligere alternatieven (prioritering en aanpak).

Trefwoorden: China, Nederland, risicobeoordeling, chemische stoffen, REACH

Abstract

Sino-Dutch cooperation in the field of risk assessment of chemicals

RIVM and the Chinese Research Academy of Environmental Sciences (CRAES) together with support from the Dutch Ministry of Economic Affairs exchanged knowledge on risk assessment of chemicals. The aim is to promote compliance by the chemical industry with European and Chinese chemical legislation. In due course, this will contribute to a reduced trade barrier regarding the import and export of chemicals between China and Europe. This will also promote chemical safety in both trade blocs.

The partners exchanged knowledge on current chemical regulations and risk assessment. Case studies were developed and discussed in detail with a focus on the implementation of chemical regulation in China and further development of technical guidance. In November 2012, RIVM and CRAES organised a seminar in Beijing bringing together approximately 50 experts involved in the assessment and review of new chemicals for the Chinese market. In addition to transfer of technical-scientific knowledge, similarities and differences between chemical regulations in Europe and China were discussed. These discussions concentrated on REACH, the 2007 regulation for industrial chemicals in Europe, and the recent Chinese regulations for new and existing substances. The second important stage of the project was the visit of two Chinese experts from CRAES to RIVM in March 2013. They worked with RIVM experts for one week to gain practical experience in risk assessment of chemicals under REACH. Pertinent recommendations were: the adaptation of European risk assessment tools to the Chinese situation, more in depth studies and discussion of Chinese case studies, and more knowledge transfer on risk assessment and related risk management aspects. Finally, there was a call for cooperation in the prioritisation and risk management of substances of concern and their gradual substitution by safer alternatives.

Key words: China, Netherlands, risk assessment, chemicals, REACH

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1 Introduction

China, the largest EU trading partner, has to deal with EU chemical regulations, particularly REACH, as it is a major exporter of chemicals to the EU. Similarly, Dutch companies have to comply with the new chemical regulations in China when exporting chemicals to China. To date, risk assessment of chemicals is a process under development in China, which prevents China from effectively complying with international conventions. Capacity building on REACH, risk assessment and standard setting in China is of interest to the Netherlands since this will be beneficial for the protection of human health and the environment, and will facilitate trade in chemicals between China and Europe.

The Chemical Registration Centre of the Ministry of Environmental Protection (CRC-MEP), which is attached to the Chinese Research Academy of Environmental Science (CRAES), is responsible for the implementation of the new Chinese chemical regulations. The CRC-MEP is responsible for organising the chemical expert committee to perform risk assessments of chemicals following the submission of dossiers by industry. The expert committee consists of independent experts from government institutes, universities, and the industry. Based on the committee's advice, the Ministry of Environmental Protection (MEP) authorises certification of chemicals allowed on the market. Currently, experts from CRAES, a national non-profit academic institution for environmental protection, are responsible for developing guidance document for the new Chinese chemical regulations.

Dutch companies in China currently face the problem of unclear guidance documents and different requirements for the risk assessment of chemicals. In collaboration with CRAES, RIVM published the Chinese version of 'Risk assessment of chemicals, an introduction' edited by Van Leeuwen and Vermeire. In 2010, the book was launched in China and this introduction was accompanied by a first exchange of knowledge on risk assessment between 4 experts from RIVM and more than 300 experts from CRAES and other institutes and universities all over China. Workshops were organised in Hangzhou and Beijing, the latter being organised by CRAES and CRC-MEP. Further cooperation between CRAES/CRC-MEP and RIVM was aspired by both institutes.

The project 'Sino-Dutch cooperation in the field of risk assessment of chemicals' (G2G11/CH/6/8) was first discussed with CRAES at the end of 2011 and was approved by both the Dutch and Chinese governments at the beginning of 2012. The main purpose of this project is to further strengthen capacity building in risk assessment of chemicals in China to facilitate companies from the Netherlands and China in complying with chemical regulations in the EU and in China. This will contribute to the removal of trade barriers with regard to chemicals, while enhancing chemical safety in both countries.

