Chinese-Norwegian Project on Emission, Impact, and Control Policy for Black Carbon and its Co-benefits in Northern China (ChiNorBC) In-depth seminar on SLCFs Report



Skylight hotel, Beijing. 20th April 2023



An in-depth seminar on Short-lived Climate Forcers (SLCFs) open to the public via live broadcasting was held 20<sup>th</sup> April 2023. This seminar was followed later the same day of the Final governmental workshop for the ChiNorBC project.

The ChiNorBC-project is jointly implemented by the Chinese Research Academy of Environmental Sciences (CRAES) and the Norwegian Environment Agency (NEA), in partnership with the Chinese Academy of Environmental Planning (CAEP), the Norwegian Institute of Public Health (NIPH) and Center for International Climate Research (CICERO), with financial support from the Norwegian Ministry of Foreign Affairs.

After three years of excellent collaboration, the ChiNorBC-project has come to an end. The project has been running through the Covid pandemic with meetings on zoom every second week. It was a great pleasure to finally meet in person.

As Dr. Wenjing Jin from CRAES mentioned in her presentation during the final governmental seminar, it has been close and at times intense communication between the project team members in Beijing and Oslo.



Dr. Wenjing Jin from CRAES presents the working process and the new ChiNorBC inventory.

The Norwegian delegation from the Norwegian Environment Agency (NEA), Norwegian Institute of Public Health (NIPH) and CICERO Center for International Climate Research landed in Beijing on 18th April in blue sky, bright sun and 28°C.

The visit also marked ten years of collaboration between China and Norway on black carbon (BC). The first seminar was in December 2013. The ChiNorBC-project cannot take the responsibility for the reduction in air pollution in the are the last years, but we hope that our work has contributed. It is also our aim that the results of the project can influence the thinking and policy planning to elevate the co-benefits of different emission reduction strategies.

The In-depth seminar had an extensive agenda also covering aspects of SLCFs not

covered in the ChiNorBC project. The agenda and list of participants is enclosed in Annex I. In mitigating SLCFs that contribute to cooling such as black carbon (BC), it is almost evitable to also reduce cooling aerosols like organic carbon (OC), and sulfur dioxides (SO<sub>2</sub>) forming sulfate in the atmosphere.

This was demonstrated in the talk on climate effects by dr. Lund. She also noted that "Integrated policies are necessary to yield multiple benefits of mitigating climate change, improving air quality, protecting human health and achieving several SDGs."

Dr. Zhi presented the ChiNorBC inventories and methodologies to derive the emissions necessary for modelling purposes. He also noted that the *measurements in the transport* and residential sector of different technologies and fuels obtained in the project can feed into the ongoing UN Intergovernmental Panel on Climate Change (IPCC) process of developing globally applicable guidelines for the estimation of SLCFs.

Dr. Du noted in her talk that *the scenarios developed from 2018 to 2035 is estimated to result in substantial (20-43%) reductions of BC*. The reductions are however not evenly distributed across provinces in Northern China, thus policies needs to take local condition into account.



Dr. Guorui Zhi from CRAES presents the development of the ChiNorBC inventories

The presentation by dr. Rao on health effects noted that heath is a vital co-benefit in the reduction of SLCFs. She highlighted the importance of *methane as an ozone producer* and thereby a health concern and that the ChiNorBC project has contributed significantly to understanding the toxicity of BC and the ranking of sources in air pollution toxicity. This has significant implications for policy making.

Dr. Li from National Centre for Climate Change Strategy and International Cooperation (NCSC) gave a comprehensive presentation about methane including an overview of

methane strategies in US and EU. A methane action plan will be developed also in China. A leadership group including NCSC, CAEP and Tsinghua university was formed in 2022 and has been submitted to ministries for comments. The Chinese emissions of methane was 55 million tons CH<sub>4</sub> in 2014 which is the latest year China has reported emissions of CH4 under the UN climate Convention. 40% is related to coal mining. A more recent inventory based on the 2014 inventory will be developed. Measurement, *Reporting and Verification (MRV) is a big challenge, and cost analysis is also lacking.* Dr. Zheng noted the large reductions obtained in  $PM_{2.5}$  between 2013 and 2017 in China and noted the decoupling between the number of cars and emissions. The number of excess deaths has decreased by 0.3 million to 1.98 million in 2017. The CO<sub>2</sub> emissions have also been reduced. Large reductions of SO<sub>2</sub> from power plants have been obtained since 2006. According to Zheng et al. 2020, the reduction in aerosols has led to an increase in global warming of 0.06°C. Dr. Zheng pointed out that according to his research the GDP will benefit from aerosol induced cooling. The aerosol reduction might therefore imply that poor countries will lose, and rich countries will gain, i.e. create bigger differences between countries in the world. According to dr. Zheng the effect of aerosol reductions should be better monetized.



