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Accompanying the

GREEN PAPER

on market-based instruments for environment and energy related policy purposes

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This paper provides analytical and explanatory background to the ideas and suggestions put forward in the Green paper on market-based instruments for environment and energy related policy purposes.

TABLE OF CONTENTS

- 1. Distributional aspects of market-based instruments 3
- 2. Environmental tax and fiscal reforms 7
- 3. Energy taxation 12
- 4. Scope for the use of market-based instruments under various Community directives on environmental policy 21
- 5. Further information on some examples of market-based instruments 22
- 6. Habitat banking 25
- 7. The need for more co-ordination within the Community 27
- Annex 1 – Minimum Levels of Taxation 28
- Annex 2 - Energy content of fuels 29
- Annex 3 - Relevant legal provisions on the use of market-based instruments under various Community directives on environmental policy 33

1. DISTRIBUTIONAL ASPECTS OF MARKET-BASED INSTRUMENTS

The use of MBI may give rise to concerns about their distributional impact, when they lead to a price increase. These distributional consequences are of two kinds: 1) the impact on the distribution of income between households, and 2) the impact on the international competitiveness of companies or industrial sectors. It should, however, be taken into account that alternative instruments to achieve the same policy objectives, such as regulation, also have distributional consequences. Furthermore, it is the choice of a policy objective itself that creates additional costs and benefits, while the instruments determine the efficiency of reaching this objective.

There are, however, means to mitigate these impacts through proper design of the instruments and various compensating measures. Often there is, however, a trade-off between the acceptability of a market-based instrument and its effectiveness.

Distributional implications for households

The main difficulty related to distributional impact in the context of individuals is when they create a disproportionate burden on low-income households.

1.1.1. Factors affecting distributional impacts

Most of the studies available on the issue focus on energy/carbon taxes. Evidence in most, but not all cases, indicates that the distributional implications of these taxes tend to be moderately regressive (see, OECD, 2006). However, there are several factors to be taken into account (see, Norden 2006):

- Nature of the goods or activity: The usual evidence is that taxes on electricity and heating tend to be regressive, while many transport taxes (fuel, vehicles, and air travel) are progressive, although taxes applied on public transport are regressive. Pollution taxes are mostly neutral.
- Tax incidence aspects: When a tax is introduced, it is not necessarily the case that full burden of it is borne by consumers. Part of it may also fall on producers (in the form of lower rate of return on capital) or on workers (in the form of lower wages) involved in producing the good in question. This tax incidence depends generally on the price elasticity's of demand and supply in the market and the market structure. Low price elasticity of demand and high price elasticity of supply imply that the largest part of the tax burden is borne by consumers, and in the opposite case more of the tax burden is borne by producers.
- The distribution of environmental benefits: Rather little is known on this topic. One could think that long-term benefits related to, for instance, measures to fight against global warming are more evenly distributed, while the benefits which have a more local character related to, for instance, human health (e.g. air quality) are more unevenly distributed and may be more related to the place of residence of households. Thus measures against air

pollution may benefit the poor more than the rich as they often live in the more affected areas¹.

1.1.2. Mitigating measures

The revenues generated by market-based instruments can be used in many different ways and provide ample opportunities to mitigate the potential regressive impacts of such taxes. In those countries that have carried out more ambitious green tax reforms, such mitigating measures have often been part of the reform package. Reductions of income taxes or social security contributions are often targeted to low-income earners (in particular reductions in social security contributions tend to benefit the low income households²). Some Member States also target income tax cuts at low-income earners, or the reform package may contain specific tax allowances with the same purpose. Studies show that such measures can largely neutralize the regressive effects of energy-related taxes (see below, chapter 4).

Competitiveness effects of market-based instruments

Competitiveness aspects may come into play when there are major differences in approaches towards environmental protection (e.g.) across countries (trading partners), depending on specific aspects of the sector. Common action of the EU restricts this problem to external competitiveness of the Community as a whole, and it can accommodate potential negative impacts on the negative position within the internal market.

1.1.3. Factors affecting the international competitiveness of enterprises

Despite the economic efficiency and welfare arguments in favour of MBI from the point of view of the economy as a whole, they also raise the cost of production for parts of domestic industry, compared to a situation of no action. All sectors are not, however, affected in a similar way³. The vulnerability of the sectors to foreign competition depends at least on the following characteristics:

- Energy-intensity or the share of energy expenditure in total production costs: Most market-based instruments are applied in energy-related sectors and raise energy prices and energy costs to the industry. The sectors with high share of energy expenditure are more affected by the increase of energy costs than others while the recycling of revenues through reductions in labour taxes affects these sectors less as they are not labour intensive. Labour-intensive sectors will most likely, on the other hand, improve their competitiveness).
- Openness to trade or the share of products sold in the international market
- Market power or the extent to which the companies have the ability to set prices instead of facing a given price in the international market: Energy-intensive sectors, which trade widely and are more price-takers than price-setters in the international market, are thus the ones that are likely to face the biggest comparative disadvantage as a consequence of green tax reforms or energy related tradable permit systems.

¹ Cf. Links between employment policies and environmental policies, SEC(200.) ...

² The Commission is currently investigating this issue further in the context of a study on the links between social cohesion/inclusion and environment and environmental policies.

³ According to the recent results of the COMETR project the most vulnerable sectors would be basic metal and paper and pulp sectors.

These adverse competitive impacts have mostly a short-run character. It is conceivable, that in the longer run, the use of MBI changes incentive structures and encourages restructuring, thus providing new growth opportunities for other sectors. Additionally, the dynamic efficiency argument implies that in longer term firms in the regulated sectors will have more incentive to research into, develop and adopt cleaner technologies and processes which allow substitution of the pollutant subject to taxes or emission allowances. This will further limit economic impact on domestic production and give them export potential.

It should be kept in mind that competitiveness is not only an economic but also environmental concern. If a polluting industry faces a loss of competitiveness, it would either relocate to a country where the cost-increasing MBIs are not implemented, or reduce its production, in which case more products would be imported. In both case the level of pollution would not decrease globally and the policy would not be environmentally effective (except for regional or local pollutants). The COMETR research project has studied the extent of this phenomenon, carbon leakage, in the seven EU Member States which have carried out green tax reforms. The results indicate that carbon leakage has been very small and in some cases negative in these countries. The COMETR project at the same time confirms that in all cases mitigating measures were in place, and thus the effective burden on these industries was considerably lower than for other economic sectors.

1.1.4. Mitigating measures

There are three most common examples of mitigating measures⁴:

(1) Tax exemptions and tax reductions

Such measures in fact often result in reduced marginal incentives towards the policy objective and consequently in reduced effectiveness of the tax instrument. In order to offset this disadvantage the measures are often accompanied by voluntary commitments (tax reduction is given in exchange for a commitment of the industry to use the amounts saved for investment and thus to achieve a given policy environmental objective on voluntary basis). This instrument has been commonly applied in several countries and is recognised at EU level in the Energy Taxation Directive, in order to allow gradual introduction of the minimum levels of taxation, or, in order to level the playing field between European companies from different Member States imposing different tax burden above the Community minima.

