



## WCCE11 - 11th WORLD CONGRESS OF CHEMICAL ENGINEERING

IACCHE - XXX Inter-American Congress of Chemical Engineering  
 CAIQ2023 - XI Argentinian Congress of Chemical Engineering  
 CIBIQ2023 - II Ibero-American Congress of Chemical Engineering  
 Buenos Aires - Argentina - June 4-8, 2023

"The global chemical engineering working for a better future world"



### GS02-Global Symposium on Bioenergy and Biorefineries: Paving the way for bioenergy and renewable chemicals from residues

Tuesday, June 6<sup>th</sup>  
 Wednesday, June 7<sup>th</sup>  
 Thursday, June 8<sup>th</sup>

## PROGRAM

### ORAL SESSIONS

#### KEYNOTE

Chair: *Ulrika Rova, Luleå University of Technology, Sweden*

Tuesday, June 6<sup>th</sup>  
 Auditorium  
 "Dr. Francisco Valsecchi"

ID3138 KEYNOTE	11:00-11:30	"Biorefineries, a key concept for achieving the Sustainable Development Goals" <b>Castro, E.</b> <i>University of Jaén (Spain)</i>
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#### SESSION 1. BIOMASS INNOVATIVE FRACTIONATION PROCESSES

Chair: *Ulrika Rova, Luleå University of Technology, Sweden*

Tuesday, June 6<sup>th</sup>  
 Auditorium 2

ID1573	14:00-14:15	"Organosolv fractionation of lignocellulose as a strategy to offer renewable lignin-based coatings for biocide-free marine applications" Thoresen, P.P. <sup>1</sup> ; Wu, Z. <sup>2</sup> ; <u>Matsakas, L.</u> <sup>1</sup> ; Lange, H. <sup>1,3</sup> ; Rova, U. <sup>1</sup> ; Kulišová, M. <sup>4</sup> ; Maršík, D. <sup>4</sup> ; Fous, K. <sup>4</sup> ; Masák, J. <sup>4</sup> ; Shi, Y. <sup>2</sup> ; Christakopoulos, P. <sup>1</sup> <sup>1</sup> Department of Civil, Environmental and Natural Resources Engineering, Luleå University of Technology (Sweden). <sup>2</sup> Division of Machine Elements, Luleå University of Technology, (Sweden). <sup>3</sup> University of Milano-Bicocca (Italy). <sup>4</sup> University of Chemistry and Technology (Czech Republic)
ID2134	14:15-14:30	"Biorefinery development for the production of polyphenols, algal biomass and lipids using olive processing industry waste" Nicodemou, A.; Kallis, M.; <u>Koutinas, M.</u> <i>Cyprus University of Technology (Cyprus)</i>
ID2165	14:30-14:45	"Transcriptional responses of <i>Saccharomyces cerevisiae</i> to environmental stresses during bioethanol production using biochar-based biocatalysts" <u>Koutinas, M.</u> <sup>1</sup> ; Kyriakou, M. <sup>1</sup> ; Ioannou, A. <sup>2</sup> ; Christodoulou, M. <sup>1</sup> ; Fotopoulos, V. <sup>2</sup> <sup>1</sup> Department of Chemical Engineering, <sup>2</sup> Department of Agricultural Sciences, Biotechnology & Food Science-Cyprus University of Technology (Cyprus)
ID2415	14:45-15:00	"Assessment of Water Treatment Networks for Integrated Lignocellulosic Biorefineries" Pardal, G.V.L. <sup>1</sup> ; Duarte, B.P.M. <sup>1,2</sup> ; Santos, L.O. <sup>1</sup> ; <u>Oliveira, N.M.C.</u> <sup>1</sup> <sup>1</sup> University of Coimbra (Portugal). <sup>2</sup> Polytechnic Institute of Coimbra (Portugal)
ID2502	15:00-15:15	"Biorefinery: Does biomass establish processing?" Dos Santos, P.S.B. <i>Federal University of Pelotas (Brazil)</i>
ID2541	15:15-15:30	"Analysis of trifluoroacetic acid as an efficient pretreatment for lignocellulosic biomass" Piedrahita-Rodríguez, S. <sup>1</sup> ; Baumberger, S. <sup>2</sup> ; Cézard, L. <sup>2</sup> ; Cardona Alzate, C.A. <sup>1</sup> <sup>1</sup> Universidad Nacional de Colombia (Colombia). <sup>2</sup> Université Paris-Saclay (France)
ID2914	15:30-15:45	"Selecting among alternative products, processes, and processes integration approaches in the biorefinery framework" Berglihn, O.T. <sup>1</sup> ; Duarte, L.C. <sup>2</sup> ; Carvalheiro, F. <sup>2</sup> ; Lopes, T.F. <sup>2</sup> ; Oliveira, C. <sup>2</sup> ; del Campo, I. <sup>3</sup> ; de Ulibarri, B. <sup>3</sup> ; Gírio, F. <sup>2</sup> ; Wittgens, B. <sup>1</sup>

