



Reasonable costs. Evidencing the limited burden of environmental regulation in Europe

Anne Le Strat (independent consultant), Yann Laurans, Sébastien Treyer, Xin Wang (IDDRI), WU Shunze, NIU Ren (CAEP)

For decades, Europe has undertaken ambitious environmental policies through a set of directives and regulations applicable in particular to the economic world. For decades as well, actors of all kinds have voiced concerns regarding the cost of such regulation and argued for reducing the environmental burden on industry. How much does environmental regulation really cost the industrial sector? However heated the debates regarding this issue may have been, surprisingly little evidence is available to document this question.

This Issue Brief is produced jointly by the Chinese Academy of Environmental Planning (CAEP) and Iddri. Indeed, China has passed a number of ambitious environmental regulation and action programs, which may trigger questions with respect to the expected future burden for the Chinese economy. Is there enough evidence of the reasonable costs or any economic benefits of environmental regulation from the European experience over decades, for those who intend to support the environmental ambition in China or other emerging contexts ?

The brief displays a synthesis of evidence produced to date, including those supporting the opposite assumption. It first gathers evidence pointing to chronic over-estimation of environmental costs, then provides materials suggesting that environmental costs have had limited impacts on US or European industry, and ends by examining to what extent environmental standardization proved beneficial.

The paper does not claim to provide an exhaustive list of studies and reports dealing with such topics: it is based on a selection, favoring most recent works, focusing mainly on the European context, encompassing both theoretical and empirical analysis and examining the point of view of researchers, experts and institutions. It relies on documented reports dealing with the impacts of environmental policies in Europe, and wishes to enlighten decision-making in China and other countries or regions that are about to experience important upgrading of their environmental standards.

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KEY MESSAGES

- In cases where the impact of European environmental policies on industries were studied, results suggest that stricter environmental regulations did not necessarily lead to higher environmental expenditures *in fine*.
- Most often, environmental protection expenditures accounted only for about 2% to 3% of total value added generated by industrial sectors, and were progressively reduced over time.
- Conversely, some studies have highlighted a number of benefits that can be derived from environmental initiatives, such as savings in materials or the reduction of depollution costs.
- However, no evidence supports the extreme opposite, *i.e.* wide-scale positive impact on the regulated companies, except on specific cases.
- The economic argument in favor of environmental regulation is thus relevant, but with a limited evidence basis, and would be strengthened if research had been more systematically and broadly produced to study all sectors of the economy over a longer period of time. This could be a relevant topic to be supported by the European research agenda.

Institut du développement durable
et des relations internationales
27, rue Saint-Guillaume
75337 Paris cedex 07 France

1. COSTS OF ENVIRONMENTAL REGULATIONS ARE CHRONICALLY OVERESTIMATED

Many studies, beyond the sole perimeter of UE, have shown that the costs associated with the introduction of environmental policies are often largely overestimated *ex-ante*. Two important studies among others, which cover a ten-year interval (Harrington, Morgenstern, & Nelson, 2000, 2010), compare the pre-regulatory estimates of the direct costs of individual regulations to the actual costs when the regulations went into effect, in the case of US Environmental Protection Agency's and Occupational Safety and Health Administration's regulations. They conclude that regulatory agencies tend to overestimate the economic burden of regulations. Most pollution control programs, for instance, turn out to be less costly than had been estimated beforehand: the review based on two dozen *ex ante/ex post* comparisons indicate that *ex ante* estimates of total cost have tended to exceed actuals in 14 of the 28 rules in the data set, while estimates were too low in only 3 cases.

In the costing of European environmental policies (Jantzen & van der Woerd, 2015; Vercaemst *et al.*, 2007b), this risk of overestimating *ex-ante* impacts is clearly identified. The studies note that the sum of individual environmental policies is less than its constituent parts, meaning that synergies reduce the cumulative burden. The drive for synergies is usually an important element in the negotiations between (local) authorities and companies, *e.g.* on a permit review. This is particularly the case for different regulations affecting one environmental medium (for example, air emissions combining IPPC and NEC requirements in a single permit review). In this respect, the authors advise being “very careful in assessing the expected effects of (new) regulation, for example in impact assessments, and avoid[ing] letting standalone consequences be used as meaningful estimates, discarding synergetic effect” (Vercaemst *et al.*, 2007b, p. 16).

