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PREMIER MINISTRE

Commissariat général
à la stratégie
et à la prospective

AN INTRODUCTION TO THE NATIONAL DEBATE

SEPT. 2013

Towards a More Sustainable Growth Model?

"Sustainable" development has to meet the needs of the present without compromising the ability of future generations to meet their own needs. For several decades French growth has not complied with this definition: the prospect of climate change, the acceleration of species' extinction and the pollution of our ground water provide three such examples merely within the field of the environment. Similar questions surround the sustainability of our Welfare State while our public debt makes us vulnerable to financial crises.

There are serious methodological difficulties in determining the possible nature of sustainable growth for the French economy. It requires anticipating the future development of our model of growth and, therefore, a clear understanding of its interaction with the natural and social environment, as well as with other economies at the European and international levels. Beyond the difficulties in predicting France's growth model, there may be disagreement with regard to the solutions required to build a sustainable model and ensure that the costs of such a model are equitably distributed. Indeed, the sustainability of a growth model presupposes that the objectives to be met and the reforms to be implemented have been developed, through discussion, while taking budgetary constraints into account. This is the only standard that will enable us to assess the possibility of succeeding in reforming our modes of production and social model, while initiating the necessary ecological and energy transition that will lead us to rethink our models of consumption, production, development and growth. In order to ensure our transition towards a sustainable growth model, our institutions will need to have more effective means of taking long-term considerations into account. The debates and consultations held in the coming weeks should enable us to outline the model (or models) of growth towards which we intend to move.

INTRODUCTION

According to *The Brundtland Report*, "sustainable" development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".[1] It means leaving subsequent generations the tangible capital (including natural capital) and intangible capital (in particular in terms of education and training of particular age groups) that will enable them to meet their own needs. The notion of positive economics recently put forward in the report submitted by Jacques Attali to the French President contains a similar idea.[2]

Assessing a growth model's sustainability is far from easy. Any definition of sustainability implicitly involves the notion of stocks. However, it is much more complicated to measure stocks (of productive, environmental and human capital) than it is to measure flows, in particular due to difficulties involved in assessing their "initial" state particularly when it comes to natural resources. In addition, assessing our growth model(s) sustainability presupposes being able of not only measuring these stocks, but also forecasting their future development, according to a number of scenarios. However, changes to these stocks are the result of complex interactions and mechanisms. Some situations confront us with phenomena of irreversibility, as is the case for climate change: the Intergovernmental Panel on Climate Change (IPCC) considers that, beyond an increase of 2°C in global mean temperature, the atmospheric concentration of greenhouse gases (GHG) will produce effects that fuel and speed up global warming. Moreover, the stocks cannot always offset each other: increase in productive capital cannot make up for loss of biodiversity.

Today, GDP (gross domestic product)[3] still constitutes the main means of measuring the wealth of States. Since the 1970s, its limitations have been widely exposed: as an accounting measure of value added created by production it only takes flows of financial activities into account, measured in marketable production expressed in monetary terms. Possible destruction of the country's natural capital (climate, biodiversity, energy resources etc.) and/or intangible capital (human capital, knowledge, health etc.) of the country is not included in the measure. The Stiglitz-Sen-Fitoussi report (2009)[4] and the UN (2012)[5] report on "inclusive wealth" recommend, like others before them, going beyond traditional indicators of economic performance in order to build indicators of the wealth of nations in terms of "social and natural assets" that take all of the different aspects into account, distinguish capitals that can be substituted from those that cannot, and enable assessment of whether or not economic development is sustainable in nature.

France is taking part in these international discussions and is increasingly equipping itself with tools to assess the sustainability of its own growth model. Since 2006, in accordance with the provisions of the Organic or Fundamental Law of 2001 concerning Financial Act, French government accounts (*Compte Général de l'État*) have been enhanced and made clearer, enabling easier assessment of assets and liabilities with regard to public finances. Beyond this accounting expressed in monetary terms, a sustainable development performance chart of 54 indicators has been developed by the INSEE (French Statistical Office) and the CGDD Sustainable Development Commission (Commissariat général au développement durable, Ministry of Ecology) in order to support the French National Sustainable Development Strategy adopted in 2010[6]. Moreover, the European States have committed to ensure the sustainability of their finances, which is assessed by the European Commission for each Member State on the basis of an indicator referred to as the "sustainability gap"[7].

1. *Our Common Future*, Brundtland Report, World Commission on Environment and Development, 1987.
2. Cf. *Pour une économie positive*, report to the President of France from the Commission chaired by Jacques Attali, September 2013.
3. GDP was adopted as the instrument of political economy in the 1940s, on the basis of two reference works: *How to Pay for the War* by Keynes and *The Condition of Economic Progress* by Clark, which were published in 1940. Also cf. Meade J.E. and Stone R. (1941), "The Construction of Tables of National Income, Expenditure, Savings and Investment", *The Economic Journal*, vol. 51, no. 202/203, p. 216-233.
4. Stiglitz J.E., Sen A. and Fitoussi J.-P. (2009), *Report of the Commission on the Measurement of Economic Performance and Social Progress*, September.
5. UNU-IHDP and UNEP (2012), *Inclusive Wealth Report 2012. Measuring progress toward sustainability*, Cambridge: Cambridge University Press.
6. In France, as in the majority of European countries, a national sustainable development strategy (*stratégie nationale de développement durable* / SNDD) was adopted in 2003. After its revision in 2006 in order to bring it into line with the European Strategy (EU SDS), the Interministerial Committee for Sustainable Development (Comité interministériel pour le développement durable) adopted a new strategy on 27th July 2010 entitled "*Vers une économie verte et equitable*" ("Towards an Equitable and Green Economy") for the 2010-2013 period. This strategy fixes objectives and is accompanied with indicators enabling assessment of its results.
7. The sustainability gap measures immediate and long-term improvement of the structural primary balance (that is to say the balance before payment of interest and excluding the effects of changes in the current economic situation) of the public administrations necessary to ensure sustainability of the public debt indefinitely.

All of these efforts clearly constitute steps forward. However, forecasting methods are still too diverse, with results that are barely comparable and often contradictory. It also remains difficult to determine whether or not progress has been made in terms of sustainability. Nevertheless, the economic, social and environmental crisis that we are going through definitely calls our model of growth into question.

In this situation, how can a growth model that guarantees the ability of future generations to meet their own needs be ensured and maintained in the long-term? What commitments do we need to set in order to make French growth more sustainable? And how can we make sure that we meet these commitments?

ASSESSMENTS

Natural, human, productive, social and institutional[8] features can be included among French society's assets, which constitute the basis of its development. This development ensures a high level of well-being for its inhabitants: the international ranking of countries provided by *International Living*[9] magazine ranks France as second in the world[10] as far as quality of life is concerned. This capital is partly inherited from previous generations and is – or is not – replaced and increased in the course of each period by withdrawing resources from immediate consumption in order to devote them to investment in the maintenance of long-term prospects.

HUMAN CAPITAL

According to the Organisation for Economic and Cooperation Development (OECD) definition, human capital comprises "the knowledge, skills, competences and other attributes embodied in individuals that are relevant to the creation of personal, social and economic well-being".

Rising levels of education and training, although qualitative difficulties remain

Education and knowledge hold a major place in the assessment of a country's wealth. On the basis of the inclusive wealth indicator[11], evaluations for twenty countries conducted over the 1990-2008 period show that the development of human capital was a major factor in growth of the overall wealth per inhabitant. In France, it is estimated that this contribution was twice as great as that made by productive capital.

