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**GREEN POLITICS AND NEW INDUSTRIAL OPPORTUNITIES: THE AQUITAINE
PAPER INDUSTRY AND BIOMASS COGENERATION**

Yves Montouroyⁱ & Arnaud Sergentⁱⁱ

ABSTRACT: *As the European forest industry takes up the challenge of certification, it is also called upon to develop a strategy which mitigates the effects of climate change. From the latter perspective, the forest industry is solicited to pursue the carbon neutrality of its activity (through the Exchange Trade System). Today, public policies have thus led the forestry industry to develop green energy by biomass cogeneration. Cogeneration is the simultaneous production of electricity and heat, both of which are used in paper-making. The aim of policy is to extend such production of electricity to cover domestic consumption. Such a path makes the forest and paper industries go deeper in the sustainability of their activities but it also makes them develop new strategies. From the point of view of political science, this new policy and industrial orientation can be best examined through analyzing the making and implementing of the territorial environmental strategies that cover both certification and forestry programs. In industrial terms, such a strategy not only challenges current practices of local resources provision and the valorisation of wood wastes, but more fundamentally still it constitutes the development of a new path, a new market and new constraints (in terms of norms and competition). The aim of our proposal is to highlight the displacements of regulatory decision-making between superior levels (top-down logic) and the political work undertaken by political enterprises on the ground (bottom-up logic). At the same time, analysis will encompass the normative environment and the convergence of green politics with competitive opportunities in the forest-wood-paper system. The paper will explore these political, normative and industrial issues linked to the new energy strategy through local case studies of globalized paper mills (Smurfit-Kappa, Tembec, Gascogne paper), located in Europe's largest human-made forest (the Landes de Gascogne), which began to go down this path in 2008.*

KEY WORDS: Climate policy, Pulp and Paper Industry, forest-based sector, political work, institutional change

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INTRODUCTION

EU actors are facing up to climate change and global competitiveness by developing adapted regulatory and industrial policies. Indeed, the EU and member states are implementing ambitious renewable energies policies. In particular, as high consumers of energy, paper mills have been the target of the green house allowance trading scheme since 2003. Through the industrial development of the consumption of biomass as a natural renewable energy source (Biomass plan since 2005 in EU and Wood energy plans in France since 2007), paper mills are once again being placed in the front line of an energy and climate public policy.

While these plans constitute important technological challenges in themselves, they also threaten the current forest and wood producing system. Thus, in France the Biomass Action Plan has given rise to the CRE biomass project (a tendering system from the Energy Regulation Comity) which is based upon private projects of electricity production from renewable energy sources (RES-E). As an opportunity, CRE could make actors mix their valuable outputs and secure their dependence on energy ressources. As a constraint, CRE demands the development of higher wood consumption and often that of specific energy production processes. In so doing, it involves changes in the inputs of forests and wood networks.

As regards this perspective, we have centered our study of the CRE biomass project on two case studies of paper mills located in the Landes (South West of France) the most important human-made forest in Europe: Smurfit-Kappa Cellulose du Pin in Fature and Tembec in Tartas. From the angle of political economy, three hypotheses appear inescapable when one studies the regulation of this industry: First, regulation is co-produced by public, collective and private actors. Second, actors problematize (Rocheport and Cobb, 1994) and politicize (Lagroye, 2003) the issues they perceive through what Jullien and Smith call 'political work' (2008). Thirdly, the Pulp and Paper industry is framed as an institutional order which interacts with its economic and political environment. Therefore, four institutionalized links structure those interactions (financial, employment, purchase and commercial).

In this paper, we argue that the energy policy as regards biomass has led forest/wood/paper actors system to re-institutionalize their relations. After a short description of the part played by biomass in the climate and energy policies of the EU and France (1), we focus our case study on the pulp and paper industry through a framework (2) that allows us finally to focus upon the process of institutional change (3).

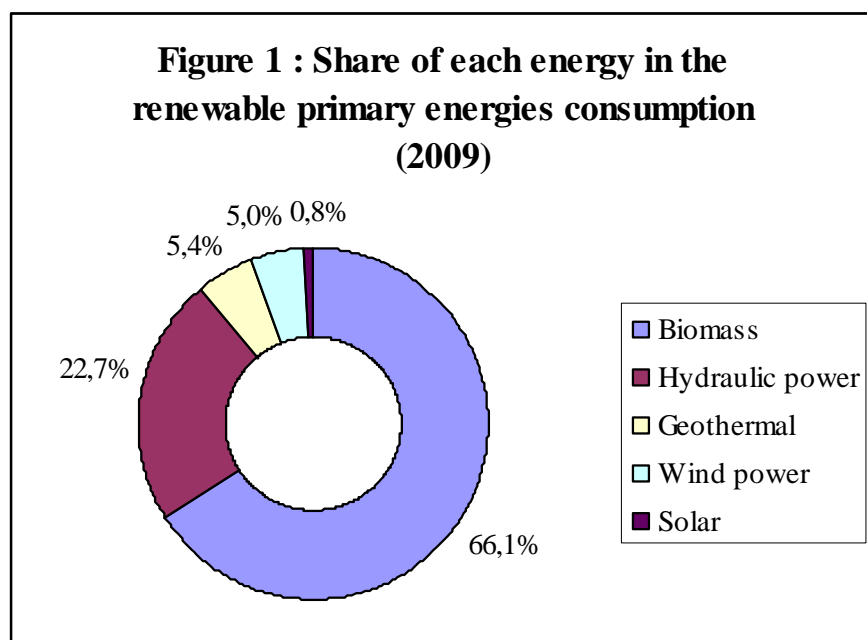
I. THE EUROPEAN CLIMATE AND ENERGY REGULATION CONTEXT

The European Union (EU) faces serious energy challenges concerning sustainability and greenhouse gas emissions as well as security of supply, import dependence and the competitiveness, develop energy technologies and effective implementation of the internal energy market (COM (2007)1 "An energy policy for Europe", COM (2007)2 "Limiting Global Climate Change to 2 degrees Celsius - The way ahead for 2020 and beyond", COM (2006) 848 "Renewable Energy Road Map. Renewable energies in the 21st century: building a more sustainable future").

