A Framework of Sustainable Development Issues for the Automotive Industry

Abstract - The GERPISA project will focus on the question of trade-offs and synergies between the different dimensions of sustainable development in the automobile industry. It retains the definition of SD, predominant in 2007, which considers as sustainable the development that guarantees compatibility between economic competitiveness, social responsibility and environment protection. This obligation to integrate the three dimensions of SD and to achieve synergies between them is increasingly significant at both corporate and public policy level. Reference to this ‘new framework’ has grown in importance over the last decade to the point where it is now in the process of being translated into both discourse and practice. In this context of growing operationalisation of the framework, the GERPISA project is based on the belief that reference to the principles of SD alone is no longer sufficient and that an analysis of the practices is now required. In analytical terms, it is, therefore important to contrast the notion of trade-off with the notion of synergy. This is necessary to understand the discrepancies between practices and discourse, to investigate the diversity of interpretations and to develop a realistic understanding of the changes related to this new framework. As a result we will be able to measure and analyse the variability of the practices associated with the implementation of the new framework at European level, and at the global level we will be in a position to evaluate the European specificity in this area. This double evaluation will be carried out with two main research axes. The first will focus on the practices of the enterprises, and the second on the design of public policy.

Keywords - Sustainable development, Economic competitiveness, Social responsibility, Environment protection, GERPISA

Social science research into sustainable development has progressively led to the constitution of specialised academic communities that view questions raised by the proliferation of these kinds of societal demands as a breeding ground for new sub-disciplines. One example is the field of economics, with the rise over the past 20 years of an environmental corpus that has tended to monopolise economists’ scientific output by replicating the main theoretical oppositions that already serve to differentiate this discipline’s main schools of analysis. Something similar has happened in management’s different sub-sectors, each of which has its own way of incorporating sustainable development, with design specialists beginning to talk about “eco-design” marketing experts about green or “ethical”
marketing, etc. Since each sub-discipline has its own way of giving voice to these discussions, what we end up with are specialised communities engaging in standalone debates on sustainable development and publishing their findings in specialised reviews.

Firms and public administrations have also jumped on the bandwagon, setting up sustainable development departments whose existence seems to substantiate researchers’ autonomy from their discipline of origin. As these new specialists often affirm, however, the development of practices apt to satisfy companies’ sustainable development requirements, and the establishment of public policies conducive to such practices, implies a modicum of synergy between all of a firm’s practices, and/or with the other public policies that exist to influence and/or regulate firms’ varying practices. Accepting the need for coherence is tantamount to advocating a de-compartmentalisation of research, whilst preserving the ability to ascertain the conditions for effectiveness of these practices or policies.

A brief analysis of the literature produced under these specialised approaches both in economy and management (and of sustainable development policies) indicates a strategy of ignoring problems and/or compatibility complexity issues - the implication being that the preferred way of achieving coherence is to subject all practices and policies to sustainable development aims. The implicit hypothesis is that principles or aims defined in reference to sustainable development are both compatible with one another and also likely to supersede any of the other principles or aims that might govern productive activities or public action. The merit of this avoidance strategy is that it provides a tool for developing and subsequently exploring the new field, thereby constituting a solid foundation of knowledge as well as a doctrinal corpus of public action that weighs heavily in favour of sustainable development as a concept. The idea here is that as long as an organisation is innovative and capable of being reformed, “being sustainable and socially responsible can be profitable” What has also come out of this at the UN and in various national environmental charters like the one France adopted in 2005 is the notion that as long as actors have enough space to interpret these principles autonomously, it makes sense to have a public policy persuading them to render their own growth (specifically their productive practices and product policies) contingent on these new constraints. In actual fact, this is one of sustainable development’s more important characteristics, to wit, it is as relevant to the managerial sphere as it is to the world of public administration. The conceit here is that sustainable development is rooted in modern regulation practices based in a form of continuity between both “worlds” that is much stronger than it used to be. This is a vision that welcomes intermediary actors like NGOs and repudiates state regulation and more generally forms of regulations in which clear and defendable objectives can be assigned to public action and imposed upon industry.

The only model put forward here is one entailing a virtuous synergy between the highly generic concerns of the three main fields in question: economic, social and environmental. This construct is an essentially idealised one built “on paper”, even if a few judiciously chosen case studies can be found amongst varying success stories to illustrate and substantiate its message. Here, economic performance is deemed congruent with an ongoing respect for social and environmental demands. This puts the market in charge of getting companies to accept their responsibilities.

- as long as consumers and investors are given maximum information on product and productive system performance. Conversely, regulatory or state constraints become superfluous or at the very least secondary. They only create norms insofar as they help with the observation of “best practices” generated by firms and decentralised experimentation alone.

What we can learn from this rapid review is that once again, innovation and substantial plausible alternatives only become doctrinally feasible when sustainable development is isolated from the more traditional development questions being asked of firms, nations and regions. In much the same way as sustainable development discourse is marked by unprecedented continuity between firms and regulatory administrations, it is clearly significant that this mainly consultant-driven ideological production has had such a strong and direct resonance in the scientific communities within which these very same consultants are operating.

Yet there is a cost to this approach to sustainable development, similar to the “all things being equal” method that a large cross-section of economic analysts apply when hypothesizing the separability of questions whose fragility has long been highlighted by a slew of authors. One problem is that sustainable development’s implicitly desired domination of other practices and/or policies is no longer feasible. In fact, the opposite occurs. In this new scenario and as is the case in a number of environment ministries, sustainable development assumes the appearance of a moral booster supplementing corporate strategies and/or public policies more than that of a force structuring them. A dream world inhabited by the kinds of synergies that are sufficiently efficient to promote an increasingly natural or self-regulated implementation of sustainable development would deprive us of the intellectual or political means to ensure these principles’ effectiveness, which in turn is a platform for their widespread support.

This stance must be transcended if we are to avoid marginalising sustainable development into the register of a discourse. The same objectives (economic progress and/or competitiveness, respect for the environment and/or future generations along with social progress) must be pursued explicitly and their satisfaction made more plausible. We can do this by producing an alternative representation of sustainable development, one that will characterised by greater realism.

