Tax exemptions and reductions for domestic commercial air passenger transport in France

Foregone tax revenues and impacts of an abolishment

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Summary

Like in many other countries, commercial aviation enjoys a favourable fiscal regime in France. Fuel used for commercial aviation is exempted from energy taxation and will also be exempted from the national carbon tax. In addition, the tickets of air passengers are subject to a reduced Value Added Tax rate, a benefit that is enjoyed by other modes of public transport too.

This study focusses on the fiscal regime for *domestic* commercial *air passenger* transport in France, including the transport to and from the overseas departments. It quantifies the forgone tax revenues for the period 2008-2011 and assesses the impacts of an abolishment of the exemptions from the energy and carbon taxation and of the VAT reduction for the period 2015-2018.

The study finds that in the period 2008-2011 the French government has, depending on the tax rate that would have been applied (€ 30.2/hl or € 42.84/hl), foregone tax revenues of in total € 2.3-3.2 billion due to the exemption of domestic commercial air passenger transport from energy taxation. Due to the application of the reduced VAT rate, the foregone tax revenues amount to in total € 2.3 billion in this period.

If the exemption from the energy and carbon tax was gradually abolished in the future, the French government could generate in total € 1.3-1.6 billion extra tax revenue in the period 2015-2018, depending on the fuel tax rate applied (€ 30.2/hl or € 42.84/hl, carbon component excluded). If these tax revenues were used to stimulate the labour market, the net effect on employment can expected to be positive. In 2018, the year in which the energy and carbon tax would presumably be fully applied, the CO_2 emissions from domestic aviation would be reduced by 20-27% relative to a baseline with continuation of the current fiscal regime. This emission reduction would be caused by an increase in ticket prices of 18-24%, resulting in a decrease of the air passenger transport demand by 17-23% on routes to and from overseas departments and by 22-30% on the other domestic routes.

The *Direction générale des douanes et droits indirects* has carried out a similar impact assessment for the energy tax exemption for the year 2009, however focusing on domestic mainland flights only. We come to the conclusion that this assessment is not being too pessimistic regarding the impacts on demand (-14%) and employment in the aviation industry (-950 jobs). The expected impact on the employment in the railway industry (+350) however seems to be relatively small in the analysis of DGGDI.

If the normal VAT rate of 20% was applied in the period 2015-2018, the French government would receive an additional tax income of around € 1.1 billion in total. If used for stimulating the labour market, the net effect on employment can expected to be positive. Applying the normal VAT tariff, would in 2018 reduce the CO_2 emissions of domestic aviation by about 10%, since demand for domestic air passenger transport would decline by about 10%.

Next to the favourable fiscal regime for commercial aviation, the European Union allows governments to subsidise airlines and airports under certain circumstances. We estimate that in the period 2000 until mid 2013 the French government has been allowed to provide at least € 10 billion of aid to the sector.

1 Introduction

1.1 Background

In France, domestic commercial aviation enjoys a favourable fiscal regime, like in many other countries. Fuel used for commercial aviation is exempted from energy taxation and will also be exempted from the national carbon tax ('Contribution Climat Énergie'), a carbon component that raises the energy tax rates on fossil fuels depending on their carbon content. Since fuel costs are a major share of the total costs of aviation, the tax exemptions lower costs significantly.

In addition, the tickets of air passengers are subject to a reduced Value Added Tax rate. This benefit is not only enjoyed by aviation, but also by other modes of public transport.

Next to the favourable fiscal regime, airlines and airports have received subsidies from government.

Réseau Action Climat - France has requested CE Delft to analyse the impacts of the fiscal treatment of aviation on the fiscal budget, the environment and the economy. This report presents the analysis.

1.2 Aim of the study

The aim of this study is fourfold:

1. The quantification of the foregone tax revenues due to the exemption of domestic commercial air passenger transport from energy taxation and due to the reduced VAT rate for domestic air passenger tickets (see Chapter 3).
2. An assessment of the impacts of an abolishment of the exemptions from the energy and carbon taxation and the VAT reduction on ticket prices, transport demand, CO_2 emissions, tax revenues and employment (see Chapter 4).
3. A comparison of the impact assessment with the analysis presented by DGDDI, the Direction générale des douanes et droits indirects (see Chapter 5).
4. The quantification of the regional aid subsidies paid to airlines and airports in France (see Chapter 3).

For introductory purposes, Chapter 2 gives an overview on the relevant past, current and planned regulations. Chapter 6 finally concludes.

