

CENTRE INTERNATIONAL DE RECHERCHE SUR L'ENVIRONNEMENT ET LE DÉVELOPPEMENT

Carbon Taxation and Social Progress

A Mapping of the French Debate

Emmanuel Combet

The CIRED's Ecological Tax Reform Program Frederic Ghersi, Jean Charles Hourcade, Camille Thubin

October 2011



C.I.R.E.D. UNITÉ MIXTE DE RECHERCHE EHESS ET CNRS - UMR 8568

JARDIN TROPICAL 45 BIS AVENUE DE LA BELLE GABRIELLE 94736 NOGENT-SUR-MARNE CEDEX - FRANCE TEL : (33-1) 01 43 94 73 73 FAX : (33-1) 01 43 94 73 70 http://www.centre-cired.fr

In many countries, a tax reform is called for to mitigate climate change, to fund the systems of social protection and to limit the rise of inequalities. In a context of globalisation and demographic transition, it should to be hard to meet those long term challenges without fostering the job creation and without controlling the public deficits. This complexity makes cooperation awkward: in an uncertain world, it is hard to disentangle the source of disagreements and therefore to reach a political consensus about a compromise solution - that may be both effective and acceptable.

An illuminating example is the recent withdrawal of the carbon tax proposal by the French government¹. It is the latest failure of a policy instrument though consistently prescribed by economists as an efficient way to mitigate climate change. The study summarised here² must be considered in this context. It aims at comparing different schemes of carbon taxation in France. It thus assesses how different use made of the tax proceeds fare on various economic, social and political criteria: growth, employment, income distribution, public debt management and trade competitiveness.

The objective is to study what kind of trade-offs the collective action is facing when defining a fair transition towards a low-carbon economy, and if there is room for compromises. A special focus is being placed on the social impacts of the reform over the short to long run; Different compensatory mechanisms able to correct the negative short term effects are considered; Ageing is then taken into account, as we link the option of carbon taxation to the management of the pension system. A "comprehensive carbon tax reform" is compared to the business-as-usual and the "conventional" structural reforms.

¹ The proposal was rejected by the *Conseil Consitutionnel* on December 28, 2009. The revision of this proposal was abandoned as a collateral damage of the setback of the governmental majority in the European elections of March 2010.

 $^{^{2}}$ This research program has been launched 4 years ago thanks to a financial support by ADEME and CFDT (by means of IRES). This summary is based on.Combet. *et al.* (2010a and 2010b) and Combet and Hourcade (2011).

According to polls, two out of three French citizens were opposed to the carbon tax announced by the French government. Is it because they perceive it as a 'green fancy', quite untimely in this period of crisis? Do they rather interpret it as yet another fiscal burden under an environmental pretence? Or are they just voicing a strong concern about the general state of affairs and the evolution of our society? All these reasons probably add up, and ultimately reveal deep misunderstandings that originate in:

• a lack of awareness of the gap between the direct cost of the tax, as perceived by the taxpayer, and its ultimate impact on the taxpayer himself and on the rest of society. A firm, for instance, can pass on part or all of the tax burden to its buyers, in which case the tax payment does not equate the ultimate economic burden, nor is he who pays the tax him who bears the major part of this burden.

• a free-lunch illusion about alternative policy and measures such as industrial norms, R&D financing, building renovation, rail and water transport development, consumer information, *etc.*; however efficient in the long run these policies will entail costs in the short run that will have to be financed one way or another.

Lifting up those misunderstandings requires thinking in terms of a *carbon tax reform*: the tax and the precise recycling of its proceeds. It also requires understanding the double role of carbon taxation, which is:

• *a price-signal* that shapes the decisions of households, firms and policymakers engaged in such paramount activities as urban and transportation planning; it also provides a benchmark against which norms and standards can be judged so as to limit administrative arbitrariness and lobby influence in their setting.