<sup>1</sup>SINTEF Industry (Norway).<sup>2</sup>Unid. de Bioenergía e Biorrefinarias (UBB), LNEG – Laboratório Nacional de Energia e Geologia, I.P. (Portugal).  
<sup>3</sup>National Renewable Energy Centre (Spain)

**ID1332**  
RAPID FIRE

15:45-15:50

“Nut shells as raw material for activated bio-char generation for environmental remediation”  
Antxustegi, M.M.<sup>1</sup>; Corro, E.<sup>1</sup>; Volpe, R.<sup>2</sup>; Labidi, J.<sup>1</sup>; González Alriols, M.<sup>1</sup>  
<sup>1</sup>University of the Basque Country (Spain). <sup>2</sup>University of Catania (Italy)

## KEYNOTE

Chair: *Pedram Fatehi, Lakehead University, Canada*

Wednesday, June 7<sup>th</sup>  
Auditorium  
“Dr. Francisco Valsecchi”

**ID3141**  
KEYNOTE

11:00-11:30

“Process intensification in biorefineries”  
Sillero, L.; Egüés, I.; Llano-Ponte, R.; **Labidi, J.**  
University of the Basque Country (Spain)

## SESSION 2. RENEWABLE CHEMICALS AND BIOFUELS

Chair: *Apostolis Koutinas, Agricultural University of Athens, Greece*

Wednesday, June 7<sup>th</sup>  
Auditorium  
“Dr. Francisco Valsecchi”

**ID3152**  
KEYNOTE

14:00-14:30

“Water-soluble lignin-derived polymers”  
**Fatehi, P.**  
Lakehead University (Canada)

**ID1788**

14:30-14:45

“Enzymatic conversion of steam exploded pine into fermentable sugars”  
**Cagno, M.**<sup>1</sup>; Reyes, C.<sup>2,3</sup>; Cabot, P.<sup>1</sup>; Tancredi, N.<sup>2,3</sup>; Lareo, C.<sup>4</sup>  
<sup>1</sup>Centro de Investigaciones en Biocombustibles 2G (Uruguay). <sup>2</sup>Instituto Polo Tecnológico de Pando, <sup>3</sup>Fisicoquímica, <sup>4</sup>Depto. Bioingeniería-Universidad de la República (Uruguay)

**ID2129**

14:45-15:00

“Manufacture of bioactive compounds and bacterial cellulose via a citrus processing waste-based biorefinery”  
Karanicola, P.<sup>1,2</sup>; Patsalou, M.<sup>1</sup>; Nicodemou, A.<sup>1,2</sup>; Christofidou, C.<sup>1</sup>; Christou, P.<sup>2</sup>; Panagiotou, G.<sup>2</sup>; **Koutinas, M.**<sup>1</sup>  
<sup>1</sup>Cyprus University of Technology (Cyprus). <sup>2</sup>KEAN Soft Drinks, Ltd (Cyprus)

**ID2205**

15:00-15:15

“Lignin and glucose obtaining from almond shell valorisation through a biorefinery facility”  
Morales, A.; Dávila, I.; Hernández-Ramos, F.; Fernández-Marín, R.; Erdocia, X.; Sillero, L.; Labidi, J.  
University of the Basque Country (Spain)

