

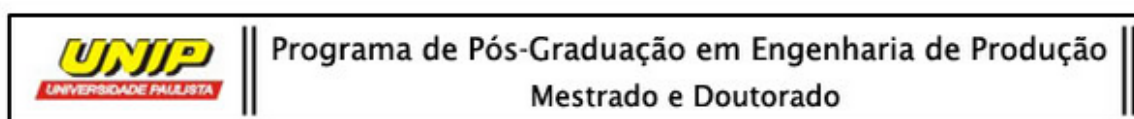


São Paulo - Brazil - May - 22nd to 24th - 2013

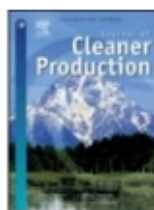
4th INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

“INTEGRATING CLEANER PRODUCTION INTO SUSTAINABILITY STRATEGIES”

organized by



in participation with



Technical Report

Responsible for the information:

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(Conference Chair)

<http://www.advancesincleanerproduction.net>

Abstract

Brazilian and foreign researchers discussed for three days at the University Paulista, Indianópolis Campus) the topic of the 4th International Workshop Advances in Cleaner Production: **Integrating Cleaner Production into Sustainability Strategies**.

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), CETESB (Companhia de Tecnologia de Saneamento Ambiental, Brazil), UNISON (Universidad de Sonora, México), and the Journal of Cleaner Production.

The partnership with the Journal of Cleaner Production, that was started during the 1st Workshop was maintained with the support of the Editor in Chief, Prof. Donald Huisingh, and resulted, as occurred at the other three 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 fourth edition.

The conference received financial support from the funding agencies FAPESP (Fundação do Amparo à Pesquisa do Estado de Sao Paulo) and CAPES (Coordination for the Improvement of Higher Education), which were fundamental to the achievement of the 4th Workshop.

The 4th Workshop also counted with the sponsorship of ABEPRO (Brazilian Association of Production Engineering), UNEP (United Nations Environmental Program), UNIDO (United Nations Industrial Development Organization), Red Latinoamericana de Producción más Limpia, LATEC (Laboratory Technology, Business Management, Jatobás Institute, Intertox, and INTA (Instituto Nacional de Tecnología Agropecuaria)

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, as well as for providing teachers and students of the Bilingual Secretarial and Pedagogy courses who were active members of the Supporting Committee. Also the UNIP Chorus performed a Brazilian repertoire.

The organizing Committee considered that all the pre-established goals proposed to be attained during the 4th Workshop were fully reached:

(1) The academic information exchange goal was fully achieved. It was significant the number of participating academic institutions (91 universities and colleges), that reflected in the 166 academic contributions and conferences 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 (JCP), for a fourth special issue.

(2) Presentations of recent achievements in CP were made by a significant number of companies. Twenty two (22) cases of success were presented in oral form. The conference promoted the transfer between academic knowledge and corporate experience and counted with the participation of 33 companies comprising industrial and services sectors.

(3) The common problems and routing of solutions was extensively and deeply discussed at plenary sessions, oral presentations, and workshops. Nine 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 "If We Have Wrong Measures, We Will Strive for the Wrong Things" was conducted by Dr. Simone Bastianoni from the University of Siena, Italy, and provided a deep discussion on the suitable indicators to measure sustainability. Thirty three (33) participants discussed actively on the search of a proper indicator for sustainability.

The second workshop, Environmental Management Systems, was conducted by Dr. Jeffrey Burke from the National Pollution Prevention Roundtable (USA). The thirty nine (39) participants who attended the workshop discussed the evaluation of alternatives implement EMS within companies.

Dr. Carlos C. Silva from IFSULDEMINAS, Dr. Feni Agostinho from UNIP and Gloria Rótolo, Jorge Frana and Mabel Fior from INTA, Argentina offered the workshop titled "Evaluacion Ambiental de los Agroecosistemas y Estrategias que Contribuyan a su Resiliencia". There, the twenty two (22) participants discussed the necessity of the systemic approach and multicriteria assessment tools in order to evaluate agro-industrial systems in terms of sustainability.

