

Institutional environment and credibility of governance structures of public policies. The case of the policies of promotion of renewable energies.

**Dominique FINON,
CIREC,
EHESS et CNRS, Paris
et
Yannick PEREZ,
GRJM-ADIS,
Université de Paris Sud 11**

23th august version

Summary

By recourse to the “Northian” approach of policy making and the veto players theory (Macintyre, 2003; Tsebellis, 2002), this paper compares the “credibility” of three policy types of promotion of renewable energies in electricity generation and the associated regulatory devices which have been recently implemented by industrialised countries. The stake of the credibility is the necessity to guarantee the government commitment during the period of return of investment of such units developers. The credibility reflects a compromise between the stability of the policy which, for the commitment school (Levy & Spiller, 1994; Weingast, 1995), is guaranteed by the protection from the governmental discretion on one side, and the flexibility which, along with the decisiveness school (Macintyre, 2003; Haggart, 2000), results from the need of reactivity to induced changes (here the increasing returns of adoption of renewable energies units) or exogenous shock (such as the electricity industry reforms or electoral changes with arrival of new veto player).

So the analysis is set on two pillars: first the characterisation of each device in terms of stability for guaranteeing the preservation of the governmental commitment concerning the former investors in RES units in relation to endogenous limits and exogenous shocks which could make intervene veto players, and second the characterisation in terms of flexibility for managing these uncertainties and the opportunism of successive governments under the occasional influence of some veto player (the electricity utilities) or the new RES-E industry. After the characterisation of each device, we compare the role of different institutional environments, those of centralised type with unique veto player (France, UK) and those of decentralised type (USA, Germany, Spain) with multi-veto players but with marked differences between them for given some flexibility besides the stability that the multiveto player configuration is supposed to give to it.

The institutional environments characterised by a risk of discretion, can better succeed in creating credible governance structures by correcting the tendencies to discretion in increasing in the number of veto players, that reinforces the stability of public commitments. In a symmetrical way the institutional environments marked by rigidity had more problems to generate the credibility of the device because of the constraints that impede them to produce necessary flexibility.

Institutional economics have not yet been very concerned by the transformation of public regulations into new ones based on market mechanisms. When it does, it highlights the importance of the stability of public engagement in relation with the characters of their institutional environment. Such is the case of work on the transformation of the monopoly regulation in networks industries into new regulations based on market mechanisms and private property, like those of Levy and Spiller (1994) and those of Guasch and Spiller (1999). They analyze the regulatory change and its irremediable character by refereeing to an interpretative model which makes possible the analysis of the congruence of new regulatory design with the institutional environment overhanging it. They are based on North's (1990) and Weingast's works (1995) and empirical contributions from reforms evaluations led by the World Bank (World Bank 1995; Shirley ED, 2002). Based on the idea that the institutional environments are given in the short run and that the governance structures allocate *ex-ante* a certain number of veto rights, the institutional design must mainly allow the stability of public commitment to incentivise the private investment.

One will discuss this conclusion here by developing the idea that this credibility must be related not only to the stability of the structures of governance, but also to their flexibility, which requires to find a good balance allowing the realization of assets which are specific to the public policies (Williamson, 1999). Starting from Tsebellis (2002) and Macintyre (2003), our analytical framework in terms of structuring the veto points and problems of governance, makes possible the analysis of the problem in terms of veto players. According to Tsebellis (2002, p 2): "*« in order to change policies (or a status quo) a certain number of individual or collective actors have to agree to the proposed change(e..). Such actors are veto players. Veto players are specified in a country by the constitution or by political systems »*". Our assumption is that the balance to be found between discretion and rigidity is contingent with the institutional environment of these governance structures.

To test this assumption, one will analyse the promotion policies of renewable energies in electric production which were developed in the OECD countries since 1990 in the context of electricity industries liberalization. The European Union countries have defined ambitious objectives which were formalized in a European directive by which they are committed seeking to develop such a production to reach a total share of 21% of their electric production in 2010 from a level of 13% in 2000 (EC, 2000). The introduction of support devices to such renewables energy production is close to the changes of regulations of the public service industries studied by the institutional economics. The former regulations answered the objective of institutionally organizing network industries in order to develop the offer in an efficient way under the constraints of public utility: obligation of supply, equal treatment and, recently, respect of the environment. The rationale of the support to Renewables Energy Sources for Electricity (RES-E), which is justified by the protection of the climate and energy security, lays in the uncompetitiveness of the technologies RES-E compared to the traditional means of electric production in terms of private costs for three reasons: (i) their technical and commercial immaturity at the beginning of the policies, (ii) the absence of scale effects on the capital costs and administrative and transaction costs of projects, because of their small unit size and (iii) their cost of insertion in the centralized electricity system with high costs of connection to the network and, for some, the randomness of an intermittent and weakly programmable production (windpower, minihydraulic). Taking into account the non-stockability of electricity, this character decreases the value of the RES-E production on an electric market (Van Dijk et al., 2003,). The use of support devices finds a justification in terms of offer of a collective good, the stability of the climate in fact. This justification is reinforced by the joined effects of collective goods offer: energy security, induced industrializing impacts, local environmental protection by avoided emissions from ordinary electric productions. But these justifications cannot rest on an unchallenged rationalization: they are elements of a social game where a certain number of veto players could act for the creation, the consolidation or the reform of the RES-E policy, according to points of veto inherent to the institutional environment. RES-E policies and the more or less generous support devices to which they are associated are thus exposed to radical changes.

Put aside direct or fiscal subsidies to investment which are regarded as inappropriate beyond a certain level of technological maturation, there are three types of devices of indirect subsidies to the RES-E production units between which the governments can choose. They are all the three based on an

obligation of purchase imposed to any electricity supplier or distributor to ensure the indirect subsidizing of the production of kWh RES-E: guaranteed buy-back tariffs (known as feed-in tariffs or FIT in Europe), biddings for the attribution of mandatory contracts of purchase with pay-as-bid price, and finally a system of quotas of electricity "RES-E" imposed to suppliers combined with possible exchanges of green certificates. One can compare the transactional efficiency of these three structures of governance by isolating them from their institutional environment in an approach inspired from the Williamson's perspective and results of the transaction cost theory (Finon & Perez, 2004). But, if one takes into account the characteristics of the institutional environment where these devices would be applied, one has to reason in a contingent way and adopt a positive perspective based on the concept of credibility. The analysis of the devices in terms of institutional credibility viewed as a balance between engagement and flexibility, will be based on the one hand on the identification of the veto players in the various institutional environments of the considered countries, and on the other hand on the identification of the capacity of each regulatory device to face with its endogenous limits and with the exogenous shocks (political change, liberalization of electric industry).

In the first part one discusses the concept of a policy framing credibility of the action of decentralized agents which one will define like balance between stability of public engagements and flexibility. In the two other parts, one applies this analysis to the governance structure of promotion of renewable energies in electric production. One treats initially the choice between options in the design of RES-E institutional devices. One applies then the concept of institutional credibility to interpretation of the evolution of these devices according to the institutional environments in four European countries and to the United States which represent a relevant variety of them.

1. The credibility of governance structure: a balance between stability and flexibility

As it is the case of any environmental or sectoral policy, the ordinary politization of a public objective, its backing with ideological values, the superposition of finalities of various nature for the rationale of a policy which is the translation of these finalities, its justification with vague and discussed contours make more complex the design of regulatory devices and condition their selection and thereafter their evolution. From this politization, each institutional environment allows the implementation of this policy in a more or less credible way. The approach of North (1990) makes possible on this point to further analyse the modes of selection and evolution of the policies, by the formal processes associated to the electoral representation or by the informal processes like the habits and traditions.

By taking up his idea that the institutional environments are given in the short run, one can describe *ex ante* the rules of the institutional game of transformation of economic rules by the distribution of rights of proposal and participation in the negotiations aiming to the implementation of the ideologies and values overhanging (North 2005). So each stakeholder being entitled to take part in the negotiations for the creation of a new economic regulation -- North uses the general concept of "Rule" -- will try to put forward provisions which are favourable for them in terms of interests or values. The definition of new regulations and new policies thus concerns conflicts of interest and representations which cross the political process and lead to evolutionary compromises which depend on the balance of power between political forces and the governmental changes (Williamson, 1999).

This has three consequences. Initially, as the political arena is less competing than the markets of goods and services, nothing guarantees that the confrontation of offer and demand for a policy leads to the best possible institutional device (North, 2005). In the second place, the political process which, by nature, is rich of uncertainties, exposes to the risk of questioning a running policy after electoral changes and turnarounds of balance of powers and values. This political uncertainty limits the investments in specific assets which the investors are supposed to develop under the incentive of such policies. At this level institutional arrangements composing a regulatory policy can profit from legal consolidation when they depend on a law rather than on a decree. Purely legislative arrangements can involve the implementation of contracts with the public authorities of licence- or concession-type, or even of private contracts with

mandated operators designated by law, which provides an additional protection to those which carry out investments within this legal framework while profiting from the possibility of recourse in front of the courts. In the third place, the fuzziest justification of a choice of "Rule" and its rationalized contents remain, the higher their exposition to the risk of periodic readjustments, for lack of rationalised legitimacy, more the modes of application must be open and find self enforcement arrangements and institutional backings¹.

Credibility becomes the principal quality of these structures of regulatory governance. According to already quoted works of Levy and Spiller (1994) or Guasch and Spiller (1999), it is built primarily by the stability of public commitments, which it is necessary to discuss in economically and politically changing contexts, but also because of the endogenous limits of the policies to be carried out.

