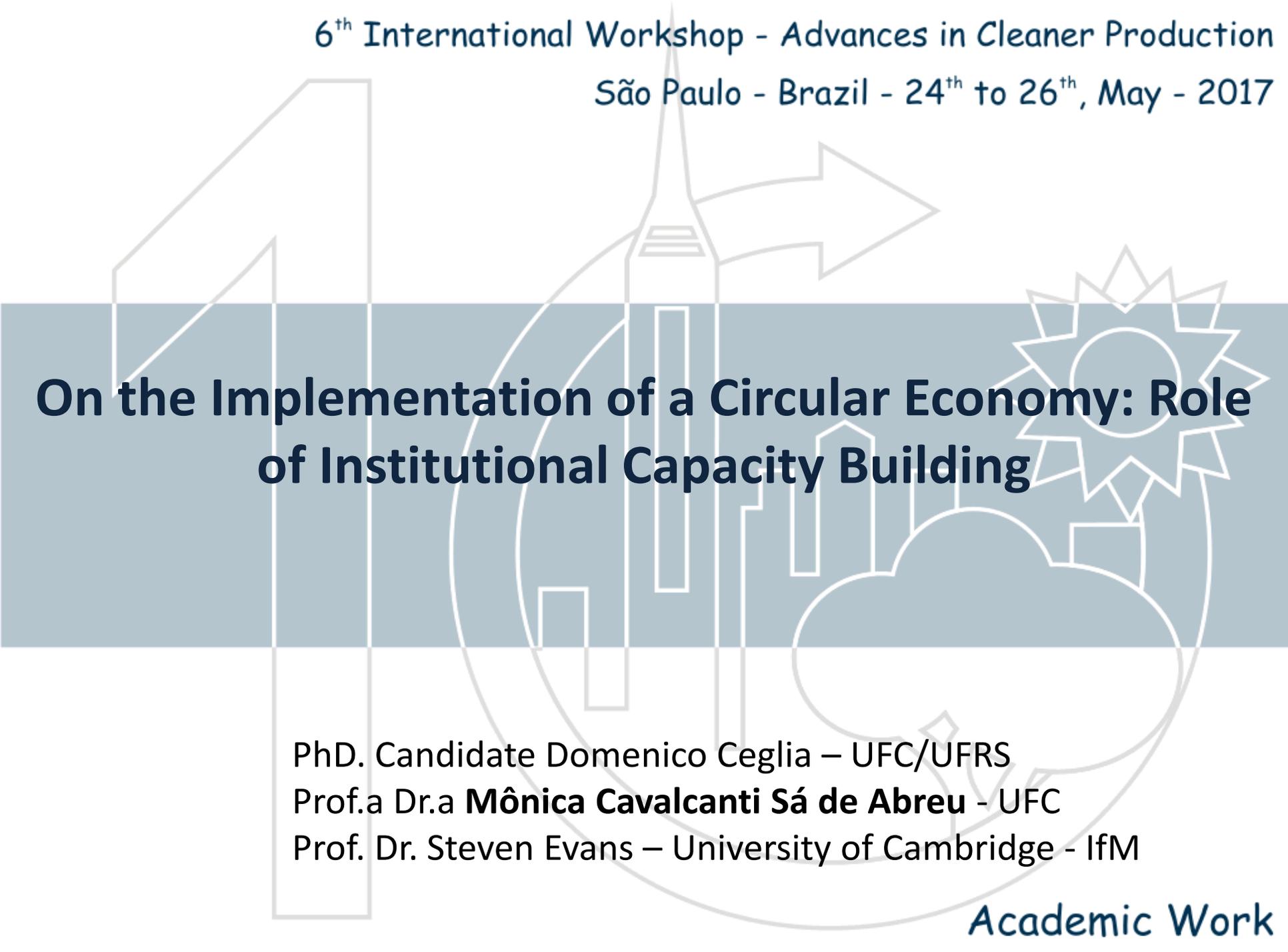


6th International Workshop - Advances in Cleaner Production

São Paulo - Brazil - 24th to 26th, May - 2017



On the Implementation of a Circular Economy: Role of Institutional Capacity Building

PhD. Candidate Domenico Ceglia – UFC/UFRS

Prof.a Dr.a **Mônica Cavalcanti Sá de Abreu** - UFC

Prof. Dr. Steven Evans – University of Cambridge - IfM

Academic Work

Objective

To highlight how institutional capacity created for Industrial Symbiose could promote Circular Economy practices in the UK.

Literature Review

- Circular Economy (CE) represents an overarching umbrella whereas planning, production and reprocessing are designed and managed, as both process and output, to maximize ecosystem functioning and human well-being (Murray, Skene, & Haynes, 2015).
- In the UK, the national waste strategy developed under the Environment act in the 1990's required companies to take responsibility for reuse, recovery and recycling waste (Costa et al., 2010).
- Industrial symbiosis (IS) means flows and the cycling of materials, nutrients, and energy as a potential model for relationships between facilities and firms (Ayres & Ayres, 2002).

- In 1996, the UK government established a landfill tax which progressively increased over a period of several years to discourage the discharge of waste.
- The landfill tax imposing was an incentive to reduce waste disposal and to support projects towards industrial symbiosis (IS) (Lombardi & Laybourn, 2012).
- The firms engage among them for an economic reason to reduce the cost of disposal, therefore they try to find a cheaply viable solution. This engagement is loaded of capacity learned across the processes of exchange over time.
- These IS processes create institutional capacity understandable as knowledge, relationship, and mobilization (F. Boons, Spekkink, & Mouzakitidis, 2011).

