EE
*E u r o E c o n o m i c a*

*Issue 1(24)/2010* *ISSN: 1582-8859*

# The influence of taxation on energy products price and consequences on the global economy

**Mihaela NICOLAU**[1]

[1]*Politecnica delle Marche University, Faculty of Economics "G.Fuà", m.nicolau@univpm.it*

**Abstract.** The dynamic of energy prices influences the entire economic activity, both at macro and micro level. Unlike other economic goods price determination, based specially on offer-demand relationship, the energy price determination is strongly influenced by the taxation policy and political factor, mostly in the case of oil and gas prices. The aim of the paper is to present, using a descriptive approach, the level and the influence of fiscal policy on energy prices, the energy tax harmonization attempt and the consequences at macro and micro economy of the tax weight in the energy final price.

**Keywords:** fiscal policy, energy taxation, energy prices, energy consumption, oil and natural gas price, energy tax harmonization

## 1. Introduction

Energy consumption is intrinsically contributing to production of goods and services. Thus, any dynamic of energy price influences directly the prices of economic goods and services, with consequences at the level of GDP and inflation rate.

Unlike other economic goods price determination, energy price determination is not based particularly on offer-demand relationship. The energy price is strongly influenced by the taxation policy and political factor, mostly in the case of oil and gas prices.

Lately it is to be found, in a way like a homogeneousness action at worldwide level, the progressive withdrawal of the public administration intervention in the framework of investment in energy sector, but, due to the strong influence of energy price on GDP and inflation rate levels, monetary and fiscal policies are influenced in most of the countries by the evolution of energy price. On the other hand, nowadays energy taxation is strongly linked with sustainable development and environmental protection[1].

Taxing energy has a double positive effect: on one hand it is a righteous way to discourage environmentally demanding activities (Goulder, 1995, Parry, 1997), and on the other hand it is quite an efficient instrument for obtaining government revenue, more than other taxes.

During the years many scholars studied the impact of energy price on macroeconomic performance of national economies (especially the impact of oil price shocks) (starting with Hamilton, 1983, Mork *et al.*, 1994) and the magnitude of macroeconomic impact (Rasche and Tatom, 1977, Rasche and Tatom, 1981) as well as the relationship between income, energy taxation and the environment (Ghalwash, 2007).

[1] According to "The Kyoto Protocol to the United National Framework Convention on Climate Change" (11th of December 1997) there are legally binding emissions targets for developed and developing countries for the post 2000 period to achieve. The EU and its Member States ratified the Kyoto Protocol in late May 2002

At the same time, the energy producers, mostly petroleum producers, always blamed for the high level of their product price, tried to show statistics regarding the weight of taxation in the energy end-user prices.

The aim of this paper is only to present, using a descriptive approach, the level and the influence of fiscal policy on energy prices, the energy tax harmonization attempt and, in a smaller part, the consequences at macro and micro economy of the tax level presented into the energy end-user price.

Due to the still important weight of oil and natural gas products in energy product demand and consumption, we analyse especially these components of energy sector.

The paper is structured in four main parts. Thus, the 2nd Section presents the evolution of energy consumption and energy price determination, fallowed by the 3rd Section where we present the role and the evolution of taxation as component of energy price, while in the Section 4 is presented the energy tax harmonization attempt for the EU region and USA. The 5th Section concludes the paper.

## 2 Energy Consumption and Energy Price Determination

### *2.1 Energy Consumption*

The United States Energy Information Administration in its IEO2009 projects an increase by 44 percent from 2006 to 2030 in total world consumption of marketed energy, the largest projected increase in energy demand being for the non-OECD economies. Indeed, the development of emerging economies, especially China and India, leads to an important increase in energy consumption that is difficult to control and limit.

If analyse the evolution of energy consumption[2] starting 1988 till 2008, as presented in Table 1, we can easily see that the regions with the biggest increase are those that include the emerging economies.

**Table 1** Energy consumption evolution*

| Region | 1988 | 1998 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| North America | 2635 | 2680 | 2747 | 2688 | 2728 | 2751 | 2803 | 2819 | 2803 | 2849 | 2799 |
| South & Central America | 447 | 448 | 459 | 462 | 465 | 470 | 490 | 511 | 538 | 563 | 579 |
| Europe, Eurasia | 2759 | 2757 | 2806 | 2827 | 2835 | 2877 | 2925 | 2937 | 2978 | 2956 | 2964 |
| Middle East | 373 | 384 | 399 | 424 | 444 | 463 | 492 | 533 | 555 | 577 | 613 |
| Africa | 266 | 273 | 276 | 281 | 289 | 302 | 318 | 323 | 327 | 341 | 356 |
| Asia Pacific | 2405 | 2477 | 2572 | 2638 | 2739 | 2945 | 3227 | 3430 | 3617 | 3816 | 3981 |
| Total World | 8885 | 9021 | 9262 | 9323 | 9502 | 9810 | 10258 | 10555 | 10820 | 11104 | 11294 |
| of which: | | | | | | | | | | | |
| E.U | 1689 | 1685 | 1703 | 1731 | 1717 | 1748 | 1770 | 1771 | 1773 | 1732 | 1728 |
| OECD | 5164 | 5237 | 5353 | 5318 | 5356 | 5415 | 5513 | 5551 | 5548 | 5568 | 5508 |