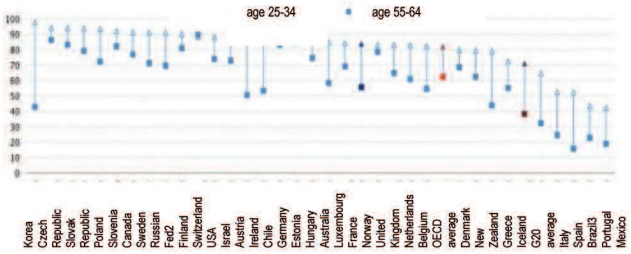
This performance is the result of a rise in the level of education and training of the population over the last thirty years due, in particular, to regular increase in education levels until 1995.[12] The proportion of the population having completed primary, secondary and higher education programmes increased by almost 28 percentage points in the course of the period (84% for the generation aged 25-34 as compared with only 56% for the 55-64 age group in 1995). Levels of qualification for 25-34 year olds are thus relatively high: in 2009, 43% in France had achieved higher educational qualifications, as compared with 42% in Sweden, 41% in the United States, 26% in Germany and 20% in Italy.

However, although inequalities have been greatly reduced in terms of access to training, they continue with regard to the choice of courses of study/career paths and access to higher education. In addition, the number of students dropping out[13] without any diploma and/or qualification remains high. Since 2003 the drop-out rate has levelled out at about 12% (i.e. 140,000 young people), whereas the overall trend in European Union (EU) countries is falling. Apart from school dropouts, international comparisons, notably the PISA (Programme for International Student Assessment), also show a fall in the educational standard of French pupils of fifteen years of age[14]: their score in mathematical knowledge declined between 2003 and 2009 (falling to 497 points) and France went from 10th place out of 27 to 17th place out of 29. Moreover, the unemployment rate of young people remains twice

8. This capital includes stability and the quality of services provided by public institutions in general, such as the social welfare system for example.
9. This index is based upon variables concerning cost of living, environment, level of political freedom, quality of health, culture, leisure activities, infrastructures, risks, security and climate.
10. Centre d'analyse stratégique (2012), *Tableau de bord de l'attractivité de la France*, www.strategie.gouv.fr/content/attractivite-france-2012.
11. UNU-IHDP and UNEP (2012), *op. cit.*
12. Due, in particular, to the national objective of bringing 80% of a given age group to school leaving certificate level, therefore increasing the number of students in higher education.
13. Proportion of young people between the ages of 18 and 24 not having successfully completed any upper secondary educational programme (i.e. possessing neither a school leaving certificate (*baccalauréat*), nor a technical school certificate (BEP) or vocational training certificate (CAP)) and not having followed any training or education in the course of the four months preceding the survey.
14. Assessments carried out in France indicate that on leaving primary school 40% of pupils have not mastered the skills expected according to the programmes in a satisfactory manner (source: *Haut Conseil de l'éducation*, 2007). The tests conducted within the framework of the *Journée défense et citoyenneté* estimate the proportion of young people aged 17 who have not mastered reading at almost 20%.

the national average. Furthermore, marked inequalities remain and access to employment and lifelong training, as well as the degree of social insecurity, are still dependent upon the level of qualifications.

CHART 1
POPULATION HAVING ATTAINED AT LEAST UPPER SECONDARY (1) EDUCATION (2010) (IN PERCENTAGES, ACCORDING TO AGE GROUP)



(1) Excluding ISCED 3C short programmes;
(2) Year of reference: 2002; (3) Year of reference: 2009.

Source: OECD, *Education at a Glance 2012*.

PRODUCTIVE CAPITAL

Productive capital comprises all means of production (machines, equipment, research and development, intellectual property, organisational capital, etc.) contributing to the manufacture of goods or the provision of services.

Major investment in research over the course of the last thirty years remains stable in proportion to GDP

The priority countries place on research and development (R&D) and higher education reflects major concerns (of a scientific, technological, and social nature as well as with regard to growth, employment and the attractiveness of companies and highly qualified staff). This high level of interest results in a high level of R&D investments at the international level: almost 1,300 billion dollars in purchasing power parity[15] in 2010, i.e. twice their level of ten years ago (at current prices).

In 2011, investment in R&D in France, measured in terms of Gross domestic expenditure on R&D (GERD), reached €44.9 billion.

These investments have doubled since 1981 (in real terms), growing more rapidly than GDP for the 1981 to 1993 period (with average increases per year of 3.9% and 2.1% respectively). Nonetheless, this trend inverted for the period 1993-2008, with an average annual growth of 1.3% for R&D expenditure and 2.0% for GDP.

These developments are also marked by structural underinvestment in R&D on the part of companies, despite public incentives that are the highest in the OECD zone. Public sector research expenditure in France is at a level comparable (in percentage of GDP) to that of other OECD countries.

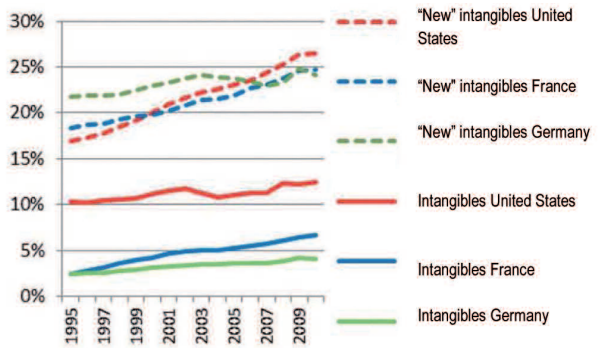
Nevertheless, with 2.25% of GDP devoted to research in 2011, France remains short of the objective of 3% fixed by the EU within the framework of the Europe 2020 strategy. However, beyond investments in R&D, global competition in a knowledge-based economy is just as strong with regard to other intangible assets.

France shows underdevelopment in certain forms of intangible assets

Intangible assets, such as software, organisational capital etc., make a critical contribution to the productivity of labour. Recent research not only enables the comparison of stocks of capital in the form of the intangible assets traditionally included in national accounting (software, artistic and literary property) but also of new assets such as R&D, design, market research, advertising, training and organisational capital.

The underdevelopment of France in relation to the United States is principally attributable to software investments. Moreover, the comparable levels observed for new categories of intangible assets conceal gaps for various sectors: although France is quite favourably positioned in terms of training and design, it shows underdevelopment in R&D and "economic skills" in particular.

CHART 2
STOCKS OF INTANGIBLE ASSETS IN RELATION TO VALUE ADDED



Source: National accounts and Corrado, Haskel, Jona-Lasinio and Iommi (2012).[16]

15. National Science Board (2012), *Science and Engineering Indicators 2012*, Arlington, VA: National Science Foundation.
16. Corrado C., Haskel J., Jona-Lasinio C. and Iommi M. (2012), "*Intangible capital and growth in advanced economies: Measurement methods and comparative results*", Working Paper, June, www.coinvest.org.uk/pub/IntanInvest/WebHome/Methods and Comparative Data -June_2012-7.pdf.

Excellent infrastructures require maintenance/replacement

According to the World Economic Forum, France ranks fifth out of 144 for quality of infrastructures (roads, railways, ports, air transport and telecommunications). Its lead is less pronounced in the case of digital infrastructures.

In particular, France is equipped with an excellent network of transport infrastructures, which promotes the appeal of its territory: more than 11,000 km of motorways, 30,000 km of railway tracks and 5,000 km of navigable waterways. Moreover, it holds 2nd place among European countries, after Spain, for its network of high-speed trains linking the national territory to neighbouring European capitals. Nevertheless, in 2005 an audit of the state of the railway network conducted by the *École polytechnique fédérale de Lausanne*[17] showed an inadequacy in the expenditures devoted to its maintenance, which needs to be increased by about one billion euros per year.

ENVIRONMENTAL CAPITAL

"Natural" capital, in general, refers to the natural resources (minerals, plants, animals, atmosphere and water etc.) present on the land and the services performed by biodiversity, referred to as "ecosystem services", of which we benefit: biodiversity is an example of a stock (or asset) that cannot easily be assessed or given a monetary value.

