



8th INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

“COUPLING GREEN TO BLUE ECONOMIES: HOW ARE CLEANER PRODUCTION AND CITIES LEADING THE NEXT SUSTAINABLE DEVELOPMENT”

Hosted by Guangdong University of Technology, Beijing Normal University, Hainan Tropical Ocean University

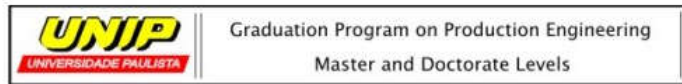


Organized by

Advances in Cleaner Production Network

Boosting Knowledge Exchange Seeking for Sustainability

Co-organized by Paulista University, Dongguan University of Technology, Parthenope University, University of Sheffield, Deakin University



in participation with



Technical Report

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The topic of the **8th International Workshop Advances in Cleaner Production (IWACP): Coupling green and Blue Economies: How are Cleaner Production and Cities Leading the Next Sustainable Development?** was discussed by Brazilian and foreign researchers for three days in Sanya, China during the period of November 13th to 15th, 2019.

The international conference was organized by the Postgraduate Program in Production Engineering (Master's and Doctoral Program) and Co-organized by Dongguan University of Technology, Parthenope University, University of Sheffield, Deakin University. The event counted with the partnership of the (University of Firenze, Italy), UNISON (Universidad de Sonora, México), the University of Manitoba (Canada), BNU (Beijing Normal University, China), the Journal of Cleaner Production, and the ACPN (Advances in Cleaner Production Network). The hosting institutions were the Guangdong University of Technology, Beijing Normal University, and Hainan Tropical Ocean University

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 Energy (<https://www.journals.elsevier.com/energy>) and 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 8th IWACP participants.

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.

In the second event organized outside Brazil, the organizing Committee considered that all the pre-established goals proposed to be attained during the 8th IWACP were fully reached:

(1) The academic information exchange goal was fully achieved. It was significant the number of participating academic institutions (160 universities and colleges), that reflected in the 169 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 a seventh special issue, a second special issue in the Journal of Environmental Accounting and Management (JEAM), and for the first time, an special issue in Energy.

(2) Presentations of recent achievements in CP were made by a significant number of participants.

(3) The common problems and routing of solutions was extensively and deeply discussed at plenary sessions, oral presentations, and workshops. This time, the workshops were organized under the theme **Cleaner Production 40 years**. Six workshops were offered during the conference to discuss the attitudes needed to answer the theme question: **How are Cleaner Production and Cities Leading the Next Sustainable Development?**

The first workshop "**Global Cleaner Production 40 years**", was conducted by Dr. Yutao Wang (Fudan University, Shanghai, China) and provided a deep discussion on the pillars on which cleaner production may lie, and how it evolved since its introduction into the academic community. Dr. Wang talked about the famous ten events of environmental pollution to the publication of Silent Spring that awaked people's environmental consciousness, which lead to the environmental movement in 1960s-1970sand how to achieve a win-win situation between ecology and economy. A remind on the role of CP emphasizing the concept of "prevention is the solution to pollution" was used to revisit the history, context, and future trends of global cleaner production.

The second workshop "**Cleaner Production 40 years in Latin America**" was conducted by Dr. Cecilia M. V. B. Almeida (Paulista University, São Paulo, Brazil). The workshop underscored the evolution and features of the development of Cleaner Production and Cleaner Production Centers in Latin America. The role of universities that have integrated the approach into their master and doctorate programmes, and the leading role of the Universidade Paulista, which developed a series of thesis and articles on environmental concerns and launched the International Workshop on Advances in Cleaner Production in partnership with the Journal of Cleaner Production was emphasized. An overview of the CP evolvement in Latin America highlighted the steps that have already been taken, the current situation and some prospects for the future.

Dr. Giovanni Baiocchi (University of Maryland - USA) offered the workshop titled "**Cleaner Production 40 years in USA**" highlighting the discussion on the main causes and the main alternatives to decrease the carbon footprint from industries and services and describing experiences from North America. The challenges for the future in the face of climate change impacts was placed on a framework for action that goes beyond the firm to include relationships between companies, social institutions, and consumers.