[2] Due data information access, in this analyze we consider only primary energy, comprises commercially traded fuels only. Excluded, therefore, are fuels such as wood, peat and animal waste which, though important in many countries, are unreliably documented in terms of consumption statistics. Also excluded are wind, geothermal and solar power generation. Taking into account that secondary energy results from the transformation of primary energy, we consider that analyzing only primary energy data for energy consumption, it does not give us a deformed illustration of state of the art regarding world energy consumption

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FSU | 902 | 905 | 925 | 927 | 943 | 953 | 973 | 973 | 1011 | 1022 | 1028 |
| Other EMEs | 2821 | 2879 | 2983 | 3077 | 3203 | 3441 | 3772 | 4030 | 4261 | 4513 | 4757 |

Sources: BP, "Statistical Review of World Energy Full Report 2009"; *million tones oil equivalent[3]

A comparative look at the evolution of energy consumption between 1988 - 2008, in percents only for 1988, 1998 and 2008 years, give us a more clear image of increasing and decreasing of world energy consumption (see Table 2).

**Table 2** Comparative evolution of world energy consumption (1988, 1998, 2008)

| Region | 1988 | 1998 | (%) | 2008 | (%) |
|---|---|---|---|---|---|
| North America | 2635 | 2680 | 14,07 | 2799 | 21,18 |
| South & Central America | 447 | 448 | 39,65 | 579 | 80,78 |
| Europe, Eurasia | 2759 | 2757 | -13,32 | 2964 | -6,89 |
| Middle East | 373 | 384 | 51,64 | 613 | 148,86 |
| Africa | 266 | 273 | 23,03 | 356 | 64,09 |
| Asia Pacific | 2405 | 2477 | 39,44 | 3981 | 130,87 |
| Total World | 8888 | 9021 | 11,07 | 11294 | 41,14 |
| of which: | | | | | |
| E.U | 1689 | 1685 | 1,14 | 1728 | 3,47 |
| OECD | 5164 | 5237 | 13,51 | 5508 | 21,08 |
| FSU | 902 | 905 | -34,6 | 1028 | -25,43 |
| Other EMEs | 2821 | 2879 | 36,1 | 4757 | 129,47 |

Sources: Calculations made in base of "Statistical Review of World Energy Full Report 2009", BP.

Comparing with the value of energy consumption of the 1988 year, the increasing of world energy consumption in the last ten and twenty years, was more significant in the last decade, but even so with only 41,14% which is not such a big growth comparing with the values meet in the consumption level by regions for the same period. As we mentioned before, the regions with emerging economies reported significant increases of energy consumption, specially in the last decade (increases in Middle East and Asia Pacific with 148,86% , 130,87% respectively, at the end of 2008 comparing with the consumption in 1988). It is also to be noted the diminution in energy consumption of the Europe and Eurasia regions, mainly because of the decrease consumption in Former Soviet Union states (with 34,6% in 1998 comparing with 1988, respectively with 25,43% lower in 2008), but also due to the energy tax harmonization attempt in EU states.

Analysing the data regarding consumption by fuel offered by BP Statistical Review of World Energy 2009, during 2007 – 2008 period we can see that oil and natural gas weight in total energy consumption is still significant in all regions (see Table 3 and Table 4). For this reason we chose to analyse in our study mostly oil and natural gas as energy products.

**Table 3** Fuel weight in total energy consumption – 2007

| Region | Oil | Natural Gas | Coal | Nuclear Energy | Hydro Electric | Total |
|---|---|---|---|---|---|---|
| North America | 39,8 | 25,9 | 21,6 | 7,6 | 5,1 | 100 |
| South &Central America | 46,1 | 22,5 | 4,0 | 0,8 | 27,1 | 100 |
| Europe, Eurasia | 32,0 | 34,6 | 17,9 | 9,3 | 6,1 | 100 |
| Middle East | 50,2 | 47,3 | 1,6 | 0,0 | 0,9 | 100 |
| Africa | 38,1 | 23,5 | 31,0 | 0,9 | 6,5 | 100 |

[3] One tone of oil equivalent equals approximately 40 million Btu

| | | | | | | |
|---|---|---|---|---|---|---|
| Asia Pacific | 30,9 | 10,8 | 50,1 | 3,2 | 5,0 | 100 |
| Total World | 35,5 | 23,9 | 28,8 | 5,6 | 6,3 | 100 |
| of which: | | | | | | |
| E.U | 40,4 | 25,0 | 18,3 | 12,2 | 4,0 | 100 |
| OECD | 40,3 | 23,9 | 21,4 | 9,4 | 5,1 | 100 |
| FSU | 18,2 | 54,1 | 16,3 | 5,9 | 5,5 | 100 |
| Other EMEs | 33,4 | 17,1 | 40,7 | 0,9 | 7,9 | 100 |

Sources: Calculations made in base of "Statistical Review of World Energy Full Report 2009", BP.

