International Conference on Carbon Dioxide Utilisation
Monday 12th September 2016

8.45 – 9.00	**LT1: Welcome:** **Prof Jim Litster,** Head of Department, Chemical and Biological Engineering **Prof Peter Styring,** Chair of Local Organising Committee **Prof Chunshan Song ,** Chair of International Organising Committee		
9.00-9.45	**LT1: Plenary:** **Dr Christoph Gürtler, Covestro** *Sustainable carbon sources for the chemical industry – CO2 is becoming a direct and indirect component in polyurethane plastics* Chair: Chunshan Song		
9.50-10.20	LT4: Keynote: **Dr Stefanie Schlager** Joahannes Kepler University *Bio-electrocatalytic CO2 Reduction using Enzymes and Microorganisms* Chair: Aaron Appel	LT1: Keynote: **Professor Arjun Kelij** Institute of Chemical Research of Catalonia (ICIQ) *Catalytic Conversion of CO2 towards and beyond Organic Carbonates* Chair: Mike North	LT3: Keynote: **Professor Peter Styring,** University of Sheffield *Why we need a whole systems approach to carbon dioxide utilisation* Chair: Chunshan Song
10.20-10.50	Coffee		
	LT4: ElectroChemistry Chair: Aaron Appel	**LT1: Cyclic carbonates** Chair: Mike North	**LT3: Capture** Chair: Chunshan Song
10.50-11.10	**Prof Richard I. Masel** Dioxide Materials *The effect of membrane composition on CO2 electrolysis using novel Sustainion™ membranes*	**Claudio Mota** Federal University of Rio de Janerio *Zeolite Y Impregnated with Metal Halides as Efficient Heterogeneous System for the Synthesis of Cyclic Carbonates*	**Lidija Siller** University of Newcastle *Nickel nanoparticles (NiNPs) versus nickel nanowires (NiNWs): increased activity towards CO2 carbon capture in water solutions*
11.10-11.30	**Marjut Suomalainen** VTT Technical Research Centre for Finland *Utilisation of SOEC simulation model both in experimental data analysis and in techno-economic evaluation*	**Paul Reiss** University of York *Immobilisation of a Bimetallic Aluminium-Salen Complex onto a Structured Silica Support and its Influence on Cyclic Carbonate Synthesis*	**Dongwoo Kang** Yonsei University *Carbon dioxide utilisation using concentrated industrial wastewater through aqueous approach*
11.30-11.50	**Ann Call** University of Sheffield *Investigation of Co-Electrolysis Processes in Solid Oxide Cells using Electrochemical and Surface Spectroscopy Methods*	**Carmine Capacchione** Università di Salerno *New [OSSO]-type iron(III) complexes as efficient catalysts for the coupling of carbon dioxide with epoxides*	**Rebecca Taylor** University of Manchester *CO2 Capture and Electrochemical Conversion Utilisation in Superbase Ionic Liquids*
11.50-12.10	**Xavier Angles** UCL *A DFT Study of the Catalytic Activity of Ni Nanoparticles on Yttria-Stabilized Zirconia and Gadolinium-Doped Ceria (111) Surfaces for Solid Oxide Fuel Cell Applications*	**Xiao Wu** University of York *Synthesis of Cyclic Carbonates Catalysed by Chromium and Aluminium(Salphen) Complexes*	**Robert Dawson** University of Sheffield *Carbon capture in Microporous Organic Polymers*
12.10-12.30	**Denis Cumming** University of Sheffield *The Chemical Server: Materials and devices for on demand conversion of CO2 directly to chemicals*	**Richard H. Heyn** SINTEF *Mechanistic studies into the formation of propylene carbonate from propylene glycol and CO2*	**Xiaoxing Wang** Pennsylvania State Universit, *Advanced Solid Sorbents for CO2 Capture from Flue Gas*
12.30-13.30	Lunch		

