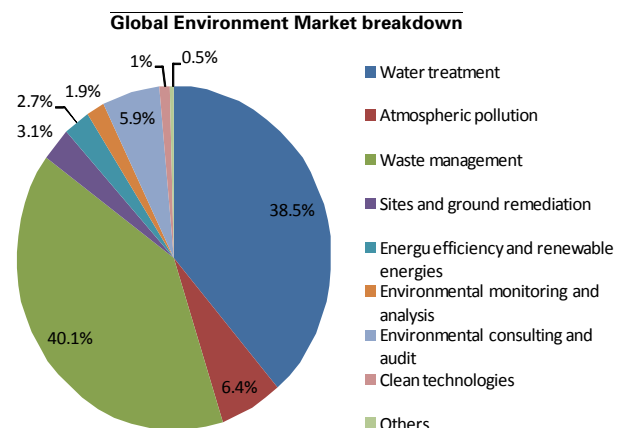


The global environment market and the outlook for French eco-businesses

This study was prepared under the authority of the Treasury and Economic Policy General Directorate and does not necessarily reflect the position of the Ministry for the Economy, Industry and Employment.

- The environment market has expanded very rapidly since 1970. Initially confined to pollution cleanup services, it has expanded over the past ten years with the emergence of "clean" products and technologies in most sectors of the economy.
- It is still hard to form a picture of the environment market in statistical terms due to the lack of any standardised definition. The United Nations Environmental Programme (UNEP) currently estimates it at €1,400 billion or 2.5% of global GDP. It is expected to expand swiftly over the coming years, at a rate of around 10% annually. This growth will be driven mainly by new sectors such as renewable energies and energy efficiency, and by the emerging countries such as China, the world's number one manufacturer of photovoltaic cells.
- The distinguishing feature of the environmental market is that its emergence and growth has been largely driven by government intervention, via regulation and pricing policies. Despite persistently strong misgivings, the growing awareness of environmental issues is giving rise to increasingly proactive policies, spurred in the recent past by the green stimulus plans.
- France is the world's fifth-largest exporter, and its firms include world leaders in water and waste, nuclear power and railways, but its positions remain weak in the "new" environmental technologies such as renewable energies, energy storage, batteries for clean vehicles, etc., which are forecast to grow strongly. Consequently, it lacks the optimal specialisation needed to make the most of the global "green" growth.
- France does not enjoy the competitive advantage in these technologies that local eco-businesses can gain from the early introduction of environmental regulations and pricing policies in the domestic market. But it can make good its relative backwardness through policies to stimulate innovation within the framework of the "Grenelle de l'Environnement" (environment round table) and the National Loan.



Sources: *Global Environment Markets and the UK environmental Industry Opportunities to 2020*, JEMU, 2005

1. While the contours of the market for environmental services remain ill defined, it is becoming increasingly "global"

1.1 The emerging concept of the "eco-business"

Although the concept of the "eco-business" or "eco-industry" is increasingly widely used, there is no standard definition as yet, thereby limiting the scope for statistical analysis.

First to emerge was the notion of "environment industry" in the 1970s. The emphasis at the time was on the "pollution cleanup" aspect of environmental protection (removing atmospheric pollution, sanitation, wastewater treatment, and waste management, etc.). These form the historical heart of the environmental services sector, thanks to the enactment of tough regulations.

As environmental issues and the fight against climate change came to the fore, a more global view of environmental management questions took hold, prompting the development of new technologies and new markets. The past ten years have seen growing demand for substitute products and less-polluting production processes, stimulating the rise of clean technologies and products designed to limit the environmental impact of economic activity preventively. We are currently witnessing a change in the environmental services market, with a shift away from "pollution cleanup" (or "end-of-pipe") technologies, products and services in favour of clean and integrated technologies and products.

Given these trends, it has become necessary to clarify the notion of environment industry or eco-industry, whose contours were very vague, initially. Eurostat and the Organisation for Economic Cooperation and Development (OECD) adopted a now-conventional definition in

1990 for the purpose of harmonising data from around the world. This states that eco-businesses are activities **"which produce goods and services to measure, prevent, limit, minimise or correct environmental damage to water, air and soil, as well as problems related to waste, noise and ecosystems. This includes technologies, products and services that reduce environmental risk and minimise pollution and resources..."**.