1.1. The concept of credibility in debate

The idea according to which the credibility of the governance structures remains mainly on the stability of public commitments in their specific institutional environment holds mainly with the idea that the institutional environments are given in the short run and that the governance structures allocate *ex ante* a certain number of veto rights. This leads to seeking the instruments and devices of the most stable possible regulation according to the characteristics of their institutional environment². The new "Rule" must be appreciated in its capacity to resist to the transformation of preferences of the main and most organised economic agents or political actors and the power of balances between them.

These authors then identify a merit order of the different types of institutional environment compared to the stake of credibility of any regulation. For them, the most stable arrangements are those inserted in a decentralised institutional environment which comprises many veto rights in processes of check & balances, with reinforcement by administrative procedures which define with precision the possibilities of transformation of the existing rules, and with the mean of recourse in front of independent and qualified courts of justice. The reference is the institutional environment suitable for the system of the United States.

The second type of institutional environment in term of arrangement stability is a system characterized by a specific legislation and supplemented by licences of private law allocated to operators in competition. This system does not offer the same guarantees of engagements stability, because it misses at the same time *ex ante* defined administrative procedures and courts of justice able to oppose to the executive and legislative powers' decisions. The reference in this second case is the institutional environment specific to the United Kingdom. These two systems are opposed in their principles to a third type of institutional environment where only one veto player has all rules transformation rights, because it is a situation where is easy to decide the introduction of a new regulation or a radical change of it, but where on the other hand it is difficult to guarantee the stability of public engagement.

The institutional environments which are characterized by several possibilities of checks & balances and allow the expression of several veto players dispersed in different institutional veto points (Parliament, courts, Regions, political parties, trade associations, etc.) offer a significant stability compared to a single veto player system³. Nevertheless this characterization of the institutional configurations which is focused

¹ Those can then take various forms like the self regulation (Brousseau, 2000; Glachant, Dubois & Perez, 2004), public-private partnership contracts like contracts of delegation of public utility (Saussier, 2004) or private contracts (Shirley & Ménard, 2002).

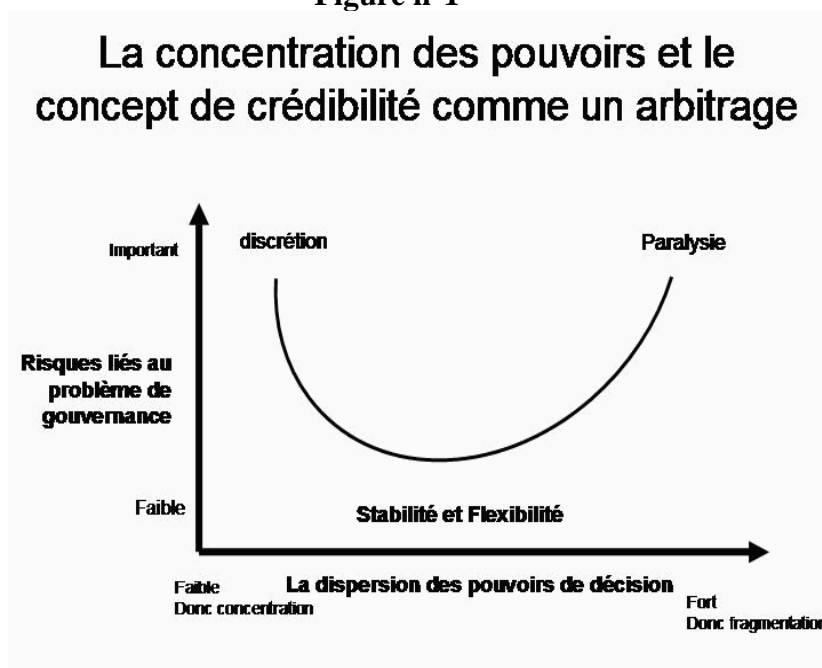
² They identify three basic means of the regulation to produce the transformation of network industries: the vote of a "specific legislation" which defines the new operating modes of the sector and the distribution of powers between the regulatory agencies and the operators; the mode of regulation by "administrative procedures" which is rather specific to the United States, which consists of a whole of formal procedures of decision-making that must respect the agencies, and which include the possibilities of appeal in front of independent courts; the "licence agreements" which has been developing in the Nineties as the example of the British reforms shows it .

³ We could elaborate briefly a connexion between the analysis of veto points and the characterisation of the institutional endowments of a country. The level of stability in the allocation of power to define public policies and regulate a sector depend upon the characters of institutional environments. Their differentiation between them will include three criteria: 1° the

only on the stability of public commitment runs up against the traditional problem of the *ex-post* adaptation needs of any governance structures vis-à-vis uncertainty and parties' opportunism. Its capacity of adaptation to the contingencies is put to the test by the risks and the uncertainty of the unanticipated behaviours. Two types of uncertainty related to the behaviours are considered in the transaction cost theory: the strategic uncertainty which reflects agents' propensity to the opportunism, and the innocent uncertainty which derives from limited rationality. The specific case of reforms and new regulatory devices results in taking into account a third form of uncertainty, institutional or regulatory uncertainty resulting from the choices of the Government, the Legislator and the Regulator on the political market of which the foreseeability of the results is less than on the economic markets (Saleth & Dinar, 2004). This last form of uncertainty is conditioned by the capacities of intervention available to each actor, given the institutional device⁴.

From Macintyre (2003), Tsebellis (2002) and Perez (2002), one can build an analytical framework of the problems of governance and structuring of decision-making powers. According to the number of veto players which reflects a situation inside the institutional environment, one identifies two opposite problems of governance: the discretion which is well studied in the literature based on the need for commitment (see work of what Macintyre named Commitment School with Kydland & Prescott (1977), Levy & Spiller (1994 & 1996), Weingast (1995)) on one side; the paralysis which is studied by the scattered literature on the need for reactivity of the public decisions (see what Macintyre named Decisiveness school, Haggart (2000), Ackermann (2000), Cox & McCubbins (2001)) on the other side. Within this framework, one defines "credibility" as a balance to be carried out between discretion and commitment, between discretion and paralysis (one will prefer in the following the concept of rigidity to that of paralysis) in each institutional environment with its particular characteristics of dispersion of the veto powers to be identified precisely.

Figure n°1



political regime: unitary states with « executive dominance » or with «parliamentarian dominance » to be opposed to federal states with also these two respective dominances, but also the regional and local powers in some political domains; 2° the jurisdictional regime with the rule of law, the influence of courts, the existence or not of administrative law and the possibility to create laws by decree. A regulation will be better protected in parliamentary unitary states than in unitary states dominated by executive powers. In the federal states the rights of the decentralised public authorities and regulatory powers are protected by constitutional order and therefore cannot easily be altered by the central authorities. In the States with strong powers given to courts for challenging the regulatory decisions, a former regulation which has promoted private contractual relationships in view of a public policy goal is protected by the permanence of these relations.

⁴ It appears in response to the changes of rate of economic growth, with technical progress on new technologies of production, with the modifications of the social preferences and the electoral changes.

Accordingly, credibility is the result of an arbitration between, on the one hand, the need for clear and stable public commitments, and on the other hand the need for flexibility of the structure of regulatory governance to correct the errors of rules design and manage their endogenous limits, to also adapt to the exogenous shocks. This flexibility should not be the reflection of opportunist behaviour of one of the stakeholding parties. In fact any transformation of the rules of the game to solve an endogenous problem with a policy must be carefully interpreted. We have to establish if it is for allowing the resolution of the problem or if it reflects the opportunist behaviour of one of the stake holding parties⁵.

2.2. The protection against opportunism

Under assumptions of opportunism and limited rationality which structure the problematic of the "new institutional economics", the constitution of assets specific for a particular policy induced a form of dependence which the selected structure of governance must be able to coordinate effectively. The institutional environment is a determining factor of the stability of this structure of governance, but also to allow its flexibility in time. In the case of sectoral reforms or new policies implying the creation of a regulatory device, like here for the devices of promotion of clean and environmental friendly technologies, the impossibility of *ex ante* envisaging all the problems and their concrete solution raises a need to adjust the execution conditions of the mutual obligations of the parties concerned with the political and economic transactions around a policy. So, as it is in the definition of incomplete contracts, we have to anticipate the necessity of *ex ante* gradual adjustment of the rules of the device by an approach which is adapted to each problem. We have to anticipate the protection of investments already carried out in the eventuality of adapting the device design, or more its replacement by a new one. Assumption of opportunism makes possible to avoid the naive readings of the operation of regulations, where the co-operation between parts must be built and does not result from a "natural order". From this point of view, the implementation of a new regulatory device in a long run perspective raises problems which exceed the issue of its stability. It acts like an enlightener of problems of internal consistency and inadequacies with its institutional environment.

The need for adaptation under the effect of the institutional learnings (and in the case of policies promoting innovation under the effect of increasing returns of technological adoption), the need for resolution of the conflicts of interpretation of rules and that of correction of the existing loopholes in the device constitute many shelves that the new structure of governance has to manage while adapting rules without the stakeholders which invested or are investing in innovative equipment are estimated damaged by the change of rules. Thus, after the stage of the production of the Rule, putting to the test of time begins by confrontation with its endogenous limits, with the defects of adequacy with institutional environment and with the exogenous shocks. They run counter to its normal operation, weaken the political compromises around the regulation and incite the opportunism of the agents in position of veto players. It is thus a question of designing mechanisms which limit the exercise of this opportunism.

One can refer with this intention with three dimensions of the trilateral relation established between the agents around a regulation of a network industry, defined by Spiller (1993), Levy and Spiller (1994) and Guasch and Spiller (1999): the dimension of relation between the government which, to simplify, gathers all public authorities and the companies, that of the relation between the companies and consumers, and finally that of the relation between the special interest groups (of which the consumers' representatives) and the government. One finds these dimensions in the case of the promotion of renewable energies in electric generation, the policy in question becoming a new floor of the regulation of electric industries centred on the environmental protection.