**Table 4** Fuel weight in total energy consumption – 2008

| Region | Oil | Natural Gas | Coal | Nuclear Energy | Hydro Electric | Total |
|---|---|---|---|---|---|---|
| North America | 38,5 | 26,8 | 21,7 | 7,7 | 5,3 | 100 |
| South &Central America | 46,6 | 22,2 | 4,0 | 0,8 | 26,3 | 100 |
| Europe, Eurasia | 32,2 | 34,7 | 17,6 | 9,3 | 6,1 | 100 |
| Middle East | 50,0 | 48,0 | 1,5 | 0,0 | 0,5 | 100 |
| Africa | 38,0 | 24,0 | 31,0 | 0,8 | 6,2 | 100 |
| Asia Pacific | 29,7 | 11,0 | 51,0 | 3,0 | 5,3 | 100 |
| Total World | 34,8 | 24,1 | 29,2 | 5,5 | 6,4 | 100 |
| of which: | | | | | | |
| E.U | 40,7 | 25,5 | 17,4 | 12,3 | 4,1 | 100 |
| OECD | 39,6 | 24,6 | 21,3 | 9,4 | 5,2 | 100 |
| FSU | 18,4 | 53,3 | 17,2 | 5,8 | 5,2 | 100 |
| Other EMEs | 32,8 | 17,3 | 41,1 | 0,9 | 7,9 | 100 |

Sources: Calculations made in base of "Statistical Review of World Energy Full Report 2009", BP.

### *2.2 Energy Price Determination*

Unlike other economic goods price determination, energy price determination is not based particularly on offer-demand relationship. Within energy system, price determination is handled in an ad hoc manner (Griffin, 1996) and could meet different determination formulas for individual fuels: according to Griffin studies for the United States energy market, the coal price could be determined as a mark-up over mining costs, while natural gas price and crude oil prices are administratively determined, obviating any need to model these prices.

Other scholars, using econometric models to analyse information that covers the period between 1Q 1979 to 3Q 1990, emphasize that there is no feedback of the energy demand and supply on prices in the Europe Community; average final energy prices in the European Community are mainly defined by (exogenous) import prices, the taxation regime, national regulations and seasonal factors (Deimezis, 1996).

Even some recent studies sustain the Deimezis, 1996, hypothesis: comparing with other commodities, the energy supply and demand are relatively inelastic, this being the main reason for the fiscal efficiency in energy sector. Studies emphasis that the consumer is more sensitive to a tax change, than a producer price change, regarding energy products (Ghalwash, 2007).

## 3 The Role and Evolution of Taxation on Energy Price

As we have already said in the Section 1, taxing energy has a double positive effect: primarily it is a righteous way to discourage environmentally demanding activities and secondarily it is more efficient than other taxes to obtain government revenue.

Due to the fact that energy end-users hardly know the influence of supply on energy end-user prices is not as important as they believe, energy producers were always blamed for the energy price changes, specially when prices are increasing. This is why energy producers (mainly oil producers) are trying to prove and to demonstrate that the biggest part of the energy end-user prices does not return to them, but to energy end-users' governments under the taxation form.

The lately issues of OPEC research studies (OPEC Research Division, 2009) illustrates the wide regional variations in the prices of different oil products for 2008 and proof that these price variations are not due to differences in crude oil prices, from region to region and during the years, but to varying levels of taxation in the major consuming countries; that range from relatively low levels (in USA) to very high levels in many European countries. For our analyse we considered the major consuming countries and regions as following: USA, Canada, Japan, France, Germany, Italy, United Kingdom and OECD[4].

Even if the discrepancy between all final energy price components is increased yearly, the crude CIF price differences from region to region vary inside of small intervals (maximum difference 7,3 UD dollars per barrel in 2007), comparing with taxes and end-user prices. If at the beginning, the maximum difference between taxes on each region was about 42,7 US dollars per barrel[5] (in 1988), at the end of 2008 the difference between the minimum tax value per barrel and the maximum level arrived at 130,3 US dollar per barrel. ($38,1 per barrel tax value in USA and $168,4 per barrel in United Kingdom) (see Table 5).