Growing seriousness of climate change

In 2012, the World Meteorological Organization (WMO)[18] noted that the Greenland ice sheet showed the largest summer melting since satellite observation began (thirty-four years previously). Moreover, a large number of scientific publications[19] find that we are already experiencing:

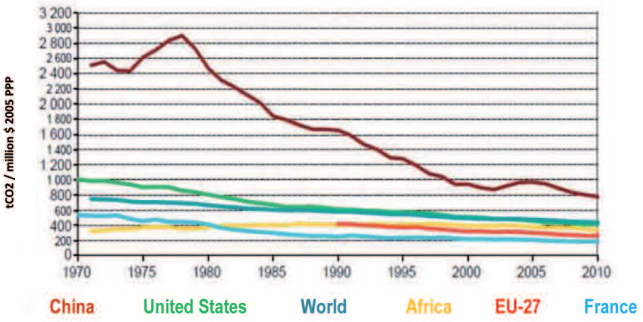
- faster than predicted melting of ice in the North Pole and Greenland;
- accelerated acidification of oceans, which is gradually destroying the coral reefs;
- increased frequency and force of extreme weather events (floods, storms and heat waves).

The next IPCC report should provide new observations.

France has succeeded in reducing its overall greenhouse gas (GHG) emissions, which however continue to increase in two sectors

At the international level, within the framework of the first commitment period of the Kyoto Protocol, which was admittedly insufficiently ambitious to succeed in stabilising the global temperature rise, France devoted effort to stabilise its GHG emissions for the 2008-2012 period to the 1990 level of emissions. In view of the 7% reduction of French GHG emissions excluding LULUCF[20] for the 1990-2010 period, France can be considered to have achieved its assigned objectives. On the other hand, Europe and France[21] have undertaken to reduce their GHG emissions fourfold as compared to 1990 levels by 2050[22]. Major efforts therefore remain to be made, particularly in the transport, residential and tertiary sectors. Indeed, in spite of favourable technological advances, road transport emissions increased by 9% in the course of the 1990-2012 period. The emissions of the residential and tertiary sectors increased by 3%[23].

CHART 3
INTERNATIONAL CO_2 EMISSIONS ATTRIBUTABLE TO ENERGY IN RELATION TO GDP



Source: *Chiffres clés du climat, France et Monde*, Collection Repères, 2013 edition, Service de l'observation et des statistiques, MEDDE, on the basis of: International Energy Agency, September 2012.

17. *Audit sur l'état du réseau ferré national français, SNCF-RFF*, dir. Messrs Rivier and Putallaz, EPFL, July 2005.
18. Source: WMO (2012), Statement on the Status of the Global Climate, www.wmo.int/pages/mediacentre/press_releases/pr_972_en.html.
19. Quoted in IEA (2013), *Redrawing the Energy-Climate Map: World Energy Outlook Special Report*, International Energy Agency, June, www.worldenergyoutlook.org/energyclimatemap/#d.en.36900.
20. LULUCF: land use, land-use change and forestry. Depending upon to its mode of occupation, land can act as a carbon sink or, on the contrary, a source of emissions.
21. Objective set out in the Act of 13th July 2005 on French energy policy and validated by the Environment Roundtable (*Grenelle de l'environnement*) in 2007.
22. Minimum reduction necessary in order to stabilise increase in global mean temperature at below 2 °C, assuming that the other major GHG emitting States adopt similarly ambitious objectives.
23. Percentages calculated on the basis of data from the CITEPA (*Centre interprofessionnel technique d'études de la pollution atmosphérique*).

It should be noted that France shows good performance in terms of its carbon intensity in relation to GDP[24]. Its performance of 186 g of CO2 per unit of GDP puts it at second place within the EU-27, behind Sweden, where nuclear energy and hydropower are also highly developed.

French biodiversity has deteriorated under the growing influence of land development and pollution

For several decades the overall species extinction rate has been far greater than its natural rate, in France as in the rest of the world. There is an unfavourable state of conservation of more than three quarters of the habitats and more than half of the species that need to be protected.[25] This is in spite of the conservation obligations of the "Habitats Directive". Everyday biodiversity is also declining as illustrated, among other indicators, by a 10% drop in the population levels of common birds between 1989 and 2011.[26]

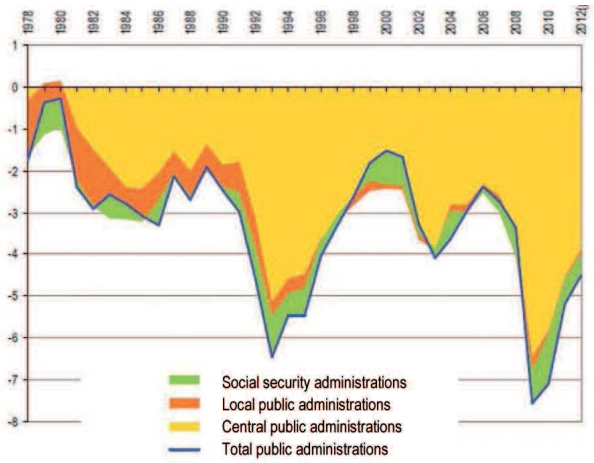
It is a delicate task to clearly distinguish an order of importance for the pressures exerted upon biodiversity. In France, these are principally the result of the increasingly artificial state of (natural and agricultural) soils, fragmentation of habitats and semi-artificial agricultural habitats. In ten years the urban surface area in Metropolitan France has increased by 19%. This trend is to a large extent attributable to urban sprawl. Major pressures are also exerted upon biodiversity in France by water, air and soil pollution. The quality of surface and groundwater is particularly unsatisfactory, notably due to high concentrations of nitrates[27] and the presence of pesticides.

PUBLIC FINANCES

The public administrations taken as a whole have been in a constant deficit for thirty years, including during periods of strong growth, and the weight of public debt in GDP has greatly increased

The major contribution made by the authorities to the provision of collective and personal services (education, health, housing, culture etc.) enables access to free high-quality services that directly contribute to the quality of life enjoyed by households. However, this expenditure has been financed by deficit spending for more than thirty years. In the course of thirty years, the public debt ratio has risen from 27% in 1983 to 94% in 2013, i.e. an increase of 67 percentage points. Having increased at a real interest rate of 2%, this burden amounts to an annual levy of 1.4 percentage point of GDP per year on the income of future generations (almost €30 billion per year).

CHART 4
CHANGES IN THE FUNDING REQUIREMENTS OF THE PUBLIC ADMINISTRATIONS



Source: INSEE up to 2011 inclusive; forecast of the Public Finance Programming Bill for 2012.

Most of the public deficit remains attributable to the central public administration. The social security administrations' funding requirements had never been greater than one percentage point of GDP until 2010, at the height of the last economic and financial crisis. Conversely, the central public administrations have shown a deficit every year since 1981 and, during the last two decades, their annual funding requirements have never been less than 2.3 percentage points of GDP. It is nevertheless true that the central public administrations are responsible for part of the financing of public investment and that they exercise a specific function of macroeconomic stabilisation.[28]

In any case, the central public administrations' debt, in the sense of Maastricht, reached 67.4% of GDP in 2011 and represented almost four fifths of the total debt of the public administrations in its own right. The debt of local government and social security administrations represented 8.3% and 10.3% of GDP respectively in 2011.