The International Chemical Secretariat—a non-profit organization—describes in a report (Vercaemst *et al.*, 2007a) some quite telling historical examples of the exaggerations about the impacts of environmental regulations on business. The report focuses on a series of well-known health and environmental problems that have been addressed through strong policy initiatives: it highlights that some industrial sectors, feeling threatened by proposed restrictions, have used a battery of tactics to predicate extravagant economic burden “based on a more or less flawed or unrealistic calculation of direct and indirect costs”. Two examples taken among the numerous documented

cases can illustrate the point. First, the *Restrictions of Hazardous Substances (RoHS) Directive*, which the industry blasted as likely to irremediably damage the domestic electronic industry market, entailed actual costs limited to 1.9% of annual industry turnover in the first year, down to 0.4% in the long run; second, the use of catalytic converters imposed by the 1991 *Directive on vehicles emissions standards* was staunchly predicted by the automotive industry to represent £400-600 extra cost per car plus a penalty on fuel consumption, when the actual cost ended up at £30-50 per vehicle with the fuel penalty being fully offset by related technological innovations.

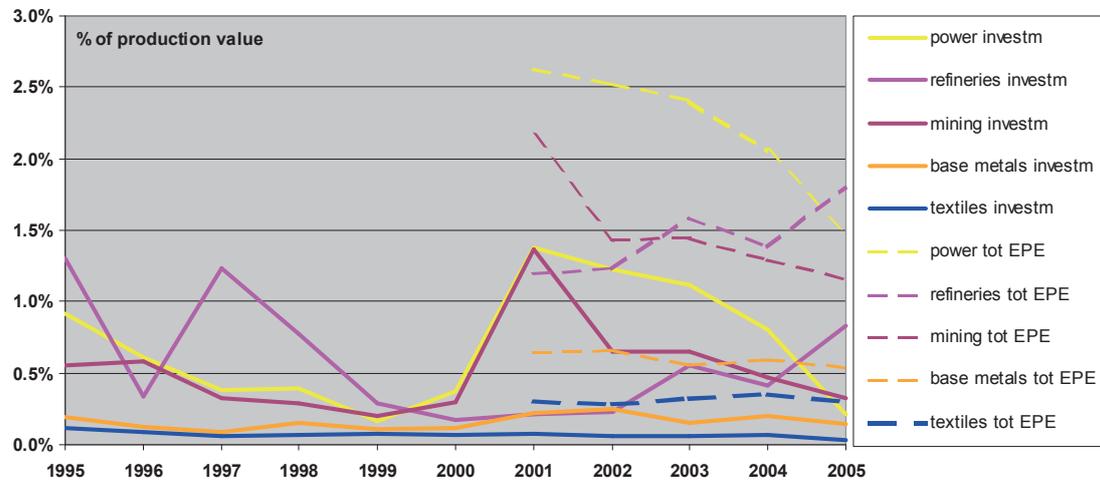
2. ENVIRONMENTAL COSTS HAVE HAD LIMITED IMPACTS IN THE EU

The EU's efforts to evaluate the economic impacts of its environmental regulations are fairly recent, and the quantity of existing studies is therefore modest. However, some of them provide key findings, in particular on the cost side. Vercaemst and colleagues (2007b) depicted an integrated picture of the drivers for environmental expenditures, their effects, and their consequences for a number of industrial sectors highly affected by EU environmental policies as a whole. In a survey of 170 plants in 14 Member States (with case studies and detailed data), four sectors were analyzed, all of them pollution-intensive industries but showing an overall strong track record of environmental improvements: the electricity sector, the oil chain sector, the textiles and leather sector and the iron and steel sector. The findings were that environmental policy accounted for a relatively low percentage of costs in the different sectors (less than 2% of production value). The costs of environmental policy since the 1990s varied between sectors, firms and countries, but generally tended to fall over time, with the exception of refineries. The study concluded that there was no evidence that environmental policy had a material effect on the competitiveness of Europe's manufacturing industry, or on production shifting.