**Table 5** Variation intervals between selected regions (US dollars per barrel)

| Region | 1988 | 1998 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Composite barrel[6] | 34,7 - 92,3 | 39,9 – 131,7 | 58,0 – 152,9 | 54,3 – 143,0 | 55,0 – 142,7 | 55,6 – 147,7 | 72,2 – 154,6 | 87, 0 – 181,7 | 108,7 – 223,8 | 119,7 – 236,9 | 159,6 – 289,0 |
| | 57,6 | 91,8 | 94,9 | 88,7 | 87,7 | 92,1 | 82,4 | 94,7 | 115,1 | 117,2 | 129,4 |
| Crude CIF Price | 14,7 – 15,5 | 12,0 – 13,7 | 27,5 – 29,1 | 22,1 – 25,0 | 23,5 – 25,4 | 27,7 – 29,5 | 32,8 – 37,9 | 46,0 – 52,6 | 56,2 – 63,2 | 63,9 – 71,2 | 91,1 – 97,3 |
| | 0,8 | 1,7 | 1,6 | 2,9 | 1,9 | 1,8 | 5,1 | 6,6 | 7 | 7,3 | 6,2 |
| Tax[7] | 8,8 – 51, 5 | 13,5 – 89,6 | 15,8 – 94,1 | 15,3 – 88,0 | 15,1 – 90,9 | 14,3 – 94,9 | 18,4 – 96,4 | 19,7 – 106,1 | 22,8 – 137,0 | 26,8 – 140,7 | 38,1 – 168,4 |
| | 42,7 | 76,1 | 78,3 | 72,7 | 75,8 | 80,6 | 78 | 86,4 | 114,2 | 113,9 | 130,3 |
| Industry Margin[8] | 11,1 – 36,8 | 14,4 – 29,4 | 12,5 – 30,4 | 14,4 – 30,5 | 12,3 – 27,2 | 8,4 – 23,6 | 10, 0 – 30,7 | 10,3 – 24,1 | 10,6 – 29,7 | 12,7 – 29,0 | 8,0 – 30,4 |
| | 25,7 | 15 | 17,9 | 16,1 | 14,9 | 15,2 | 20,7 | 13,8 | 19,1 | 16,3 | 22,4 |

Source: Calculations made in base of OPEC 2009 statistical data

Given the end-user price differences between regions during the analysed period and price components considered, we can strongly state that end-user price differences between regions and its increment are not consequences of a proportional increment of producers price, but of fiscal policy conducted by each country/region.

Regarding the tax level evolution in major consumer countries we considered, it is to notice the big differences between USA - Canada and European countries. While in the USA, one of the biggest consumer of oil products in the world, the average taxation weight in end-user price during the

[4] OECD countries excluding Australia, New Zealand, Turkey, Iceland; Greece included only for 1993 - 1999
[5] 1 barrel (US petroleum) = 158,9872956 liters, http://www.convertunits.com/from/barrel+%5BUS,+petroleum%5D/to/litres
[6] Composite barrel is a consumption weighted average of final consumer prices of main groups of refined products (including taxes).
[7] Tax is a consumption weighted average of total taxes (including VAT if applicable) levied on refined products.
[8] Industry Margin is a calculated value subtracting the Tax and Crude CIF Price from the price of Composite Barrel.

analysed period is 25,74%, in European developed countries it represents more than 50 percent of end-user price (as average value for the analysed period, it has been found the fallowing: Germany 57,11%, France 57,87%, Italy 59,12% , United Kingdom 60,23%).

We emphasize also that the industry margin in final price is not as important as could believe. Except USA and Canadian petroleum industry, the industry margin has decreased in the past years. (Table 6)