In the first dimension of the regulation of a network industry, the stake is to limit the governmental opportunism which can be expressed by a relative or absolute expropriation of the quasi-rent resulting from the specificity of assets which were developed within the framework of the institutional device

⁵ It can be the government, or one of the lobbies which intentionally amplify the defects of a mechanism of the device of regulation concerned or which is seeking additional rent.

implemented. Conversely there is also a risk of capturing the regulator by the developers of assets which can result in undue revenues. *Vis-à-vis* the first risk, *ex-ante* guarantees can be asked for, but they must also be accompanied by supplementary *ex-post* measures, because the fear of the discretionary intervention of the State and the aversion to the regulatory risk are realities such as simple *ex-ante* guarantees are not sufficient (Moe, 1991; Moe and Howell, 1994; Moe and Cadwell, 1999). In the case of promoting the RES-E considered here, which rests on regulatory devices ensuring the investors a remuneration stable and higher than market prices over one guaranteed period, there is a risk that the State expropriate the “environmental quasi-rent” of the investments carried out under the influence of hostile veto players to the device, either by degrading the conditions of indirect subsidisation considered as too favourable, or by removing straight the device.

The second dimension of opportunism is expressed in the relations between the companies and the purchasers. In the case of network industries considered by Levy and Spiller after the reforms of liberalization, the possibility of the companies to using their local market power while being protected by the barriers to entries creates a significant risk of opportunism with respect to consumers by the raising of prices largely above the cost price. In the case of the promotion of the RES-E considered here, the promoters of projects can want to extract the maximum rent in their sales of green electricity to the mandated purchasers (the suppliers) within the framework of the device in place, in particular by preventing a refinement or an adjustment of the rules of support (for example by differentiation of sites, of technologies or by decreasing the support as far as the increasing returns of adoption play).

The last dimension of opportunism relates to the requests for protection of the various stakeholders or interest groups to the government. Requests for governmental protection are not only addressed by the consumers. Electric industry was in various ways instrumentalized to serve a great number of political, social and economic objectives rather far away from the only effectiveness of the supply (Joskow, 1991; Surrey, 1996; Finon, 1997; Newbery, 1999). The interests associated with these policies (for example those of the producers of nuclear equipment in a country strongly engaged in the nuclear option) can ask for protections in many manners. In the case of the promotion of the RES-E, the upholding of advantageous regulatory device is obviously the subject of the pressures of the environmentalists and the industrial constituencies developed around their progressive development.

The analysis in terms of veto players and points of veto must refer to a characterization of the institutional environment: a type of agent which cannot act on the considered regulation and the Rule in a country because of characteristics of the institutional environment could be found in position to influence this one in another country because of environment particular to this one. It must be also carried out in dynamic terms because the regulation itself and its object know endogenous evolutions: one sees veto players indeed emerging under the effect searched by the creation of the device and being opposed to any change or any evolution which would be against their interest.

2. The choice between institutions of RES-E promotion

The promotion of renewable energy sources (RES) is the matter of ordinary politization of any public objective. Its partisans lean with ideological values and economic rationalizations *vis-à-vis* the other actors in favour of centralized energies based on large scale effects like the nuclear energy. These ones lean back with economic rationalizations and ideological values opposed to the RES rationales, and they were a long time closer to the governments than the first. Where the nuclear power development was stopped by the local and national oppositions, RES-E policies then met more legitimacy than where it could be developed without major difficulty. But, though it is, the justification of RES-E policies preserves controversial elements.

This reality makes complex the design of the RES-E devices and conditions their selection and their evolution according to the priority granted to the protection of the climate by the veto players (§ 2.1). It is upon this evolution the stake of credibility of the adopted device carries. The governments have the

choice between three types of devices whose designs will be specified (§ 2.2). The selection criteria will be then specified, by taking into account that the selected device must respect a principle of adequacy to its immediate institutional environment, i.e. that who frames the regulation and organisation of electric industry in which the device is supposed to work (§ 2.3).

2.1. The controversial justification of institutions of RES-E promotion

Let us consider the public choice between several types of instruments for the protection of the climate which are focused on the promotion of renewable energies. The various limits of the economic rationalization expose to their questioning. There are initially major dissensions on reality of the risks and the future impacts, on the mode of action and the interest to have a specific treatment for the promotion of certain "green" technologies like the RES-E or efficient energy utilisation. Some, like Newbery (2002), defend the idea that one could do without particular devices on these technologies by correcting in a uniform way the imperfections of market by a high taxation which reflects the value of the avoided marginal damage. The search for compromise on the climate protection led to policies targeted on quantities, like the emissions quotas, or with particular devices targeted on the promotion of clean technologies like "renewable energies", because they are more easily acceptable. Others, like the former European energy Commissioner (De Palacio, 2003) and French industry ministers (Assemblée Nationale, 2003), consider that all non CO₂ emitting technologies, and in particular nuclear power, must be considered by taking account their advantages relatively to the RES-E. Those are thus exposed to the permanent risk of political contestability because there are no unanswerable economic and social justifications, as it is less the case for policies alleviating local pollution.

The implementation of a new «Rule» in this field however reserves reinforcements from a number of other public policies objectives than the protection of the climate. In the set of justifications, the set of collective goods to offer can be complemented by national energy security and local environmental protection because units RES-E avoid SO₂ or NO_x emitting electric productions. The rationale of their development can also include stakes of industrial policy such as the development of a RES-E construction industry. The European States which have adopted after 1995 the most generous RES-E device based on feed-in tariffs (Germany, Denmark, Spain) are not by chance to the rank of leaders of the world industry of wind equipment, their national industry having been able to benefit from the regulatory device to be in position of first movers. But, in all the cases, governments pay attention to the cost of the RES policy for the economy, even if any of these devices have no impact on the public budget. (Indeed for a government their attractiveness relies on the fact that the overcost of the RES-E development are paid by the electricity suppliers and then after pass-through on the final buyers).

But the commitment of the governments to promote RES-E and its translation in a regulation are subjected to the risk of change in the preferences of the veto players and the government's weightings of preferences between these various objectives. The absence of non contestable economic and social rationalization creates a significant problem in term of "credibility" of the devices.

2.2. The design of regulatory device of RES-E promotion

The public objective, let us recall, is to incite private agents to invest in RES-E equipment which present an overcost compared to the centralized means of electricity generation by creating a structure of governance which protects them from the risk of hold up and allows rentabilization of the equipment. In the Seventies and Eighties, the principal tool used by governments was a direct subsidy or a fiscal one to investment, but the experience shows two difficulties: the risk of opportunism of the investor (once the subsidy paid and the equipment commissioned, its owner is not encouraged to maintain it in service) and, vis-à-vis the need for a stable policy to allow time for the technological learnings, the permanent risk of suppression of the subsidies from the public budget which is a well-known risk. In the Nineties, one designed RES-E devices in which the support is directly connected to kWh produced by the new units. They constitute regulatory contracts in the sense of Goldberg (1977) which impose an obligation of purchase to appointed actors and make it possible to producers RES-E to profit from prices higher than those of "ordinary" electricity.

Within these second generation RES-E policies, in order that the agents which are the most engaged by the political transaction of RES-E development with the public authority realize their investment; it is necessary that two ex-ante guarantees are brought to them for the return and the profitability of their investment (Langniss et Wiser, 2002; Finon and Perez, 2004):

- the one against the risk of opportunism of the public authority and more largely against the risk of change in the institutional environment under the effect of the intervention of veto players;
- the other against the risk of opportunism of the purchaser of green electricity, and it is what the codification of the regulatory contract by the design of the device is supposed to guarantee to him⁶.

At this level, two other sets of institutions influence the implementation of RES-E policies which is not only conditioned by the level of the incentives to invest and the credibility of the regulatory devices. It is also conditioned by two rules which are external to them. The first is related to the type of institutional regime of electric industry. They are the economic rules of integration of the new RES-E units in the electric systems, whatever is the mode of regulation, monopoly or competition mode. These rules relate to the mutualisation of their cost of connection of decentralised and small units to the network and that of the adjustment costs of the weakly programmable productions by some of the RES-E units (in particular the most popular ones the windpower units). The definition of these rules can be an efficient means of action of veto player to counter or contrary encouraging the RES-E. The second rule relates to the procedures of authorization of installation which give margins of action to new veto players (such as the territorial administrations or the groups of local opposition). They can have a determining influence because a device which is theoretically effective in terms of installation of a significant number of units RES-E (for example the feed-in tariffs) can see its effects completely countered by the existence of penalizing rules (such as in France since 2001).

The governments can implement three principal devices between which they choose according to a principal criterion which can be either the maximization of RES-E capacities development, thanks to credibility of the device and the remuneration that they offer to the RES-E developers, or the control of the cost for the community and the revenues granted to producers RES-E (Perez et Finon, 2004).

