

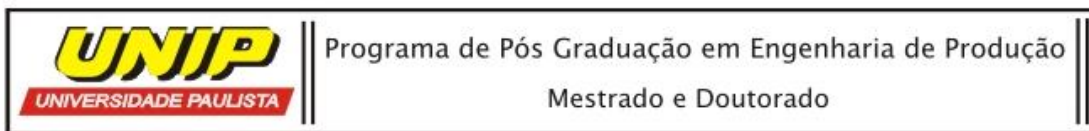
São Paulo - Brazil - May - 20<sup>th</sup> to 22<sup>nd</sup> - 2015



**5<sup>th</sup>**  
INTERNATIONAL WORKSHOP  
ADVANCES IN CLEANER PRODUCTION

“CLEANER PRODUCTION TOWARDS A SUSTAINABLE TRANSITION”

organized by



in participation with



## Technical Report

Responsible for the information:

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**Abstract**

The topic of the 5th International Workshop Advances in Cleaner Production: **Cleaner Production towards a Sustainable Transition** was discussed by Brazilian and foreign researchers for three days at the University Paulista, Indianópolis Campus).

The international conference was organized by the Postgraduate Program in Production Engineering (Master's and Doctoral Program) and counted with the partnership of the NPPR (National Prevention Pollution Roundtable, from United States), UNISON (Universidad de Sonora, México), the University of Winnipeg (Canada) and the Journal of Cleaner Production.

The conference received financial support from the funding agencies FAPESP (Fundação do Amparo à Pesquisa do Estado de São Paulo) and CAPES (Coordination for the Improvement of Higher Education), which were ~~fundamental~~ essential to the achievement of the 5<sup>th</sup> Workshop. The event also counted with financial support from EcoAdvisor Associados and the sponsorship of ABEPRO (Brazilian Association of Production Engineering).

The partnership with the Journal of Cleaner Production, which started during the 1st Workshop was maintained with the support of the Editor in Chief, Prof. Donald Huisingh. This resulted, as occurred at the four previous conferences, in the Call for Papers (<http://www.journals.elsevier.com/journal-of-cleaner-production/call-for-papers/>) for a special issue of the journal to be published with the best works presented in this fifth edition.

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. Also, the UNIP Chorus performed a Brazilian repertoire.

The organizing Committee considered that all the pre-established goals proposed to be attained during the 5th Workshop were fully reached:

**(1) The academic information exchange** goal was fully achieved. It was significant the number of participating academic institutions (125 universities and colleges), that reflected in the 176 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 fifth special issue.

**(2) Presentations of recent achievements in CP** were made by a significant number of companies. Twenty five (25) cases of success were presented in oral form. The conference promoted the transfer between academic knowledge and corporate experience and counted on the participation of 30 companies comprising industrial and services sectors.

**(3) The common problems and routing of solutions** were extensively and deeply discussed at plenary sessions, oral presentations, and workshops. Seven workshops were offered during the conference, where working groups were formed to discuss attitudes needed to contribute to the integration of CP practices and strategies in the search for sustainability. These activities were coordinated by foreigner and national invited speakers.

The first workshop "How Does the Recent Base of the Pyramid (BoP), Social innovation and Entrepreneurship Discourse Align with, contributes toward and/or conflict with Sustainable Development?" was conducted by Dr. Jeremy Hall from the Beedie School of Business, Simon Fraser University - Canada, and provided a deep discussion on the entrepreneurship increasing sustainability.

The second workshop, "Good/Best Practices for Waste Prevention, Reuse, Recycling", was conducted by Dr. Sergio Ulgiati from the Parthenope University - Italy. The thirty five (35) participants who attended the workshop discussed the evaluation of alternatives implement best practices at regional and individual level.

Dr. Asher Kiperstok from Universidade Federal da Bahia offered the workshop titled "Can We Achieve Sustainability? How to Build Utopian Ideal". There, the forty two (42) participants discussed feasible and unfeasible ideas for the transition to sustainability.