**Table 6** Components weight in final consumer price for oil products

| | 1988 | 1998 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **USA** | | | | | | | | | | | |
| Crude CIF Price | 42,4 | 30,1 | 47,4 | 40,7 | 42,7 | 49,7 | 45,4 | 52,9 | 51,7 | 53,4 | 57,1 |
| Tax | 25,4 | 33,8 | 27,2 | 28,2 | 27,5 | 25,7 | 25,5 | 22,6 | 21,0 | 22,4 | 23,9 |
| Industry Margin | 32,3 | 36,1 | 25,3 | 31,1 | 29,8 | 24,6 | 29,1 | 24,5 | 27,3 | 24,2 | 19,0 |
| **Canada** | | | | | | | | | | | |
| Crude CIF Price | 29,0 | 24,9 | 42,2 | 38,2 | 39,6 | 44,6 | 44,3 | 53,6 | 53,5 | 55,6 | 59,7 |
| Tax | 30,7 | 40,0 | 32,4 | 32,4 | 32,5 | 31,3 | 27,7 | 28,7 | 27,9 | 27,3 | 29,7 |
| Industry Margin | 40,3 | 35,1 | 25,4 | 29,3 | 27,9 | 24,2 | 28,0 | 17,7 | 18,6 | 17,2 | 10,6 |
| **Japan** | | | | | | | | | | | |
| Crude CIF Price | 19,2 | 17,0 | 27,0 | 25,6 | 28,2 | 33,2 | 32,6 | 42,9 | 47,6 | 48,9 | 53,4 |
| Tax | 56,2 | 65,1 | 55,7 | 56,3 | 49,7 | 50,6 | 37,3 | 35,8 | 39,6 | 37,3 | 40,7 |
| Industry Margin | 24,6 | 17,9 | 17,3 | 18,1 | 22,1 | 16,2 | 30,1 | 21,4 | 12,9 | 13,8 | 6,0 |
| **France** | | | | | | | | | | | |
| Crude CIF Price | 18,6 | 12,1 | 25,6 | 22,1 | 22,6 | 25,7 | 30,3 | 37,2 | 37,0 | 39,1 | 42,5 |
| Tax | 63,8 | 72,5 | 58,5 | 54,4 | 59,3 | 58,7 | 61,0 | 52,2 | 52,4 | 49,9 | 53,9 |
| Industry Margin | 17,6 | 15,4 | 15,9 | 23,5 | 18,1 | 15,6 | 8,7 | 10,6 | 10,6 | 10,9 | 3,6 |
| **Germany** | | | | | | | | | | | |
| Crude CIF Price | 27,8 | 14,9 | 30,3 | 26,9 | 25,8 | 29,2 | 31,1 | 41,0 | 35,5 | 37,4 | 38,4 |
| Tax | 52,0 | 63,5 | 56,2 | 57,1 | 60,8 | 62,1 | 56,3 | 50,7 | 57,0 | 55,8 | 57,1 |
| Industry Margin | 20,2 | 21,6 | 13,5 | 16,0 | 13,3 | 8,7 | 12,6 | 8,4 | 7,5 | 6,8 | 4,5 |
| **Italy** | | | | | | | | | | | |
| Crude CIF Price | 19,6 | 12,5 | 27,6 | 25,0 | 24,6 | 28,1 | 30,8 | 39,3 | 38,6 | 39,5 | 41,0 |
| Tax | 65,2 | 70,7 | 58,9 | 59,2 | 62,9 | 63,7 | 59,5 | 52,4 | 54,7 | 50,7 | 52,5 |
| Industry Margin | 15,2 | 16,9 | 13,5 | 15,8 | 12,5 | 8,3 | 9,6 | 8,3 | 6,7 | 9,9 | 6,6 |
| **United Kingdom** | | | | | | | | | | | |
| Crude CIF Price | 16,3 | 9,6 | 18,6 | 17,1 | 17,2 | 19,7 | 22,6 | 28,4 | 28,0 | 29,9 | 33,2 |
| Tax | 43,9 | 68,1 | 61,5 | 61,5 | 63,7 | 64,3 | 62,4 | 58,4 | 61,2 | 59,4 | 58,2 |
| Industry Margin | 39,9 | 22,3 | 19,9 | 21,3 | 19,1 | 16,0 | 15,0 | 13,2 | 10,9 | 10,7 | 8,6 |
| **OECD** | | | | | | | | | | | |
| Crude CIF Price | 29,4 | 18,3 | 33,1 | 30,2 | 30,5 | 33,5 | 40,3 | 48,4 | 48,2 | 49,2 | 32,3 |
| Tax | 40,5 | 48,0 | 42,7 | 44,9 | 47,5 | 46,9 | 44,6 | 40,2 | 42,0 | 41,3 | 36,9 |
| Industry Margin | 30,1 | 33,6 | 24,2 | 25,0 | 22,0 | 19,6 | 15,1 | 11,3 | 9,8 | 9,5 | 30,8 |

Source: Calculations made on the base of OPEC statistical data 2009

The Figure 1 illustrates the weight of each price component (crude CIF price, tax, industry margin) for OECD countries[9]. It is easy to notice that always during the last 20 years the industry gain from final price value around or less than 30%, while the taxis have always been the major component.

The crude CIF price had a calm dynamic for almost 16 years, with weights between 18% and 30% in final price, until 2004, when the weight arrived at 40,3% and continued to rise. Thus, starting late 2004 till 2007 crude CIF price was the main component of end-user price, surpassing the tax level. After 2007, the CIF price weight decreased and also tax level, but it is notice an important increment of industry margin. At the end of 2008, for OECD countries we could see that there is an equilibrium between price components weights: crude CIF price 32,3%, tax 36,9% and industry margin 30,8%

[9] OECD countries excluding Australia, New Zealand, Turkey, Iceland; Greece included only for 1993 - 1999

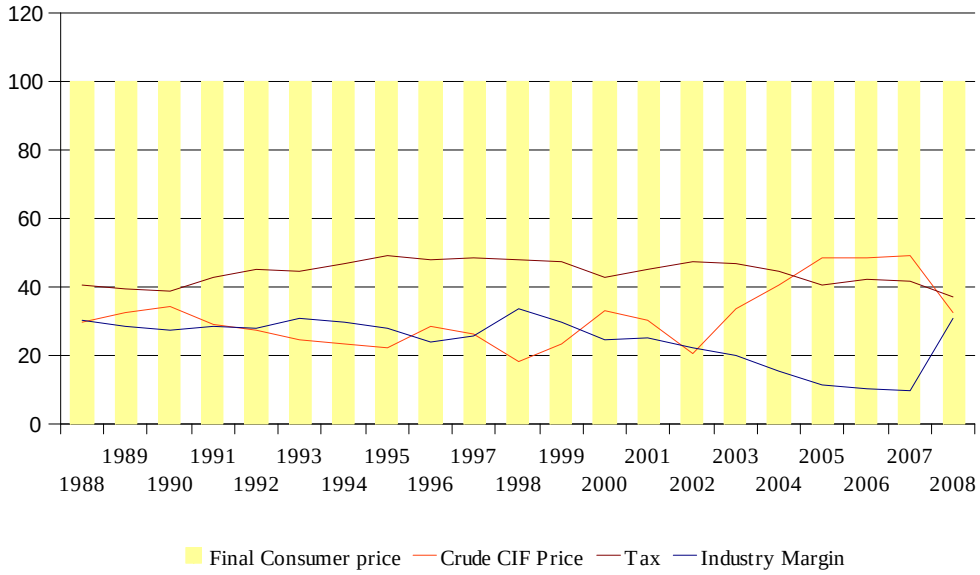


**Figure 1** Components weight of final consumer price – OECD

## 4 Energy Tax Harmonization

Many countries have, over the last few decades, raised specific energy taxes, which has acted to reduce energy dependence, especially oil dependence, and to create a tax harmonization environment.