- The first device is the feed-in tariffs (FIT) system. It rests on two elements: an obligation of purchase imposed to the distributors-suppliers of electricity for the kWh produced by RES-E producers located in their area of service on the one hand, and a buy-back tariff decided by the public authorities and guaranteed over one long duration (15 years in France and Germany for example) on the other hand. These prices are defined by reference to RES-E cost prices and according to technologies in order to not favour the most mature technologies. The financing of the overcost for the mandated companies can be covered in three ways: a rise of the prices of all the electricity sold by the distributors subjected to the obligation of purchase (as Germany until 2000 under the regime of distribution monopoly), a reimbursement by a fund financed by a tax on all kWh transferred by the national grid (as in France), or finally a tax reduction on RES-E electricity revenues. The overprice is thus paid by the whole of the electricity consumers in the first both cases, by the taxpayers in the third case. The public commitment can be consolidated by an explicit contract between the RES-E producer and the mandated purchaser (for instance the distributor) to protect it from the possible political changes (case of Spain and the United States), but it can not exist any contract, except technical conventions concerning the secondary duties of producer (conditions of connection, etc). This combination of purchase obligation and guaranteed price constitutes the ideal framework for any RES-E producer-investor in the search of a

⁶ Opportunism, as a main assumption of behaviour of the agents, is one of the key-concept of the TCT to explain the need for framing the development of specific assets by contracts or the hierarchy, but also the difficulty in designing contracts: to precisely consider the clauses of adjustment and renegotiation, to specify the methods of arbitration. The opportunism of the party which is the less engaged in the transaction can encourage it to leave the contract if the conditions of market open to him prospects for profits higher than the costs of exit of the contract. One also speaks about passive opportunism when the general conditions of market lead the agents buying the production of a producer to pay below the level which allow the recovery of the capital of the latter.

guaranteed cash flow current. The principal risk for the investor is related to the credibility of political commitment in the long run: the guaranteed prices can be modified by decree or the device replaced by another within the framework of a new law, without guarantee of prolongation of the former support to the new installed RES-E units.

- The second device is the competitive bidding for long term contracts. It allocates mandated purchase contracts at guaranteed price to candidates to investment in units RES-E. When adopting this device the government seeks to achieve a goal of RES-E capacity with a definite technology mix to a horizon of ten to fifteen years, while proceeding by round of bidding at interval of one to two years. It dissociates various technologies in the process of selection. Like the precedent this device includes an obligation of purchase to the distributor in the area where a unit RES-E is installed. Each RES-E producer is paid at his pay-as-bid price. The system thus combines a programming principle and a market principle for the allocation of contracts, the long run competition bearing on the proposition of buy back prices of kWh in the bidding. The proposals are ordered by increasing prices and selected up to the capacity put in the bidding. Compensation of the overcost for the mandated purchasers is done in the same way than in the feed-in tariffs device. It will be noted that the regulatory contract binding the public authority to the mandated purchasers is not defined in advance in price at the opposite of the FIT system. The call for tender is carried out at the time decided by the public authority, this discretion impeding possible long anticipation for project developers and equipment makers, although the policy has long-term goal in terms in terms of capacity installation and the learning and project constraints would be overcome by long run anticipation. The inciting character of the device for the investment is also attenuated by a complementary rule: the definition of a limit of cost cap by the ministry or the sectoral regulator, which reduces ex ante the prospects for profitability of the projects which need high risk premium and compensation for high preparation cost. It will be noted also that the system offers a guarantee to the investor by the private contract that are signed between the mandated purchaser and the new RES-E producer.
- The third device is the exchangeable quotas (Berry et Jaccard, 2001; Langniss et Wiser, 2003). It is known as Renewable Portfolio Standards in the USA, Renewable Obligation Certificates in the UK and Green Certificates in some other countries of European Union. It is based on the mandate of increasing quotas of renewable electricity placed upon clearly designated actors (in general the electricity suppliers in competition or the distributors). RES-E production is developed under two distinct ways of remuneration, the ordinary sale of electricity at market prices and the sale of certificates to actors subjected to the RES-E quotas. Sale of certificates thus acts like a premium with the production of green electricity in the respect of the competitive game between participants in the electric market. To function, the device indeed requires a whole of rules and institutions which will consolidate its operation:
 - the clear designation of the agents subjected to the quotas of green electricity,
 - the designation of the eligible installations,
 - procedures of certification and control
 - the definition of a penalty for non-observance of the quotas which will constitute a ceiling price for the certificates market in the event of tensions on it,
 - the creation of a certificate exchange with rules such banking and borrowing.

The regulatory contract between the public authorities and the mandated purchasers is thus slightly constraining. It imposes the quota with a programmed increase and a penalty for non respect, but it does not impose a type of arrangement between RES-E producer and obliged purchaser and a fortiori a price. So the agents subjected to the quotas have the choice between three solutions to respect them: to build and produce themselves the mandated quantity of RES-E, to negotiate long term contract at guaranteed price with specialized producers who will be incited to invest, or to buy each year the certificates corresponding to part or the totality of their quota. One must note the need for a foreseeability of the progressiveness of the quota on the long term and the need to maintain a progressiveness in the long term in order to sustain the certificate price and limit the risk of price fall for lack of certificates demand in order to secure the return on investment and attract the

developers of RES unit⁷. One will also note the importance of the regulatory risk on the certification rules of technologies, because the introduction of an eligible technique would increase abruptly the number of certificates available and make fall the price of the certificate.

2.3. The choice between RES-E devices

In a given country, the choice between devices is directly related to the hierarchy of preferences of the veto players: namely the environmental efficiency (i.e. installed capacity to be incited with a device), the economic efficiency and the associated redistributive effects of the device, and finally the level of adequacy with the type of competitive regime of the electric industry of the country⁸. Thus a government strongly engaged in the promotion of the RES-E will privilege the criterion of environmental efficiency and will choose the system of feed-in tariffs. By doing that, it meet a secondary goal of industrial policy by allowing the emergence of a local equipment industry. The limit of this system is its high cost if it meets success and RES-E capacity reaches a certain level of development, after which the policy becomes disputed. The acceptance of this cost and the level of contestation of the feed-in tariffs is obviously related to the political configuration, as shows its adoption in Germany in 1996 and France in 2001 by Left-Greens coalition.

For a government anxious to find a balance between an ambitious development of the RES-E and the control of the collective cost, the search for economic efficiency also intervenes in the choice of the device. This search for balance then results in preferring a monitoring by the capacities to be reached and some form of competition aiming at controlling the costs. Such is the case of the use of the bidding device in the United Kingdom until 2000 and in France of 1995 to 2001. Such is also the case of the adoption of the exchangeable quotas in a number of European countries under the overhanging market ideology in the energy industries.

Table 1. National choices between institutional devices for the promotion of RES-E

	Feed-in tariffs (or assimilated)	Bidding	Exchangeable quotas
Selected Countries	Germany (since 1995) France (since 2001) Spain (since 1995) USA (up to 1992)	UK (1991-2001) France (1996-2000)	USA (17 states in 2004) UK (since 2002)
Other countries	Portugal (since 2001) Ireland (since 2004) Italy (up to 2002) Denmark (with defiscalisation) Netherlands(with defiscalization)	Ireland (1995-2003)	Italy (since 2002) Belgium (since 2003) Sweden (since 2004) Austria (minihydro only) <i>Candidates:</i> Denmark, Netherlands

Finally the degree of liberalization of industry will influence the arbitration between the three criteria. A high degree of liberalization results in the choice of devices being able to be associated to market operating modes and competition principles. It determines also the veto players' margins of action because of the need for institutional adequacy between the new market rules of electric industry and the regulatory device of the RES-E. The reforms of liberalization of electric industries are carried out according to different schemes of horizontal de-integration of the production and vertical separation

⁷ The stagnation of the quota beyond the ten years horizon can make fear a lack of certificates demand, and so an overproduction which would reflect in a price collapse. One saw these fears being expressed in the United Kingdom where it was not initially envisaged to go beyond 10, 4% after 2011.

⁸ It is significant in the context of reforms of the last fifteen years in electricity industries.

between activities of network and supply, depending upon the national cultures and the initial institutional state of electric industries (Glachant and Finon, 2002). The activities under competition, the production and the supply, must be in theory separate from regulated activities in natural monopoly. Downstream, a thorough horizontal de-integration leads to a deterritorialisation of the supply of electricity which was formerly closely related to the service area of the public utilities. For the devices of promotion of the RES-E, this change questions the possibilities of funding the device on a rule of purchase obligation.

The first two devices, feed-in tariffs and bidding, rest on the obligation of purchase put upon regional and national distributor, which is valid with a total monopoly regime or even a partial one with a large segment of captive clients, but not in the mode of complete competition where in principle the supplier is not related any more to a network and a area of service. However these two devices can continue to function in institutional environments where the companies remain integrated and can preserve a strong territorial base of captive customers on which the overcosts of mandated purchase of RES-electricity can be transmitted, as it is the case in Germany and France by opposition to the United Kingdom where the unbundling was thorough.

In conclusion, the pursuit of several political objectives led to the definition of devices of promotion of RES-E the function of which is to offer incentives to invest in RES-E units and to offer guarantees of stability, taking into account the duration of implementation of the projects and the lifespan of the equipment. Generally speaking, the absence of incontestable economic and social rationalization for specialized policies in a sectoral field, which reflects in fact the absence of large social consensus, creates a significant problem of "credibility" of the devices which are selected to develop these policies in each particular field. It is the case of the RES-E promotion. It puts them at the mercy of the intervention of veto players in two circumstances: a change of balance of powers following (or reflecting by) an electoral change, but also the endogenous limits of the existing device which weaken the former compromise. It is the case if there is a too great success of development of RES-E equipment, or conversely of the relative failure installations of the device. It is also the case if, under the increasing returns of installation of the RES-E techniques by the learning, the device allows increasing rent to the successive developers of RES-E units.

3. The construction of the credibility of RES-E policies: a balance between rigidity and discretion

The analysis of the devices of RES-E promotion in terms of credibility is carried out along two axes. The first seeks to identify the degree of commitment of the government. The second seeks to determine and identify the capacity of flexibility that each structure of governance of promotion of the RES-E presents vis-à-vis its endogenous limits and the exogenous shocks. Each device has indeed a capacity of different intrinsic adaptation which we analyzed elsewhere (Finon and Perez, 2004). A mode of consolidation is the signing of private contracts between the investor in RES-E and the mandated purchaser, which introduces the legal protection of the recourse to courts. But if it does not make it possible to avoid blocking on the level of the structure of governance, a political intervention must allow a revival of the RES-E policy by a reorganization of the regulatory device or its change.