An indication of the importance of environmental investments of the four selected sectors is provided by the annualized environmental investments as a percentage of gross production value (Figure 1). Sectoral environmental investments show several peaks, but are not higher than 1.5% of sectoral production values. Total environmental protection expenditures (EPE) are higher in the sectors strongly related to energy policy (refineries, mining and power).

This assessment was updated and its scope widened in Jantzen and colleague's (2015) time series

Figure 1. Trends in annualized environmental investments as a percentage of gross production value for different sectors within the EU for the period 1995-2005



Source: (Vercaemst *et al.*, 2007b)

of environmental expenditures. Six industrial sectors were examined from 1995 to 2012: mining and quarrying, manufacturing, refineries, chemical industries, the base metal sector and the power sector. Two types of environmental expenditures were studied (investments and operational expenditures) in 23 EU Member states. This study highlighted the counter-intuitive decrease of environmental expenditures over time (Figure 2): total annual environmental expenditures of all studied sectors had decreased from €60 billion in 1996 to €40 billion in 2012 (in fixed 2012 value).

Here again, these environmental protection expenditures accounted only for about 2% to 3% of total value added generated by these sectors, with a small downward trend. “Peaks” of relative expenditure in 2001 and 2009 correspond to investment peaks. While the study highlighted noticeable sectoral and country differences, this analysis suggested that new and stricter environmental regulations in general had not led to significantly higher environmental expenditures (at the level of the EU). Such findings are generally explained by the sectors’ capacities to increase efficiency over time in responding to regulation, and so their environmental expenditures (investment and operational) tend to decrease over time as a result of technological progress; besides, in most cases such environmental-related progress goes faster than the general technological progress in an industry.

Turning to other sources, the “Assessment of cumulative cost impact for the steel industry” undertaken for the Centre for European Policy Studies (2013b) examines in details the cumulative costs stemming from EU regulations for the steel industry. The figures show differentiated results

depending on the type of plant and the year (with a strong pro-cyclical factor, e.g. impacts are relatively stronger in more difficult years) but overall tend to assess that these EU regulation-induced costs remain in a manageable range of the total costs and were not the most decisive factor in terms of competitiveness vis-à-vis least cost producers (Russian steel makers for instance) even though they can amount to a third of EBIDTA during difficult years.

A similar study was published the same year and also focused on the costs, this time for the aluminum industry (Centre for European Policy Studies, 2013a). It deals with two different groups of producers: those who buy electricity on the market, and those who are shielded from regulations affecting market prices thanks to old long-term contracts or in-house (green) electricity production. For the first group, the study showed a rather important impact of EU regulations (mainly ETS and other energy-related regulations, far more than other environmental regulations) on their profits and margins, both in good and difficult years. However, the study also concluded that those regulatory costs should be kept in proportion, as they represented on average probably less than a third of the competitive gap with least cost producers (Middle-East ones).

It is worth keeping in mind that in both these studies focusing on costs, the various benefits of operating in the EU, such as proximity to a large high-value consumer market or access to a skilled labor force, are not examined. Not only are the costs generally over-estimated, as many studies corroborate, but the *benefits* of environmental regulations tend to be underestimated, although they might outweigh the costs.

3. ENVIRONMENTAL STANDARDIZATION HAS HAD POSITIVE EFFECTS

The European Commission has extensively used standardization to build the single market, regulating to an important extent the specificities of products, services and processes, but also leading to the development of high-impact technological solutions. However standardization can sometimes be manipulated, in particular for reasons of environmental or consumer protection, in order to increase the costs of competitors, and therefore by modifying, at least in part, competitive positions in the markets (Ben Youssef, Grolleau, & Jebzi, 2005).

Studies have highlighted a number of benefits that can be derived from environmental initiatives: saving raw materials and energy, reducing contaminant and waste disposal costs, improving the company's image, improving processes, technological innovations, etc.

A study by Bipe and Afnor (2016) explains how environmental standardization can be supported by the industries themselves. Be it for goods or services, standardization induces optimization of the usage and maintenance of installations, and allows monitoring and therefore reducing natural resources consumption, thus reducing costs. Finally, if production is related to the resources used to obtain it (labour, capital, intermediate consumption), voluntary standards are among the best allies of productivity. The study concludes that voluntary standards act as a growth catalyser and may even alleviate economic crises in certain sectors or regions.