The fourth workshop, conducted by Marcus E. M. da Matta (Intertox Consultoria e Pesquisa), debated how to improve Cleaner Production through Brazilian pollutant release and transfer register. It counted with eighteen (18) participants.

The fifth one, with three hours duration: "Beyond GDP to Happiness, Wellness, Quality of Life, Living Planet and other indices: Guides for establishing Post Fossil Fuel Societies ", was conducted by Dr. Donald Huisingh (University of Tennessee-USA), editor-in-chief of Journal of Cleaner Production. There, ninety four (94) 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 integration of biophysical and economic values was the topic of the sixth workshop, where thirty nine participants (39) conducted Dr. Mark Brown (University of Florida) discussed the importance of resources availability can enhance progress within societies.

At the seventh workshop, Kannan Govindan from the University of South Denmark, discussed Modeling Approaches for Sustainable Management with 17 participants.

Danish researchers conducted the eighth workshop that was entitled: "Eco-Design as a Stepping-Stone towards Sustainable Business Models in the Circular Economy". Dr. Arne Remmen and Dr. Gert Hansen debated with twenty three (23) participants on the organizational models to contribute to sustainable development.

¿Cómo Identificar Oportunidades de Producción más Limpia en las Pequeñas y Medias Empresas? was the title of the workshop conducted by Dr. Andrea Zavala from University of Sonora (Mexico). The twenty six (26) participants worked on real cases of Cleaner Production application.

(4) The increase in **international relationship** through individual and institutional contact was a goal achieved. Participants of 18 countries attended the conference.

(5) The deepening of the discussion on the fundamental theme of the conference: Integrating Cleaner Production into Sustainability Strategies was the concern of the conference. Given these impressive results, the Organizing Committee is honored for having organized the 4th International Workshop on Advances in Cleaner Production.

Presentation

The **4th 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.

- Aalborg University, Denmark
- Agricultural University of Tirana-Albania
- Ambientacy Engineering
- Anna University, India
- APTA, Pólo Regional Leste Paulista, Monte Alegre do Sul
- Associação Brasileira de Engenharia de Produção
- Associação de Engenheiros da CETESB
- Barilla G e R. Fratelli S.p.A., Italy
- BMC Moerdijk, Belgium
- Braskem, SP
- Brazilian Bioethanol Science and Technology Laboratory
- Brazilian Ministry of Planning
- Brazilian Ministry of the Environment
- Brinkvos Water BV, The Netherlands
- Centro de Tecnologia Canavieira S.A., Piracicaba
- Centro Nacional de Pesquisa em Energia e Materiais
- Centro Universitário Católica de Santa Catarina
- Centro Universitário da FEI
- Centro Universitário Univates
- CNH Latin America
- Companhia Ambiental do Estado de São Paulo
- Cranfield University, United Kingdom
- Danish Ministry of Environment
- Delmanto Lawyers
- Embrapa Environment, Jaguariúna
- Escola de Artes e Ciências Humanas, USP
- Escola de Engenharia de São Carlos, USP
- Escola Politécnica, USP
- Escola Superior de Agricultura Luiz de Queiróz
- Estre, São Paulo
- Faculdade de Economia e Administração, USP
- Faculdade de Engenharia de Alimentos, UNICAMP
- Faculdade de Saúde Pública
- Faculdade de Tecnologia de Jahu
- Faculdade de Tecnologia Wilson Roberto Ribeiro de Camargo
- Faculdade Metropolitana de Camaçari
- Faculdade Paulista de Pesquisa e Ensino Superior
- Faculdade Sudoeste Paulista, Avaré,
- Faculty of Business and Economics, University of Winnipeg, Winnipeg, Canada
- Fundação Getúlio Vargas
- Grupo de Gestão Ambiental de Pernambuco
- HortaSri-Italy
- Instituto Nacional de Tecnologia Agropecuária, Argentina
- Institut National Polytechnique de Grenoble, France
- 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 do Rio Grande do Norte
- Instituto Federal de Educação, Ciência e Tecnologia Sul de Minas Gerais
- Instituto Federal Fluminense, Campos dos Goytacazes-RJ
- Instituto Jatobás
- Instituto Potosino de Investigación Científica y Tecnológica-Mexico
- Instituto Superior Tupy, Santa Catarina
- Intertox Consultoria e Pesquisa
- Italian Agency for New Technology,
- Journal of Cleaner Production, USA
- KTH Royal institute of Technology, Sweden
- Laboratório Nacional de Energia e Geologia, Portugal
- Mesa Redonda Paulista de Produção mais Limpia
- National Institute of Technology-India
- National Pollution Prevention Roundtable, USA