1.2 Building a statistical perimeter

Even so, environmental goods and services do not always form an identifiable statistical category. France's Comité d'orientation stratégique des éco-industries (COSEI-Eco-industries strategic steering committee)¹ is currently in the process of formulating a standardised definition of the perimeter of eco-businesses and eco-activities. The aim is to create a classification through which to observe trends in the sector and to support it.

At the same time, work on methodologies to provide greater insight into the environmental sphere was launched on the occasion of the 22 October 2008 meeting of the National council for statistical information on sustainable development, based on the ongoing work being done by Eurostat (see Table 1).

This classification, which will then be broken down into specific sub-groups, is expected to serve as a basis for the collection of national data and the production of consolidated data on the environmental services market.

Table 1: Nomenclature of the environmental goods, services and technologies

			Environmental Protection	Resources Management
Technologies	Integrated	Cleaner	X	
		Resource efficient		X
	End-of-pipe		X	X
Goods	Adapted	Cleaner	X	
		Resource efficient		X
	Directly designed to protect the environment or conserve resources		X	X
Services	Environmental specific		X	X
	Aimed at combating pollution and conserving resources		X	X

Source : Eurostat, Handbook on Environmental Good and Services Sector

1.3 Substantive differences in measurements of the global market for eco-businesses

Divergences between currently available estimates can be accounted for by the absence of any stable definition of what an eco-business is, and by the (sometimes considerable) differences in the scope considered, as well as in methodologies, interpretations, and data quality. Above all, most of the differences would appear to stem from the way clean technologies² are classified.

1.4 A fast-growing, increasingly global market

According to UNEP³, the eco-business market represented a turnover of €1,400 billion in 2007, or around 2.5% of global GDP. Even now, the market is heavily concentrated both geographically and by sectors.

Western Europe, North America and Japan still account for over 80% of the global eco-business market. Asia (excluding Japan) ranks 2nd, with around 7% of the market, followed by Latin America (2.8%), Central and

(1) The COSEI comprises business leaders and qualified personalities, and was instituted on 10 July 2008 by the Ministers responsible for Industry and for Ecology for the purpose of defining a public-private strategy for the development of a French environmental technologies offering.

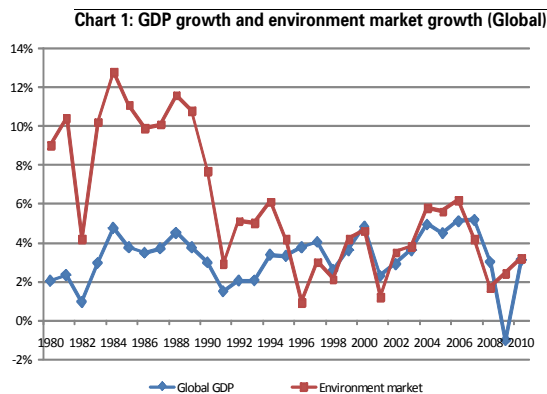
See: http://www.developpementdurable.gouv.fr/rubrique.php3?id_rubrique=1011.

(2) The United Nations Environmental Programme defines clean technologies as the continuous application of an integrated preventive environmental strategy to processes, products and services to increase overall efficiency and reduce risks to humans and the environment. Another, narrower definition refers to actions entailing the introduction of production equipment or technologies that serve to eliminate or reduce the volume and polluting burden of waste.

(3) Green Jobs: Towards Sustainable Work in a Low-Carbon World, Worldwatch Institute (Michael Renner) and Cornell Labour Institute (Sean Sweeney, Jill Kubit), for UNEP, 2008.

Eastern Europe (2.3%) and the Middle East (1.6%). Africa still represents only a very marginal share of the market, at less than 1%.

The market continues to be dominated by its historical sectors, i.e. water treatment, waste management and atmospheric pollution. Conversely, the "new" environmental goods and services, i.e. renewable energies and goods and services used in boosting energy efficiency, still account for only a small share of the market, at around 3%. Yet the market for renewable energies alone already generates annual revenues of €54 billion, investments of €80 billion, and around 3.4% of total world electricity production⁴.



Source: IMF (WEO October 2009), EBJ

This market has grown strongly, and faster than global GDP, since the 1980s. In particular, growth in exports of environment goods has outstripped that of total global

exports of goods since the 1990s, growing by a factor of 4.5, while total goods exports merely doubled.

