THE INSTITUTIONAL ENTREPRENEURSHIP AND INSTITUTIONAL WORK IN THE CREATION OF THE NEW FIELD OF GREEN CHEMISTRY IN BRAZIL: HOW MICRO AND MACRO WORLDS INFLUENCED THIS PROCESS

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Abstract: Sustainability is a recurring theme in the business. In its beginning the theme was incorporated by companies by doing isolated social projects; nowadays, sustainability has become part of business strategy, particularly with the creation of sustainable products. This change occurred primarily because of sustainability's institutionalization in the market as well as by individual or organizational agency. One of the industries that have major challenges in this picture is the petrochemical sector because its main raw material is oil, a non-renewable source, which in the long run is economically unfeasible. Moreover, its operation can cause several negative environmental impacts such as oil spills in the seas, damaging the marine ecosystem, episode that happened with BP petroleum in the Gulf of Mexico in 2010. In the search for a new paradigm in this industry, companies are researching renewable raw materials for products that are currently derived from petroleum. Brazil is known for replacing fossil fuels such as gasoline and diesel, for renewable energy (ethanol).
In this context, two fields come together, petrochemical and sugar cane, seeking to develop a plastic from sugar cane (Silva, Lacerda and Junior Jones, 2005). The surveys to launch this product have occurred since the 70s, but it wasn't economically viable. In 2009, Braskem, a Brazilian petrochemical company, produced the first economically viable polyethylene in the world made with 100% renewable material. With the introduction of this product, it marked the

creation of the field of green chemistry in Brazil and also extends the possibility of creating a market/field for plastics made from 100% renewable material in the world.
This case is interesting for institutional theory because the transformation/creation of this polyethylene occurred with the coalition/union of two fields in which strategic sustainability was not institutionalized: petrochemical and sugar cane. However, these two fields participate in a macro, societal field, in which strategic sustainability is normalized. This address the argument of Kaghan and Lounsbury (2011) that institutional researches about institutional work - the intentional action of individuals and organizations to create, maintain and disrupt institutions (Lawrence and Suddaby, 2006) - need to understand all the "social worlds", micro and macroworlds, in which actors participate and the frameworks related to those worlds, because they shape how actors act and interact with each other, consequently, they shape institutional work.
With that in mind, we aim to understand the institutional work made by institutional entrepreneur (Braskem) in the process of launching and marketing the green polyethylene, which lead to the introduction of a new product use and that might lead to a Brazilian green chemistry field creation. More specifically, our goal is to address the suggestion of Tracey, Phillips and Jarvis (2011) to analyze if the types institutional work identified in their research also occurs when, instead of the creation of a new organization, two institutional logics bridges to create a new practice (the use of bioplastic).
Some of our findings suggested that the institutional work described by Tracey, Phillips and Jarvis (2011) occurred in the launch of green polyethylene, except for building the product, instead, mimicry was done and what we called analyzing frames.

Keywords: institutional entrepreneurship, institutional work, green chemistry, sustainability

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Sustainability is a recurring theme in business. In its beginning the theme was incorporated by companies creating social projects; nowadays, sustainability has become part of business strategy, particularly with the creation of sustainable products. This change occurred primarily because of sustainability's institutionalization in the market as well as by individual or organizational agency.

In Europe and North America green consumers are more active. In Brazil it is possible to note the beginning of this movement. According to the report from the Institute for Conscious Consumption Akatu, 12% consumers prefer socially responsible companies and 14% punished organizations attitudes incompatible with social responsibility (Waddock, 2008; Akatu, 2007). Many companies request sustainable practice form its suppliers, international agencies have incentive sustainability like Global Compact. Thus, sustainability is a theme that concerns many sectors.

One of the industries that have major challenges in this picture is the petrochemical sector because its main raw material is oil, a non-renewable source, which in the long run is economically unfeasible. Moreover, its operation can cause several negative environmental impacts such as oil spills in the seas, damaging the marine ecosystem, episode that happened with BP petroleum in the Gulf of Mexico in 2010. In the search for a new paradigm in this industry, companies are researching renewable raw materials for products that are currently derived from petroleum. Brazil is known for replacing fossil fuels such as gasoline and diesel, for renewable energy (ethanol).