• *a lubricant for the transition toward less carbon-intensive societies*: because of the inertia of equipments and infrastructures, of technological uncertainties, of the resilience of road mobility to public policies, or of the magnitude of the required restructuring of our productive systems, such a transition will be more costly than suggested by the more optimistic technological scenarios; it will generate tensions that a judicious use of the carbon tax proceeds can help relaxing.

The research synthesised here thus primarily aims at overcoming the *dilemma* between demanding sacrifices today in the name of future threats, and addressing the needs of the current population hit hard by a severe economic crisis. This is why we carried out numerical experiments in which a carbon tax is treated as one element of the transformation of the tax and benefit system that is required to face challenges as diverse as industrial competition, population ageing, unemployment, social solidarity, energy security and public debt.

Such a transformation only makes sense over the long run, it is necessary to analyse its impact on different 'visions' of 2020 or 2030 France. To avoid, in the first

place, entering controversies about such visions, we decided to simulate the impact of a carbon tax³ that would have been initiated at the end of the 1980s and would have risen to between 100 and 400 Euros *per* tonne of CO_2 ($\notin tCO_2$) in 2004. We deliberately opted for *the worst scenario of a unilateral carbon tax*, with a view to clarify how autonomous France can be as regards carbon-based fiscal reforms. We started by comparing three main recycling modes (lump-sum universal allocation, decrease of the VAT, decrease of the payroll taxes), before examining *the most robust compromises between the level of economic activity and the equity of income distribution*. Table 1 at the end of this synthesis summarises the computed impacts of seven of those reforms.

The assumption of a well-known policy environment is then removed. In available projections financial tensions will be increased due to ageing. By 2020, the retired to workers ratio will rise by 30% and the pensions spending be multiplied by 3, while the households' saving rate will drop by almost 40%. Tensions on energy resources and global markets will as well be amplified due to the rapid development of emerging economies and the depletion of fossil reserves. In a best case scenario, the import price of oil double and the "price-competitiveness" is slightly reduced (-0.5%). We reproduce a projection of the pension system in business-as-usual (from the *Conseil d'Orientation des Retraites*, COR) and we compare the macroeconomic impacts of various reforms that all allow to reach a same "deficits control target": to fund the cumulated deficit of the pension system. Table 2 at the end summarises the impacts of seven of those reforms.

A model for the synthesis and the debates

The impacts of various carbon tax reforms on a large number of environmental, economic and distributional indicators have been simulated with IMACLIM-S, a computable general equilibrium model developed at CIRED that represents the open French economy⁴. This model has two specificities.

First, it relies on a coherent system of national accounting that has been extended to the interfaces between the economy, the environment and the social dimensions. The flows of energy are described precisely thanks to an effort to harmonize the energy balances with the national accounts. Similarly, the distribution of incomes between four categories of agents (households divided into twenty classes of income, companies, public administration and "the rest of the world"), as well as the state and the structure of

³ A uniform tax on the carbon content of the energy consumptions of both firms and households.

⁴ *Cf* Its general description, the formal structure and the data tables are available at: <u>http://www.imaclim.centre-cired.fr/spip.php?article162&lang=en</u>.

public finances, are detailed using some "satellite accounts" and households' surveys.

Second, it is used to compare different beliefs, on one hand, about the functioning of the world, and the other hand, on the potentials and constraints of the future. No assumptions of perfect market functioning, flexibility and efficient uses of resources are made. Thus, a wide range of "second best world" can be depicted, but they all respect a core of realistic assumptions: technical and institutional inertia, structural unemployment, imperfect knowledge or expectations about the future outcomes of individual actions. Therefore, it is used to study whether or not the opposite conceptions that proved to be decisive obstacles in reaching a political consensus are determinant for decision-making (*e.g.* on technical potentials, labour market functioning or market imperfections).