1.1 The state of renewable energy in EU

In 2008, renewable energies represented 16.5 % of the EU27's energy production and 8 % of EU27 consumption (Eurostat, 2009). In 2007, 135.9 Mtoe of renewable primary energy were

consumed. Biomass represented 65.6% of energy consumption, followed by hydroelectricity with 21.7 %. Biomass represent 16, 7 of the RES-E produced (hydraulic 64.4%).



Source: EurObserv'ER, 2009.

Table 1: RES-E Production in 2007

	Biomass (TWh)	Wind power (TWh)	Photovoltaic (TWh)
Total EU	49.2	103.5	4.8
France	1.4	4.05	0.05
Germany	7.4	39.5 (1rst)	3.9 (1rst)
Finland	9.8(1rst)	0.2	0.006
Sweden	8.5	1.4	0.005

Source: EurObserv'ER, 2008

Table 2: Biomass in the primary energy production and consumption (Million of tons of oil equivalent) in 2007

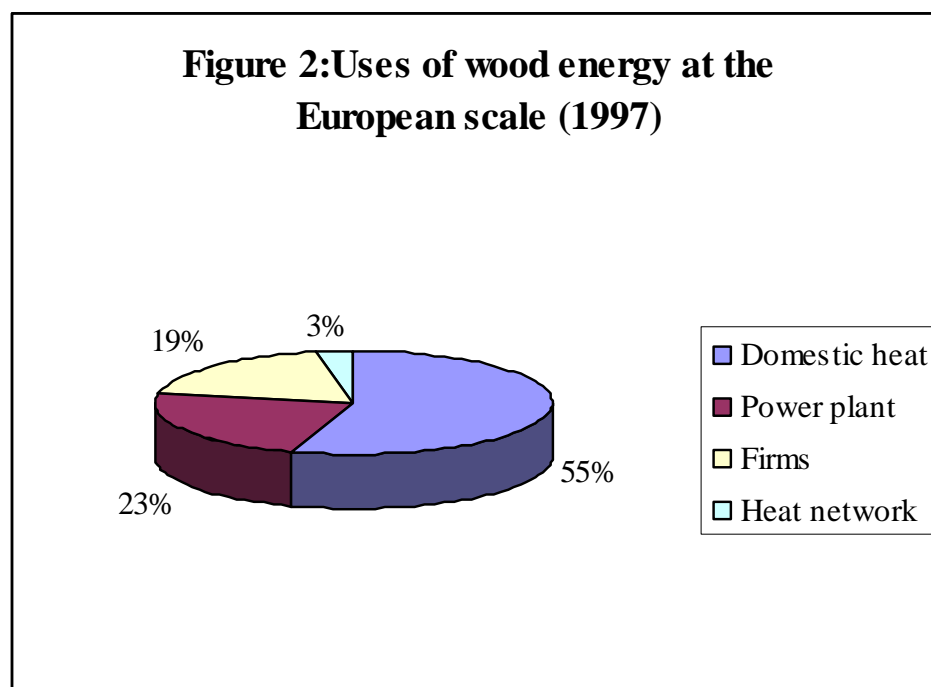
	Biomass fuel	RES production	Primary production	Gross consumption (Production+import-export)
Total EU	66.4	128	834.2	1822.2
France	9.2 (1rst)	18	129.3	265.0
Germany	9.1	22 (1rst)	131.1	330.3
Finland	7.1	9	15.3	36.8
Sweden	8.4	15	32.6	51.2

Sources: EurObserv'ER 2008 & Eurostat

Primary energy production from biomass includes biogas (4%), biofuels (5%), municipal wastes (8%) and wood (52%).

Wood and wood wastes are the main categories of biomass in the production from RES in 22 countries of the EU-27. 'This situation is particularly noticeable in nine countries (Scandinavian and Baltic States, Romania, Bulgaria and France), where the share of wood and wood wastes is over 95%' (Eurostat, 2006).

Domestic heating is the main user of wood. Then, power plants and firms are respectively the second and third economic sectors which use biomass.



Source: VTT ENERGY 1997

1.2 European and French Renewable Energy Policies

To cope with the increasing dependence on imported energy, the European Union (EU) has decided that it must bring into play a new energy policy. The three main objectives are competitiveness, sustainable development and security of supply. It is in this wider context of an integrated and coherent energy policy and, in particular, of promoting renewable energy sources that the Commission has presented its renewable Energy Policy. In 2009, renewable energy represents 5% of the energy mix. EU objectives for 2020 rise to 20% of its projected needs. The EU renewable energy potential rises to 300 m/toe (15% of the needs) in 2030.

The EU level

- Directive 2009/26/EC of the European Parliament and the Council on **the promotion of the use of energy from renewable sources** amends the Directive 2001/77/EC of the European parliament and the Council on the **promotion of electricity from renewable energy sources in the internal electricity market**. The Accession Treaty sets national indicative targets for the proportion of electricity produced from renewable energy sources (RES-E) in each new Member State the result of which is an overall objective of 21% for the EU-25 in 2020.
- To promote the production of RES-E, the EU has developed some public incentives (COM (2005)627 “**the support of electricity from renewable energy sources**”). First, feed-in tariffs. These systems are characterised by a specific price, normally set for a period of around seven years, that must be paid by electricity companies, usually distributors, to domestic producers of green electricity. Secondly, the green certificate system (currently in force in Sweden, the United Kingdom, Italy, Belgium and Poland). RES-E is sold at the conventional market price. In order to finance the additional cost of producing green electricity, and to ensure that it is generated in sufficient quantities, all consumers are obliged to purchase a certain number of green certificates from RES-E producers according to a fixed percentage (quota) of their total electricity consumption/generation. Thirdly, tendering systems (only in Ireland and France). Under this procedure, the State issues a series of invitations to tender for the supply of RES-E, which will be sold at market price. The additional cost is passed on to the final consumer in the form of a special tax. Finally, tax incentives are given, but exclusively in Malta and Finland.
- More specifically, the **Biomass Action Plan** (COM (2005) 628) focuses on wood energy for electricity and heat. Biomass currently meets 4% of the EU's energy needs (69 million tonnes of oil equivalent (toe)). The aim is to increase biomass use to around 150 million tonnes by 2010. An increase of this magnitude could bring benefits such as: diversifying Europe's energy supply; significantly reducing greenhouse gas emissions (209 million tonnes); direct employment for 250 to 300 000 people; and potentially lowering the price of oil as a result of lower demand.
- COM (2008) 19 Member States must **guarantee the origin of electricity** and heating or cooling energy produced in plants with a capacity of at least 5 MW_{th}, in response to a request from an energy producer. When a Member State cancels a guarantee of origin that it did not issue, the corresponding quantity of renewable energy is deducted from the total quantity produced during the year by the issuing State and added to the total quantity produced during the year by the cancelling State.
- The directive 2003/87/EC **Greenhouse gas emission allowance trading scheme** established a Community greenhouse gas emission trading scheme as of 1st January 2005

and listed the wood pulp, paper and board industry as one of the key sectors to be targeted (along with the cement and chemical industries).