2 Past, current and future regulation

2.1.1 Taxation of fuel used for domestic aviation

In France, the fuel used for domestic commercial aviation is exempted from energy taxation and will be exempted from the national carbon tax ('Contribution Climat Énergie'). The French government sets tax rates for fuels used by aviation (see Table 1), but these are only applied to non-commercial flights.

Table 1 Fuel tax rates including carbon component for 2015 and 2016

		Unit	2008-2014	2015	2016
Light oil and preparations	Aviation gasolene[1]	€/100 litre	35.9	37.81	39.72
	Gasolene-type jet fuels[2]	€/100 litre	30.2	32.11	34.02
Medium oil	Kerosene-type jet fuel[3]	€/100 litre	30.2	32.11	34.02
Heavy oil	Gas-diesel oil ('Other use')	€/100 litre	42.84	44.82	46.81

Source: Legifrance (2013)[4].

In October 2013, the first chamber of the French parliament has adopted the CCE (Contribution Climat Énergie). According to this law, the excise duty on fossil fuel will be raised by a carbon component from 2014 on. This carbon component has been fixed at € 7/tCO_2, 14.5 €/tCO_2 and € 22/tCO_2 for the years 2014, 2015 and 2016. For 2014 however, the gross fuel tax rate is reduced by the amount of the carbon component, so that the carbon component will actually not have an impact on the 2014 fuel prices.

It has been announced that the additional tax revenue from the carbon tax will be used, on the one hand, to finance the tax refund ('CICE') that is available for companies that want to improve their competitiveness by taking certain investments e.g. in R&D, and, on the other hand, to finance the reduced VAT rate that can be applied to labour costs for the improvement of the energy efficiency of housings.

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1 Aviation gasoline is defined as motor spirit prepared especially for aviation piston engines (UN, 2013).

2 Gasolene-type jet fuel is defined as all light hydrocarbon oils for use in aviation gas-turbine engines (UN, 2013).

3 Kerosene-type jet fuel is defined as medium oil for use in aviation gas-turbine engines (UN, 2013).

4 http://www.legifrance.gouv.fr/affichCodeArticle.do?idArticle=LEGIARTI000025074000&cidTexte=LEGITEXT000006071570&dateTexte=20131216&fastPos=6&fastReqId=637475101&oldAction=rechCodeArticle

2.1.2 EU Emissions Trading System

From the beginning of 2012 on, CO_2 emissions from all domestic and international flights that arrive at or depart from an airport in the EU territory or an EEA-EFTA country (Iceland, Liechtenstein, Norway) had been covered by the EU Emissions Trading System (EU ETS).

However, in April 2013, the EU decided to temporarily suspend enforcement of the EU ETS requirements for flights operated from or to non-European countries.

In October 2013, the ICAO Assembly agreed to develop by 2016 a global market-based mechanism (MBM) addressing international aviation emissions to be applied by 2020 and the EU Commission consequently proposed (EC, 2013) to generally exempt flights to and from countries outside the EEA for the proportion of emissions that take place outside EEA airspace from January 2014 on.

In this EC proposal it is also stated that emissions from flights between airports in the European Economic Area will continue to be covered by EU ETS. In this study we therefore assume that the CO_2 emissions from domestic flights in France will still be covered by the EU ETS in the period 2015-2018, the period of interest in this study.

In this period 82% of the emission allowances allocated to the aviation sector will be granted for free to the aircraft operators[5] and the current price of the European Union Aviation Allowances (EUAAs) Futures indicates that the price of the allowances will be rather low. ETS can therefore not be regarded as a full internalisation of the external costs of CO_2 emissions.

2.1.3 Value added tax on airline tickets

In France, a reduced VAT rate is and has been applied to domestic airline tickets. In Table 2 an overview is given on the past and current levels of these reduced VAT rates. The full VAT rate in France is 20%.

Table 2 Value added tax rates applying to domestic airline tickets in France

	2008-2012	2013	2014
Value added tax rates applying to airline tickets	5.5%	7%	10%

[5] Together with the 3% special reserve, 85% of the allowances are granted for free.