Towards this end, the present project suggests five paths:

- We intend to raise sustainable development issues not on paper or by means of a few success stories but within the context of a specific activity, the automobile industry a sector characterised as one of the most environmentally fraught in Europe and across the world, even as it is driven by other considerations like jobs or the social and geographic division of labour;
- We intend to organise a hybridisation of competencies amongst sustainable development specialists who have generated knowledge during past “autonomous” social science research phases. We also want to bring in specialists on the way industrial dynamics play out in the world’s different automobile regions.
- We intend to continue the useful link between researchers on one hand, and industrial actors or policy makers on the other, a connection that has strongly influenced sustainable development research. We will benefit in this respect from the international automobile research network that GERPISA has already mobilised around this project (even if up until now sustainable development was not the main focus), i.e. some actors are already mobilised;
- We intend to integrate into this project:
  - The sustainable development interpretations being produced at different levels in the various categories of firms that comprise the automobile systems, in light of the issues that these firms themselves have been highlighting;
  - The sustainable development interpretations characterising public action such as it plays out at various levels (national, regional or global), in light of the interventions by means of which authorities try to influence automobile system structures and dynamics.
  - As the tender bid requires us and since we consider this appropriate, we intend to avoid highlighting only syner-
gies in our analysis of the interactional modes linking sustainable development’s different dimensions. Henceforth we will consider the need for trade-offs as being just as necessary. This will help us not only to identify which trade-offs have in fact already occurred (and possibly improve upon them) but also what kind of interaction they have with the different type of synergies considered.

Before reverting to the ties between the proposed project and existing studies on these topics, and before showing how we have structured the project into four WPs, it is necessary to specify the tenor of these principles, as well as the theoretical and empirical questions raised by research into what it means to adhere to them. This can be achieved by applying what has been said to the emblematic example of the automobile.

Recent studies ordered and then exploited by the European Commission as part of CARS 21 clearly applied the same hypotheses as we have used here. The automobile is not only a major economic and social activity in Europe but just as significant a source of environmental damage (12% of emissions of greenhouse gases). It is also the kind of laboratory that allows us to identify what transformations might become necessary in an industry that is pursuing sustainable development aims - as well as the policies required to implement such changes. The report defends two principles: the first is an analytical premise; the second a rule for action. The adoption of a holistic approach to analysis and the coordination of interventions undertaken by different departments (Competition, Environment, Enterprise, Industry, etc.) are presented here correctly as necessary not only to encourage the automobile’s sustainable development in Europe but also to implement these kinds of dynamics in other sectors.

The report seems to confirm the view we outline above. Its authors, who come from different sectors of industry or from a range of European countries or relevant national or European administrations, have juggled their own different aims and devised an accounting system that is capable, in the project’s own terms, of creating synergies. The great merit of their work is that it generates such synergies, although their consensus was only achieved because little was said about (or an at best expeditive analysis was made of) the different trade-offs that are required. What this means is that strategic and political problems whose resolution necessitates clear choices are not made explicit here but stated indirectly in a text that purports to consider that interactions between different dimensions are always positive ones lending themselves to the automobile’s further advance, one that will be synonymous with increased competitiveness in the European industry’s different sectors, more environmentally friendly policies, more road safety and more jobs. The question of trade-offs is truly key to most of this report. In CARS 21 this is not resolved, however, as shown by the following statement:

"Clean, lean and safe’ cars are not only societally desirable but they also have the potential to create a competitive advantage for the industry, insofar as they meet these consumer expectations, are affordable and address needs which are applicable to, and have to be addressed by, the global community as a whole. CARS 21 stakeholders therefore find it important that European standards are being adopted in other markets and would encourage this trend."(CARS 21 Final Report p.16)

Three dimensions of sustainability are distinguished in the new framework: ecological sustainability, social sustainability, and economic sustainability. We can easily recognize these three dimensions, for instance, in the CARS 21 report. The report formulates recommendations for a better regulation that include the ecological dimension (objective to reduce emissions), the social dimension (objective to increase road safety), and the economic dimension (objective to improve competitiveness of the automobile industry).

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2) Some of us have already worked on the preparation or conclusion of these reports: U. Jurgens was one of the experts consulted by the ‘high level group’ to prepare their report; B. Jullien was appointed as an expert by a working group set up by the European Economic and Social Council to examine the lessons that the Commission drew from the report.

The public debate and the research about sustainable development issues related to the automobile and to mobility show that there are (at least potential) trade-offs between these dimensions and that it is not simple to achieve synergies. The long debate between those who see ecological regulation as a job killer and those who stress its employment-creation potential is the best known example of trade-offs and synergies. The relation between ecological innovation and employment is an important but not the only arena of trade-offs and synergies. If we take the ecological sustainability as the starting point, we can see several areas of potential trade-offs or synergies:

- **Ecological innovation - employment**: Technological innovations aiming at improving ecological sustainability have effects on the value chain and can cause employment losses in some parts of the automobile industry and in other industries linked to automobile production. However, they can also create new products and employment (e.g. fuel cell). Cross-industry effects have to be taken into consideration. The change to regenerative fuels creates new growth opportunities for agriculture in both industrialized and developing countries but it implies also some dangers (e.g. negative social effects through increasing corn prices).

- **Ecological innovation - regional development**: Ecological innovations can change the competences required in the development and production of automobiles and cause a restructuring of value chains and automobile production regions. Do traditional automobile regions profit from the orientation on ecological sustainability due to their technological capabilities? How can regional policy create synergies between ecological innovation and regional development?

- **Ecological innovation - innovation costs**: Ecological innovations require high investment and high innovation capability as well of OEMs as of suppliers. It is an important question if the OEM-supplier networks support such innovations and if the power-asymmetries and the cost pressure of OEMs on suppliers does not represent an innovation barrier. OEMs can shift the burden of innovation costs to suppliers or they can develop a more cooperative division of labor.

- **Ecological innovation - consumers’ demand**: The ecological sustainability can collide with the consumers’ preferences for size, speed and price (SUVs and premium cars on the one hand, and low-cost vehicles on the other hand), though there are activities for and signs of a change of preferences. Thus, the companies have to solve conflicts between ecological goals and product policy requirements. They can choose an active approach aiming at developing new markets or remain passive.

- **Ecological innovation - functional requirements**: The ecological goal of emission reduction (e.g. use of light materials, reduction of weight) can collide with the requirements for safety. However, there are also potential synergies. The development of sensors and electronics pushed by safety regulation can also help in the development of ecological innovations.

- **Ecological innovation - relocation and international division of labor**: Since the 1990s, there is an intense discussion about the relocation of production from industrialized countries (Western Europe, USA) to low-wage countries (Eastern Europe, China). The costs of ecological innovation can increase cost pressure and relocation to low-wage countries. Another aspect is the development of competences needed for “green” cars: Will the traditional industrialized regions profit from their technological experiences and will the newly industrializing countries develop the competences needed for ecological sustainable products? Ecological regulation in the Triad countries has also the effect of raising market entry barriers for car producers from LCC-countries like China or India which do not have the required technological capabilities. How will the producers outside the Triad react?