The best package: tax pollution and de-tax productive activities

Our first conclusion is that a given rate of the carbon tax, while leading to similar CO_2 emission abatement, has economic and social impacts that vary strongly depending on (*i*) *the way in which its revenue is recycled* and (*ii*) *the budgetary context* (evolution of public expenditures, management of the public debt) *in which it is implemented*. Depending on the assumptions made in those two dimensions, a 400 \notin tCO₂ 2004 carbon tax resulting from a reform started in *ca* 1990 would have led to the following variations from historical 2004 levels: a -41.4% to -42.0% in CO₂ emissions and 4.3 to 4.5 billion Euros savings on oil imports; a GDP variation ranging from -0.8% to +2.1%; a variation of aggregate household consumption ranging from +0.4% to +1.8%; a variation of the consumption of the poorest households (lower twentile) ranging from +0.2% to +6.2%.

To put it in another way: depending on the variant, the historical December 2004 GDP level would have been attained between February 2004 and April 2005—a 14month gap. Besides, the most pessimistic variant counts 922,000 more unemployed than the most optimistic one. Such results are contrasted enough to require further scrutiny: too adverse impacts on employment or on the purchasing power of households would block the rise of the tax much below the level required by a significant decoupling between GHG emissions and growth.

The variant showing the best results in terms of growth and employment is that which uses carbon tax revenues to *moderate the historical growth of payroll taxes per working hour*—an arguably major pre-existing distortion of the French tax system. A rising carbon tax replacing part of the payroll taxes would have indeed *alleviated the tensions between social protection, debt containment and employment*. Such tensions are congenial to the French social solidarity system and its payroll-tax financing in a context of population ageing and rising social expenditures. They result in an increasingly problematic trade-off between *augmenting the gap between the labour costs of firms* *and the net wage of workers*, lowering the social protection expenditures, and increasing the reliance of the social care system on private capitalisation funds—of which the recent crisis has shown the limits.

This carbon-based fiscal reform cannot be a magic bullet that delivers a large double dividend. It has indeed been demonstrated that taxing energy largely amounts to taxing the income that is spent on it. However, in an open economy with structural unemployment, a carbon tax may *trigger a virtuous circle* based on a lower oil import bill and a lower aggregate fiscal burden on the productive sector, thanks to a tax shifting to land and real estate rents, and transfer revenues. The release and strength of this virtuous circle is not automatic and *depends on two main tradeoffs*:

• between household consumption and debt containment: under a constant public debt-to-GDP ratio a $400 \notin tCO_2$ tax induces a 1.8% increase in household consumption; if the tax proceeds are partially used to lower the public debt ratio by 10 percentage points household consumption decreases by 0.5% (a cut of 25 points implies a decrease of 0.9% of consumption);

• between the maximization of GDP and employment, an equal distribution of the induced income variations and the competitiveness of energy-intensive industries.

It still remains that, no matter how these trade-offs resolve, *lowering labour taxes is a better option than other recycling modes* as lowering the VAT or organising a lumpsum transfer to households. One key reason is that these alternative options cannot *limit the propagation of higher energy costs from one sector to the other*, and its adverse consequences on competitiveness and thus employment.

Income distribution: beware of misperceptions

If applied without accompanying measures, the package of a carbon tax and lower payroll taxes exacerbates inequalities. In those variants that increase GDP the poorest household twentile benefits from a slightly higher consumption (higher employment, higher transfers and individualized public services) but the richest twentile, whose budget share of energy is lower, benefits more from the higher activity level. As a matter of fact it is the middle classes who least benefit from the reform.

Intuition suggests that redistributing all the tax proceeds in *an equal lump-sum transfer* to households would more than compensate such inequalities; but this would be a counterproductive correction. As already hinted, by transferring the whole burden of taxation onto firms, it would increase production costs, and consumers would pay a much inflated final bill. The rise of the final bill would indeed supersede the only carbon tax proceeds because of inter-sectoral propagation effects; the compensation would thus not

allow households to maintain their purchasing power—at least when the pressure exerted by competitiveness constraints on real wage adjustments is duly accounted for. In addition, the cost increase would lead to lower international competitiveness and *more unemployment*. These perverse effects could be mitigated through a duty on imported goods, but this would make the reform utterly dependent on an unlikely agreement within the European Union.