The French level

In 2009, wood energy has risen to 30 Mm³/year. Overall, the wood energy sector is dominated by domestic consumption and self retraining and self heating of wood transformation firms. Nowadays, a commercial wood energy sector is growing (for both heating and electricity generation).

- The French Government adopted two **Wood Energy Plans** (from 1994 to 1999 and from 2000 to 2006). The objective was to reach 450 000 toe of primary energy, which implied a wood consumption of 2 Mt/year¹.
- The **Wood Energy Program** 2007-2010 plans an increased production of 290 000 toe.
- Decree 2006/1118 (September 2006) **Guarantee of origin**
- **Green certificate** (decree 2006/1118)
- **Tendering systems**: French tendering system makes firm propose a RES-E from biomass cogeneration objective and a price to sale RES-E to the central French operator. Tembec Tartas and Smurfit Kappa Factice participated in the invitation to tender CRE2 (from the Energy Regulation Comity) in 2008 (decree 2002-1434) with a power by unity >9MW. 54 projects were examined and 22 accepted. CRE 1 failed because of a too low RES-E price proposed to amortize the investment. Firms which had participated to this first tendering system did not have enough reliance and knowledge about this new market to propose the real price needed to engage in cogeneration from biomass. Today a CRE 3 is in preparation.
- Our **two case studies** are presented in Table 3 and Table 4 :

Table 3: Smurfit Kappa Factice and Tembec Tartas: some key figures

	Input (tonnes of wood)	employment	Output (tonnes of paper)	Waste (tons)
Smurfit Kappa Factice	1.5 million	450	520 000	250 000 (bark)
Tembec Tartas	750 000	300	165 000	45 000 (bark)

¹ 1 toe = 4 t of wet wood or 2.3 of dried wood.

Table 4: Smurfit Kappa Factice and Tembec Tartas biomass cogeneration project: some key figures

	Investment (m€)	Direct employment*	MW	Inputs (tons
Dalkia (Smurfit Kappa Factice)	140	20	69.6	500 000(bark, biomass wastes, ...)**
Tembec Tartas	48	No additional employment	14	225 000 (bark)***

* We address the indirect employment issue in the part 2.2

**250 000 tons of barks+200 000 of biomass wastes+ 50 000 let

*** 45 000 from self consumption +130 000 are still purchased for the former cogeneration process + 50 000 with the new turbine

Table 4 highlights how biomass wastes are inescapable in such a project and the additional need of 100 000 tons of biomass.

II. THE REGULATION OF THE PULP AND PAPER INDUSTRY AND THE CRE BIOMASS PROJECT

2.1 Climate policy and the government of the pulp and paper industry: a political economy framework

The pulp and paper industry (PPI) has been concerned by environmental concerns for a long time. On one hand, pulp and paper come from natural raw materials. On the other, the paper production process can be an important source of pollutants. So, since the beginning of the 1970s, environmental policies and social pressure have lead PPI to decrease its ecological footprint and to improve its communication on these issues (Kirkpatrick, 1991).

In France for instance, paper manufacturers were in 1972 the first industrial actors who voluntarily entered into a contract with the public authorities for reducing their emissions of pollutants. In so doing, they are engaged with the French Agency of Water in the protection of the water resource. Criticized in the 1980s for using chlorine to bleach paper, they introduced technical innovations and replaced it with new chemicals, such as oxygen bleaching. At the upstream level, papermakers have also made important efforts to use recycled paper and change part of the process to ensure the optimal and environmentally sound recycling of used paper products². More recently, dealing with deforestations issues, PPI have been involved in forest certification schemes. The Forest Stewardship Council (FSC) and the Program for the

² In 2004, the paper recycling rate in Europe was 54.6% or 45.5 million short tons (41.3 Mt). The recycling rate in Europe reached 64.5% in 2007, which confirms that the industry is on the path to meeting its voluntary target of 66% by 2010.

Endorsement of Forest Certification (PEFC) certifies papers and boards made from trees harvested according to guidelines meant to ensure good forestry practices. All this shows how environmental concerns have been decisive factors of change in this industry's regulation.

From this perspective, climate policy is now a new challenge for the regulation of the PPI. Both the economic and political contexts encourage papermakers to tackle carbon dioxide emission and renewable energy issues. First, as high energy users, papermakers are dependent on the significant increases in the price of oil. The industry is already a significant user of renewable energy sources, notably forest biomass, and has continued to switch into renewables, as well as reduce energy consumption because primary energy costs have risen. Second, as indicated in the previous section, governments, and particularly those of the European Union, have started to impose rules and regulations to reduce carbon emissions and promote renewable energy. Regulation of carbon emissions and future cost implications directly affect the overall competitiveness and development of this industry³ (Emission Trading System). According to public actors, ETS is thus seen as an inescapable regulation for quickening sustainable change.