Even if this list does not provide an exhaustive overview on all areas of trade-offs or synergies related to sustainable development in the automobile industry, it shows that most of them have a complex character and (with a few exceptions) cannot be reduced to technological problems. Actually, actors in the automobile industry are confronted with a variety of trade-offs within companies, within the industry, and...
between different industries, which they have to manage concurrently and (in the best case) turn into synergies. They do this on the basis of given company productive models which are the results of the trajectories of the companies in the past. Product technology issues have to be seen in relation to product policy, supply chain, labor and financing issues in order to get a comprehensive view of the trade-off and synergy problematic. The interaction of different processes means that the solution to one particular trade-offs can produce new conflicts and problems in another area, thus generating a fragile process of readjustment and the on-going formulation of compromises.

So, clearly trade-offs will have to be made. Firms will do this, each probably in its own manner. Public policies will have to be coordinated as ranked objectives that will influence these trade-offs in a way specified by this hierarchy. To achieve our purposes, it will be necessary to take a deeper look at the trade-offs identified in such cases, in relationship to the synergies that could either be implied by them or arise from them. This is the purpose behind the present proposal and the goal of our research.

**Progress beyond the State of the Art**

Until the end of the 1990s, the literature on sustainable development exhibited a clear tendency to detach environmental questions and the issues related to the corporate social responsibility from the other key influencing factors on the dynamics of firms and industries. The past ten years, however, have seen greater theoretical and operational convergence, as the limits of this position have become more apparent. The subordination of corporate management to more stringent environmental requirements and the development of socially responsible organisations was explicitly formulated in 1997 by Elkington in the introduction to “The Triple Bottom Line of 21st Century Business” in which it is claimed that “it can be profitable to be a sustainable and socially responsible firm”. During this past decade, managers, public policy makers and researchers have been drawn towards a common goal to identify and foster the innovations and/or the conditions under which these synergies can be achieved (Godard 1994).

In essence, the prevailing viewpoint is that these conditions remain to be unearthed by the actors through both innovation and experimentation. This has had two major consequences at the research level:

1. At firm level, most of the research has been based on case studies proving that this virtuous circle could be in fact attainable and implying therefore that there were good “rational” reasons to push or to persuade corporate managers in this direction. As a result, managers were expected to adapt their perception of environmental and societal pressures as threats, and to start seeing them as opportunities to differentiate their corporate policy and guarantee their financial results. For the firms engaged on these new paths of growth, therefore, regulations resulting from environmental and CSR concerns would no longer be perceived as obstacles and would support the development of their “virtuous” strategies.

2. At the level of public policies and regulation, fundamental change in the forms of regulation of economic activity was also expected from the necessity for renewal in order to create the right conditions for sustainable development. It was argued that new forms of innovation were required and that these were, by definition, difficult to translate into “civic regulation” (Vogel 2005) as the “traditional forms of state regulation” had become obsolete. It was not believed that public policy could deal efficiently with the new social and corporate demands for institutional innovations, whether they were taking the shape ‘of new demands of consumers for ethic products’, ‘social movements (boycotts, militant actions by NGO)’, ‘pressures from investors who want to be socially responsible’ or ‘the assertion of values brought forward by managers and employees’ (Aggeri and Godard 2006). As public policy makers are too removed from economic action, it was argued that public policy itself required major changes, for example with the establishment of ‘hybrid forums’ (Callon et al. 2001) where it would be possible to bring out the ‘best practices’, and, if necessary, the rules and the norms
needed to foster the changes implied by the imperatives for sustainable development.

By 2007, the research output developed under these two perspectives had grown significantly and the response both from managers and public policy makers was largely positive. They have contributed to the political success of sustainable development. Sustainable development in general, and in the automobile industry in particular, has become one of the strategic priorities of firms, whether they are OEMs, suppliers, distributors or after-sale suppliers. Sustainable development has also acquired a dominant status in the framework for public policy making at different European levels and worldwide. The pertinent research question today is to consider how these principles can be applied on a larger scale to cover an entire sector of activity and not only the practices of a few pioneering firms. When implemented at the level of an entire industry sector, sustainable development becomes a new paradigm that is able to structure the productive logics of industry actors and the regulations that apply to them.

It is precisely in these terms that the report CARS 21 is defined and the consequences drawn from this report by the European Commission in their statement of 7 February 2007 further underline the importance of this sectoral approach. In order to entrench the principles of sustainable development into a general system of regulation and a shared framework by industry actors, it is obvious that research on questions relating to issues of sustainability needs to be closely linked to a deep insight into broad sectoral concerns yet this is not yet the case in much of the specialist literature on the topic.

Therefore, when we seek to do more than to highlight few exemplary cases, and wish to portray sustainable development either as a general system of regulation or a shared system of reference, the research undertaken must also progress beyond the principle of separation that is still evident in much of today’s specialist literature. What both firms and policy makers need is an understanding of practices of social responsibility that is not removed from an understanding of the dynamics of the industry in question and the specific concerns of different actors. This involves identifying not only when actors manage to develop the positive synergies looked for but also identifying the times when the actors are unable to generate them and they are forced to make trade-offs between conflicting priorities.

The underlying hypothesis of our work is that firms involved at the different levels of the value chain are primarily concerned with the economic sustainability of their strategies. In order to identify the transformation in these firms’ economic, managerial, technological and commercial rationales that occurs when they adopt a framework of sustainable development, it is first necessary to understand their initial strategies and trajectories.

Similarly, public policies that regulate the automobile sector have pre-existing purposes and the forms of intervention used have developed progressively over the years. The new framework and measures required to promote sustainable development will not “naturally” fit into the existing set of processes and procedures. Therefore, as suggested by the few examples of trade-offs highlighted above, the concept of trade-off has to become at least as important in the research process the notion of synergy has been to date.

Our goal is to integrate the findings of the work conducted in social sciences on sustainable development with the research carried out in the same period in the automobile industry. Neither approach will dominate but we believe that previous advances in understanding gained from our work conducted on the automobile industry will permit the development of a sector-specific framework for sustainable development. In the automobile industry, more than in any other sector, it is our firm conviction that “history matters”. Subsequently, the capability of the different actors involved in this industry to integrate the sustainable development orientation into their individual trajectories continues to be strongly influenced and shaped by other considerations. It is our appreciation of this interdependence that will allow us to understand why and how they can or cannot achieve the different levels of synergies potentially achievable by integrat-
ing the sustainable development framework.