The fourth workshop "**Cleaner Production 40 years in European Union**" was directed by Dr. Gang Liu (University of Southern Denmark - Denmark). The workshop helped to reflect on the history of the theory, applications, and policy framework of cleaner production in Europe, from prevention to circular economy and sustainable production and consumption. Examples were used to illustrate this development and also to discuss its implications on addressing overall sustainability challenges and achieving United Nations Sustainable Development Goals.

The fifth workshop, "**Cleaner Production 40 years in Oceania**", was conducted by Dr. Linda Hancock (Deakin University - Australia), when participants were invited to reflect on options towards future sustainability. Participants were invited reflect on the key advances and challenges in cleaner production in Oceania by focusing on "hot" issues in selected parts of the region in terms of "what have we accomplished in 40 years".

"**Cleaner Production 40 years in China**" was the topic of the sixth workshop, Dr. Lei Shi (Tsinghua University - China) talked about cleaner production implementation and promotion in key industrial sectors, such as iron & steel, pulp & paper, textile, leather, metals, cement, plastics and chemicals. History and trends of cleaner production education as part of education for sustainable development was also underscored. Along with some obstacles and challenges for the in-depth implementation of

cleaner production in China, including the discontinuity of policies, the movement feature of policy implementation and the poor innovation industry ecosystem.

(4) The increase in **international relationship** through individual and institutional contact was a goal achieved. Participants of 15 countries attended the conference.

(5) The deepening of the discussion on the fundamental theme of the conference: How are Cleaner Production and Cities Leading the Next Sustainable Development? was the concern of the conference. Given these impressive results, the Organizing Committee is honored for having organized the 8th International **IWACP**.

Presentation

The **8th 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.

China University of Geosciences	Cleaner Production Center, Ministry of Ecology and Environment of China
Gruppo Iren	College of Environment, Liaoning University
Universidade Paulista – UNIP	College of teacher education in Xinyang Normal University in Henan province in China
University of Naples Parthenope, Centro Direzionale di Napoli	Coventry University
University of São Paulo -	Dalian University of Technology
Aalborg University	Deakin University
Adadplan Technical Drawing	Department of Economics and Statistics, University of Siena
Agricultural Information Institute, Chinese Academy of Agricultural Sciences	Department of Sciences and Technologies, Parthenope University of Napoli, Italy
Agustino de Souza e Rozita dos Reis Souza	Dongguan University of Technology
Asia-Europe Institute, University of Malaya	Dongguan University of Technology
Beijing Chemical University	East China University of Science and Technology
Beijing Drainage Group Research Center	Ecodynamics Group, Department of Physical Sciences, Earth and Environment, University of Siena
Beijing ecological restoration association	ENEA, Research Centre of Portici
Beijing Forestry University	Federal Institute of Goias
Beijing Institute of Technology	Federal Rural University of Pernambuco (Brazil) - UFRPE
Beijing Normal University	Federal Technological University of Paraná (UTFPR)
Beijing University of Technology	Federal University of Goias
Campo Limpo Paulista Faculty	Federal University of Paraíba
Center for a Livable Future, Johns Hopkins University	Federal University of Santa Catarina
Central Research Institute of Building and Construction Co., Ltd.	Fudan University
Centre for Future Materials, University of Southern Queensland	Fuzhou University
China Agricultural University	Gampe/UFRPE
China Institute of Water Resources and Hydropower Research	GuangDong Academy of Social Sciences
China University of Geosciences (Beijing)	Guangdong University of Finance & Economics (GDUFE)
China University of Mining and Technology (Beijing)	Guangdong University of Technology
China University of Petroleum	Guangdong University of Technology
Chinese Academy of Agricultural Sciences	Guangdong University of Technology
Chinese Academy of Environmental Planning	Guangzhou Institute of Geography,
Chinhoyi University of Technology	Hohai University
Chongqing University	Hunan University
Chongqing University of Technology	Hunan University of Commerce
City University of Hong Kong	Illinois Institute of Technology