2 Project results

The project aims to achieve the following results:

1. Understanding the methods and principles of risk assessment of chemicals.
2. Developing case studies that can be used for implementing risk assessment in China.
3. Harmonising guidance documents for risk assessment of chemicals for the new chemical regulation in China.

Seminar in Beijing on 20-23 November 2012

Prior to the seminar, RIVM and CRAES/CRC-MEP thoroughly discussed its contents and programme. CRAES/CRC-MEP invited members of the chemical expert committee and experts from CRAES/CRC-MEP to attend the seminar. Four experts from RIVM, Theo Vermeire, Patrick Zweers, Theo Traas, and ZhiChao Dang, gave presentations. Experts from RIVM and CRC-MEP introduced the current chemical regulations in the EU and in China and gave presentations on the risk assessment of chemicals by using case studies. Participants were asked to fill in the evaluation form (see Annex 1), immediately after the seminar. RIVM and CRAES/CRC-MEP reviewed the results.

1. The participants agreed that the seminar was very helpful for them to understand the methods and principles of risk assessment of chemicals. Discussions with some participants and members of the CRAES/CRC-MEP staff further confirmed this point.
2. RIVM developed case studies for the seminar. The case studies provided practical training and insights into chemical legislation and the role of risk assessment in legal frameworks. The participants agreed that this very much helped them understand and implement principles of risk assessment in China.
3. The guidance for the new chemical regulation, developed by experts from CRAES/CRC-MEP, is now in a consultation period. These experts stated that the seminar helped them clarify some issues of the guidance document and considered harmonisation of the guidance documents to be a long-term goal which should be achieved by further cooperation.

Working visit of CRAES-experts to RIVM

The working visit of CRAES experts to RIVM was initially planned in the first half of 2012. Due to financial support limitations, CRAES experts had to combine their trip with the visit to Delft University. As the trip to Delft University was not possible, the visit planned in May 2012 could not take place. After further discussion with CRAES, three experts planned to visit RIVM between 9-14 December 2012, the period of the IRAS-RIVM training course for risk assessment of chemicals. RIVM sent the invitation letter to CRAES on Nov. 2, 2012. During the seminar in Beijing, CRAES asked the RIVM whether it was possible to arrange a new visit in 2013 because of difficulties in the application process.

The visit of two CRAES experts, Dr Chang Hong and Dr. Wang XianLiang, took place on 3-8 March 2013. The purpose of this visit was to gain practical experience in risk assessment models (EUSES and ConsExpo) and the OECD QSAR toolbox, as well as in chemical risk assessment related topics like data selection/evaluation and PBT assessment. Dr. Wang and Dr. Chang experienced that this RIVM course helped them to better understand the methods and

principles of risk assessment of chemicals and the exercises with case studies helped them to understand the risk assessment models. They considered this course very useful for their future work on environmental standard setting and on risk assessment of chemicals in China.

3 Project activities

Seminar on risk assessment of chemicals, CRAES, Beijing, Nov 21-22, 2012.

A two-day interactive seminar plus bilateral meeting was organised by CRAES/CRC-MEP and RIVM. The presentations were provided by experts from both RIVM and CRC-MEP.

During this seminar, case studies and the difficulties in risk assessment were discussed. In addition, discussion sessions provided insights into similarities and differences between REACH and the new Chinese regulations on new and existing industrial chemicals, as well as the most interesting topics for further cooperation in risk assessment of chemicals: training, development of China-specific risk assessment tools, software etc.

The seminar's programme and the list of participants are shown in Annex 2 and 3, respectively. Participants were from government institutions, the Chemical Review Committee, and academia. They came from Beijing, Shanghai, Hangzhou, Shenyang, and Nanjing.

According to the evaluations received from 23 participants, the quality of the whole workshop was rated high (8.9, see evaluation Annex 1), whereas the duration of the workshop was considered too short (5.9) by the majority of the participants. The usefulness of each presentation scored above 8.

