9th High Temperature Solid Looping Cycles Network (HTSLCN) Meeting

In collaborazione con

COMUNE DI PIACENZA

14-15th March 2023 - Palazzo Farnese, Piazza della Cittadella 29, Piacenza, Italy

DAY 1 - March 14th

9:00-9:10	**Registration**
9:10-9:20	Welcome
Calcium Looping I	
9:20-9:40	Carina Hofmann[a], Martin Greco-Coppi[a], Diethelm Walter[b], Jochen Ströhle[a], Bernd Epple[a] *[a] Technische Universität Darmstadt; [b] Lhoist Germany Rheinkalk GmbH* **Pilot-Scale Investigation of the Indirectly Heated Carbonate Looping Process for CO_2 Capture of Lime Plants**
9:40-10:00	Gabriele Mazzolari[a], Edoardo De Lena[a], Maurizio Spinelli[a], Manuele Gatti[b], Federico Viganò[b], Stefano Consonni[b] *[a] LEAP; [b] Politecnico di Milano* **The potential of Calcium Looping technology as BECCS system in Waste-to-Energy plants**
10:00-10:20	Roberto García, Yolanda A. Criado, Borja Arias, J. Carlos Abanades *CSIC-INCAR* **Design of a countercurrent moving bed reactor pilot to capture CO_2 with Ca-containing particles**
10:20-10:40	José J. Fierro, Matteo C. Romano, Marco Astolfi *Politecnico di Milano* **Sensitivity analysis of a Calcium Hydroxide based Calcium Looping for low capacity factor coal-fired power plants: impact of main design parameters on the SPECCA index**
Coffee	
Calcium Looping II	
11:10-11:30	J. Carlos Abanades *CSIC-INCAR* **Overview of the CaLby2030 project**
11:30-11:50	Martin Haaf [a], Mohamed Magdeldin[a], Edgardo Coda[a], Felix Mangold[b], Marco Lindemann[c] Lino, Jan Sklyaruk[c], Nicolae Pascal[d] *[a] Sumitomo SHI FW Energia Oy; [b] University of Stuttgart; [c] VDZ Technology gGmbH; [d] Opterra Zement GmbH* **Calcium Looping based on Circulating Fluidized Beds as a CO_2 Capture Technology for the Cement Industry - Development Pathway in the CaLby2030 Project**
11:50-12:10	Malin Blomqvist[a], Malin Hagemalm[a], Paul D. Cobden[a], Martin Haaf [b], Edgardo Coda Zabetta[b], Jan Haraldsson[c], Susanne Nævermo-Sand[d] *[a] Swerim AB, [b] Sumitomo SHI FW Energia Oy, [c] Alleima AB, [d] Celsa Nordic,* **CaLby2030 for the steel industry: the four D's of electricity-based steelmaking**

Sorption-enhanced reforming	
12:10-12:30	Peter Clough *Cranfield University* **Hydrogen Production by Sorbent Enhanced Steam Reforming**
12:30-12:50	Abdelrahman Mostafa[a], Irene Rapone[b], Aldo Bosetti[b], Matteo C. Romano[a], Alessandra Beretta[a], Gianpiero Groppi[a] *[a] Politecnico di Milano; [b] Eni SpA* **Role of the Reactor Thermal Capacity on the Sorption Enhanced Reforming for Blue Hydrogen Production**
12:50-13:10	Navid Khallaghi[a], Jose Ramon Fernandez[b], Miriam Diaz Gutierrez[b], J. Carlos Abanades[b], Vincenzo Spallina[a] *[a] University of Manchester; [b] INCAR-CSIC* **Blast furnace gas utilisation with Ca-Cu looping cycle for hydrogen-enriched syngas production**
Lunch (13:10-14:10)	
Chemical looping	
14:10-14:30	Christopher de Leeuwe[a], Syed Zaheer Abbas[a], Alvaro Amieiro[b], Stephen Poulston[b], Vincenzo Spallina[a] *[a] University of Manchester; [b] Johnson Matthey Technology Centre* **High pressure glycerol and methane reforming for chemical looping processes for zero or negative emissions plants**
14:30-14:50	Yongliang Yan, Matteo Fella, Daniel Telford, Wenting Hu, Ian S. Metcalfe *Newcastle University* **Design of a 3 kW_{th} chemical looping water gas-shift (CL-WGS) reactor for clean hydrogen production**
14:50-15:10	Adam Zaidi, Christopher de Leeuwe, Vincenzo Spallina *University of Manchester* **Iron-Nickel Containing Perovskites for Chemical Looping Water Splitting Using Renewable Resources**
15:10-15:30	Ismaeel Ali, Syed Zaheer Abbas, Vincent Gouraud, Wenchao Yu, Vincenzo Spallina *[a] University of Manchester; [b] TotalEnergies OneTech* **(Comparative) Methodology for Packed Bed Chemical Looping Reactor Design, 2-Dimensional Modelling and CFD Simulation**
15:30-15:50	Falko Marx, Paul Dieringer, Jochen Ströhle, Bernd Epple *Technische Universität Darmstadt* **Autothermal Operation of a 1 MW_{th} Chemical Looping Gasifier for Biogenic Residues**
Coffee	
Calcium looping and Chemical looping for energy storage	
16:20-16:40	Mohammad Saghafifar, Stuart Scott *University of Cambridge* **Chemical looping for electricity storage**
16:40-17:00	Carlos Ortiz [a], Ricardo Chacartegui [b], José Manuel Valverde [b], Luis Pérez-Maqueda [c] *[a] Universidad Loyola Andalucía; [b] Universidad de Sevilla; [c] CSIC-Universidad de Sevilla* **Advances in the CaL process as thermochemical energy storage system**
17:00-17:20	Marco Astolfi[a], María Elena Diego[b], Matteo C. Romano[a], J. Carlos Abanades[b] *[a] Politecnico di Milano; [b] CSIC-INCAR* **Integration of a novel Chemical Looping Combustion reactor into a thermochemical energy storage system**

