

CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

International Co-operative Programme on Effects on Materials, including Historic and Cultural Monuments

Minutes for 38th Meeting of the Programme Task Force

The meeting was held on 4-5 May 2022 with several independent sessions taking place on Teams. There were total of 26 participants from 16 countries, including the chair of the working group on effects. All participants joined the meeting at different sessions depending on their responsibilities. All presentations presented in the meeting can be found at Teams in the ICP Materials group. For further assistance concerning presentation files, please contact [Johan Tidblad](#).

Please note that these minutes focuses only on the main discussion and decision. Details of all discussion are not included.

The sequence of sessions was sometimes re-arranged to facilitate the discussion based upon participation of the key persons in each session. However, the minutes written here follows the original schedule.

Session overview

Date	Time	Topic
May 4	9:00-10:30	General Session 1/2
	10:45-12:00	Discussion on corrosion and soiling data, environmental data and new exposure
	13:30-15:00	Discussion on corrosion and soiling data, environmental data and new exposure (contd.)
	15:15-16:30	Discussion on corrosion and soiling data, environmental data and new exposure(contd.)
May 5	9:00-10:30	Update of dose-response function for each material and discussion on pH (EMEP data)
	10:45-12:00	UNESCO Cultural heritage sites including upscaling of economics
	13:30-15:00	UNESCO Cultural heritage sites including upscaling of economics (contd.)
	15:15-16:30	General session 2/2

Wednesday May 4

09:00-10:30 General session 1/2

1. Test of the meeting system 09:00-09:15

At 09:00 participants started to join the meeting

2. Opening of the meeting

Johan started the meeting by welcoming all participants and giving practical information.

3. Introduction of participants

Guadalupe Dominica Pinar Larrubia, Austria

Valentina Pintus, Austria

Goran Purić, Croatia

Kateřina Kreislová, Czech Republic

Markéta Vlachová, Czech Republic

Jelena Tsurkan, Estonia

Tiina Vuorio, Finland

Aurelie Verney-Carron, France

Stefan Brüggerhoff, Germany

George Kouremadas, Greece

Pasquale Spezzano, Italy

Teresa La Torretta, Italy

Terje Grøntoft, Norway

Rafal Lutze, Poland

Bartłomiej Wierzba, Poland

Joanna Kobus, Poland

Daniel de la Fuente, Spain

Johan Tidblad, Sweden

Namurata Pålsson, Sweden

Markus Faller, Switzerland

Ulrik Hans, Switzerland

Tim Yates, UK

Isaura Rabago (chair of Working Group on Effects)

Marta Segura Roux (IVL Swedish Environmental Research Institute)

Sophie Standring (Task Force for International Cooperation on Air Pollution: TFICAP)

Vasile Rus (observer)

Note: the list above includes all participants joining the meeting in at least one of the sessions listed above. All names appear according to alphabetical order of their countries or responsibility in the meeting.

4. Overview of meeting objectives and approval of the agenda

Johan presented an overview of the agenda of the current meeting. The agenda was approved without additions.

5. Information from the joint meeting of EMEP & WGE, Gothenburg Protocol Review and Review of CLRTAP science strategy 2020-2029

Isaura presented outcome from previous meetings, work plan for Gothenburg Protocol and Science Strategy and agenda of the upcoming 8th Joint EMEP WGE session, which is scheduled on 12-16 September 2022. Further details can be found in her presentation.

Johan asked Isaura about the data for EMEP projection. Isaura mentioned that Hilde Fagerli will distribute the information. Johan received e-mail from Hilde on 5 May.

6. Information on FICAP

Sophie presented vision, aim, work plan and current activities of FICAP. Three questions were raised for further collaboration with ICP Materials:

- a. What capacity building work is currently happening under ICP Materials?
- b. Where do you see areas of collaboration between TFICAP and ICP Materials?
- c. Are there any materials/tools that TFICAP should be promoting from ICP Materials?

Isaura commented that the focus of discussion will be depended on regions, and this will be decided after the first meeting in October 2022.

Johan commented on international collaboration to reach out for new contacts since different regions may experience different problems. Regarding ICP Materials, the Technical Manual is following ISO standard which is already written in English.