This capacity of taking the RES-E policy in hand can be analyzed in term of veto player, in order to identify the problems of governance – paralysis/rigidity or discretion - according to the institutional environment of the device and capacities of intervention in order to ensure the credibility of the device in the long term. But each of the three devices of RES-E promotion is potentially called in question one day or another by endogenous limit or external shocks. The problem is that the system must keep its credibility to allow the investment in RES-E. Thus credibility results from the conditions of adaptation of a device or of its replacement. It is the case with the security of the investments carried out within the framework of a device when it will be modified or replaced. It is the case also the specific assets in competences developed in implementation of RES-E projects and the manufacture of these new types of equipment.

The question here is to identify the role of the institutional environment in the credibility of the devices and to determine how the problems of governance could be limited by distinguishing the centralized environments with few veto points and those decentralized with several points of veto.

The cases of the United Kingdom and France show how centralized institutional environments (which are characterized by a strong concentration of the powers and the initial presence of one only veto player and the importance of the risk of discretion) have established devices and adapted them much more easily by their complete replacement than by their improvement. Moreover, whereas the devices have a weak legitimacy at the beginning and are subjected to the discretionary risk, these environments built the credibility of the devices by accepting the emergence of a second collective veto player around the environmental protection that conditions a new stability of the device.

In decentralized institutional environments characterized by the presence of several veto players which creates a risk of paralysis, one shows that the credibility of the structures of governance rests on the adaptation capacity of the rules of the device within reasonable times. The difference between the American experiment on one hand side and the German and Spanish ones of the other side, shows different capacities to manage the balance between rigidity and discretion because a different propensity institutional propensity to rigidity.

3.1. Constraining the adaptation of governance structures in institutional environments with potential discretion

A centralized politico-institutional structure generally results in a concentrated industrial organization in the electric sector which tends to facilitate the installation of new devices and their fast adaptation to any change of their environment when a government is favourable to the promotion of decentralized production by RES-E . The problem which this institutional environment must manage is however the excess of flexibility and the risk of discretion that any strong political power makes weigh on the investors at long term horizon of capital return. It is either because it is not constrained to rest on a law to implement this type of policy, or because in a political system dominated by the executive power it can easily modify the legislation. However, the emergence of these policies is carried out thanks to the emergence and the consolidation of a new veto player, the environmentalist movement and its political relays, the legitimacy of which increases with the integration of the climate protection in the political diary. It benefits the reinforcement of the new industrial interests which are constituted gradually around RES-E policies. Thus the progress of these new devices of RES-E promotion in terms of credibility is authorized by the emergence of this new veto player which slows down governmental discretion and helps to produce a more balanced and credible governance structure.

- *The British case : one veto player, with discretion balanced by secondary veto players*⁹

In the United Kingdom, the politico-institutional structure limits the veto points because of its centralization. The political system belongs to the stable parliamentary type without need for political parties coalition for governing. Before in the electricity industry this environment had been reflected in an organisational mode of integrated monopoly and of public property, which had facilitated its reform by privatization and complete horizontal and vertical de-integration since 1990. Governmental opportunism is limited by the presence of a sectoral regulator. It is the regulator which is in charge of the implementation of RES-E policy beside the supervision of various obligations of public service; they are both complementary missions to the main one of competition promotion. The system rests in fact on a co-regulation led by the sectoral regulator and the qualified ministry (the Department of Trade and Industry). The ministry has the capacity to change the "Rule" if there are dysfunctioning or institutional inadequacy, in particular in the event of deepening of the reform of liberalization.

⁹ We refer mainly to analysis of the British RES-E policies by Mitchell, 1997, Mitchell et Connors, 2004.

The British initial device was the bidding system of the Non Nuclear Fuel Obligation NFFO. It was established in 1990 to protect the nuclear production under the argument of the climate protection and energy security, but it benefited the partisans from the RES-E by extension because of these justifications which related to these last ones too. Within the framework of the successive calls to tender (five between 1991 and 1998), it selected proposals for long term purchase contracts imposed on the distributors located in the service area where the RES-E units are located. Initially five years, the length of the next contracts was then decided to be extended to twelve years. The device imposes a severe cost cap in order to control the collective cost. Since the complete market opening realised in 1999 and the legal obligation of dissociation between the network and supply activities, this measure makes difficult the imposition of a purchase obligation upon the suppliers, because these sellers are not territorialized any more, contrary to the countries where the reforms were not led to this degree of de-integration as in France, in Germany, in Spain and in the United States.

Consequently during the period of the deepening of the electric reform between 1998 and 2001 the ministry and the regulator have prepared the skipping to the exchangeable quotas device which removes the geographical specificity of new RES-E assets. The change of device in 2002 is thus mainly explained by the will of the “co-regulators” of electricity industry to put in adequacy the mode of support to the renewable RES-E with the more decentralized and competitive mode of organization of electric industry. In the Renewable Obligation, the twofold competition for the sale and the purchase of green certificates is also supposed to create a competing pressure on the RES-E developers as on the suppliers subjected to the quotas.

The change of political majority in 1998 and the arrival of the New Labour cabinet more favourable to the questions of environment played only in a complementary way in this change. The weak performances of the bidding system in terms of installation (explicable by the *ex-ante* transaction costs and the cost cap imposed to the candidates with the invitation to tender) were indeed criticized (409 MW installed into windpower in 2000 instead of 6120 MW in Germany). With making the Parliament to vote the Utilities Bill in 2000, the new government has reinforced the duties of operators and the implication of the regulators of network industries in the environmental protection and the redistributive equity. In parallel it initiated the first in Europe a consistent climate policy founded on market instruments (exchangeable CO2 quotas) in the industrial activities of which the electric sector. But this did nothing but reinforce the perception of the need for changing the RES-E device.

The credibility of RES-E policy was enforced by the central position of the regulator which allowed the definition of clear solutions with respect to the investors' interests. It was the case for the RES-E units invested within the framework of the former NFFO. The safeguarding of engagements with respect to those interests was carried out by transferring the obligation from purchase of the former regional distributors (the RECs) towards a specialized agency, the Non Fossil Purchase Agency (NFPA). This obligation relates to the remaining duration of the contracts on the basis of initial contractual price in order to preserve the contractual commitments undertaken with the developers. The NFPA then markets at its risks the electricity on the wholesale market and the associated certificates on another side. (It sells them by auction each year on precise dates).

So if the English institutional environment reacts mainly by change of device to external shocks, it has also a capacity of rapid adaptation of the new device to correct its defects under the pressure of RES-E producers that enforce its credibility. Thus the system of the quotas underwent two adjustments under the influence of producers RES-E¹⁰. The first difficulty to rectify: this system has a need for stability of anticipations of the certificate price. It must seek to ensure an incentive and stable price of the certificate by posting an increasing of the certificates quota on a long horizon. In order to ensure a stable price anticipation to the investors, the quotas to be reached must definite on a horizon of long term (much more than ten years) and be milestone in regularly increasing intermediate objectives. So the regulator has had

¹⁰ They are in fact the subsidiary companies of the large suppliers of electricity subjected to the quota of the green certificates.

to defer in 2004 the horizon of the quota increase from 2011 to 2015¹¹. The second difficulty was the question of the gate closure of the electricity market: in the institutional context of 2001 when the objective of efficiency of the new electric market design which has been just set up (the so-called NETA) was favoured to the protection of environment and the promotion of RES-E units in the hierarchy of the regulator's mission, the weakly programmable productions of RES-E units were treated in a way equivalent to the hourly production of ordinary electricity on the balancing market which is the last stage of electricity market. (It is used by the system operator to adjust the physical equilibrium of all the electricity system in quasi real time). It was very dissuasive because the initial rules of the NETA removed any value to the windpower productions¹². Under the pressures of RES-E producers, the regulator had to revise the hierarchy of these objectives and to adjust the market rules to limit the penalization of intermittent RES-E productions. This resulted in the bringing nearer the gate closure and the effective realization, which made the production wind more easily programmable. So the British institutional environment is also able to give some flexibility to the governance structure because of the decisional power of the regulator on its rules.

- *The French case: the balancing influence of a second collective veto player*

In France the centralized political structure with the parliamentary institution dominated by the executive power and the possibility of legislating by decree limits the veto points and can preserve the existence of a single veto player. This political structure nourished the legitimacy of the integrated public electric company (EDF). By limiting the effects of the nuclear opposition, it has ensured the efficiency of the development of a large fleet of 58 nuclear reactors (80% of all the French production) which was strongly legitimated by the pre-eminence of the objective of reduction of the energy dependence. After the realisation of this development, it proved to converge with the climate protection when this objective entered in the political agenda and made it possible to disqualify any proposal in favour of the RES-E. The alliance of the ministerial administration and the public electric company influenced the government's timidity in this field. It made it possible the second to be an effective veto player against any policy of promotion of decentralized production until 1995. But three factors weakened its position of veto player in the whole of the public choices concerning electric industry: the European mobilization since 1992 around objectives as regards promotion of renewables, energy efficiency and the more general climate protection (on the first ones, it was concretized later by the Directive of 2001 of voluntary engagements of the member-States to develop the RES-E up to a total value of 21% of electricity production in 2010); the liberalization of the electric industry in 2000 which induced the entry of new actors (producing, distributors, etc) and the creation of a sectoral regulator, which weakens its monopoly of the legitimate expertise; the emergence of a collective veto player playing in the direction of environmental protection and in particular the promotion of renewable energies.