Climate change policy is usually considered to be the emblematic form of the globalization of environmental policies. The main policy focus is to achieve a global agreement on the definition of rules and strategies of adaptation to climate change. The other key challenge for adaptation is to ensure that such aims are integrated into industrial policies⁴. Industries therefore consider climate policies and competitiveness paths to be important parts of their globalized industrial context. For political economics, this new trend can be analyzed in two different ways. On the one hand, neo institutional economics underlines that climate adaptation law and market-based climate policy are 'institutional constraints' for industrial actors. They develop an institutional path dependence approach to explain why the process of institutional change is 'locked-in' and why the way that economies are governed converges (Woerdman, 2004). On the other hand, others academics suggest that globalization can be also considered as an opportunity for the different industries to develop new strategies and new paths of development. They argue that institutions are co-produced by the 'political work' (Jullien & Smith, 2008) of both economic and political actors, and this at local, national and international scales. From this point of view, climate policies are not only top-down rules which constraint industrial actors and limit their competitiveness, but also bottom-up logics with political mechanisms which are conducive to producing new institutional re-arrangements and new competitive configurations.

Following on from this viewpoint, and based on the politics of industry approach, we propose a framework to study the implementation of the CRE policy within the French PPI. The aim of this study is a better understanding of institutional change. How does such a policy transform the regulation of the relationships which structure the PPI activity? Thus, according to Jullien and Smith approach (2008), we characterize the organization of any industry as an Institutional Order (IO) of four Institutionalized Relationships (IRs): Employment IR, Finance IR, Purchase IR and Commercial IR. Each one is a configuration of rules and institutions established to regulate a set of constraints and opportunities linked with industrial activities.

2.2 The institutional order of the pulp and paper industry and the CRE biomass project: the case of Smurfit Cellulose du Pin and Tembec Tartas

The involvement of the papermakers in the CRE policy and the implementation of a process of cogeneration in some paper mills is a new challenge for the PPI Institutional Order. From

³ PwC, Global Forest, Paper & Packaging Industry Survey, 2008

⁴ PEER, Europe adapts to climate change. Comparing national adaptation strategies, 2009

the politics of industry perspective, this new industrial issue is the result of a collective 'problematization' within the industry which implies a specific response in terms of institutional regulation. The order of an industry is a dynamic structure stabilized by the construction of compromises and rules, politically and economically legitimized by the collective action. In our case study, the increasing demand for biomass energy is a core issue for the PPI. Cogeneration processed by papermakers is the solution promoted by the PPI actors in order to adapt their activity to the energy and climate policies.

This trans-industry energy policy necessarily impacts upon the PPI's Institutional Order and entails changes in each IR. In order to analyze these consequences, we briefly describe each IR and the impact of the CRE policy upon it. The aim of this section is to present the main elements of the PPI's Institutional Order⁵ and to highlight the re-arrangements which occur for our two paper mills case studies (Smurfit Comptoir du Pin and Tembec Tartas).

The financial IR:

The pulp and paper industry is one of the most capital-intensive industries in the world. Most of the companies are part of international groups managed by North Americans or North Europeans. For example, Tembec Tartas belongs to Tembec which is a leading integrated forest products company, with operations in North America and France. With sales of approximately \$2.4 billion and some 7,000 employees, it operates 40 market pulp, paper and wood product manufacturing units. Smurfit Cellulose du Pin is part of the Smurfit Kappa Group which is a world player in paper based packaging with leading market positions in Europe and in Latin America (sales in 2008 of € 7 billion and around 40,000 employees).

In France, in recent years, capital investments are well below historic levels due to difficult market conditions. Because no new mills are being built, most capital expenditures represent limited increases of production capacities, upgrades, and environmental protection initiatives⁶.

It follows that the context is not favourable to investment for French papermakers. Thus, Smurfit Cellulose du Pin chose to join with Dalkia which financed its recently built cogeneration unit. For Tembec Tartas, the new biomass boiler investment involved an innovative partnership with local authorities and the financial support of the *Conseil régional d'Aquitaine* and the *Conseil général des Landes*. Further, Tembec Tartas is self financing its investment. It is benefiting from interest-free term loans for the financing of their infrastructure but it will finance alone the supply of the 180 000 tons needed for the cogeneration project. However, Tembec Tartas have still not bought an electric turbine because the French company is waiting for the Canadian headquarters to make its decision.

The Commercial IR:

Pulp and paper products are intermediary goods for packaging, printing, sanitary products and chemicals industries. Some mills, like Smurfit Cellulose du Pin, are integrated and produce both pulp and paper whereas others firms, like Tembec Tartas, manufacture only pulp. Smurfit Kappa Cellulose du Pin is specialized in the manufacture of liners for corrugated board. Tembec Tartas is a producer of Fluff pulp, which is the main component of disposable

⁵ In this section we do not study the employment IR. This relationship is not very modified by the CRE biomass project.

⁶ COPACEL, L'industrie papetière en 2008. Rapport développement durable, 2008

absorbent products. Tembec Tartas also produces Floc pulp which is used in the chemical industry for the manufacturing of cellulose derivatives.

Over recent years the European PPI's profits have been under pressure and margins have been reduced, because of increased competition on domestic markets as well as on external markets – linked with the strong Euro/USD exchange rate. Market developments have suffered from a less dynamic economy in Europe, compared to other areas in the world. Production within the EU has had to accommodate high costs for pulpwood, energy and labour and is meeting increasing competition from low-cost production in tropical and subtropical areas. Environmental legislation is also more severe in the EU than in these areas. Many leading EU firms intend to concentrate new capacity investments in third countries, due to relatively lower raw material costs. Generally, cost is a major determinant of competitiveness, because most of the products are commodities with little product differentiation⁷. The European PPI is facing a challenge to develop new products with higher value-added and new services as Tembec Tartas do with its special Floc pulp produced from a high green process (wood from forest managed according to certification schemes, recovery of intermediate material like black liquor and vapor, water treatment, low use of fossil energy and now RES-E production).

From this perspective the implementation of the CRE biomass project could significantly change the Commercial IR for the French papermakers. First, the sale of electricity could be an opportunity for papermakers to diversify their activity and improve their competitiveness. Smurfit Comptoir du Pin doesn't follow this path whereas Tembec Tartas does. The French electricity market is under the control of a former public and monopolistic firm *Electricité de France* (EDF). EDF has significantly developed hydro-electricity and nuclear electricity. Under EU directives, French Government has to open up the French electricity market to new actors. It also has to develop RES-E. EDF is still in a dominant position, but French law compels EDF to buy the RES-E output. Nevertheless, with a quite high-performance hydro and nuclear electricity production, the RES-E is often seen as having no commercial future. From hydro or nuclear, 1MW costs more or less 50 Euros. That is the reason why, in order to promote RES-E, the State imposed a RES-E minimum purchase price on EDF. Thus 1 MW from RES-E costs normally 70 Euros but through the CRE 2 policy purchase electricity prices were negotiated case by case. The average price rises at 128, 1 Euros.