In this context, two fields come together, petrochemical and sugar cane, seeking to develop a plastic from sugar cane (Silva, Lacerda and Junior Jones, 2005). The surveys to launch this type of products have occurred since the 70s, but it wasn't economically viable. In 2009, Braskem, a

Brazilian petrochemical company, produced the first economically viable polyethylene in the world made with 100% renewable material. With the introduction of this product, it marked the beginning of green chemistry field creation in Brazil and also extends the possibility of creating a market/field for plastics made from 100% renewable material in the world. Since them, Rhodia developed Augeo, Dow is in a joint venture with Mitsui to produce bioplastic, sugarcane companies research for new uses to sugarcane. Also, the bioplastic market is growing, according to BBC Research (BBC research, 2012) it is expected a growth at a 41.4% compound annual rate from 2010 through 2015. According to UNICA (2012), the Brazilian sugarcane association, it is expected a demand of 1.5 billion liters of ethanol to produce bioplastic.

This case is interesting for institutional theory because the transformation/creation of this polyethylene occurred with the union of two different fields (and thus, two diverse institutional logics) in which sustainability was not institutionalized as it was in society: petrochemical and sugar cane. However, these two fields participate in a macro, societal level, in which sustainability is normalized. This address the argument of Kaghan and Lounsbury (2011) that institutional researches about institutional work - the intentional action of individuals and organizations to create, maintain and disrupt institutions (Lawrence and Suddaby, 2006) - need to understand all the "social worlds", micro and macroworlds, in which actors participate and the frameworks related to those worlds, because they shape how actors act and interact with each other, consequently, they shape institutional work.

In this call, Tracey, Phillips and Jarvis (2011) demonstrated the institutional work in different levels to the creation of a different organizational form where two institutional logics were bridge: non profit homeless discussion and for-profit logics.

With that in mind, we aim to understand the institutional work made by institutional entrepreneur (Braskem) in the process of launching and marketing the green polyethylene, which lead to the introduction of a new product use and that might lead to a Brazilian green chemistry field creation. More specifically, our goal is to address the suggestion of Tracey, Phillips and Jarvis (2011) to analyze if the types institutional work identified in their research also occurs when, instead of the creation of a new organization, two institutional logics bridges to create a new practice (the use of bioplastic).

The rest of this article proceeds as follows. We briefly discuss three subjects: sustainability and sustainable chemistry, institutional entrepreneurship and institutional work. Then, we explain the methodology used in the research. Data analysis is the fourth section of this article, in which we narrates the green polyethylene launch and the institutional work related to it. Finally, the conclusions are discussed.

SUSTAINABILITY AND SUSTAINABLE CHEMISTRY

The concept of sustainable development refers to Brutland Report, document discussions on the environment of the World Commission on Environment and Development UN, and refers to the ability to meet the needs of the present without compromising the ability of future generations in meeting needs (World Comission on Environment and Development, 1987). From this framework, different concepts of the term social responsibility were created (Whetten et al, 2002, Carroll, 1999). Currently, the concept of social responsibility is associated with sustainable development, environmental responsibility, sustainability, among others. Montiel (2008) explains how the concepts converge and argues for their interchangeability, as in business practice that is occurring. This article agrees with the approach of Montiel (2008) and now use an expression now another, referring to the same construct that will be the one defined by Bansal (apud Montiel, 2008), where sustainability is defined as the economic integrity, social equity and integrity environment.

In this sense, a sustainable business is one that contributes to sustainable development by generating both economic, social and environmental - known as the three pillars of sustainable development (Elkington, 1994). In the advent of social responsibility movement, the concept was not directly related to the company's strategy, often seen as philanthropy or social projects. Currently the concept came to be included in the strategic benchmark, therefore the definition of new products and markets.

The notion of sustainability has spread to many areas of knowledge and activities. Within the chemical area, the quest for sustainable development,

> requires a new approach to the improvement of chemical processes, with the fundamental goal of the dwindling generation of waste and toxic effluents, as well as the lower production of undesirable gases to the environment. This new path to be outlined by the chemical is known as sustainable chemistry or green chemistry (Prado, 2003, p. 2)

Thus, green chemistry is defined as "the design, development and implementation of chemical products and processes to reduce or eliminate the use or generation of substances harmful to human health and the environment" (Lenardão, Freitag, Dabdoub, Batista, 2003, p .124).