The European Committee for Standardization and the European Committee for Electrotechnical Standardization¹ share this analysis by insisting on all of the benefits for SMEs and companies of using standards in general. In their various publications, these organizations present the standards as helpful to achieve a successful business by maintaining high levels of quality throughout the supply chain and production process, reducing costs, improving efficiency, attracting new customer markets, opening new export markets, disseminating and promoting innovation, etc. They affirm that standards help to protect the health and safety of the employees, customers as well as the general public, protect the natural environment and in turn improve the companies' reputation. ■

1. Both officially recognized as European Standardization Organizations (ESOs) responsible for developing and defining voluntary European standards and other standardization deliverables.

REFERENCES

- Ben Youssef, H., Grolleau, G., & Jebzi, K. (2005). L'utilisation stratégique des instances de normalisation environnementale. *Revue internationale de droit économique*, t. XIX, 4(4), 367. <https://doi.org/10.3917/ride.194.0367>
- BIPE & AFNOR, Étude de l'impact économique de la normalisation, January 2016. norminfo.afnor.org
info@cencenelec.eu; www.cen.eu; www.cenelec.eu; www.cencenelec.eu
- Centre for European Policy Studies. (2013a). *Assessment of cumulative cost impact for the aluminium industry*. European Commission, Brussels: European Commission, CEPS and Economisti Associati.
- Centre for European Policy Studies. (2013b). *Assessment of Cumulative Cost Impact for the Steel Industry* (Research Final Report No. SI2.648823 30-CE-0558235/00-06) (p. 259). European Commission, Brussels: European Commission, CEPS and Economisti Associati. Retrieved from http://www.getrawama.eu/siderurgia/steel-cum-cost-imp_en.pdf
- Harrington, W., Morgenstern, R. D., & Nelson, P. (2000). On the accuracy of regulatory cost estimates. *Journal of Policy Analysis and Management*, 297–322.
- Harrington, W., Morgenstern, R., & Nelson, P. (2010). *How Accurate Are Regulatory Cost Estimates?* (Working Paper) (p. 4). Washington, D.C. USA: Resources for the Future.
- Jantzen, J., & van der Woerd, H. (2015). *Environmental expenditures in EU industries - Time series data for the costs of environmental legislation for selected industries over time - Final report* (p. 86). European Commission, Brussels: European Commission – DG ENV and TME, Institute for Applied Environmental Economics. Retrieved from http://ec.europa.eu/environment/enveco/economics_policy/pdf/Costs%20of%20environmental%20legislation.pdf
- Vercaemst, P. et al. (2007a). *Cry wolf - Predicted costs by industry in the face of new environmental regulation* (p. 32). Chemsec. Retrieved from http://www.i-tme.nl/pdf/sectoral_costs_report.pdf
- Vercaemst, P. et al. (2007b). *Sectoral Costs of Environmental Policy* (Study No. 2007/IMS/R/427). European Commission – DG ENV. Retrieved from http://www.i-tme.nl/pdf/sectoral_costs_report.pdf
- Albrizio, S., Koźluk, T., & Zipperer, V. (2014). Empirical evidence on the effects of environmental policy stringency on productivity growth. *OECD Economics Department Working Papers*, No. 1179. Paris, France: OECD Publishing.
- Dechezleprêtre, A., & Sato, M. (2014). The impacts of environmental regulations on competitiveness. *Policy Brief*, Grantham Research Institute on Climate Change and the Environment, LSE.
- Martin, R., Muñils, M., & Wagner, U. J. (2015). The impact of the European Union Emissions Trading Scheme on regulated firms: What is the evidence after ten years? *Review of Environmental Economics and Policy*, 10(1), 129–148.
- Rubashkina, Y., Galeotti, M., & Verdolini, E. (2015). Environmental regulation and competitiveness: Empirical evidence on the Porter Hypothesis from European manufacturing sectors. *Energy Policy*, 83, 288–300.