Second, they will be able to produce green electricity and eventually eco-labelled paper products. In fact, energy is an important factor of production which could be concerned by environmental criteria. In the last ten years consumers have paid attention to the wood and PPI actors have developed certification schemes (PEFC and FSC). 'Should, therefore, the consumers require also sustainability in energy production for papermaking?' (Luukkanen, 2003). Thus the CRE biomass project allows green electricity producers like Tembec Tartas to accumulate Green Certificates which has caused them to reduce their carbon assessment. Smurfit Comptoir du Pin will not directly sell electricity but it will significantly improve its environmental image through its partnership with Dalkia.

The employment IR:

The PPI provides currently a significant number of jobs in the European's rural areas. For instance, in France pulp and paper mills and broad manufacturers employ more than 80 000 workers. And, this activity widely contributes to the development of the employment in the sector of the forestry (wood harvesting, wood transport). In Aquitaine, the forest based sector

⁷ European Commission Enterprise and Industry Directorate-General, European Industry: A Sectoral Overview Technical Update, 2006

represent 22 000 employees, which 4500 employees in the pulp, paper and broad mills and more than 2 900 employees in the sector of the forestry⁸.

The implementation of the CRE biomass project and the increase of the wood supply will have consequences on the forest based sector employment. According to a recent study⁹ this will contribute to the preservation of the employment in the sector in spite of the development of the mechanization of the forestry activities. Moreover, this will imply needs for specific professional competencies, and thus needs for training programs, in order to exploit new kind of wood resources for biomass supply.

The Purchase IR:

First, PPI is considered as an energy intensives industry that is also rather emission intensive. Energy is a major portion of a mill's business costs so the relationships with public authorities, which regulate the energy market, and energy suppliers is a really strategic topic for papermakers. In a context of electricity market liberalization, fossil energy cost volatility and carbon dioxide emissions reduction, they have to decrease the use of the energy they purchase and to improve the security of their supply. Since the 1980's, French papermakers have made important efforts by reducing total energy use and by increasing the use of natural gas, a less emissive energy than fuel and coal. Nevertheless the competitiveness of the European PPI is still hugely dependent on energy policies and the recent rise of the energy cost is critical for papermakers. According to the Confederation of European Paper Industry (CEPI), in spite of the liberalization of the energy market in Europe, 'in both electricity and gas markets, old monopolies remain dominant and the structure of the supply is oligopolistic with little room for new entrants'. That is the reason why increasing the rate of energy provided from self-generated biomass sources is a great opportunity for papermakers. To promote the cogeneration process is not only a way of reducing carbon dioxide emissions but also a way to improve energy independence.

Second, the purchase RI is also structured by relationships between papermakers and producers of raw materials (recovered paper and wood producers). Concerning the supply of wood, the papermakers are involved in the forest based sector and have to share this resource with other users. In this forest based sector, they are in a quite central and dominant position. In fact, they are the main consumers of wood pulp (round wood thinning, low quality logs and harvesting residues) and sawmill waste, so they significantly all affect the entire sector's development.

Thus, two kinds of relationships can be identified: a competitive one and a coordination one. On one hand, papermakers are in competition with wood-based panels makers who use the same raw materials in their production process. The regulation of this relation is often based on an informal compromise between the different firms involved. With the increasing cost of transport, the sharing of the resource tends to be geographically determined. On the other hand, papermakers coordinate with forest owners, cooperatives and sawmill operators. Papermakers enter into supply contracts with cooperatives and sawmill, they regularly fix the price and the volume expected. With forest owners the selling of wood is regulated by mutual agreement. Moreover, all the actors are more and more embedded in certification schemes (such as PEFC or FSC) and thus in 'a chain of custody'.

⁸ Insee-Clap2003, MSA, enquête CRPFA.

⁹ Laurier, JP., Le Net, E. and Thivolle, A. (2008) « Evaluation de l'emploi lié à la mobilisation de bois supplémentaire, 2012 et 2020 », FCBA

The supplying of wood to Tembec Tartas mill and Smurfit Comptoir du Pin mill is organized differently. The former directly purchases wood from forest owners, cooperatives and sawmills. The latter has a partnership with Smurfit Comptoir du Pin, belonging to the Smurfit group, which is dedicated to forest harvesting, wood trade and wood supplying for Smurfit Cellulose du Pin, and for Smurfit Rol Pin, a plywood manufacturer. For both, it is a great challenge to increase to a significant extent the wood supplying for the cogeneration units. In fact, this is a big issue not only for these papermakers but also for the whole regional forest sector. The purchase relationships are concerned by the implementation of the CRE biomass project in Aquitaine. To take into account of this new demand for wood the relationships between papermakers, public authorities and wood suppliers have been modified. First, Public authorities have obliged papermakers to participate in drawing up a supply plan. Second, changes have occurred in silvicultural practices and forest owners have begun to sign wood supplying contracts with papermakers or energy industries. Third, Smurfit Comptoir du Pin has developed a partnership with Dalkia to supply the cogeneration process with wood and recovered wastes.

The following figure schematizes the Institutional Order of the PPI and summarise the key elements of changes implied by the implementation of the CRE Biomass Project.