This collective veto player gathers a constellation of actors who integrate the environmental sensitivity in their repertory of actions. Its principal political lever was the emergence of a green party and its regular access to the governmental responsibilities since 1988¹³. From its influence it comes out new compromises in the field of energy policy, of which that on the promotion of renewable in electricity (like that of promotion of the decentralized production by cogeneration). The possibility of creating devices by central decree and not by a law allows a rapid implementation of the policies. But on the other hand they can not have legitimacy necessary to overcome the administrative barriers, in particular the procedures of authorization of RES-E units. Thus the two devices set up successively in 1996 and 2001 were systematically countered by the central veto player. Initially in 1996, under a right government which sought to attract a green electorate and to conform to the European orientations, the device of the bidding

¹¹ The ROC policy, which initially posted an increasing quota until 2011 up to a level of 10,5% of the electricity provided by each supplier, followed by a stabilization to this level, saw in 2004, to prolong its growth towards a stage of 15 % in 2017 under the pressures of the candidates to the investment and their lenders (OFGEM, 2004).

¹² The long time between gate closure of the market of adjustment and its effective realization (3,5 hours) made not easily programmable the hourly achievements for the wind power producers.

¹³ Following frequent political alternances since 1981, the weakening of the electoral base of the left parties makes necessary this type of coalition.

with cost cap is adopted by decree for the windpower (plan Eole 2005) and then for RES-E based on biomass¹⁴. The ministry and EDF chose this device which seemed to them to leave few rents to the developers and to make it possible to control the collective cost. But the device does not create a business environment sufficiently favourable for the investors. It follows from there weak results of installation (71 MW installed at the end of 2000 instead of 450 MW in the UK and 6590 MW in Germany).

In a second step, a Left-Greens coalition which governs between 1997 and 2002 decides to revive the development of the RES-E by passing in 2001 to the device of feed-in tariffs by a new decree. The obligation of purchase is placed on the historical operator who owns near all of the distribution networks (Notice that it carries only on the installations of less than 20 MW, which excludes the large installations). It forsakes the option of the exchangeable quotas promoted by the European Commission, largely discussed at the time with the preparation of the Directive of 2001 on the RES-E, even if this option had the favours of EDF, the administration and the regulator¹⁵. This is allowed by the conservatism of the French reform of liberalization in electricity which contrasts with the British reform. It marks also a choice in favour of the "environmental efficiency" and the will of public commitment to secure investments in RES-E on the long run and with high tariffs. The overcost is financed by a uniform tax on all kWh, which abounds a special "funds of public service".

But the collective veto player Administration-EDF, allied with the large purchasers of electricity who refuse the payment of a tax and with the regulator which wants to avoid a high overprice which would hide any effect of competition on the power price, criticized the increasing cost of this device in the future. They find a new ally in the territorial administration which manages the authorisation procedure. It raised many administrative hurdles in front of the RES-E installations (mainly windpower) at the level of the districts. Whereas the feed-in tariff system is the most effective system in terms of installation as the case of Germany proves it (16000 MW installed in 2004), this reinforcement brought to the dominant veto player results in a ridiculous performance of installation (300 MW installed at the end of 2004), whereas the candidates seemed to precipitate (15000 MW in pre-projects in 2002). In front of these weak results which question the credibility of French engagement in the Directive of 2001, the right-wing government in place since April 2002 relaunch the former device by using calls for tender for large installations of wind farms.

This change of government could have involved a revision of the device with generous feed-in tariffs, given that, after it, an energy law was prepared by a long parliamentary process between Spring 2003 and July 2005. In fact the device of feed-in tariffs was not questioned because of the youth of the device and its weak effects. In a revealing way, in the parliamentary debate and the dialogue between the two Chambers, the low one i.e. the National Assembly, sought to legalize the administrative barriers with the development of projects of wind mills by voting in a first step the remove of the obligation of purchase for the projects lower than 20 MW in order to limit the desamenities created on the landscapes by the small projects and to favour the projects higher than 20 MW by making them benefited from such an obligation. But, by playing on the second Chamber, the second veto player ruined this attempt. Ultimately, in the law voted finally in July 2005, the decision is replaced in the hands of the local communities which decide if a project must profit from the obligation of purchase or not.

In France, institutional environment is thus characterized by a game with two collective veto players. The one which benefits the best from the workings of politico-administrative centralization manages to call in question the credibility of public commitment to favour RES-E investments on a scale desired by the political power. The competition of the nuclear option the efficiency of which reflects the position of the same dominant veto player and its allies maintain this imbalance in disfavour of the RES-E policy.

¹⁴ In parallel feed-in tariffs aligned on the complete avoided cost of EDF are also adopted for the electricity of the units of cogeneration.

¹⁵ The regulator, let us precise it, does not have formal power in this field other than to evaluate the expenses to be refunded to the dominant operator which is mandate to off take all the RES-E kWh.

3.2 Evolution of the governance structures in potentially paralysing institutional environments

The decentralized and federal institutional environments authorize the existence of multi veto players, which in some countries are reinforced by the existence of a parliamentary system. In the United States, Germany and Spain, in spite of different political institutions, these systems led to a strong anchoring of the devices of the feed-in tariffs, but with different capacities of adaptation. In the first country, one observes a rigidification of the old device because of the thorough juridiciarisation which ensured the perennality of the prior contracts at guaranteed prices; the only possible evolution appears to be the complete change of the device which can be concretized lately because of the need for an agreement between veto players. There is a lasting crisis of credibility of the RES-E policy. Conversely in the other countries where the rule of the contracts law is less stringent, there is possibility of reforming the device in order to make it flexible in response to the objections of the dominant veto player. In this type of institutional environment, the necessary flexibility to preserve credibility is created by integrating inside the RES-E device rather than by changing it.

- *The multi-veto player case of the USA : the rigidities of the regulatory device in place*

In the United States, with a two-stage regulation system (the federal one and the States one) which is reflected in a balkanized organization of the electric industry by State, the powers of the two chambers to balance those of the government, the importance of the legal sphere to thwart the policies, the logic of a system with multi-veto player ends in the rigidification of the regulatory devices by creating significant barriers to their change or to the skipping to another device in the event of large dysfonctionnings. They rest on the federal laws on the energy which are very complex to establish because they cope with all the sectoral fields to be treated like are the successive Energy Policy Acts of 1978, 1992 and 2005 prepared on a several years. The system of the feed-in tariffs and purchase obligation was established from 1978 by the PURPA (Public utilities Regulatory Policies Act) of promotion of renewables and the cogeneration for the sake of energy security objective. A temporary system of tax credit to the RES-E investment was also instaurated by the National Energy Act which complemented the support to RES-E by the feed-in tariffs (Energy Information Administration (EIA), 2005). The principle of definition of those in the PURPA was the alignment on the avoided cost for the mandated utility, but the practical definition was let to the interpretation of the regulators of State.

The device set up for the promotion of RES-E systems is completely a matter of «administrative procedure" by taking again one of the categories of Spiller (1996). It is characterized by the vague character of the law and by an implementation by the Regulatory Commissions of the States which define the contents of it according to quasi-jurisdictional procedures with representation of the interest groups and stakeholders in the decision-making procedure. The stability of public commitments is reinforced by the possibility of legal recourse to the courts in the event of change of rules. Any negative effect on the investments which it causes by the change must be automatically compensated, taking into account this legal threat of recourse. This system quickly proved very expensive in the most favourable States (California, New York, etc.) by obliging the utilities to buy the production of all new units with generous feed-in tariffs over a first 10-years period and within the framework of thirty years contracts. Whereas they were already in large overcapacity, the utilities have to buy at a price aligned on the complete cost of kWh of new equipment and while referring to an anticipated rapid growth of the fuel prices.

The PURPA incentive framework proved to be a great success in some major States for the independent production based on cogeneration units which filled the criteria of qualification by provoking an uncontrolled and massive development of this equipment. Under the pressure of the utilities, this led the federal regulator of energy (the FERC) to establish new rules to rationalize the entries in this regulatory niche. It recommended in 1986 to the regulators the use of a competitive bidding for the entry of independent producers and its implementation only when new capacities were necessary. But it awaited 1995 for reappraising the concept of avoided cost in relation to the actual marginal cost of the mandated utility according to the level of the capacities of the mandated utility (EIA, 2005). In this particular

environment, all the RES-E had not the commercial maturity of other technologies and remained in the first set of PURPA rules. They developed much less quickly than the other equipment benefiting from the PURPA. The feed-in tariffs at the avoided cost was in fact far from the development cost of the RES-E units -- this one was the reference cost level used in the European countries -- was insufficient to ensure the profitability of RES-E projects without tax subsidies¹⁶.

The rapid RES-E development between 1980 and 1990 in a small number of States (primarily California which had concrete objective of installation) is explained by the high level of the feed-in tariff (6,9 c/kWh for a normal electricity cost price of 3 c/kWh) during the first ten years of the buy-back contract because of the reference to a very high anticipated fuel price, and the addition of the tax subsidy to the investment until 1985. The suppression of it and the dramatic revision of the buy-back tariffs at the end of the first ten years of the contracts has stop the development of the new capacities in California At the end of the year's furnace twenties.

At the beginning of the Clinton Administration, the federal Administration tried to revive the RES-E by creating a tax subsidy on the production of 1,5 c/kWh over the first ten years of production for the units brought into service between 1994 and 1999 in the National Energy Policy Act voted in 1992. It envisaged a possible extension of the device that has been done three times in 1999, 2001 and 2004, with a starting effect since 1999. But the new development came up also in relation to the passage to the device of RES quotas (the so-called Renewable Portfolio Standards) which has been individually decided by a number of States.