In this context, the scientific institutions, governments and industries emerge with the twelve principles of sustainability practice chemistry. In this research, one of those principles is essential, that the raw material should be derived from inexhaustible sources, or renewable, whenever technically and economically feasible (Prado, 2003; Lenardão, Freitag, Dabdoub, Batista, 2003; Silva, Lacerda, Junior Jones, 2005).

The best known example is nationally important and the use of sugar cane as fuel to replace fossil fuels that after the decline of its use at the beginning of the century, grew after developing engine flex-fuel (alcohol / petrol) (Silva, Lacerda, Junior Jones, 2005).

In 2000, a biodegradable plastic made from sugar-cane was produced in large scale in Brasil (Unica, 2012), however with different properties or its usage in industry as well as problems regarding the necessity of specific ways to be biodegradable. Since then, many researches have been made to develop different types of plastics from sugarcane. In 2010, Braskem is the first petrochemical industry to launches polyethylene from sugarcane and became an institutional entrepreneur in the petrochemical field in Brasil.

INSTITUTIONAL ENTREPRENEURSHIP AND INSTITUTIONAL WORK

In neoinstitutionalism perspective, theorists focused how schemas, rules, norms and routines become legitimate guidelines for organizational action (Meyer, Rowan, 1977; Zucker, 1977; DiMaggio, Powell, 1983). According to Scott (2001), these works were important to the influence of institutional environments on organizations. However, they paid little attention to the ambiguity and conflict inherent in social processes. In this sense, institutions are seen to be variable independent, following a top-down approach to institutional analysis in organizational studies, which brought strong tendency to focus on the problem of order, stability and maintenance (Bowring, 2000; Scott, 2005), in an often deterministic view (Hirsch, Lounsbury, 1997).
However, while institutions are taken as the "most enduring aspects of social life "(Giddens, 2003, p.28) they go through transformation. Seeing the lack of studies regarding transformation in neoinstitutional theory, two concepts were brought to attention: institutional entrepreneurship and institutional work.

INSTITUTIONAL ENTREPRENEURSHIP

DiMaggio introduced the concept of institutional entrepreneur in his essay “Interest and Agency in Institutional Theory” (1988) where he concludes that "new institutions arise when organized actors with sufficient resources (institutional entrepreneurs) see the opportunity to realize interests that they value highly" (p. 14, italics in original). However, it was after 1999 that studies in the subject grew substantially (with 5 articles in that year opposed to 2 articles per year in the previous years) reaching 16 articles in 2006 (Battilana, Leca and Roxenbaum; 2009).
The institutional entrepreneur pursue their interests, and does it consciously (Koene, 2006; Greenwood, Suddaby, 2006). Finally, the activities in which institutional entrepreneurs engage are innovative, such as: creation or transformation of existing institutions. The institutional entrepreneur can be characterized as the agent or group of agents, which seeks to create a new institution, or modify an institution, persuing her/his or the collective interest, through the use of resources, intentionally and knowingly.

The process of entrepreneurship encompasses, usually, some elements such as: high degree of projective agency, reflexivity autonomous, analytical skills, social, political and cultural activity. Also, the process is influenced by the availability and access to resources, divided in discursive, material-technical and structural (Battilana, Leca and Roxenbaum; 2009).

INSTITUTIONAL WORK

Institutional work was introduced by Lawrence and Suddaby in 2006 in a book chapter of Handbook of Organization Studies. The authors drawn from practice theory, primarily Bourdieu, to conceptualize institutional work as "purposive action of individuals and organizations aimed at creating, maintaining and disrupting institutions" (2006, p. 215). In a later article (2011), written with Bernard Leca, the authors discussed how institutional work involves effort, being it physical or mental and is related to intentionality.
Lawrence and Suddaby (2006) create an institutional work's taxonomy mapped in three categories: creating, maintaining or disrupting an institution, as shown in table 1.

Table 1: Types of institutional work

Creating institutions	**Maintaining institutions**	**Disrupting institutions**
Advocacy; Defining; Vesting; Constructing identities; Changing normative associations; Constructing normative networks; Mimicry; Theorizing; Educating.	Enabling institutions; Policing; Deterring; Valourizing and demonizing; Mythologizing; Embedding and routinzing.	Disconnecting sanctions; Disassociating moral foundations; Undermining assumptions and beliefs.