3 Foregone tax revenues and aid for airports and airlines

3.1 Foregone energy tax revenues

Since the fuel that is used for commercial domestic aviation has been exempted from energy taxation, the French government has had lower tax revenues and has indirectly subsidised domestic aviation. We have calculated the foregone tax revenues for the period 2008-2011 thereby considering two scenarios: one scenario in which we calculate the costs resulting from an exemption from a fuel tax of € 30.2/hl (low energy tax scenario) and a second scenario in which we calculate the costs resulting from an exemption from a fuel tax of € 42.84/hl (high energy tax scenario). These are the excise duty tax rates that would have respectively applied to jet fuels and gas-diesel oil in France if domestic aviation had not been exempted. As can be seen in Table 3, the costs of the exemption in the low fuel tax scenario range from € 545-580 million and in the high fuel tax scenario from € 770-820 million in the period 2008-2011.

Table 3 **Forgone tax revenues due to energy tax exemption of domestic commercial air passenger transport**

	2008	2009	2010	2011
Low energy tax scenario (if tax had been € 30.2/hl) (million €; rounded)	545	550	560	580
High energy tax scenario (if tax had been € 42.84/hl) (million €; rounded)	770	785	790	820

The calculation of these foregone tax revenues is based on the CO_2 emissions data as published by the Direction du Transport aérien (2012) for the domestic aviation in France and on the according fuel consumption as given in Table 4.

Table 4 **Historical CO_2 emissions and fuel consumption of domestic aviation in France**

	2008	2009	2010	2011
CO_2 emissions (Mt)	4.7	4.6	4.6	4.8
Fuel consumption (million hl)	18.89	18.49	18.49	19.29

Source: Direction du Transport aérien (2012); own calculation.

Since the fuel used for domestic commercial aviation is mainly kerosene-type jet fuel, we have applied an emission factor for of 4.02 hl/t CO_2[6] to convert the CO_2 emissions.

[6] The density of kerosene can vary; we have assumed a density of 0.8 kg/litre.

3.2 Foregone VAT revenues

Commercial domestic aviation is subject to a reduced VAT tariff, like other forms of public transport. This could be seen as an indirect subsidy of domestic aviation. As can be taken from Table 5, the French government has, due to this tax reduction, missed out tax revenues between € 500 and € 620 million per year in the period 2008-2011, assuming that the VAT rate would have been 20% instead of 5.5%.

Table 5 Foregone tax revenue of reduced VAT tariff for airline tickets for domestic flights

	2008	2009	2010	2011
Value added tax scenario (if VAT rate had been 20%) (million €; rounded)	**580**	**500**	**540**	**620**
Change of ticket price compared to reference scenario	14%	14%	14%	14%
Change of ticket price in € (single leg)				
– flights to and from overseas departments	+49	+44	+46	+50
– other domestic flights	+14	+12	+13	+14
Number of passengers (million)				
– flights to and from overseas departments	5.56	5.46	5.66	5.9
– other domestic flights	22.74	22.03	21.74	23.14

Assuming that the number of passengers would not have changed, the change of the ticket price compared to the reference case reflects the extra VAT revenue per passenger.

3.3 Aid for airports and airlines

The European Union allows governments to subsidise airlines and airports under certain circumstances as laid down in the State aid aviation guidelines (2005/C 312/01)[7]. Small regional airports for example can be compensated for carrying out public services or aid can temporarily be paid to airlines, if this provides them with the necessary incentive to create new schedules from regional airports.

From the DG Competition database for state aid cases[8], the aid that, since 2000, has been allowed to be granted to French airlines and airports can be identified. For those cases were no objection has been made, the total aid allowed for in the period 2000 until mid 2013 amounted to at least € 10 billion. The cases were no decision has been made yet are worth another € 1 billion.

7 These guidelines are currently under revision.

8 http://ec.europa.eu/competition/elojade/isef/index.cfm?clear=1&policy_area_id=3

4 Impacts of abolishment of tax exemptions and reductions

4.1 Introduction

This chapter analyses the impacts of an abolishment of the energy and carbon tax exemptions for the fuel used for domestic commercial air passenger transport as well as the impacts of an application of the normal VAT rate to domestic air passenger tickets for the period 2015-2018.

In the impact assessment we focus in a first step on the impact on the airline ticket price, the transport demand, the CO_2 emissions, and the tax revenues (Paragraph 4.4 and 4.5) and in a second step we analyse the potential employment effects (Paragraph 4.6). In Paragraph 4.2 we describe the approach, the data, and the assumptions underlying the impact assessment before we present the reference scenario in Paragraph 4.3.

4.2 Approach, data used and assumptions

We have derived the impact of an abolishment of the tax exemptions and reductions for the commercial domestic aviation in France, assuming that the emissions decrease as much as the demand for air transport; in other words, by assuming that lower demand will not result in more empty seats or different aircraft types.