Practical training course for risk assessment of chemicals, RIVM, Bilthoven, March 4-8, 2013.

A one-week training course was organised by RIVM for Dr. Wang and Dr. Chang, two experts from CRAES. Theo Vermeire, Patrick Zweers, Lidka Maslankiewicz, Jan-Dirk Biesebeek, Emiel Rorije and ZhiChao Dang from RIVM gave presentations and supervised case exercises. The detailed programme of this one-week training can be found in Annex 4. Evaluation was performed at the last day of training by face to face discussion with Theo Vermeire and ZhiChao Dang. Both CRAES experts expressed that the programme was well designed and the goals of this training were reached. All the teachers were highly appreciated for their clear explanations. Both experts considered that this course was very useful for their future work in China e.g. on the Taihu Pollution project and on local and regional pollution estimation. They further suggested that the EUSES model should be introduced in China and should be further developed using Chinese exposure scenarios. Possible future cooperation, e.g. developing Chinese exposure scenario and joint risk assessment of chemicals, was discussed. Both experts felt, however, that a one week course was too short to fully understand and use the models to perform risk assessment of chemicals.

4 Cooperation between implementing team and beneficiaries

Seminar in Beijing

There was an intensive exchange of information between RIVM and CRAES/CRC-MEP before the seminar. The expectations of CRAES/CRC-MEP and RIVM, as laid down in the project description, proved to be very similar. This was confirmed at the post-seminar discussion between RIVM and CRAES/CRC-MEP. The commitment of all parties to make the seminar successful ensured that all appointments and the agreed programme were followed, with some slight amendments. Communications, before and after as well as during the workshop, were optimal and facilitated greatly by Prof. Dr. Dang and two excellent translators. The practical arrangements made by CRAES/CRC-MEP were outstanding. The performance of the CRAES/CRC-MEP and the experts who contributed to the seminar can also be judged from the evaluations by participants. These evaluations show that the seminar very much fulfilled the expectations of the great majority. Both RIVM and CRAES/CRC-MEP had enough human resources available and communication per email, phone and in person went smoothly.

Training course by CRAES experts in Bilthoven

Excellent coordination was carried out by Mr Xia Rui, representative from the international affairs department, CRAES and by Prof. Dr. ZhiChao Dang of RIVM. Communications between RIVM and CRAES went smoothly and both parties committed to performing this project in time. Before the two experts from CRAES visited RIVM, the programme had been thoroughly discussed via email. During the course, communication also went smoothly.

5 Programme objectives

Economic Interest

Capacity building on REACH, risk assessment and standard setting in China is of interest to the Netherlands as this will be beneficial for the protection of human health and the environment, and will facilitate trade in chemicals between China and Europe. The seminar and the training course contributed to achieving this goal, perhaps resulting in the good expectations in the long term regarding the exchange of knowledge and experience. This project helped resolve a trade barrier by aiming for harmonisation of chemical risk assessment and related risk management options.

Bilateral public relations

The seminar focussed on training the Chemicals Review Committee and CRAES/CRC-MEP staff. In addition, new contacts were established with other governmental organisations and academia. Bilateral relationships were strengthened and there appeared to be a strong wish to continue and even expand the relationship, as indicated during the post-seminar discussion and as expressed at the farewell dinner by Prof. Dr. Meng Wei, President of CRAES.

6 Project effect and sustainability

The seminar resulted in new insights into the European chemicals regulation REACH and the principles of risk assessment and risk management. The practical course helped CRAES experts gain experience with models and practical cases. These clarified some issues on the European regulations and inspired CRAES/CRC-MEP staff. The following statement was made by Dr. Wang Hong from CRAES, who is in charge of writing the guidance document for the new chemical regulations.

'Just like I say at the meeting, when we draft out the "Technical guideline for chemical substance in China", we refer to the "Guidance on information requirements and chemical safety assessment" under REACH. After reading these technical documents, we found that there are some parts that we cannot understand so clearly. I think some of my confusion or problems were solved through this meeting. For example, in the TGD documents there are many default parameters, just like temperature, the population etc, we don't know the principle of the author design these default values, and we also have some questions about the Simpletreat model, from communicated with the experts from RIVM, I am more clear about the reasons for the confusion. On the other hand, I think if we want to use these method into China, and make it suitable for China, a more in-depth cooperation and more in depth study is needed in the future.'

