ChiNorCH4 Oslo meeting 19-21 November 2025

Introduction

After several weeks of planning, Chinese participants in the ChiNorCH4 project finally landed in Oslo 18. November 2025. What a relief! The agenda and list of participants can be found in Annex 1 and 2.

On 19. November they were warmly welcomed at the Norwegian Environment Agency's (NEA) premises by the Department Director in the Climate Department, Anna von Streng Velken. Marte Nordseth from the Norwegian Ministry of Climate and Environment presented Norway's Green Book on Climate Policy (Climate Status and Plan), while Yuan Zhou from NCSC presented the policy evaluation indicator system for methane control, which is being developed under the ChiNorCH4 project. This was followed by an interesting discussion on policy governance.

The ChiNorCH4 team at NEA including Anna von Streng Velken, Department director, Climate Department, Camilla Schreiner, Head of Section for Climate Science, Air Quality and Local Climate Mitigation and André Kammerud, Head of Section for the High North and Bilateral Relations from NEA and Marte Nordseth and Elin Økstad from the Norwegian Ministry of Climate and Environment. Photo: Private.

Project work at NEA will be documented at the project website https://www.chinorclimate.org/. Photo: Vigdis Vestreng.

Field visit to waste facility (ROAF)

ROAF is a Norwegian intermunicipal waste management company serving more than 200 000 residents across several municipalities in the Oslo region.

The delegation was received by ROAF's Technical Director, Mr. Jone Rivrud Rygg. Following a mandatory safety briefing, the visit commenced at one of Europe's most advanced and fully automated waste-sorting facilities. The facility processes household waste by separating it into food waste (collected in green bags), multiple plastic fractions, and residual waste.

Subsequently, the delegation proceeded to the gas houses located on the closed landfill site, where methane gas is captured and flared to minimize environmental impact. The program continued with an inspection of the composting area for garden waste. The visit concluded at ROAF's reuse shop, where participants were given the opportunity to select second-hand items free of charge.

Project team visiting ROAF waste facility. Technical Director of ROAF, Jone Rivrud Rygg, (green helmet). Photo: Private.

Excellent information, weather and happy project participants at ROAF. Photo: Private.

After dinner at Aker Brygge with the town hall in the background. Marianne Tronstad Lund and Shipa Rao from the Sino-Norwegian project on black carbon were participating. Photo: André Kammerud.

Waste management and livestock solutions

20. November started with project work in break out groups per outcome. Outcome 1 had online participation from Han Xue and Gao Wenkang. After lunch we had three following presentations.

Metan HUB

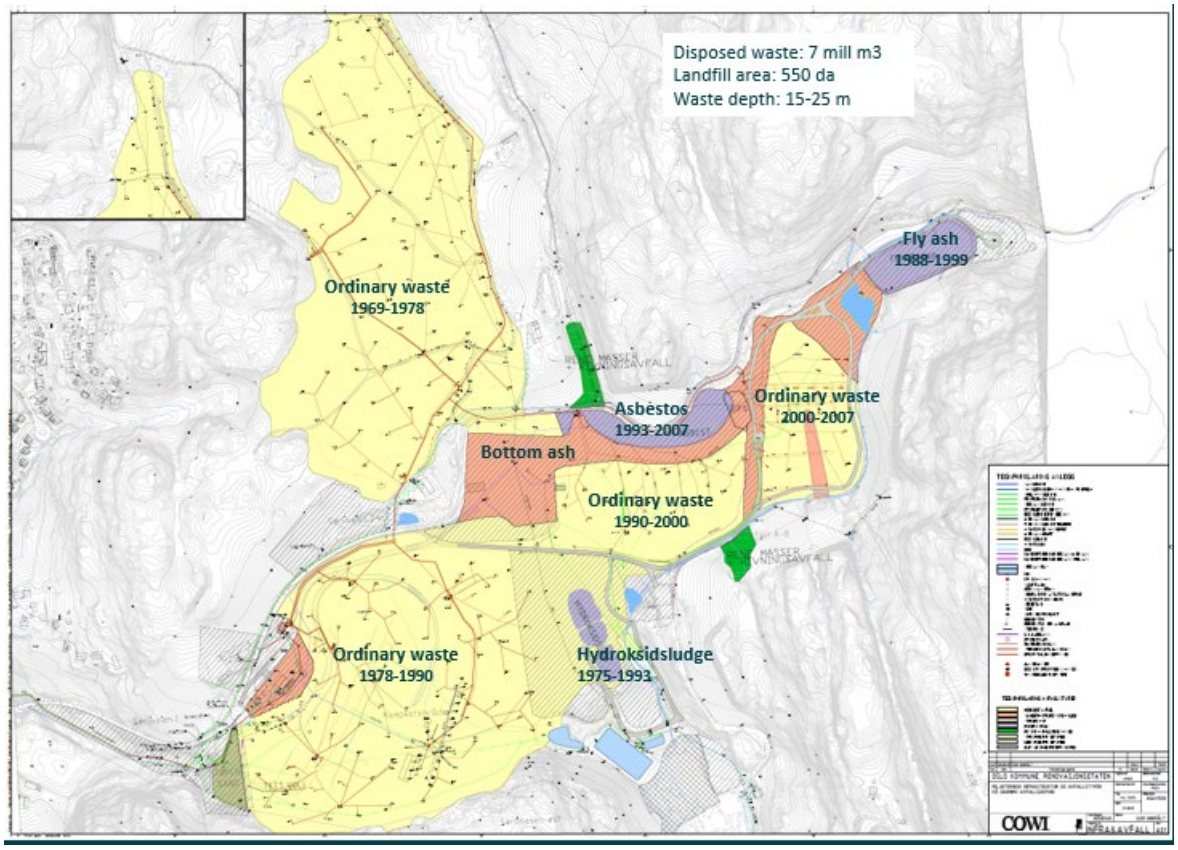
MetanHUB is research project working with how to reduce emissions from enteric fermentation from ruminants in Norway. Former project leader Erik Selmer- Olsen and Heidi Josten Skreden presented the project. They are testing different feed additives on dairy cow, goats, sheep and suckling cows. The largest trial has been on 3-NOP (Bovaer) for dairy cows where 100 farms has been involved in the trials. The farm trials are testing out practical feeding methods. The trials with emission measurements by green feeders are done in the research farm at NMBU. For goats the additive SilvAir and rapeseed oil were tested in 2024. Methane emissions were measured in PAC- chambers. For sheep Calcium peroxide has been tested and measurements done in respiratory chambers. For suckling cows SilvAir has been tested and methane emissions measured with a methane sensor in the barn. The results from alle the trials are under analysis. The presentation was followed by many interesting questions from an engaged audience and a good discussion.