**ID2429**

15:15-15:30

“Comparison of different thermochemical processes for glucose release from soybean hulls”  
Leonardi, R.J.<sup>1</sup>; Gentile, A.<sup>1</sup>; Gil Rolón, M.<sup>1</sup>; Seluy, L.G.<sup>1</sup>; Llano, T.<sup>2</sup>; Comelli, R.N.<sup>1</sup>; **Coz, A.**<sup>2</sup>  
<sup>1</sup>Universidad Nacional del Litoral (Argentina). <sup>2</sup>University of Cantabria (Spain)

**ID2823**

15:30-15:45

“Preparation and characterization of sulfonated biochar and its application as a photo-Fenton catalyst”  
**Farnood, R.**; Rangarajan, G.  
University of Toronto (Canada)

**ID1617**  
RAPID FIRE

15:45-15:50

“Producción de hidrógeno de alta pureza combinando el reformado de biogás y el proceso vapor-hierro”  
**Veiga, S.**; Rodríguez, T.; Musso, M.; Bussi J.  
Universidad de la República (Uruguay)

**ID2263**  
RAPID FIRE

15:50-15:55

“Obtención de biodiésel a partir de aceite residual doméstico”  
Falcon Ramírez, I.; Guerrero Vejarano, T.  
Universidad Nacional Agraria de la Selva (Perú)

## SESSION 3. PROCESS INTENSIFICATION AND ADVANCES IN NANO-, MICRO- AND SMART MATERIALS

Chair: *Pedram Fatehi, Lakehead University, Canada*

Wednesday, June 7<sup>th</sup>  
Auditorium  
“Dr. Francisco Valsecchi”

**ID1357**

16:30-16:45

“Multiphase strategies for furan production using green solvents”  
**Esteban, J.**<sup>1,2</sup>; Thanheuser, N.<sup>1</sup>; Vorholt, A.J.<sup>1</sup>; Leitner, W.<sup>1</sup>  
<sup>1</sup>University of Manchester (United Kingdom). <sup>2</sup>Max Planck Institute for Chemical Energy Conversion (Germany)

**ID1747**

16:45-17:00

“Innovative and sustainable functional cellulose based composite materials”  
Freire, C.S.R.; Vilela, C.A.C.; **Silvestre, A.J.D.**  
University of Aveiro (Portugal)

**ID2014**

17:00-17:15

“Magnesium carbonate addition evaluation on succinic acid production by *Actinobacillus succinogenes* DSM 22257 and *Basfia succiniciproducens* DSM 22022”  
Mihalik, J.; Banchieri, C.; Lareo, C.; **Rochón, E.**  
Universidad de la República (Uruguay)

**ID2192**

17:15-17:30

“Selective hydrogenation of methyl oleate catalyzed by Ni supported on niobia containing mixed oxides”  
**Navas, M.B.**; Raad, Z.; Domine, M.E.  
Universitat Politècnica de València. Consejo Superior de Investigaciones Científicas (Spain)

### SESSION 3. PROCESS INTENSIFICATION AND ADVANCES IN NANO-, MICRO- AND SMART MATERIALS (Cont.)

Chair: *Pedram Fatehi, Lakehead University, Canada*

Wednesday, June 7<sup>th</sup>  
Auditorium  
"Dr. Francisco Valsecchi"

ID2488	18:30-18:45	"Poly(3-hydroxybutyrate) production using degradation products from chemical and enzymatic recycling of post-consumer bioplastics" <u>Zoghbi, L.</u> ; Argeiti, C.; Ladakis, D.; Pateraki, C.; Koutinas, A. <i>Agricultural University of Athens (Greece)</i>
ID2585	18:45-19:00	"Bio-based Functional PU Materials from Lignin and Other Biomolecules" <u>Yan, N.</u> <i>University of Toronto (Canada)</i>
ID3027	19:00-19:15	"Cellulose-based films added with hydrophobic curcumin compatibilized through the use of Pickering emulsions of the same polymeric nature" Caldas dos Santos, N. <sup>1,2</sup> ; Schreiner, T.B. <sup>1,2</sup> ; Lovo da Rocha Watanabe, E.R. <sup>3</sup> ; <u>Santamaria-Echart, A.</u> <sup>1,2</sup> ; Barreiro, F. <sup>1,2</sup> <sup>1</sup> CIMO, <sup>2</sup> SusTEC-Instituto Politécnico de Bragança (Portugal). <sup>3</sup> Federal University of Technology (Brazil)
ID1600 RAPID FIRE	19:15-19:20	"Advanced Functional Lignin Nanoparticles" Fatehi, P.; Shomali, Z.; Hassanpour, F.; Zare, R.; Alipourmazandarani, N. <i>Lakehead University (Canada)</i>