The ChiNorBC project team gathered at CRAES premises

The In-depth seminar was closed by comments from dr. Qingxian Gao followed by a panel discussion among the scientists on research needs led by dr. Vestreng. Dr Gao highlighted the value of including the results / measurements from the project into the IPCC 7 assessment cycle, that health data was a sensitive issue in China and that no methane reduction plan was yet released. The questions addressed in the panel discussion were:

• Q1: There are many **co-benefits** on air quality, health, and climate of emission reduction as we have heard from your excellent presentations. In your opinion, why or why not is the scientific communities, institutions, and processes <u>nationally</u> able to deliver highly policy

relevant integrated analysis, analysis which also highlight potential trade-offs depending on the chosen emission reduction strategies?

- Q2: Emission inventories are not perfect representations of real emissions. What would you, in your field of expertise, highlight as the most important factor (emission levels, sectoral, geographical, and temporal distributions etc.) to improve in order to avoid wrong policy decisions based on inaccurate emission data?
- Q3. **Methane** is both a strong greenhouse gas and contribute to air pollution, adverse health effects and reduced crop yields. Can more scientific research contribute to assist in the value judgement of focusing on methane versus CO2?

The discussion was interesting, and it was noted that policy makers might be well aware of the co-benefits and trade-offs between air pollution and climate change, but the main problem might be the high uncertainties.

## Annex 1: Agenda and list of participants

# **Chinese-Norwegian Project on Emission, Impact, and Control Policy for Black Carbon and its Co-benefits**

## in Northern China (ChiNorBC)

## In-depth seminar on SLCFs Agenda

Date: Thursday 20th April 2023

### Grand Skylight Catic Hotel (Yun Hai Ball Room, 3rd Floor) Broadcast live:

(https://wx.vzan.com/live/tvchat-504387960?v=638168631156126197)

#### Simultaneous interpretation

In-depth seminar on short-lived climate forcers		
Time (Beijing/Oslo): 09:30-12:00 / 03:30-06:00		
Moderator: Dr. Miaomiao Cheng		
09:30-11:05 / 03:30-05:05	The co-benefits of mitigating short-lived climate forcers with a focus on the key results from the ChiNorBC project.	<ul> <li>09:30-09:35, Welcome and purpose of the seminar.</li> <li>09:35-09:50, Emission Inventories (Dr. Zhi)</li> <li>09:50-10:05, Climate effect of short-lived climate forcers (Dr. Lund)</li> <li>10:05-10:20, Air quality effects (Dr. Du)</li> <li>10:20-10:35, Health effects (Dr. Rao)</li> <li>10:35-10:50, Methane (Dr. Li)</li> <li>10:50-11:05, The co-benefits of mitigating SLCFs (Dr. Zheng)</li> </ul>
11:05-11:15 / 05:05-05:15	Coffee Break	
11:15-11:30 /	Comments from	Dr. Qingxian Gao
05:15-05:30	Chinese scientist	
11:30-12:00 /	Knowledge gaps	Panel discussion on research needs
05:30-06:00		
12:00-14:00 /	Lunch	
06:00-08:00		

## List of participants:

#### **Physical participation (P):**

#### **Chinese Research Academy of Environmental Sciences (CRAES)**

- 1. Qingxian Gao, Institute of Atmospheric Environment(P)
- 2. Guorui Zhi, Institute of Atmospheric Environment(P)
- 3. Yongjie Wei, State Key Laboratory of Environmental Criteria and Risk Assessment(P)
- 4. Miaomiao Cheng, Institute of Atmospheric Environment(P)
- 5. Xiaohui Du, Institute of Atmospheric Environment(P)
- 6. Xiaoyan Zhu, Institute of Atmospheric Environment(P)
- 7. Wenjing Jin, Institute of Atmospheric Environment(P)
- 8. Zhigang Li, State Key Laboratory of Environmental Criteria and Risk Assessment(P)
- 9. Xiaojing Zhu, State Key Laboratory of Environmental Criteria and Risk Assessment(P)
- 10. Han Wang, Institute of Atmospheric Environment(P)
- 11. Boya Zhang, Institute of Atmospheric Environment(P)

#### **Chinese Academy for Environmental Planning (CAEP)**

- 12. Yixuan Zheng, Institute of Atmospheric Environment(P)
- 13. Zhulin Qi, Institute of Atmospheric Environment(P)
- 14. Wenxin Cao, Institute of Atmospheric Environment(P)

# National Centre for Climate Change Strategy and International Cooperation (NCSC)

15. Xiang Li(P)

#### Royal Norwegian Embassy, Beijing

- 1. Knut Thonstad, Development counsellor (P)
- 2. Silje Christine Andersen, Second secretary (P)

3. Yinglang Liu, Senior project officer (P)

#### Norwegian Environment Agency (NEA)

- 4. André Kammerud, Head of section for the High North and Bilateral Relations (P)
- 5. Tor Skudal, Senior Adviser, Section for the High North and Bilateral Relations (P)
- 6. Vigdis Vestreng, Senior Adviser, Section for Climate Science and Air Quality (P)

#### **Center for International Climate Research (CICERO)**

7. Marianne Tronstad Lund, Senior Researcher (P)

#### Norwegian Institute of Public Health (NIPH)

- 8. Shilpa Rao-Skirbekk, Senior researcher (P)
- 9. Per Everhard Schwarze, Scientist (P)
- 10. Marit Låg, Senior Scientist (P)
- 11. Vegard Grytting (P)