To determine the impact of the abolishment of the tax exemptions and reductions on the demand for air transport we have used the average ticket price in 2010 as a starting point and estimated the impact that the change of the fuel costs (due to fuel and carbon taxation) or the impact that a higher VAT rate would have on this ticket price.

The change of the demand has then be calculated assuming an elasticity of demand of -0.96% for flights to and from overseas departments and of -1.23% for the other domestic flights.[9]

Regarding the CO_2 emissions we have used the emissions of domestic aviation in France as presented in Direction du Transport aérien (2012) (see Table 4 in report at hand).

All scenarios take the changes in fuel prices in account. There are no jet fuel price predictions available in the literature, but since in the past the change of the kerosene-type jet fuel price has been very similar to the change of the price of crude oil, we make use of the reference crude oil price prediction of the U.S. Energy Information Administration (EIA, 2013) to predict the future jet fuel price, using a 2010 jet fuel price of € 51/hl[10] as a starting point. Note that this results in a declining fuel price in the period 2015-2017.

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[9] The price elasticities have been calculated on the basis of Intervistas (2007).

[10] Modalité de calcul de l'impôt No 800109, Exonération de taxe intérieure de consommation pour les produits énergétiques utilises comme carburant ou combustible á bord des aéronefs, á l'exclusion des aéronefs de tourisme prive.

Further assumption made in the impact assessment:

- The emission data of domestic aviation in France as presented in Direction du Transport aérien (2012), is taken to be related to commercial air passenger transport only.
- The change of the demand for air passenger transport is determined solely by the change of the ticket price. Demand growth, e.g. due to GDP growth, has not been taken into account, probably leading to a slight underestimation of the impact on CO_2 emissions.
- Aircraft do not refuel outside France and thus cannot avoid paying the fuel tax, probably leading to a slight overestimation of the impact on CO_2 emissions.
- The fuel efficiency of the aircrafts is assumed not to improve in the period until 2018, probably leading to a slight overestimation of the impact on CO_2 emissions.
- Ticket prices are determined by fuel costs, other costs, the profit margin, and VAT and it is assumed that the other costs and the margin do not change over time, probably leading to an overestimation of the impact on CO_2 emissions.
- Commercial domestic aviation is assumed to make solely use of kerosene-type jet fuel. We have therefore applied an emission factor of 0.249 t CO_2/hl fuel.

4.3 Reference scenario

The expected CO_2 emissions of commercial domestic air passenger flights and the average ticket prices for these flights in the reference scenario, i.e. for the case that the tax exemptions and reductions will not be abolished, are presented in Table 5.

Table 6 **CO_2 emissions of and average ticket price for domestic flights in reference scenario**

	2015	2016	2017	2018
CO_2 emissions (Mt) of domestic aviation	4.12	4.18	4.20	4.19
– flights to and from overseas departments	2.01	2.03	2.04	2.04
– other domestic flights	2.11	2.15	2.16	2.16
Average ticket price (single leg, €)				
– flights to and from overseas departments	365	361	359	360
– other domestic flights	103	102	101	101

We have thereby assumed that domestic aviation will still fall under the EU Emissions Trading Scheme in the period 2015-2018. At the end of each year, airline operators would then have to hand in emissions allowances according to the CO_2 emitted by the aircrafts on the routes covered by the system in that year. We have assumed that the price for such an emission allowance, the so called European Aviation Allowance (EEA) will be € 5/tCO_2 and will thus be in accordance with the EEA Futures price as by mid January 2014.

4.4 Gradual cutback of exemption from energy and carbon taxation

4.4.1 Low energy tax scenario

In the low tax scenario it is assumed that the exemption from the energy and the carbon tax is gradually reduced in the period 2015-2018 with the fuel tax rate being € 30.2/hl in each year and with the carbon tax amounting to € 1.91/hl in 2015 and increasing annually by € 1.91/hl in the years until 2018.

Note that the tax rate of € 30.2/hl actually is the fuel tax rate for jet-fuel (net of the carbon component) which would be applied in the period 2015-2018 if the sector was not exempted. The abolishment of the exemption is taken to be gradual in the sense that the share of the resulting total tax rate that is applied increases from a quarter in 2015 to full application in 2018. In Table 7 the tax rates (including energy and carbon tax) that have been used in the low tax scenario are given in the last row.