The fourth one "How to Measure/Assess Sustainability in the Future Post-Fossil Fuel Society?", was conducted by Dr. Donald Huisingh (University of Tennessee-USA), editor-in-chief of Journal of Cleaner Production. There, forty four participants were invited to reflect on options towards future sustainability, and based on a discussion on the GDP measures, to reflect about indicators to measure happiness and the real wealth of a society.

The fifth workshop, conducted by Dr Hans Schnitzer from the Graz University of Technology (NAWI), Austria. He debated how to improve energy efficiency in urban systems. It counted with thirty two (32) participants.

"Advancing the Use of Pollutant Release and Transfer Register (PRTR). Data and Information: What PRTR Data Users Really Want!" was the topic of the sixth workshop, where thirty seven participants (37) discussed with

Steve DeVito (Environmental Protection Agency, USA) and Marcus da Matta (Ecoadvisor Associated) the importance of pollutants control and register.

At the seventh workshop, Dr. Nora Elba Munguia Vega (UNISON - Mexico), discussed the role of Occupational Health and Safety: Towards a Sustainable Production with 27 participants.

**(4)** The increase in **international relationship** through individual and institutional contact was a goal achieved. Participants of 17 countries attended the conference.

**(5) The deepening of the discussion on the fundamental theme of the conference: Cleaner Production towards a Sustainable Transition** was the concern of the conference. Given these impressive results, the Organizing Committee is honored for having organized the 5<sup>th</sup> International Workshop on Advances in Cleaner Production.

### **Presentation**

The **5th International Workshop: Advances in Cleaner Production** 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.

- Associação Beneficente BRAVANIR
- Associação Brasileira de Engenharia de Produção
- Beedie School of Business, Simon Fraser University - Canada
- Beijing Normal University, China
- Braskem, SP
- Braskem, Unidade Vinílicos
- Centro Federal de Educação Tecnológica – Rio de Janeiro
- Centro Nacional de Pesquisa em Energia e Materiais
- Centro Universitário Católica de Santa Catarina
- Centro Universitário da FEI
- Centro Universitário Univates
- Chinese Academy of Sciences, China
- Cleaner Production Center, El Salvador
- Companhia Ambiental do Estado de São Paulo
- Construction Business Group of Cienfuegos, Cuba
- Córdoba National University, Argentina
- Cranfield University, United Kingdom
- Ecoadvisor Associados
- Embrapa Agroindústria Tropical, Ceará
- Embrapa Environment, Jaguariúna
- Empresa Eléctrica Nacional, Cuba
- Erasmus University, The Netherlands
- Escola de Engenharia de São Carlos, USP
- Escola Politécnica, USP
- Escola Superior de Agricultura Luiz de Queiróz
- EY - Brasil - Ernst & Young Ernest & Young
- Faculdade de Economia e Administração, USP
- Faculdade de Engenharia de Alimentos,
- Faculdade Meridional, Passo Fundo
- Faculdade Metropolitana de Camaçari
- Faculdade Paranaense, Rolândia-Paraná
- Faculdade Paulista de Pesquisa e Ensino Superior
- Faculdade SENAI Fatesg, Goiânia
- Faculdade Sudoeste Paulista, Avaré
- Faculdades Metropolitanas Unidas, São Paulo
- Faculty of Business and Economics, Winnipeg, Canada
- Flemish Institute for Technological Research (VITO), Mol, Belgium
- Fundação Getúlio Vargas
- Fuzhou University, China
- GKN Driveline Americas
- Graz University of Technology, Austria
- Grupo de Gestão Ambiental de Pernambuco
- Hebei University of Science and Technology, China
- Honduras Autonomous University, Illinois Institute of Technology, USA
- Instituto de Pesquisa e Marketing Integrado, Recife
- Instituto de Pesquisas Energéticas e Nucleares
- Instituto de Pesquisas Tecnológicas
- Instituto Federal de Educação, Ciência e Tecnologia de Goiás
- Instituto Federal de Educação, Ciência e Tecnologia de São Paulo
- Instituto Federal de Educação, Ciência e Tecnologia do Acre
- Instituto Federal de Educação, Ciência e Tecnologia do Estado do Amazonas
- Instituto Federal de Educação, Ciência e Tecnologia do Rio de Janeiro
- Instituto Federal de Educação, Ciência e Tecnologia do Sul de Minas Gerais
- Instituto Federal do Amazonas
- Instituto Federal Fluminense, Campos dos Goytacazes
- Instituto Jatobás
- Instituto Nacional de Tecnologia Agropecuária, Argentina
- Instituto Prominas
- Intertox Consultoria e Pesquisa
- Journal of Cleaner Production, USA
- Karlsruhe Institute of Technology
- Key Laboratory of Green Process and Engineering
- KTH Royal Institute of Technology, Sweden
- La Salle University Center
- Laboratório Nacional de Energia e Geologia, Portugal
- LEVENOX Serviços de Engenharia Ltda,
- Mesa Redonda Paulista de Produção mais Limpa
- National Association of Public Transportation, ANTP.