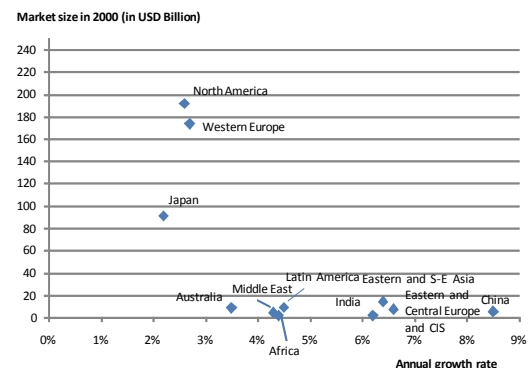
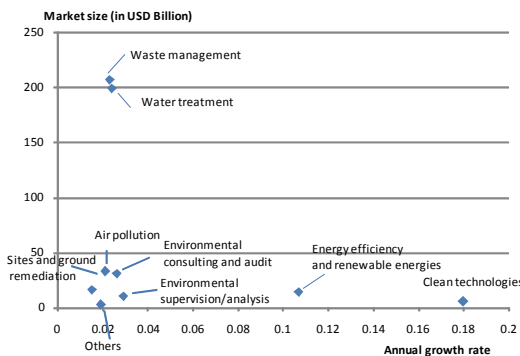
Since the mid-1990s, however, as the scope of the market for environmental goods and services has broadened to embrace the economy as a whole, its growth rate has progressively converged with that of global GDP.

UNEP expects growth in the global market for environmental goods and services to accelerate, more than doubling from €1,400 billion in 2007 to €3,100 billion in 2020.

The developed countries' markets are gradually approaching maturity, and future growth will be driven by the emerging countries. Over the past ten years, already, the environmental market grew by between 2 and 6% annually in the developed countries, compared with 12-13% in the emerging countries. This trend is expected to accelerate. Yet new opportunities are opening up for eco-businesses even in the developed markets, thanks to rapidly evolving environmental legislation demanding the upgrading and renewal of infrastructures, for instance, and new needs are arising.

The fastest-growing sectors will be the new markets in eco-technologies such as renewable energies, energy efficiency and clean technologies. More mature segments such as water and waste management, along with air and ground pollution abatement are expected to grow more slowly, yet even these sectors will continue to benefit from the emerging countries' growth and from policies aimed at improving these services (such as efforts to reduce or recycle waste, etc.) in the developed countries.

Chart 2: Size and growth of the environment market by sector and geographic region



Sources: Global Environment Markets and the UK environmental Industry Opportunities to 2020, 2005

These new sectors are expected to grow strongly worldwide. While Europe and the United States continue to dominate in terms of investment flows into sustainable development⁵ (around USD 80 billion in 2008), investment in these sectors is growing fastest in the emerging countries, now representing 31% of total investment. Some emerging countries already account for a hefty share of the world market: China in particular leads the way in terms of total renewable energy capacity, already representing 13% of the global photovoltaic market, and

is the world's leading producer of photovoltaic cells, exporting 95% of its output.

In the field of energy efficiency, most of the growth will occur in the developed markets, but the need will grow too in the developing countries as governments seek to optimise their energy use in the face of soaring demand. This is happening already in China, where the construction of supercritical reactors and the closure of small coal-fired plants, for example, will significantly boost energy performance.

(4) Not including large-scale hydroelectricity, which is generally not included in statistics on renewable energies.

(5) This figure includes investment in renewable energy and energy efficiency, based on Global Trends in Sustainable Energy Investment 2009, Analysis of Trends and Issues in the Financing of Renewable Energy and Energy Efficiency, REN21 for UNEP, SEFI and New Energy Finance, 2009.

Finally, the environmental consulting and audit markets, which embrace all environmental sectors, will grow in parallel with these markets.

2. A market that is set to expand as a result of proactive environmental policies, and boosted by green stimulus plans

2.1 A distinctive feature of the eco-business market is the role of government in bringing it into being

By analogy with Simon Kuznets⁶, who argued in 1955 that economic growth would mechanically reduce inequalities, Grossmann and Krueger⁷ detected a "Kuznets-style" curve in the environmental sphere. This thesis, which has been verified for certain local cases of pollution, is not compatible, however, with the global threats to the climate and biodiversity, for example. This is because the environment is a global public good and if governments fail to protect it, private investment will be suboptimal, leading to negative externalities resulting from economic activity, in the form of pollution, greenhouse gas emissions, advance of semi-arid areas, etc., and to "pillaging" of resources, in what is known as the "tragedy of the commons"⁸.