### KEYNOTE

Chair: *Jalel Labidi, University of the Basque Country, Spain*

Thursday, June 8<sup>th</sup>  
Auditorium  
"Dr. Francisco Valsecchi"

ID2481 KEYNOTE	11:00-11:30	"Circular and sustainable chemical and biopolymer production via biorefinery electrification and recycling of post-consumer bioplastics" <u>Koutinas, A.</u> <i>Agricultural University of Athens (Greece)</i>
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### SESSION 4. TECHNO-ECONOMIC AND ENVIRONMENTAL ASSESSMENT

Chair: *Jalel Labidi, University of the Basque Country, Spain*

Thursday, June 8<sup>th</sup>  
Auditorium  
"Dr. Francisco Valsecchi"

ID1224	14:00-14:15	"Biorefineries with carbon, capture and storage: towards carbon-negative multi-products from olive-derived biomass" <u>Galán-Martín, A.</u> ; Contreras, M.d.M.; Romero, I.; Ruiz, E.; Bueno-Rodríguez, S.; Eliche-Quesada, D.; Castro-Galiano, E. <i>University of Jaén (Spain)</i>
ID1640	14:15-14:30	"A techno-economic analysis and life cycle assessment of an olive-based multiproduct biorefinery coupled with carbon capture and storage" Fanourakis, S.E. <sup>1</sup> ; Garcia J.M.R. <sup>2</sup> ; Castro, E. <sup>2</sup> ; Jiménez, L. <sup>1</sup> ; Boer, D.T. <sup>1</sup> ; <u>Galán-Martín A.</u> <sup>2</sup> <sup>1</sup> Universitat Rovira i Virgili (Spain). <sup>2</sup> Universidad de Jaén (Spain)
ID1959	14:30-14:45	"Sustainability assessment of bacterial cellulose production from lignocellulosic biomass pretreated with dielectric barrier discharge air plasma" <u>Ladakis, D.</u> <sup>1</sup> ; Filippi, K. <sup>1</sup> ; Ioannidou, S.M. <sup>1</sup> ; Sarafidou, M. <sup>1</sup> ; Cullen, P.J. <sup>3</sup> ; Kookos, I.K. <sup>2</sup> ; Koutinas, A. <sup>1</sup> <sup>1</sup> Agricultural University of Athens (Greece). <sup>2</sup> University of Patras (Greece). <sup>3</sup> University of Sydney (Australia)
ID2381	14:45-15:00	"Potential of renewable carbon to reduce planetary boundaries footprints in the petrochemical sector" <u>Galán-Martín, A.</u> <sup>1</sup> ; Tulus, V. <sup>2</sup> ; Pérez-Ramírez, J. <sup>2</sup> ; Guillén-Gosálbez, G. <sup>2</sup> <sup>1</sup> University of Jaén (Spain). <sup>2</sup> Institute for Chemical and Bioengineering, ETH Zürich (Switzerland)
ID2535	15:00-15:15	"Analysis of composition for transformation routes selection: Lignocellulosic biomass case in the Colombian context" Piedrahita-Rodríguez, S. <sup>1</sup> ; Baumberger, S. <sup>2</sup> ; Cézard, L. <sup>2</sup> ; Ortiz-Sánchez, M. <sup>1</sup> ; Cardona Alzate, C.A. <sup>1</sup> <sup>1</sup> Universidad Nacional de Colombia (Colombia). <sup>2</sup> Institut Jean-Pierre Bourgin, INRAE, AgroParisTech, Université Paris-Saclay (France)
ID2827	15:15-15:30	"Techno-economic and life cycle assessments of a microalgae-based biorefinery for the valorization of gaseous and liquid effluents from wineries" <u>Lopes, T.F.</u> <sup>1</sup> ; Cabeza, A. <sup>2</sup> ; Leão, S. <sup>3</sup> ; Quijano, A.J. <sup>2</sup> ; Rodriguez, I. <sup>2</sup> ; Reis, A. <sup>1</sup> ; Gírio, F. <sup>1</sup> <sup>1</sup> Laboratório Nacional de Energia e Geologia, I.P. - Unidade de Bioenergia e Biorrefinarias (Portugal). <sup>2</sup> Idener Technologies S.L. (Spain). <sup>3</sup> LEITAT, Technological Center (Spain)
ID3019	15:30-15:45	"Environmental assessment of an industrial-scale microalgae production system through process modelling" <u>Ortigueira, J.</u> <sup>1</sup> ; Lopes, T.F. <sup>1</sup> ; Matos, C.T. <sup>2</sup> ; Costa, L. <sup>2</sup> ; Ribeiro, C. <sup>2</sup> ; Reis, A. <sup>1</sup> ; Gírio, F. <sup>1</sup> <sup>1</sup> Laboratório Nacional de Energia e Geologia, I.P. - Unidade de Bioenergia e Biorrefinarias (Portugal). <sup>2</sup> A4F – Algae for Future (Portugal)
ID3039	15:45-16:00	"Preliminary Life Cycle Assessment of butyl butyrate production process based on Miscanthus energy crop" de Ulibarri, B. <sup>1</sup> ; del Campo, I. <sup>1</sup> ; <u>Lopes, T.F.</u> <sup>2</sup> ; Duarte, L.C. <sup>2</sup> ; Carvalheiro, F. <sup>2</sup> ; Oliveira, C. <sup>2</sup> ; Gírio, F. <sup>2</sup> ; Berglihn, O.T. <sup>3</sup> ; Wittgens, B. <sup>3</sup> <sup>1</sup> CENER. National Renewable Energy Centre (Spain). <sup>2</sup> Laboratório Nacional de Energia e Geologia, I.P. - Unidade de Bioenergia e Biorrefinarias (Portugal). <sup>3</sup> SINTEF Industry (Norway)