- National Engineering Laboratory for Hydrometallurgical Cleaner Production Technology, Institute of Process Engineering,
- National Pollution Prevention Roundtable, USA
- National University of Córdoba-Argentina
- National University of Engineering, Nicaragua
- New York Institute of Technology, USA
- Núcleo de Altos Estudos Amazônicos
- Núcleo de Automação e Tecnologias Limpas, NATEL
- Núcleo de Estudos Ambientais e Geoprocessamento
- Parthenope University of Naples, Italy
- Petrobras, Rio de Janeiro, Brazil
- Pontifícia Universidade Católica de Goiás
- Pontifícia Universidade Católica do Paraná
- Pontifícia Universidade Católica do Rio Grande do Sul
- Prefeitura Municipal de São Paulo
- PROGESA, Tecnologia em Saneamento Básico
- Programa de Pós-Graduação em Energia, USP
- San Ignacio de Loyola University, Peru
- Serviço Nacional de Aprendizado
- Stuart School of Business – USA
- Syngenta Proteção de Cultivos
- Technical Services Company Thermoelectric, Cuba
- Technological Institute of Costa Rica
- Universidad de Cienfuegos, Cuba
- Universidad de Sonora, Mexico
- Universidade Anhembi Morumbi
- Universidade Cândido mendes
- Universidade de Brasília
- Universidade de Caxias do Sul
- Universidade de Mogi das Cruzes
- Universidade de Santa Cruz do Sul
- Universidade de São Paulo
- Universidade de Sorocaba, São Paulo
- Universidade do Alto Vale do Itajaí
- Universidade do Estado de Santa Catarina
- Universidade do Oeste Paulista
- Universidade do Vale dos Sinos
- Universidade Estácio de Sá
- Universidade Estadual de Campinas
- Universidade Estadual de Londrina
- Universidade Estadual de Maringá
- Universidade Estadual de Santa Catarina
- Universidade Estadual do Maranhão
- Universidade Estadual do Oeste do Paraná
- Universidade Estadual do Piauí
- Universidade Estadual Paulista "Júlio de Mesquita Filho, São Paulo
- Universidade Estadual Paulista, Bauru
- Universidade Estadual Paulista, Botucatu
- Universidade Estadual Paulista, Sorocaba
- Universidade Federal da Bahia
- Universidade Federal da Grande Dourados
- Universidade Federal de Alagoas
- Universidade Federal de Goiás
- Universidade Federal de Minas Gerais
- Universidade Federal de Pernambuco
- Universidade Federal de Santa Catarina
- Universidade Federal de Santa Maria
- Universidade Federal de São Carlos
- Universidade Federal do ABC
- Universidade Federal do Ceara
- Universidade Federal do Pará
- Universidade Federal do Paraná
- Universidade Federal do Rio de Janeiro
- Universidade Federal do Rio Grande Norte
- Universidade Federal do Rio Grande Sul
- Universidade Federal do Sul de Santa Catarina
- Universidade Federal do Triângulo Mineiro
- Universidade Federal Fluminense
- Universidade Federal Rural de Pernambuco
- Universidade FEEVALE
- Universidade Metodista de Piracicaba
- Universidade Municipal de São Caetano do Sul
- Universidade Nacional de La Plata, Argentina
- Universidade Norte do Paraná Universidade Nove de Julho
- Universidade Paulista
- Universidade Regional de Blumenau
- Universidade Tecnológica Federal do Paraná
- Universidade Tuiuti do Paraná
- University of Cienfuegos, Cuba
- University of Florence, Italy
- University of L'Aquila, Italy
- University of Leuven, Belgium
- University of Massachusetts Lowell, USA
- University of Tennessee – USA
- University of Valenciennes and Hainaut-Cambrésis, France
- University of Winnipeg, Canada
- University Rafael Landívar, Guatemala
- Vesalius College - Belgium
- Washington State Department of Ecology USA

