

Centre of Industrial Economics (CERNA)

2009 annual report

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CERNA is the Centre of Industrial Economics at [MINES ParisTech](#). Its work centres on the dynamics of companies and markets, the impact on economics and competition resulting from state intervention (i.e. competition policy, regulations, environment, technology-related policy and trade agreements), and quantitative finance. Industrial economics and regulatory economics currently play a central role in defining company strategy and financial communication, in choosing state policy instruments, and in legal arbitration (e.g. commercial and regulatory litigation). CERNA's research is broken down into six main areas: the digital economy, regulation, the environment and climate change, globalization, quantitative finance and innovation management. The corresponding projects are carried out within a range of national and international partnerships (e.g. academic, industrial).

Education

CERNA runs three of the university's civil engineering course options: *Industrial Economics*, *Law and Business Economics* and *Quantitative Finance*. We are also involved in educating civil engineers on economics and finance within a core syllabus (*Macroeconomics*, *Introduction to Economics*, *Economic Calculation*) and with specialist courses (*Industrial Economics*, *Introduction to Market Finance*, *Project Finance*, *Stochastic Processes and Globalization of the World Economy*). CERNA also offers courses on *Public Goods and World Governance*, *Research and Innovation* and *Corporate Strategy* and supervises dissertations produced by engineering students in the "Corps techniques de l'Etat" (state technical corps). In partnership with the CEP (Centre for Energy and Processes), it has run a Master's degree course on Energy Strategy since 2004.

In addition to these activities, CERNA researchers give lectures at other postgraduate-level establishments: Master's degree in *Economics of sustainable development, environment and energy (EDEE)* and Master's degree in *Risk Management in Finance and Insurance* at Paris Ovest University, Master's degree in law at the Université Catholique de Louvain, Master's degree in *Technology and innovation* at Paris Dauphine University, and specialist Master's degree in *Environment Engineering and Management (IGE)*.

 **Research****Digital economics**

In 2009, the team extended its research of media-related industrial economics to encompass the digital environment. Our researchers also made progress in the economic analysis of regulations relating to culture industries. In January of that year, the ParisTech Chair for Media and Brand Economics was created (see Key Events section).

Regulation of network industries

Our research in this domain mainly centres on the European gas and electricity sector, and in particular on access pricing, market structure and energy policy. In 2009, François Lévêque participated in debates on reforming French electricity markets. He published an article on the subject, entitled ‘Where the Champsaur Commission has got it wrong’, in the *Electricity Journal*.

Intellectual property rights

Intellectual property rights come under the work of the Industrial Chair of Law and Brand Economics, supported by Air Liquide, Microsoft and Philips. The Chair’s research during 2009 continued work already started in 2008 on technological standards as well as corporate involvement in free software. Two new PhD students, Henry Delcamp and Justus Baron, were taken on to produce and analyze empirical data on the theme of standards. An international survey was also launched relating to standards organizations’ policies on intellectual property.

Industrial policy

Work on this theme looks at the characterization of the industrial domain and its principal structural development over the last twenty years (i.e. relative influence, economic role, specialization and the phenomena of deindustrialization and relocation). The team also attempts to develop a comparative analysis of different industrial policy instruments (e.g. competitiveness clusters, strategic investment funds and sectorial projects).

Environment and climate change policies

In the domain of policies to combat the greenhouse effect, CERNA is involved in a research programme on transferring technologies that consume low levels of greenhouse gases from industrialized countries to developing countries. The programme is funded by the Agence Française de Développement, the GICC and the Conseil Français de l’Energie. In 2009, Benjamin Bureau and Antoine Dechezleprêtre defended excellent theses on the subject. CERNA attended the Copenhagen Summit on Climate Change to present the results of a new study on the photovoltaic industry. It also launched a new PhD theme on the economics of Corporate Social Responsibility (RSE).

Analysis of globalization

CERNA Globalization's research topics currently focus on sustainable urban development, measurement and dynamics of exhaustible and renewable natural capital, and establishing sustainable development indicators.

In the area of sustainable urban development, work continues on making an economic assessment of curbing so-called "illegal" housing in Mumbai, the sustainability of urban transport policies and evaluating the costs of the transition towards sustainable urban development.

Relating to measuring natural capital and sustainability indicators, the work done by Timothée Ollivier culminated in the thesis he defended in December 2009. Three publications are underway.

The WEC (World Energy Council) has asked P-N. Giraud and his team researching towns to undertake a study: *Energy for Megacities*, to be presented at the World Energy Congress in Montreal in September 2010.

Quantitative finance

Mining and petroleum projects are subject to both technical and financial uncertainties. The quantitative finance group has been developing ways of incorporating these two types of uncertainties when evaluating these projects. A consortium composed of Areva (France), BHP Billiton (Australia) et Codelco (Chile) financed work on the application of real options in mining. Two papers were presented at an international conference on Project Evaluation held Melbourne (Australia) in April 2009.

Our work on VPP (virtual power plants) was presented at a seminar, *Price & decision support modeling in electricity markets*, held in February in Trondheim (Norway), and at the IAEE international congress held in San Francisco in June. The Journal of Energy Markets will publish a paper on this work in a forthcoming issue.

Finally we continue working on dynamic copulas in collaboration with Daniel Totouom (BNP Paribas, NY).

Innovation management

The competitiveness cluster observatory, led by a mixed team involving CERNA and the CGS (in association with Paris-Dauphine's IMRI and ESCP-Europe) encourages fruitful exchanges between research teams, observers and participants from different clusters. Monthly seminars, quarterly newsletters and a website help to develop a community of practice.

Funding from ANR for the Epictetus project makes it possible to analyze the directions followed by competitiveness clusters and the way that this state policy is piloted. We work in particular on characterizing the clusters' background conditions, actions, results and added value.

For the thirteenth year running, the monthly seminars on Technological Resources and Innovation, organized in partnership with the Ecole de Paris du Management, led to interesting discussions between innovation practitioners relating to real-life cases.



Key events

The publication of a paperback edition (Points Seuil) of the book by P-N. Giraud, initially published in 2001 (winner of the Grand Prix Turgot and the European Economic Book Award): *Le Commerce des Promesses*, with two new chapters on the 2008 financial and economic crisis.

The creation of the ParisTech Chair of Media and Brand Economics in January 2009 associates CERNA with ParisTech's Telecom Network and Computer Science Department. The Chair has received funding for five years from Vivendi. Groupe Lagardère joined the chair in 2010.

A Side Event was held at the Copenhagen Summit on Climate Change in December 2009, entitled *Beyond patents: innovation, competition and technology diffusion in the photovoltaic industry*.