7. 39th meeting of the Programme Task Force

Stefan mentioned that it is possible to have a physical meeting in Bochum in 2023. The date is planned on 3-5 May 2023 based on the deliverables 2023. However, Stefan will confirm the final decision within 2-3 weeks after an internal discussion with his colleagues.

8. Access to Teams channel

Access to Teams channel is only available to the members of ICP Materials Task Force. Namurata asked all members to update their e-mail address used for Teams application. If anyone cannot access the link, they have to contact Namurata.

9. Update on contact person of each site

Namurata presented the updated list of contact persons of each test site. The list will be uploaded on Teams channel and members can further modify the list themselves.

10. Tour de table; Current financial situation and condition to release data to open access

Country	Test site	Status of test rack	Financial situation	Open access of environmental data
Czech Republic	01 Prague	ok	Annual budget	ok
	03 Kopisty			
Germany	10 Bottrop	There will be new contact person	Up to 2023	ok
	41 Berlin	Ruth Keller has been retired. Send e-mail to her and cc: Stefan		
Italy	13 Rome	ok	Similar to previous year	ok
	14 Casaccia			
	15 Milan			
Norway	21 Oslo	ok	Similar to previous year	ok
	23 Birkenes			
	44 Svanvik			
Sweden	24 Stockholm	ok	ok	ok
	26 Aspvreten			
Spain	31 Madrid	ok	New budget for all ICPs	ok
	33 Toledo			
Estonia	35 Lahemaa	The representative cannot attend this session.		
France	40 Paris	ok	ok	ok
Switzerland	45 Chaumont	ok	Applied for 4-year funding	ok
Poland	50 Katowice	ok	Until the end of 2023	ok
Greece	51 Athens	The representative cannot attend this session.		
Austria	53 Vienna	ok	No specific funding	ok
Finland	57 Hämeenlinna	ok	Funding from industry	ok
USA	58 New Haven	The representative cannot attend this session.		
Slovakia	59 Zilina	The representative cannot attend this session.		
Croatia	60 Split	ok	ok	ok
	61 Zagreb			

== Coffee Break ==

Wednesday May 4 (contd.)

10:45-12:00 Discussion on corrosion and soiling data for the exposure for trend analysis, including plan for report on corrosion and soiling data

11. Passive samples exposition

Marta mentioned to use the address below for shipping of exposed passive samplers without her name written. If passive samplers from any test sites have not been sent, please contact her as soon as possible.

IVL Swedish Environmental Research Institute
Laboratory, diffusive
Aschebergsgatan 44
411 33 Göteborg
Sweden

Johan suggested to Marta that preliminary results can be sent only to him and Terje with average temperature of 20 °C so all test sites can pay their invoice. Marta replied that the results calculated with 20 °C cannot be distributed to all sites and she agreed to send preliminary results only to Johan and Terje. Terje mentioned that the final results from passive samplers must be calculated with average temperature.

Aurelie ask Marta to send the invoice and receipt to her e-mail address as well. Marta mentioned that invoice and receipt can be sent upon request. Terje mentioned passive samplers from another project and he and Marta will have a separated discussion on this. Johan mentioned that there are no passive samplers exposed in 2021 and 2022 since we only monitored every three years.

12. Environmental data report

Terje went through environmental data that he has received:

Test site	Status of data
01 Prague	Completed
03 Kopisty	Completed
10 Bottrop	The data has been sent to Terje, but Terje has not received it. Stefan will check.
13 Rome	Completed
14 Casaccia	Completed
15 Milan	Completed
16 Venice	Completed
21 Oslo	Completed
23 Birkenes	Completed
44 Svanvik	Completed
24 Stockholm	The data will be sent before summer vacation.
26 Aspövreten	The data will be sent before summer vacation.
31 Madrid	Completed

33 Toledo	Completed
35 Lahemaa	The data can be obtained from EMEP.
40 Paris	The data will be sent before summer vacation. Aurelie asked the question about when to start measuring environmental data if the samples were exposed during day 1-15 and day 16-30 of the month. Terje replied that monthly average is best.
41 Berlin	Ruth Keller has retired. Stefan expected that she has sent the results to Terje. Stefan suggested to contact Stefan Simon.
45 Chaumont	The data is measured at another lab at EMPA. It has been requested and will received soon.
50 Katowice	The data will be sent before summer vacation.
51 Athens	The data will be sent before summer vacation.
53 Vienna	Completed
57 Hämeenlinna	Completed
58 New Haven	The representative cannot attend this session. Namurata will make a contact.
59 Zilina	The representative cannot attend this session. Namurata will make a contact.
60 Split	The representative cannot attend this session. Namurata will make a contact.
61 Zagreb	The representative cannot attend this session. Namurata will make a contact.

