



# Agenda of the 2<sup>nd</sup> Annual Workshop of the Cebama Project

May 16<sup>th</sup> – 19<sup>th</sup>, 2017 - Espoo, Finland

*Cement-based materials,  
properties, evolution and  
barrier functions*



EURATOM

Horizon 2020 Collaborative Project





## Tuesday, May 16<sup>th</sup>, 2017

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**Place : VTT campus**

Betonimiehenkuja 4, 02151 Espoo (Finland)

- 9:30-11:00      **1<sup>st</sup> ExCom meeting**  
*(restricted to ExCom members. Room 1-120 "Granitti")*
- 13:00-14:00      **Welcome + Presentation by the Coordination Team - auditorium**
- 14:00-16:00      **Individual WP session**  
*(WP1 in "Sederholm-Sali" auditorium, WP2 in room 1-108, WP3 in room 1-120 "Granitti")*
- 16:00-16:30      *Coffee break – Auditorium lobby area*  
*and*  
**1<sup>st</sup> EUG meeting**  
*(restricted to ExCom and EUG members. Room 1-120 "Granitti")*
- 16:30-17:00      **Finish Safety Case - auditorium**  
*B. Pastina (Posiva)*
- 17:00-18:00      **Geological Survey of Finland**  
2 groups:
  - Talk from Geological Survey - T. Ruskeeniemi
  - Guided visit to the geological museum area
- 19:00              Workshop dinner**  
*Boat departs from Otaniemi "saaristovenelaituri" (=Arrival to Suomenlinna sea fortress island 20.00 and to Brewery Restaurant. Transport back to Helsinki/hotel by own means (public ferry/bus).*



**Wednesday, May 17<sup>th</sup>, 2017**

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**Place : VTT campus**

Betonimiehenkuja 4, 02151 Espoo (Finland)

08:30-8:45      **Associated Groups Presentation - auditorium**

*M. Altmaier (KIT-INE)*

8:45-9:05      **General Posiva Status - auditorium**

*M. Vuorio (Posiva)*

9:15-9:30h      *Coffee break*

9:30-11:30      **WP1 Plenary Session - auditorium**

WP leader: *E. Holt (VTT), F. Claret (BRGM) and U. Maeder (UniBern)*

- **Status of WP1**

*F. Claret (BRGM), U. Maeder (UniBern)*

Technical presentations

- Evolution of porosity in cementitious materials during early stage of alkali-activation: a spin echo small angle neutron scattering and SEM/EDS investigation  
*A. Sabau, D. Bykov, W. Bouwman, C. Duif, J.-L. Kloosterman (TU-Delft)*
- Comparison of experimental and modelled pore solutions of low-pH Ordinary Portland Cement based mix designs  
*T. Vehmas, M. Leivo, E. Holt (VTT)*
- Preliminary experimental results on the changes in microstructure, mineralogy and transport properties of Boom clay - concrete interface  
*F. Claret, S. Gaboreau, N. Maes, Q. Tri Phung (SCK-CEN, BRGM)*
- Effects of the hydrogeochemistry of the FEBEX in situ test on the aging of the concrete plug  
*(UAM, CSIC, CIEMAT)*
- Experimental investigation of hydro-mechanical behavior of claystone-concrete interface  
*Z. Liu, J. Shao (LML)*



- Interaction between cement and Czech bentonite under temperature load and in in-situ conditions: Results after first testing period

*Vašíček, Večerník, Hloušek, Červinka, Hausmannová, Havlová (CTU/UJV)*

- **WP1 benchmark comparison** of analysis to-date

*M. Leivo (VTT)*

**11:30-12:30**      **LUNCH** (and time to hang posters for evening session)

12:30-14:30      **WP3 Plenary Session** - - auditorium

WP leader: *A. Idiart (Amphos21)*

- **Status of WP3** and **Modelling task**

*A. Idiart (Amphos21)*

#### Technical presentations

- Long-term non-isothermal reactive transport model of the interactions of concrete with the compacted bentonite and the clay host rock in a HLW repository in clay: Discretization errors and feed-back effect of the changes in porosity caused by dissolution/precipitation reactions

*Samper, J., Mon, A., Fernández, J., Montenegro, L., Naves, A. (UDC)*

- Modelling of interactions between hydrated OPC and Czech bentonite under in-situ conditions and by heating

*T. Rosendorf, D. Vopálka, R. Červinka (CTU)*

- Compositional parameters for solid solution CSH and the applicability to thermodynamic modelling

*T. Vehmas, A. Itälä (VTT)*

- Rapid development of a reactive transport code with FENICS and Reaktoro

*L. Hax Damiani (PSI)*

- Final results of modelling chemo-mechanical couplings of calcium leaching experiments

*A. Idiart, E. Coene, M. Laviña (Amphos21)*

- H-M-C coupling analysis considering several scenarios of long-term alteration in cement-bentonite system: Part 2: Permeability

*S. Ito, S. Tachibana, A. Iizuka (Kobe Univ.) H. Owada, D. Hayashi (RWMC)*



- Reactive transport model in the low pH cement / bentonite interface and effects on radionuclide migration

*V. Montoya, N. Ait Mouheb, T. Schäfer, V. Metz (KIT-INE)*

14:30-17:00h      **Socio-political Stakeholder panel** discussion - *auditorium*