24. Co_2 emissions per unit of GDP.
25. Bensettiti, F. and Trouvilliez, J. (2009), *Rapport synthétique des résultats de la France sur l'état de conservation des habitats et des espèces conformément à l'article 17 de la directive Habitats*, rapport SPN 2009/12, MNHN-DEGB-SPN, Paris, 48 p.
26. INSEE sustainable development indicators.
27. At 13th June 2013, the Court of Justice of the European Union (CJEU) condemned France for failure to comply with its obligation to designate the whole of the "vulnerable zones" within French territory under the directive of 1991. The Court also pointed out the "incomplete character" of the list (revised in 2007) which should have mentioned "ten additional zones".
28. HCFi-PS (2012), *État des lieux du financement de la protection sociale en France*, Haut Conseil du financement de la protection sociale, October.

LIMITED CREDIBILITY

In order to make its model of growth more sustainable, France has made a number of commitments. As far as public expenditure is concerned, France has published a stability programme every year since 1998, aiming to return to a near budgetary balance in the space of the subsequent four years. The objectives needed to return to a budgetary balance have never been met. The table 1 thus compares the deficits planned in the stability programmes and actual observed deficits.

TABLE 1
PROJECTED AND ACTUAL DEFICITS

Stability programme	Projected average annual growh for the period of the programme	Projected deficits (% GDP)	Actual deficits	Actual/ planned difference in % points
1999-2002	2.5%	2002: -1.2%	-3.3%	-2.1
2001-2003	3%	2001: -1% 2002: -0.7% 2003: -0.3%	-1.6% -3.3% -4.1%	-0.6 -2.6 -3.8
2002-2004	3%	2002: -1% 2003: -0.4 % 2004: +0.2%	-3.3% -4.1% -3.6%	-2.3 -3.7 -3.8
2003-2005	2.5%	2003: -1.3% 2004: -0.5% 2005: 0%	-4.1% -3.6% -2.9%	-2.8 -3.1 -2.9
2004-2006	2.5%	2004: -2.1% 2005: -1.6% 2006: -1.0%	-3.6% -2.9% -2.3%	-1.5 -1.3 -1.3
2005-2007	2.5%	2005: -2.9% 2006: -2.2% 2007: -1.5%	-2.9% -2.3% -2.7%	0 -0.1 -1.2
2006-2008	2.5%	2006: -2.2% 2007: -1.6% 2008: -0.9%	-2.3% -2.7% -3.3%	-0.1 -1.1 -2.4
2007-2009	2.25%	2007: -2.6% 2008: -1.9% 2009: -1%	-2.7% -3.3% -7.5%	-0.1 -1.4 -6.5
2008-2010	2.25%	2008 : -1.8% 2009: -0.9% 2010: 0%	-3.3% -7.5% -7.1%	-1.5 -6.6 -7.1
2009-2012 (dated November 2007)	2.5%	2009: -1.7% 2010: -1.2% 2011: -0.6% 2012: 0%	-7.5% -7.1% -5.3% -4.8%	-5.8 -5.9 -4.7 -4.8
2010-2013	1.4% in 2010 and 2.5% on average for 2011-2013	2010: -8.2% 2011: -6% 2012: -4.6% 2013: -3%	-7.1% -5.3% -4.8%	+1.1 +0.7 -0.2

Sources: *programmes de stabilité*; INSEE.

Since the Earth Summit in Rio de Janeiro in 1992, reduction in the loss of biodiversity has been a recurrent objective of international as well as national authorities. In 2004 France adopted the first version of its National Biodiversity Strategy (SNB/*Stratégie nationale pour la biodiversité*) intended to halt destruction of biodiversity by 2010, followed by a second in 2011 in order to "protect, restore, consolidate and promote biodiversity" and "ensure sustainable and equitable use thereof". However, the pressures exerted upon natural areas have continued to increase. In the field of agricultural pollution, in spite of the Ecophyto 2018 plan launched in 2008[29], use of synthetic crop protection products shows no sign of decreasing.

As far as climate change is concerned, the problem lies above all in the ambitiousness of the objectives set at the international level. Indeed, current promises on the part of States for the reduction of GHG emissions do not leave any room to hope that the rise of the global mean temperature might be kept below the 2°C level: the United Nations Environment Programme (UNEP)[30] thus places the world on course for an increase of between 3°C and 5°C in view of the emission reductions forecast by the various countries. The principal challenge for the coming two years lies in urging China and the United States, which together account for more than half of global GHG emissions, to commit to significant emission reduction objectives.

How can this inability to meet our commitments be explained? Is it because, due to high levels of uncertainty concerning the assessments on which they are based, consensus with regard to these commitments is weak and their pertinence disputed? Is it because the objectives set are technically unattainable? Is it because the present cost of meeting our commitments is out of proportion to the future benefits that can be expected? Is it due to lack of political courage? The answers to these questions differ considerably according to the topic being dealt with.

29. This plan sets the objective of a 50 % reduction in use of synthetic crop protection products within ten years.
30. UNEP (2012), *The Emissions Gap Report 2012*, United Nations Environment Programme.

PROSPECTIVE ASSESSMENT

The assessment given above suggests that although France has invested in certain fields such as education and infrastructures in the course of recent decades, it has also allowed the deterioration of environmental capital and mounting financial debt. The questions that need to be answered concerning the next ten years are those that determine which objectives need be fixed in the various fields, the effort they involve and whether there is any room for trade-offs between these different goals.

It is difficult to anticipate possible changes to environmental, social and economic capital. An attempt can nevertheless be made to specify an order of magnitude of changes on which there is widespread consensus, before addressing future risks and changes about which there is greater debate.

CONSIDERABLE CONSENSUS EXISTS WITH REGARD TO CERTAIN PROSPECTS

Increases in the levels of training and qualification needs to continue

Increases in levels of education, training and qualifications constitute a response to our economy's growing need for a skilled workforce. According to the Inclusive Wealth Report[31], raising levels of training and qualifications also constitutes one of the essential components for the development of sustainable models of growth. For the most part, this is achieved through increasing the proportion of persons awarded diplomas (in secondary and higher education) within a given generation and within the total population more generally, raising the average time spent in education and developing lifelong training and education.

In France, the objectives fixed in 2005 of attaining a level of 50% graduates of higher education within a given generation and of raising the number of successful pupils to 80% at the school leaving certificate level [i.e. the equivalent of A-levels/high school diploma] have been reasserted. Education is considered a priority and has the benefit of substantial means in view of budgetary constraints. In addition, higher education and training are identified as strategic areas and have enjoyed a large share of allocations under the "Investing in the Future" (investissements d'avenir) programme. In view of the coming expenditure in this field and the objectives set, the French population's level of qualification and training should continue to increase. However, past experience and international comparisons teach us that overall investment allocated to raising levels of education does not guarantee the lessening of social inequalities in terms of educational success and access to certain courses of study/career paths. The effectiveness of the education system also depends on improved allocation between and within its stages and courses. It also requires greater preventive expenditure, from the earliest years, whose effects should enable reduced remedial expenditure.[32]

Growing investment in R&D, but at a lower rate than for the emerging economies

The emerging countries have stepped up their investments, including in periods of crises, thus increasing their convergence with the OECD countries. China, which accounts for 12% of global R&D, is the country with the second highest levels of R&D investment after the United States. The latter has experienced a *de facto* fall in its global share of 7 percentage points in the space of ten years (38% in 1999 and 31% in 2009), whereas the European Union's share only declined by 4 points (respectively 27% and 23%) over the same period. For its part, France went down two places in the world ranking in terms of R&D expenditure in the course of the 2000-2010 period. This trend towards the convergence of investments, which also concerns higher education[33], is set to continue in the course of the next ten years.