17:30-18:30	**Open discussion: The present and the future of Calcium looping and Chemical looping**
18:30-19:30	Guided tour of Palazzo Farnese Museum
Dinner	

DAY 2 - March 15th

8:45-9:00	**Registration**
9:00-9:10	Welcome

9:10-9:25	Maurizio Spinelli[a], Martina Fantini[b], Stefano Consonni[c] *[a] LEAP, [b] EU CORE, [c] Politecnico di Milano* **Cleanker project overview**
9:25-10:10	J. Carlos Abanades[a], Borja Arias[a], Monica Alonso[a], Jose Ramon Fernandez[a], Sandra Turrado[a], Nico Mader[b], Joerg Maier[b] *[a] CSIC-INCAR, [b] University of Stuttgart* **Sorbent properties and lab scale tests for cement applications**
10:10-10:25	Jörg Hammerich *IKN GmbH* **Cleanker pilot plant design**
10:25-10:55	Francesco Magli[a], Edoardo De Lena[b], Riccardo Cremona[c], Maurizio Spinelli[b], Monica Alonso[d], Nico Mader[e], Marco Lindeman Lino[f], Manuele Gatti[c], Matteo C. Romano[c] *[a]Buzzi Unicem SpA, [b]LEAP, [c]Politecnico di Milano, [d]CSIC-INCAR, [e] University of Stuttgart, [f] VDZ Technology gGmbH,* **Cleanker pilot test results**
Coffee	
11:15-11:35	Kari Myöhänen, Jouni Ritvanen *LUT University* **Simulation and validation of reactor models of Cleanker Vernasca pilot**
11:35-12:05	Edoardo De Lena[a], Maurizio Spinelli[a], Riccardo Cremona[b], Matteo C. Romano[b], Guido Pellegrino[c], Ancelin Coulon[d], Anna Kounina[d] *[a] LEAP, [b] Politecnico di Milano, [c] Italcementi-HeidelbergCement, [d] Quantis* **Cleanker process analysis and retrofitting**
12:05-12:25	Jörg Hammerich[a], Marco Lindeman Lino[b], Kari Myöhänen[c] *[a] IKN GmbH, [b] VDZ Technology gGmbH, [c] LUT University* **Scale-up and economics for a full-size plant**
12:25-12:50	Alla Shogenova[a], Kazbulat Shogenov[a], Mai Uibu[a], Rein Kuusik[a], Mustafa Cem Usta[a], Jüri Ivask[a], Glea Habicht[a], Andres Trikkel[a], Daniela Gastaldi[b], Fulvio Canonico[b], Guido Pellegrino[c] *[a] Tallinn University of Technology, [b] Buzzi Unicem, [c] Italcementi-HeidelbergCement* **CO_2 utilization, transport and storage study**
12:50-13:10	Maurizio Spinelli[a], Matteo Romano[b] *[a] LEAP, [b] Politecnico di Milano* **Cleanker strategic conclusions**
Lunch (13:30-14:15)	
14:15 – 19:00 Cleanker pilot plant visit	