(Lawrence and Suddaby, 2006).

For this article, we mainly examine the institutional work needed to create the green polyethylene and the beginning of Brazilian green chemistry's field, thus, we describe in more details this type of institutional work. Advocacy is the work to get political and regulatory support. Defining is the construction of rules that defines boundaries of membership or that creates hierarchy within a field. Vesting is the work to construct rules that confer property rights. Constructing identities "describe the relationship between an actor and the field in which that actor operates" (Lawrence and Suddaby, 2006, p. 223). Changing normative associations is the re-making of the relations between practices and the moral and cultural settings. Constructing

normative networks is the network creation that makes possible to practices be normatively sanctioned. Mimicry is the work in which the new is made similar to the old, so there is not many changes to its adoption. Theorizing is the elaboration of abstract categories, such as naming concepts and practices so "they become a part of the cognitive map of the field" (Lawrence and Suddaby, 2006, p.226). Educating is the transmitting knowledge and skills that are necessary to support the new institution.

Many authors (Lawrence and Suddaby, 2006; Kaghan and Lounsbury, 2011) have shed light on the need to understand the relation between different field levels. Kaghan and Lounsbury (2011) pointed out the urge to understand "micro-worlds" and "macroworlds" that actors participate in and the institutional frameworks associated with those worlds, which profoundly shape the individual behavior and collective interaction of actors" (p. 75).

Lawrence and Suddaby (2006) explained that institutionalization occurs in a microcosm surrounded by other social fields as well as inside a broader societal field. So, the author identified the institutional work – translation, interpretation, modification, accommodation - involved in institutions that exists in different fields and levels "that connects institutions across levels, potentially drawing one level to create new institutions at another level." Also, they reflected how actors

> occupy simultaneous (and Bourdieu would add, homologous) positions in multiple fields and it is really the intersection and contestation of multiple logics within nested fields that provide actors the resources to engage in activities of contestation and reconceptualization that we refer to here as 'institutional work' (Lawrence and Suddaby, 2006, p. 248)

Tracey, Phillips and Jarvis (2011), based in the discussion above, studied how two institutional entrepreneurs "draw on elements of multiple existing logics to build a new organizational form with its own distinct logic, a process we term bridging institutional entrepreneurship" (p. 75). Institutional logics are practices and symbolic constructions that composes society's organizing premises. Individuals and organizations guide their behavior in a field with institutional logics, so their actions are predicable and comprehensible.

In the research, they found six types of institutional work that occurred in three different levels - individual, organizational and societal- explained below.

Table 2: Institutional work in bridging institutional entrepreneurship

Institutional work	Concept	Level of analysis
Framing the problem	To identify and express an original understanding of a certain problem.	Individual
Counterfactual thinking	Thinking differently about a problem and imagining	Individual

	alternatives for the future.	
Building the organizational template	To create an organization's rules and practices.	Organizational
Theorizing the organizational template	To legitimize the new institution (organizational template) for people that will use it, or "distilling the essence of the organizational form to help actors used to operating according to different logics understand the new logic" (p. 73).	Organizational
Connecting with a macrolevel discourse	To have the "power to voice" and make communications related to a macrolevel discourse ("the broad discourses and associated sets of institutions that extend beyond the boundaries of any institutional field and are widely understood and broadly accepted in society" (Lawrence, Phillips, 2004, p. 691, apud Tracey et al, 2011, p. 73).	Societal
Aligning with highly legitimate actors	To build "relationships with highly legitimate actors" (p. 74).	Societal

(Font: Tracey et al, 2011)