The two recycling schemes ultimately outline an equity-efficiency dilemma, which is conveniently represented on a four-dimensional diagram (Figure 1):

• on the north-south axis, two efficiency criteria: employment and GDP;

• on the east-west axis, two equity criteria: the level of consumption of the poor (first twentile) and the inverse of the Gini index (to produce an indicator that increases as the consumption distribution becomes more equal).

In this diagram the historical situation of 2004 is represented by a dashed black diamond with an index of 1 on the four criteria.



Figure 1: The equity-efficiency dilemma of a carbon tax reform

A better compromise between economic efficiency and social justice is obtained by a '*mixed recycling*' option that consists in allocating the carbon tax on households to lump-sum transfers, while the carbon tax paid by firms is recycled in lower payroll taxes. At a constant public debt-to-GDP ratio, compared to the full recycling on lower payroll taxes this option creates 350,000 less jobs, but *it markedly improves the income of the poorest* (which rises by 3.6% rather than 1.5% only).

A still (slightly) better option is to combine lower payroll taxes with a tax exemption on the basic needs and accompanying measures for the 80% lower-income *households* (support to energy efficient equipments and to social housing). Without weakening the price-signal, and even when further constrained by a *10-percentage point decrease of the debt-to-GDP ratio*, this option allows an increase in the poorest twentile's consumption (+2.4%) and a decrease in inequalities, while *maintaining the overall economic performance of the reform* (665,000 more jobs than in the reference case). It can even be more equitable than lump-sum transfers because the negative impact of an energy tax is less dependent on income than on other parameters (Figure 2), such as housing location (north vs. south, plain vs. mountain, remoteness), housing type (individual vs. collective), energy end-use equipment, *etc.*, which can be taken into account when shaping the accompanying measures.



Figure 2: Energy vulnerability is ill-explained by 'income'

International competitiveness: let us not miss the issue

Substituting a unilateral carbon tax of $400 \notin tCO_2$ to part of the 2004 payroll taxes would have preserved the competitiveness of 74% of the French productive activity (inducing an increase of production costs below 0.5%); 48% of this activity would even have improved its competitiveness, as it would have saved more payroll taxes than paid carbon taxes. The 'winners' (services but also large industries such as the car or textile industries) benefit from a cost transfer onto household rents and transfers, and carbon-intensive industries.

Carbon-intensive industries, paying most of the tax and benefiting less from decreased payroll taxes, see their costs rise more markedly. They may lose in market share but they are above all *vulnerable to the carbon tax impact on their profit margin*. In a globalised capital market, significantly lower profits can undermine their ability to modernise their equipments and invest in low-carbon technologies. The only solution consists in partial tax exemptions based on their carbon contents and capital intensity.

Such tax exemptions obviously weaken the social benefits of the reform, by cutting down the proceeds that allow for payroll tax reductions. But they do better than tax-free quotas to carbon-intensive industries if, as it is suspected to be the case for the European Union Emission Trading System (EU-ETS) these quotas are allocated with some laxness: in the compromise option outlined above, with a 10 percentage-point decrease in the public debt-to-GDP ratio, a total exemption of those emissions covered by the EU-ETS results in a GDP increase of 0.1%, but in an average consumption loss of 0.4%.

Pensions and public deficits: a broader frame for the debates

The reproduction of *the best case scenario of the COR* in the IMACLIM-S model *leads to an unrealistic explosion of the deficit of the external position by 2020*, the national debt reaching twice the level of GDP^5 . This result comes from the interplay effects of ageing and energy dependency. The increased ratio of social spending to GDP (+16%) can be neither financed by households' savings whose share relative to income decline by 37%, or by foreign trade as imports are rising sharply mainly due to the explosion of its oil bill (+180%) and exports are forced down by the rise in domestic production costs. Without a rise in tax rates or a restriction of public expenditures, the public deficit (multiplied by 10) can just be financed by foreign investors.