(2) Grandfathering or benchmarking of emission allowances

Tradable permit systems allow a given environmental objective being reached irrespectively from the fact whether allowances are auctioned or not. Therefore grandfathering or benchmarking, as alternative allocation methodologies do not question the environmental effectiveness of the instrument. Emission trading with grandfathered or benchmarked allowances is in economic terms a similar measure as the full recycling of tax revenues back to the industry, if this recycling is done in such a way as not to reduce marginal incentives to reduce emissions.

For society, however, this approach most likely creates welfare losses, because the positive revenue-recycling effect is foregone, but the costly tax interaction effect still prevails, as the

⁴ Where the use of mitigating measures may imply state aid, they have to comply with Community rules and have to be notified to the Commission under Article 88 of the Treaty.

impact of tradable permit schemes on consumer prices is similar to those of equivalent emission taxes.

(3) Recycling of revenues

If revenue from taxes or auctioned permits is recycled to domestic business, their costs will not rise to the same extent, thus mitigating potential adverse competitiveness effects of the instrument. There are several ways how revenues can be recycled:

- Direct recycling to the companies concerned (revenue neutral approach for the industry): It has to be ensured, however, that the way revenue is recycled does not reduce marginal abatement incentives to business to improve energy efficiency or reduce emissions⁵.
- Reduction of distortionary taxes, in particular taxes on labour, as in the context of green tax reforms (revenue neutral approach for the public budget).
- Use of the revenues for supporting R&D and innovation (e.g. via direct subsidies and direct tax incentives).

⁵ One example is the Swedish charge on the NO_x emissions of power plants, where almost all revenue is recycled to power plants according to their energy output, so that those using cleaner technology even have net benefits.

2. ENVIRONMENTAL TAX AND FISCAL REFORMS

2.1. The double dividend argument

Environmental tax reforms are based on the double dividend argument: Provided that market-based instruments raise revenue that is freely available to the public budget (i.e. not earmarked for a certain purpose), they provide a further advantage, namely an opportunity to reduce (more) distortionary taxes in the economy, notably the tax burden on labour⁶. In such a case a "second dividend", namely an increase in employment may be achieved in addition to the "first dividend", i.e. environmental (or other policy) benefit, which was the primary aim of introducing such instrument in the first place.

The double dividend argument has been questioned on the basis of the "tax interaction effect". The "tax interaction effect" arises from the interaction of environmental taxes with pre-existing distortionary taxes: public intervention increases commodity prices, which in turn reduces the real value of wage and have a negative impact on labour supply. It was argued that the resulting negative impact on employment may thus completely offset the positive impact of the reduced tax burden on labour.

Recent studies show, however⁷, that the positive revenue recycling effect may entirely counteract the tax interaction effect⁸ so that the overall welfare impact of a tax reform is positive. It is also shown that the impact on employment is the strongest in the case revenue recycling in the form of reduction of the employers' social security contributions. This was for example confirmed by studies carried out for DG TAXUD on the impacts of energy taxation in the EU.⁹ This implies that the use of revenue raising instruments, such as taxes or auctioned permits, to reach a given environmental outcome, offer a potential for social welfare gains.

High price elasticity of demand is desirable, when the market-based instruments are used purely as incentive instruments, i.e. with the aim of achieving a large quantity response (e.g. the reduction of the use of a particular harmful substance). Very elastic demand would, however, lead to the erosion of the tax base and not allow substantial revenue recycling or shifts of tax burden so as to achieve the double dividend. Goods with lower price elasticities serve such purpose better, as the tax base is more stable while still having a significant positive environmental impact. Typical examples are energy and transport products.

⁶ The so called revenue recycling effect, which allows to use additional revenue from market-based instruments to cut distortionary taxes, in particular labour taxes, in the economy and in this way enhance employment and thus increase welfare.

⁷ See, Schoeb, R.: *The Double Dividend Hypothesis of Environmental Taxes: A Survey*. (Fondazione Eni Enrico Mattei, Working Paper no. 60.2003), and *The use of Economic Instruments in Nordic and Baltic Environmental Policy 2001-2005* (TemaNord 2006:525).

⁸ Most importantly the presence of imperfect competition and involuntary unemployment in the labour market, the effect of higher prices on the value of unemployment benefits and the dependence of labour supply decisions on labour market conditions (see Schoeb, 2003). It also pointed out that in the case the tax revenue is recycled in the form of the reduction of employers' social security contributions the tax interaction effect is likely to remain small, as the firms are less likely to shift the effect of taxes to consumer prices (Norden, 2006).

⁹ Impacts of energy taxation in the enlarged European Union, evaluation with GEM-E3 Europe. Study for the European Commission, DG TAXUD. Final Report 11.7.2005 and The macroeconomic evaluation of energy tax policies within the EU, with the GEM-E3-Europe model. Final report February 2003. Similarly the existence of double dividend is also confirmed in a more recent paper based on WorldScan model (CPB Netherlands Bureau for Economic Policy Analysis).

Price elasticities of demand of energy products

The size of price elasticities in energy and transport sectors has been estimated in a number of studies by various econometric methods¹⁰. This evidence confirms that demand for energy, as a whole, tends to be rather inelastic in the short-run (ranging between -0.13 and -0.26 according to OECD, 2000), but that long-run elasticities are considerably higher (-0.37 to -0.46). Price elasticities are not necessarily of the same magnitude for all energy products. For instance, own-price elasticities for petrol seem to be higher than for residential electricity according to mostly US studies cited in OECD (2006). Moreover, long-run elasticities seem to clearly exceed short-run elasticities, in particular, in the case of petrol. This can be interpreted in such a way, that short-run elasticities mainly account for the changes in driving habits and kilometres driven, while the long-run price elasticities reflect also the shifts of car purchases towards more energy-efficient vehicles. High long-run elasticities imply that a tax reform indeed leads to an environmental improvement on a permanent basis.

2.2. Trends in labour and environmental taxation

2.2.1. Trends in labour taxation

The latest available figures (2004)¹¹ confirm that despite the wide consensus on the desirability of lower taxes on labour, the EU faces persistent and widespread difficulty in achieving this aim. The average **implicit tax rate on labour** was 35.6% in the EU in 2004 and despite reductions in those Member States that enacted environmental tax reforms, on average it has remained almost stable over the last more than 10 years. It is also noteworthy that the new Member States which generally have much lower taxation levels than the EU-15 are, however, almost on a par with the old Member States average in terms of labour taxation.

In most Member States, social security contributions account for a greater share of labour taxes than the personal income tax. In 2004, on average, about 65% of the overall implicit tax rate on labour consisted of social contributions¹²; only in Denmark, Ireland and the United Kingdom do personal income taxes form a larger part of the total charges paid on labour income.