In addition, specific information requests were made for both the short and the long-term, assuring continued contact between RIVM and CRAES; see also Section 9.

What could have been done differently?

The financial issue should have been clarified at the initial stage. For this project, CRAES/CRC-MEP received no financial support from the Chinese government, which made it difficult for the CRAES experts to visit the RIVM in the first half of the year. At this stage, a change in project planning caused difficulties for the timing of visit by the CRAES experts to RIVM. In addition, visa application needed more time than expected, another point of attention.

7 (Dutch) economic interests

See section 5.

8 Important developments

The Ministry of Environmental Protection (MEP) in China has promulgated the MEP Order No 22, 'Measure for the Environmental Management of Hazardous Chemical Registration (Trial)', which took effect on March 1, 2013. New chemical companies and toxic chemical importers/exporters have already been required to register with the MEP for environmental management, and companies of 'high environmental concern chemicals' are additionally required to conduct the environment risk assessment and inform the release, migration and control measures for their 'high-concern hazardous chemicals'.

The trial measures are formulated in line with the State Council Decree No.591 (Regulations on the Control over safety of Hazardous Chemicals), which brought about a complex regulatory network consisting of more than ten departments or ministries, including the Ministry of Industry and Information Technology(MIIT), State Administration of Work Safety (SAWS), and the Ministry of Environmental Protection(MEP). The Trial measure shares some legislative content with the 'Measures for the Administration of Hazardous Chemical Registration (SAWS Order No 53)', which came into force on August 1, 2012, and both measures are regarded as a supporting measure under Decree 591. However, more emphasis on emission (hazard exposure) and a migrating reporting system for 'hazardous chemicals of high concern' has been noted in the trial measures. The measures stipulate that manufacturers and the users of hazardous chemicals listed in the C&L Inventory, have to submit the application and dossiers of environmental management registration to their local environmental protection authorities.

9 Follow up and recommendations

Several projects were discussed for a follow-up to the seminar:

Short-term goals:

1. Adaptation of European Guidance and risk assessment tools (such as the EUSES), software to the Chinese situation.
 - a. During the seminar, several participants indicated that they use tools like EUSES and noted that the situations and assumptions used for the EU are totally different to those in China. Participants expressed a strong wish to adapt them (most notably on ecological and human characteristics used in the models) to the Chinese situation. This is perceived by the RIVM experts as a very pragmatic and achievable goal. Similar experience has been gained by adapting EUSES to an African setting.
 - b. Human characteristics that influence exposure to chemicals (behaviour, physical characteristics, diet etc.) differ between populations. For instance, different handbooks of human exposure factors exist for the USA and Europe. A joint workshop on exposure factors was proposed to address the differences between Europe and China (Chinese CDC study).
2. A workshop to stimulate suitable implementation of risk assessment and risk management principles, e.g. by evaluating Chinese case studies with problematic chemicals. This could effectively form a more in-depth continuation of the 2012 seminar.
3. Gaining experience in risk assessment of chemicals. Currently, RIVM is working on the chemical risk assessment within the scope of the OECD Cooperative Chemicals Assessment Meeting (CoCAM) programme. It would be very beneficial to CRAES experts to evaluate CoCAM chemicals together with the RIVM experts to gain practical experience.

Mid to long term goals

4. Cooperation on prioritising and managing problematic chemicals due to their great impact on human health or the environment. Special attention could be paid to successive replacement of these substances by safer alternatives. The main groups are:
 - a. carcinogenic, mutagenic or reprotoxic substances (CMR);
 - b. persistent, bioaccumulative and toxic (PBT) or very persistent very bioaccumulative substances (vPvB);
 - c. endocrine disrupting substances (EDs) or substances with properties that are of equivalent concern to categories a and b.

