



# **Technical Report**

**Responsible for the information:**

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**(Conference Chair)**

**<http://www.advancesincleanerproduction.net>**

Due to COVID-19 pandemics, the **9th IWACP** occurred in a different way. The topic of the **9th International Workshop Advances in Cleaner Production (IWACP): Towards Sustainable Energy-Water-Food Nexus: The Contribution of Cleaner Production?** was discussed by Brazilian and foreign researchers totally **ONLINE**. The event was hosted in Melbourne, Australia, by Deakin University. All the content of **9th IWACP** (Conferences, Plenary and Oral Presentations, etc.) are available in the events' website since May, 26<sup>th</sup>, 2020.

The international conference was organized by the Postgraduate Program in Production Engineering (Master's and Doctoral Program) and Co-organized by Alfred Deakin Institute for Citizenship and Globalization and ARC Centre of Excellence for Electromaterials Science. The event counted with the partnership of the University of Kent (UK), BNU (Beijing Normal University, China), UNIFI (University of Firenze, Italy), CUC (Universidad de la Costa, Colombia), Illinois Institute of Technology (USA), the University of Manitoba (Canada), UNISON (Universidad de Sonora, México), Deakin University (Australia), the Journal of Cleaner Production, the Journal of Environmental Accounting and Management, and the ACPN (Advances in Cleaner Production Network). The Vice Dean for Post-Graduate Studies and Scientific Research of UNIP had the merit of the conference success, having been responsible for infrastructure support.

The partnership with the Journal of Cleaner Production (<https://www.journals.elsevier.com/journal-of-cleaner-production/>), that started during the 1st IWACP was maintained with the support of the Co-Editors in Chief: Prof. Cecilia M. V. B. Almeida, Prof Yutao Wang and Prof. Jiri Klemes. This year, the conference received also support from the Journal of Environmental Accounting and Management (<https://www.lhscientificpublishing.com/journals/JEAM-Default.aspx>). Three special Issues will account for the contributions of the 9<sup>th</sup> IWACP participants.

In the second event organized outside Brazil, the organizing Committee considered that all the pre-established goals proposed to be attained during the 9th IWACP were fully reached:

**(1) The academic information exchange** goal was fully achieved. It was significant the number of participating academic institutions (188 universities and colleges), that reflected in the 274 academic contributions presented. The excellent quality of the contributions presented, in a process of continuous improvement as was seen edition by edition, resulted in another invitation by the Journal of Cleaner Production (JCLP), for an eighth special issue and a third special issue in the Journal of Environmental Accounting and Management (JEAM).

**(2) Presentations of recent achievements in CP** were made by a significant number of participants. In this event, the participants with the best papers received a 'Special Mention Award' and were invited to record their presentations. All these presentations are available in 9<sup>th</sup> IWACP's website via streaming.

**(3) The common problems and routing of solutions** was extensively and deeply discussed at plenary sessions, oral presentations, and workshops. This time, regarding the COVID-19 events, the workshop was made online. The participants fulfilled a form in order to discuss the attitudes needed to answer the theme question: **Sustainability and 5SEnSU Model**.

**(4) The increase in international relationship** through individual and institutional contact was a goal achieved. Participants of 47 countries attended the conference.

**(5) The deepening of the discussion on the fundamental theme of the conference: Towards Sustainable Energy-Water-Food Nexus: the Contribution of Cleaner Production** was the concern of the conference. Given these impressive results, the Organizing Committee is honored for having organized the 9th International **IWACP**.

### Presentation

The **9th IWACP** was carried out with the participation of a group of people committed to the success of the conference. This team consisted of guest speakers, lecturers, presenters of academic and organizational experiences and sessions' coordinators.

The institutions represented at the event through active participants are listed below. The list evidences the broad institutional representation at the conference.