Both income tax and social security component come equally into play under the environmental tax reforms, and no particular division is made between them. The progressive population ageing (increasing pressure on social security funds) would however rather call for reducing income taxes.

2.2.2. Trends in environmental taxation

In 2004¹³, revenues from environmental taxes in the EU-25 accounted for 2.6 % of GDP and for 6.6 % of total revenues. Environmental taxes can be divided into four broad categories. Energy taxes are by far the most significant, representing around three quarters of environmental tax receipts and around one twentieth of total taxes and social contributions. Transport taxes (registration and circulation taxes) correspond to, on average, one fifth of total environmental tax revenues and 1.4 % of total taxes and social contributions (in the weighted

¹⁰ See, the political Economy of Environmentally Related Taxes (OECD 2006).

¹¹ Source: Structure of taxation in the EU (2006).

¹² Comprising both employers' and employees' social contributions.

¹³ Source: Structure of taxation in the EU (2006).

average)¹⁴. The remaining categories of environmental taxes play a marginal role. Pollution taxes and resource taxes together make up just 3 % of total environmental taxes.

In the 1995-2004 period, the levels of environmental taxation in the EU-15 and the new Member States converged. While several of the old Member States showed moderate declines in their tax-to-GDP ratio, leading to a decline in the EU-15 average, the new Member States, which initially had significantly lower environmental taxes, witnessed a general increase in their level with an average increase by almost 1 percentage point. Currently there is practically no longer a difference between the two sub-groups of countries, in this respect. It ought to be stressed, however, that this refers to the levels measured in percent of GDP (due to higher energy intensity in GDP of the new Member States¹⁵); in per capita terms taxation of energy remains more moderate in the new Member States, but this effect is offset by the lower per capita GDP. As for the composition of increases, it is notable that in several new Member States pollution and resource taxes, though yielding much less revenue than energy and transport taxes, have been increased markedly and in some cases now yield non-negligible amounts, as is the case in the Baltic counties (for this reason new Member States are often said to have larger environmental tax base than the rest of the EU).

Several factors can explain these two opposite trends:

- Increased recourse to road pricing systems accompanied by a reduction in car circulation taxes. In this case, environmental tax revenues fall while revenues from road user charges increase. As the latter are earmarked to cover the costs to which they refer, they are not available to the general budget in the context of an "environmental tax reform".
- Effectiveness of environmental taxes reduces revenues over time. A common example is switching from leaded petrol to unleaded petrol. Higher penetration of diesel cars (as a result of the long term lower excise duty rates on diesel as compared to petrol) also plays a role in declining revenues from energy taxation.
- On the other hand, energy taxes tend to increase as a consequence of the adoption of the Energy Taxation Directive at EU level.

Market-based instruments and high energy prices

The prospects of structurally higher world energy prices in certain cases lead to somewhat reduced appetite towards market-based instruments affecting energy prices. There are however several reasons that plead against reconsidering policy approaches in the event of high energy prices:

- While increased energy prices may partially replace the role of taxation or some other economic instrument as an incentive towards energy efficiency (as the steering effect of the price is maintained), they do not internalise the external costs of energy consumption borne by the society (e.g. pollution). Higher energy prices therefore cannot replace the environmental objectives of MBI.

¹⁴ The predominance of energy taxes is common to almost all Member States; only in Ireland and Cyprus do transport taxes account for nearly half of environmental taxes, while in Malta they represent almost 60 % of total environmental taxation.

¹⁵ The energy intensity of an economy is influenced by several factors, in the first place by its structure (an industry based economy is much more energy intensive than a services based economy), but as well by the energy efficiency.

- High energy prices reflect the global political and economic aspects. Reconsidering the use of MBI with the aim to stabilise the consumption price of energy products would equally maintain the demand for energy at current levels while further aggravating import dependency of the EU and the alleged or real issue of scarcity of energy.
- Prices of primary energy are only one of several components of the consumer price of final energy products, but are the most vulnerable one. Energy taxation is, on the other hand, a very important and stable element of consumer prices of energy. It mitigates the relative impact of the market-dependent component in the final consumer price of price.

2.3. Experience with environmental tax reforms

2.3.1. Experience with the design of the environmental tax reforms

Environmental tax reforms have been carried out in several EU Member States during the last two decades in the form of shifting the tax burden away from labour towards environmentally harmful goods and activities (with focus on energy taxation)¹⁶ When presenting their National Reform Programmes under the Community's Lisbon strategy, several Member States declared their intention to either use or develop ETR further to help achieve their Lisbon objectives.

Although the features of environmental tax reforms differ between Member States, there are some key lessons from the experience so far:

- Many ETR were done in multi-annual programmes with steps for each year that were defined ex-ante to increase legal certainty and facilitate adjustment for economic actors.
- Extensive consultation of stakeholders in the design and implementation of ETR has helped overcome resistance. Some Member States have formalised this process by creating green tax commissions.
- Most Member States focus on increasing taxes on energy use, not only because of the policy reasons, but as well as they have the highest and most stable revenue-generating potential, and thus a lasting potential to reduce other taxes. Other environmental taxes have been used for ETR in a supplementary way in Member States, such as the UK. Their revenue potential is, however, rather small (see 2.3.2. above, except in some of the new Member States).
- The environmental tax reforms were in all cases accompanied with mitigating measures in order to address equity and competitiveness concerns (cf. chapter 3).

At EU level, the experience gained in the countries that carried out environmental tax reforms during the 1990s as part of national policies, inspired the Energy Taxation Directive adopted in 2003. The Directive foresees the same kind of mitigating measures and recognises the potential of the double dividend argument. It contains a suggestion for Member States that they might decide not to increase the overall tax burden if they consider that the implementation of the principle of tax neutrality could contribute to the restructuring and

¹⁶ Elements of environmental tax reform were explicitly implemented in Denmark, Germany, Netherlands, Austria, Sweden, Finland, Slovenia and in the United Kingdom. Reference could be made here to the COMETR project, because they provide new results on the experience of green tax reforms in six countries.

modernisation of their tax systems by encouraging behaviour conducive to greater protection of the environment and increased labour use¹⁷.

2.3.2. *Effects of environmental tax reforms*

- The ex-post evidence from Nordic countries shows, for instance, that such reforms have a potential to lead to significant overall improvements in energy efficiency and emission reduction, whilst the effect on employment and GDP is neutral or slightly positive. All the Nordic countries carried out important environmental tax reforms in the 1990s with focus on energy and transport tax base. According to studies, energy-related taxes are estimated to have reduced total industrial CO₂ emissions by 9-11 percent between 1992 and 2000 in Denmark. In Sweden it is estimated that 60% of emission reductions between 1987 and 1994 are attributable to the energy tax system. Likewise, in Finland energy taxes are estimated to have decreased CO₂ emissions by 7%, by 1998, compared with a business as usual scenario. In Norway, the contribution of energy taxes to the reduction in CO₂ emissions is estimated to be only 2.3%¹⁸.
- Ex-ante evidence obtained from the abovementioned model-based studies also usually indicates that green tax reforms have a potentially favourable impact on employment.¹⁹ They show that when the revenues accruing from higher energy taxes in the EU are recycled in the form of reductions of the employers' social security contributions, the impacts on employment are always positive. This holds both in the case energy tax increases are modest, and in the case they are sufficiently large to achieve substantial reduction of CO₂ emission in the whole EU. Such positive employment effect is not achieved, in contrast, if the tax revenues are not used to decrease labour costs.