The Treaty of Rome, in 1957, emphasis the four fundamental freedoms necessary to establish a Common Market: movement of people, goods, capital and the freedom to supply services, which imply, besides others, the harmonization of indirect taxes: customs duties, value added tax, excise duties, *energy and environmental taxes*, vehicle taxation.

The tax harmonization, seen either as environment protection or reducing distortions instrument, is not a worldwide nations aim. The United States of America, for example, do not have legal statements for energy tax harmonization at the level of each one of its states. At the same time it has very low motor fuel tax rates compared with other advanced economies and no general tax on the carbon content of fuels. Instead, the U.S. Tax law contains a complex and growing set of incentives for energy production and investments in alternative fuels and technologies (Toder, 2007).

### *4.1 Tax Harmonization Attempt for European Union*

European Commission regard energy tax as a crucial instrument in meeting Kyoto Protocol targets for reduced greenhouse gas emissions. Besides Kyoto Protocol targets, the aim of European institutions is to maintain a functional Common Market at the level of energy products also, therefore reducing distortions that currently exist between Member Stats is to be done. On this meaning, in October 2003, the European Union introduced a Directive regarding the EU's minimum taxation system from mineral oils to all energy products including coal, natural gas and electricity[10].

The Directive aims at reducing distortions that still exist between Member States and between mineral

[10] Council Directive restructuring the Community framework for the taxation of energy products and electricity 2003/96/EC

oils and other energy products which up to now have not been subject to EU tax legislation. Also, it has to be seen as the result of a series of attempts to establish a more stringent energy taxation system in Europe, attempts that during the years have had the evolution as presented in Table 7.

**Table 7** Attempts to establish an energy taxation system in EU

| Year | Attempt characteristics | Comments |
|---|---|---|
| 1992 | - a Community system for taxing mineral oils was established by 2 Directives (92/81/EEC and 92/82/EEC);<br>- this system, however, was far from a full harmonization of oil taxation | One of the Directive was regarding the harmonization of the structure of excise duties on mineral oils (92/81/EEC ), while the second focused on the approximation of the rates of excise duties on mineral oil (92/82/EEC) |
| May 1995 | - a proposal for $CO_2$/energy taxation | Political blockaded |
| 1997 | - the European Commission presented a proposal for a taxation framework of energy products (including coal and gas) and electricity. | It suffered a long process of discussions and modifications and its final form was the foundation for the Directive adopted in 2003 |
| 27 October 2003 | - after discussions and modifications of the proposal from 1997, the Council of the European Union adopted Directive 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity | It gives minimum tax rates to comply with by January 2004 for various fuel types and electricity, separated by three user categories. |
| April 2004 | - an amendment was adopted by EU's Council of Ministers that allows the EU accession countries temporarily to apply country specific excise duty exemptions or lower rates. | The exemptions last no longer than 2012 |

The minimum levels of taxation according to Directive 2003/96/EC are as following:

**Table 8** Minimum levels of taxation according to Directive 2003/96/EC

| Energy carriers | Units in Euro per... | Motor fuels | | | Heating fuels and electricity | |
|---|---|---|---|---|---|---|
| | | 1 Jan. 2004 | 1 Jan. 2010 | Special, industrial, commercial purposes | Non-business use | Business use |
| Leaded petrol | 1000 l | 421 | 421 | - | - | - |
| Unleaded petrol | 1000 l | 359 | 359 | - | - | - |
| Gas oil | 1000 l | 302 | 330 | 21 | 21 | 21 |
| Kerosene | 1000 l | 302 | 330 | 21 | 0 | 0 |
| Heavy fuel oil | 1000 kg | - | - | - | 15 | 15 |
| LPG | 1000 kg | 125 | 125 | 41 | 0,3 | 0,15 |
| Natural gas | GJ gcv[11] | 2,6 | 2,6 | 0,3 | 0,3 | 0,15 |
| Coal, coke | GJ gcv | - | - | - | 0,3 | 0,3 |
| Electricity | Mwh | - | - | - | 1 | 0,5 |

Source: Hohlhaas *et al.*(2004)

11 gcv – gross caloric value

There are a number of studies regarding this Directive and previews attempts, conducted to research their economic and environmental effects under different scenarios. It is to mention here Jansen and Klaasen (2000), that study the macroeconomic and sectoral impacts of the 1997 proposal using three EU wide top-down simulation models, and Heady e*t al.*(2000) who calculate the employment effects of the same 1997 proposal using a bottom-up engineering approach.