ARC Centre of Excellence for Electromaterials Science  
 Australian Research Council Centre of Excellence in  
 Electromaterials Science (ACES)  
 Curtin University  
 Deakin University  
 Murdoch University  
 The University of Adelaide  
 University of New South Wales  
 University of Tasmania  
 Ressourcenforum Austria  
 STENUM GmbH  
 Technical University of Graz  
 Bangladesh Agricultural Research Institute  
 KU Leuven  
 ABRAPS  
 Agronomic Institute of Campinas  
 Biohack  
 Centro Estadual de Educação Tecnológica Paula Souza –  
 CEETEPS  
 Centro Universitário Herminio Ometto -FHO  
 Centro Universitário UniFG

Cleaning Company of Rio de Janeiro (COMLURB)  
 EMBRAPA  
 ESALQ  
 Escola de Engenharia de Piracicaba - EEP/FUMEP  
 Facens University Center  
 Faculty of Technology Senac  
 Federal Institute of Rio de Janeiro  
 Federal Institute of Rio Grande do Sul  
 Federal Institute Of Science and Technology of Goiás  
 Federal Institute of Triangulo Mineiro  
 Federal Intitute of Alagoas  
 Federal University of ABC  
 Federal University of Bahia  
 Federal University of Espírito Santo  
 Federal University of Itajubá  
 Federal University of Mato Grosso do Sul  
 Federal University of Parana  
 Federal University of Rio Grande do Sul  
 Federal University of Santa Catarina  
 Federal University of Santa Catarina (UFSC)  
 Federal University of Santa Maria

Federal University of São Carlos	CIRANO
Federal University of Technology OF Paraná	Dutch Industries Ltd
Federal University of Viçosa	Polytechnique Montreal
Fersol Indústria e Comércio S/A	University of Calgary
FGV	University of Regina
IBGE	University of Victoria
IFG	Beijing Normal University
IFMT	China Agricultural University
IFPR	China University of Mining and Technology
IFRJ	College of Agronomy and Biotechnology
IFRJ	Dalian University of Technology
IFRS	Guangdong University of Technology
IFSP	Huazhong Agricultural University
Instituto 17	Shenyang Agricultural University
Instituto Mauá de Tecnologia	Sichuan Agricultural University
IPEN/CNEN	South China Agricultural University
Martinelli Advogados	Sun Yat-sen University
Nove de Julho University - UNINOVE	Tongji University
Paulista State University (UNESP)	Tsinghua University
Paulista University-UNIP	COORPORACION UNIVERSITARIA DEL CARIBE CECAR
Pontifical Catholic University of Campinas	REDCOL HOLDING
Pontifical Catholic University of Goiás	Universidad de Ciencias Aplicadas y Ambientales
Pontifical Catholic University of Paraná	Universidad de La Sabana
Pontifical Catholic University of Rio de Janeiro	Universidad Militar Nueva Granada
Prefeitura Municipal da Serra	Cairo University
PRODNORTE	University of Vaasa
Santa Catarina Federal University	University of Vaasa
Santa Catarina State University	Engineering at Mines Saint-Etienne
Sao Paulo State University (UNESP)	IRSTEA, National Research Institute of Science and
São Paulo's State Government	Technology for Agriculture and Environment
SENAI	KEDGE Business School
State University of Amapá	Technische Universität Berlin
State University of Maringa	Foundation of Research and Technolog
State University of Santa Catarina (UDESC)	Harokopio University
State University of Southwest Bahia	National Technical University of Athens
Tiradentes University	Technical University of Crete
UDESC	University of Pannonia
UESB	Alagappa University
UFBA	Amity University Uttar Pradesh
UFCE	B.S. Abdul Rahman Crescent Institute of Scienceand
UFES	Technology
UFG	Chaudhary Devi Lal University
UFPR - Universidade Federal do Paraná	CSIR-National Metallurgical Laboratory
UFRGS	GLA University
UFRJ	Guru Nanak Dev University Amritsar
UFSC	Hindustan Institute of Technology and Science
UFSCar	Indian Institute of Technology Madras
UnB	Kamaraj College of Engineering and Technology
UNICAMP	Mangalam College of Engineering
UNIDAVI	National Institute of Technical Teachers Training and
UNILA	Research
UNISINOS	National Institute of Technology Silchar
UNISUL	Post- Graduate Institute of Veterinary Education & Research
UNIVALI	(PGIVER)
UNIVEL	Punjabi University
Universidade de Passo Fundo	SCSVMV University
Universidade de Santa Cruz do Sul	Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya
Universidade do Estado de Mato Grosso	University
Universidade do Oeste Paulista (UNOESTE)	Symbiosis University of Applied Science
Universidade do Sul de Santa Catarina	SMART Researct Institute (SMARTRI)
Universidade Estadual de Maringá	Research Institute of Petroleum industry
Universidade Estadual de Santa Cruz	Shiraz University
Universidade Federal de Viçosa	University of Isfahan
Universidade Federal do Rio Grande do Sul (UFRGS)	University of Tehran
Universidade Nove de Julho - UNINOVE	University of Zabol
Universidade Positivo	Al-Mustaqbal University College
Universidade Tecnológica Federal do Paraná (UTFPR)	University of Technology, Baghdad
University Center UniFG	AREA Science Park
University of Passo Fundo	ENEA - Italian National Agency for New Technologies,
University of Santa Cruz do Sul	Energy and Sustainable Economic Development
Univesidade de Santa Cruz do Sul	Parthenope University of Naples
Univille	Roma Tre University
UNOESTE	Sapienza University
USP	Sapienza University of Rome