13.30-15.30	**LT2, LT3, LT4: Flash Presentations** Please see separate timetable for the Flash Presentations. Three parallel sessions will run containing a mixture of topics please choose one session to attend		
15.30-16.00	Coffee		
	LT1: PtoX Chair: Youssef Travely	**LT3: CO2-Derived Fertilisers and Carbamates** Chair: Willy Offermans	**LT4: TEA/LCA** Chair: Stefan Bringazu
16.00-16.20	**Heriberto Pfieffer** Unversidad Nacional Autonoma de Mexico *CO2 capture on alkaline ceramics and its catalytic conversion to added value products*	**Peter Hammond** CCm Research *Utilisation of Carbon Dioxide within Biogenic Fertiliser Production*	**Rebecca Frauzem** Technical University of Denmark *A generic methodology for the design of sustainable carbon dioxide utilization processes using superstructure optimization*
16.20-16.40	**Iker García García** Faculty of Engineering (UPV/EHU), Spain *Power-to-Gas: Storing Surplus Electrical Energy. Catalytic systems based on unconventional supports.*	**Mei-Yan Wang** Nankai University *Upgrading carbon dioxide by incorporation into heterocycles: Carboxylative cyclization of propargylic amines with CO2 promoted by bifunctional polyoxometalate-based ionic liquids*	**Arno Zimmerman** TU Berlin *Techno-economic-environmental assessment: state of literature and integrated assessment method for CO2-utilization in chemicals production*
16.40-17.00	**Dennis Krämer**, Dechema, *Power to X: Drawbacks and opportunities*	**Terry Makenyire and Justin Driver** University of Sheffield *Ionic Liquids as Catalysts for the Synthesis of Urea and N,N' Disubstituted Ureas From Carbon Dioxide*	**Ioanna Dimitriou** University of Sheffield *Production of Synthetic Gasoline and Diesel from Carbon Dioxide/Methane Reforming: A Comprehensive Techno-economic Assessment*
17.00-17.20	**Karen Callebaut** Antwerp Port Authority *Power-to-Methanol and CCU potential*	**Min-Gu Lee** Yonsei University *Introduction of various processes for the carbon dioxide utilization using ammonia compounds*	**Sarah Deutz** RWTH Aachen University *Reactions with benefits? Screening the environmental potential of CO2 reactions*
17.20-17.40	**Steven Chiuta** North-West University South Africa *Power-to-methane and power-to-syngas business models for sustainable carbon dioxide utilization in coal-to-liquid facilities: A techno-economic assessment*	**Richard Heyn** SINTEF *Experimental and theoretical investigations of industrially relevant binary CO2-propylene oxide and ternary CO2-propylene oxide-poly(propylene carbonate) systems*	**Dimitri Mignard** Univerisity of Edinburgh *Simulating a chemical process for the co-utilization of electrolytic hydrogen and CO2 at variable feed rate.*
17.40 – 19.00	***SCOT Matchmaking Event*** ***WORKROOM 2*** ***Find partners for your research***		

International Conference on Carbon Dioxide Utilisation
Tuesday 13th September 2016