For example, the work of Aggeri et al. (2005) on a limited sample of enterprises who are pioneers in the area of sustainable development highlights the fact that these companies, before even making explicit reference to this concept, had to face a series of problems related to different forms of pollution generated by their installations. Unlike other firms, they had pro-actively developed technical and social solutions (involving, for example, consultations with local communities) to these problems, which have allowed them later to assert - rather than endure - their social responsibility. As a result, each of the cases studied (the cement manufacturer Lafargé, the steel manufacturer Arcelor, the hotel group Accor and the distributor Monoprix) exhibits quite different forms of interpretation of the concept of sustainable development. Similar work, albeit from a more theoretical perspective, has been carried out by Oltra and Saint-Jean (2006) on the development of clean technologies in the automobile industry. Their models are based on the concepts of evolutionist theories of technical change and they consider that the learning achieved by these firms occurs on the basis of what they have learned to do in the past (path dependency) and convergence did not occur between them even when they are subjected to a common set of new constraints.

On Corporate Social Responsibility, the GERPISA project aims at developing a critical interdisciplinary perspective. CSR (Ruggie 2004) is a concept which gains in importance and is taken up by institutions and actors like the EU, the OECD or the UN. But at the same time, authors like Heckscher et al. (2003) claim that what we are currently witnessing is a fundamental break with the post-war governance regime and point to conflicts that lurk beyond the discourse of CSR: “what is happening now is the dissolution of the existing stakeholder regime under the pressures of new actors and economic forces.” In this respect, the question raised is to what extent the development of CSR carries the synergies expected, or covers the emergence of new trade-offs. On the other hand, the approach developed by Daugareilh, which adds a legal perspective to the research on CSR, questions, in line with other studies (Hommel 2006) what is truly novel in the regulation practices that are connected to the generalisation of CSR concepts. By linking ‘hybrid forums’ and the other “open arenas” to the generally accepted principle in Labour Law of a plurality of sources of law, this critical approach allows more rigorous evaluation of the degree of novelty that most of the references to CSR appear to imply. More important, it shows, as was already the case in the research work done on the plurality of sources of law, that the constraints placed on the different actors and the balance of power at work can vary significantly, even when the reference is made to the same set of rules (Daugareilh 2005).

The work and concepts developed by the international network GERPISA over the last 15 years, and which have structured the activity of its four consecutive international programmes, also indicate the extent to which the automobile industry is characterised by a great degree of variety, both in terms of strategies and organisations. Whether at the level of the internationalisation process, or at those related to technology, human resources and innovation management, the different international programmes of GERPISA have demonstrated that the idea of a ‘one best way’ is historically untrue and theoretically doubtful. At the same time, by relying on the concept of the productive model (Boyer and Freyssenet 2002) introduced during the first international programme, GERPISA has developed and diffused a theoretical framework which does not reduce the analysis of this variety to the sociography of single cases, but tries to grasp and explain how, in the automobile industry, this historically limited diversity of productive models is constantly organised and renewed. This has been connected in particular, both theoretically and empirically, to the diversity of macro-economic conditions under which the actors of the automobile industry have to perform, and to the variety of the internal compromises of government which emerge in this process. For example, the carmakers Toyota and Honda, both operating under the same macro-economic conditions, actually rely on quite distinctive productive models (Freyssenet et al. 1998). The first model refers to a strategy of “permanent reduction of cost at constant volumes” and the second to a strategy of “innovation and flexibility”. They do not implement the same type of employment relationship,
nor do they have the same type of organisation of their suppliers or the same product policies. Yet they have both achieved the internal and external coherence necessary to make of these companies two viable and prosperous actors in the automobile industry.

This approach was developed on the basis of the research work conducted for the first programme called ‘emergency of new industrial models’ and carried out between 1993 and 1996. It has constituted a major theoretical reaction to the propositions of the International Motor Vehicle Program (IMVP) of MIT, whose coordinators, Womack, Jones and Roos had published in 1990 “The Machine that Changed the World”, a well know and very influential book. This work claimed that no carmaker would be able to survive the 1990s without wholly implementing the principles of lean production, which were based on Japanese practices, and were supposed to become the “one best way” for the automobile industry (and beyond) in the 21st century in the same way as the principles of mass production had developed in the 20th century. The research output developed initially was integrated into the productive models approach by GERPISA and researchers have thus shown that, as it was already the case throughout the 20th century, there was not a “one best way” emerging from the analysis of the recent period. Moreover, the approach underlined that this diversity was not only necessary but also desirable both economically and socially: firstly because a part of the sustainability of each model is related to the fact that is differentiated from those which characterise its competitors, and secondly, because the capability of the industry as a whole to find ways to adapt to new conditions is strongly increased by this diversity.

While IMVP, in carrying on their research on questions also addressed by GERPISA, persisted in their quest for a “one best way” towards which the search for efficiency would compel the industry to converge, the other international programmes of GERPISA have built on the results of the first programme to integrate other dimensions of industrial activity. These cover the forms of internationalisation of design, production and product policies, and, in the CoCKEAS programme financed in the FP5 framework, the modes of coordination of competences and knowledge in the European automobile systems. In both cases, it emerged that the forms of internationalisation and the forms of innovative activity on the part of the firms studied and of their partners did not adhere to the thesis of growing convergence.

More recently, under the ESEMK programme financed by EU’s FP6, GERPISA researchers have focused their attention on the micro - meso - macro conditions of viability of productive models not only in the automobile industry, but also in other sectors, in order to assess the structural linkages between the industrial performance at the micro level, and the performance of different types of capitalism at the national macro level. In analysing how employment relationships are changing in an enlarged Europe, and by increasing the stress both on the commercial practices and on the relationships that take shape between the firms and the regulations which apply to them, the research output in this fourth international programme highlights once again the ongoing renewal of diversity of the practices studied. This diversity emerges at different levels, between the variety of contexts and the different forms of national regulations in which the enterprises operate, between the path dependencies embedded in the trajectory of these firms and the new challenges that they have to take on, and between the crisis or the evolutions of the national political compromises and the search for viable compromises of governance at the enterprise level.

For example, the study carried out by the researchers of WZB on the manner in which the “German model” or the “Swedish model” are exported in the countries which have recently entered the European Union, shows that neither the reference to a specific national context, nor the fact of belonging to a same industry and/or even to a same firm, can explain how the employment relationship is articulated at each production site. Internationalisation does not emerge as a factor for homogenisation, but rather as a process where the structural diversity of the car industry is constantly renewed. The same logic applies to the impact of European competition law on the dynamics of the automobile sector, and in particular at the level of distribution, which has been another important object of research for the ESEMK project. A great level of variety remains in the way European carmakers conceive and manage their interests, which explain
why the attempts of the European Commission to force the sector towards new forms of distribution have been largely frustrated to date. There are of course lessons that can be taken from these analyses of the fundamental distinctive dynamics which characterise the different actors of the European automobile industry, in particular at the level of policy making. Attempts to force these actors towards a desirable unique model - the lean distribution for example - were inevitably thwarted by the structural variety of the productive models involved and by the specific needs of each to guarantee their economic survival. A more nuanced approach aimed at introducing the relevant desirable practices within different models would appear to offer greater chances of success.