¹⁷ The 1997 proposal for the Energy Taxation Directive even called in its Article 1 for the Directive being implemented at national level in a revenue neutral way, which should, in particular be achieved by reducing statutory charges on labour. While better reflecting the tax competences of the EU, this proposed article was turned down into a suggestion in one of the introductory recycles of the Directive.

¹⁸ See, TemaNord 2006/525 *ibid*.

¹⁹ cf above point 4.1.

3. ENERGY TAXATION

This chapter provides a background that allows to understand the current features of energy taxation and further develops the main aspects and potential impacts of the ways forward with the Directive suggested in the green paper.

3.1. The Energy Taxation Directive

The Energy Taxation Directive is one of the Community market-based instruments. The history of the Directive dates back to 1992, when the EU agreed on common rules for taxation of mineral oils in order to ensure proper functioning of the internal market and eliminate any distortions that national taxes in this area could create. Member States have been using energy taxation for a multitude of objectives, budgetary in the first place. Energy taxation also represents an important stabilising factor in the final price of energy. In practice, energy taxation creates traditionally an incentive towards more efficient consumption of energy. In some cases energy taxes address explicitly as well environmental considerations.

3.1.1. *Basic principles of the Energy Taxation Directive*

3.1.1.1. Scope of taxation

The Directive applies to almost all energy products and electricity when used as motor fuel or heating fuel, thus building on the long term experience with taxation of mineral oils which is common to all Member States, and further extending it, in particular to coal, natural gas and electricity²⁰ ("the newly taxable products").

The Directive does not apply to non-fuel uses of energy products, in particular their use as raw material²¹. In addition, energy products are not taxed when used in the production of energy products (cf. the case of refineries) and when used for electricity generation.²²

3.1.1.2. Minimum levels of taxation

The Directive follows the traditional approach in the field of excises, based on the *principle of the approximation of rates* by means of Community minima so that fewest possible distortions in the internal market occur. They were set at a level reflecting existing realities in Member States. Above the minima Member States remain free to set their national rates as it suits them.

As for all specific taxes levied on a physical unit there is a general disadvantage that their impact is eroded over time and therefore some formula might be needed to maintain their real value (such as indexation to inflation or regular updates of their value). Annex 1 provides an overview of the current real value of the minima in the Energy Taxation Directive.

²⁰ The extension of the scope of Community excise legislation to other products was considered indispensable in order to remove distortions of competition between mineral oils and other competing products on the one hand, and distortions of competition between energy consumers in different Member States taxing or not taxing energy products other than mineral oils.

²¹ Electricity is treated in a similar way.

²² For details of the above, cf. Articles 2(4), 14(1)(a) and 21(3) and (6) of the Energy Tax Directive.

3.1.1.3. Differentiated tax treatment of energy according to use

Energy taxation, reflecting in particular the indispensability aspects, traditionally differentiates between motor fuel and heating fuel uses of energy, and further takes into account in particular business aspects within each category thus allowing more particular tax treatment of certain users.

The differentiated approach towards taxation of motor fuel and heating fuel is reflected in the minimum levels of taxation being set at very different levels. Taxation of fuels for heating purposes and for use as motor fuel in certain industrial and commercial cases (stationary motors in industry, agricultural use) has always been significantly lower than taxation of motor fuels in order not to impose excessive burden on the industry and on heating needs of the population.

3.1.2. *Energy taxation and Community policy objectives*

At Community level, the Directive aims at ensuring minimum common standards and rules throughout the EU (to avoid distortions of competition on the internal market), while leaving sufficient room for Member States to pursue national approaches for example by using CO₂ or other specific taxes as part of their national policies.

In practice this means that it is largely at the discretion of Member States whether or not the incentive effect of energy taxation is present, and similarly, whether environmental aspects of energy consumption are appropriately reflected. The Community has defined very clear objectives in this area. However, as their implementation by means of energy taxation is largely left to national appreciation it often underlies Community State aid assessment.

3.2. **Ways forward: clearer linking of the Energy Taxation Directive to policy objectives**

It would be appropriate to establish a clearer link between the provisions of the Directive and the policy objectives it is meant to integrate, in particular to ensure coherent and uniform incentive for energy efficiency, while however recognising explicitly as well environmental considerations.

3.2.1. *General principles*

Clearer linking of the Directive to the said policy objectives would mean introducing coherent approaches in the Directive that would ensure that taxation always represents an incentive towards energy efficiency without creating any distortions between different energy products on the one hand, while allowing however differentiation based on environmental grounds, thus explicitly recognising the environmental objectives which taxation can serve as well.

- (1) Incentives towards energy efficiency require taxation to be as uniform as possible across the EU and across energy products when they are used as fuel.

The best way to ensure that taxation represents a uniform incentive towards energy efficiency is to tax fuels according to their energy content. Taxation according to energy content is neutral, because the higher the energy content, the lower the consumption necessary to generate the same amount of energy. Taxation according to energy content follows the general idea in the field of excises (the stronger the presence of the taxable substance, the higher the tax). This approach would be to the benefit of both the internal market and energy

efficiency since the need to consume energy in most efficient way applies always, irrespectively from the fuel used.

- (2) Environmental considerations, on the other hand, call for differentiated taxation to reflect the environmental aspects of the fuels under consideration, i.e. emissions generated during their combustion.

Taxing emissions is the most appropriate solution to reflect environmental aspects of fuels. Ideally, taxation should differentiate between greenhouse gas emissions and non-greenhouse gas emissions.

The above approaches could in practice be combined at EU level by identifying minimum levels of taxation both for energy and for environmental purposes. Depending on the actual case in question, this could also be done within the limits of the current minimum levels of taxation.

3.2.2. *Current state of play*

Apart from their use as a motor fuel, the minimum levels of taxation tend, to a certain extent, to be set on the basis of the energy content of the fuels. Currently, the minimum levels of taxation do not reflect the environmental impacts of different fuels and, in most cases, are too low to comprise a real environmental element (although a distinction must be made between motor fuels and heating fuels).

3.2.2.1. Fuels used for heating

Taxation according to the energy content has already been introduced in the heating fuel area for newly taxable products (1 GJ of energy content has been attributed the value of €0,3) and similarly for electricity. For mineral oils, the minimum levels of taxation are not set according to the energy content. Currently, in most cases, the minimum levels of taxation do not reflect environmental considerations (see table A1 in Annex 1).