CAMBI

Cambi, a Norwegian company, specializes in the treatment of sewage sludge and organic waste. Dr. Zuliang Liao, Regional Technical Director for Cambi China, delivered an insightful presentation on the company's approach to waste management and methane production. Cambi focuses on long term collaboration with Chinese institutions and have established several facilities in Beijing. Dr. Liao extended an invitation to the methane project for an on-site visit.

GRØNMO

Grønmo was the main landfill of Oslo municipality from 1969-2007. It is now closed and reopened as a public recreational area, recycling facility and golf course. As a visit to these premises was scheduled for the project members on Friday the 21.11, Elise Amland presented the history of Grønmo from an active landfill for ordinary waste, to decreased landfilling and closure.



Map of the Grønmo landfill with the periods of landfilling and waste categories.

The closed landfill is currently a subject to intensive post-closure operations such as improved leachate-treatment and gas-collection. Grønmo clearly shows how landfills demand active management and produce both severe amounts of methane and leachate for more than 50 years. It is also a good example of how low tech and mature solutions if adapted to local conditions, waste content and continuous follow-up, can have a significant impact on reducing methane-emissions.

Field visit to research farm

The day started out with a presentation of research projects on ruminants by Professor in animal nutrition and physiology Egil Prestløkken from Norwegian University of Life Sciences (NMBU). The research the last years has been focused on the environmental impacts of ruminants and mainly enteric methane emissions. The emissions can be reduced through improved productivity, better feed utilisation, use of feed additives, increased use of pasture and breeding. Right now there are ongoing trials on the feed additive 3- NOP for dairy cows, as also mentioned by MethaneHUB.

After the presentation Egil joined us for a tour of the cattle barn in the research farm at Center for Animal Trials. We got to study the green feeders and see how the cows are fed controlled amounts of feed with additives for every meal. The 3- NOP trail only included 16 cows at the moment, but we also got to see the large barn of several hundred dairy cows that are currently not part of any trials. We saw how the milking robot worked and how the feed was individually adjusted to every cow. At the end we also visited the very cute and social calves.

Tour of the research farm at NMBU. Left picture: The cow Vilma in the background while Professor Prestløkken is explaining the green feeder technology. Right picture: Feed tray with scale to register exact amount of feed consumed.

Visit to Norwegian Institute of Bioeconomy Research (NIBIO)

We visited NIBIO in their premises at Ås close to NMBU. NIBIO is subject to the Ministry of Agriculture and Food as an administrative agency with special authorization and its own supervisory board. We got a nice overview of NIBIOs research and the institute's engagement worldwide. The institute has 760 employees and are situated 15 different places in Norway (https://www.nibio.no/en). In this way they have close connection with different climatic zones for measurements and research.