TABLE 2
R&D EXPENDITURE
(VOLUME AND RANK; 2000-2010)

in billions of dollars

	2000			2010		Changes in ranking
Rank	Country	Volume	Rank	Country	Volume	2010/2000
1	USA	268,121	1	USA	408, 657	=
2	JPN	98,667	2	CHN	178,168	+4
3	DEU	52,350	3	JPN	140,959	–1
4	FRA	32,962	4	DEU	86,280	–1
5	UK	27,859	5	KOR	53,243	+2
6	CHN	27,216	6	FRA	49,934	–2
7	KOR	18,559	7	UK	39,506	–2
8	CAN	16,690	8	RUS	32,788	+4
9	ITA	15,249	9	IND	31,823	+2
10	BRA	12,483	10	BRA	26,017	=

Source: Ghislaine Filiatreau, OST, Carist, April 2013.

31. UNU-IHDP and UNEP (2012), *op. cit.*; also cf. the Stiglitz-Sen-Fitoussi report, op. cit.
32. Cf. "Which Social Model?", an Introduction to the National Debate, CGSP, september 2013.
33. 80 million additional students for the 2000-2010 period. The four BRIC countries accounted for almost 50% of this increase.

The effects of climate change will occur long before the exhaustion of fossil fuel resources

Beyond 2025, a large majority of experts agree that the impact of the risks linked to climate change will be felt long before the exhaustion of fossil fuel resources (oil, gas and coal). "Proven reserves" are currently estimated as being sufficient for more than 100 years at the current rate of consumption in the case of coal, 55 years for gas, and 50 years for oil.[34]

International efforts are insufficient to limit the scale of the negative impact linked to climate change

Given the projected increase of the global mean temperature, a revision of national objectives appears necessary in order to succeed in stabilising the temperature rise at less than 2°C.[35] More specifically, world GHG emissions need to stop increasing and begin decreasing from 2020 onwards until reaching 22 Gt in 2035. This level of emission would be 30% lower than that noted in 2011: success would amount to returning to the level of emissions of 1990-1995.

At the European level, within the framework of the Climate and Energy Package adopted in 2008 the EU has undertaken to reduce its GHG emissions by 20% as compared with 1990 between now and 2020, which constitutes the most ambitious international objective in favour of stabilising the temperature increase at 2 °C (that is to say, returning to the global level of emissions of 1990-1995). For its part, France has made a commitment to reduce its GHG emissions by 14% between 2005 and 2020 for sectors not subject to the EU ETS[36]. Emissions fell by 4% between 2005 and 2010 and, on the basis of a business as usual scenario, should fall by 15% in the course of the 2005-2020 period[37]; France is therefore on course to meet this objective[38], although this is admittedly partly due to its weak level of growth. The international community has set 2015 as the date for the signature of a new world climate agreement: France, which will be hosting the summit, and thus Europe, will therefore be in a highly favourable position to work for the adoption of a sufficiently ambitious agreement to avoid irreversible disasters caused by global warming.

Energy transition represents an investment amounting to around 20 billion euros per year

The French environmental conference made it possible to specify some of the principal objectives of the energy transition that need to be conducted: 500,000 homes to be renovated and insulated every year, the deployment of 35 million smart meters between now and 2020, a 50% reduction of the share of nuclear energy in electricity production by 2025, a European objective of a 40% reduction in greenhouse gas emissions between now and 2030, a 30% reduction in our consumption of fossil energies by 2030 and the halving of our energy consumption by 2050 combined with a 75% reduction of our greenhouse gas emissions.

The expenditure and financing involved in this transition needs to be organised: pieces of research associated with the debate on energy transition estimate the required amount of investment at around 20 billion euros per year, taking all sectors into account.

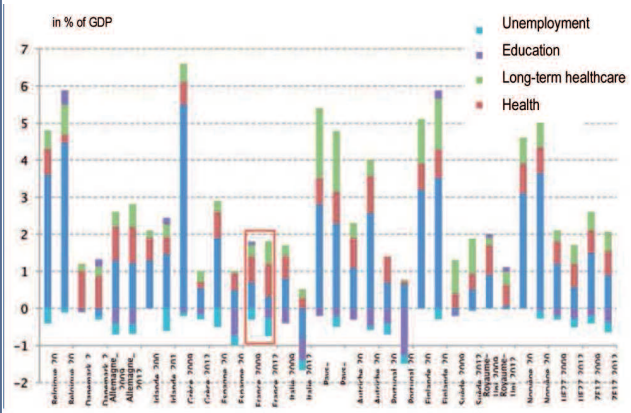
Population ageing is set to continue leading to upward pressure on public expenditure

In spite of a demographical trend showing a high fertility rate (an average of 2 children per woman in France as compared with 1.6 children per woman in the EU), population ageing will undoubtedly continue. In 2050, one out of three people will be aged over 60 as compared with 1 out of 5 people today. By 2025, the over 60 age group is set to increase from 31.5% to 38.4% of the population. According to the latest European Commission Ageing Report[39], if policies remain unchanged, by 2030 demographic ageing will have lead to an increase of 0.3 percentage points of GDP in retirement pension expenditure, 0.9 GDP point in health expenditure and 0.6 GDP point in expenditure linked to long-term healthcare. These increases could be partially offset by reduction of education spending and unemployment benefits. Of course, these forecasts vary according to the scenarios used, in

34. Source: *BP Statistical Review of World Energy*, June 2013. Nevertheless, as far as petroleum is concerned, the risk of tensions in the medium-term cannot be ruled out in case of a sharp increase in world oil demand and too slow a rate of expansion of new oil reserves (in particular of so-called "unconventional" oil).
35. Source: UNEP (2012), *op. cit.*
36. European Union Emissions Trading System.
37. Source: *Rapport de la France sur les Mécanismes de Surveillance, Actualisation 2013*, www.developpement-durable.gouv.fr/SceGES-outil-d-evaluation-de-l.html.
38. On the condition that the premises of the business-as-usual scenario remain valid: moderate economic growth, building rate of 500,000 new constructions, maintenance of incentive tools for the renovation of homes and effective implementation of the 2013 French thermal regulations for new buildings.
39. European Commission (2012), *The 2012 Ageing Report. Economic and budgetary projections for the 27 EU Member States (2010-2060)*, http://ec.europa.eu/economy_finance/publications/european_economy/2012/pdf/ee-2012-2_en.pdf.

terms of life expectancy, potential growth and the employment rate in particular. According to the latest forecasts published in December 2012 by the *Conseil d'orientation des retraites* ("Pensions Advisory Council"), finance requirements for the pensions system are between 19.8 and 21.9 billion euros in 2020, depending on the scenarios and variants, that is to say between 0.9 and 1 GDP percentage point[40].

CHART 5
SOCIAL AND ADDITIONAL EXPENDITURE LINKED TO AGEING IN 2030, ACCORDING TO THE AGEING REPORTS FOR 2009 AND 2012



Source: European Commission (2009), *Ageing Report 2009 and 2012*.

THE SCALE OF CERTAIN CHANGES AND THE PROBABILITY OF CERTAIN RISKS ARE MORE CONTROVERSIAL

Failure to take action on climate change will cost humanity more dearly than reducing GHG emissions, but by how much?

The *Stern Review* estimates that the future cost induced by the effects of global warming will be between 5 and 20 times greater than that of GHG emission reduction measures.[41] However, the Report's methodology has been severely criticised, in particular by economists such as W. Nordhaus and R. Tol. Their disagreements, both in terms of marginal abatement costs (i.e. emission reductions costs) and the social cost of carbon, are essentially due to differences in discount rate assumptions.[42] Indeed, Nordhaus adopts a descriptive approach to the discount rate, seeking to balance it with the market interest rate (i.e. 4.1%), whereas Stern opts for a normative approach with a lower rate (i.e. 1.4%).[43] Stern thus envisages the need to devote 1% of global GDP to the fight against climate change in order to guard against its worst negative impacts.