Solwa Srl	Universidade Católica Portuguesa
TIM	Universidade Nova de Lisboa
Unitelma Sapienza	King Fahd University of Petroleum and Minerals
Università Ca' Foscari Venezia	King Faisal University
Università degli Studi di Roma "Tor Vergata"	Heriot-Watt University
University of Florence	Kothuis Consulting
University of L'Aquila	Seoul National University
University of Pisa	Autonomous University of Barcelona (UAB)
University Of Rome "Tor Vergata"	Institut de Recerca i Tecnologia Agroalimentàries
Institute for Global Environmental Strategies	Universitat Autònoma de Barcelona
The Kyoto College of Graduate Studies for Informatics	Universitat Rovira i Virgili
BA School of Business and Finance	Chalmers University of Technology
BIORGANIKS	Lund University
Idea and Innovation Institute, NGO	Southern Taiwan University of Science and Technology
University of Malaya	Mae Fah Luang University
Science University of Malaysia (USM)	Selcuk University
Universiti Malaysia Terengganu (UMT)	Imperial College London
Universiti Teknologi Malaysia (UTM)	Nottingham Trent University
University of Malaya	Sheffield Hallam University
Telcel	Springfield Fuels Ltd
UNISON	University of Coimbra
Inner Mongolia University	University of East Anglia
ENSA AGADIR	University of Edinburgh
IBN ZOHR UNIVERSITY	University of Kent
IBN ZOHR UNIVERSITY	University of Lincoln
Moulay Ismail University	University of Sheffield
CSTM of University Twente	University of Sharjah
Ahmadu Bello University	BGR
Federal Polytechnic Kaura Namoda	Development Horizons Foundation
Sur College of Applied Sciences	John Deere
Punjab Group of Colleges	Johns Hopkins University
Punjabi University, Patiala	LA Sanitation & Environment
The Smart College	Michigan Technological University
An-Najah National University	Oregon State University
CENTRUM PUCP	Southern Technical University
PUC Perú	University at Buffalo
Universidad La Salle	University of Alabama
AGH University of Science and Technology	University of Florida
Mineral and Energy Economy Research Institute of Polish Academy of Science (MERRI)	University of Hawaii
Polish Academy of Sciences	University of Maryland
Católica Porto Business School	University of South Carolina
Polytechnic Institute of Leiria	Hanoi University of Science and Technology
	Zero Regional Environment Organisation

### ***The ACPN Award***

For the **9<sup>th</sup> IWACP**, two researchers representing the new and the senior generation of Advances in Cleaner Production Network (ACPN) were chosen: Alexis Sagastume Gutierrez (University of the Coast, Colombia) and Zhifeng Yang (Beijing Normal University, China).

The ACPN Award is to recognize the contribution of young and experienced researchers to the advances of cleaner production and to the preservation of the environment. The medal is inspired by the logo of the International Workshop on Advances in Cleaner Production 2007. Elements of the biosphere - nature and society - are represented in trees and buildings. The main driving force of the natural services used by society, renewable solar energy, transforms and circulates within the ecosystem. The arrow represents the ideal flow of resources in the biosphere as the basis of the planet's sustainability.

The tallest building is the icon building of the Paulista University, symbolically representing a teaching and research institution not only as the highest and most prominent institution of a sustainable society, but also the institution where the International Workshop and Advances in Cleaner Production Network was founded.

### ***Participants Profile***

The **9<sup>th</sup> IWACP** had 692 participants from various sectors committed with the theme: **Towards Sustainable Energy-Water-Food Nexus: the Contribution of Cleaner Production** (Figure 1). The 24 best papers, of 274 submitted, were organized in six oral presentations sessions, totaling 4 hours of activities with intense and pro-active information exchange among participants.