*Chairperson: E. Holt (VTT)*

*Panellists: L. Heikinheimo (The Ministry of Economic Affairs and Employment – Energy department), S. Hautakangas (Fortum Oy), Jaakko Leino (STUK), V. Jalonen (Eurajoki Municipality), T. Seppälä (Saanio & Riekkola Oy), M. Kojo (University of Tampere)*

14.30      *Coffee break)*

15.00      Welcome and Panel structure presentation

15.10      Panellist introduction (background/experience related to stakeholder engagement)

15.30      Q&A session

17.00      Closing statements and summary

**17:00**              **Poster Session** (Finger food and drinks) – *open to panel guests*

18:00-19:00      2nd **ExCom** meeting + **EUG** meeting - *Room 1-120 “Granitti”*



**Thursday, May 18<sup>th</sup>, 2017**

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**Place : VTT campus**

Betonimiehenkuja 4, 02151 Espoo (Finland)

09:00-10:30      **WP2 Plenary Session - auditorium**

WP leader: *B. Grambow (Subatech/Armines)*

- **Status of WP2**

*B. Grambow (Subatech/Armines)*

Technical presentations

- Study of radium uptake by cementitious materials relevant for LILW disposal in the Czech Republic  
*B. Drtinová, J. Kittnerová, D. Vopálka (CTU)*
- Preliminary results from the study of radionuclide retention in cementitious systems and single mineral phases  
*M. Isaacs, M. Felipe-Sotelo, E. Rastrick, D. Read (Surreys)*
- Effect of redox conditions on sulfur and selenium binding in AFm phases  
*L. Nedyalkova, B. Lothenbach, J. Tits, E. Wieland, U. Mäder (PSI/Empa)*
- C-14 sorption on CEM I : effect of HCP degradation on C-14 uptake  
*C. Bucur, I. Florea, R. Dobrin, A. Dinu (RATEN) – talk given by B. Grambow (Subatech/Armines)*
- Structural investigations on the uptake of long-lived safety relevant radionuclides by cementitious materials  
*S. Lange, M. Isaacs, M. Klinkenberg, D. Read, D. Bosbach, G. Deissmann (JUELICH)*
- Radionuclide through-diffusion experiments in unsaturated carbonated and non-carbonated hardened cement paste using the osmotic technique  
*S. Rasamimanana, K. Perrigaud, B. Grambow, C. Landesman (Subatech/Armines)*
- Update on beryllium activities at KIT-INE within WP2: solubility, hydrolysis and uptake by cement  
*X. Gaona, N. Cevirim, M. Böttle, E. Yalcintas, N. Ait Mouheb, V. Montoya, T. Rabung, M. Altmaier (KIT-INE)*



- The use of a flow-through reactor to study AFm anion exchange  
*N. Marty, S. Grangeon, F. Claret (BRGM)*
- Building blocks on molybdenum retention processes in cement systems. First experimental results from solubility and sorption onto pure cement phases  
*M. López-García, J. Olmeda, M. Grivé (Amphos21)*

10:30-11:00      *Coffee break*

11:00-11:30      **EUG** feedback - *auditorium*

11:30-12:00      **General Assembly** - *auditorium*

**12:00-13:00      LUNCH**

### **Optional sessions**

13:30-14:30      **VTT** Underground Research **Lab Tour\*** (Group 1 = *those not attending the PhD session*).

13:30-16:30      **PhD** and young researchers **session** + **VTT** Underground Research **Lab Tour** (Group 2) - *auditorium*

13:30-15:30      PhD and young researchers session  
*(restricted to PhD students, advisors, young researchers and EUG)*

15:30-16:30      **VTT** Underground Research Lab Tour\*. (Group 2).

\* *Note: VTT lab tour address is Kemistintie 3, Espoo (5 minute walk on campus). Passport needed for photo identification.*





**Friday, May 19<sup>th</sup>, 2017**

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**Posiva site Excursion** (*Optional – required pre-registration for security purposes*):  
***Olkiluoto Visitor Centre, Low & Intermediate level repository***

**Location:** Olkiluoto Visitor Centre, Eurajoki Finland

**Hosts:** Ms Anne Niemi, Manager, Visits, TVO  
Ms Marja Vuorio, Expert, Disposal site, Posiva Oy  
Mr Timo Kukkola, Chief engineer, Civil Engineering, TVO  
*assistance:* Erika Holt, VTT (+358 40 593 1986, erika.holt@vtt.fi)

**Agenda:**

7.00 Bus departs from hotel #1 (Espoo – Otaniemi Radisson SAS)

7.10 Bus departs from hotel #2 (Espoo – Sokos Tapiola Garden)

10:30 Arrival to Olkiluoto

- Registration of visitors
- Coffee/tea/refreshments

11:00 Site Program:

- Company presentation (Anne Niemi)
- Posiva overview of cementitious material R&D (Marja Vuorio)
- TVO overview of cementitious material safety (Timo Kukkola)

**12:00 LUNCH**

12:45 Site tour

- Underground repository for low-intermediate level waste (LILV-repository)
- ONKALO Research Galery

14:00 Electricity from Uranium -scientific exhibition



- 14:45 Depart from Olkiluoto
- 18.00 Arrive back to Espoo/hotels

*Notes:*

- Please bring your passport with you as a form of identification.
- Wear comfortable clothes and shoes for walking.
- There are some restrictions about use of cameras on-site.