Project leader on the Chinese side, Shule Liu, gave a presentation of the ChiNorCH4 project that was very well welcomed. Participants notes that they had many interests in common, and we foresee to meet with NIBIO again.

Shule Liu presents the ChiNorCH4 project at NIBIO. Photo: Private.

Visit to the Grønmo abandoned landfill

Heading back to Oslo the project team made a short stop to see the closed Grønmo landfill next to the Klemetsrud facility – one of two waste-to-energy plants processing municipal waste from Oslo. By 2029, the facility is set to have a full-scale carbon capture plant in place, the first of its kind in the world for waste incineration.

Left: Gas regulation house at Grønmo with the smoke from the Klemetsud waste-to-energy-facility in the back. Right: Golf course situated on top of the oldest part of the landfill.

We had a short stroll in the recreational area situated on top of the old disposed waste and surrounded by a national park. Elise Amland explained the underlying waste content, cover layers, gas and leachate collection systems as we moved around on the premises.

Project team by the artificial dam to ensure clean water from the surrounding forest to avoid entering the landfill and becoming leachate. Currently standing on top of several meters of bottom ash covered with a fiber-cover, 0,7 meters of clay-rich soil and 0,3 meters of topsoil.

Key Takeaways from the Visit:

The delegation observed several noteworthy practices and insights during the visit to Norway:

Advanced Waste Sorting Systems: Norway places strong emphasis on municipal solid waste sorting. Residents are encouraged to conduct initial separation at source, followed by further advanced mechanical sorting in large-scale facilities to recover plastics, metals, paper and other materials. While not yet 100% recovery, this system significantly improves resource recovery rates and reduces potential methane emissions and overall carbon footprint. Similar advanced sorting facilities are already being piloted in cities like Beijing, demonstrating the transferability and relevance of such approaches.

Incentive-based Waste Management: The Norwegian government is encouraging “Pay-As-You-Throw” system for waste—a model that has evolved from earlier pilot programs—charges households based on the volume or weight of their non-recyclable residual waste, while sorted recyclables are typically collected free or at low cost. This provides a direct financial incentive that has proven to be an efficient measure for more efficient waste collection, waste reduction and improved separation at source.

Long-term Landfill Gas Management: Monitoring data and management practices from multiple closed landfills in Norway indicate that landfill gas emissions can persist for nearly a century after peak production. This underscores the importance of continued gas extraction, monitoring, and management even after landfill closure to mitigate long-term methane emissions.

Debrief and next steps

We returned to NEA after a long and interesting day. We completed the 2026 Work plan with the aim to meet in Beijing in May/June 2026 for a seminar including emissions of enteric methane and other project work including field visits to Chinese farms and waste facilities where measurements for the project are taken.

The word cloud below conveys participants expressions of the three day's Oslo visit.


Fruitful
Nice
Efficient
Colourful
Appreciate
Wonderful
Interesting
Memorable
Cold
Fruitful
Nice
Efficient
Colourful
Appreciate
Wonderful
Interesting
Memorable
Cold

Annex 1 ChiNorCH4 Delegation Visit Program – Oslo, Norway

Dates: November 19–21, 2025

Duration: 3 days

Location: Miljødirektoratet (NEA), Grensesvingen 7, 0661 Oslo and surrounding areas

Wednesday, November 19 – Welcome and policy development

Location: Oslo, Vestmarka meeting room at NEA

08:30 – Arrival and registration

09:00 – Welcome by Anna von Streng Velken, Director of the Climate Department at NEA

09:15 – Group photo

09:30 – Presentation round

10:00 – Norway's Green Book on Climate Policy (Climate Status and Plan). Presentation by Marte Nordseth, Head of Analysis, the Norwegian Ministry of Climate and Environment

10:30 – ChiNorCH4 development of a policy evaluation indicator system for methane control, NCSC

11:00 – Coffee and networking

11:15 – ChiNorCH4 work plan

12:00 – Lunch at NEA

13:00 – Departure from NEA to waste facility

13:30 – Field visit Romerike waste facility (ROAF)
ROAF is a Norwegian intermunicipal waste management company that serves over 200,000 residents across several municipalities near Oslo. They operate one of Europe's most advanced and fully automated waste sorting facilities, in addition to landfill management, composting and recycling stations.

16:30 – Return to hotel

17:30 – Welcome dinner

Thursday, November 20 – Project work and presentations

Location: Miljødirektoratet (NEA), Grensesvingen 7, 0661 Oslo

09:00 – 12:00 Project work by Outcomes in breakout groups including admin and web site.