Industrial and Systems Engineering Graduate Program	Sichuan Agricultural University
Inner Mongolia University	South China Normal University
Institute for Technological Research.	South China University of Technology
Institute of Agricultural Information, Chinese Academy of Agricultural Sciences	South Denmark University
Institute of Clean Coal Technology, East China University of Science and Technology	South-East European Research Centre
Institute of Energy and Environment, University of São Paulo, São Paulo, Brazil	Southwest University
Instituto de Pesquisas Energéticas e Nucleares	State Key Laboratory of Multi- phase Complex Systems, Institute of Process Engineering
KTH Royal Institute of Technology	Sun Yat-sen University
Maryland University	Taiyuan Normal University
Nanchang University	Taiyuan University of Technology
Nanjing University of Aeronautics and Astronautics	The United Nations Development Programme
North China Electric Power University	The University of Queensland
Northeastern University	The University of Sheffield
Norwegian University of Science and Technology	Tokyo Institute of Technology
Nottingham Trent University	Tsinghua University
Parthenope University of Naples	Unitelma Sapienza, University of Rome
Paulista University	Universidad de Sonora
Paulista University (UNIP)	Universidade Federal do Paraná
Pisa University	Universidade Nove de Julho - UNINOVE
Pontifical Catholic University of Parana	Università Ca' Foscari Venezia
Pontifical Catholic University of Parana	Università degli Studi di Roma "Tor Vergata"
Positivo University	Universitat Autònoma de Barcelona
Quanzhou Normal University	University of East Anglia
Research center for eco-environmental engineering	University of East London
São Paulo State University	University of Florence
School of Architecture Design and Urban Planning	University of Florida
School of Environment and Civil Engineering, Dongguan University of Technology	University of Groningen
School of Environmental Science and Technology, Dalian University of Technology	University of International Business and Economics
School of Geography Science in Xinyang Normal University in Henan province in China	University of L'Aquila
School of Geography, South China Normal University	University of Leeds
School of Natural Sciences, Trinity College Dublin	University of Michigan
Shanghai SUS Environmental Co. Ltd.	University of Science and Technology Beijing
Shanghai University of International Economics&Business	University of Sheffield International Faculty, CITY College
Shanxi University	University of Sonora
Shanxi University of Finance & Economics	University of Wisconsin Milwaukee
Sheffield University Management School, The University of Sheffield	Univesidad de Oriente
	Vignan Institute of Technology and Science
	Xiamen University
	Zhejiang University of Finance & Economics
	Zhejiang University

The ACPN Award

The second ACPN award ceremony was held during the **8th IWACP**, two researchers representing the new and the senior generation of Advances in Cleaner Production Network (ACPN) chosen: Dr. Weslynn Ashton (Illinois Institute of Technology (IIT) - EUA) and Sergio Ulgiati (Parthenope University - Naples - Italy).

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 **8th IWACP** had 417 participants from various sectors committed with the theme: **Coupling green and Blue Economies: How are Cleaner Production and Cities Leading the Next Sustainable Development?** (Figure 1). 169 scientific works from 17 different countries. Scientific works of Brazilian researchers from 7 different states, all of them in 46 hours of oral sessions aiming intense and pro-active information exchange among participants.

The participants of Asia, as expected, were mainly from China, but there were also participants from Japan, Malaysia and India (Figure 1). In the same way, Brazilians (with an expressive number of 87 participants) was the leading country from Americas, but there were also participants from Mexico and United States. The participation of European Union plus UK was also significant. UK sent 13 participants, and Italy 33, noteworthy they represented different universities in both countries.