Table 2. Evolution of the installed capacities in wind power in the USA between 1985 and 2004 (in MW and round capacity)

1980	1983	1985	1987	1990	1995	1997	2000	2003
150	200	1000	1200	1800	1700	1600	2300	5600

Source ; EIA, 2005

The feed-in tariff system has been replaced only in 1998-2000 and in a certain number of States, for two reasons of institutional inertia. On the one hand, in the logic of the securization of RES-E investment by the "administrative procedure", the change of devices was made possible only by the extinction of contractual engagements of buy-back electricity from RES-E and cogeneration developed under the PURPA. In addition, with the long lasting process of electricity reform in each State under the federal supervision (Joskow, 2000), the institutional environment of the policy of promotion of RES-E was long to be stabilized. This process lasted so long because of the number of veto points (the first effective market opening to consumers occurred in 1998 instead of 1990 in the first European movers and is still far to be legal in half of the States)). It placed the reform of the policies of RES-E promotion at the second rank of the agenda of the regulators, the FERC and the federal Congress.

The American RES-E case is thus characterized by a certain heaviness, that revealed the failure of the two attempts to legislate on this only field at the federal level in the nineties. Given the points of veto offered by the bicameral system, the electricity utilities, which got their fingers burnt by the cost of PURPA projects (Laufer, 2003; Deyette and Clemmer, 2004), have been able to hold twice in check the vote of two federal laws aiming the revival of the RES-E development between 1996 and 2000. The only federal device remains the subsidisation by tax credit on the production of new units RES-E. The recent results then by individual decisions of States where the executive power is favourable to the RES-E, while being based on the device of the quotas. They are seventeen (of which the main ones) to have adopted them at the end 2004¹⁷. Other local supports are done on the basis by small public funds financed by local taxes on electricity in fifteen States. In such a system with multi-veto player authorized by decentralised political structures, there is thus rigidity of the commitment of the public authorities around the regulatory

¹⁶ The exception is the small units developed by the private individuals such as the solar photovoltaic units could profit from price of very generous repurchase.

¹⁷ California aims to make grow the quota of green electricity(except hydraulics) from 9 % in 2004 to 20% in 2017

devices, once they are set up. When the positive effects of a device becomes exhausted or proves in inadequacy with its changing institutional environment, there are difficulties of reforming it to set up a more effective device. The force of the rule of law reinforces inertia by consolidating the contractual commitments of long term which are undertaken. But in such a context it is the credibility of the whole of a policy which is in question, which reveals the absence of investments in RES-E in the Nineties in the USA.

- *The case of the German double veto player : the stability of the RES-E device allowed by its flexibilisation*¹⁸

The German institutional system which is characterised by the federalism and a parliamentary system with stable coalition authorizes the intervention of several veto players in the processes of energy and environmental policies. The existence of this multi-veto player is allowed by a politico-administrative structure at the two levels (with a significant economic power and regulatory capacity allocated to the länder), a court system also opening to the possibilities of legal recourse to these two levels against any change of regulation affecting the projects, a bicameral system favouring the representation of regional interests and an electoral rule requiring coalitions of parties to govern, a practice of self-regulation of industries by co-decision between stakeholding companies. The structure of the electricity industry follows also a division by regions in production-transmission and local communities in distribution.

As in much of countries, the RES-E support device was integrated before 1991 in the buy-back system of the independent electricity decided by the monopolies of zones, in which the rules were negotiated between those and the large industrial self producers. The large regional electric companies could for a long time maintain a system of low buy-back tariffs aligned on their short term marginal costs. The opposition of this collective veto player had to be circumvented by the vote in 1991 of a law which gives to the federal government the capacity of fixing the tariffs according to precise principles and by the definition of prices very favourable to the RES-E¹⁹. In parallel a certain number of regions and cities political encouraged the projects by tax subsidies. The success of the federal law caused a growing dissatisfaction with the electric companies on the territory of which RES-E were installed because of the inequality of the burden to support between companies and the significant rises of tariffs necessary for a number of them to compensate for the buy-back overcosts. Moreover, the device met the crucial problem of redistributive equity by the rents which are allocated to the renewable producers in the best endowed areas. The opposition of the companies was reinforced by the liberalization of the electric markets made effective by a federal law voted in 1998, which increased the requirements for competition equity between mandated companies in the name of the competing principles.

The rise of the Greens party and its access to the government within a coalition in 1996 ensured the protection of the feed-in tariffs device, in spite of its endogenous limits, in particular its significant collective cost in the event of success of the installations²⁰. Because of social consensus, the procedures of authorization which are controlled by the regional level did not slow down the equipment installations in the länder where are the most significant potentials of resources at the difference of France. Between 1999 and 2001 (date of the next federal elections), the large companies, very influential on the parties of opposition (CDU and FDP), wanted the replacement of this device by the system of exchangeable quotas regarded as less expensive and more equitable. The coalition SPD-Greens' victory to the elections of 2001 did not make it possible this "veto player" to cause this change. But, just before, by the vote of a new law in April 2000 (the Erneuerbare Energien Gesetz or EEG), the coalition preferred to proceed to a sound revision of definition of the tariffs to leave less rent to the developers of RES-E projects and to introduce an equitable mode of compensation of the companies obliged to buy the electricity of the RES-

¹⁸ Our main analytical reference on the German experience is Laufer (2004).

¹⁹ This 1991 law, the Stromeinspeisungsgesetz (or law EFL) forces the electric companies to buy the totality of the electricity produced from renewable at a price fixed by the government, corresponding to a percentage of the selling price to residential, (90% of the residential price for the windpower, and from 65 to 80% for hydraulics and the bioelectricity according to the size of the installations)

²⁰ The cost in 2002 is estimated at 1,45 billion €, according to official estimates reported by Jacobson and Laufer, 2005

E units located on their area, mode placed under the aegis of the ministerial authority²¹. So, in Germany, the system of multi-veto player which is inherent in the federal structure and the parliamentary system with stable coalition thus plays in the direction of a stability of the device while allowing certain flexibility. It results in a spectacular volume of installations (for the only case of windpower, the capacity installed reached 7000 MW in 2000 and 18000 MW in 2004). In this direction, this mechanism of promotion of the German RES-E can be regarded as credible in the terms we defined it.

- ***The Spanish case of a hybrid multi-veto player : the stability of the costly device based on a general rent sharing***²²

In Spain which has a hybrid system of centralization and federalism, the government has important means in industrial policies and decision making in regulatory design in strategic sectors such as the electricity; it can legislate by decree. Sectoral regulator has only an advising function. Parliament legislates in secondary position. Electoral system produces stable coalition. The regionalization of the political institutions acts in an asymmetrical way onto the reinforcement of public policies defined at the central level: it does not allow the reduction of policies initiated by the central level, but authorizes the increase in public commitment and regulatory support by the Provinces (Perez, 2002). It is the case of the environmental policies and thus of the promotion of renewables and decentralized production by cogeneration. So the Spanish system is moderate multi-veto player.

The RES-E device was set up in 1994 by a decree of definition on the mandated contractual purchase of electricity by the companies and of the rules of buy-back tariffs definition (Royal Decree 2366/1994). It was consolidated by the law of liberalization of the electric industry of 1998 in which this regulatory device has been integrated. It is integrated in the particular regulatory niche of the “system of independent production” created beside the new regulatory system of “ordinary” electricity competition. This system organizes the obligation of purchase of decentralised production by the large regional producer-distributors at guaranteed prices defined by the ministry of industry. It is reinforced by direct subsidies on the investment and tax subsidies at the central and provincial level (in particular of the Galice Region where more half of the capacity of windpower is developed).

This system has a significant efficiency in terms of installation (with 8000 MW installed in windpower between 1995 and 2004). It is expensive and dispenser of rents because of high tariffs of purchase. It was occasionally criticized like too expensive by electric industry (Del Rio et Gual, 2005), but it is stable. It did not attract real hostility from the electric companies because the mode of regulation allows the pass-through of all the overcosts on the electric prices and tariffs. It was not called in question during the right-wing government period between 1996 and 2004.

This stability is based on the agreement of the large companies and their principal ally, the Ministry for industry. This is explained for two reasons. Firstly the policy of RES-E promotion compensates for the impossibility of carrying out nuclear investments since the end of eighties, and is perceived as a recourse to respect the objectives of the Spanish climate policy. Secondly the device is coherent with the usual rent mechanisms in the Spanish electric market: indeed the revenues are collected by the RES-E producers who are mainly the subsidiaries of the 4 major electricity operators, which themselves benefit from considerable rents of the electric system (stranded costs, price making on the wholesale electric market). In other words the stability of the device is ensured by the attribution of rents to the incumbents. An internal characteristic ensures also its credibility by getting flexible from a rule of annual adjustment of the premiums of feed-in tariffs compared to the wholesale price and by the relatively short duration of purchase obligation (5 years instead of 12 or 15 years in other countries), which facilitates the flexibility

²¹ The whole of electricity consumers pay *in fine* the overcosts in a uniform way, approximately 5,34 euros per year and by domestic subscriber. The compensation is carried out between companies of transport.

²² The Spanish case study is based here on the evaluation of the Spanish device carried out by Del Rio P. et Gual M.A (2005) . in « An integrated assessment of the feed-in tariffs system in Spain », Working Paper, Universitat de Castilla (Toledo), forthcoming in *Energy Policy* (2006).

of the device. The arrival of a new government in 2004 also led to a revision of the device to improve its foreseeability for the RES-E investors. It should be noted that the Spanish Provinces have a role of veto player to any change of policy of RES-E promotion to ensure by a right registered in the Spanish constitution of 1978. Their powers on economic and industrial issues allow them to animate local economic activities. It was the case of the Galice and Navarre for the development of a local manufacturing industry of windmills, which have use subsidies conditioned to the development of local employment.