3.2.2.2. Electricity

Electricity as an energy carrier is a specific case and differs from other energy products. It is the only secondary source of energy taxable under the Energy Taxation Directive.

Electricity is taxable on output and the minimum levels of taxation are set per MWh, at a level comparable to other newly taxable products when used for heating purposes (energy products used in the production of electricity are exempt under the Energy Tax Directive²³).

The output taxation rule for electricity suits indirect tax policy best (by ensuring that taxation occurs in the country of consumption) as well as the needs of the internal market. It does not allow for tax differentiation according to the environmental impacts of electricity production. These can be reflected, on optional basis, by means of additional taxation of inputs used in electricity generation. Environmental aspects of its generation are nevertheless address by EU ETS in most of the cases anyway.

²³ An optional taxation remains possible under certain conditions, set out in Article 14(1)(a) of the Energy Tax Directive.

3.2.2.3. Fuels used for certain industrial and commercial uses

The minimum levels of taxation for fuels used for certain industrial and commercial purposes (such as stationary motors, agricultural use, off-road vehicles), are rather close to the energy content approach existing in the heating area (see table A2 in Annex 1) and cannot be understood as appropriately reflecting environmental considerations (cf. minimum levels of taxation for LPG ad compared to gas oil).

3.2.2.4. Motor fuels

Taxation according to energy content does not at present apply to motor fuels. Motor fuels are traditionally the most heavily taxed category and the current minimum levels of taxation are several times higher than for the other categories of fuels referred to previously. The minimum levels of taxation in fact reflect much more than energy content alone (see table A2 in Annex 1). Moreover, significantly higher minimum levels of taxation applicable to conventional fuels as compared to cleaner natural gas and LPG would imply that the minima also reflect environmental considerations.

3.2.3. *Practical implications of linking the Energy Taxation Directive to policy objectives*

Differentiation between energy and environmental counterparts of the minimum levels of taxation would have several practical implications. The most important ones are further mentioned below.

3.2.3.1. Coherent approach

As a principle, all fuels would be taxed according to their energy content in a uniform way and, in addition, each fuel would be taxed on their own “merits” in terms of actual emissions. Coherent taxation according to the energy content would in the first place remove all persisting distortions of competition between different energy products, particularly in the field of heating (see table A1 in Annex 1).

Within this approach there would however be a need for further differentiation according to use, thus reflecting the indispensability and competitiveness aspects as is the case now.

The existing differentiated approach towards taxation of energy according to use, would in practice require that 1 GJ of energy having different monetary value depending on the use of energy. Such differentiated treatment is most pronounced while comparing motor fuel and heating fuel use of energy products.

It has to be stressed that the minimum levels of taxation were originally set to approximate as much as possible the existing national tax rates to avoid distortions in the internal market. Taxation of motor fuels is a traditional and stable source of revenue for Member States and the higher minimum levels of taxation for motor fuel follow suit and reflect such practice.

There might, however, also be several policy reasons that could justify that such a differentiated approach continues:

- Indispensability and competitiveness aspects (that would call for not aligning the minimum levels of taxation for heating on those applicable for motor fuels)

- Growing environmental impact of transport (that would call for not aligning the minimum levels of taxation for motor fuels with those applicable for heating fuel use).
- The almost total dependency of transport on imported oil (the higher value of the respective minimum levels of taxation can be understood as containing a certain security of supply premium).

3.2.3.2. Environmental aspects

While taxation according to energy content is rather easy to introduce, particularly in the heating area, taxation according to environmental impact would require clear guidelines on the environmental aspects of different fuels. Such taxation would clearly have to take into account the greenhouse gas emissions. Potentially, taxation could as well specifically address the non-greenhouse gas emissions.

It seems to be an open question whether differentiation according to use shall as well apply for taxation according to environmental considerations.

Traditionally, national emission taxes (such as CO₂ taxes levied under the Directive) address combustion emissions only indirectly as they are levied on the quantity consumed. The same approach should be followed in the Directive itself. This would allow minimum levels of taxation to continue to be expressed in the units currently set out in the Directive

Given that the minimum levels of taxation are set for the main fuel categories only (and these are always fossil fuels) and other products are taxed by analogy, this would make introduction of the environmental counterpart easier. It would first of all require setting appropriate minimum levels of taxation for the main fuel categories²⁴. For fuels with proven environmental benefit, the (relevant) environmental counterpart of the minimum levels of taxation would not apply.

In practical terms identification of an environmental element in the minimum levels of taxation would allow, compared to the current situation, for more automatic and straightforward tax differentiation in favour of more environmentally-friendly energy sources, notably renewables, in a coherent way.

This approach would have several advantages:

- It would align the Community tax policy on Community objectives to promote renewable energies. As the current approach in the Directive depends largely on national discretion, it is subject to State aid appreciation to ensure that competition is not distorted.
- Due to the specific taxation rules mostly relevant for motor fuels (see box), the new approach would be of particular importance for promotion of biofuels in transport. As recently stated by the Commission, biofuels are currently the only form of renewable energy that can address the energy challenges of the transport sector, including its almost

²⁴ For example in terms of CO₂ emissions, the main fuel categories perform in the following way: 1 GJ of energy corresponds on average to 0,09 tonnes of CO₂ generated in the case of coal,, to 0,07 tonnes of CO₂ for heating gas oil and heavy fuel oil, and to 0,06 tonnes of CO₂ for LPG, kerosene and natural gas.

complete reliance on oil and the fact that greenhouse gas reductions in this sector are particularly difficult to obtain²⁵.

- Still in the transport field, the new approach would remove differentiation between "alternative fuels" such as LPG and natural gas on the one hand²⁶ and renewables on the other²⁷. The new approach would ensure that taxation always represents an incentive towards energy efficiency, while at the same time directly promoting more environmental friendly fuels (by means of "isolating" the environmental aspects of taxation and applying them only where justified).

Energy taxation and renewables

The Energy Taxation Directive applies primarily to hydrocarbons (in line with the approach adopted back in the time when the original proposals for harmonisation of excise duties on mineral oils were presented). Renewables are in most of the cases (except for vegetable oils) not considered as energy products. However they can become taxable by analogy:

- Since energy taxation does not apply to non-hydrocarbons used in **heating**, it indirectly favours the use of biomass for heating purposes. Energy taxation would however apply for example to biogas used in heating, since biogas is hydrocarbon. By analogy the relevant tax rate would be the one applicable at national level to natural gas.
- A different approach exists for **motor fuels**. Despite the objective to tax primarily hydrocarbons, to avoid distortions of the tax base, taxation equally applies to all additives, extenders or substitutes for hydrocarbons. These can easily be of renewable origin. As a consequence, renewables used in transport are treated for tax purposes in the same way as equivalent fossil fuels, thus prioritising the fiscal aspects over any other policy considerations. While proposing this rule in 1990, the Commission was however conscious that such an approach might not be appropriate forever: *"Future developments, particularly in the area of more environment friendly motor fuels may demand that the taxation of such fuel will have to be reconsidered in time"* (cf. COM(1990) 434 of 7 November 1990). The optional tax differentiation in favour of biofuels introduced in 2003 with the adoption of the Energy Taxation Directive left the general rule unchanged. In relation to the current policy development on the area of renewables, the reconsideration or not of the existing general rule might be useful.