- The knowledge capacity should design new products/production systems to reduce the energy wasteful from the extraction of raw materials to sell products or services.
- The relational capacity in the CE paradigm should be understood as an articulation between actors along the value chain to find a new solution for resource efficiency. Moreover, the actors involved should foment trust to make viable long-term partnerships (Lozano & Witjes, 2016).
- The mobilization capacity should incentive the actors in the CE to engage in new practices through the relational and knowledge one.

- Throughout the production and consumption phase, these capacities should be developed to:
 - share information about the commons and use-patterns;
 - create a space for communication among companies along the value chain;
 - accept the cost-sharing formulae;
 - enforceable contracts and to effect monitoring of use-patterns (Blomquist & Ostrom, 1985)

Methodology

- 5 companies and 9 organizations engaged to develop IS for CE in the UK.
- Semi-structured interview guide developed for each firm and actor to understand the institutional capacity building towards CE
- Face-to-face detailed in-depth interviews were conducted during 2014 in the UK
- The NVivo® 10 software package was used for a systematic analysis of the interviews and secondary data collected.

6th International Workshop - Advances in Cleaner Production

Academic Work

Characteristic	Actor	Interviewee position	Organizational area
Company	Lower Reule Bioenergy	Managing Director	Senior Executive Management
	Ab Connect	Co-Products Technical Development Manager	Production Engineering
	GNK Aerospace	Sustainability Manager	Sustainability Department
	Veolia UK	CEO	Executive committee
	Arla foods	Sustainability manager	Sustainability Department
IS Promoter	International Synergies Ltd (ISL)	Operations Manager	International Project Development
Government	Birmingham City Council	Sustainability and Science City Manager	Climate Change and Environmental Team
	Waste and Resources Action Programme (WRAP)	Head of Collaborative Programmes	Innovation Department
	Innovative UK	Knowledge Transfer Manager- Materials Security and the Circular Economy	Sustainability Innovation
Academia	Linköping University (LU)	Professor	Institute for Industrial Productivity
	University College London (UCL)	Researcher	Industrial Ecology
Media	Financial Times	Financial Time and Economist Group contributor	Environmental Department
NGO	Green Alliance	Associate	Sustainability Department
	Forum for the Future	Senior Sustainability Advisor	Innovation

Results

- All interviewees pointed out the importance of the UK Government role in imposing and periodically escalating landfill tax and waste recycling targets. These pushed firms to find alternatives.
- According to International Synergies Ltd (ISL) and WRAP interviewees, the UK government targeted diverse sectors and encourage them to take ownership and find its own solutions.
- All companies interviewed agreed that the UK Government should apply the landfill tax escalator but they also indicated the need for financial and technical support.

Results

- All interviews indicate that waste disposal was clear issue to be solved but sharing solution and resource is hardly mentioned.
- The interviewees indicated four reasons why their companies participate in NISP:
 1. Workshops were cost free.
 2. They were sold as business opportunities to save money using waste.
 3. They were seen as providing network building opportunities to reduce the cost of waste disposal.
 4. Government money was available for technical assistant and equipment acquisition.

Building Knowledge Resource

- ISL build trust through NISP as a program that can provide new solutions for waste problems.
- ISL interviewee reinforced that brought people to get this talking about a particular program that we're involved in is a hard task.
- Companies interviewees reinforced that they get a benefit and figure out that help them get more benefit if they share that information within their supply chain.

Building Relational Capacity

- Company responses showed that the “relational capacity” is a starting point for interactions with other companies about industrial symbiosis development.
- According to ISL interviewee, NISP had developed a culture of sharing, of trust and of development, and a mutual confidence.
- Companies when come together they sign a NDA, non-disclosure agreement. So, if they are talking about something between and there’s a certain element of intellectual propriety then by signing this declaration between two companies, it promises to not talk about the secret thing they’ve got.

Building Mobilization Capacity

- According to ISL interviewee, they have a large solid waste database.
- The ISL encouraged people, and research people to companies interested in waste exchange.
- The “mobilization capacity” is weak because once companies got Government funding for waste management through WRAP, such as to install a bio-digester or set up contracts with suppliers, they discontinued involvement in NISP

Discussion

- CE requires a formal agreement among actors, sharing of information gained from research and material use, co-branding strategies (Braungart, McDonough, & Bollinger, 2007)
- As IS developed a integration of actors around trust building, in the CE, however, they should be in circular value chains through business model innovations that reinforce the transition towards a circular economy and better positions supply chain operations (Batista, Bourlakis, & Maull, 2016).

Discussion

- The workshops promoted new skills and acquires new knowledge sharing information with others (Boons et al., 2011).
- The CE requires a combination of advanced technology, skills, management, finances, policy and governance develop strategy and to update production facilities and equipment (Heshmati, 2015),

Conclusion

- A new approach needs to take towards this alternative economy. Industrial Symbiosis should be considered as one of the brunch of Circular Economy because it works with resource efficiency through waste management in input and output.
- NISP was set up to reduce waste production at firm level through a coordinating firm UK based to build institutional capacity for Industrial Symbiosis to work on.
- However, Institutional Capacity building for Industrial symbiosis was not intended for CE, thus the companies need to develop new strategies to adapt these capacities.

Thanks!!!

Prof.a Mônica Abreu
mabreu@ufc.br