An important contribution to literature in this area is bringing out by Kohlhaas *et al.* (2004) that analyse the effects of the EU Directive on tax harmonization as actually put into force on January 2004 and simulate alternative policy scenarios to investigate the comparative static effects of the tax harmonization on economic growth, energy consumption and emissions, as well as on international trade: partial tax harmonization scenarios and full tax harmonization at the minimum level scenario. According to information offered by Kohlhaas *et al.* (2004), in 2002 almost all EU countries had the taxation level over the minimum requested. The exception cases are: Greece and Czech Republic , for unleaded petrol; Austria, Greece, Luxembourg, Portugal, Spain, Czech Republic, Poland and Slovenia for diesel; Belgium and Luxembourg in the case of LFO taxes.

The European Directive, with or without its amendments, presents both positive and negative aspects. Thus, the Directive make possible a differentiation of diesel taxation, an aviation taxation and a possible combination emission trading/energy, on the one hand, but, on the other hand, there are deficits in the agreement due to requirement for unanimity voting in fiscal policies.

### *4.2 Tax Harmonization in USA*

We cannot talk about an harmonization policy for energy tax in the United States. The US energy tax policy has also some specific characteristics from the tax components point of view, as long there are state tax and federal tax that make up US energy tax.

In October 2009, the USA average tax on gasoline was $0,473 per gallon (pg)[12]. The average tax on gasoline is make up by federal tax on gasoline ($0,184 pg), state gasoline excise tax ($0,185 pg) and other taxes (approximately $0.104 pg). The other taxes represent applicable sales taxes, gross receipts taxes, oil inspection fees, county and local taxes, underground storage tank fees and other miscellaneous environmental fees. As regarding diesel taxes in USA, the average tax on motor diesel fuel in October 2009 was $0,518 pg, of which $0,244 pg represents average federal tax on diesel, $0,190pg average state diesel fuel excise tax and $0,085 other state and local taxes average.

Average tax level, both for gasoline and diesel, does not represent significant values, but we can notice that there is a big difference between minimum and maximum values of gasoline and diesel taxes from state to state. According to State Gasoline and Diesel Tax Reports of American Petroleum Institute in October 2009 the tax values are between $0,264 pg and $0,658 pg for gasoline and between $0,324 pg and $0,709 pg for diesel, as we illustrate in the bottom table.

**Table 8** Minimum and maximum values for USA fuel taxes – October 2009

| Fuel tax | Minimum values | | | Maximum values | | |
|---|---|---|---|---|---|---|
| Gasoline Taxes | New Jersey | Wyoming | Alaska | California | New York | Hawaii |
| | 0,329 | 0,324 | 0,264 | 0,658 | 0,632 | 0,628 |
| Diesel Taxes | Wyoming | Oklahoma | Alaska | Hawaii | California | Connecticut |
| | 0,384 | 0,384 | 0,324 | 0,709 | 0,697 | 0,695 |

[12] 1 gallon (U.S. Liquid) = 3,7854118 litres, http://www.convertunits.com/from/gallon+%5BUS,+liquid%5D/to/litres

*Issue 1(24)/2010* *ISSN: 1582-8859*

## 5 Conclusions

Energy final prices are not necessarily influenced by supply-demand relationship, but, in an important way, by taxation, fiscal, environment policies and politics. Tax policies can be used to increase relative fuel prices in ways that promote the two related but distinct energy and environmental policy goals of reducing oil dependence and slowing the growth of greenhouse gas emissions, while leaving to private individuals and firms decisions on how to alter consumption choices and production methods.

The world consumption of marketed energy is increasing each year, according to all international energy authorities projection, the largest projected growth being from non-OECD countries due to the development of emerging economies, as China and India. It is difficult to ask those economies to stop their development as much as to accept less environment protection policies.

The main reason of the fiscal efficiency in energy sector is given by the relatively inelastic energy supply and demand, comparing with other commodities, and by the behaviour of energy products consumer, that is more sensitive to a tax change than a producer price change.

Energy tax policy and environmental settlements face big challenges, mostly because generally tax is a continuous issue for business and environmental settlements enforce redesign business activity in order to implement them.

The objectives of energy taxation is threefold: internalise environmental costs, achieve environmental goals and raise revenue, of course taking account of other policy purposes.

Our study emphasize, using only statistical descriptive method, that the weight of tax in energy final price has considerable increased in the last twenty years[13], distant relative much faster than the increment of supply price. So that we can state the energy supply price rise (for oil and gas products) is given mostly by the new tax levels and less by producers behaviour on the market.

The most significant reason of energy tax rising is environmental protection, but it is to present, in a further study that we develop, how much this is truly happened, seeing that by now the energy taxes are contributing especially to bring government revenues, more than other taxes.

Even if it is widely accepted that a proper energy tax policy leads to pollution decrease and it is known that almost all developed economies accuse the emerging countries for the lack of environmental policies, we have to note that not all industrialized countries promote a high level of energy tax in order to diminish the energy consumption (and we are referring here to oil and natural gas products consumption).