METHOD

In this research, we conducted a case study on the company Braskem SA, a Brazilian petrochemical company. A case study is interesting because it allows deep understandings of a phenomenon and provides details (Yin, 2001), which are essential to address institutional work.
The choice is due to the fact that it has been a pioneer in the worldwide launch of polyethylene (a type of plastic) from renewable raw materials, thus the company can be configured as institutional entrepreneur that institutionalized the use of bioplastic in the market.
Braskem SA was established in 2002 with the integration of petrochemical group Odebrecht and Mariani to Copene (Central Camaçari Petrochemical). In his letter of launching guided the principles that would govern its operations. Among them stands out: "To contribute to the competitiveness of the productive chain of petrochemical and plastic and expand their market opportunities; Acting in accordance with the principles of sustainable development" (Braskem, 2002).
The company currently produces over 15 million tons / year of thermoplastic resins and other petrochemical products. It has 28 industrial plants in Brazil and three in the United States, 23 laboratories and eight pilot plants, 190 qualified researchers, and its revenue in 2009 was U.S. $ 19.5 billion.
Among the activities are socially and environmentally responsible Braskem relevant facts to demonstrate its performance as its principles: participation in Responsible Care Program

(Responsible Care), a voluntary initiative that seeks to improve the environmental management of chemical companies and their supply chains; inclusion in the Index Corporate Sustainability Index (ISE) of BM & FBOVESPA since 2005, joining the International Declaration on Cleaner Production, which is part of the United Nations Program for the Environment, the first Brazilian company to sign in 2004.

Braskem can be said to be part of petrochemical field and is inside a broader field of business. In the last one, sustainability has been institutionalized. But, for the creation of biopolyethylene, Braskem was involved with the sugarcane field as well. In this researched we aimed to understand the different fields affect this innovation.

We operationalized the research in four stages. First we constructed a narrative of Braskem's project to product and launch the green polyethylene using the semi-structure interviews with Braskem's sustainability directors and the biopolyethylene project manager, Braskem internal documents and secondary data from articles in the trade associations of sugarcane sector (UNICA – União da Indústria da Cana-de-açúcar) and chemical sector (ABIQUIM- Associação Brasileira da Indústria Química) websites.

Then, we constructed a chronological list of important events and activities about Braskem's launching, sustainability, sugarcane and petrochemical fields. In this phase we used the data already mentioned before as well as: an interview with a manager of São Martinho, a sugarcane company that has a joint venture to develop new products from sugarcane that now is produced with petroleum; an interview with solvents director of Rhodia, which launched a new product made from biodiesel; Dow Chemical's internal documents about the joint venture with Mitsu to product green polyethylene.

In the third phase we reexamined the narrative and other data to identify the six types of institutional work described by Tracey, Phillips, Jarvis (2011) as well as the others forms identified by Lawrence and Suddaby (2006). We also looked for other institutional work that was not in the literature.

The reason to use trade association news to access the fields institutional logics is draw from Hoffman (1999, p.356) analysis of how environmental issues changed the petrochemical field in US from 1960 to 1993 that utilized trade journals, claiming that

> such a publication offers specialized coverage for specific audiences, providing information through the frames of reference of the focal industry's readership. Trade journals' role in the institutionalization process is twofold. First, they act as a historical record of key issues and events as perceived from within an industry as well as of the motivating factors behind industry actions. Second, they are themselves organizational players whose output influences issue interpretation and is subject to the political pressures exerted by powerful figures within industries

The semi-structured interviews were held for accessing the types of institutional work as well as the fields' beliefs and values to corroborate what was found in internal documents and the trade associations websites articles. The interviews happened between October 2010 and September 2012.
This study mainly methodological limitation is the few interviews that we were able to conduct. However, we interviewed the two principal actors in the green polyethylene creation, production and launch; and we much information was founded in the trade associations' website, predominantly concerning to the macrolevel institutional work.