- National University of Córdoba- Argentina
- Norwegian University of Science and Technology
- Organização das Nações Unidas
- Petróleo Brasileiro S.A., Rio de Janeiro
- Pinheiro Pedro Lawyers
- Pontifícia Universidade Católica de Goiás
- Prefeitura Municipal de São Paulo
- PROGESA, Tecnologia em Saneamento Básico
- Programa de Pós-Graduação em Energia, USP
- PSA Peugeot Citroën-SP
- Public School-SP
- Roma TreUniversity, Italy
- Serviço Nacional de Aprendizado
- Smart Modular Technologies
- Sociedade de Abastecimento de Água e Saneamento S/A, SANASA, Campinas
- StudioLCE, Italy
- Sustainable Innovations Academy, The Netherlands
- Universidad de Cienfuegos, Cuba
- Universidad de Sonora, Mexico
- Universidade Anhembi Morumbi
- Universidade Camilo Castelo Branco
- 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 Três-os-Montes e Alto Douro
- Universidade do Estado de Santa Catarina
- Universidade do Vale do Rio dos Sinos
- 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
- Universidade Estadual Paulista, Bauru
- Universidade Estadual Paulista, Botucatu
- 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 São Carlos
- Universidade Federal do ABC
- Universidade Federal do Ceara
- 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, Novo Hamburgo
- 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 Leuven, Belgium
- University of Ljubljana, Slovenia
- University of Massachussets Lowell, USA
- University of South Denmark-Denmark
- University of Technology and Life Sciences, Bydgoszcz-Poland
- University of Tennessee – USA
- Vesalius College - Belgium
- Washington State Department of Ecology USA

Participants Profile

The **4th International Workshop: Advances in Cleaner Production** had 547 participants from various sectors committed with the theme: Integrating Cleaner Production into Sustainability Strategies (Figure 1). Comparison with the earlier conferences shows an increase in the total number of participants. Worth of notice are the increase in the participation of universities and colleges and maintenance in the number of undergraduate students, companies and CP Centers. In 2013 the conference counted with 33 private companies represented by 112 participants.

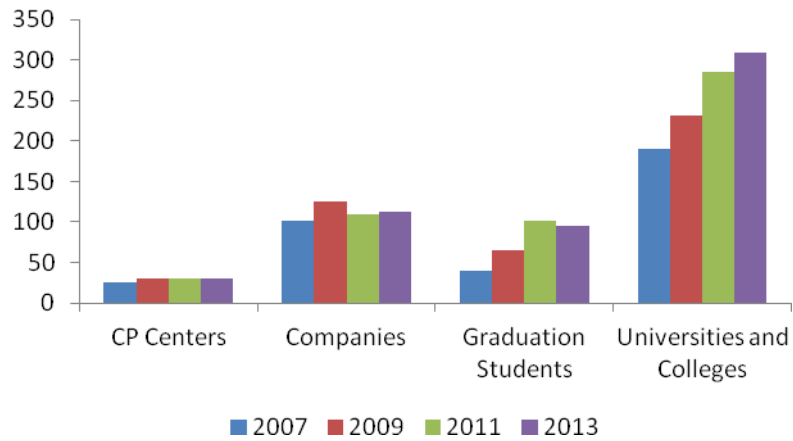


Figure 1. Participants of the 4th International Workshop Profile compared to the profile of the previous conferences.

In addition to the lectures presented by the eight foreign invited speakers, 166 academic works and 22 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 Southern states and the Northeastern states, with participants of Bahia, Paraíba, Piauí, Rio Grande do Norte, Sergipe and Pernambuco. The participation of Central-West Region 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. Participation of foreign universities increased 17 % in oral presentations in relation to the 2011 Workshop, and for the first time, the event counted with presentations from foreign companies.