Above all, environmental policy is in itself a source of growth, spawning new "green" markets. The link between protecting the environment and economic competitiveness was long seen as a negative factor, with environmental policy thought of as undermining the competitiveness of the nation's industry. But over the past 20 years or so, the view has gained ground⁹ that the environment could, on the contrary, be a source of growth. The reasoning is that environmental regulation acts as an incentive to firms to innovate and develop new clean technologies, ultimately cutting production costs thanks to lower energy consumption, recycling, etc. We thus go progressively from a system of pollution control, which is expensive, to a system of pollution prevention and efficient use of resources giving rise to savings: from then on, competitiveness and the environment go hand in hand.

2.2 Environmental policies contribute to every stage in the development of the environment market, but they need to be selected on the basis of their cost and effectiveness.

Government plays a role at every stage in the development of the environment market and acts on both supply and demand. Policies contributing to the emergence and growth of the eco-business market take two forms, essentially:

- regulation, which can be distinguished according to:
 - sectors, which depend for the most part on environmental policy (air pollution, ground remediation, etc.);
 - markets in staple goods, which depend mainly on population growth, but which are affected by regulations on drinking water, wastewater and waste treatment, etc.;

- emerging sectors such as renewable energies and R&D, etc.

- economic instruments that seek to set a "price" on the environment or create a market as an incentive to agents to internalise environmental costs:

- what are known as "Pigovian" taxes¹⁰ on polluting activities and goods: in keeping with the polluter-pays principle, these eco-taxes seek to modify behaviour;
- positive measures in the form of fiscal and financial incentives to adopt renewable energies, in the form of feed-in tariffs, tax reductions, tax credits, subsidies, subsidised loans, etc. For the renewable energies sector, these measures help to reduce the cost of producing these energies relative to fossil energies;
- finally, cap and trade markets such as the emissions trading system that has existed in the European Union since 2005¹¹. This market consists of a body of tradable pollution rights that obliges polluting firms to buy pollution rights in the marketplace or else pollute less by developing cleaner technologies. They choose on the basis of the "price" of these pollution rights, which make recourse to these technologies more or less attractive.

However, these environmental policies cannot generate sustainable "green growth" unless they are designed to strike a balance between the ensuing opportunities (new markets), and costs incurred (for example, sending high price signals on certain products or investment efforts needing to be funded). Now, while they all contribute to the emergence of green markets, these policies are not all equivalent in terms of cost-effectiveness to the public finances. This is because regulatory policies and fiscal incentives appear to be relatively more costly than carbon taxes or carbon markets, insofar as the first require mechanisms to enforce compliance and the second take the form of a budgetary subsidy. Where efficiency is concerned, the main question is that of the optimal level of each instrument (standard, tax, or the level of the quota imposed on the market) set by the government in order to encourage the creation of an environmental product or service.

To be efficient, this sustainable growth model therefore needs to be based first and foremost on economic instruments, e.g. taxes and quotas. These should be set at a level implying a credible commitment to a price signal that effectively nudges behaviour in the desired direction. In addition, budgetary support should do everything to encourage innovation and R&D, so as to ensure that imported goods do not substitute for an under-developed national offering.

(6) Economic Growth and Income Inequality, *The American Economic Review*, vol. 45, no 1, pp. 1-28, 1955.

(7) Grossman, G. and Krueger, A. "Economic Growth and the Environment", *NBER Working Papers* n°4634 (1994).

(8) Garrett Hardin, 1968, *The Tragedy of the Commons*, *Science*.

(9) Michael E. Porter and Claas van der Linde (1995), 'Toward a new Conception of the Environment-Competitiveness Relationship', *Journal of Economic Perspectives* vol. 9, no. 4, pp. 97-118.

(10) These taxes owe their name to the British economist Arthur Pigou (1877-1959) who was the first to propose a corrective tax for externalities in 1920 in *Economics of Welfare*, first edition, Macmillan, London.

(11) The Emissions trading scheme (ETS) was introduced on 1 January 2005.