THE INSTITUTIONALIZATION OF GREEN POLYEHTYLENE USE

The use of ethanol in the chemical industry in Brazil goes back to 1944 when Rhodia used ethanol as a raw material. Until the launch of petrochemical centrals in the 70s many companies used ethanol to produce ethane, component to produce polyethylene and PVC. However this production stopped once petrochemicals were in the country and the price of petroleum derivatives was more attractive than ethanol (Szwarc, 2011).
However, in 1973, with the first petroleum crisis, Brazilian government created ProAlcool that aimed to incentive the substitution from gasoline to ethanol. In late 90s, with petroleum' low price, ProAlcool is not active and sugarcane market drops.
More recently, with the petroleum prices increase since 2004, the idea to produce again plastics from ethanol reappeared. However, by this time, two other reasons motivate it: depletion of known oil reserves and high costs involving in other reserves and the increasing attention by business to sustainability.
According to UNICA (2012), although in Rio Summit of 1992 a research showed that ethanol CO2 emissions represented 18% of fossil fuels emission, sustainability was not yet market appealing.
It was only in 2007, with the Ethanol Summit, that the sugarcane field discussed deeply about how the sector contributed to a more sustainable world and the identification of the sector started to be aligned with sustainability discourse (and practice). In the same year three important projects were announced by chemical companies. Braskem developed a project to produce and commercialize 200 thousand tons of polyethylene (the most used plastic in the world) from ethanol. Dow Chemical announced an industrial complex capable of producing 350 thousand tons of polyethylene. Solvay, a Belgium chemical enterprise, announced the intention to build a plant to produce ethane for PVC's production. Braskem was the only company that took the project ahead. The other two companies stopped the projects in 2008 due to economic recession and difficulties to consolidate partnerships.
The story of the introduction of green polyethylene in the market by Braskem dates back to 2003 when the idea within the innovation department proposed to manufacture polyethylene from ethylene, a component derived from ethanol. Before Braskem's project, the product was seen

only as an alternative of production. Until Braskem's launch, polyethylene derived from ethanol was not well known and widely used by the market.

Braskem's interest in the product draws on the company's interest to differentiate from the market. After a chemical sector important security and environmental accident in 1984, the industry sought to reduce risk, creating in the late 1980s the Responsible Care program, aiming to make the industry safer. This program arrived in Brazil in 1992. So, in the question of health, safety and environment, all chemical companies have acted responsibly, it was necessary to go beyond this work to stay ahead of the competition and act in accordance with the principles of Braskem's creation, sustainable development. Thus, due to a desire to be an organization that is always aligned to sustainability, the development of green polyethylene was configured as a business opportunity, a way to integrate sustainability into business strategy and thus differentiating from competitors.

In an article, Braskem's president stated that the "green polyethylene" was "aligned with the company's objective to be an international reference regarding green polymers developers".

In developing the project, the board was required by the presence of a member of the commercial area to interface with the product market. This project started with a chemical engineer in the innovation department. In his academic and professional history he work with ethanol, so he proposed to the company a project to introduce this production process (that already existed), but was not used on large scales. The project was developed entirely in-house.

At this stage, although the production process already existed, it was not the same technology and "efficiency" used in the process from petroleum. Thus, this team aimed to create improvements to the process and adapt the company's plan to conduct pilot tests. At this stage, a client promptly became interested in the product.

Initially a pilot project was developed with 10 types of polythene to understand market acceptance. Being accepted by the market in 2006, a polyethylene plant started with 200 thousand tons of polyethylene per year capacity, a still small consumption over the 70 million tons of polyethylene world's consumption.

Entrepreneurship institutional occurred when Braskem, launching a new product in the market. Although many other "chemical" products from ethanol were in the market, none was a plastic. Since the launch, many important partnerships with clients were made to institutionalize the green polyethylene in the market such as Coca-Cola, Estrela Toys Manufacture, Embalixo, Ecover, PetroPack, Shisheido, Procter and Gamble, Toyota, Natura, among others. These companies also made several advertisements regarding the use of bioplastic in its products and packages.

Currently, continuing in the search for sustainable innovations, Braskem completed the conceptual design of building a green propylene plant, which is scheduled to start production in the second half of 2013. So the company can produce polypropylene, the second most used plastic in the world from renewable sources.

Following this actions, in 2009, UNICA, in partnership with sugarcane companies and BASF (a petrochemical company) launches AGORA Project, conceptualized as "one of the most important marketing and communication action of the Brazilian sugarcane-energy chain". One of AGORA's objectives is to incentive the use of sugarcane as raw material for bioplastic. The project also aims "to transmit to public opinion the benefits of the production and use of renewable and sustainable products and energy from agriculture origin; such as ethanol, bioeletricity, bioplastics and hydrocarbons".
In 2010, Dow Chemical and Solvay announced the continuity of their projects stopped in 2008. Several biotechnology laboratories are settling in Brazil to discover other products currently derived from petroleum that can be derived from sugar cane and other renewable materials. As an example, the Laboratory Amyris, in joint venture with the sugar and ethanol group Sao Martinho has been developing products for lubricants, cosmetics, polymers, flavors and fragrance (Amyris, 2010).
UNICA's president stated that "(the use of bioplastic) intensifies every time more and is irreversible". In the UNICA's stand in COP-16 (the UNO convention for climate changes) the most popular product was the bioplastic. The biggest producer of PET announced its interest to use bioplastic. Also, for sugarcane specialists a legitimating signal is when "companies traditionally focused on petroleum, like BP, recognizing that the energy's future is in sugarcane's bioenergy".