Table 7 **Tax rates used in low energy tax scenario**

	2015	2016	2017	2018
Fuel tax rates(€/hl)	30.2	30.2	30.2	30.2
Carbon tax rates (€/hl)	1.91	3.82	5.73	7.64
Total (€/hl)	32.11	34.02	35.93	37.84
Factor for gradual implementation	1/4	1/2	3/4	1
Tax rates used in low tax scenario (€/hl)	**8.03**	**17.01**	**26.95**	**37.84**

In Table 8 the impact of such an energy and carbon tax on the fuel used for domestic commercial aviation is summarized.

Table 8 **Impact of an energy and carbon tax on fuel used for domestic aviation (low energy tax scenario)**

	2015	2016	2017	2018
Change of ticket price compared to reference scenario (rounded)	4%	8%	13%	18%
Change of ticket price in € (average, per leg)				
– flights to and from overseas departments	+14	+29	+46	+65
– other domestic flights	+4	+8	+13	+18
Impact on demand				
– flights to and from overseas departments	-4%	-8%	-12%	-17%
– other domestic flights	-5%	-10%	-16%	-22%
Impact on CO_2 emissions compared to reference scenario	-4%	-9%	-14%	-20%
Additional tax revenue; VAT decrease accounted for (million €; rounded)	125	255	380	490

As a result, compared to the reference scenario, the ticket price would rise to up to 18% in 2018, the CO_2 emissions of domestic aviation would decline to up to 20% in 2018 and the additional tax revenue would amount to up to € 490 million in 2018. The reduced VAT income has thereby been taken into account.

4.4.2 High energy tax scenario

In the high tax scenario it is assumed that the exemption from the energy and the carbon tax is gradually reduced in the period 2015-2018, with the fuel tax rate being € 42.84/hl in each year and with the carbon tax amounting to € 1.91/hl in 2015 and increasing by € 1.91/hl in the years until 2018. Note that the tax rate of € 42.84/hl actually is the fuel tax rate that holds for gas-diesel oil (net of the carbon component) in the period 2015-2018. The abolishment of the exemption is taken to be gradual in the sense that the share of the resulting total tax rate that is applied increases from a quarter in 2015 to full application in 2018. In Table 9 the tax rates (including energy and carbon tax) that have been used in the high tax scenario are given in the last row.

Table 9 **Tax rates used in high energy tax scenario**

	2015	2016	2017	2018
Fuel tax rates(€/hl)	42.84	42.84	42.84	42.84
Carbon tax rates (€/hl)	1.91	3.82	5.73	7.64
Total (€/hl)	44.75	46.66	48.57	50.48
Factor for gradual implementation	1/4	1/2	3/4	1
Tax rates used in high tax scenario (€/hl)	**11.19**	**23.33**	**36.43**	**50.48**

In Table 10 the impact of such an energy and carbon tax on the fuel used by domestic commercial aviation is summarized.

As a result, compared to the reference scenario, the ticket price would rise up to 24% in 2018, the CO_2 emissions of domestic aviation would decline up to 27% in 2018 and the additional tax revenue would amount to up to € 590 million in 2018. The reduced VAT income has thereby been taken into account.

Table 10 **Impact of an energy and carbon tax on fuel used for domestic aviation (high energy tax scenario)**

	2015	2016	2017	2018
Relative change of ticket price compared to reference scenario	5%	11%	18%	24%
Change of ticket price in € (average)				
– flights to and from overseas departments	+19	+40	+63	+87
– other domestic flights	+5	+11	+18	+25
Impact on demand				
– flights to and from overseas departments	-5%	-11%	-17%	-23%
– other domestic flights	-7%	-14%	-22%	-30%
Impact on CO_2 emissions compared to reference scenario	-6%	-12%	-19%	-27%
Additional tax revenue; VAT decrease accounted for (million €; rounded)	170	335	480	590

4.5 Increase of value added tax rate

The impact of an increase of the value added tax rate on airline tickets to a level of 20% is very similar per year in the period 2015-2018 and thus not presented per year.

Table 11 **Impact of an in increased value added tax on airline tickets**

	2015	2016	2017	2018
Value added tax rate applied to tickets	20%			
Relative change of ticket price compared to reference scenario	9%			
Change of ticket price in € (average)				
– flights to and from overseas departments	+33			
– other domestic flights	+9			
Impact on demand				
– flights to and from overseas departments	-9%			
– other domestic flights	-11%			
Impact on CO_2 emissions compared to reference scenario	-10%			
Additional tax revenue (million €)	280			

Compared to the reference scenario, the ticket prices would rise by approximately 10%, the CO_2 emissions of domestic aviation would decrease by 10% and, per year, additional tax revenues of about € 280 million would be generated.