The financial need is yet much higher in the most pessimistic but plausible COR scenarios (+20% in 2020 and +60% in 2050). It is therefore likely that before reaching such levels of debt, either the country will be forced to conduct painful and drastic "rigorous policies" or the risk premium on bonds will fly and to the best foreign investors will refuse to lend more, at worst they will retire massively. That shows that *pursuing to fund pensions by the public deficits is not a realistic option*, in other word, *a "wait-and-see" strategy is likely to deepened energy, economic and social tensions*.

In addition, this counterfactual exercise shows that it may be socially costly to narrow the debates to a pure accounting reasoning by assuming that there is no effect on prices, wages, growth, employment *etc*. This can lead to miss some interesting institutional innovation in the process of collective decision-making and to put the focus upon the distributive dimension alone neglecting the possibility of 'win-win' strategies or the risks of 'bigger loss' for all.

⁵ This situation of over-indebtedness is only possible in the model, because no mechanism of financial instability is represented there: the interest rate and payments to creditors rise sharply but *the country run into debt more and more to pay its debt*. This modeling choice is made necessary, otherwise it would be impossible to replicate the scenario of the COR in this general equilibrium setting.

Beyond climate change: a potential synergy for social progress

The 'favoured option' in the French debate on pension reform - an increase of the legal retirement age - not only improves the supply potential by feeding the workforce, it also exacerbates tensions on the labor market, driving down wages and affecting household consumption. Therefore, contrary to the COR estimates, a legal postponement of the retirement age of 4 years do not allow to reach the balance of the system in 2020; with our imperfect labor market, the social debt is only financed at 79% and an additional increase is needed to reach the balance with a higher cost for growth and employment. We take the France-2020 resulting from this reform (4 years increase) as reference situation for assessing the outcomes of other scenarios.

The comparison of the macroeconomic performances of seven other schemes, financing the same levels of social debt shows, first, that the two other "conservative options" - an increase in payroll taxes or a cut in public expenditures – are not the most efficient. They do not address the core of the long-term problem: the energy and carbon dependency of the economy, the competitiveness of French productions, the systemic constraints to job creation. Besides, they do not allow the French economy to be on a trajectory that is compatible with the achievement of the national CO_2 mitigation target.

Public spending (consumption and investment) must be reduced by 5.0% to reach the balance. This is done hardly at a lower cost and the numerical exercise assumes no effect on the overall productivity, which is obviously unrealistic if such an "austerity policy" is applied over the decade. In particular, the decline in national education spending can have important adverse effects on potential future growth and inequalities. The rise in payroll taxes appears to be the worst solution. The balance requires a sharp increase of the rate (+7.1), because this solution weight on the cost of production and increase the cost of labor relative to energy. As a result, a general inflation of prices is triggered and the structural change towards a high employment path is slowed down.

A "comprehensive tax reform" that combines the introduction of a carbon tax reaching a high rate of $200 \notin tCO_2$ in 2020 and recycled through lower payroll tax to an increase in income tax, presents better outcomes. It induces a real bifurcation towards a more sustainable growth path by releasing three favorable mechanisms that mutually reinforce (figure 3): a structural change towards production and consumption patterns that are more labor intensive (+0.9%), a higher alleviation of the oil bill (-12.7 billion Euros), and a limited propagation of the costs increases (unchanged). As a result, the unemployment rate is reduced (-1.8 pts) while net wages are increased (+4.6%) and CO_2 emissions are reduced by a third.



Figure 3: The mechanisms of a potential macroeconomic virtuous cycle

The key to success: the negotiation of a novel fiscal deal

One of the stakes of a significant carbon tax reform is to contribute to restoring a climate of public confidence to speed up recovery from the ongoing crisis. This might sound paradoxical to most observers, who perceive climate policies as constraints impinging on economic growth. However, a carbon tax reform offers a unique opportunity to promote a new technological frontier, that of decarbonisation, and to develop new markets in the building sector, the energy industry and transportation. It also offers a way of *reducing labour costs while preserving social protection, and without weakening the labour legislation or developing insecure or black labour.*