As expected, participants from Oceania increased, and the participants of Asia, as expected, were mainly from China, but there were also participants from Japan, Malaysia and a high participation of India (Figure 1). In the same way, Brazilians (with an expressive number) was the leading country from Americas, but there were also participants from Mexico, United States and Canada. The participation of European Union was also significant, especially from UK and Italy, but the number of different EU

countries increased with the participation of researchers from Austria, Belgium, Finland, Germany, Greece, Hungary, Latvia, Poland, Portugal, and Spain. In this edition, and increased participation of Middle-East and African countries was also noticed and welcome.

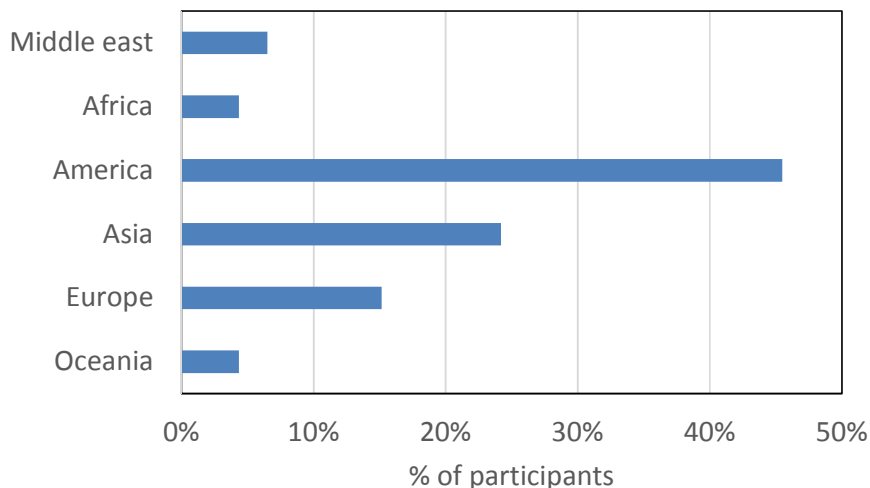


Figure 1. Participants of the 9th IWACP profile according to geographical origin.

### Plenary Sessions

Besides the webinar with live broadcasting by Dr. Benjamin Sovacool, 10 conferences focused on new approaches towards the advancement of cleaner production and sustainability were presented (Table 1).

Table 1 Invited speakers, topic addressed and speakers' institution.

Speaker	Topic addressed	Institution	Country
<b>Zhifeng Yang</b>	China-US: Integrated Systems Modeling of Food-Energy-Water (FEW) Nexus for Urban Sustainability	Beijing Normal University	China
<b>Alexis Sagastume Gutierrez</b>	From Energy Efficiency to Cleaner Production. The Need to Widespread Environmental Concern	University of the Coast	Colombia
<b>Saleen Ali</b>	The Energy Budget of Large-Scale Land Acquisitions: The Potential role of Cleaner Production in Mitigating Climate Impacts	University of Delaware	USA
<b>Marilyn Brown</b>	First Mover Advantages Amid a Clean Energy Boom	Georgia Institute of Technology	USA
<b>Maria Forsyth</b>	Electrochemical Energy Storage - Beyond 2020	Deakin University	Australia
<b>Doug MacFarlane</b>	Towards to "Ammonia Economy"	Monash University	Australia
<b>Adrian Panow</b>	The Deakin Waurn Ponds Microgrid	Deakin University	Australia
<b>Susan Park</b>	Protecting Environmental Rights through International Grievance Mechanisms?	University of Sydney	Australia
<b>Lauren Rickards</b>	Beyond Physical Flows to Cultural Complexities in Nexus Thinking: The Case of Biosolids-to-Biochar Transformation	RMIT University	Australia
<b>Greg Trencher</b>	Developing and Diffusing Fuel-Cell Vehicles: Governance Strategies and Experiences in Japan	Tohoku University	Japan

### Quality of work

The high number of citations of the previous issues, allied with the high quality of the participants' contributions, resulted in invitations by the Journal of Cleaner Production and the Journal of Environmental Accounting and Management.