Currently, the Member States can therefore favour renewables on voluntary basis only, by means of optional tax reductions and tax exemptions. These however depend on national discretion and are subject to Community State aid approval.

3.2.3.3. The case of electricity

Energy taxation does not address the environmental aspects of electricity generation. Taking into account that most electricity production is currently covered by EU ETS, therefore there is no need to set minimum levels of taxation for the same environmental purpose. The general rule for taxation of electricity does not even effectively allow doing that.

²⁵ COM(2006)848 of 10 January 2007 Renewable Energy Road Map. Renewable energies in the 21st century: building a more sustainable future.

²⁶ LPG and natural gas can be fully exempt from taxation if used as propellant.

²⁷ Renewables can be exempt from taxation up to the difference between their production costs and the production costs of equivalent fossil fuel.

However there might be a need to tackle the remaining environmental impacts of electricity production, in particular in those cases when small installations fall outside the scope of EU ETS. This could be done by means of obligatory environmental taxation of the inputs. Such an approach would create a comprehensive framework for up take of electricity of green origin, including for small scale production. The current optional provision allowing to exempt from energy taxation electricity of renewable origin would run dry in this context.

Simultaneously, such a comprehensive approach would further confirm the already existing incentive of the EU MBI framework for nuclear energy. That has indisputable negative impacts on the environment as well. Although national approaches towards nuclear energy differ substantially, it is a question whether nuclear electricity should be subject to the same framework as renewable electricity; this is the case now to some extent since EU ETS addressing CO2 emissions from fossil fuels is inapplicable to both categories and because none of them can be subject to the optional additional taxation on input (cf. Article 14(1) of the Energy Taxation Directive)²⁸.

3.2.3.4. More effective energy taxation

Taxation according to the energy content would lead to an adjustment in the current minimum levels of taxation. Such adjustments could be both upwards and downwards²⁹. For example should the value of 1 GJ of energy content should be set as starting point at €0,3 per 1 GJ for heating purposes (equal to the current non-business rate for natural gas and coal³⁰), €0,6 for certain industrial and commercial uses of motor fuels and €2,6 per 1GJ of energy content for motor fuels used as propellant.

The environmental element of the minima would be added on top of the energy content, possibly within the current minima, or on top of them. However, the environmental element of the minima would not apply to fuels with proved environmental benefit and for situations addressed by other Community instruments.

All in all, the current minimum levels of taxation should serve as starting point for any potential adjustments. Such adjustments should avoid an overall decrease of the level of taxation (to maintain both the current incentive effect of taxation, i.e. to reduce consumption, and the current level of revenue). The final outcome of such adjustments cannot be easily predicted and would depend on several factors. But it would make energy taxation more ambitious and effective where justified in terms of policy objectives. The exact determination of the actual levels of taxation would need to be examined in detail, while taking into account all relevant aspects.

²⁸ It remains, though, that the possibility under Article 15(1)(b) of the Energy Taxation Directive to totally or partially exempt electricity produced from certain renewables has no parallel in the field of electricity produced through nuclear generation.

²⁹ The 1997 proposal that became later the Energy Taxation Directive had foreseen minimum levels of taxation for heating purposes in the amount of €0,7 per 1 GJ, and €1,1 per 1 GJ for motor fuels used in certain industrial and commercial cases.

³⁰ As regards the “correct value” of the energy content, it must be pointed out that the levels of taxation were set at a rather low level for those products that became taxable for the first time in 2004. The objective however is that the levels of taxation would be progressively aligned on those applicable to mineral oils as, otherwise, distortions of competition on the internal market (the primary reason for extending the scope of the tax legislation) would not be removed. Therefore the rate shown in the non-business column above and, in particular, the rate applicable to heavy fuel oil (the most common equivalent mineral oil when it comes to business use) could serve as reference point.

3.2.3.5. Energy taxation and other Community market-based instruments

And finally, splitting the minima, i.e. a clearer identification of the purpose of energy taxation at EU level, would, compared to the current situation, allow for easier application of energy taxation alongside other market-based instruments, and would favour an efficient Community mix of such instruments (cf. chapter 3.3).

3.3. Interaction of energy taxation with other market-based instruments

Of the different Community market-based instruments existing in the field of energy, transport and environment, energy taxation is perhaps the most cross-cutting with impacts in all three areas and directly interacting with all other instruments.

Clearer linking of energy taxation at EU level to the policy objectives it seeks to serve would make the interaction of energy taxation with other market-based instruments much easier at Community level and would also allow for energy taxation to be a more effective instrument for policy makers (more ambitious and better structured).

In particular including an environmental element in the minimum levels of taxation (potentially differentiating between greenhouse gas emissions and non-greenhouse gas emissions) would allow for clearer linking between energy taxation and infrastructure charges (non-greenhouse gases) on the one hand, and, similarly, between energy taxation and emission trading at EU level (greenhouse gases). This would allow that always only one instrument is applied for the same purpose and with the same scope within the Community.

3.3.1. Interaction between energy taxation and EU ETS

The Energy Taxation Directive already foresees options according to which taxation can be fully or partially replaced when tradable permit schemes are implemented in order to achieve environmental protection objectives or improvements in energy efficiency. It has been argued that this raises questions of overlap between the EU ETS and energy taxation.³¹

The green paper suggests that the best option to avoid problems of the kind , would be to establish clearly circumscribed taxation elements and to attribute them to specific purposes. In the same context, it should be ensured that there is no overlap at any moment between the two instruments with regard to the same purpose and scope.

Scope of EU ETS and the Energy Taxation Directive

The EU ETS applies currently to emissions from certain combustion and industrial *installations*:

- Energy production: combustion installations with a rated thermal input exceeding 20 MW (excepting hazardous or municipal waste installations power plants), mineral oil refineries, coke ovens
- Production and processing of ferrous materials (iron and steel production)
- Mineralogical industry (from certain capacity threshold upwards)

³¹ Independently from the discussion about the Energy Tax Directive, it must be borne in mind that tax exemptions or reductions have to comply with the Treaty rules on State aids.

- Other activities: industrial plants for the production of pulp from timber or other fibrous materials, industrial plants for the production paper and board with a production capacity exceeding certain threshold)

Energy taxation, meanwhile, applies instead to *fuel uses of energy*³², while leaving the most energy intensive sectors (currently covered by EU ETS) outside its scope in an important number of cases. Apart from that energy taxation does not apply to energy products used in the production of energy products (most commonly in the case of refineries) or as inputs for electricity generation.