9.00-9.45	**LT1: Plenary:** **Professor Ron Zevenhoven** **Åbo Akademi University** *Serpentinite carbonation process routes and integration in industry* Chair: Mike North		
9.50-10.20	LT4: Keynote: **Professor Chang-Jun Liu** Tianjin University *New Catalysts for CO2 Hydrogenation* Chair: Nannan Sun	LT3: Keynote: **Professor Walter Leitner** RWTH Aachen University *Catalytic Synthesis of Carboxylic Acids from CO2 Dreams and Reality* Chair: Christoph Guertler	LT1: Keynote: **Bernard David** Global CO2 Initiative *The business case for CO2-based products* Chair: Peter Styring
10.20-10.50	Coffee		
	LT4: CO2 Reduction + Capture Chair: Nannan Sun	**LT3: CO2-Derived Acids** Chair: Christoph Guertler	**LT1: Policy** Chair: Peter Styring
10.50-11.10	**Aaron Appel,** Pacific Northwest National Laboratory *Using free energy for H-plus and H-minus transfers to design catalysts for the reduction of CO2.*	**Sang Eon Park,** Inha University, *Utilization of methane and carbon dioxide in continuous process for direct formation of acetic acid*	**Bu Jie**, A*STAR *The Impact of CO2 Emissions Data Management and Scenario Predictions on National Energy Policies*
11.10-11.30	**Reynald Henry** University of Oslo, *Study of CO2 reduction by cerium oxide nanoparticles with transient response experiments*	**George Dowson**, University of Sheffield, *Direct conversion of carbon dioxide from the gas phase under mild conditions using reactive metal cycling*	**Henriette Naims**, Institute for Advanced Sustainability Studies, *CO2 Recycling – An Option for Policymaking and Society? Twelve Theses on the Societal and Political Significance of Carbon Capture and Utilisation (CCU) Technologies*
11.30-11.50	**Himeda Yuichiro,** AIST, *Efficient Iridium Catalysts with Imidazoline Ligands for CO2 Hydrogenation*	**Wen-Zhen Zhang**, Dalian University of Technology, *Sequential organic reactions using carbon dioxide*	**Hans Bolscher,** Trinomics *How CCU is affected by European policies in general and on CCS and ETS especially*
11.50-12.10	**Chunshan Song** Pennsylvania State University, *Bimetallic Pd-Cu Catalysts for CO2 Hydrogenation to Methanol*	**Ben Buckley,** Loughborough University, *Exploiting Electrosynthesis to Enable Selective Hydrocarboxylation*	**Stefanie Roth**, Forschungszentrum Jülich GmbH *From Waste to Resource - Can CO2 replace crude oil in the future?*
12.10-12.30	**Sunil Josi**, National Chemical Laboratory *Hydrogenation of Carbon Dioxide to N, N dimethyl formamide using Hydrotalcites as a catalyst*	**Gaia Neri** University of Liverpool *A Highly Active Nickel Electrocatalyst shows Excellent Selectivity for CO2 Reduction in Acidic Media*	**Ted Grozier,** ClimateKIC, *EnCO2re: Achievements and Ambitions in Enabling CO2 Re-use*
12.30-12.50	**Dan Reed,** University of Sheffield, *Advances in pressure swing carbon capture using low complexity sorbents*	**Xinkui Wang** Dalian University of Technology *A Schiff base modified gold catalyst for efficient carbon dioxide hydrogenation to formic acid*	**Youssef Travely** SCOT *What are the strategic research and innovation targets for CO2 utilisation? Findings of the SCOT Project*
12.50-13.50	Lunch		

	LT4: Plasma Reactions Chair: Rachel Elder	**LT3: Mineralisation** Chair: Alissa Park	**LT1: Carbon Capture** Chair: Hans Bolscher
13.50-14.10	**Tom Butterworth** University of Sheffield *Towards optimisation of packed bed plasma reactors for CO_2 reduction*	**Yeo Tze Yuen** Institute of Chemical and Engineering Sciences, Singapore *An Analysis of the Current State, Limitations, and Potential for Improvement of Direct Aqueous Pressure Carbonation Processes*	**Arturo Castillo-Castillo** Imperial College London *Tipping point analysis of carbon capture and transportation*
14.10-14.30	**Bryony Ashford** University of Liverpool *Conversion of CO2 into value-added chemicals in a packed bed plasma-catalytic reactor*	**Katie Joanna Lamb** University of York *Electrochemically driven CO2 Capture and Mineralisation*	**Carla I. Costa Pinheiro** Instituto Superior Técnico/Universidade de Lisboa *Use of activated carbon in the synthesis of highly active and stable sol-gel CaO sorbents for CO2 capture*
14.30-14.50	**G Rooij** DIFFER *Understanding dynamics of a pulsed microwave plasma for efficient CO2 dissociation*	**Abdallah Dindi** Masdar Institute of Science and Technology *Carbon dioxide utilization for the production of precipitated silica and sodium bicarbonate*	**Nadeen Al-Janabi** University of Manchester *Assessment of MOF's structure quality: quantifying defects content in crystalline porous materials; A case study: CuBTC*
14.50-15.10	**James Comerford** University of York, *Synthesis of functionalized benzoic acids using non-thermal plasma generated carbon monoxide*	**Inseong Hwang** Pusan National University *Kinetics and Extent of Accelerated Carbonation of MgO-Based Binder*	**Susana Garcia** Heriot Watt University *CO2 capture using high-temperature lithium silicate sorbents: A process integration study*
15.10-15.30	**Khelifa Yanallah** University of Algeria/University of Sheffield *Experimental and Numerical Investigation of CO2 Splitting in a Nanosecond Pulsed Corona Discharge.*	**Georg Baldauf-Sommerbauer** Graz University of Technology *Reductive Calcination - A means of Carbon Dioxide Utilisation in Minerals Processing*	**Shengping Wang** Tianjin University *Incorporation of (Zr-Ce) into Calcium Oxide for Improving the Stability of CO2 Capture Sorbent*
15.30-18.00	**Poster Session with Afternoon Tea**		