The United States, for example, does not impose substantial broad-based taxes on energy inputs, and it taxes highway motor fuels at a much lower rate than in other major economies. US politicians prefer tax subsidies (which provide visible benefits to identifiable groups and impose widely diffused costs on others) to energy tax increases (which impose visible costs on identifiable groups to produce widely diffused benefits for others). The USA approach is explain by their idea that tax incentives for alternative fuels and technologies are less cost-effective ways of achieving energy and environmental policy goals than are taxes on fossil fuels.

On the opposite pole are positioned the EU countries that have to respect the minimum tax levels imposed by the European Commission Directive on tax harmonization. The reason of Directive was initially environmental, but it chases also the Common Market purposes. As statistics present, all developed EU economies respect Directive conditions, accession countries being allowed to apply lower energy tax rates, exemption however limited in time and last now longer than 2012; even so, the Directive conditions will cause notable unbalances for the inside economy of each accession country.

[13] particularly for oil and gas products; we did not make a concrete study on taxes for renewable energy but it is known the worldwide nations effort to promote new renewable energy, also through tax incentives.

## 6 References

BP (2009). *Statistical Review of World Energy. Full Report*. London: BP p.l.c.

Council Directive 92/81/EEC of 19 October 1992 on the harmonization of the structures of excise duties on mineral oils. *Official Journal of the European Union (OJ)L 316*, 31.10.1992, p.12.

Council Directive 92/82/EEC of 19 October 1992 on the approximation of the rates of excise duties on mineral oils. *Official Journal of the European Union (OJ)L 316*, 31.10.1992, p.19.

Council Directive 2003/96/EC of 27 October 20033 on the approximation of the rates of excise duties on mineral restructuring the Community framework for the taxation of energy products and electricity. *Official Journal of the European Union (OJ)L 283/51*, 31.10.2003.

Deimezis, N. (1996). ERASME: a Short-term Energy Forecasting Model for the European Community. *Models for Energy Policy*, pp. 23-33.

EIA (2009). *International Energy Outlook*. Washington: US Energy Information Administration, Department of Energy.

Ghalwash, T. (2007). Energy Taxes as a Signaling Device: an Empirical Analysis of Consumer Preferences. *Energy Policy 35(1)*. pp. 29-38.

Goulder, L.H. (1995). Effects of Carbon Taxes in an Economy with Prior Tax Distortions: An Inter-temporal General Equilibrium Analysis. *Journal of Environmental Economics and Management 29(3)*. pp.271-297.

Griffin, J. (1996). Methodological Advances in Energy Modeling: 1970-90. *Models for Energy Policy*. pp. 2-9.

Hamilton, J.D. (1983). Oil and the Macro-economy since World War II. *Journal of Political Economy 91*. pp. 228-248.

Heady, D.J., Markandya, A., Blyth, W., Collingwood, J., Taylor, P.G. (2000). Study on the Relationship Between Environmental/Energy Taxation and Employment Creation. *Study prepared for the European Commission Directorate General XI*

Jansen, H., Klaassen, Ger. (2000). Economic Impacts of the 1997 EU Energy Tax: Simulations with Three EU-Wide Models. *Environmental and Resource Economic 15s*. pp. 179-197.

Kohlhaas, M., Schumacher, K., Diekmann, J., Cames, M., Schumacher, D. (2004). Economic, Environmental and International Trade Effects of the EU Directive on Energy Tax Harmonization. *Discussion Papers of DIW Berlin*. 462.

Mork, K., Olsen, O., Mysen, H.T. (1994). Macroeconomic Responses to Oil Price Increases and Decreases in Seven OECD Countries. *Energy Journal 15(4)*. pp. 19-35.

OPEC (2009).*Annual Statistical Bulletin*. Vienna: OPEC Research Division.

OPEC (2005). *Who Gets What from Imported Oil*. Vienna: OPEC Research Division.

OPEC (2007). *Who Gets What from Imported Oil*. Vienna: OPEC Research Division.

OPEC (2008). *Who Gets What from Imported Oil*. Vienna: OPEC Research Division.

OPEC (2009). *Who Gets What from Imported Oil*. Vienna: OPEC Research Division.

Proposal for a Council Directive amending Directive 2003/96/EC as regards the possibility for certain Member States to apply, in respect of energy products and electricity, temporary exemptions or reductions in the levels of taxation. 2004/(COD) 2004/(CNS).

Rasche, R.H., Tatom, J.A. (1977b). Energy Resources and Potential GNP. *Federal Reserve Bank of St. Louis Review 59(6).* pp.10-24.

Rasche, R.H., Tatom, J.A. (1981). Energy Price Shocks, Aggregate Supply and Monetary Policy: the Theory and the International Evidence. *Carnegie-Rochester Conference Series on Public Policy 14* (pp. 9-93).

Toder, E. (2007). Energy Taxation: Principles and Interests. *Energy Viewpoints. Tax Policy Centre*. pp. 93-96.