### Visibility

The visibility of the event and the search for information through the website increased significantly till 2011 and stabilized for the fourth event. The increase of the number of visits to the website can be evidenced by the crescent trend of graphic (Figure 2). The first peak with 10.732 visits is simultaneous to the **1<sup>st</sup> IWACP**, held in November 2007. Subsequent peaks are related to the Call

for Papers for the **1<sup>st</sup> Special Issue** – Journal of Cleaner Production. The peak that corresponds to 20.515 is related to the **2<sup>nd</sup> IWACP** (May 2009) and the subsequent ones to the Call for Papers for the **2<sup>nd</sup> Special Issue** – Journal of Cleaner Production. The 37.047 peak corresponds to the Call for Papers of the **3<sup>rd</sup> Special Issue** and this high number of visits is in agreement to the number of manuscripts sent (more than 250) and the number of papers effectively published (48 papers). The peak 32.276 is simultaneous to the occurrence of the **4<sup>th</sup> IWACP** (18, 19 and 20 May 2011), and a higher peak is expected regarding the Call for papers of the **4<sup>th</sup> Special Issue** in the next months. The peak of 2015 is related to the **5<sup>th</sup> IWACP** and the subsequent ones to the Call for Papers for the **5<sup>th</sup> Special Issue** – Journal of Cleaner Production, which was published with 43 articles. For the **6<sup>th</sup> IWACP**, the number of visits to the website, related to the **5<sup>th</sup> IWACP**, increased. The Call for Papers for the **6<sup>th</sup> Special Issue** – Journal of Cleaner Production was published in 2019 with 38 articles. The **7<sup>th</sup> Special Issue** - Journal of Cleaner production will be launched in 2020. The **8<sup>th</sup> IWACP** will have Special Issues in three different scientific journals: Journal of Cleaner Production, Journal of Environmental Accounting and Management and Energy.

The fall of visits in the website, from **8<sup>th</sup> IWACP** onwards, can be justified by the partnership in the organization. In these two last editions some pages – mainly the submission and registration – were in charge of the host institution. Figure 3 shows that, from July/2018 to December/2019 the website had 41,437 page views. Also, in this period the number of new visitors increased from 72.4% to 75.2%. For the **9<sup>th</sup> IWACP** the website, even with some pages had been in charge of the host institution, the website had some improvement in its peaks of views. 5,482 views in April/2020 and 5,623 in May/2020.

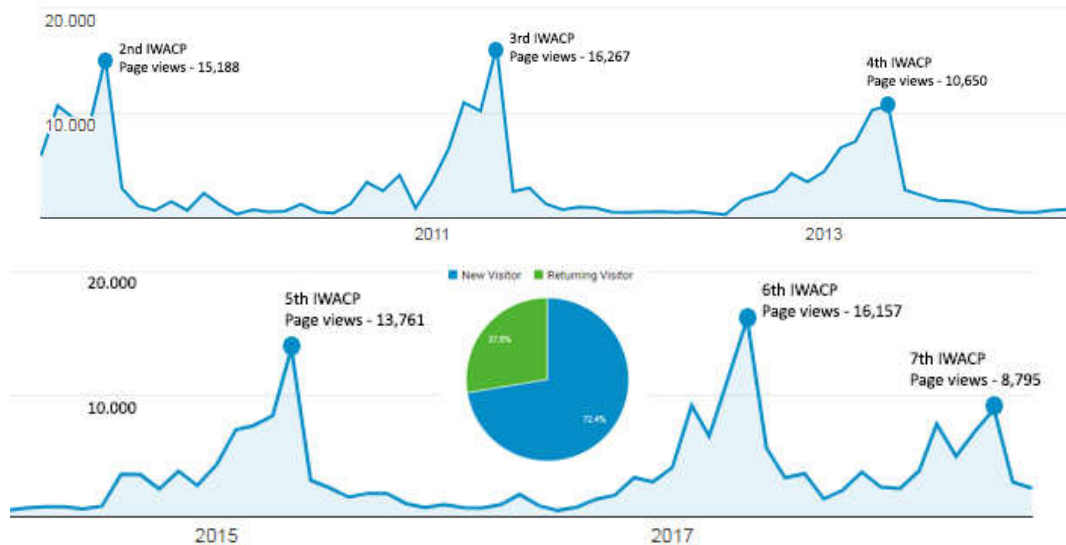


Figure 2. Number of visits to the website [www.advancesincleanerproduction.net](http://www.advancesincleanerproduction.net) from January 2009 to June 2018.