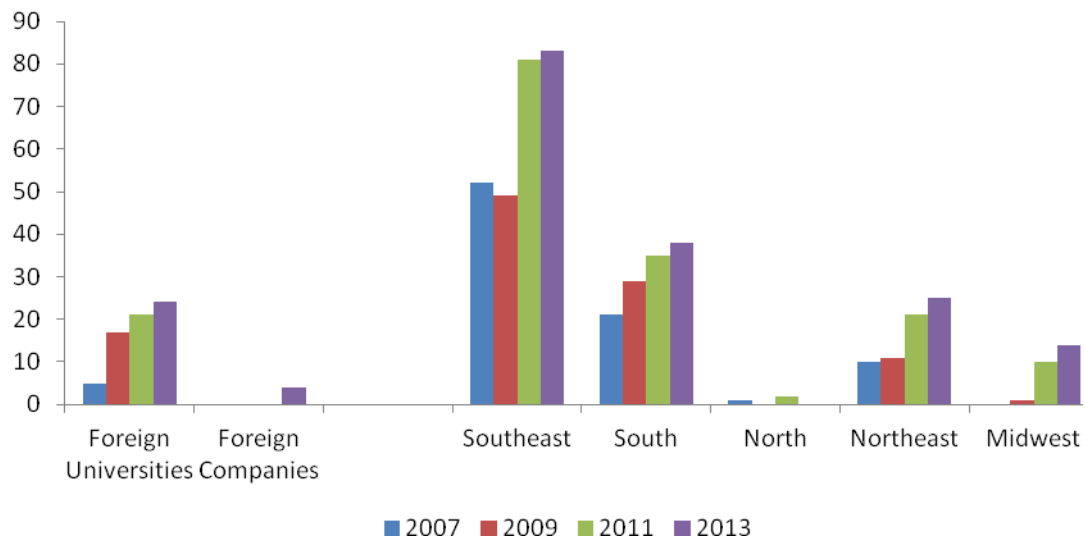


Figure 2. Number of participants who present works at the three conferences, organized according to geographical origin.

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
Donald Huisingh	From 'Dilution is the Solution to Pollution' to 'Regional Sustainable Development' is the Solution for improved Quality of Life for All: A Long and Challenging Journey	University of Tennessee	USA
Arne Remmen	Life Cycle Management – Bringing People, Organizations and Product Chains into the Environmental Field	Aalborg University	Denmark
Mark T. Brown	Energy and the Economy: Reflections on Sustainability	University of Florida	USA
Simone Bastianoni	Unsustainability: A Syndrome of Human Systems	University of Siena	Italy
Jeffrey Burke	Environmental Management Systems: Providing the Best Opportunity to Integrate Cleaner Production into Sustainability Strategies	National Pollution Prevention Roundtable	USA
Javier Esquer Peralta	Promoting Cleaner Production through Higher Education Institutions as a Sustainability Strategy	Universidad de Sonora	Mexico
Carlo Vandecasteele	Cleaner Production in the Sector of Waste Combustion and Sustainability of the Sector: Past and Future	University of Leuven	Belgium
Gert Hansen	Highlights of Danish Priorities and Initiatives in Cleaner Production	Danish Ministry of Environment	Denmark

Quality of work

The quality of the work presented resulted in a fourth invitation by the Journal of Cleaner Production, for a special issue of the journal containing papers related to the 4th International Workshop: Advances in Cleaner Production. The call for papers may be accessed at the event website: (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/integrating-cleaner-production-sustainability-strategies/>).

Workshops

In the Workshops, issues concerning the Integrating Cleaner Production into Sustainability Strategies were addressed and debated (Table 2). Three hundred and eleven participants (Figure 3), of the most diverse sectors were invited in the nine workshops to reflect and discuss on the following important issues.

Table 2. Workshops delivered at the conference.