4.6 Impact on employment

Higher taxes result in lower demand and lower employment in domestic commercial aviation if the labour market is flexible. On the other hand, higher ticket prices could prompt airline passengers to make use of rail transport which could lead to a positive employment effect in the rail sector. If the additional tax revenues were not used to cut the national debt but recycled to stimulate the labour market, the negative employment effect could be further compensated and could even result in a positive net employment effect. This will be analysed in the following subsections.

To derive the employment effects we have used indicators in terms of the average number of employed per passenger in a sector. We are aware that working with an average employment indicator can lead to an overestimation of the employment effect. Ideally, one wanted to work with a marginal indicator which gives the number of people being additionally employed per extra passenger. This data however is not available to us.

4.6.1 Impact without recycling of the additional tax revenues

An abolishment of the exemption from the energy and the carbon tax or the reduction of the VAT rates for domestic commercial aviation can be expected to have an impact on the employment in the aviation industry because the demand for domestic commercial passenger air transport will decline.

In Table 12 the expected demand decrease in terms of number of passengers is given for the three scenarios.

Table 12 Reduction in the number of airline passengers per scenario (in thousand) on domestic routes

(rounded)		2015	2016	2017	2018
Low tax scenario	Total	1,100	2,400	3,800	5,300
	– flights to and from overseas departments	200	400	700	900
	– other domestic flights	900	2,000	3,100	4,400
High tax scenario	Total	1,500	3,200	5,100	7,100
	– flights to and from overseas departments	300	600	900	1,200
	– other domestic flights	1,300	2,700	4,200	5,800
VAT scenario	Total	2,600	2,600	2,700	2,700
	– flights to and from overseas departments	400	500	500	500
	– other domestic flights	2,100	2,200	2,200	2,200

Since on average the French aviation sector employs one person per two thousand passengers[11], we estimate that the abolishment of the tax exemptions/reductions for domestic aviation would lead to a decrease of employment in the French aviation industry by 2018 of:

- 2,700 jobs in the low tax scenario;
- 3,600 jobs in the high tax scenario;
- 1,400 jobs in the VAT scenario.

However, this negative employment effect will, at least partially be compensated by a positive employment effect in the rail sector due to an increase in the demand for longer distance rail transport: some of the domestic air transport passengers, at least those on the routes that are not related to the overseas departments, will decide to use the train instead.

SNCF Voyages, responsible for the longer distance rail passenger transport in France, says that it has transported about 127.5 million passengers in 2012 (SNCF, 2014).

The increase of this demand, due to the increase of the airline ticket prices[12], can be estimated, by making use of a cross price elasticity, which we assume to be +0.2 in this study, i.e. if an airline ticket price rises with 1%, the demand for long distance rail transport will rise by 0.2%.[13]

Assuming just as for the aviation industry, that that the number of French employees in the rail industry is linearly related to the number of rail passengers (0.13 per thousand passengers) the number of jobs created in the French railway industry due to the abolishment of the tax exemption/reduction for the domestic air transport amounts in 2018 to approximately:

- +700 in the low tax scenario;
- +900 in the high tax scenario;
- +400 in the VAT scenario.

The net effect on employment in 2018 thus amounts to approximately:

- a loss of about 2,000 jobs in the low tax scenario;
- a loss of about 2,700 jobs in the high tax scenario;
- a loss of about 1,000 jobs in the VAT scenario.

4.6.2 Impact with recycling of additional tax revenues

If the additional tax revenue from the energy and carbon tax on the fuel used by domestic aviation or from the increased VAT rate on airline tickets for domestic flights was recycled, i.e. was not used to cut down the national debt but was rather used to stimulate the labour market, the negative impact on the labour market could be mitigated.

There are several studies that have studied the economic impacts of a national carbon tax in France which have also considered the recycling of the additional tax revenues (see e.g. Report of the Committee «Trajectoires 2020-2050 vers une économie sobre en carbone» (2011), Coe-Rexecode (2012), Rexecode Services (2013)). If you compare the economic impacts derived for

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[11] According to the Commissariat Général au Développement Durable (CGDD, 2013a) the French aviation sector (in total) accounted for 70,000 employees in 2012 and about 137 million air passengers have been transported (domestic and international), leading to an indicator of about 0.5 French employees per thousand air passengers.

[12] See Table 8, Table 10, and Table 11 for the relative increase of the airline ticket prices in the three scenarios.