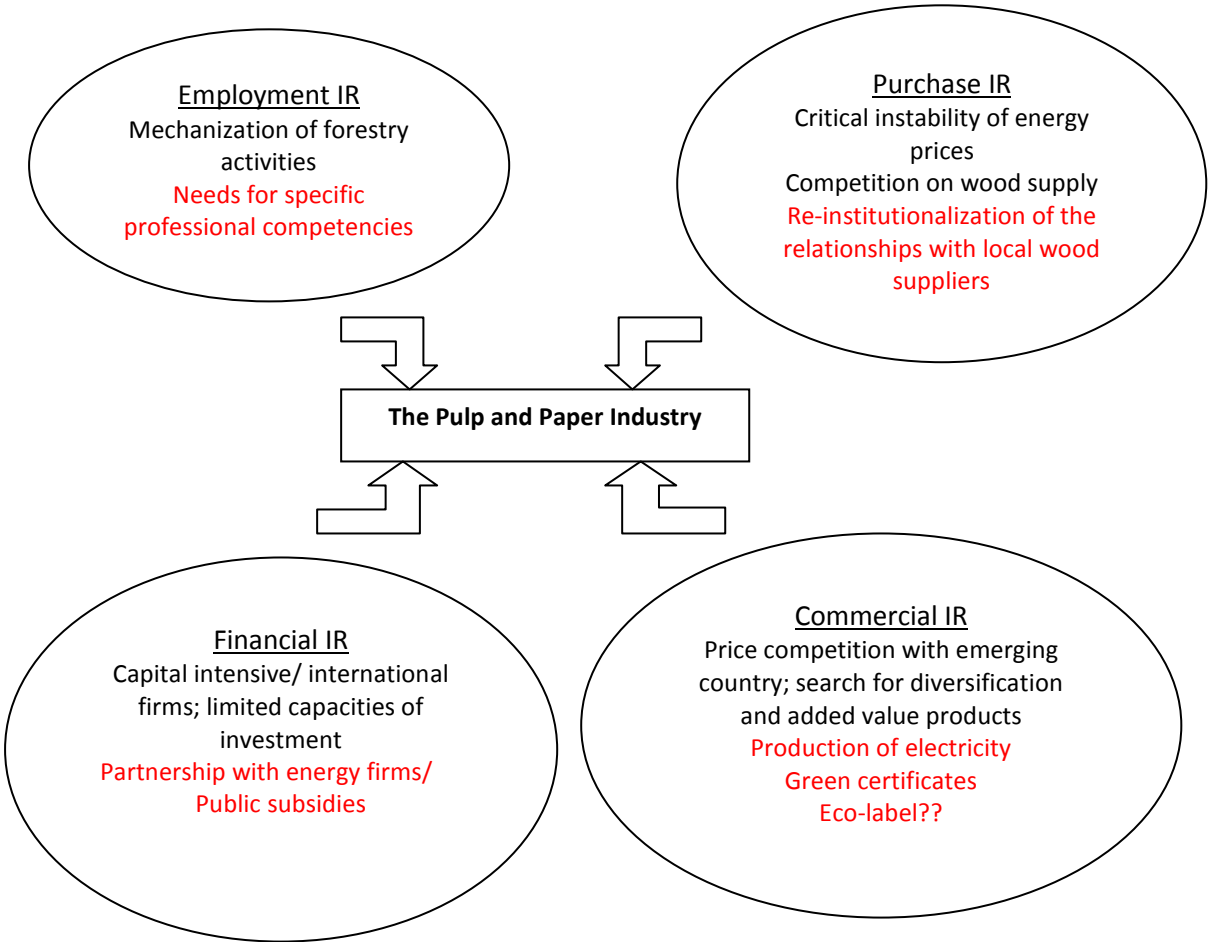


Figure 3: The Institutional Order of the Pulp and Paper Industry and the CRE biomass project (In red colour: changes due to the implementation of the CRE Biomass project)

III. THE PROCESS OF INSTITUTIONAL CHANGE WITHIN THE PURCHASE IR

According to the European PPI, one of the main productive problems caused by climate policies is the impact of the share target of biomass energy on competition for raw materials. For the regulation of the industry, this related issue has consequences on the international competitiveness of the European firms by redefining the conditions of production and competition within the PPI. From the politics of industry perspective, this critical moment of the PPI life can be analysed in terms of institutional change. This change has led to institutional rearrangements which have implied the construction of new compromises and new forms of coordination. Within an Institutional Order such institutionalization can affect each IR at different scales. In this way, for example, the guarantee of the cost price of the electricity by the CRE policy is an institutionalization of the Commercial IR at the national scale whereas the establishment of supplying plans in the purchase IR occurs at the local scale. The aim of the following section is to analyse the political process by which climate policies have been accompanied by an institutional change of the purchase IR in Aquitaine. This process is the result of both political work (3.1) and a re-institutionalization of the relationships which regulate the raw materials supply concerned (3.2).

3.1 Political work over the wood supply issue

Political work is considered here as a key explanatory variable for analyzing change within the PPI. Following Jullien and Smith (2008), faced with a productive problem, the work carried out by the actors of an industry to achieve their goal is political for two reasons. First, 'they use arguments to legitimize the problem through highlighting its extra industry relevance'. Second, 'they appeal to the public authorities to obtain the resource they fail to possess'. Thus, the political work of the PPI actors concerning the purchase RI can be studied through the way they both problematize competition for raw materials and politicize threats to the industry's durability.

Problematization

In response to EU and national policies which promote renewable energy sources (RES), the Confederation of European Paper Industry (CEPI) has urged the Commission to assess the impact of the energy use of wood and wood residues on forest based industries¹⁰. According to them wood is an easily accessible RES source, which is likely to lead to a significant increase in the demand for it as a raw material and, consequently, will create unfair competition in these markets due to the 'artificial' subsidies granted to promote RES¹¹. The strategy of the CEPI members is not to contest the legitimacy of climate policy and incentives to promote wood as a renewable resource. On the contrary, they underline the fact that the PPI is already the biggest industrial producer and consumer of renewable energy (recovered paper and wood) so that they are well placed to 'be the key enabler in meeting the renewable energy targets'¹². Nevertheless, from their point of view, the goals of the RES policy need to be clarified to take the socio-economic side of the question into account. In order to justify and legitimate their position, they have looked for support through financing an independent study made by consultants (McKinsey-Pöyry) which evaluates the possible impact of the climate

¹⁰ CEPI, Position of the European pulp and paper industry on the use of biomass for energy and biofuels, 2007

¹¹ CEPI, The European Paper Industry's views and action plan on climate change, 2003

¹² McKinsey & Company, Inc. And Pöyry forest industry consulting, Bio-energy and the European pulp and paper industry – An impact assessment. A summary of the conclusions of the report. October 2007

policy targets on the PPI. One of the main results of this study is that an approach promoting the use of wood as a raw material first and only secondarily as a source of energy provides significantly more value added to the economy and retains significantly more jobs. Thus, the discourse elaborated by PPI actors to influence the RES policy refers not only to the competitiveness principles of the EU, but also to its sustainable development principles (Environment, Economy and Social).