3.3.2. *Interaction between energy taxation and user charging*

The Energy Tax Directive already foresees a link with infrastructure charging, under strict conditions for the purposes of commercial transport.³³ . According to this option, Member States with special tax rates applicable to commercial use of gas oil used as propellant can, above the minimum levels of taxation, combine taxation and infrastructure charging in a way so not to raise the overall burden imposed on the hauliers.

Clear identification of the non-greenhouse gas component of the minimum levels of taxation could further leave the option open for the future potential linking of some local pollution aspects of the relevant motor fuel taxation and the Eurovignette directive at EU level.

³² In particular energy taxation does not apply to energy products (and electricity) used as raw materials in industrial processes

³³ In its recent commercial diesel proposal the Commission has proposed to make the interaction more easily applicable for Member States. Cf. *Proposal for a Council Directive amending Directive 2003/96/EC as regards the adjustment of special tax arrangements for gas oil used as motor fuel for commercial purposes and the coordination of taxation of unleaded petrol and gas oil used as motor fuel* COM (2007) 52 of 13 March 2007 .

4. SCOPE FOR THE USE OF MARKET-BASED INSTRUMENTS UNDER VARIOUS COMMUNITY DIRECTIVES ON ENVIRONMENTAL POLICY

The Directives on batteries, on packaging waste and the water framework directive include provisions concerning the use of market-based instruments, as follows:

The **Directive on batteries** and accumulators and waste batteries and accumulators³⁴, provides Member States with the possibility to use market-based instruments to promote the collection of waste batteries and accumulators or to promote the use of batteries and accumulators containing less polluting substances, for instance by adopting differential tax rates (Article 9). It stipulates that if they do so, they shall notify the measures related to the implementation of those instruments to the Commission.

The **Directive on packaging and packaging waste**³⁵ provides for the Council to adopt on the basis of the relevant provisions of the Treaty, market-based instruments to promote the implementation of the objectives set by this Directive (Article 15). In the absence of such measures, the Member States may, in accordance with the principles governing Community environmental policy, inter alia, the polluter-pays principle, and the obligations arising out of the Treaty, adopt measures to implement those objectives.

The **Water Framework Directive**³⁶ clearly integrates economics into water management and policy making. To achieve its environmental objectives in the most effective manner (i.e. good water status for all waters), it calls for, inter alia, the consideration of market-based instruments (e.g. water pricing) to ensure the recovery of costs, including environmental and resource costs (Article 9). By 2010, pricing policies should be in place to ensure adequate incentives for efficient water use. All users are to contribute adequately to this, and industry, households and agriculture are explicitly mentioned. Member States are to report on measures in their river basin management plans, due by 2009. They can abstain from applying pricing policies of this type if this does not compromise the achievement of the objectives of the directive. In this case, they shall explain the reasons in their river basin management plans.

The Directive also specifies (in an annex) the type of economic analysis which is to be at the basis of the cost recovery systems to be introduced. The analysis will be based on long-term forecasts for supply and demand for water and will include the volumes and costs of water services and investment requirements as well as the cost of data collection for this analysis³⁷. Furthermore, cost-effectiveness must be demonstrated when establishing the programme of measures. Taken together, the WFD has introduced market-based (or economic) instruments as an integral part of sustainable water management.

For the legal text of the relevant provisions, please see Annex 2.

³⁴ Directive 2006/66/EC of 6 September 2006.

³⁵ Directive 2004/12/EC of 11 February 2004 amending Directive 94/62/EC.

³⁶ Directive 2000/60 of 23 October 2000.

³⁷ For more details, see: Common Implementation Strategy for the Water Framework Directive, Guidance Document No 1, Economics and the Environment – The Implementation Challenge of the Water Framework Directive, 2003.
http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/framework_directive/guidance_documents/guidancesnos1economics/_EN_1.0_&a=d

5. FURTHER INFORMATION ON SOME EXAMPLES OF MARKET-BASED INSTRUMENTS IN ENVIRONMENTAL POLICY

This section provides more detail on several of the market-based instruments introduced by Member States in the area of environmental policy that are referred to in chapter 4 of the green paper. The information is based on two reports by the European Environmental Agency³⁸.

London's congestion charge

A congestion charge was introduced in central London in February 2003. The main aim of the scheme was not environmental, but to reduce traffic congestion in and around the charging zone. It was noted that, on average, vehicles spent half their time in queues, and that the average speed was only 15 km/hour. The charge was also expected to raise revenues to improve transport in London more generally. Vehicles entering, or parked on the streets in central London on weekdays during the day (7.00 to 18.00) are subject to a GBP 5 daily charge, which can be paid electronically. The charging zone covers 40 km² (since February 2007). Certain vehicles, for example taxis, motorcycles, buses and alternatively fuelled vehicles, are exempt from the charge, while some users, for example residents and the disabled, benefit from discounts.

A review of the charging system undertaken by Transport for London in June 2006 found that congestion within the charging zone has reduced by 26 % and the volume of traffic by 15 %, and that there was no sign of significant adverse traffic effects outside the zone. Bus services in the zone have improved and public transport, more generally, has coped with the displaced car users, although some users dispute this. The evidence suggests that the charge has had little direct negative impact on business, but has had benefits in terms of environmental amenity and reduced traffic emissions.

UK landfill tax

The United Kingdom generates about 29 million tonnes of municipal solid waste a year and in 2002 approximately 77 % of this went to landfill.

The United Kingdom introduced the landfill tax in 1996 with the intention of internalising the externalities associated with landfill. The initial tax rate was derived from assessments of external costs, and based on consultations with industry, local authorities and environmental groups.

The tax is applied to all waste that is disposed of at licensed landfill sites, although there are some exemptions. There are two rates of tax, a lower rate of GBP 2 per tonne that applies to inert/inactive waste (typically construction waste) and a standard rate applicable to all other types of waste, originally GBP 7 per tonne, increasing by GBP 1 per tonne each year. From 2005/06, to help reaching the targets of the Landfill Directive, the standard rate is set to rise by at least GBP 3 per tonne per year until it reaches GBP 35 per tonne. The rate in 2005 was GBP 15 per tonne.

³⁸ EEA Report No 1/2006. Using the market for cost-effective environmental policy. Market based-instruments in Europe EEA Technical report No 8/2005. Market-based instruments for environmental policy in Europe.

Some revenues have been earmarked for waste management research and investment projects in landfill areas. The UK Treasury is working on mechanisms to earmark revenues from the increasing tax to help business address issues of waste management, in particular approaches to improve resource efficiency through waste minimisation.

Danish packaging tax

The tax on packaging introduced in 1999 replaced another, more narrowly defined tax, which only applied to bottles and jars. The old tax was volume based and applied only to liquids such as drinks, vinegar, edible oil and methyated spirits.

From 1999, the packaging tax was broadened so as to include sales packaging and multi-packs with volumes of less than 20 litres for the packaging of specific articles. Initially, the tax remained based on weight, irrespective of the character of the packaging material.