13. Report 92: Corrosion and soiling data from the exposure for trend analysis 2017-2021

For Task force members, presentations can be found at <https://risecloud.sharepoint.com/:f:/r/sites/ICPMaterials/Delade%20dokument/General/Meeting/38th%20Meeting/Presentation?csf=1&web=1&e=7srrm4>. Otherwise, presentation can be distributed upon request. Please contact [Namurata Pålsson](#).

a. Carbon steel and stainless steel

Kateřina mentioned usually higher mass loss of carbon steel at Berlin from exposure in 2017-2018 and 2020-2021. Corrosion sensors were also exposed at test sites in Prague, in which corrosion loss can be monitored continuously. All participants agreed that this is very interesting and will be discussed further in later sessions. For stainless steel, further corrosion analysis has not been performed yet, only photographs of samples were documented.

== Lunch ==

Wednesday May 4 (contd.)

13:30-15:00 Discussion on corrosion and soiling data for the exposure for trend analysis, including plan for report on corrosion and soiling data (contd.)

b. Weathering steel

Daniel presented results of 1- and 4-year corrosion and the plan to collect samples for 8-year corrosion.

c. Zinc

Markus mentioned that it was expected that corrosion loss of Ti-Zn would have been higher than Zn. Kateřina suggested to continue with only Zn. Johan mentioned that Ti-Zn cannot be used for 1-year trend, but it would be interesting to plan 4-year exposure for both materials to see the results.

d. Aluminum

Namurata presented decreasing trend of 4-year corrosion loss in 1987-1991 and 2011-2015. It is expected that 4-year corrosion loss would be lower in 2017-2021. Analysis of weight loss data is on-going since pickling with HNO₃ is more complicated to define weight loss. Pit analysis will also be done. The samples from Paris and Split are missing. Kateřina mentioned that for stainless steel it is also complicated to define weight loss, so she used oxalic acid for pickling stainless steel.

e. Limestone and plan on transfer of sub-center

Tim presented 1- and 4- year trend of limestone. The subcentre of limestone will be transferred to Aurelie. Drawing of carousel is available and limestone for future exposure will be shipped to France.

f. Modern glass, limestone and marble

Aurelie presented the results and asked Namurata to check with test site 58 New Haven if the glass samples were exposed since it was cleaned. Results from 1-year exposure do not show any evident trend. More trends are expected from 2-, 3- and 4-year exposure.

g. Coil coated materials

Tiina presented the results and mentioned that samples from test site 35 Lahemaa and 58 New Haven may have been exposed upside down, therefore excluded. Results from 1-year should be interpreted in correlation with those from 4-year. Stefan suggested to exposed coil coated materials under shelter to void effect of rainwash. Aurelie suggested to monitor frequency of rain event together with amount of rain.

== Coffee break ==

15:15-16:30 Discussion on corrosion and soiling data for the exposure for trend analysis, including plan for report on corrosion and soiling data (contd.)

14. Update on new exposure of carbon steels, weathering steels and limestone

Namurata presented the date where samples A41-49, B41-49 and M31-33 were started to be exposed at all sites. The information for Task Force members only can be found at

<https://risecloud.sharepoint.com/:x:/r/sites/ICPMaterials/Delade%20dokument/General/Exposure/2021/Shipment%20and%20Exposure%202021.xlsx?d=w2199c97159e042098c804fda131def60&csf=1&web=1&e=SoPQCR> (sheet name "exposure").