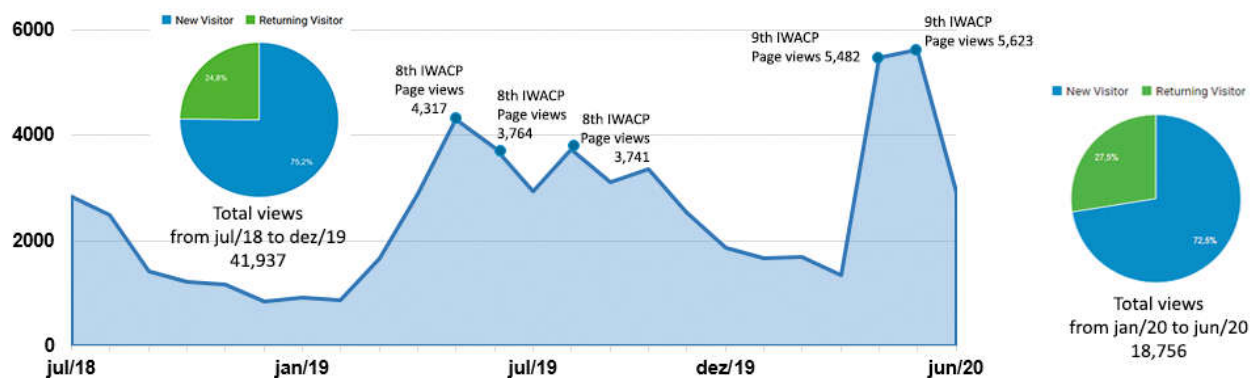


Figure 3. Number of visits to the website [www.advancesincleanerproduction.net](http://www.advancesincleanerproduction.net) from July 2018 to June 2020.

### Evaluation of the conference according to the goals

It is considered that the conference was a great success reaching fully its objectives, namely:

- ✓ The goal of academic information exchange has been fully achieved, by the significant number of participating academic institutions (188 universities and colleges and the presentation of 274 academic contributions).

- ✓ The discussion of common problems and routing of solutions was extensively covered by the plenary sessions, oral presentations.
- ✓ The increase in international relationship through individual and institutional contact was a goal achieved. Participants of 47 countries attended the conference.
- ✓ The deepening of the discussion on the fundamental theme of the event " **Towards Sustainable Energy-Water-Food Nexus: the Contribution of Cleaner Production**"

#### **Evaluation of the conference according to audience**

The audience of 9th IWACP received, by e-mail, an evaluation formulary edited In Google Forms (Figure 4).

**9th IWACP - Event's Impressions**

In order to improve the next edition of IWACP, we kindly ask you to respond the questions below. Your impressions about the event is very important to us. We hope to see you in Florence, Italy in 2021.

\* Required

Name

Melbourne - Australia  
May, 26<sup>th</sup> 2020  
**ONLINE WORKSHOP**  
**OPEN ACCESS**

**9<sup>th</sup> IWACP**

“Towards Sustainable Energy-Water-Food Nexus: the Contribution of Cleaner Production”

INTERNATIONAL WORKSHOP ON ADVANCES IN CLEANER PRODUCTION

Your answer

Institution

Figure 5. Partial view of evaluation form sent to participants of the 9<sup>th</sup> IWACP.

According to the evaluation of the respondents, the event's goals were achieved in more than 91%. On the average score, goals reached 91% of it was expected. The conference attained the audience expectations of all respondents. Partnerships and sponsorship of other institutions were considered important by 100% of participants who answered the form.

Regarding the organization of the conference, 72% consider this item as excellent / good. The website was considered excellent / good by 83% of respondents and 73% considered the service excellent / good. There were no insufficient or bad assessments.

#### **Acknowledgments**

The success of the **9th IWACP** would not have been possible without the support of important partners such the Co-organizing Institutions: Alfred Deakin Institute for Citizenship and Globalization and ARC Centre of Excellence for Electromaterials Science, which significantly contributed to the event's achievement.

Special thanks are addressed to Linda Hancock and Linda Wollersheim who, from the beginning, as co-organizers of the Melbourne program, fully supported this project. Thanks to the Director of the Alfred Deakin Institute for Citizenship and Globalisation Prof. Fethi Mansouri and to Institute staff who assisted on the organisation and technical side of converting a land-based conference to on-line. Thanks also to the Australian Research Council Centre for Excellence on Electromaterials Science and to Prof. Gordon Wallace in partnership with UNIP and partners.



Finally, thanks to Dr. Yugo Okida (*in memoriam*), the Vice-Rector of Post Graduation and Research of Universidade Paulista, Dr. Marília Ancona-Lopez, the Vice-Rector of Graduation of Universidade Paulista, and to Dr. Marina Soligo, Main Coordinator of Post Graduation and Research of Universidade Paulista, for their unconditional support since the first event in 2007.