International Conference on Carbon Dioxide Utilisation
Wednesday 14th September 2016

9.00-9.45	**LT1: Plenary:** **Professor Andy Bocarsly** **Princeton University** *Commercially viable chemistry for the conversion of CO2 to organics* Chair: Peter Styring		
9.50-10.20	LT1: Keynote: **Professor Ah-Hyung (Alissa) Park** Columbia University *Novel Design of Liquid-like Nanoparticle Organic Hybrid Materials with Tunable Chemical and Structural Properties for CO2 Capture and Conversion* Chair: Alessandra Quadrelli	LT3: Keynote: **Professor Mike North** University of York *Starbons as CO2 capture agents* Chair: Richard Heyn	LT4: Keynote: **Dr Chris Jones** University of Sheffield and **Dr. Barbara Olfe-Kräutlein** IASS Potsdam *Lay perceptions of Carbon Dioxide Capture and Utilisation technologies in the UK and Germany: A qualitative interview study* Chair: Katy Armstrong
10.20-10.50	Coffee		
	LT1: CO2-Derived Fuels Chair: Alessandra Quadrelli	**LT3: CO2-Derived Methanol** Chair: Richard Heyn	**LT4: TEA/LCA** Chair: Katy Armstrong
10.50-11.10	**Peter Edwards** University of Oxford *Effective utilization of CO2 in flue gas with alkane conversion*	**Ki-Won Jun** Korea Research Institute of Chemical Technology (KRICT) *Carbon Dioxide Utilization in a Gas-to-Methanol Process Composed of CO2/Steam–Mixed Reforming and Methanol Synthesis*	**Mar Perez-Fortes** European Commission, Joint Research Centre (JRC) *Evaluation of the CO2 utilisation potential of urea production*
11.10-11.30	**Alan Chaffee** Monash University *Gas-Phase Conversion of CO2 Using a MIL-140C-(Ru) Metal-Organic Frameworks as Catalyst*	**Andres Garcia Trenco** Imperial College London *Highly active Pd/Ga colloids for the liquid phase synthesis of methanol from CO2*	**Leonard Müller** RWTH Aachen University *Selecting environmentally optimal CO2 sources for CO2 utilization*
11.30-11.50	**Xinwen Guo** Dalian University of Technology *A combined experimental and density functional theory study on Co/ZrO2 and Co/Al2O3 catalysts for CO2 methanation*	**Feng Li** Chinese Academy of Science, *Cu-based perovskite metal complex oxide catalysts for methanol synthesis from CO2 hydrogenation*	**Jin Xuan** Heriot-Watt University *Energy and CO2 emission assessment of CO2-to-liquid electrochemical processes*
11.50-12.10	**Peng Gao** Shanghai Advanced Research Institute *High-performance and long-lived Cu-ZnO-based catalysts for slurry methanol synthesis from CO2 hydrogenation*	**Sigrid Douven** University of Chester *Utilisation of CO2 from an Industrial source for Methanol production*	**Stefan Bringezu** Kassel University *Integration of renewable energy supply and carbon recycling for chemical production: Life cycle assessment of a CO2-based production of basic chemicals and polymers*
12.10-12.30	**Frans van Berkel** ECN *Thermodynamic limitations and how to overcome them in carbon utilization*	**Christian Ahoba-Sam** University College of Southeast Norway *Low temperature methanol synthesis over copper nanoparticles*	**Marvin Kant** TU Berlin *An enabling start-up support system for CO2 utilisation: A case study on barriers to commercial success*
12.30-13.30	Lunch		
	LT1: Photocatalysis Chair: Andy Bocarsly	**LT3: Cyclic Carbonates** Chair: Claudio Mota	**LT4: Biological** Chair: Stefanie Schlagar
13.30-13.50	**Junwang Tang** University College London *Visible light driven CO2 conversion by rational designed junctions*	**Willy Offermans** RWTH Aachen University *On the Mechanism of the Cycloaddition of Carbon Dioxide and Epoxides*	**Marianne Haberbauer** ACIB GmbH *Microbial electrosynthesis systems for the production of methane from CO2*