These insights appear particularly useful once applied to the question of sustainable development and desire, at policy making level, for an industry wide convergence towards this new organisational model, as expressed in the CARS 21 report. It is clear since the beginning of the 2000s that all the firms involved in the automobile industry have recognised the need to reform their practices in order to adhere to a framework more in line with that of sustainable development. For many observers, this credo appears as the logical replacement of many others that have previously defined the point of expected convergence for this industry, such as lean production fifteen years ago, the globalisation of the automobile industry and the need to manufacture at least 4 million vehicles to survive ten years ago, or, more recently, the necessity for the industry to adopt the practices of a knowledge based society in order to maximise their innovative capabilities. The scientific approach of GERPISA to analyse this supposed convergence towards sustainable development will thus be built on the line of what has been achieved in the previous programmes. It will focus on the concrete reality of public policies and of company practices in terms of sustainable development, at the micro, meso and macro levels, in different national contexts and within the trajectory of each major actor of the industry. It will structure, in analytical terms, the variety of the macro-economic and socio-political contexts on the one hand, and the variety of the company trajectories on the other, based on the underlying hypothesis that it is at the junction of these two dimensions that actors try to achieve the desired synergies in terms of sustainable development but also make the inevitable trade offs under the on-going constraints of their economic activities.

Our ambition is therefore to integrate in a single scientific approach the social, environmental and economic dimensions at the core of the development of the automobile industry today. Our work will be organised in two main axes:

- The first research axis focuses on the practices of the firms and its objective is to determine how their trajectories have been affected by the integration of the new environmental and social stakes embodied by the concepts of sustainable development and corporate social responsibility. More specifically, we will try to characterise how the main actors of the industry (at the different levels of the value chain) interpret these common references and translate them into concrete practices.

  For this purpose we will rely on:
  - The research output on the trajectories of the firms already published, which will be largely updated at the 15th International Colloquium of GERPISA to include in detail the developments of the last ten-fifteen years;
  - The research work on design and innovation and in particular the research conducted by the CGS (Armines) on new paradigms of innovative design (Hatchuel et al. 2006);
  - The research on the supplier industry and on the new forms of division of labour in production and design identified in the debates on the question of modularity (Frigant 2005; Jullien and Jurgens 2006);
  - The research on distribution, repair and automobile services, which stress the need to integrate these actors and the role they play in the management of innovation in the research agenda (Ballot et al. 2006; Jullien 2006).

- The second research axis focuses on the political, economic and social contexts in which the firms have to define their strategies and develop their own concrete interpretations of this new framework.

  For this purpose we will rely on:

5) A new collective book which will be published in 2008
The research work on the variety of capitalisms (Amable 2003) which expands on the theoretical and empirical effort made during the ESEMK (FP6) programme and tries to characterise how these configurations are translated at the meso economic level into the structure of the automobile systems, considered as both systems of production and systems of use;

- The research work produced by the research of historians, sociologists, economists and political scientists on the “politics of industries”, which tries to understand how a political order emerges in a sector which has multi-level configurations as regional politics - European in particular - have to be integrated with national and international forms of regulation.

- The work of researchers directly involved in the study of the different dimensions of sustainable development and in particular those concerned with the production of environmental norms and their effects on the development of new technologies (Oltra and Saint-Jean 2006), and with Social Corporate Responsibility and its relationship to the regulatory devices already in place and which continue to be used by the actors (Daugareilh 2006).

The GERPISA project aims to take a holistic approach to the issues to be investigated. All the interactions that link the economic, social and environmental dimensions of the development of the European automobile industries will be taken into consideration. These interactions will be considered both from the perspective of the companies involved in the automobile industry and from the perspective of the policy makers whose decisions influence the industry. The project will thus lead to the creation of a typology of possible forms of interaction. The purpose of this typology is twofold. On the one hand, it will be of interest to different stakeholders involved in the industry for the purposes of dialogue and debate on key issues and it will help them to evaluate alternatives more clearly. On the other hand, it will allow for identification and analysis of key synergies and trade-offs to facilitate comparison with the emergence and adoption of sustainable development practices in other industries that have also needed to adapt.

Methodology and Associated Work Plan

As the methodology for addressing the research questions raised is intensely time consuming, a certain number of key interactions will be selected and to be examined in great detail. This selection will be the objective of the first Work Package (WP1), outlined below. The primary focus of the research undertaken will be the synergies and trade-offs within a European context and their comparison with other regions. The in-depth studies of similar synergies and trade-offs in a US, Japanese, Chinese and Indian context will be conducted within the international GERPISA network whose research programme for 2008-2010 will be structured to reflect the same themes as those outlined in this project.

Within this framework, the research work will be structured around two main axes. The first will consider how positive synergies and negative trade-offs related to sustainable development emerge at firm level with specific attention paid to interfirm relations, where many of these interactions occur. This will be the objective of WP2. The second axis will examine the macro-economic environment and the broader political, social and institutional framework and the public policies that have an impact on the development of automobile systems, regardless of whether or not these were explicitly referring to sustainable development. This is the objective of WP3. By combining these two research axes, we will subsequently analyse how the automobile system in Europe is evolving in a way that will favour sustainable development. WP4 will thus address the dual objective presented in the conclusion of the previous section to identify best practices in decision-making on the part of both firms and policy makers.

WP1 - Development of Hypotheses and Selection of Key Synergies and Trade-offs and Case Studies

The objectives of WP1 are:

1. To study each main dimension of the sustainability of the development of the automobile industry as they have been traditionally defined and as they are interpreted today;
2. To identify precisely a collection of trade-offs and synergies linking these dimensions and to select some of them as the core agenda of future research;
3. To build the analytical framework that will be applied in WP2 and WP3 to examine the positive and negative interactions between the different dimensions of sustainable development in the automobile industry;
4. To translate this framework into research hypotheses and into a research agenda for the different tasks defined within WP2 and WP3.

Concerning the first objective, four major themes will be examined in detail and, for each, a detailed bibliography will be created and interviews will be conducted with industry specialists. The research team will thus develop in-depth understanding of the questions facing the industry and the manner in which firms and policy makers have been addressing them.

These four themes are:
- The environmental impact of automobiles both ‘in use’ and at ‘end of life’
- The social responsibility of automobile firms with respect to their employees, their subcontractors and their distribution and repair channels
- The competitiveness of the European automobile industry
- Road safety

Four international and interdisciplinary task forces will be created to examine these four key themes in detail. This analysis will cover the academic literature available on the topic and the major studies and reports that have been commissioned over the past fifty years in response to public policy makers desire to address the issues involved. This phase will involve diffusing the work done already by many members of the research consortium on these issues and ensuring that each of them has been researched in detail.