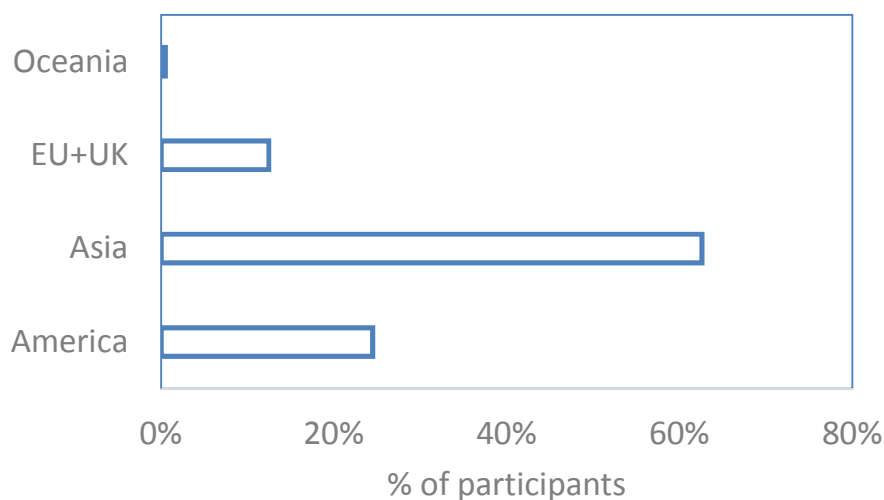


Figure 1. Participants of the 8th IWACP profile according to geographical origin.

Various regions of Brazil were also represented at the conference among them all Southeastern states had the highest number of representatives, but the participation of Southern, Central-West Region, and Northeastern states should be highlighted. the participation of new institutions.

Plenary Sessions

Besides the opening conference provided by Dr. Henrik Lund, Editor-in-Chief of Energy, 5 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
Henrik Lund	100% Renewable Smart Energy Systems	Aalborg University Editor-in-Chief of Energy	Denmark
Renato Boero	IREN Contribution to Sustainability of Energy Water and Waste Management	CEO Gruppo Iren	Italy
Ming Xu	Life Cycle Thinking for Decision Support in Cleaner Production	University of Michigan Editor-in-Chief of Resources, Conservation and Recycling	USA
Lu Ding	Clean Solid Biofuel Production from High Moisture Content Biomass Waste by Employing Hydrothermal Treatment Technology	Tokyo Institute of Technology East China University of Science and Technology	Japan/China
Sergio Ulgiati	Overcoming the Asymmetry between Urban and Rural Systems. Towards Fair Exchange and Appropriate use of Environmental and Human Capital	Parthenope University	Italy
Weslyne Ashton	Building Regenerative Economies for People and Planet	Illinois Institute of Technology (IIT)	USA

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, the Journal of Environmental Accounting and Management, and Energy.

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 4). The first peak with 10.732 visits is simultaneous to the **1st IWACP**, held in November 2007. Subsequent peaks are related to the Call for Papers for the **1st Special Issue** – Journal of Cleaner Production. The peak that corresponds to 20.515 is related to the **2nd IWACP** (May 2009) and the subsequent ones to the Call for Papers for the **2nd Special Issue** – Journal of Cleaner Production. The 37.047 peak corresponds to the Call for Papers of the **3rd 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 **4th IWACP** (18, 19 and 20 May 2011), and a higher peak is expected regarding the Call for papers of the **4th Special Issue** in the next months. The peak of 2015 is related to the **5th IWACP** and the subsequent ones to the Call for Papers for the **5th Special Issue** – Journal of Cleaner Production, which was published with 43 articles. For the **6th IWACP**, the number of visits to the website, related to the **5th IWACP**, increased. The Call for Papers for the **6th Special Issue** – Journal of Cleaner Production was published in 2019 with 38 articles. The **7th Special Issue** - Journal of Cleaner production will be launched in 2020. The **8th 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 **8th 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 5 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%.