[13] This cross-price elasticity has been determined on the basis of DGDDI (2011a).

the scenario without and for a scenario with tax revenue recycling then these studies allow to assess the economic impact of tax revenue recycling.

To get an indication of the employment impact of the recycling of the additional tax revenues determined in this study, we have transferred the results of the Rexecode Services (2013) study, a very recent study that has analysed several alternative tax scenarios[14], several alternative tax revenue recycling options, and which clearly states the amount of tax revenue that is being recycled. The five recycling options analysed in this study are as follows:

1. Reduction of employers' social security contributions.
2. Reduction of employees' social security contributions.
3. Reduction of employers' and employees' social security contributions.
4. Reduction of employers' social security contributions and of the income tax.
5. Reduction of employers' social security contributions and funding of innovation.

For the tax scenario we have looked at, the study concludes that the negative employment effect of the carbon tax can be overcompensated by all recycling options except:

- in the short and medium run: the second recycling option that reduces the social security contribution of the employees;
- in the long run: the fourth recycling option that reduces the social security contributions and the income tax can overcompensate the negative employment effect of the carbon tax.

We have transferred the results of Rexecode Services (2013) onto this study, by applying the ratio of the difference in employment between the reference case and the case with revenue recycling and the amount of revenue recycled as derived in Rexecode Services (2013) onto the extra tax revenue as derived in this study. In Table 13 the according net employment effects, i.e. the employment effects on aviation, rail sector and the employment effect due to revenue recycling taken together, are given for the three scenarios.
The ranges thereby reflect the different revenue recycling options.

Table 13 Net employment effect

	2015	2016	2017	2018
Low energy tax scenario	-200 – +200	+400 - +1,700	+1,800 – +3,700	+2,500 – +4,600
High energy tax scenario	-300 - +300	+400 – +2,200	+1,300 – +3,200	+1,800 - +3,900
VAT scenario	-600 - +300	+400 - +1,800	+1,400 - +2,800	+4,400 - +7,000

As mentioned in the introduction of Paragraph 4.6, the impact on employment should ideally be determined using marginal effects. Here, due to a lack of data, we have worked with average effects (average number of jobs created per Euro of recycled tax revenue). The actual employment effect can thus expected to be lower than given in Table 13. A positive overall impact on employment is nevertheless plausible if the additional tax revenue is used for stimulating the labour market.

[14] Rexecode Services (2013) do present the economic impacts for different scenarios. We have chosen to work with the scenario in which the tax as put forward by the 'Comité pour la fiscalité écologique' is analysed since this is a progressive tax and is thus similar to the gradual implementation of the energy and carbon tax as assumed in this study.

5 Benefit of the energy tax exemption as presented by the CGDD and DGDDI

5.1 The benefit presented by CGDD and DGDDI

The *Commissariat général au développement durable* quantifies the 2011 tax relief due to the energy tax exemption of aviation in France with € 555 million for domestic flights and € 2,448 million for international flights (CGGD, 2013) thus in total with € 3 billion.

Domestic mainland flights thereby account for € 315 million (Assemblée Nationale, 2013).

According to the DGDDI (2011a), the tax relief has been estimated to amount to almost € 2 billion for the period 2002-2004, € 1.2 billion for the period between 2005 and 2008, and € 3.5 billion for 2011. The estimation for 2011 is significantly higher than for the previous years. According to DGGI (2011a), this deviation can be explained by change in the calculation method.
It is further concluded that, based on 2009 data, the exemption of the domestic flights on mainland routes from the energy tax is worth 600 jobs (net effect) in France.

The following line of reasoning lies behind this employment effect (DGDDI, 2011b):

- Fuel costs would double if the exemption from the energy tax was abolished (from € 43/hl to € 86/hl for jet fuel in 2009).
- 30% of operating costs of airlines are fuel costs and doubling of fuel costs will thus lead to a 28% rise of the airlines' operating costs.
- Airlines do not/are not able to pass on the full cost rise onto the consumer. Only half of the cost rise would be passed on: ticket prises would rise with 14%.
- The price elasticity of demand is assumed to be -1: a 1% increase of the ticket prise would then lead to a 1% decrease of demand and thus would a 14% ticket prise increase lead to 14% decrease of demand. In terms of passengers in 2009 this would mean a drop of 2.38 million passengers on domestic mainland routes.
- According to FNAM (Fédération Nationale de l'Aviation Marchande), a drop of thousand passengers is equivalent to 0.4 jobs in the aviation industry.
- Since the 2.38 million passengers are not lost due to the energy tax exemption, 950 jobs in the aviation industry are persevered.
- However, about 350 jobs are not created in the railway sector due to the energy tax exemption (expert opinion).
- Conclusion: 950-350 = 600 jobs are preserved by the tax exemption.