### **Participants Profile**

The **5th International Workshop: Advances in Cleaner Production** had 454 participants from various sectors committed with the theme: **Cleaner Production towards a Sustainable Transition** (Figure 1). Comparison with the earlier conferences shows an increase in the total number of participants. Worth of notice in the 5th edition of the event are the increase in the participation of undergraduate students and companies, and maintenance in the number of universities and colleges and CP Centers. In 2015 the conference counted with 30 private companies represented by 42 participants.

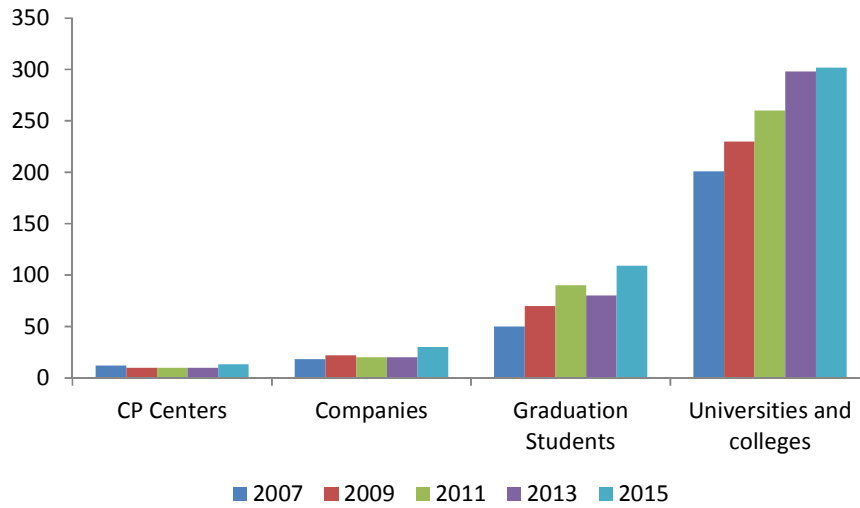


Figure 1. Participants of the 5th International Workshop Profile compared to the profile of the previous conferences.

In addition to the lectures presented by the eight foreign invited speakers, 151 academic works and 25 organizational experiences were presented. Among all these contributions, various regions of Brazil were represented (Figure 2). All Southeastern states were represented at the conference, and this was the region with the highest number of representatives. It should be highlighted the increasing participation of the Northern states, including Acre and Amazonas, and the Northeastern states, with participants of Bahia, Paraíba, Piauí, Rio Grande do Norte, Sergipe and Pernambuco. The participation of Central-West Region was also increased at this fourth edition of the conference, with the participation of new institutions. The comparison with previous data shows an increase of the participants from each Brazilian Region as well as of foreign participants, especially in this edition. Participation of foreign universities increased 31 % in oral presentations in relation to the 2013 Workshop, with presentations from Mexico, Cuba, Guatemala, Honduras, Peru, Netherlands, Italy, Belgium, France and United States.