Lastly, any public policy aimed at supporting the transition to a more carbon-thrifty economy must be subject to evaluation, particularly its environmental impact relative to its opportunity cost, and priority should go to deploying the most efficient measures.

2.3 Environmental policy goes global

The realisation of the vital need to combat climate change internationally (cf. the UNCCC in Rio, in 1992, followed by the Kyoto Protocol signed in 1997), and to radically overhaul a growth model based on the extensive utilisation of resources, led to the adoption of a large number of national strategies aimed at cutting greenhouse gas emissions and entailing significant financial commitments.

The European Union currently leads the way in combating climate change, with the adoption of the Climate Package in December 2008. In the United States, it is one of the priorities of the Obama Administration.

Many developing countries also, including some of the world's biggest polluters¹², have enacted national plans with a significant environmental dimension. These include Brazil, South Africa, India and China. China has made the environment a priority aim of its 11th Plan (2006-2011)¹³. Investment relating to the environment is forecast to amount to 1.5% of GDP (pre-stimulus).

At the beginning of 2009, there were 64 countries seeking to promote various forms of renewable sources for electricity generation.

2.4 Public funding is growing despite the financial crisis...

Public funding to promote the development of the eco-business market is poorly understood, at present, owing to the large number of mechanisms available. Nevertheless, three series of figures give some idea of the amount of "green" public financing.

The International Energy Agency (IEA) estimates subsidies and other forms of public aid¹⁴ for clean energies at USD 33 billion annually, of which USD 10 billion for renewable energies, USD 16 billion for nuclear power, and USD 6 billion for biofuels. These amounts are still small relative to the USD 180-200 billion a year spent in fossil fuel subsidies, according to the latest IEA estimates (2006), but they are growing steadily. Governmental R&D accounted for USD 7.5 billion of this funding in 2008.

Meanwhile, the OECD and the European Environment Agency have identified around 375 environment-related taxes in the OECD countries, additional to other measures such as some 250 environmental fees and duties. The number of environment-related taxes has grown steadily in the OECD countries over the past ten

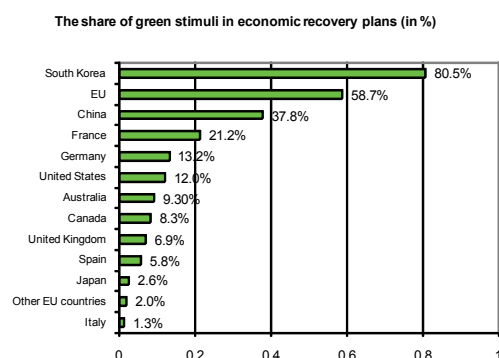
years, and their proceeds now represent between 2 and 2.5% of GDP.

International public flows to combat climate change, channelled via bilateral and multilateral players¹⁵, have expanded very rapidly also. According to UNEP, these now represent €12 billion annually. They are expected to grow significantly in the wake of the Copenhagen conference, since the developed countries have announced sums of USD 100 billion per year between now and 2020, although no details have been provided as to the breakdown between public and private (funds derived from carbon trading) financings. If these sums are indeed committed, international public funding will come to represent a not-insignificant share of green financing in the developing countries in the years to come.

2.5 ...and spurred by the green stimulus plans

With a few exceptions, the many national recovery plans launched in 2008 and after include a significant environmental component. Thus for the first time since the Kyoto Protocol, a majority of countries has announced large-scale investments aimed at cutting greenhouse gas emissions, when unveiling economic recovery plans to tackle the crisis. Out of twenty or so plans reviewed amounting to USD 2,800 billion in budgetary expenditures¹⁶, around USD 430 billion or 15% correspond to "green" investments. These stimuli are accelerating an underlying trend rather than signalling a new green revolution, but they account for more than 30% of current revenues of the eco-business market.

Chart 3: Green stimulus plans



Source: *A Climate for Recovery, The Colour of Stimulus Goes Green*, HSBC Global Research, February 2009

At a time of straitened public finances, it has become vital to pick the most effective aids. Yet public funding concentrates for the most part on sales of products, in particular via feed-in tariffs, to the detriment of pilot project funding. It is therefore more and more crucial to redirect public funding upstream, for the development of new technologies.