## POSTER SESSION

Thursday, June 8<sup>th</sup> (COFFEE AREA) 10:30-11:00 h & 16:00 -16:30 h

<b>ID1237</b>	<p>“Effect of the bioactive compounds recovery on the lignocellulosic biomass composition” Gómez-Cruz, I.<sup>1,2</sup>; Contreras, M.d.M.<sup>1,2</sup>; Romero, I.<sup>1,2</sup>; Castro, E.<sup>1,2</sup> <sup>1</sup>Department of Chemical, Environmental and Materials Engineering, <sup>2</sup>Center for Advanced Studies in Earth Sciences, Energy and Environment (CEACTEMA)-Universidad de Jaén (Spain)</p>
<b>ID1239</b>	<p>“Cascade valorization based on organosolv delignification of exhausted olive pomace in the context of a biorefinery” Gómez-Cruz, I.<sup>1,2</sup>; Romero, I.<sup>1,2</sup>; Contreras, M.d.M.<sup>1,2</sup>; Labidi, J.<sup>3</sup>; Roseiro, L.B.<sup>4</sup>; Duarte, L.C.<sup>4</sup>; Carvalheiro, F.<sup>4</sup>; Castro, E.<sup>1,2</sup> <sup>1</sup>Department of Chemical, Environmental and Materials Engineering, <sup>2</sup>Center for Advanced Studies in Earth Sciences, Energy and Environment (CEACTEMA)-Universidad de Jaén (Spain). <sup>3</sup>University of the Basque Country (Spain). <sup>4</sup>Laboratório Nacional de Energia e Geologia, I.P. - Unidade de Bioenergia e Biorrefinarias (Portugal)</p>
<b>ID1270</b>	<p>“A local approach to Sustainable Development Goals from olive-derived biomass Biorefineries” Castro, E.; Contreras M.d.M.; Galán-Martín, A.; Romero-García, J.M.; Romero, I.; Ruiz, E. University of Jaén (Spain)</p>
<b>ID1302</b>	<p>“Valorization of vine shoots for hydrogen biological production” Rabelo, C.A.B.S.<sup>1</sup>; Vidal, A.M.<sup>2</sup>; Romero-García, J.M.<sup>2</sup>; Romero, I.<sup>2</sup>; Varesche, M.B.A.<sup>1</sup>; Castro, E.<sup>2</sup> <sup>1</sup>University of São Paulo (Brazil). <sup>2</sup>Universidad de Jaén (Spain)</p>
<b>ID1411</b>	<p>“Comparing the technoeconomic analyses for the production of Acrylic Acid using a fossil and a renewable-based route” Sandid, A.; Esteban, J.; Spallina, V. University of Manchester (United Kingdom)</p>
<b>ID1457</b>	<p>“Green extraction of antioxidants for grape waste valorization using bio-based solvents and process intensification” Cañadas, R.; Díaz, I.; Rodríguez, M.; González, E.J.; González-Miquel, M. Universidad Politécnica de Madrid (Spain)</p>
<b>ID1490</b>	<p>“Estudo da cadeia produtiva do bioquerosene de aviação e do diesel verde no cenário do Brasil, Argentina e Paraguai” Penello, J.R.; Cruz, Y.R.; Diaz, G.C.; Aranda, D.A.G. Universidade Federal do Rio de Janeiro (Brazil)</p>
<b>ID1553</b>	<p>“Evaluation of olive stones organosolv pretreatment for biohydrogen production” Casanova-González, R.<sup>1</sup>; Rabelo, C.A.B.S.<sup>2</sup>; Vidal, A.M.<sup>1</sup>; Romero, I.<sup>1</sup>; Castro, E.<sup>1</sup> <sup>1</sup>Universidad de Jaén (Spain). <sup>2</sup>University of São Paulo (Brazil)</p>