Such expectations cannot be fulfilled in the absence of social negotiation. Indeed, it first matters to achieve a fair sharing of the decrease in payroll taxes between higher net wages and lower production costs (in our simulations an improved competitiveness is compatible with net wages increased by an amount of 75% to 130% of the decline of the employee's social contribution—a *ca* 40% of total payroll taxes). Secondly, it matters to find the right balance between public objectives such as public debt containment, heavy industry protection, income distribution, pension or healthcare financing. Finally, the legitimate concerns of vulnerable sectors such as agriculture, fishing or road transport, must be addressed while preserving the effectiveness of the price-signal.

Ultimately, a carbon tax reform is *a unique opportunity for a new fiscal deal* that could transform our productive systems to help us face the challenge of climate and energy, employment and social protection, under the constraint of a public debt containment.

Public debt targ	et		Cons	10-point lower public debt-to-GDP ratio				
Lump-sum transfers to households		None	None	Full recycling ¹	Partial recycling ²	Targeted tax credit ³	Partial recycling ²	Targeted tax credit ³
Use of remaining tax revenues		Lower payroll taxes	Lower VAT	No remaining Lower payroll tax revenues taxes		Lower payroll taxes	Lower payroll taxes	Lower payroll taxes
Use of potential budget surplus		Lower payroll taxes	Lower VAT	Increased lump-sum transfer	Lower payroll taxes	Targeted transfers ³	Lower payroll taxes	Targeted transfers ³
Total CO ₂ emissions		-15.9% / -41.5%	-15.9% / -41.4%	-16.4% / -42.2%	-16.1% / -41.8%	-16.0% / -41.7%	-16.8% / -42.1%	-16.6% / -42.0%
Real gross domestic product		+1.0% / +2.1%	+0.1% / -0.2%	-0.2% / -0.8%	+0,5% / +1,0%	+0,7% / +1,4%	-0,3% / +0,3%	+0,1% / +0,9%
Job creation (thousands of full time equivalent)		+407 / +1 016	+56 / +112	+54 / +94	+259 / +666	+317 / +784	+34 / +479	+174 / +665
Oil imports (billions of Euros)		-2.2 / -4.3	-2.2 / -4.3	-2.3 / -4.5	-2.3 / -4.4	-2.2 / -4.3	-2.5 / -4.5	-2.4 / -4.5
Effective consumption (including energy efficiency gains)	Total	+0.9% / +1.8%	+0.3% / +0.4%	+0.3% / +0.4%	+0.7% / +1.3%	+0.8% / +1.5%	-0.5% / +0.2%	-0.3% / +0.5%
	Poorest households (F0-5)	+0.8% / +1.5%	+0.1% / +0.2%	+2.5% / +6.2%	+1.6% / +3.6%	+1.6% / +4.0%	+0.4% / +2.6%	-0.3% / +2.4%
	Poor households (F5-35)	+0.8% / +1.7%	+0.1% / +0.0%	+1.4% / +3.4%	+1.1% / +2.5%	+1.3% / +3.3%	-0.1% / +1.5%	-0.4% / +1.8%
	Median households (F35-65)	+0.7% / +1.3%	+0.1% / -0.1%	+0.4% / +0.6%	+0.5% / +1.0%	+0.7% / +1.3%	-0.6% / +0.1%	-0.4% / +0.4%
	Rich households (F65-95)	+1.0% / +2.3%	+0.5% / +1.0%	-0.2% / -0.8%	+0.5% / +1.1%	+0.5% / +0.9%	-0.6% / +0.1%	-0.1% / +0.3%
	Richest hholds (F95-100)	+1.9% / +4.8%	+1.4% / +3.4%	-0.0% / -0.4%	+1.1% / +2.7%	+1.1% / +2.7%	-0.3% / +1.4%	+0.4% / +2.0%

Figures on the left / right hand side respectively refer to 100€ and 400€/tCO2.

1 All tax revenues paid by households or firms are recycled through equal lump-sum transfers to households (depending on size and composition).