Table 3- Chronology of events

Chronology of events

Year	Event
1944	Rhodia used ethanol as raw material
1973	Petroleum crisis and ProAlcool creation
1984	Petrochemical major accident
1992	Responsible Care Program adopted by ABIQUIM
1992	Rio Summit
1998	ProAlcool disactivated, Ethos Institute for social responsibility is founded
2000	First BASF GRI report
2003	Braskem's green polyethylene project created
2004	Petroleum price start increasing
2007	Green polyehtylene launched, Dow nd Solvay announces projects to produce bioplastic, Ethanol Summit
2008	Dow Chemical and Solvay stopped bioplastic projects, Formule One Trophy with green plyethylene
2009	ÚNICA"s Program AGORA that promotes bioplastic
2010	Dow and Mitsui joint venture to produce green polyethylene is announced< Braskem launches I'm green label
2011	Rhodia launches Augeo
2012	PHB announces it biodegradable plastic

BRIDGING INSTITUTIONAL ENTREPRENEURSHIP: A NEW PRODUCT MODEL

Nowadays, it can be said that Braskem introduced the bioplastic use in the for profit sector bridging sugarcane and petrochemical knowledge system and institutional logics. Bioplastic production encompasses sugarcane and petrochemical technology. The product is equal to a petroleum made at the same time that aggregates the low carbon sugarcane's value. As noted, Braskem didn't invent polyethylene made from sugarcane; but it was the company that linked the sustainability value to the product and enabled it to be economically viable. This process was related to Tracey, Phillips and Jarvis (2011) concept of bridging institutional work. Nevertheless, instead of a new organizational form, bioplastic is a new product.

Now we return to our research question and identify the institutional work (see table 4) in the process of bridging institutional logics to create a new product.

It was frames of different contexts that allowed the project manager and sustainability director to introduce the idea of green polyethylene. By 2004, many chemical companies were facing the petroleum price increases which lead them to search for new solutions to not be dependent on it. In this context, a Braskem's engineer that previously worked in the sugarcane field, suggested to produce a green plastic. At the same time, the sustainability director had the understanding about how sustainability would promote innovations and differentiation to companies. Both distinctive frames (not usually found in the chemical sector) allowed them to frame the problem in this way.

After attesting the project's viability, it was time to disseminate inside the organization how to do the product and also, and must important, how to commercialize it. At the same time, the product needed to be disseminating to be approved by possible buyers. Braskem's timing were perfect since by 2007 sustainability was the main discourse in the for profit fields as well as in sugarcane.

However the green polyethylene was aligned to a macrolevel discourse of sustainability, Braskem wanted to sell its product with a premium price. To introduce the green plastic in the market, managers and the organization, especially the commercial area, needed to understand the culture of other organizations for approaching those that were linked to the idea of sustainability. This work was essential due to the need for the product to me accept so it could be institutionalized. Another work important to green polyethylene acceptance was mimicry. In Rhodia's director interview, he stated that one difficulty to introduce the company's green product in the market, even in European market that is known to demand many sustainable characteristic, was that the product was not identical with the petroleum version. Because of that, the client needed to change a little its production. Polyethilene didn't have that problem, as the product is equal to its traditional.

Another form to legitimize the bioplastic was to build partnerships with major and well known companies (such as Coca cola) as well as companies that sustainability is strategic (like Natura). Braskem also build relationship with UNICA, an important trade association in sugarcane field that has been promoting the environmental benefits of bioplastic.