(12) The world's top 10 greenhouse gas emitters are, in decreasing order: China, the United States, the EU27, Russia, India, Japan, Brazil, Canada, Mexico, and Indonesia.

(13) The plan contains the following objectives: a 20% reduction in energy consumption per unit of GDP relative to 2005; a 10% reduction in emissions of the main pollutants; and a doubling of the share of renewable energies in total energy sources.

(14) These studies cover the different types of subsidy and public aid, including direct grants (i.e. budgetary transfers to producers or consumers), or indirect ones (e.g. tax incentives, energy services supplied by the authorities at preferential rates, energy sector regulation in the form of price controls, market restrictions, etc.).

(15) Via bilateral development banks such as the French Development Agency (AFD), Germany's KfW, Japan's JICA and multilateral organisations such as the Global Environment Fund, the World Bank, UNEP, and UNDP, etc.

(16) Tax rebates and credits, public loans to households and businesses, public subsidies, excluding measures in support of the banking and financial sectors.

2.6 Private funding continues to rise, but it is still too low

Despite the key role played by the regulatory framework and the extensive array of public financial incentive mechanisms, protecting the environment demands additional financial resources far outstripping the capacity of the public finances. The United Nations reckons that nearly 90% of the necessary financial resources to combat climate change will need to come from the private sector. According to the IEA, to avoid a 2°C rise in the global temperature, a total investment of USD 10,500 billion between now and 2030, or USD 500 billion annually and the equivalent each year of the amount spent on the green stimulus plans, will be required¹⁷.

Yet global investment¹⁸ in renewable energies and energy efficiency by businesses is reckoned to have come to USD

155 billion in 2008, or 4 times more than in 2004 (USD 35 billion). In view of this steep growth in private investment in sustainable energies, a figure of USD 500 billion annually does not look beyond reach, but it will demand a significant additional effort.

Private investment is financed essentially in the form of projects (around USD 100 billion or 83% of total investment in sustainable energy), and is concentrated on the most highly developed eco-businesses. Investment in green venture capital for start-ups is still modest, at USD 8 billion in 2008, although it has been growing steadily and now accounts for 10% of total venture capital worldwide. There is also a lack of growth-phase funding for eco-businesses, due to the relatively under-developed state of bank instruments and specific guarantees for these businesses in the form of subsidised loans, investment guarantees, etc.¹⁹.

3. French eco-businesses could become "major" international players in the green market

3.1 French regulation is a powerful force driving development of eco-businesses

Europe adopted its Climate and Energy Package at the end of 2008, but there has been a steady stream of national legislation and regulations enacting similar goals over the past ten years. These include the 2004-2012 Climate Plan updated in 2006, the 13 July 2005 Pluriannual Energy Policy Act, and the 2005 "réglementation thermique" (setting rules governing the maximum energy consumption of new buildings for heating purposes). More recently, the first law to flow from the *Grenelle de l'Environnement* environment round table (Grenelle 1) was promulgated on 5 August 2009, and a second law is under discussion in the French Parliament.

3.2 Strong growth in output and exports ...

According to a study by the French energy conservation agency ADEME in July 2009, environmental output, valued at €59 billion in 2007, is growing faster than all sectors combined. Production of eco-products has grown at an average annual rate of 7.7% at current prices between 2004 and 2007, with robust (19.5% p.a.) growth in renewable energies, versus 4.9% for all sectors combined.

Eco-businesses' exports amount to €7 billion, up sharply between 2004 and 2007 (+19% p.a., compared with less than 5% for all French exports combined). Materials recovery accounts for the largest share of exports, with €4 billion. Prices of secondary raw materials have soared over the period, and output in current prices has increased by nearly €1 billion over the period. Renewable energies were the second largest export item

in 2007, at €1.2 billion, which corresponds to the manufacture of equipment. The trade balance for eco-products showed a surplus of around €2.5 billion in 2007²⁰.

3.3 ...driven by "national leaders"

French eco-businesses' strong suit lies in the historically well-established environmental industries. French firms (Saur, Suez and Veolia) are often world leaders in water and wastewater treatment, waste management, and treating local pollution (air and noise). In 2008, these businesses accounted for €29 billion in revenues and 180,000 jobs, or nearly 50% of eco-businesses' activity and jobs in France. They are now mature businesses in the industrialised countries, but they see expanding opportunities in the emerging countries.