The veto player which emerges from the creation of a RES-E manufacturing industry limits the possibility of change of the device towards a new one which would leave less rent and create less opportunities of industrial development, as it is also the case in Germany²³. It is followed from there that the passage to the device of the quotas which was discussed in Germany in 2000 and will be again is not discussed in Spain, despite the European procedure of harmonization which aims at a unification of the RES-E devices between country. The Spanish institutional environment thus creates an effective incentive structure for the developers of RES-E by insuring a stability corrected by an adaptability of the device in place.

4. Conclusion

The issue of the credibility of the regulatory devices of RES-E promotion illustrates the importance of flexibility as a condition of guarantee of the credibility of a structure of governance associated to a public policy and its regulation. The approach in terms of credibility viewed as a balance between stability and flexibility led, within this particular economic and political stake of the RES-E promotion, to identify the different veto players and their influence on the creation of devices, their adaptation and their replacement in relation to the specific institutional environment in one country.

Taking into account these characteristics, the devices of RES-E promotion make it possible to pursue various contradictory goals: environmental efficiency, economic efficiency, industrial policy. They have intrinsic qualities of stability and flexibility which are congruent with the institutional characteristics of their environment in term of structure of governance. The analysis in term of veto player indeed makes it possible to distinguish those which are characterised by a tendency to discretion and those which are by rigidity and paralysis, and to clarify how the political process subjacent to one specific RES-E device can deal to correct it or to change it.

The institutional environments which are characterised by a risk of discretion can better succeed in creating credible governance structures by correcting the tendencies to discretion by the increase in the number of veto players that reinforces the stability of public commitments. In a symmetrical way the institutional environments marked by rigidity had more problems to generate the credibility of the device because of the constraints that impede them to produce necessary flexibility.

²³ However it is not a sufficient condition so that this veto player prevents a change of policy. In Denmark where a significant industry of construction of wind mills was developed under the effect of a generous policy combining buyback tariffs and defiscalisation of green electricity, the right wing government arrived in 2002 decided to stop the subsidization for new projects

References

- ACKERMANN B. (2000) The New Separation of Powers. *Harvard Law Review* 113 (3): 633-729
- BERRY T., JACCARD M. (2001), "The renewable portfolio standard: design consideration and implementation survey", *Energy Policy*, Vol. , p.
- BIRD, L., WUSTENHAGEN, R., AABAKKEN, J. (2002), *Green Power Marketing Abroad: Recent Experience and Trends*, NREL/TP-620-32155. Golden, CO: National Renewable Energy Laboratory, April 2002.
- EIA (Energy Information Administration) (2005), *Policies to promote non-hydro renewables in the US and selected countries*, Washington: US DOE.
- COX G. & MCCUBBINS M. (2001), The institutional determinants of policy outcomes, in Presidents, Parliaments, and Policy (eds) HAGGARD S. & MCCUBBINS M. (2001) 21-63 Cambridge University Press, New York
- De PALACIO L. (2003),
- DEL RIO P. et GUAL M.A (2005) . « An integrated assessment of the feed-in tariffs system in Spain », Working Paper, Universitat de Castilla (Toledo), forthcoming in *Energy Policy* (2006).
- DEYETTE et CLEMER (2005),
- FARHAR, B. (1999), *Willingness to Pay for Electricity from Renewable Resources: A Review of Utility Market Research*. NREL/TP-550-26148. Golden: CO: National Renewable Energy Laboratory, July 1999.
- FINON, D., MENANTEAU, P. (2003), The Static and Dynamic Efficiency of Promotion of Renewables, *Economic Studies Review*, Vol. 12, n°1, January 2004, p.53-81
- GOLDBERG, V. (1976), Regulation and administered contracts, *Bell Journal of Economics*, n° 7, p. 426-448
- GUASCH, J.L., SPILLER, P.T. (1999), «Managing the Regulatory Process: Design, concepts, Issues, and the Latin America and Caribbean Story», The International Bank for Reconstruction and Development, the World Bank Washington D.C.
- HAGGARD S. (2000), "Interest, Institutions and Policy Reform" in *Krueger A.O. Economic Policy Reform: The second Stage*, Chicago University Press, p. 21-57.
- HOLBURN, G.L. & SPILLER P.(2002), "Institutional or Structural : Lessons from international electricity sector reforms". in Brousseau E. and Glachant J.M. eds. (2002), *The Economics of Contract: Theories and Application*. Cambridge: Cambridge University Press
- HOLBURN, G.L.F., SPILLER, P.T. (2002), «Institutional or Structural: Lessons from International Electricity Sector Reforms», in BROUSSEAU, E., GLACHANT, J.-M. (eds.) (2002), «The Economics of Contracts: Theories and Applications», Cambridge University Press
- KYDLAND F.E. & PRESCOTT E.C. (1977) Rules Rather than Discretion : The inconsistency of Optimal Plans, *Journal of Political Economy* 85: 473-91.
- JACOBSEN et LAUFER (2005), voir Del Rio
- LANGNISS O. & WISER R. (2003), The Texan Renewable portfolio standard, An early assessment, *Energy Policy*, Vol 31, p.527-540.
- LAUBER, V. (2004), REFIT and RPS : options for a harmonised Community framework, *Energy Policy*, 32, p. 1405-141
- LEVY B. & SPILLER P. (1994), The institutional foundations of the regulatory commitment: a comparative analysis, *Journal of Law, Economics and Organisation*, vol 10, n°2.
- LEVY B. & SPILLER P.T. (1994) The institutional Foundations of Regulatory Commitment : A comparative Analysis of Telecommunications Regulation *Journal Of Law, Economics, and Organization*, 10 (2), p. 201-246.
- LEVY, B., SPILLER, P.T. (eds) (1996), «Regulations, Institutions and Commitment. Comparative Studies of Telecommunications». Cambridge University Press
- MACINTYRE A. (2003), *The Power of Institutions, Political architecture and governance*, Cornell University Press.
- MENANTEAU P., FINON D., LAMY M.L. (2003).- Prices versus quantities: Environmental policies for promoting the development of renewable energies , *Energy Policy*, June 2003.
- MENARD C. & SHIRLEY M.M. (2002), Cities awash : a synthesis of the country cases, in M.M. Shirley (eds), *Thirsting for efficiency, The Economics and Politics of Urban Water System Reform*, World Bank and Pergamon.
- MITCHELL, C. (1995), The Renewable NFFO, A Review, *Energy Policy*, vol.23, n° 12, p.1077-1091.

- MITCHELL, C. et CONNORS P. (2004), Renewable Energy Policy in the UK 1990-2003, *Energy Policy*, Vol 32, p. 1935-1947.
- MOE T. M. (1991) Politics and the Theory of Organization *The Journal of Law, Economics & Organisation Vol 7 Special Issue*.
- MOE T. M., Caldwell M. (1994) The Institutional Foundation of Democratic Government : A Comparison of Presidential and Parliamentary Systems, *Journal of Institutional and Theoretical Economics*, 150/1
- MOE T. M., HOWELL W. G. (1999) The Presidential power of Unilateral Action *The Journal of Law, Economics, & Organization*, vol. 15, N° 1.
- MORTHORST, P.E., (2000), The development of a green certificate market, *Energy Policy*, 28 (15), pp. 1085-1094.
- NEWBERY, D. (1999), «*Privatization, Restructuring and Regulation of Network Utilities*», The MIT Press
- NORTH D. C. (1990), *Institutions, Institutional Change and Economic Performance*, Cambridge (Ma.), Cambridge University Press.
- NORTH, D. (1990), A transaction cost theory of politics, *Journal of Theoretical Politics*, n°2, p.355-367.
- OFGEM, (2004), *The Renewables Obligation, First annual report*, February.
- PEREZ Y. (2002), *L'analyse Néo-institutionnelle des réformes électriques européennes*, Thèse de doctorat, Université de Paris I.
- PEREZ Y. (2004). *Credibility as a trade off in network industries*, Working Paper GRJM-ADIS 2004-6.
- SALETH M. & DINAR A. (2004), *Institutional Economics of Water : A Cross-Country Analysis of Institutions and Performance*, World Bank Publications.
- SAUSSIÉ, S. (2004) "Contract Design: Empirical Studies", *Handbook of New Institutional Economics*, C. Ménard & M. Shirley (eds.), Norwell MA: Kluwer Academic Publishers (forthcoming).
- SHIRLEY M. (2002), *Thirsting for efficiency, The Economics and Politics of Urban Water System Reform*, World Bank and Pergamon.
- SHIRLEY M. (eds) (1995), *Bureaucrats in Business: The Economics and Politics of Government Ownership*, Oxford University Press.
- SPILLER P.T. (1996), Institutions & Commitments *Industrial and Corporate Change Volume 1*, pp 421-452.
- SURREY J. (ed.) (1996), *The British Electricity Experiment* Earthscan.
- TSEBELLIS G. (2002), *Veto Players. How Political Institutions Work*, Princeton University Press
- VAN DIJK, A., BEURSKENS, L., BOOTS, M., KAAL, M., DE LANGE, T., VAN SAMBEEK, E., UYTERLINDE, M. (2003), *Renewable Energy Policies and Market Developments*, ECN – Energy research Centre of the Netherlands, march, ECN-C—03-029.
- VOOGT, M., BOOTS, M.G., SCHAEFFER, G.J AND MARTENS, J.W. (2000), Renewable electricity in a liberalised market : the concept of green certificates, *Energy and Environment*, vol. 11 (1).
- WEINGAST B. R. (1995) The Economic Role of Political Institutions: Market-Preserving Federalism and Economic Development. *Journal of Law, Economics and Organisation*, April, 269-96
- WILLIAMSON O.E. (1999), Public and private bureaucracies: a transaction cost economic perspective, *Journal of Law, Economics and Organisation*, p. 306-342