Table 4 – Braskem's forms of institutional work

Institutional work	Representative Data
Framing the problem	"In my master degree I studied sustainable technology and strategic social responsibility" (Sustainability director) "I knew the production process because of my previous academic and working experience in a sugarcane company" (Project Manager)
Counterfactual thinking	"Thus, I evaluated potential projects and implement that which was in line with the company's objectives and purposes" (Sustainability director)
Theorizing the product	"We need to create an internal networking as well as align the ideas from different areas in an activity based on sustainability conviction. We needed to explain the whole concept to all employees involved in the project" (Project Manager)
Connecting with a macrolevel discourse	"While products from fossil origin harm the environment, the bio polyethylene combats global warming" (Unica website news, 2008) "The green polyethylene was the same as the one made from petroleum, so the sustainability idea needed to be accepted. Thus, this feature was extremely important. So, we conducted an intensive media and marketing campaign. We first showed the product in Formule 1 (the trophy was made by the green polyethylene), the subject was published in several papers and magazines" (Sustainability director) "The product is the same. We needed to give credibility to the information (that the plastic was 100% from renewable resources) we were communicating" (Project Manager, 2010). "The green polyethylene was first used in the Sustainable Monopoly game, produced by Estrela Brinquedos. In sustainable version, the pieces are made of green plastic cards and the packaging by recycled paper, and instead of portraying an urban setting, the properties represent the board mills, farms, sugar cane and environmental preservation areas" (Braskem website, 2010) "The world dreamed. Braskem made it happen. The Green plastic is reality" (Braskem website, 2012)

Aligning with highly legitimate actors	"In the introduction of the product in the market, we contacted companies that were aligned to sustainability ideas" (Sustainability director) "Toyota Tsusho, trading da Toyota Corporation, Coca Cola, Procter and Gamble, Nestle, Tetra Pak, Heinz, Johnson & Johnson, Danone, Michelin, AT&T" (Braskem's partners in the green polyethylene, Braskem site) "The material (Green polyethylene) technical viability can be comproved in the Morumbi stadium VIP area chairs, in São Paulo" (Unica website's new, 2012)

DISCUSSION AND CONCLUSION

CONCLUSIONS

Our study aimed to examine the institutional work done to legitimize green polyethylene use. So we conducted a case study on petrochemical company Braskem.
Some of our preliminary finding suggested that the union of fields/institutional logics (petrochemical, sugarcane and sustainaility) occurred because some actors working in one field had previously worked in the other. That allowed these actors to have both frameworks to search for solutions when strategic sustainability spread and the necessity to create sustainable products emerged. Internally, Braskem theorized about the product so its employees could produce and sell ir. Also, because sustainability is institutionalized in society, Braskem connected its product to the macrolevel discourse of sustainability as well as made important alliances to legitimate its product in the for profit sector.
Another form of institutional work was identified: to analyze frames of possible innovation supporters. Organization and actors must accept and continually act in accordance to a new practice so that practice can be institutionalized. So, if the institutional entrepreneur can identify organization and actors that have the same frame as the new practice and thus will accept it easily, the creation is more likely to succeed. Mainly when it is a business innovation that would require lots of capital to convince buyers of something that they don't previous understand or belief.
Note that the introduction of bioplastic can be considered a step for field emergence of green chemistry in Brazil. Currently there are no associations, study groups or even articulation between universities, NGOs, government organizations, chemical and sugarcane companies. However, with the expansion of this discourse and the proliferation of initiatives with this imprint is to be expected that an institutional field is constructed. For future research, some

interesting studies would be conducted, for example, to study the emergence of the institutional field of sustainable chemistry considering how it has affected various organizations whether business, government or the nonprofit sector.
An intriguing fact is that petrochemical industries search for products to decrease risk due to petroleum price, but algo sugarcane companies struggle with selling commodities which prices are fixed externally. Both fields could financially benefit from producing and commercializing bioplastic. However, out of the projects with bioplastic (Braskem, Dow, Solvay, Rhodia), only one (Usina da Pedra development of PHB, a biodegradable plastic) is developed by sugarcane, the rest are done by petrochemical companies. The question is: why that happens? Are sugarcane field's frames not enclosing innovation? Contrary to that, the sugar cane trade association is more engaged in the bioplastic dissemination and promotion than the chemical trade association. Why didn't Abiquim was more involved in this process?
Finally, bioplastic is still a niche. But by the action of so many chemical industries, the common path is green chemistry. That said, it would be interesting to study how first the product is institutionalized in a niche and after in the whole market. What forms of institutional work would happen in that case?

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