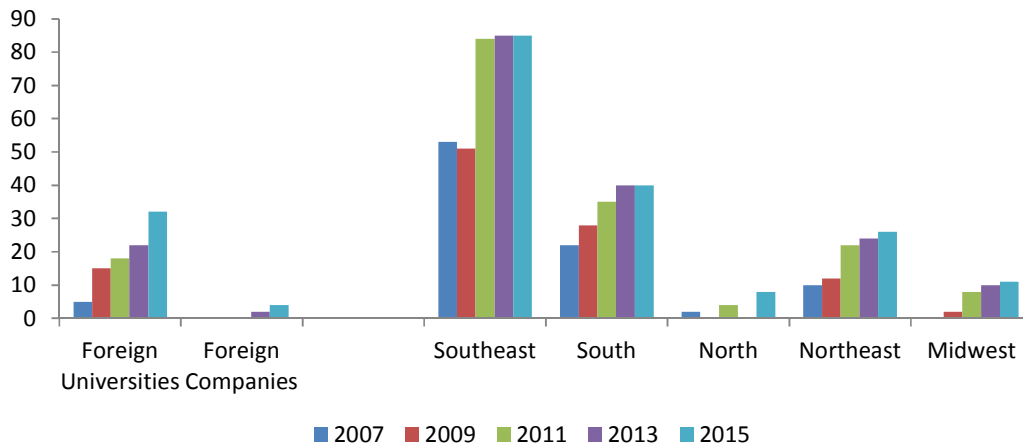


Figure 2. Number of participants who present works at the five conferences, organized according to geographical origin.

**Plenary Sessions**

The eight invited speakers addressed important issues related to Cleaner Production advances and the theme of the conference. (Table 1).

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

| Speaker                 | Topic addressed   | Institution                      | Country |
|-------------------------|---|----------------------------------|---------|
| <b>Donald Huisinh</b>   | Why do YOU Think YOU Can Change the Future of Society?  | University of Tennessee          | USA     |
| <b>Hans Schnitzer</b>   | Resource efficient and clean urban technologies   | Graz University of Technology    | Austria |
| <b>Jeremy Hall</b>      | Developing and Diffusing New Technologies through Eco-value Propositions                          | Simon Fraser University          | Canada  |
| <b>Steve DeVito</b>     | Defining the Role of Pollutant Release and Transfer Registries (PRTR's) in Global Sustainability" | Environmental Protection Agency  | USA     |
| <b>Sergio Ulgiati</b>   | Growth, De-growth and Circular Economy. A Resource-based Perspective on Sustainability"           | Parthenope University of Naples  | Italy   |
| <b>Marcus da Matta</b>  | Pollutant Release and Transfer Register in Brazil   | Ecoadvisor Associated - Brazil   | Brazil  |
| <b>Massimo Gastaldi</b> | A WTE Strategic Analysis in Italy   | University of L'Aquila           | Italy   |
| <b>Weslyne Ashton</b>   | Cleaner Production in the Americas: Education Challenges and Outlook                              | Illinois Institute of Technology | USA rk  |

### Quality of work

The quality of the work presented resulted in a fifth invitation by the **Journal of Cleaner Production**, for a special issue of the journal containing papers related to the 5th International Workshop: Advances in Cleaner Production. The call for papers may be accessed at the event website: ([www.advancesincleanerproduction.net](http://www.advancesincleanerproduction.net)) and at the website of the Journal of Cleaner Production (<http://www.journals.elsevier.com/journal-of-cleaner-production/call-for-papers/> ).

As a consequence of the invitation of several Editors-in-Chief of scientific journals devoted to issues correlated to the event's theme, participants were also invited to submit full papers to:

- **Journal of Engineering and Technology Management**
- **Journal of Environmental Accounting and Management**
- **International Journal of Management and Network Economics**
- **Environment, Development and Sustainability**

### Workshops

In the Workshops, issues concerning the **Cleaner Production towards a Sustainable Transition** were addressed and debated (Table 2). Two hundred and forty five participants (Figure 3), of the most diverse sectors were invited in the seven workshops to reflect and discuss on the following important issues.