Financial support

It was made clear that all interested parties should look for funding opportunities to achieve sustainable results. Some topics are of importance for both countries. It would be valuable for NWO or KNAW from the Netherlands and the National Natural Science Foundation of China or the Ministry of Science and Technology to set up a joint scientific thematic research programme on risk assessment of chemicals. Another option is to jointly apply for the EU-funded projects.

10 Publication text in Dutch and English

Import en export van chemische veiligheid in China en Nederland

RIVM en CRAES hebben in het kader van een G2G-project samengewerkt aan uitwisseling van kennis over de risicobeoordeling en opties voor risicomanagement van chemische stoffen. Op termijn draagt dit bij aan de vermindering van handelsbarrières tussen China en Europa doordat chemische bedrijven beter kunnen voldoen aan wettelijke eisen. Dit zal de chemische veiligheid in beide handelsblokken bevorderen.

In dit G2G-project werkte RIVM samen met CRAES (Chinese Research Academy of Environmental Sciences) en het aan CRAES verbonden Chemical Registration Centre van het Ministry of Environmental Protection (CRC-MEP).

Er is gewerkt aan overdracht van kennis over wetgeving en risicobeoordeling en er zijn case studies ontwikkeld en besproken ten behoeve van de implementatie van wetgeving in China met de daarmee verbonden verdere uitwerking van technische richtlijnen. In november 2012 organiseerden RIVM en CRAES een seminar in Beijing voor circa vijftig deskundigen die betrokken zijn bij de beoordeling en review van nieuwe chemische stoffen op de Chinese markt. Naast alle technisch-wetenschappelijke kennisoverdracht zijn ook de overeenkomsten en verschillen besproken tussen de sinds 2007 in Europa van kracht zijnde Verordening voor industriële chemicaliën REACH enerzijds en de recente Chinese wetgeving voor nieuwe en bestaande stoffen anderzijds. Als tweede belangrijke onderdeel van dit project brachten twee Chinese deskundigen van CRAES in maart 2013 een bezoek aan RIVM, waar zij een week lang praktische ervaring hebben opgedaan met de risicobeoordeling van stoffen in het kader van REACH.

Beide deelprojecten zijn zeer goed ontvangen door de betrokken Chinese deskundigen en het management van CRAES. De deskundigen gaven aan vooral meer begrip te hebben gekregen van de Europese technische richtlijnen. In de evaluaties en bilaterale gesprekken met het CRAES-management werd ook aanbevolen de contacten en kennisoverdracht te continueren. Specifieke aanbevelingen waren de aanpassing van Europese risicobeoordelingsinstrumenten aan de Chinese situatie, meer diepgaande studie en discussie van Chinese case studies en meer kennisoverdracht over risicobeoordeling en daaruit volgende risicomanagementaspecten. Ten slotte is ook aanbevolen om samen te werken in de prioritering en aanpak van zorgstoffen en hun geleidelijke vervanging door veiliger alternatieven. Daarbij hebben momenteel wereldwijd hormoonverstorende stoffen speciale belangstelling.

Import and export of chemical safety in China and the Netherlands

Within the scope of a G2G project, RIVM and CRAES exchanged knowledge on risk assessment and options for risk management of chemicals. In due course this will contribute to reduce trade barriers between China and Europe as chemical companies will be more compliant with regulatory requirements. This will promote chemical safety in both trade blocs.

Partners in this G2G-project were the Dutch National Institute of Public Health and the Environment, the Chinese Research Academy of Environmental Sciences (CRAES) and the Chemical Registration Centre of the Ministry of Environmental Protection (CRC-MEP). The latter Centre is attached to CRAES.

The partners exchanged knowledge on current chemical regulations and risk assessment. Case studies were developed and discussed in detail with focus on the implementation of chemical regulations in China and further development of technical guidance. In November 2012, RIVM and CRAES organised a seminar in Beijing bringing together approximately 50 experts involved in the assessment and review of new chemicals for the Chinese market. In addition to transfer of technical-scientific knowledge, similarities and differences between chemical regulations in Europe and China were discussed. These discussions concentrated on REACH, the 2007 regulation for industrial chemicals in Europe, and the recent Chinese regulations for new and existing substances. The second important stage of the project was the visit of two Chinese experts from CRAES to RIVM in March 2013. For one week, they worked with RIVM experts for one week to gain practical experience in risk assessment of chemicals under REACH.