5.2 Differences with this impact assessment

The analysis carried out by the DGDDI differs from the impact assessment carried out in this study mainly in five aspects:

1. The analysis carried out by DGDDI analyses domestic mainland flights only whereas the study at hand also takes domestic flights to and from overseas departments into account.
2. DGDDI assumes that the airlines do not fully pass on the raised fuel costs to the passengers whereas we have assumed that the costs are fully past on. The impact on CO_2 but also the negative impact on employment are thus higher in this study.
3. The elasticity of demand for air transport is assumed to be higher in this study (-1.23) than in the analysis of DGDDI (-1). This again makes the impact on CO_2 but also the negative impact on employment are higher in this study.
4. The DGDDI uses an estimate of FNAM that states that a drop of thousand passengers is equivalent to 0.4 jobs in the aviation industry. In this study we assumed that a drop of thousand passengers is equivalent to about 0.5 jobs in the aviation industry, leading to a more pessimistic assessment of the employment effect in aviation.
5. The additional jobs created in railway industry is assessed more optimistically in this study: applying our approach to the numbers above would lead not to 350 but to 630 jobs not being created in the railway industry due to the tax exemption.

6 Conclusions

Due to the favourable fiscal regime of the commercial domestic air passenger transport in France, we have estimated that the French government has, in the period 2008-2011 missed out the following tax revenues:

1. € 560-790 million annually due to the exemption of jet fuel from energy taxation, depending on the reference tax rate; this is in total about € 2.3-3.2 billion for this period. And
2. Again about € 560 million per year due to the VAT reduction for airline tickets which in total is about € 2.3 billion in this period.

The European Union allows governments to subsidise airlines and airports under certain circumstances. We estimate that in the period 2000 until mid 2013 the French government has been allowed to provide at least € 10 billion of aid to the sector.

The impacts of a gradual abolishment of the exemption of the fuel used for domestic commercial air passenger transport from the energy and carbon taxation as well as the impact of an application of the full VAT rate to the air passenger tickets of domestic flights have been analysed for the period 2015-2018 in this study. In the following table the main findings are summarized for the year 2018. In the low and the high energy tax scenario, a different reference energy tax rate (€ 30.2/hl and € 42.84/hl) are thereby assumed.

Table 14 Main findings of impact assessment for the year 2018

Scenario	Low energy tax and carbon tax	High energy and carbon tax scenario	Normal VAT
Impact			
Change of ticket price compared to reference scenario (rounded)	+18%	+24%	9%
Impact on demand			
– flights to and from overseas departments	-17%	-23%	-9%
– other domestic flights	-22%	-30%	-11%
Impact on CO_2 emissions compared to reference scenario	-20%	-27%	-10%
Additional tax revenues (million €; rounded)	490	590	280
Net impact on employment in French aviation and rail sector if additional tax revenue is not earmarked	-1,800	-2,400	-900
Overall employment impact if additional tax revenues are used to stimulate labour market	Can expected to be positive.		

An abolishment of the energy and carbon tax exemption would in 2018 thus lead to a CO_2 emissions reduction of 20-27% of domestic aviation, which is effected by a increase of the ticket prices by 18-24% and a decrease of the air passenger transport demand by 17-23% on routes to and from overseas departments and by 22-30% on the other domestic routes. Additional tax revenues could be collected ranging from € 490-590 million. If these tax revenues were not used to cut the national debt but used to stimulate the

labour market the negative employment impact of 2,000-2,700 jobs can be expected to be overcompensated.

If the normal VAT rate of 20% was applied to the tickets of domestic air passengers, CO_2 emissions of domestic aviation could be reduced by 10%, since demand for domestic air passenger transport would decline by about 10% too. The rise of the VAT rate would lead to an extra tax income of about € 280 million. If used for stimulating the labour market, this extra tax revenue can be expected to be able to overcompensate the negative employment impact of 1,000 lost jobs.

The *Direction générale des douanes et droits indirects* has carried out a similar impact assessment for the energy tax exemption for the year 2009, however focusing on domestic mainland flights only. We come to the conclusion that this assessment is not being too pessimistic regarding the impacts on demand and employment in the aviation industry. The expected impact on the employment in the railway industry however seems to be relatively small in the analysis of DGGDI.

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