Table 2. Workshops delivered at the conference.

| Workshop  | Presenter       | Number of participants |
|---|-----------------|------------------------|
| <b>W#1</b> How Does the Recent Base of the Pyramid (BoP), Social innovation and Entrepreneurship Discourse Align with, contributes toward and/or conflict with Sustainable Development? | Jeremy Hall     | 28                     |
| <b>W#2</b> Good/Best Practices for Waste Prevention, Reuse, Recycling   | Sergio Ulgiati  | 35                     |
| <b>W#3</b> Can We Achieve Sustainability? How to Build Utopian Ideal  | Asher Kiperstok | 42                     |

|            |  |                                  |    |
|------------|--|----------------------------------|----|
| <b>W#4</b> | How to Measure/Assess Sustainability in the Future Post-Fossil Fuel Society?   | Donald Huisingh                  | 44 |
| <b>W#5</b> | Towards a Sustainable Transition in Cities   | Hans Schnitzer                   | 32 |
| <b>W#6</b> | Advancing the Use of Pollutant Release and Transfer Register (PRTR). Data and Information: What PRTR Data Users Really Want! | Steve DeVito and Marcus da Matta | 37 |
| <b>W#7</b> | Occupational Health and Safety: Towards a Sustainable Production   | Nora Elba Munguia Vega           | 27 |

The expressive number of 245 participants, distributed along the workshops, showed the increase of concern on this type of group activity by the academy community. Figure 3 shows the profile of participants.

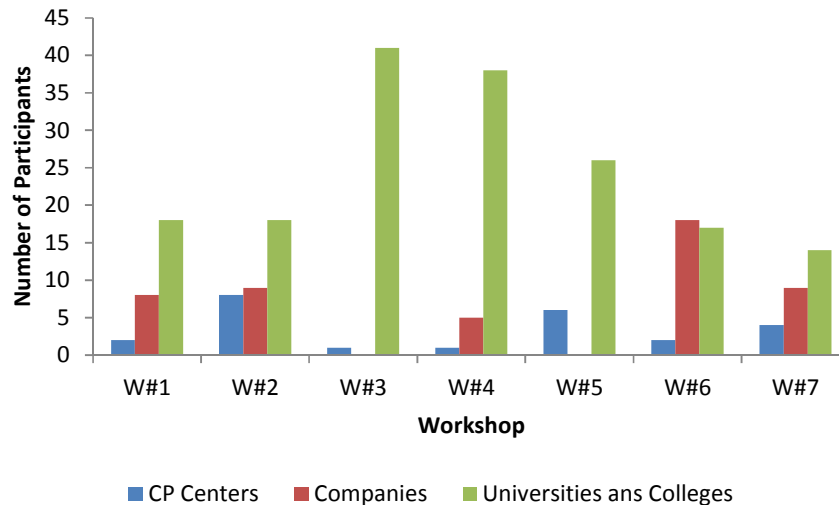


Figure 3. Profile of workshops' participants at the 5th International Workshop: Advances in Cleaner Production.

### Visibility

The visibility of the event and the search for information through the website increased significantly till 2011 and stabilized for the fourth event (Figure 4). The increase of the number of visits to the website can be evidenced by the crescent trend of graphic (Figure 4). The peak that corresponds to 15.188 is related to the **2<sup>nd</sup> Workshop** (May 2009) and the subsequent ones to the Call for Papers for the **2<sup>nd</sup> Special Issue – Journal of Cleaner Production**. The 16.267 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 10.650 is simultaneous to the occurrence of the **4<sup>th</sup> Workshop** (18, 19 and 20 May 2011). The peak 13.761 is related to **5<sup>th</sup> Workshop**. A higher peak is expect regarding the Call for papers of the **5<sup>th</sup> Special Issue** in the upcoming months. The pizza graph represents the returning visitors (in green, 35,2%) and the new visitors (in blue, 64,8%) to the site in 2015.