The Chinese experts involved as well as the CRAES management expressed their satisfaction with the results of both subprojects. The experts stressed that they gained a better understanding of the European technical guidance for the risk assessment of chemicals. In the evaluations and bilateral discussions with the CRAES management, it was strongly recommended to continue the contacts and knowledge transfer. Pertinent recommendations were: the adaptation of European risk assessment tools to the Chinese situation, more in depth studies and discussion of Chinese case studies, and more knowledge transfer on risk assessment and related risk management aspects. Finally, there was a call for cooperation in the prioritisation and risk management of substances of concern and their gradual substitution by safer alternatives. In this regard, endocrine disrupting substances currently have special global attention.

Annex 1: Average scores for different items of the SINO-DUTCH WORKSHOP ON RISK ASSESSMENT OF CHEMICALS (November 21-22, 2012)

I General course evaluation

Please rate between 1 and 10:

How would you rate the duration of the workshop?
(too short ← 1 .. 10 → too long):

 5.9

How would you rate the quality of the workshop venue?
(low ← 1 .. 10 → high):

 8.6

How would you rate the quality of the workshop organization?
(low ← 1 .. 10 → high):

 9.0

How would you rate the quality of the total workshop?
(low ← 1 .. 10 → high):

 8.9

Is the workshop helpful for you to understand the methods and principles of risk assessment of chemicals?

Are the case studies useful for improving risk assessment in China? Please explain.

Should risk assessment of chemicals be harmonised globally? Please explain

Suggestions for topics missed:

Which areas of international cooperation do you consider important?

What would be the aim of this international cooperation?

Which organisations in China should be involved?

Other remarks and suggestions:

SINO-DUTCH WORKSHOP ON RISK ASSESSMENT OF CHEMICAL

November 21, 2012

Please rate between 1 and 10 (low ← 1 .. 10 → high)

	Quality	Difficulty	Usefulness	Overall impression
WEDNESDAY, November 21, morning				
Introduction to risk assessment and risk management	9	4.5	7.9	8.5
Introduction to chemical legislation in Europe: past and present, role of authorities	9	4.8	8.4	8.6
Introduction to current chemical legislation in China	9	4.3	8.3	8.6
Introduction to chemical legislation in Europe: industry EU perspective	9.1	5.0	8.1	8.6
Risk management option: China perspective	8.7	4.3	7.7	8.1
WEDNESDAY, November 21, afternoon				
Hazard assessment (including derivation of PNECs and DNELs)	9.1	6.1	9.2	8.8
Case studies for hazard assessment, ecosystems	9.2	6.7	9.1	8.8
Case studies for hazard assessment, humans	9	6.8	9.1	8.9
Hazard and exposure assessment of difficult substances, e.g. poorly soluble substances, PBT, unstable substances, volatile substances, etc., including case studies	9	6.4	8.9	8.6
THURSDAY, November 22, morning				
Environmental exposure assessment (including humans exposed via the environment)	9.1	6.9	8.9	8.9
Exposure scenarios in REACH 1. Key Concepts	9.1	6.5	8.9	8.9
Exposure scenarios in REACH 2. Development and tools	9.2	6.9	9.1	9
THURSDAY, November 22, afternoon				
Case studies for exposure assessment and risk characterisation (environment)	9.2	7.1	8.8	8.9
Risk characterization and risk management options, uncertainty	9.1	7.5	8.7	9

Annex 2: Seminar on chemical risk assessment and management of industrial chemicals, CRAES-RIVM, Beijing, Nov. 21-22, 2012