Workshop	Presenter	Number of participants
1 If We Have Wrong Measures, We Will Strive for the Wrong Things	Simone Bastianoni	33
2 Environmental Management Systems	Jeffrey Burke	39
3 Evaluacion Ambiental de los Agroecosistemas y Estrategias que Contribuyan a su Resiliencia	Gloria Rótolo, Jorge Frana, Mabel Fior, Carlos C. Silva and Feni Agostinho	22
4 Improving Cleaner Production through Brazilian Pollutant Release and Transfer Register	Marcus E. M. da Matta	18
5 Beyond GDP to Happiness, Wellness, Quality of Life, Living Planet and other indices: Guides for	Donald Huisingh	94

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establishing Post Fossil Fuel Societies			
6	Emergy: Integrating Biophysical and Economic Values	Mark Brown	39
7	Modeling Approach for Sustainable Management	Kannan Govindan	17
8	Eco-Design as a Stepping-Stone towards Sustainable Business Models in the Circular Economy	Arne Remmen, Gert Hansen	23
9	¿Cómo Identificar Oportunidades de Producción más Limpia en las Pequeñas y Medias Empresas?	Andrea Zavala	26

The expressive number of 311 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.

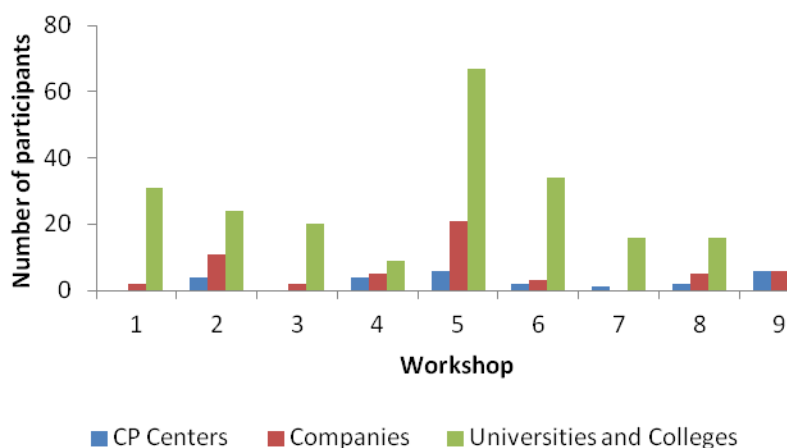


Figure 3. Profile of workshops' participants at the 4th International Workshop: Advances in Cleaner Production.

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 first peak with 10.732 visits is simultaneous to the **1st Workshop**, 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 Workshop** (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 Workshop** (18, 19 and 20 May 2011), and a higher peak is expect regarding the Call for papers of the **4th Special Issue** in the next months. The pizza graph represents the returning visitors (in blue, 65,9%) and the new visitors (in green, 34,1) to the site in 2013.



Figure 4. Number of visits to the website www.advancesincleanerproduction.net from January 2007 to June 2013.

Since its creation the website more than one million visits (Table 3), and last year accesses surpassed the number of de 200.000.

Table 3. Report of the number of visits to www.advancesincleanerproduction.net, since the website creation (April 2007).

Total Visits	1.075.042	Average visits per day	497,94
Total printed pages	2.184.151	Average printed page per day	1.011,65
Total de Hits	6.274.080	Average hits per day	2.906,01
Total Bytes Transferred	437,09 GB	Average bytes transferred per day	207,31 MB


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 (91 universities and colleges and the presentation of 166 academic contributions).
- ✓ The presentations of recent achievements made by companies (featuring success experience): twenty two 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 nine workshops.
- ✓ The increase in international relationship through individual and institutional contact was a goal achieved. Participants of 18 countries attended the conference.
- ✓ The deepening of the discussion on the fundamental theme of the event " Integrating Cleaner Production into Sustainability Strategies"

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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4th
 INTERNATIONAL WORKSHOP
 ADVANCES IN CLEANER PRODUCTION
 "INTEGRATING CLEANER PRODUCTION INTO SUSTAINABILITY STRATEGIES"

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 4th International Workshop: Advances in Cleaner Production.

Accordingly to the evaluation of 72% of the participants, the event's goals were achieved in more than 90%. On the average score, goals reached 89% 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, 85% consider this item as excellent / good. The facilities were considered excellent / good by 96% of respondents and 98% 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 teachers and students of the Bilingual Secretarial and Pedagogy courses who were active members of the Supporting Committee. The Organizing Committee thanks all the institutions involved and, in particular, lecturers and other participants that made the conference possible