Thursday May 5

9:00-10:30 Update of dose-response function for each material and discussion on pH (EMEP data)

15. Approval of the final-update version of Mapping Manual Ch 4.

Namurata presented the latest version of the Mapping Manual Ch.4. All agreed to change from draft to final-update version for publishing on Coordination Center for Effects (CCE) webpage.

16. Dose-response function (DRF)

Johan mentioned three main materials for modification of DRF: carbon steel, zinc and limestone. Kateřina mentioned that SO₂ has become milder and there is no effect on carbon steel at all when SO₂ is below 5 µg/m³. Effect of time of wetness (TOW) is important and effect of chloride from de-icing salt has become more significant than SO₂. Johan replied that effect of pollution is necessary for DRF and raised the question on which DRF of materials among those three should be modified first. Kateřina suggested zinc due to sensitivity of carbon steel to TOW. Markus suggested to see statistic of results both from 1- and 4-year exposure. Tim suggested to apply current DRF to the updated data and modelling work may help to understand mechanism. For limestone, effect of SO₂ can be observed when the concentration is above 10-15 µg/cm³. Rainfall also affects limestone. Since rainfall is vary year to year, 4-year result is better for modification of DRF for limestone. Tim also suggested to have a look on composition of the particulate matters. All agreed that to modify DRF, 1-year data is more important for carbon steel and 4-year data is more important for zinc and limestone.

Vasile asked pickling and mass loss analysis of Ti-Zn.

17. Discussion on data of pH: short- and long-term scenario

Johan mentioned that it is problematic to monitor pH of rain (Rain[H+]) for DRF. And pH of rain is not provided by EMEP. The question is if we should try to remove Rain[H+] from DRF and what the long-term scenario should be.

Tim replied that for limestone, it is very sensitive to pH of rain. The change of pH from 5.5 to 6.5 can affect limestone significantly.

Kateřina replied that for carbon steel, and possibly zinc, it is difficult to see the effect of pH. For zinc, pH measured on the surface is not only from rain, but contribution from the contaminants. Terje mentioned that pH of rain is collected monthly. It could be interesting to correlate monthly data in 2024-2025 by using carbon steel and zinc corrosion sensors. Tim mentioned that corrosion sensor from limestone is not available yet. pH of rain is also deviated largely from south to north of Europe.

For the short-term scenario, Pasquale mentioned that he has collected open-access data and interpolated according to EMEP grid from year 2015. Acid rain has become a milder problem in Europe. pH of rain has not changed much from year to year and the general trend is decreasing. Terje mentioned that Norway has station where pH of rain was collected, and it can be compared to interpolated data from Pasquale. Pasquale informed that Teresa has this data already.

== Coffee Break ==

10:45-12:00 UNESCO Cultural heritage sites including upscaling of economics

18. Referencing documents and reporting requirements

- a. Report on Call for Data – Part VI: Study on the relationship between the environmental and the artefact on selected UNESCO sites (2022)

Teresa presented the results and informed that local data, e.g., emission and energy consumption, is appreciated. Teresa will contact representatives from Croatia and Germany for such data. The draft of this report will be presented at WGE meeting in September 2022.

- b. Report on Call for Data – Part VII: Application of models with increased resolution on selected UNESCO sites (2023)

Teresa informed that this report will be written in the similar manner as Report 90. Teresa has sent out request for data, but has not received the data yet. Teresa will arrange meetings with each country including Croatia, Germany, France and Prague. More data is needed to increase resolution from 1 km to 0.1 km.

== Lunch ==

Thursday May 5 (contd.)

13:30-15:00 UNESCO Cultural heritage sites including upscaling of economics

c. Upscaling of economics

Teresa informed that data on stock of materials at risk, i.e., type of materials and surface area, in various countries is required. Terje suggested numerical analysis by using approximation of number of houses, number of UNESCO sites, surface area and height. All agreed that amount of uncertainty must be accepted. This work requires great effort and economist partner is preferred. A separated working group, Johan, Pasquale, Teresa and Terje, will be formed to discuss the idea on how to proceed.

== Coffee Break ==

15:15-16:30 General session 2/2

19. Summary of decisions and time schedule

a. Exposure for trend analysis: Reporting 2022

Johan summarized deliverables in the work plan.