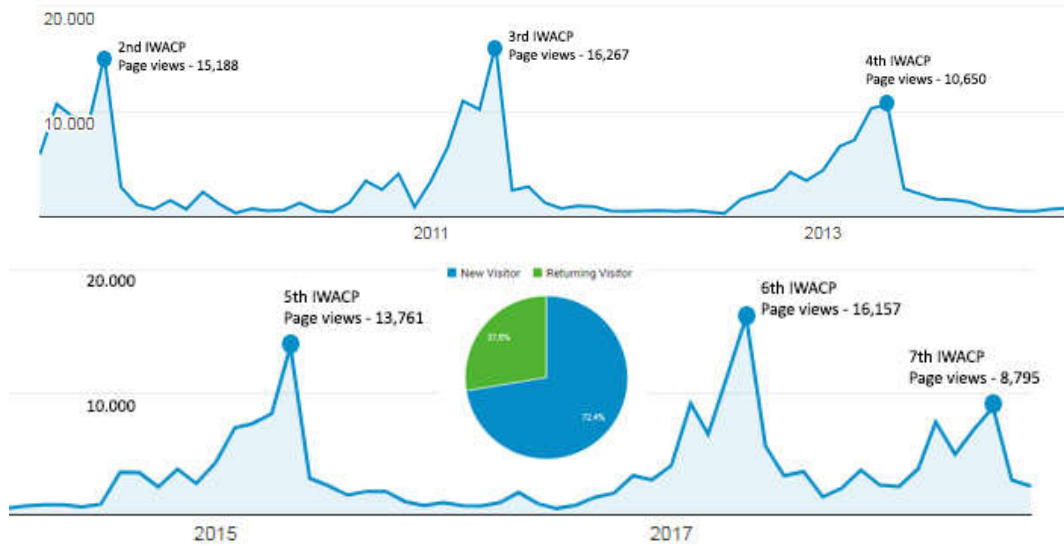


Figure 4. Number of visits to the website www.advancesincleanerproduction.net from January 2009 to June 2018.

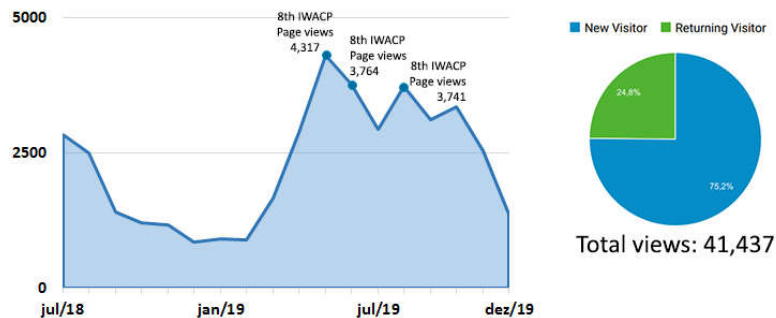


Figure 5. Number of visits to the website www.advancesincleanerproduction.net from July 2018 to December 2019.

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 (160 universities and colleges and the presentation of 169 academic contributions).
- ✓ The presentations of recent achievements made by companies (featuring success experience) promoting the share of knowledge between academic and corporate experience. For the first time, a CEO from the industrial sector, Renato Boero, provided a plenary conference showing the progress of industry in the area.
- ✓ The discussion of common problems and routing of solutions was extensively covered by the plenary sessions, oral presentations and, particularly, at the six workshops that covered forty years of Cleaner Production in key geographical areas.
- ✓ The increase in international relationship through individual and institutional contact was a goal achieved. Participants of 15 countries attended the conference.
- ✓ The deepening of the discussion on the fundamental theme of the event **"Coupling green and Blue Economies: How are Cleaner Production and Cities Leading the Next Sustainable Development?"**

Evaluation of the conference according to audience

The audience of 8th IWACP received, by e-mail, an evaluation formulary edited In Google Forms (Figure 6).

Figure 5. Partial view of evaluation form sent to participants of the 8th IWACP.

Accordingly to the evaluation of 80% of the participants, the event's goals were achieved in more than 90%. 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, 60% consider this item as excellent / good. The facilities were considered excellent / good by 80% of respondents and 70% considered the service excellent / good. There were no insufficient or bad assessments.

Acknowledgments

The success of the **8th IWACP** would not have been possible without the support of important partners such as the Hosting institutions: Guangdong University of Technology, Beijing Normal University, and Hainan Tropical Ocean University, and the Co-organizing Institutions: Paulista University, Dongguan University of Technology, Parthenope University, University of Sheffield, Deakin University, which significantly contributed to the event's achievement.

Thank you to all the staff of Guangdong University of Technology, Beijing Normal University and Hainan Tropical Ocean University who has contributed to the preparation of the event.

Special acknowledgements are addressed to Prof. Zhifeng Yang (Chair of the 8th IWACP, Academician of Chinese Academy of Engineering, and Deputy chairman of Sanya Municipal Federation of World Academician) who, from the beginning, fully supported this project.

Special thanks are addressed to Prof. Gengyuan Liu, Chair of Local Organizing Committee, and team of researchers, students and staff whose work resulted in a perfect event.

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.