So, WP1 will firstly address the following questions:
- When and how did these questions emerge and how have they been addressed? How have firms acted or reacted in relation to them in different European countries, at the level of the European Union and beyond?
- What questions are generating heated debate in 2008?
- How does each theme relate to the other three themes being examined?

The second part of the research of WP1 is
- The iterative design of a common analytical framework by the coordinator and the steering committee on the basis of the state of the art and of intense exchanges with the members of the consortium,
- The definition of research hypotheses and research methods by the teams involved in WP2 and WP3. It will involve a preliminary enquiry to verify that the synergies and trade-offs to be examined are, in fact, believed to be of critical importance and to guarantee that the research teams will have access to data and key actors for their empirical work.

Then GERPISA will produce:
- A set of four reports about the topics selected
- A summary of the current situation of the European automobile industry in relation to sustainable development, covering the main trade-offs to be made and/or synergies to be developed by both firms and policy makers.
- A specification of the common framework and definitions of the research agendas to be implemented for both research axes whose programmes will be then defined clearly by the coordinators of WP2 and WP3.

WP2: Firm-level Analysis of SD Related Tradeoffs and Synergies in the Automobile Industry

The aim of the WP2 will be to analyze trade-offs and synergies related to issues of “sustainable development” at the level of firms. The configurations of trade-offs and synergies are influenced by regulatory contexts, company trajectories and strategies, and factors linked to innovation dynamics. Thus there are considerable differences for instance in how firms in Europe, the U.S., Japan, Brazil, China and India deal with the trade-offs and synergies of sustainable development. For instance even within Europe recently, companies have followed different approaches (e.g. the difference between German and French producers with respect to the Diesel filters).

There are a large number of studies on the issue of sustainable development at the company level (“greening business”). These include economist approaches dealing with
the possibilities to internalize the costs of ecological damage, analyses of conditions for success of ecological products (e.g. the “strategic niche management”) (Kemp et al. 1998), studies about the “greening” of particular company functions like marketing or supply chain management (Preuss 2005), studies about organizational cultures and their effects on the capability of companies to adapt to sustainable development (Hard and Knie 2001) or studies stressing the role of pioneering companies and isomorphism in “greening business” (Aggeri et al. 2005). There are also many studies about ecological innovations in the automobile industry. Most of them have a very narrow focus on particular products or technologies, however. Within this context, there are studies which analyze the employment effects of “green” innovation and there is a long debate about trade-offs between ecological requirements and employment (Brett and Smith 2001; Meisser 2005; Ziegler and Zwick 2004).

Despite this broad discussion, however, there are only a limited number of studies that link the study of sustainable development at the company level with the analysis of industry dynamics and company trajectories which shape the options for action available to companies and other actors. Such an integrated approach will be undertaken in WP2. WP2 will provide studies from three perspectives on sustainable development at the company level:

- Studies of company trajectories, which analyze trade-offs and synergies of sustainable development within the organizational context of one company,
- Studies of innovation trajectories, which analyze trade-offs and synergies of sustainable development from the perspective of particular innovations and large ensembles of companies and other actors,
- Studies of the issue of social sustainability and Corporate Social Responsibility.

The first strand of research will provide studies of company trajectories, in particular for car manufacturers. Company trajectories evolve from strategies, events and framework conditions in the history of companies, and include in particular specific product policies, productive organization and labor relations. The industrial models resulting from these trajectories limit the strategic options of actors in the companies. Synergies and trade-offs between environmental dimensions and the product policy and productive organization of the firms will be at the heart of the analysis. We will analyze whether the trajectories have led to path dependent structures and strategies regarding sustainability or if, and in which situations and constellations, new path creation is possible. While this research focuses primarily on the leading OEMs, an important aspect will be the role of alliances between companies. Alliances between different OEMs and between OEMs and key suppliers have become an important element of innovation strategies related to issues of sustainable development (for instance, in the area of hybrid cars). Besides car makers, company case studies will also be conducted on selected suppliers of product or process technologies and, in view of the crucial importance of emissions, on fuel producing companies, carbon-based or alternative.

Another important issue in order to link the research in WP2 to WP3 will be the demands formulated by companies and the influence of automobile companies on public regulation. Another question will be the relationship between the “sustainable development” narratives developed by firms and their actual practices in terms of product policies, productive organization, employment, and supplier relations.

The second strand of the WP2 will be the analysis of innovation dynamics within and between firms related to sustainable development. The research will focus on trade-offs and synergies linked to important innovation fields in the automobile industry. WP2 will take a “process view” on configurations and chains of trade-offs and synergies. The “process” view allows us to investigate the interaction between different trade-offs or synergies and analyze how the solution for a particular trade-off can produce new trade-offs in another domain. The research interest here is on gaining a deeper understanding of the dynamics of trade-off and synergy processes and transformations of one into the other.

The research will go beyond simple one to one tradeoff-relationships between sustainability goals. Rather we are interested in more complex relationships such as, for example, between innovations in the area of safety and of emis-
sions thereby relating different aspects of sustainability. Product technology issues will have to be seen in relation to product policy, supply chain, labor and financing issues in order to get a comprehensive view of the trade-off and synergy problematic. One approach for the analysis of innovation trajectories will be the “innovation biography”.

An important point will be to analyse the relationship between “green” innovations and the cost competitiveness requirements in the industry. This concerns first the classical debate whether ecological innovations are job killers or job creators. But there are also other issues. OEMs use cost pressure on suppliers and the relocation of production to low-wage countries as instruments to safeguard cost competitiveness of their products. How does the cost pressure on suppliers affect their innovation capabilities related to sustainable development? How does “green” innovation influence the division of labour between high-wage and low-wage countries? Can the emerging markets become the laboratory for new innovations (e.g. Brazil and its ethanol cars)? What will be the sustainability implications of the current wave of low cost cars?

The third strand of research within the WP2 will deal with issues of social sustainability and of corporate social responsibility (CSR). The European Commission has identified CSR as a contribution of business companies to the goals declared at the Lisbon summit and has expressed interest in the evaluation of CSR activities. There is, however, no consensual definition of CSR, a broad range of different firm practices and a lot of issues which are subsumed under CSR starting with ecology and ending with corporate citizenship. Within the scientific discourse, there is considerable dissatisfaction with the strong normative overtones of the concept and with its vagueness (Crouch 2006). Within firms, CSR remains an issue of controversy and uncertainty. The elements and the impacts of CSR are far from clear as it is a voluntary concept on the one hand and on the other hand a concept which is supported by political actors and increasingly monitored by financial markets. Many rating agencies have emerged which evaluate the performance and policy directions of companies vis-a-vis sustainable development and corporate social responsibility goals. Capital market actors and institutions play an increasingly important role in influencing the specific trade-off/synergy calculations.