2022

- ⇒ Report 92 Corrosion and Soiling Data
 - Data (text in word file and excel file separately) to be sent to Namurata before summer vacation.
- ⇒ Report 93 UNESCO Part VI
 - Contact to individual countries, e.g., Croatia, Germany.
 - Updated version to be sent to Namurata to be distributed to the whole group before summer vacation.

2023

- ⇒ Report 94 Environmental Data
 - Report data in one file to Terje before summer vacation.
- ⇒ Report 95 Trend Exposure
- ⇒ Report 96 UNESCO Part VII
 - Individual meeting with Teresa to find our more sources on high resolution data.

b. Exposure for trend analysis: Exposure programme 2020-2029

c. Update of dose-response function and data on pH (EMEP)

- ⇒ 1-year data: prioritize carbon steel, no need to include pH
- ⇒ 4-year data: prioritize Zn and limestone and evaluate if we have enough data for revision.

20. Discussion on 2024-2025 work plan

Johan mentioned that there could be some test sites that can do more monitoring, “super sites”. High resolution of corrosion data and environmental data can be monitored:

- ⇒ Continuous SO₂ measurement (Kateřina mentioned that SO₂ during winter in Prague is always higher due to heating from coal.)
- ⇒ Monthly passive sampler exposure.
- ⇒ Corrosion sensor (Fe, Zn)

Johan asked all test sites for their opinion and possibility to become super sites.

Country	Test site	Possibility
Czech Republic	01 Prague	Interested and possible
	03 Kopisty	Interested and possible
Germany	10 Bottrop	Representative was absent
	41 Berlin	Representative was absent
Italy	13 Rome	Depending on additional budget. Milan is the most promising site.
	14 Casaccia	
	15 Milan	
Norway	21 Oslo	SO ₂ is below 5 µg/cm ³
	23 Birkenes	
	44 Svanvik	
Sweden	24 Stockholm	Interested and Stockholm is possible
	26 Aspöreten	
Spain	31 Madrid	Toledo is more interesting based on corrosivity, but the travel is far.
	33 Toledo	
Estonia	35 Lahemaa	The representative cannot attend this session. Namurata will make a contact.
France	40 Paris	Depending on additional budget
Switzerland	45 Chaumont	Corrosion rate of carbon steel is quite low
Poland	50 Katowice	Depending on additional budget
Greece	51 Athens	The representative cannot attend this session. Namurata will make a contact.
Austria	53 Vienna	Depending on additional budget
Finland	57 Hämeenlinna	Interested
USA	58 New Haven	The representative cannot attend this session. Namurata will make a contact.
Slovakia	59 Zilina	The representative cannot attend this session. Namurata will make a contact.
Croatia	60 Split	Interested and Zagreb is easier with the access to test site.
	61 Zagreb	

Other important points summarized are:

- ⇒ Passive samplers (IVL)
 - Additional shipping: use the address without Marta's name
 - Invoicing: payment as soon as possible
- ⇒ Approval of Mapping Manual to "final update"

- ⇒ Open access to data
- ⇒ pH: use Pasquale data set for scenario projection
- ⇒ Upscaling of economics
 - Creation of working group: Sweden, Italy, Norway
- ⇒ Publication
 - Considered as ICP Materials publications if using data or DRFs, infrastructure is not enough reason.
 - Co-authors in publication
- ⇒ Transfer of subcenter limestone will be finalized in connection with 2023 exposure for trend analysis.

21. Dissemination of results

j. Scientific publications

When use only infrastructure (test rack) from ICP Materials Programme, the publication should not be considered ICP Materials publication. It should be considered as ICP Materials publication only when DRFs are used, or data is published. If Task Force members are co-authors, it must be informed and get approval for submission.

Daniel planned for publication on 8-year results of weathering steels.

k. Conferences

Aurelie plan to present at the conference. Johan suggest that if Task Force members are not co-authors, information to the group and acknowledgement to ICP Materials Programme is sufficient.

22. Update on ICP Materials webpage

Namurata presented the webpage and all agreed that the information there is correct and updated.

23. Any other business

Vasile asked for presentation of carbon steel and zinc. Daniel asked if there is any template for Report 92. Kateřina mentioned that we can follow the previous report. Johan informed to follow Report 85.