<b>ID1559</b>	<p>“Bio-fuel production by catalytic assisted hydrothermal liquefaction process from underutilized biomass” Moreira-Mendoza, C.A.<sup>1,2</sup>; Essounani, S.<sup>1</sup>; Molina-Ramírez, S.<sup>1</sup>; Cortés-Reyes, M.<sup>1</sup>; Herrera, C.<sup>1</sup>; Larrubia, M.A.<sup>1</sup>; Alemany, L.J.<sup>1</sup> <sup>1</sup>Universidad de Málaga (Spain). <sup>2</sup>Universidad Técnica de Manabí (Ecuador)</p>
<b>ID1593</b>	<p>“Different strategies for pretreatment and delignification of vine shoots” Vidal, A.M.<sup>1,2</sup>; López-Linares, J.C.<sup>1</sup>; Contreras, M.d.M.<sup>1,2</sup>; Ruiz, E.<sup>1,2</sup>; Castro, E.<sup>1,2</sup>; Romero, I.<sup>1,2</sup> <sup>1</sup>Universidad de Jaén (Spain). <sup>2</sup>Universidad de Jaén (Spain)</p>
<b>ID1797</b>	<p>“Evaluación termogravimétrica y calorimétrica de pellet de biomasa de Coffea arabica L.” Delgado, D.R. Universidad Cooperativa de Colombia (Colombia)</p>
<b>ID2117</b>	<p>“Microbial oil production from fruit and vegetable residues: evaluation from a techno-economic perspective” Gallego-García, M.; Susmozas, A.; Moreno, A.D.; Iglesias, R.; Negro, M.J. Advanced Biofuels and Bioproducts Unit Energy Department-CIEMAT (Spain)</p>
<b>ID2135</b>	<p>“Integral use of citrus processing waste for essential oils, pectin and bacterial cellulose production via a biorefinery approach” Karanicola, P.<sup>1,2</sup>; Patsalou, M.<sup>1</sup>; Nicodemou, A.<sup>1,2</sup>; Evripidou, N.<sup>3</sup>; Christou, P.<sup>2</sup>; Panagiotou, G.<sup>2</sup>; Damianou, C.<sup>3</sup>; Koutinas, M.<sup>1</sup> <sup>1</sup>Department of Chemical Engineering, <sup>3</sup>Department of Electrical Engineering, Computer Engineering and Informatics-Cyprus University of Technology (Cyprus). <sup>2</sup>KEAN Soft Drinks, Ltd (Cyprus)</p>
<b>ID2346</b>	<p>“Assessing sustainable biofuel production routes through multi-criteria decision-making and LCA tools” Cabrera-Jimenez, R.; Fanourakis, S.; Gavalda, J.; Jiménez, L.; Pozo C. Universitat Rovira i Virgili (Spain)</p>
<b>ID2442</b>	<p>“Producción de “etileno verde” por deshidratación de etanol en fase gas” Licona, W.; Poggio, E.; Mariño, F. Instituto de Tecnologías del Hidrógeno y Energías Sostenibles – ITHES (UBA/CONICET) (Argentina)</p>
<b>ID2468</b>	<p>“Assessing the environmental merits of added-value commodities yielded via hydrolysis of municipal biowaste in agricultural and biochemical applications” Koutinas, M.<sup>1</sup>; Christodoulou, M.<sup>1</sup>; Kallis, M.<sup>1</sup>; Photiou, P.<sup>1,2</sup>; Montoneri, E.<sup>3</sup>; Tzortzakis, N.<sup>4</sup> <sup>1</sup>Department of Chemical Engineering, <sup>4</sup>Department of Agricultural Sciences, Biotechnology &amp; Food Science-Cyprus University of Technology (Cyprus). <sup>2</sup>Sewerage Board of Limassol – Amathus (SBLA) (Cyprus). <sup>3</sup>Università di Torino (Italy)</p>