France also stands in the front rank for civil nuclear power and rail transport, two sectors not included in the statistics for eco-businesses. The €140 billion-a-year global rail transport market is expected to enjoy rapid future growth with the expanding Asian market. As for nuclear power, France accounts for 15% of the worldwide nuclear fleet, and the current revival of civil nuclear building (in Brazil, Canada, China, India, Italy, the United Kingdom and the United States, etc.) should considerably boost the size of this still small market²¹.

Finally, a number of sectors now emerging onto the global scene are already well-developed and growing fast (at a rate of over 5% annually). Examples include energy efficiency for buildings, uses of biomass and biofuels, site remediation, together with waste recycling and the conversion of waste to energy. These different sectors accounted for revenues of €27 billion in 2008. French

(17) *World Energy Outlook 2009*. More precisely, the IEA estimates that additional global investment required in energy-related infrastructure and investment goods will rise to USD 430 billion (0.5% of GDP) in 2020 and USD 1,200 billion (1% of GDP) in 2030.

(18) Comprising all types of financing, including research funding and venture capital for early-stage developments, up to financing via stock market flotations for more mature projects and firms.

(19) See Arnaud Berger (Groupe Banque Populaire): "Pour une contribution bancaire au financement de la lutte contre l'effet de serre et la protection de l'environnement" (How the banks can contribute to financing the fight against the greenhouse effect and protecting the environment), Sept. 2007.

(20) Figures for 2008 and the first half of 2009 are not yet available, but these observations will probably be affected by the economic crisis, with the collapse in secondary raw material prices, notably.

(21) The contract between Areva and the Chinese electricity producer CGNPC in November 2007 to supply two nuclear islands is expected to generate revenues of €8 billion.

firms such as Saint-Gobain are also leaders in the global market for insulating materials.

3.4 French eco-businesses are still under-represented in world markets...

Although France ranks no. 2, behind Germany, in the European market, in terms of turnover per head of population it comes only 5th, behind Denmark, Austria, the Netherlands, and Germany.

It still plays only a minor role in the "new" environmental technologies (such as renewable energies, energy storage, batteries for clean vehicles, and so forth) expected to grow strongly in future.

French eco-businesses appear to be more specialised in curative technologies than in integrated (or preventive) ones, which are generally more valuable, environmentally and economically speaking. As a result, 90% of French investment goes on treating pollution, compared with 10% on preventing it.

There is currently no French company among the world's top ten manufacturers of wind turbines, or among the top

ten makers of photovoltaic cells, with the result that France imports a large proportion of its components in these sectors.

3.5 ... resulting in a weakness in our external eco-trade

France lags behind the United States, the United Kingdom, Germany and Japan as a supplier of clean technologies. While French exports of environmental goods grew much faster than its total exports of goods, between 2004 and 2007, this was less than the growth potential of the global environment market, for renewable energies especially. France considerably underperforms certain of its European partners such as Germany, Denmark and Spain in this market.

The development of a French offering of new green technologies would also serve to rebalance our geographical specialisation, currently skewed towards Europe (accounting for 2/3 of total French exports), in favour of the emerging countries-notably the Gulf-where the growth potential lies.

Table 2: The French eco-businesses market (in € million and %)

	Turnover	2007-2006 change	Average annual change 2004-2007	Exports	Imports	Trade balance	Change in exports 2006-2007	Average annual change in exports 2004-2007
Environmental protection	35 600	4.10%	6.10%	1 050	950	100	10.50%	5.30%
Air pollution	1 600	6.70%	4.60%	200	200	0	0%	0%
Waste water	14 000	4.50%	4.70%	600	450	150	9.10%	26%
Waste	14 100	2.90%	7.00%	100	0	100	50%	14.50%
Radioactive waste	700	0.00%	0.00%	150	100	50		
Ground and water remediation	2 800	7.70%	11.90%	0	0	0		
Noise	1 500	7.10%	7.70%	0	200	-200		
Nature, landscape, biodiversity	900	0.00%	4.00%	0	0	0		
Natural resources management	19 500	4.30%	12.50%	5 800	3 450	2 350	9.40%	23.20%
Sustainable water management	1 100	22.20%	16.30%	200	250	-50	33.30%	26%
Recovery	6 900	4.50%	7.20%	4 150	1 900	2 250	9.20%	23.26%
Energy conservation	3 300	6.50%	8.30%	250	400	-150	0%	7.70%
Renewable energies	8 200	1.20%	19.50%	1 200	900	300	9.10%	26%
Cross-cutting activities	3 800	2.70%	1.80%	0	0	0		
General public services	2 100	10.50%	3.40%	0	0	0		
R&D	1 700	-5.60%	0.00%	0	0	0		
Total	58 900	4.00%	7.60%	6 850	4 400	2 450	9.60%	19.60%