WP2 research will take particular account of stakeholder interests from the side of the employees and the trade unions (sometimes called “stakeholder dialogue”), suppliers, and of the regions and municipalities where firms are located. All these stakeholders are becoming increasingly concerned about the threat of relocation of production and about competition from low-wage countries. The research will investigate the impact of company decisions on trade-offs and synergies regarding sustainable development on employment levels and management-employee relations as well as on the relations with regional suppliers. It will pay particular attention to the role of CSR in the debate about relocation from high-wage to low-wage countries. Does CSR have much to offer to industrial workers in advanced industrial countries, as the frame of reference shifts away from the nation-state towards regions or the “global arena” (Ruggie 2003) In what ways are companies dealing with issues of employment protection and of monitoring work standards in supplier companies in their CSR policies.

**WP3 : Policy Makers-level Analysis of Synergies and Trade-offs of ‘Sustainable Development’**

Even if both managers and administrators responsible for regulating the automobile industry willingly adhere to the sustainable development framework, policies which directly or indirectly, explicitly or implicitly intend to promote sustainable development in the automobile industry cannot be solely derived from the interests of firms or from what their entry into the new framework may lead them to develop in terms of discourse and practices. It is for this reason, in parallel to the ongoing work of WP2, that another WP will study the impact of public policies on industry life, its trade-offs and/or synergies that are at the origin of interpretations of the sustainable development framework. To accomplish this goal we need to investigate the different dimensions involved in a holistic approach that integrates environmental, social and economic objectives in the development of the automobile industry. For this reason the WP3 can not confine itself to measures that are exclusively concerned
with sustainable development. This study will therefore seek:

1. To understand how the complex set of rules which regulate the development of the automobile industry is constituted.

2. To evaluate if and in what way this complex produces synergies and/or trade-offs that makes sustainable development possible.

To grasp the ensemble of these rules fully and to appreciate their variation from one country to another within the European Union and from one world region to another, it is imperative to define from the start how automobile systems are structured and differentiated in relation to their macroeconomic, social and political context. It is clear, in fact, that debates of a seemingly technical nature like those surrounding ‘pedestrian directive’ or acceptable emission limits involve high stakes for automotive makers and their ability to defend their relative competitiveness. These stakes relate directly to the systems of production and differentiated automobile usages whose structures and transformations may only be understood with reference to the economic, social and institutional configurations in which these systems emerge.

Therefore, in order to determine which modes of interpretation of sustainable development characterize different national and regional configurations within Europe and in the other two regions of the Triad or in emerging automotive markets, one must understand that the very notion of automobile and its broader implications does not have at all the same meaning from the perspective of all the different stakeholders. Thus scholars have recently argued that the opposition between manufacturing and non-manufacturing countries constitutes a major key to understanding other European debates, such as the application of competition laws to automobile distribution (Pardi 2006). Moreover, with respect to debates over environmental norms, the characteristics of national or “regional” automobile markets play a critical role in the staking out of positions and, therefore, the outcomes of debates.

In order to comprehend the automobile industry as the aggregate of business activity, markets, and employment and how these systems evolve in greater or lesser convergence, this work will first attempt to link the evolution of these systems to economic and institutional trajectories on the national and regional level. It will be possible to rely on previous research for this purpose. Indeed, an analysis of productive models and their evolution will make it possible to identify the conditions of compatibility between product strategies, production organizations, and labor relations within the sector of auto makers on the one hand and the modes of growth and the distribution of revenue of national economies on the other (Boyer and Freyssenet 2002). An analysis of the systems of automobile usage or of “automobility” will provide here additional insight by adopting a perspective focused on automobile demand. This analysis will make it possible to understand the economic and social relations that households and private companies have with automobile products (and services) and the structure of business opportunities that present themselves to automobile professionals.

In parallel with the first task of the project, WP3 will investigate the policies of the automobile industry and how they are structured and restructured on national and regional levels (Jullien and Smith 2005a, 2005b). In this case we will rely on a approach of political analysis informed by the work of historians (Ramirez 2006). These policies, tied as they are to automotive manufacturing, relate back to productive strategies as well as to the logic and doctrines that define the different institutional environments. These include property rights, automotive fiscal systems, infrastructure policies, and international commerce. Whether explicitly or implicitly, these automotive policies influence trade-offs and potentially produce synergies, it becomes therefore useful to ask if they have been reevaluated and/or revised under the pressure represented by the rise of sustainable development as a new framework of reference.

In developing this perspective, reference will be made to both historical and political analyses. The role of the State in the development of the automobile industry during the last century has been indeed clearly stressed by the works of historians (Bardou et al. 1982), for example at the level of public investment, fiscal policy and the deployment of commercial and technical barriers. It is in order to better understand
these interactions that a group of young researchers have come together to form the working group SAPAI (State And Politics in the Automobile Industry) in 2004 within the GERPISA (Pardi 2007). In a similar perspective, the works of the political scientist A. Smith and economist B. Jullien aim at investigating the problems of industrial organizations and the politics of industry. For this purpose they have conceived and tested an analytical framework that distinguishes four large series of regulations that structure the life of automobile industry: their role is to stabilize the relations that industry firms form with financial institutions, employees, suppliers and customers by establishing what have been defined as “instituted relations” (Jullien and Smith 2008).

The questions raised by this framework are:

1. How were these relations structured and differentiated in Europe and in other regions of the world in accordance to the historical evolution of policies aimed at regulating the development of the industry in particular, commercial (Customs Law, Property Law), fiscal, trade, and infrastructure policies, and also road transportation safety;

2. Whether if or how the new objectives and procedures associated with the new sustainable development framework have an impact on the restructuring of these relations.

So far we have researched the political and economic context of these policies and identified the trade offs associated with them. In WP3 we move to the final stage of analysis, which will concentrate on those policies explicitly conceived to promote sustainable development in the automobile industry and their associated synergies and/or the trade offs.

From this perspective, the consequences drawn from the different administrative levels of the necessity to improve transportation safety and environmental policy will be privileged and studied both from their genesis and in their impact on different industry stakeholders. To this end, then, the skills of historians, sociologists, legal scholars, and environmental economists will be brought to bear in Task 3.