2 The tax paid by households is recycled through equal lump-sum transfers; the tax paid by firms through a decrease in payroll taxes.

3 Compensating measures are limited to the 80% lower-income households. They consist in a tax credit on an energy consumption amounting to 56% of that of the first twentile, and of targeted measures such as increased social transfers financed by the surplus of net revenue collected by the carbon tax reform.

Table 1- Environmental, macroeconomic and distributional impacts of seven variants of a carbon tax reform ("counterfactuals France-2004")

	"(Conservative reforms'	9	"	single-lever tax reform	"Comprehensive tax reform" ¹	
Schemes	Postponement of the legal retirement age	Increase in payroll taxes (PT)	Cut in public expenditure	Carbon tax	Increase in income tax (IT)	Increase in TVA	Carbon tax (200€/tCO₂) used to lower PT ² & increase in IT
Adjustment required	4 years / >4 years	+5.2 / +7.1 pts	-2.8% / -5.0% ³	295 / 614 €/tCO ₂	+1.1 / +1.4 pts	+1.3 / +1.7 pts	-7.0 / -7.0 pts of PT -1.7 / +2.0 pts of IT
Total CO ₂ emissions	id. / -0.4%	-0.6% / -1.2%	+0.3% / id.	-35.6% / -53.6%	+0.1% / -0.3%	-0.5% / -1.1%	-27.5% / -27.8%
Real gross domestic product	id. / -0.4%	-1.5% / -2.4%	+0.1% / -0.3%	-1.9% / -3.9%	+0.1% / -0.3%	+0.2% / -0.2%	+0.6% / +0.3%
Unemployment rate	id. / +0.4 pts	+1.6 / +2.6	-0.1 / +0.3	+1.6 / +2.6	-0.1 / +0.3	-0.3 / id.	-2.1 / -1.8
Labor intensity of growth (non energy goods and services)	id. / id.	-0.2% / -0.3%	id. / id.	+0.1% / +0.1%	id. / id.	+0,1% / +0.1%	+0.9% / +0.9%
Oil imports (billions of Euros)	id. / -0.4	-0.4 / -0.9	+0.2 / -0.1	-15.7 / -20.0	0.1 / -0.2	-0.4 / -0.8	-12.4 / -12.7
Nominal net wages	id. / -0.9%	-3.5% / -5.6%	+0.2% / -0.7%	-0.6% / -2.5%	+0.2% / -0.6%	+0.8% / +0.1%	+5.4% / +4.6%
Producer price (non energy goods and services)	id. / -0.5%	+1.6% / +1.8%	+0.1% / -0.4%	+2.7% / +3.2%	+0.1% / -0.3%	+0.7% / +0.4%	+0.5% / id.
Real exports (non energy goods and services)	id. / +0.2%	-0.8% / -0.9%	id. / +0.2%	-1.4% / -1.6%	-0.1% / +0.2%	-0.4% / -0.2%	-0.3% / id.
Effective consumption (including energy efficiency gains)	id. / -0.7%	-1.1%/ -2.2%	+0.5% / -0.1%	-2.0% / -4.3%	+0.2% / -0.4%	+0.5% / id.	+0.2% / -0.3%

All schemes are compared to the same reference situation: the France-2020 resulting from a 3 years increase of the legal retirement age (the "favoured option" in French debates on pension reform)

In the model this favoured option fund only 79% of the cumulated deficit of the pension system over the period 2004-2020. Figures on the left / right hand side refer to deviations from the reference situation respectively when 79% and 100% of the cumulated deficit of the pension system is funded.

1 The results with an increase of in VAT instead of IR are similar (from strict macroeconomic point of view).

2 Cuts in payroll taxes are financed by the carbon tax proceeds.

3 Adjustment of the level of real public current consumption and investment.

Table 2- Environmental and macroeconomic impacts of seven variants of a public finance reform ("counterfactuals France-2020")

Public finance target

79% / 100% of the cumulated deficit of the pension system over the period 2004-2020 is funded