It is still difficult to grasp the extent of the negative impact caused by loss of biodiversity

In the spirit of the Stern Review (2007), *The Economics of Ecosystems and Biodiversity* (TEEB)[44] international study, conducted under the aegis of the UNEP and directed by Pavan Sukhdev, has made an initial attempt at assessing the combined cost of failure to take action. First of all, it recalls that by 2050 pursuit of human activities according to an unchanged scenario could result in: an 11% reduction in natural areas as compared with 2000; the conversion to intensive agriculture of almost 40% of land currently farmed using low-intensity forms of agriculture; and the disappearance of up to 60% of coral reefs by 2030.

On the basis of this scenario, the study estimates future global losses at around 50 billion euros every year, with regard to the services rendered by terrestrial ecosystems alone. However, there are still too few studies of this kind that provide finer detail in order to gain a fuller understanding of the overall value of services rendered by biodiversity.

Uncertainties with regard to the long-term impact of ageing

According to the French High Council for the future of the health insurance system (*Haut Conseil pour l'avenir de l'assurance maladie*), the ratios of the different "age groups" in the population should remain relatively stable between 2008 and 2020, with the exception of the 60-75 age group, whose share in the population is set to increase by more than 25%: ageing will be fundamentally marked by the appearance of a growing proportion of "young pensioners". Moreover, changes between 2020 and 2050 will principally involve the oldest age groups: the main change is set to be an increase in the proportion people over 75 year old. Between 2020 and 2050, population ageing will be attributable to the "oldest of the old". This will therefore raise questions about the loss of autonomy more than ever before.

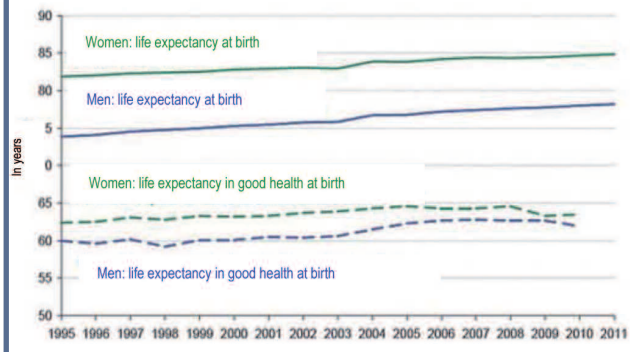
Nevertheless, consensus is not complete concerning the quantitative impact of ageing on health expenditure.

40. Conseil d'orientation des retraites, *Retraites : perspectives 2020, 2040 et 2060*, report adopted at 19th December 2012.
41. Stern, N. (2006), *The Economics of Climate Change: The Stern Review*, London, HM Treasury, October.
42. This rate makes it possible to attribute a current value ("discounted value") to future costs and benefits. The lower the discount rate, the greater the value attributed to future benefits.
43. According to ethical considerations: only the possibility of extinction of the human race makes it possible to justify the lesser weight given to usefulness to future generations as opposed to current generations.
44. TEEB (2008), An Interim Report, European Communities.

According to the Council for the future of the health insurance system, which uses the results of econometric studies, the increase in health expenditure is principally attributable to medical progress rather than ageing. Under these conditions, the mechanical impact of changes in the population pyramid over the course of the next forty years can only account – in very broad outline – for one tenth of the growth in expenditure each year.[45]

However, the currently observed expenditure gap between the oldest age groups and the rest of the population could increase in the future. Thus, France shows a growing division between life expectancy, which is constantly increasing, and disability-free life expectancy, which has been declining since 2006. If this trend continues, it could result in the escalation of health and dependence costs.

CHART 6
CHANGES IN LIFE EXPECTANCY AND HEALTH EXPECTANCY AT 65 YEARS OF AGE FOR FRANCE BETWEEN 2005 AND 2011 – ACCORDING TO SEX



Source: INSEE sustainable development indicators.

The public cost of dependence, of which health expenditure is only one component, was estimated at 24 billion euros in 2010. Population ageing will probably lead this cost to rise, but the scale of the increase will depend on both technological and sociological factors (strength of family bonds, isolation etc.), which are difficult to anticipate.

As far as the retirement pension system is concerned, funding requirements depend to a large extent on the economic scenarios used. Thus, according to the French Pensions Advisory Council (COR), in 2060 the financial balance of the pension system could range from a deficit of 99.1 billion to a surplus of 97.4 billion euros (at the 2011 rate of value), that is to say between – 2.7 and + 1.8 GDP percentage points, depending on the scenario used.[46]

The difficulty of determining the maximum permissible level of debt

Increase in public expenditure (State, local authorities, social security administrations) does not *ipso facto* mean that such expenditure is not sustainable. Growth of public spending is sustainable if receipts increase at the same rate and if this increase in receipts is itself economically and politically sustainable. Thus, the European Commission calculates an overall indicator, which makes it possible to assess the sustainability of public expenditure, in regard to the long-term manner in which both receipts and expenditure need to increase. This indicator, referred to as the "sustainability gap", refers to the continuous budgetary consolidation (increase of receipts and/or reduction of expenditure), expressed in percentage points of GDP[47], needed to guarantee the financing of public expenditure on an indefinite time-scale. It enables the analysis of the extent of the necessary adjustments by isolating the initial budgetary position and the impact of future population ageing.

In 2009, the Ministry of Finance, within the framework of the 2010-2013 stability programme, estimated the sustainability gap at 5.6 percentage points of GDP. In 2012, within the framework of the 2013-2017 stability programme, it estimated that this gap had been reduced to 3.6 percentage points of GDP, that is to say a notable improvement in the space of three years. The gap nevertheless remains considerable. For comparison, receipts from income tax represented around 2.5% of GDP in 2011.

The sustainability gap is a useful indicator because it compares current levels of receipts with those necessary to finance expenditure on an indefinite timescale, on the assumption that such expenditure develops in accordance with the baseline trend. In the short to medium-term, it is preferable to think in terms of development of the public debt ratio. The primary balance (i.e. before payment of interest on the debt), which enables the stabilisation of a given debt ratio, depends upon three parameters: the level at which the debt is to be stabilised, the rate of interest and the rate of growth of the economy. Interest rates and the rates of economic growth partly depend on inherently uncertain external parameters: technical progress, changes in the debt market and changes in creditors' opinions concerning financial credibility etc. Additionally, there is no consensus among economists concerning the optimal levels of public debt. In any case, during periods of crisis France greatly increases its debt and is distinguished by its difficulty in reducing it at the peak of the business cycle.

45. HCAAM, "*Vieillissement, longévité et assurance maladie*", statiement adopted at 22nd April 2010.
46. Conseil d'orientation des retraites (2012), *op. cit.*
47. This is the required consolidation of the structural primary balance (difference between expenditures and receipts). It is referred to as "primary" because it is calculated before payment of interest on the public debt and as "structural" because the effects of short-term economic circumstances are not included.

For this reason, France's level of indebtedness tends to be too high at the time of downturns in the economic cycle. There are several arguments in favour of beginning to reduce the debt.

In the first place, governments can only increase the primary surpluses (i.e. receipts excluding debt service) demanded from their populations up to a certain limit. Indeed, such surpluses represent the difference between receipts collected from the nation and services provided by public administrations. There is thus a level of primary surplus beyond which the consent to taxation may be jeopardised. Yet, the primary balance required to stabilise the debt ratio increases in proportion to the size of the outstanding debt. Thus, the higher the level of debt, the higher the risk of default.

Secondly, the establishment of a (EU) banking union should enable more effective regulation of the banking system, thereby reducing the occurrence of banking crises. This should have a positive impact on public finances because of the reduced need to rely on the State as guarantor of last resort. Nevertheless, a banking union will cause States to lose the special access to finance provided by national banks.