13.50-14.10	**Wei Chen** Shanghai Advanced Research Institute *Size-Dependent Photoelectrocatalytic Reduction of CO2 over Graphene/SiC composites*	**Bemjamin Bousquet** University of Lyon, *Zn-azatrane complexes as efficient catalysts for CO2 conversion*	**Lindsey Garcia-Gonzalez** VITO *Biotechnological routes for valorization of CO2 to polymers*
14.10-14.30	**Alessandra Quadrelli** CPE Lyon *Carbon Dioxide Utilisation for Renewable energy harvesting : Context elements and examples with a Novel MOF-Based Photocatalyst*	**William Webb** University of Southampton *Engineering heterogeneous organocatalysts for the sustainable utilisation of carbon dioxide*	**Seetharaman Vaidyanathan** University of Sheffield *Carbon dioxide uptake by microalgae and relevance to lipid accumulation*
14.30-14.50	**Mercedes Maroto-Valer** Heriot-Watt University *Solar Fuels from Photocatalytic Reduction of CO2 via Engineering innovation*	**Veronique Dufaud** CNRS *Organocatalysis in confined space for the production of cyclic carbonates from CO2 and epoxides*	**Karolien Vanbroekhoven,** VITO *Bioelectrochemical CO2 Reduction integrated with product separation: a prospect for future application*
14.50-15.10	**Yuaka Amao** Osaka City University *Visible-light induced conversion of carbon dioxide to formic acid with the system consisting of water-soluble zinc porphyrin and formate dehydrogenase electron-mediated bipyridinium salt*	**Antione Buchard** University of Bath *Synthesis of 6-membered cyclic carbonates from 1,3-diols and low CO2 pressure: a novel mild strategy to replace phosgene reagents and enable new sustainable polymers from sugars*	**Nannan Sun** Shanghai Advanced Research Institute *CO2 fixation via microalgae and successional conversion to bulk chemicals*
15.10-15.30	**Coffee**		
	LT1: CO2-Derived Fuels Chair: Sang Eon Park	**LT3: Organic Carbonates and Capture** Chair Ajian Kelji	**LT4: Enabling Technologies and LCA** Chair: Annika Stute
15.40-16.00	**Jere Elfving** VTT Technical Research Centre of Finland *Supporting Power-to-X with CO2 Capture from air: Initial experiences, challenges and opportunities*	**Cecile Daniel** IRCELYON *Unravelling mechanisms of DMC synthesis from CO2 and MeOH on very active CeZr oxides*	**Steve Woolass** Tata steel *The Application of Carbon Dioxide Capture and Utilisation Technologies wthin the Steel Industry*
16.00-16.20	**Hui Wang** Shanghai Advanced Research Institute *Sustainable performance of Ni-based ferrite for thermochemical CO2 conversion into fuels*	**Amélie Boyaval** CNRS Université Bordeaux *Cyclic carbonates by organocatalytic coupling of CO2 with propargylic alcohol*	**Pelayo Garcia Gutierrez** University of Manchester *Production of Liquid Fuels from Biogas through High-Temperature Co-Electrolysis of Steam and Carbon Dioxide: an Environmental Assessment*
16.20-16.40	**Grant Wilson,** University of Sheffield *Why we need CO2 utilisation fuels in the future for energy integration*	**Markus Scharfenberg** Johannes Gutenberg University *Multi-arm star polyether-polycarbonates based on tailored epoxides and carbon dioxide*	**Maria Grahn** Chalmers University of Technology, *Cost-analysis utilizing CO2 in industrial flue gases for the production of electrofuels*
16.40-17.00	**Liguo Wang** Chinese Academy of Sciences *Influence of ordered mesoporous KIT-6, MCM-41 and SBA-15 supported copper catalysts for the hydrogenation of ethylene carbonate derived from CO2*	**Nannan Sun** Shanghai Advanced Research Institute *Synthesis of high performance SAPO-34 zeolite membrane for CO2 capture*	**Zhiyong Tang** Shanghai Advanced Research Institute *Research of industry related carbon dioxide emission and opportunities of integrated systems in a carbon-constrained world*
17.00-17.20		**Nannan Sun** Shanghai Advanced Research Institute *One-pot solvent-free synthesis of mesoporous carbons and enhancing their low pressure CO2 adsorption by surface modification*	**Wei Chen** Shanghai Advanced Research Institute *Advanced manganese based electrocatalysts free of precious metals for efficient low and intermediate temperature water electrolysis*
19.00	**Conference Dinner @ Cutlers Hall, Church St, Sheffield, S1 1HG**		