时间 Time	第一天 21-11-2012	报告人 Speaker
	Chair: Yun Zhou	
9:30 - 9:40	Welcome 致辞	Meng Wei, CRAES
9:40 - 10:15	Introduction to risk assessment and risk management 欧盟风险评价和风险管理概况	Theo Vermeire, RIVM
10:15 - 10:45	Introduction to chemical legislation in Europe: past and present, role of authorities 欧盟化学品管理立法概况：过去、现在及政府定位	Theo Traas, RIVM
10:45 - 11:00	Break 休息	
	Chair: YingXin Gao	
11:00 - 11:30	Introduction to current chemical legislation in China 中国化学品立法概况	Jinglei Nie, CRC-MEP
11:30 - 12:00	Introduction to chemical legislation in Europe: industry EU perspective 欧盟化学品法规介绍：工业欧盟展望	Theo Traas, RIVM
12:00 - 12:30	Risk management option: China perspective 中国风险管理展望	Hong Zhou, CRC-MEP
12:30 - 13:30	Lunch 午餐	
	Chair, Theo Vermeire	
13:30 - 14:30	Hazard assessment (including derivation of PNECs and DNELs) 危害评价（包括PNECs和DNELs的推导）	ZhiChao Dang, RIVM
14:30 - 15:30	Case studies for hazard assessment, ecosystems 危害评价案例（生态）	Patrick Zweers, RIVM
15:30 - 15:45	Break 休息	
	Chair, JingLei Nie	
15:45 - 16:30	Case studies for hazard assessment, humans 危害评价案例（健康）	Theo Vermeire, RIVM
16:30 - 17:30	Hazard and exposure assessment of difficult substances, e.g. poorly soluble substances, PBT, unstable substances, volatile substances, etc., including case studies 困难物质的危害和暴露评价	Patrick Zweers, RIVM
17:30 - 17:40	Evaluation 会议成效评估简介	ZhiChao Dang, RIVM
17:30 - 19:00	Dinner 晚餐	

时间 Time	第一天 21-11-2012	报告人 Speaker
	Chair, ZhiChao Dang	
9:30 – 10:15	Environmental exposure assessment (including humans exposed via the environment) 暴露评估 (包括大众环境暴露)	Theo Vermeire, RIVM
10:15- 11:15	Exposure scenarios in REACH 1. Key Concepts REACH暴露场景构建1：重要概念	Theo Traas, RIVM
11:15 – 11:30	Break 休息	
11:30– 12:30	Exposure scenarios in REACH 2. Development and tools REACH暴露场景构建2：构建及其工具	Theo Traas, RIVM
12:30 – 13:30	Lunch 午餐	
	Chair, Hong Zhou	
13:30– 14:30	Case studies for exposure assessment and risk characterisation (Environment) 暴露评价和风险表征案例 (环境)	Patrick Zweers, RIVM
14:30 – 15:30	Risk characterisation and risk management options, uncertainty 风险表征和风险管理及不确定性	Theo Vermeire, RIVM
15:30 – 15:45	Break 休息	
15:45 – 16:45	Evaluation, Wrap-up and discussion 会议成效评估、总结和讨论	All
16:45 – 17:30	Reporting and collaboration issues 报告和未来合作	RIVM and CRAES

Annex 3: List of experts attending the seminar (total 57 experts)

中欧化学品风险评估研讨会参会专家签到表
(2012年11月21-22日)