Finally, the maintenance of a high level of public debt makes us vulnerable to rises in interest rates. France currently benefits from extremely low long-term interest rates. However, the macroeconomic conditions (low levels of growth, preference for liquid assets, flexible monetary policies) that lead to the maintenance of these extremely low long-term rates (apart from country-risk premiums) could change considerably in the near future (global economic recovery, tightening up of monetary policies etc.). A rise in long-term interest rates above growth rates would trigger a snowball effect, as a result of which debt would increase of its own accord.

WHY IS IT SO DIFFICULT TO EMBARK UPON A COURSE OF SUSTAINABLE GROWTH?

The continuing inability to attribute a price to certain resources

Authorities often use a number of tools in order to influence behaviours (emissions trading, regulation and subsidies, etc.). Each of these instruments attributes a specific or implicit price to damage to the environment: for example, to a certain extent, the European market of GHG emissions allowances makes it possible to give a price to global warming; compliance with norms may make it necessary to plan work and make use of more expensive technology. However, it is always difficult to adjust the scale of public initiative when market failures need to be corrected. The European Union Emission Trading Scheme (European carbon market) remains highly imperfect, in particular because of its European rather than international nature, its failure to include all of the greenhouse gases and the fact that it only applies to certain sectors (industries with the highest carbon emission levels). Furthermore, implementation of this market needs to be extended to all GHG and emissions-producing sectors, while decreasing the quantity of quotas allocated in a sufficiently rapid manner in order to increase the incentives to reduce GHG emissions. Moreover, ideally the price per tonne of CO_2 outside of the carbon market needs to be uniform. This is rarely the case. In order to increase its effectiveness, the whole GHG emissions reduction policy needs to be revised in a manner consistent with the price of carbon on the European market.

In order to change behaviours with regard to biodiversity, the authorities make use of norms in the majority of cases. For example, almost 13% of France's land surface area consists of "Natura 2000"[48] protected areas (SOeS [the statistical service of the CGDD] figures for metropolitan France). In addition, the Ministry of Ecology has established a doctrine for conserving biodiversity outside of these protected sites based on the principle of "prevention, reduction and offsetting" ("*éviter, réduire et compenser*"), according to which it is better to prevent than compensate for negative impact. However, the doctrine is unevenly applied, because of insufficiently clear methodological and legal framework. In order to slow down the artificial development of agricultural and natural areas, it may be appropriate to provide improved support for the implementation of this principle.

Assessment of the cost-benefit ratio of long-term decisions depends also highly on the applied discount rate. However, in the case of decisions with very long-term consequences, the fundamental consideration remains that of equity between generations. The limited ability to substitute environmental resources with produced resources, as well as the profound uncertainties concerning the scale of future negative impacts, provide additional arguments in favour of a low discount rate and therefore a high valuation for the future. In view of the

48. Directive 92/43/EEC on the Conservation of natural habitats.

importance of the discount rate in the economic assessment of long-term decisions, it would be appropriate to establish standardised rules of implementation for environmental, human and productive assets as a whole as soon as possible.

Numerous sources of disagreement concerning the solutions to the problems encountered

Even when there is relative consensus with regard to assessment, there is sometimes disagreement concerning the appropriate solutions to the problems encountered. Within the field of the environment, the "technological" approach is often opposed to the "environmentalist" approach: is it preferable to temporarily promote the development of "clean" technologies, at the price of allowing damage to the environment to temporarily continue, or rather to immediately increase the cost of damage to the environment, thus prompting industry to develop clean technologies? More generally, there is sometimes disagreement as to the very possibility of responses of a technological nature to environmental challenges. Once again, the destruction of environmental assets is not necessarily substitutable by technology, nor always in a cost-effective manner.

Consensus on the solutions can also be difficult to find because of disputes concerning financial burden-sharing: who is to pay the cost? How can it be equitably shared? Such questions are at the heart of the debates surrounding the restoration of the balance of our retirement pensions system: how should the contribution be shared between employers and employees? Between the working and non-working population? And within the working population, between public and private sector employees, high and low wage earners, women and men, etc.? Similar issues are involved in the case of damage to the environment: does taxation of diesel carry the risk of weighing disproportionately upon working-class categories whose homes are far from their places of work? Will increasing the prices of gas and electricity carry the risk of particularly penalising poor households, with little option but to live in poorly insulated accommodation? As for climate change, each country may be tempted to behave as a free rider. Even in the case where each country agrees to contribute to the effort, fixing an equitable level of contribution for each country is far from easy. For example, should emissions quotas be allocated to countries in function of their level of production? According to their population? Or on the basis of their level of emissions at the assignment date of the quotas?

An inefficient institutional design

Making our economic and social model sustainable means taking decisions that present an immediate cost in exchange for benefits that are sometimes uncertain and delayed. Everyone, from citizens to companies and politicians, is tempted to postpone the deadline. The solutions chosen may be partial, be based on scenarios that are too optimistic or be subsequently called into question.

In addition, it is not uncommon for the assessments, not only the solutions, to be subject to negotiation between the stakeholders. They may also be affected by a number of distorted views, optimism bias in particular.

In the field of risk management, and environmental and health risks in particular, there are notable difficulties in establishing shared collective assessments and implementing precautionary measures in a balanced manner. The precautionary principle has been included in the French Environmental Charter (*Charte de l'environnement*) since 2005.[49] Its first years of implementation confirmed the necessity of considering it a principle of action that needs to be based on the best current technical and scientific knowledge and lead to more research. Unfortunately, the principle is often poorly understood by citizens, and sometimes by politicians, poorly explained in the media and frequently used as an argument for inaction or postponement. On the contrary, its implementation should lead to programmes of research and the further expansion of knowledge required to assess existing doubts. The development of new technologies (biotechnologies, nanotechnologies etc.) thus makes it necessary to establish a clear, collective framework that can be adapted according to the development of knowledge concerning the environmental, health and social impact of these technologies. It is necessary to enable effective governance of new technologies on the basis of continuous interaction between scientific expertise on the known and possible (beneficial and negative) effects of these technologies and consultation between the public and the stakeholders as a whole and political decision-makers.

Moreover, France's inability to meet its commitments is probably partly attributable to the fact that failure to comply with them does not lead to truly dissuasive sanctions, whether financially, with regard to reputation or in electoral terms.

49. This principle stipulates that "lack of certainty, in view of current scientific and technological knowledge, should not delay the adoption of effective and proportionate measures aimed at guarding against the risk of serious and irreversible damage to the environment at an economically acceptable cost" (cf. Act of 2nd February 1995 referred to as the "*loi Barnier*").

PRINCIPAL ALTERNATIVES

Establishing a more sustainable growth model makes it necessary to answer a number of questions.

WHICH OBJECTIVES AND WHICH REFORMS?

Getting the nation as a whole to support the transition towards a sustainable growth model means declaring specific objectives for at least the next ten years. This necessarily involves trade-offs.

Firstly, qualitative trade-offs: should the State invest in infrastructures to deal with new environmental challenges and support our productive apparatus, or should it place education and human capital as the priority? Should private actors be directed towards productive investment (private tangible and intangible capital) or rather be encouraged to show greater respect for the environment (energy efficiency in residential and tertiary real-estate as well as in transport, transformation of the agricultural sector etc.)? Of course, these options are not entirely incompatible and may even complement each other. For example, targeted investment in research may enable the design of more environmentally-friendly infrastructures.

Secondly, as far as quantitative trade-offs are concerned, it appears necessary to reduce public debt and the necessary investments will not therefore be financed in this way. Nor is greater reliance upon foreign finance a sensible option in view of the fact that France's net external position has deteriorated considerably since 2008.[50] In the absence of growth, these investments will therefore require a reduction of public and/or private consumption. Ultimately, the greater the level of growth, the smaller the level of contribution demanded to households (increased tax burden and/or lesser consumption). Moreover, growth would make it possible to avoid the need for trade-offs between the objectives (education/capital/ecological transition). On the other hand, if growth is weak, a course that places priority upon a certain level of frugality needs to be envisaged.