ID2620	<p>“Butanol production from undetoxified olive tree pruning biomass hydrolysate by an adapted strain of <i>Clostridium acetobutylicum</i>”  Mau-Inchaustegui, S.<sup>1,4</sup>; Romero-García, J.M.<sup>2,3</sup>; Gentina, J.C.<sup>1</sup>; Castro, E.<sup>2,3</sup>; Aroca, G.<sup>1</sup>  <sup>1</sup>Pontificia Universidad Católica de Valparaíso (Chile). <sup>2</sup>Department of Chemical, Environmental and Materials Engineering,  <sup>3</sup>Center for Advanced Studies in Earth Sciences, Energy and Environment-Universidad de Jaén (Spain). <sup>4</sup>Universidad Nacional de Costa Rica  (Costa Rica)</p>
ID3008	<p>“Renewable energy production based on CO<sub>2</sub> capture, utilization and storage for sustainable production of biofuels and biopolymers”  Nanaki, E.<sup>1,2</sup>; Kiarziz, S.<sup>1</sup>; Koutinas, A.<sup>3</sup>; Ioannidou, S.M.<sup>3</sup>; Ladakis, D.<sup>3</sup>; Chacartegui Ramirez, R.<sup>4</sup>  <sup>1</sup>HelleniQ Energy (Greece). <sup>2</sup>University of Aarhus (Denmark). <sup>3</sup>Agricultural University of Athens (Greece). <sup>4</sup>University of Seville (Spain)</p>
ID3029	<p>“Valorisation of rice husk in the production of value-added biopolyols”  Pinto, J.<sup>1,2</sup>; Santamaria-Echart, A.<sup>1,2</sup>; Belgacem, N.<sup>3</sup>; Rodrigues, A.<sup>4</sup>; Barreiro, F.<sup>1,2</sup>  <sup>1</sup>CIMO, <sup>2</sup>SusTEC-Instituto Politécnico de Bragança (Portugal). <sup>3</sup>Laboratoire de Génie des Procédés Papetiers (UMR 5518 - CNRS) (France).  <sup>4</sup>Universidade do Porto (Portugal)</p>



### Coordinators

**Carlos Cardona**, Department of Chemical Engineering, National University of Colombia in Manizales, Colombia, (CO)  
**Eulogio Castro**, Department of Chemical, Environmental and Materials Engineering, University of Jaén, Spain (ES)  
**Pedram Fatehi**, Chemical Engineering Department, Lakehead University, Canada (CA)  
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