09:00-10:00

- O1 in break out room Lillomarka. Chinese partners also on Teams.
- O3 links to the other outcomes. O2, O3, O4 Vestmarka

10:00-11:00 Outcome 4 with focus on input from other outcomes, all

11:00-12:00

- O2 in break out room Romeriksåsene
- O3 and O4 in Vestmarka
- Admin and web site in break out room Lillomarka

12:00 – Lunch at NEA

Presentations and discussions of waste management and livestock solutions

13:00 – Sewage sludge and organic waste management by CAMBI
Dr.ing Zuliang Liao, Regional Tech Director (Cambi China) & Project Development

14:00 – Measures to reduce enteric menthane by Methane Hub. Presentation by Project leader Ellen Hassel from Tine and former project leader Erik Selmer Olsen from Tine

15:00 – Grønmo landfill, by Norwegian project team
16:30 – Cultural activity (Munch Museum, Opera House)
19:00 – Free time

Friday, November 21 – Field Visits, Innovation and Closing

Location: Transport from NEA

08:30 – Gather at NEA. Minibus to Visit to Norwegian University of Life Sciences (NMBU)

09:15 – Presentation and field visit Methane Pasture
Egil Presteløkken, Professor in Animal Nutrition and physiology at NMBU, Department of Animal and Aquacultural Sciences. Visit to research farm

12:00 – Lunch on site

13:00 – Presentation by Norwegian Instiute for bio economy (NIBIO)
Dr Jihong Liu Clarke, Research Professor & Coordinator for China Relations

14:00 – Visit to Grønmo landfill
16:00 – Debrief and next steps at NEA
17:00 – Farewell Dinner

Annex 2 ChiNorCH4 meeting in Oslo 19-21 November 2025 – List of participants

Name	Affiliation	Titel	Task
			Chinese side
Miaomiao CHENG	CRAES	Professor	Project leader ChiNorBC
Shule LIU	CRAES	Associate Professor	Project leader ChiNorCH4, Outcome 2
Yun SHU	CRAES	Professor	ChiNorCH4 Outcome 3
Zhenhua CHU	NCSC	Assistant Professor	ChiNorCH4 Outcome 4
Yuan ZHOU	NCSC	Assistant Professor	ChiNorCH4 Outcome 4
			Norwegian side: ChiNorCH4 project
Tor Skudal	NEA	Senior Adviser	Project administration ChiNorCH4
Vigdis Vestreng	NEA	Project leader	Project leader ChiNor CH4+Outcome 4
Vilde Maria Lavoll	NEA	Senior Adviser	ChiNorCH4 Outcome 1+Outcome 4
Beate Langset	NEA	Senior Adviser	ChiNorCH4 Outcome 2+Outcome 4
Elise Narum Amland	MEPEX	Senior Adviser	ChiNorCH4 Outcome 2
Erik Nygaard	NEA	Senior Adviser	ChiNorCH4 Outcome 3+Outcome 4
			Norwegian side: other participants
Anna von Streng Velken	NEA	Department director	Opening speech
Camilla Schreiner		Head of section	9-12 and dinner 19/11
Marte Nordseth	KLD	Head of Analysis	Presentation 19/11
Elin Merete Økstad	KLD	Head of Analysis	Former Counsellor (Climate and Environment) in Beijing, 9-12 and lunch 19/11
Marianne Tronstad Lund	CICERO	Head of research	Participant in ChiNorBC project, dinner 19/11
Shilpa Rao-Skirbekk	FHI	Scientist	Participant in ChiNorBC project, dinner 19/11
Ellen Thomsen Halaas	ROAF	Environment and Development	Field visit to waste facility 19/11
Zuliang Liao	CAMBI	Regional Tech Director (Cambi China) & Project Development	Presentation 20/11
Ellen Hasssel	TINE	Project leader MethaneHub	Presentation on Teams 20/11
Erik Selmer Olsen	TINE	Former project leader MethaneHub	Presentation on Teams 20/11
Egil Presteløkken	NMBU	Professor in Animal Nutrition and physiology, Department of Animal and Aquacultural	Presentation and visit to reseach farm
Britta Maria Hoem	NEA	Chief Engineer	Participate in field visit and lunch 21/11
Vilde Camilla Melø	NEA	Advisor	Participate in field visit and lunch 21/11
Bjørn Huso	Norwegian Agricultural Authority	Head of Analysis	Participate in field visit and lunch 21/11
Ingvild Solhjem	Norwegian Agricultural Authority	Advisor	Participate in field visit and lunch 21/11
Thomas Hartnik	NIBIO	Division Director, Division of environment and natural resources	Visit 21/11
Jihong Liu Clarke	NIBIO	Senior Advisor, Division of environment and natural resources	Visit 21/11