There is a consensus with regard to the need to implement the ecological and energy transitions and progressively establish a new economic processes that corresponds to a more circular economy and more sustainable consumption (development of recycling sectors, development of industrial ecology-type flow complementarities). Conservation of our biodiversity presupposes bringing about changes in our agricultural model and halting the development of land, by limiting the development of urban sprawl. Without a return to satisfactory levels of growth, the financing of such transitions necessarily leads to trade-offs.

In these fields, the setting of ambitious but achievable objectives presupposes an assessment of:

- the rate at which technical progress is capable of providing credible solutions in terms of clean technologies;
- the rate at which behaviours are capable of changing in favour of practices that are less wasteful of environmental resources;
- the cost of these solutions.

Finally, with regard to the pension system, where France has the benefit of a less pronounced level of ageing, how can the long-term visibility of the structural balance objective be ensured for the working and retired population? The same questions need to be raised with regard to the long-term financing of the health insurance system. In the field of social welfare, should the resources be transferred from curative to preventive action?[51]

HOW CAN LONG-TERM ISSUES BE MORE EFFECTIVELY TAKEN INTO ACCOUNT?

In order to organise our transition towards a sustainable model of growth, it will be necessary to provide our institutions with a more effective means of taking long-term considerations into account.

In the field of public finances, recent progress should be noted. On 10th October 2012 France ratified the Treaty on Stability, Coordination and Governance (TSCG). This treaty obliges the States not to exceed, in the medium term, a structural deficit equal to 0.5% of GDP, or 1% if its level of debt represents less than 60% of GDP. The Treaty came

50. France's net external position, which represents the overall assets or liabilities of France in relation to other countries, went from -4% of GDP in 2007 to -33% of GDP in 2011.
51. See footnote 32.

into force on 1st January 2013. It was incorporated into French law by means of Organic Law no. 2012-1403 of 17th December 2012 concerning the planning and governance of public finances. The HCFP "High Council for Public Finances" (Haut Conseil des finances publiques) was created under this Institutional Act. Under the terms of article 17 of the Organic Law, the High Council is responsible for assessing the macroeconomic forecasts upon which projected stability programmes are based. Assessment of the sustainability of public finances does not specifically lie within its field of authority, while not being excluded either. Although decision-making comes within the field of democratic choice, risk assessment might usefully be exercised by an independent authority. Would it be appropriate to specifically entrust the HCFP with the task of assessing the sustainability of public finances?

In the field of the environment, an environmental authority was created in 2009, which is responsible for giving its opinion on the impact of major development projects. Moreover there are a certain number of consultative bodies in charge of giving opinions on specific environmental issues (GMOs, water, coastal matters etc.). Would it be appropriate, generally speaking, to consolidate the capacity for the independent assessment of long-term environmental risks, in a more transverse manner?

Whether with regard to budgetary or environmental sustainability, the main issue remains the interests of future generations. Would it be possible to envisage the creation of a specific body, or even court, specifically and exclusively in charge of representing the interests of the future at the time of the debates linked to the preparation of major reforms and projects?

Similarly, would it be appropriate to incorporate the notion of "environmental damage" into French law or the Constitution, in order to sanction damage to the environment?

WHICH INSTRUMENTS ?

The effectiveness of public initiative needs be improved in order to reinforce the sustainability of our model of growth.

In order to monitor the progress of our transition, it will firstly be necessary to continue the efforts already undertaken to develop a new system of national accounting enabling the monitoring of changes in our assets, whether they be economic, social or environmental in nature (cf. the sustainable development indicators of the INSEE and the CGDD Sustainable Development Commission).

It will also be necessary to encourage and direct households, companies and economic agents more generally towards more sustainable behaviours and investments. This presupposes equipping oneself with more effective instruments. According to the objectives that are set and the sectors in which action is to be taken, should priority be given to norms, contracts, taxation or the market?

With regard to environmental taxation, France is lagging behind some of its European neighbours. For example, the rate of the Swedish emission tax on nitrogen oxide (NOx) is over thirty times higher than that of France's TGAP general tax on polluting activities (*taxe générale sur les activités polluantes*). Should greater use be made of this instrument? In the field of agriculture, agri-environment contracts have existed for about twenty years in order to encourage farmers to produce environmental services, but the results are still very limited. How then can the current scheme be improved in order to increase its effectiveness?

The implementation of a new carbon tax (*contribution climat-énergie*) has already been announced during the Environment Conference held on 20th and 21st September 2013: a part of domestic taxes on the consumption of fossil fuels and combustibles (petrol, diesel, coal, natural gas, fuel oil and heating oil) will be calculated according to the CO_2 emissions produced by their use. Part of the financial receipts collected from the current nuclear power network will also be used for financing the energy transition. Is this enough or is it necessary to go further?

The choice of the political instruments to be implemented needs to be preceded by an analysis of their possible consequences in terms of equity and administrative costs.[52] In particular, the social acceptability of its cost by citizens depends on how equitable they consider the financial burden-sharing.[53] How can instruments be designed which are both effective and fair?

52. For example, resorting to diffuse emissions market permits would lead to very high management costs, due to the need to put in place very heavy control mechanisms.
53. For example, a survey conducted by the CSA market research / public opinion group in 2009 on behalf of the *UFC-Que choisir* consumers' association revealed that although 74% of persons consulted declared themselves opposed to carbon tax, only 48% opposed such measures when accompanied with redistribution of the receipts thereof by means of green cheques.

Contributors: Mahdi Ben Jelloul, Pierre-Yves Cusset, Géraldine Ducos, Clélia Godot, Mohamed Harfi, Jean-Luc Pujol.

QUELLE FRANCE DANS 10 ANS?

At the governmental seminar held on August 19, 2013, the Head of State wished to begin, without waiting, a widely-concerted process relying on joint efforts to elaborate a 10-year strategy for France.

The definition of such a strategy includes several objectives:

- Establish a path that permits the country to move forward with points of reference and indicators clearly identified.
- Engage in collective choices that regulate the major transitions.
- Adapt policies and instruments according to the objectives set.
- Initiate an extensive dialogue with everyone concerned.

At the end of the seminar, the Prime Minister entrusted the *Commissariat général à la stratégie et à la prospective (CGSP)* with the preparation of this project, identifying notably five major issues: the future of the production model, the reform of the social model, the sustainability of the growth model, the transformations occurring in the French society and the European project.

The CGSP report will be handed over to the Head of State and the Prime Minister at the end of 2013. In particular, this report will have the goals of:

- Clarifying a certain number of prospects for the next ten years through a prospective assessment based on the most common findings.
- Proposing among possible choices a limited number of national priorities.
- Setting concrete and quantitative objectives concerning these priorities in order to mobilise the relevant stakeholders and the society as a whole, beyond a single Parliament's term.

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"Towards a More Sustainable Growth Model?" - September 2013 - is a publication of the Commissariat général à la stratégie et à la prospective
Editor:
Jean Pisani-Ferry, Commissioner-general for policy planning
Managing Editor:
Hervé Monange, Assistant to the Commissioner-General
Printing: CGSP
Registration of copyright: September 2013 - ISSN no.: 1760-5733
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Created by decree on April 22, 2013 the *Commissariat général à la stratégie et à la prospective* (CGSP) replaced the *Centre d'analyse stratégique*. A place of dialogue and discussion, the CGSP assists the government in determining the main directions for the future of the Nation and the medium and long term objectives for its economic, social, cultural and environmental development. It contributes, moreover, to the preparation of governmental reforms.