More precisely, the purpose of the study is to evaluate if and to what extent the integrated approach reforms regulations which have traditionally been applied to the automobile industry in a few key domains. In fact, even if the “new guiding principle” carries the hope of tying together all these dimensions, they continue to be the object of what political scientists call “sectorial policies” (Muller 2003). Leaning on administrations and specialized expertise, this sectorization, which in many cases has existed for a long time, continues to prevail and justify itself by the complexity of the questions posed by each of the dimensions themselves and the related necessity of developing a highly specialized expertise required to document decisions. A number of GERPISA researchers are specialists in understanding sectoral policies. For example, the historian, M. Moguen has analyzed how policies aiming to reduce automobile fatalities have been structured in Europe. Another example is how industrial economists from GREThA have developed for several years a common approach to understand how different types of norms are more or less adapted to contribute to the development of clean technologies. Finally, the legal scholar I. Daugareilh examines the question of CSR by attempting to measure and situate this novelty as a tool for social regulation.

In the three approaches proposed, the necessity to integrate all the interactions is obvious in order to resolve the problems that are being addressed. The question of vehicle safety, for example, is thus incomprehensible without taking into account the industrial constraints and the functions and powers of the relevant public authorities, on the one hand, and the need to convince all parties of the compatibility between the measures taken and the preservation, if not the improvement of relative competitive positions for automotive makers on the other (Moguen 2007).

To approach these sets of issues from another perspective, Oltra and Saint Jean’s research (2005a, 2005b) demonstrates that in order for firms to adopt clean technology, it must combine environmental performance with productive efficiency (in terms of productivity and cost). Indeed, clean technology must also be competitive when compared to conventional technologies on non-environmental criteria. This means that both objectives should be considered simultaneously, in particular for radically new clean technologies that may exert disruptive effects on prevailing processes and products. Clean technology must lead in the short term to
more efficient and to cleaner production in order to benefit from “win-win” effects as described by Porter and Van der Linde (1995).

By bringing together all of competencies in Task 3 of WP3 it will be possible to determine the degree of potential fruitfulness of the new guiding principle in helping to make trade offs more effective today.

**WP4 - Synthesis and Political Implications**

Over the past decade, sustainable development has become associated with the adoption of a new framework. This framework has obliged public and private actors to develop and justify their activities simultaneously along three dimensions: social, environmental and economic. As they are seeking to make compatible objectives that may appear contradictory, the actors encounter difficulties in developing their activities under this new regime. This, in turn, requires us to pay particular attention to the analytical dyad of synergies and trade-offs. We are as interested in the manner in which actors make their choices as in the outcome of the final decisions. In studying how the practices of automobile firms have been renewed by this sustainable development framework, it is crucial to identify the forms of innovation and the types of organisation that will generate positive synergies. Similarly, in relation to the development of public policy, it is as important to understand the procedures and the tools used to build the norms, rules and practices as it is to understand their outcomes. With this in mind, WP4 will provide a synthesis and integration of the research work conducted in WP2 and WP3 and will address both perspectives.

The first perspective will concentrate on the automobile industry and the position of the European actors in this industry. It will address the following questions:

- Does sustainable development require a new paradigm for the industry or can it be considered a logical evolution of evolving practices and strategies?
- Are the relative competitive positions of different firms and regions of the world being redefined by the new requirements of the sustainable development framework?
- Are there different levels of ability to develop the synergies between the three dimensions and are these differences significant enough to generate sustainable competitive advantage as is proposed in the work “The Triple Bottom Line of the 21st Century Business” that is a founding stone of the new framework of sustainable development?
- Do these different levels of ability relate to qualities developed by the firms or to the economic, political and regulatory environments in which they operate?

In replying to these questions in relation to the automobile industry and in questioning directly how applicable these results are to other contexts, WP4 will enhance our understanding of how sustainable development can be encouraged and ‘engineered’.

The second perspective will centre more closely on the question of what organisations and procedures enhance the development of a strategy of a sustainable development at both micro and macro-economic levels. This question will be addressed both in operational terms and from a more political perspective. In operational terms, we will ask how firms seeking to progress in areas linked to sustainable development also continue to develop their other areas of activity and how these other activities are affected by the norms related to sustainable development. This issue will be addressed in relation to the cases concerning road safety, emissions regulation and corporate social responsibility. We will consider how true it is that policy makers have been more willing in recent times to adapt their procedures for developing norms by accepting more experimental and voluntary regulation on the part of firms and groups of firms. From a political perspective, this form of reasoning may lead to accusations of the ‘privatisation of norms’ in which all that is made obligatory is what firms or certain firms are able or willing to accept.

As researchers, we do not have to choose between the two points of view. Nonetheless, our research work will offer stakeholders the analytical and empirical elements needed to redefine the terms of the debate. Without oversimplifying reality, we will propose a configuration of trade-offs and synergies and analyse which are more and
which are less efficient in promoting sustainable development outcomes and which are more and which are less democratic in designing and implementing an operational framework.

REFERENCES


[한국어 요약(Korean Abstract)]

본 연구는 자동차산업에서 지속가능발전을 추구하는 가운데 고용, 경제, 정책, 비용, 수요 등 다양한 차원에서 나타날 수 있는 상각관계와 시너지에 초점을 맞추고 있다. 최근 주목 받고 있는 지속가능발전을 경제적 경쟁우위, 사회적 책임, 환경보호를 아우르는 개념으로 정의하였다. 지속가능발전의 세 가지 차원을 통합해 시너지를 창출하는 노력은 기업과 공공정책 차원에서 중요성이 높아지고 있다. 이 라면 지속가능발전에 대해 지난 수년간 논의와 적용의 과정을 거치면서 새로운 프레임워크의 필요성이 늘어지고 있다. 기존에 논의되어왔던 지속가능발전에 대한 원론적인 수준에서 더 나아가 실제 적용과 관련된 분석이 필요하게 된 것이다. 새로운 프레임워크는 지속가능발전이 업체, 정책, 연관산업 등과 긴밀히 연결되어 있으므로 이들의 연관성을 반영하고 기업이 전략을 수립하고 지속가능발전을 수행하게 되는 정치, 경제, 사회적 충면을 고려하였다. 새로운 연관 프레임워크를 구성하고 이에 따른 분석을 위해 본 연구는 총 4개의 연구 패키지(working package)를 구성했다. 제1 연구패키지에서는 자동차산업에서 지속가능발전의 새로운 정의를 도출하고 상각관계와 시너지에 관한 가설을 수립하였다. 제2 연구패키지에서는 지속가능발전의 상각관계와 시너지가 기업 내부에서 어떻게 나타나는지를 살펴보고, 제3 연구패키지에서는 자동차산업 발전에 영향을 미치는 거시경제, 사회, 정치, 정책적 환경에서의 지속가능발전의 상각관계와 시너지를 분석했다. 제4 연구패키지에서는 제2 연구패키지와 제3 연구패키지를 통합해 기업과 공공정책 충면에서 이 새로운 프레임워크가 유합과 글로벌 자동차산업 환경에 적용될 수 있는지 분석하고 평가하였다.