International Conference on Carbon Dioxide Utilisation
Thursday 15th September 2016

The CO_2 Forum

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on Sustainable CO_2 Chemical &
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ICCDU-CO_2 Forum **Mo**rning session

"Carbon Dioxide Utilization Deployment : an Industrial Reality"

08:15 - 09:00	***Registration***
09:00 - 09:10	Welcome Address **Alessandra QUADRELLI**, CO_2 Forum chairwoman (CPE Lyon –CNRS) **Chunsang SONG**, ICCDU (Penn State , EMS Energy Institute)
09:10 - 10:30	**Session 1- Update on ongoing LARGE SCALE Industrial CDU deployment : part 1 Materials**
Chair Moderator	**Chunshan SONG**, Penn State , EMS Energy Institute **Hans BOLSCHER**, Trinomics
Panelists	**Christoph GÜRTLER,** Covestro (G) "*Markets for Polyurethanes with CO_2*" **Ah-Hyung (Alissa) PARK,** Columbia University (US) "Development of CSS technologies" **Colin HILLS**, *Carbon8 (UK), "*Inorganic Carbonates: aggregates from CO_2 gas
10:30 - 11:15	***Coffee break***

11:15 - 12:15	**Session 2- Update on ongoing LARGE SCALE Industrial CDU deployment : part 2 fuels and more**
Chair Monderator	**Richard HEYN (Sintef)** **Hans BOLSCHER**, Trinomics
Panelists	**Christian von OLSHAUSEN ,** Sunfire Gmbh (G) (via Skype) *"Power-to-X and automotive sector"* **Andrew BOCARSLY,** Princeton University (US) "*From lab electrochemistry to liquid Light®*

12:15 - 12:30	**Closing of 14th ICCDU** Chairs: Peter STYRING, Sheffield (UK)
12:30 - 14:00	***Lunch break***

CO_2Chem-CO_2 Forum **Afternoon** session

"Impacts, Policies And Strategies of CDU""

2:00 - 2:10	Welcome Address **Peter Styring**, CO_2 chem network, U. Sheffield **Claude Fussler**, CO_2 Forum co-chair, CO_2 Forum vice-chair
2:10 - 2:30	Introductory Addresses
2:30 - 2:45	**Scene setting warm-up talk to session 3 : The broader context of CDU** Claude FUSSLER, *CO_2 Forum* "**The broader context of CDU "**

2:45 - 3:45	**Session 3 – Global Economy and Climate Targets**
Chair	**Claude FUSSLER**, CO_2 forum vice-chair, Cleantech advisor
Panelists	**Issam DAIRANIEH,** The Global CO_2 Initiative *"The big Idea" plan: What will it take to turn 10% of annual CO2 emissions into competitive commercial products"* **Tristan STANLEY** IEA *"Energy Analyses on industrial CCS and CO_2 utilisations."* **Pierre BARTHELEMY,** CEFIC *"Industry needs to create a climate-neutral circular economy of carbon"* **Hariette NAIMS** IASS Potsdam *"Economic realities: what does the emergence of a knowledge base for decision making tell us for policy incentives*"

3:35 - 4:05	***Coffee break***
4:05 - 4:20	**Scene setting warm-up talk to session 4 : Scenarios enabled by CDU massive deployment** Peter Styring, CO_2Chem

4:20 - 5:10	**Session 4 : Identified gaps, Policies and Future-looking Strategies**
Chair Moderator	**Katy ARMSTRONG**, Sheffield (U.K.) Hans Bolscher (Trinomics)
Panelists	**Peter Styring**, CO_2Chem **Dennis Krämer** *Dechema* **Youssef Travaly** Greenwin *"A Strategic European Research and Innovation Agenda for Smart CO_2 Transformation in Europe"*

5:10 - 5:30 **Closing of 4th CO2 forum and of the CO2 Chem event**
Peter STYRING, Sheffield (UK)
Alessandra Quadrelli (CO_2 Forum)

* as of Jun 20th, 2016

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