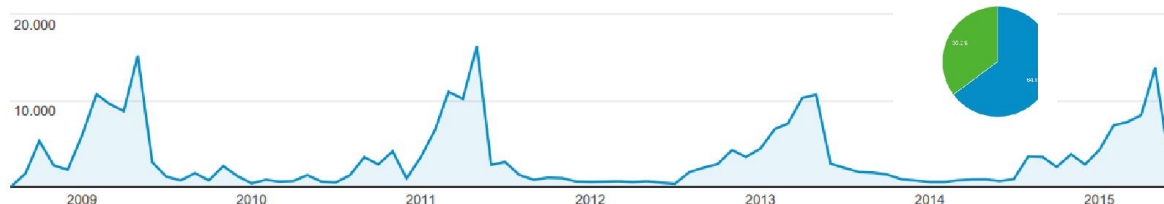


Figure 4. Number of visits to the website [www.advancesincleanerproduction.net](http://www.advancesincleanerproduction.net) from August 2008 to June 2015 (Font: Google Analytics).

***Evaluation of the conference according to the goals***

It is considered that the conference planned and hosted by the Paulista University 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 (125 universities and colleges and the presentation of 176 academic contributions).
- ✓ The presentations of recent achievements made by companies (featuring success experience): twenty five organizational reports were presented in oral form and thirty three companies were actively present at the conference. In this way, this objective was achieved. In this way, the event promoted share of knowledge between academic and corporate experience.
- ✓ The discussion of common problems and routing of solutions was extensively covered by the plenary sessions, oral presentations and, particularly, at the seven workshops.
- ✓ The increase in international relationship through individual and institutional contact was a goal achieved. Participants of 16 countries attended the conference.
- ✓ The deepening of the discussion on the fundamental theme of the event "**Cleaner Production towards a Sustainable Transition**"



**Evaluation of the conference according to audience**

The audience in the oral presentation rooms received a form for conference evaluation (Figure 5).

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5<sup>th</sup>  
INTERNATIONAL WORKSHOP  
ADVANCES IN CLEANER PRODUCTION  
"CLEANER PRODUCTION TOWARDS A SUSTAINABLE TRANSITION"

**FORMULÁRIO DE AVALIAÇÃO DO EVENTO**

Este questionário tem como objetivo a melhoria do evento numa próxima edição.  
Por gentileza, conceda-nos alguns minutos de seu tempo para responder às questões abaixo, manifestando sua opinião sobre o evento.

a) Você avalia que o evento atingiu \_\_\_\_\_ % (de 0 a 100) de seu objetivo.  
b) O evento correspondeu a sua expectativa? (  ) Sim (  ) Não  
c) Você considera importante o apoio de instituições parceiras a este tipo de evento  
d) Qual é a sua avaliação dos assuntos abaixo?

|                       | Ótimo                    | Bom                      | Regular                  | Insuficiente             | Ruim                     |
|-----------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Organização do evento | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Instalações           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Atendimento           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Comente, se desejar:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Figure 5. Evaluation form distributed to participants at the 5th International Workshop: Advances in Cleaner Production.

Accordingly to the evaluation of 72% of the participants, the event's goals were achieved in more than 95%. On the average score, goals reached 92% 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, 89% consider this item as excellent / good. The facilities were considered excellent / good by 100% of respondents and 96% considered the service excellent / good. There were no insufficient or bad assessments.

**Acknowledgments**

The success of the International Workshop would not have been possible without the support of important partners such as FAPESP and CAPES, significantly to the event's achievement.

The Vice Dean of Post Graduate Studies and Research UNIP was responsible for infrastructure support, as well as for providing staff for the Supporting Committee. The Organizing Committee thanks all the institutions involved and, in particular, lecturers and other participants that made the conference possible.