序号	姓名	工作单位	
1	贾光	北京大学公共卫生学院	Beijing University
2	胡建信	北京大学环境科学与工程学院	Beijing University
3	刘建国	北京大学环境科学与工程学院	Beijing University
4	李华	北京化工研究院	Beijing Research Institute of Chemical Industry
5	竺建荣	北京师范大学环境学院	Beijing Normal University
6	高星	北京市卫生局	Beijing Bureau of Public Health
7	周志俊	复旦大学公共卫生学院	Fudan University
8	刘济宁	环境保护部南京环境科学研究所	Nanjing Institute of Environmental Sciences
9	王蕾	环境保护部南京环境科学研究所	Nanjing Institute of Environmental Sciences
10	关勇彪	军事医学科学院毒物药物研究所	Academy of military medical sciences
11	顾海蓉	上海市环境科学研究院生态毒理研究所	Shanghai academy of environmental sciences
12	殷浩文	上海市检测中心	Shanghai Academy of Public Measurement
13	刘敏	上海市检测中心	Shanghai Academy of Public Measurement
14	梁艺怀	上海市检测中心	Shanghai Academy of Public Measurement
15	王捷	沈阳化工研究院	ShenYang Research Institute of Chemical Industry
16	蔡磊明	浙江省农科院	Institute of Quality and Standard of Agro-products
17	付立杰	中国毒理学会	Chinese society of toxicology
18	郑玉新	中国疾病预防控制中心职业卫生所	Chinese center for disease control and prevention

19	李 斌	中国疾病预防控制中心职业卫生所	Chinese center for disease control and prevention
20	李正先	中国农药工业协会	Chinese society of pesticides
21	刘思思	北京市卫生局	Beijing Bureau of Public Health

List of experts from CRAES 中国环境科学研究院

1	孟伟	环境科学研究院院长
2	周云	国际部
3	高映新	化学品登记中心
4	沈英娃	化学品登记中心
5	李捍东	污染物生态效应
6	王宏	污染物生态效应
7	杨霓云	污染物生态效应
8	王一喆	污染物生态效应
9	刘晓宇	环境评价中心
10	郑欣	污染物生态效应
11	王先良	环境污染与健康研究室
12	段小丽	环境污染与健康研究室
13	闫振广	污染物生态效应
14	常红	湖泊重点实验室
15	聂晶磊	化学品登记中心
16	周红	化学品登记中心
17	胡俊杰	化学品登记中心
18	蒋翼然	化学品登记中心

19	于洋	化学品登记中心
20	吕磊	化学品登记中心
21	张梦莎	化学品登记中心
22	刘洪英	化学品登记中心
23	刘存新	化学品登记中心
24	于丽娜	化学品登记中心
25	霍立彬	化学品登记中心
26	王芳	固废中心
27	任志鸣	气溶胶
28	李霁	污染物生态效应
29	李彦武	污染物生态效应
30	赵兴茹	污染物生态效应
31	赵艳民	污染物生态效应
32	贲玉婕	污染物生态效应
33	赵秀阁	环境污染与健康研究室
34	聂静	环境污染与健康研究室
35	余若祯	化学品生态效应
36	夏瑞	国际部

Annex 4 Training programme for Chemical Risk Assessment and Management of industrial chemicals

RIVM, Bilthoven, March 4-8, 2013

4-3-2013	General introductions	
9:30 – 10:30	Welcome, introduction to risk assessment and management	Theo Vermeire
10:30 - 11:00	Coffee break	
11:00 – 12:30	Introduction to the programme	Zhichao Dang
12:30 – 13:30	Lunch break	
13:30 – 16:30	Data evaluation + selection (exercise)	Patrick Zweeers
5-3-2013		
9:30 – 12:30	Consexpo introduction	Jan-Dirk Biesebeek
12:30 – 13:30	Lunch break	
13:30 – 14:00	Feedback	ZhiChao Dang
14:00 – 16:00	Exercise PBT assessment	Patrick Zweeers
6-3-2013		
9:30 – 12:30	Exercise Consexpo	Jan-Dirk Biesebeek
12:30 – 13:30	Lunch break	
13:30 – 16:30	Data estimation QSARs for phys/chem. and environmental endpoints + exercises	Emiel rorije
7-3-2013		
9:30 – 12:30	EUSES general introduction	Lidka Maslankiewicz
12:30 – 13:30	EUSES program+ emission+ exercise	Lidka Maslankiewicz
13:30 - 14:30	Lunch break	
14:30 – 16:00	SARs/QSARs for human endpoints Read-across Practical exercises	Emiel rorije
8-3-2013		
9:30 – 11:30	Evaluation, wrap-up and discussion Reporting and collaboration issues	ZhiChao Dang/Theo Vermeire