Source: Etudes & documents - Les éco-activités et l'emploi environnemental, Périmètre de référence - résultats 2004-2007, Service de l'observation et des statistiques (SOeS), (Studies and papers: Eco-activities and environmental jobs, reference perimeter-Findings 2004-2007. Department of Observation and Statistics), July 2009

3.6 France is stepping up its efforts to develop its eco-businesses in the most promising sectors and to enable them to gain a foothold in the emerging green markets

The early adoption of regulations and pricing policies ahead of other countries gives domestic firms an incentive to innovate ahead of the field in the environmental sector, giving them a competitive advantage.

This theory of the Early or First Mover Advantage²² sheds light on the current specialities of French eco-businesses

and their relative backwardness. France occupies positions of strength in water and waste, nuclear power and rail transport thanks to proactive policies in these sectors²³. The priority given to nuclear power over a period of many years held back investment in renewable energies, which thus partly explains why France lags behind Germany in this sector.

However, France is now attempting to make good this relative backwardness in high potential sectors through policies to boost innovation, with eco-technologies

(22) Michael E.Porter and Claas Van der Linde, op cit.

(23) In the nuclear sector, for example, the creation of the Commissariat à l'Énergie Atomique (CEA-Atomic energy commission) as far back as 1945 and the accelerated French nuclear programme in the wake of the first oil shock with the creation of public monopolies (Framatome, COGEMA and EDF). Today, 78.5% of the electricity produced in France is of nuclear origin, according to the CEA.

among the chief beneficiaries. This policy includes heavier spending on research and funding targeted at start-ups and demonstrator projects.

Initially within the framework of the Grenelle environment round table, the French Government plans to step up research spending to €470 million a year, versus €70 million in 2006, equivalent to spending on nuclear power.

Above all, the National Loan²⁴ will set the scene for an aggressive policy to stimulate innovation through research funding (€8 billion out of the loan's total of

€35 billion), and much of this effort will be channelled towards the new environmental technologies.

In addition to this effort in favour of research, the National Loan is marshalling the resources and financial instruments French eco-businesses, start-ups especially, will need in order to grow. Indeed these are still short of funds, as shown by the example of venture capital. This sector has grown considerably in France, with €10 billion raised in 2007 and €12.5 billion invested, the 3rd-largest amount in the world. But very few venture capital funds are dedicated to eco-innovation or sustainable development.

Table 3: What the National Loan has to offer eco-businesses

Description	€ Mn
National seed fund run by the FSI (strategic investment fund) for key technological priorities*	400
Bolstering OSEO's resources to fund innovative SMEs and Innovative technology firms*	1 500
Funds dedicated to innovative and demonstrator decarbonised energy projects (managed by the ADEME)	1 500
Funds for setting up research institutes connected with competitiveness clusters for decarbonised energies	1 000
Clean vehicles (cars, lorries, ships (laboratories and industrial firms in conjunction with competitiveness clusters)	1 000
Nuclear technologies (4 th -generation reactors)	1 000
Aerospace (the aircraft of the future, Ariane 6, greenhouse gas emissions observation satellite)	2 000
Fund managed by the CDC for the co-funding of bids for integrated urban projects (transport, housing, energy)	1 000
Thermal renovation of privately-run social housing (grant to the Agence Nationale de l'Habitat - national housing agency)	500

* Grants to all innovative SMEs, not exclusively to eco-businesses.

Consequently, a significant portion of the National Loan will be devoted to the creation of a seed capital fund and to funds dedicated to the financing of demonstrator projects, with special emphasis on decarbonised energies.

The National Loan will also finance projects for the most-advanced eco-businesses working on clean vehicles, nuclear power, aerospace, sustainable cities, and thermal renovation of public housing.

All of these measures are expected to spur the development of French eco-businesses and, ultimately, improve their international positions in green markets.

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