Politization

The process of politization occurs when actors of an industry seek to publicize a collective productive problem and try to make it enter into the public domain. This process is intertwined with the production of discourse because it gives is aimed at providing actors with legitimacy and efficiency. This work is often undertaken by interest groups or 'professional organization', so it takes place at different scales.

At the European scale, the CEPI undertake a very active lobbying of the UE's major bodies. In fact, located in Brussels CEPI is involved in all the stakeholders' networks and monitors all the UE activities related to its industry. Moreover, as regards climate policy concerns, the CEPI has joined the Alliance of Energy Intensive Industries which has made propositions to the EU Institutions to maintain the competitiveness of these industries. Concerning the RES policy, the CEPI has worked with specific organizations like the European Mine, Chemical and Energy Workers Federation or the World Wide Fund for Nature to develop good relationships and to elaborate joint positions on Biomass and Renewable Energy¹³. Finally, all these relationships are framed as a means of overcoming the limits of the PPI industry by legitimating the solutions proposed as trans industrial concerns.

At the French National scale, RES policies issues have been mainly politicized during the *Grenelle de l'Environnement* within the meetings of the Operational Committee n°10 (Comop 10) called 'Plan for the development of the renewable energies with high environmental quality'. This working group highlighted the important potential of biomass in the implementation of an ambitious program of development for renewable energies. But, the Alliance for the planet, France Nature Environnement, and Medef (French employers' syndicate) suggests establishing a general principle of priority between the different uses of the biomass (goods production before energy and heat production before electricity production) and emphasizes the need for promoting high efficiency cogeneration process. Moreover, Comop 10 highlights the fact that, in order to increase the demand for wood biomass it is necessary to increase the supply with an efficient forestry policy for wood production. Following these recommendations, the CRE has modified the conditions of eligibility within its 2nd and the 3rd invitations to tender. In fact, since the last CRE2, the efficiency of the cogeneration process has to be above 50 % and candidates are obliged to establish a supply plan. Thus, stakeholders seem to have developed non confrontational relationships with each other. However, some of them remain cautious. On the one hand, members of COPACEL¹⁴ fear that the wood energy strategy of FNCOFOR¹⁵ and ADEME¹⁶, which promotes collective heat networks, leads to an anarchical raw material market. On the

¹³ CEPI, Sustainability Report, 2007

¹⁴ Confédération Française de l'industrie des papiers, des cartons et celluloses

¹⁵ Fédération Nationales des Communes Forestières

¹⁶ Agence de l'Environnement et de la Maîtrise de l'Energie

other hand, Environmentalist organizations have pressurized foresters, public authorities and papermakers into protecting biodiversity and soil quality when planning the supply of wood.

In Aquitaine, the purchase IR has been quite stable over time. Informal relationships have limited conflicts over the use of forestry resources. Therefore, this equilibrium is fragile because 90 % of the resource is used by local wood companies and all the economic actors are interdependent. If one part of the system changes, the whole system is disrupted. From that perspective, the increasing demand for wood energy is considered as a threat for papermakers but also for wood-based panels makers and sawmill operators. The *Fédération des Industries du Bois d'Aquitaine* (FIBA) supports the papermakers and lobbies on local authorities for controlling wood energy development in Aquitaine. Papermakers are the dominant actors of the forest-based sector in Aquitaine so they have easily convinced all the stakeholders that what is good for the paper industry is good for the whole sector. The aim of the papermakers in Aquitaine is to lock in the potential of Maritime Pine biomass. During the elaboration of the Aquitaine's climate plan, all the stakeholders agreed on the fact that the development of wood energy mustn't be in competition with other parts of the forest's industries. It follows that papermakers are involved in wood based cogeneration in order to dominate wood energy policy and promote their own preferred path of development.

3.2 The re-institutionalization of the Purchase IR

The implementation of the CRE biomass project in Aquitaine and related evolutions of the papermaker's activity have engendered a re-arrangement of the purchase RI.

The supply plan

As mentioned above, public authorities have forced the papermakers to make a supply plan to meet the CRE contract. In other words, they have to plan what kind of raw materials they will use in the cogeneration process. The objective is to avoid conflicts between firms over the supplying of wood.

The companies analyzed in our two cases studies plan to supply the cogeneration process with wood residues like black liquor, bark, branches and stumps –ones which have not been processed. For the first time the public authorities are involved in the regulation of the industrial development through regulating the capacities of the forest's resources. This regulation is carried out at a regional scale and is under the control of the *Prefet* (the public authority representative in the *Région*).

Moreover Smurfit Kappa Factice and Tembec Tartas have planned together the stumps supply. The stumps salvage values the forest economy and provides resources to cogeneration but it has to be planned according to the soil disturbance and its regeneration. However, the storm of January 2009 had let much wood on soil. In so doing, the stumps purchase is no longer a supply issue but it will be again when all forest would have been clean.

The biomass plan CRE thus highlights an important evolution of public-private linkages. The CRE stems from a policy of decentralized electricity production. From now on, papermakers are no longer only producers of industrial goods but also producers of services – services for the State. Thus, biomass policy is not only a de-institutionalization process but also a re-institutionalization one. First, papermakers have consolidated their own position by forbidding the entrance of new rival actors (institutionalization) in the changing economic and political environment that the EU and French State has sought to create (de-institutionalization) (see 2). By being producers of RES-E, papermakers change supply within the forestry system. In the place of the State, papermakers have become new providers of

services (re-institutionalization) deeply inscribed in a sustainable path –they provide green energy from biomass harvested in forests managed according to certification schemes. However, the recent Klaus hurricane (2009, January) has already modified this wood supply plan. Papermakers are going to use first and foremost the wood fallen during this storm. The hurricane destroyed many plantations. Trees from those plantations were too young and/or too damaged to be used as inputs in industrial processes. As they cannot be used for their initial destiny, they have lost their value. In this context, papermakers will benefit from an important and cheap resource over the coming years. But they also have to plan a supply strategy for the medium term because local forests will experience a trough in their capacity to supply local firms. Indeed, this event shows just how uncertain the long-term planning of supply is in this industry.

Prospective questioning: adapting short-rotation forestry to climate change

Biomass cogeneration could entail the development of short-rotation forestry and, consequently, forests owners and foresters will have to protect themselves with sound supply contracts. Forest owners have to face climate accidents (the hurricanes of 1999 and 2009, drought in 2003) in a difficult economic conjuncture. Moreover, they have to adapt climate change to new planting strategies. Mitigating climate change implies planned adaptation of forestry to climate change with pine, eucalyptus and poplar plantings. “Planned adaptation involves redefining forestry goals and practices in advance in view of climate change-related risks and uncertainties.” (Bernier and Schoene, 2009). South West France’s Forests Owners have traditionally grown maritime pines for long forestry rotation (40 to 50 years) and to produce both quality timber and industrial wood. Short rotation (less than 15 years) only industrial wood is less risky but the owners have to secure their respective outlets through long-term contracts. Adapting and mitigating climate change in a changing industrial environment (with high demand for energy wood) will imply redefining the forestry industry’s economic paths and, as our case study has shown, re-institutionalizing the markets and relationships between papermakers and forest owners.

However, biomass cogeneration also belongs to policies which aim at mitigating the effects of climate change. Indeed, by taking up the opportunity offered by short-rotation forestry, the CRE policy of mitigation joins up with strategies of adaptation to climate change. As seen previously, short-rotation forestry makes actors able to protect themselves from climate accidents (at least to some extent). Moreover, many studies have highlighted the potential of short rotation forestry in stocking carbon.

Biomass cogeneration and new trans-industry links

Finally, the Forestry industry’s new purchase IR also highlights the new trans-industrial links caused by CRE and RES-E. Biomass cogeneration makes actors value wood and biomass wastes. Until cogeneration entered the tendering system, these wastes were only reused in the paper-making process. Unless paper production needed all the barks of the trees involved, they were stocked as wastes without value. The tendering system of the CRE has made Tembec Tartas self develop cogeneration and sell electricity by self investment and learning in the development of cogeneration. But in another way Smurfit Kappa and Dalkia (a provider of energy to businesses and local authorities) have also gone into partnership (localization into the firm and financing). They had already been negotiating a partnership since 2000. This early negotiation, in the rise of SFM and certification schemes, demonstrates the strategic interest for such a plan (security and green energy). Indeed, both parts of the new policy have led to such a large-scale project within France. Smurfit Kappa Factures has increased biomass

cogeneration and secured its electricity purchases. Within the frame of this agreement, Dalkia will provide 200 000 tons of biomass from the Veolia Propreté (a main actor in environmental services and wastes collection). Dalkia and Veolia Propreté belong to Veolia Environnement. They could now value the biomass collected. Biomass cogeneration values these wastes and makes three isolated sectoral actors work together.

This Smurfit-Kappa Factice and Veolia trans-industry link highlights an example of collective action which grounds and reinforces their political work aimed at institutionalization, re- and de-institutionalization. This collective work has made Smurfit-Kappa able to escape from its own sectoral issues. Indeed, such a strategy has allowed them to focus on their own political work to produce their own politics of industry regarding public intervention (re-institutionalization).

From this external dimension, the political work has inscribed Smurfit-Kappa Factice in trans-industry IO in order to guarantee the durability of its new “green” industrial path regarding to the EU sustainable objectives (SFM certification schemes and RES-E green certificates) and the global competition.

CONCLUSION

This paper has been centred upon two main challenges of the climate policy for the Pulp and Paper Industry: First, industry and power plants have started to develop renewable energies policies as a RES-E. As a localized RES-E, biomass makes papermakers able to escape from the dependence on fossil energies and on the volatility of their prices on the one hand, and on the other to meet the sustainable goals of climate control and energy supply. Second, this case study highlights the strategies of papermakers focused on high value added paper (economical and ecological values) and skill-demanding products. While delocalizing to developing countries the production of non value-added products, in Europe they have not only focused on specific types of papers, board and skills, they have also developed bio energies and bio-refineries. Indeed, they are currently investing a great deal of faith in the development of biofuels. This second challenge draws how papermakers escape competition by price and/or products to enter competition by green products following a “green industrial path”.

This case study also highlights the importance of conceptual development. Multilevel governance does not appear adequate as a concept for studying the politicization of such an issue. States no longer implement their rules but negotiate them with private and collective actors in order to adopt various tools of regulation more adapted to the globalization. The actors concerned have not developed their political work within a clearly defined hierarchy of actors, rather they have sought to escape such ‘levels’ because they seem unable to provide satisfactory decisions. In so doing, it is important to apprehend the relationships between actors as ‘orders’ within which governance and the decision making process across EU has taken place.

In fact, studying PPI as orders makes us understand the change of industrial path as a process of politicization. In being inescapable actor of the forest, wood and paper system, papermakers highlights the intra-industry political work indeed by institutional change. From that perspective, this institutional change exacerbates the local foresters’ dependence to the papermakers. The purchase IR describes the dominant (papermakers)/dominates (local foresters) relationship involved by changes in forestry (short rotation and species). In others words, adaptation to climate change does not mean a passive adaptation following the prospective about the climate variation by region. Forestry will follow industry demand for

specific species according to competitive rotation. Change is not only inferred by law but by its interpretation by industry, which one is strengthened by the general use of private tools in regulation. In the French tendering system of RES-E from biomass, public regulation does not appear as a cause of an industrial change, but as an accelerator of it.

Either this paper focuses on the purchase Institutionalized Relationships (IR), it also brings some elements to understand change in the commercial IR. RES-E is not a strategy aim but one of its tools. Already engaged in certification schemes for SFM, in norms of corporate societal responsibility, papermakers aim to produce paper with green energy in order to reduce its carbon footprint to zero. In so doing, PPI works to change its commercial IR in order to bring actors of the chain of custody to promote to consumers green papers and boards. In the global competition, paper makers have found refuge in high value added products and the “green industrial path” appears now the future competitive way of European PPI.

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