The aim of 'fiscal equality' of materials was changed in the revision of the tax in 2001, when the government decided that the environmental impact of different packaging materials should be reflected in the tax rate. Originally the same for all materials, tax rates were then differentiated on the basis of an index of environmental impact, CO₂ emissions, primary energy use, fossil resource use and waste, with glass as the benchmark. Different rates were applied to one-trip and multi-trip packaging, with the tax base being the weight for the former and the volume for the latter. This reflects the fact that multi-trip packaging generally needs to be heavier to withstand the handling associated with such packaging.

The Irish plastic bag levy

Prior to the introduction of this levy, some 1.2 billion plastic shopping bags were provided annually free of charge to Irish consumers (about 325 bags per person per year). They were a highly visible component of litter and had negative impacts on habitats and wildlife. The possibility of an Irish plastic bag levy had been on the political agenda since 1994 and the levy was finally introduced in March 2002 as a point-of-sale charge. The levy was fixed at EUR 0.15 per bag (to rise to EUR 0.22 from July 2007 onwards), which was thought to be sufficiently high to stimulate consumers to avoid paying by bringing their own 'permanent' reusable shopping bags with them. There was no attempt to identify the marginal external costs and determine the optimum level of tax. Retailers have reported a reduction of over 90 % in the provision of disposable plastic bags since the levy's introduction, amounting to around 1 billion plastic bags.

The revenues from the levy have been assigned to a new environmental fund and are used for a variety of purposes such as to defray the costs of administration, support and promote any programmes established for the prevention or reduction of waste, and research and development in the waste area. The costs to the government are modest. Furthermore, retailers are facing lower costs because they do not have to purchase the plastic bags which were provided free of charge.

The design of the levy is simple and transparent, and immediate environmental benefits are discernible because there is less litter on the streets. Own bags can easily be used as substitutes for plastic bags and this is also responsible for the success. The experience gained in Ireland has led several other countries and regions, such as Australia, the United Kingdom and New York City, to discuss the introduction of such a levy.

In this relation it has to be pointed out that the Irish plastic bag levy is a classical example of a tax that was introduced purely for environmental purposes and lacks the traditional revenue generating feature of a tax.

6. HABITAT BANKING

Habitat banking is a term used for generic, flexible and market-based compensation mechanisms concerning ecological compensation³⁹.

The instrument emerged in the US in the early 1990s in response to new requirements ('no-net-loss' policy) concerning the compensation of damages to habitats resulting from planned projects. As a consequence, habitat banks are not (or barely) involved in the ex-post handling of environmental damages but ensure compensatory measures to offset damage to habitats through projects ex ante.

Nevertheless, the mechanisms developed could be easily transposed to ex-post handling of environmental damages requiring ex-post assessment and compensation: this is the idea of private service providers 'selling' equivalent damage remediation schemes, and the techniques required for ex-post handling (equivalency and discounting methods) are similar to those required for ex-ante handling⁴⁰.

Up to a point, some existing EU experiences could be classified as following the concept of habitat banking. This concerns measures, such as the German "compensation pools", which, on a local or regional scale, provide a pool of compensation measures to the "damager" of habitats⁴¹. The main difference is that clearly opting for 'habitat banking' would mean facilitating the creation of a real 'market', on which remediation would be sold as any other service.

Habitat banking provides for advantages from both environmental and economic points of view. In most cases, the use of off-the-shelf projects should allow the cost for operators to be lower and the whole implementation to be much quicker and easier.

However, with habitat banking, the stakeholders who actually suffered from the damage might get lower direct compensation. Rather, projects are likely to be implemented and to produce environmental benefits 'elsewhere', i.e. farther from where the damage occurred. Simultaneously, other people, closer to the final implementation place of such projects, will benefit from a better environment. From an individual point of view, the operation is not neutral and there are distributional impacts which address the issues of social and environmental equity.

Nevertheless, if one is allowed to follow a relaxed approach on the link between the original damage and the location of the complementary and compensatory remediation, it will be easier to recycle resources to remediate, on an alternative site, 'similar' previous damages of a particularly high environmental value and interest. These advantages may justify why priority is not given to geographical proximity.

³⁹ National Oceanic and Atmospheric Administration. 2000. *Habitat Equivalency Analysis: An Overview*. Prepared for the National Oceanic and Atmospheric Administration, Damage Assessment and Restoration Program. Revised October

⁴⁰ DeVault, D.S., D. Laugland, and J. Charbonneau. 2003. Habitat Equivalency Analysis in Complex Environments. Presented at the Society of Environmental Toxicology and Chemistry 24th Annual Meeting In North America. November.

⁴¹ Their institutional structure is akin to the wetland mitigation banks in the US

Other Community legislation, in particular the Habitats Directive⁴², which requires compensation in the form of habitat creation in new sites after a damaging development project causes deterioration of a site in the Natura 2000 network, follows strict habitat definitions and classifications, which makes the scope for using a relaxed habitat banking approach as described above limited.

⁴² Directive 92/43/EEC.

7. THE NEED FOR MORE CO-ORDINATION WITHIN THE COMMUNITY

This paper demonstrates that in areas where no Community instrument exists for achieving common goals, there might be a need for more Community co-ordination when it comes to the use of MBI by Member States. The need for co-ordination and exchange of best practices might exist for environmental tax and fiscal reforms and, more generally, for all possible common goals relevant to the present context.

This soft approach – or other similar methods of co-operation between the Commission and Member States, such as those undertaken in the context of ETAP- could prove useful in the area of market-based instruments to allow MS to exchange best practices and to make some progress towards a joint approach. The green paper raises the question whether an MBI forum could be a tool for closer co-co-ordination.

ANNEX 1 – MINIMUM LEVELS OF TAXATION

Table 1 provides a comparison of the evolution of the minimum tax rates and inflation for mineral oils, reflecting the corresponding EUROSTAT inflation rate for the period 1993 – 2005⁴³.

Table 1: review of the minima

	1992 minima	Today's value of the 1992 minima	2003 minima	Today's value of the 2003 minima
Motor fuel use				
petrol (1000l)	287	378	359	374
diesel (1000l)	245	323	302	314
LPG (1000 kg)	100	132	125	130
kerosene (1000l)	245	323	302	314
Motor fuel use (certain commercial and industrial uses)				
diesel (1000l)	18	24	21	22
kerosene (1000l)	18	24	21	22
LPG (1000 kg)	36	47	41	43
Heating fuel use				
Gas oil (1000l)	18	24	21	22
heavy fuel oil (1000 kg)	13	17	15	16
kerosene (1000l)	0	0	0	0
LPG (1000 kg)	0	0	0	0

1992 minima = minimum levels of taxation set in the Mineral Oils Directive

2003 minima = minimum levels of taxation set in the Energy Taxation Directive

⁴³ All figures are rounded and refer to inflation in the EU-15

ANNEX 2 - ENERGY CONTENT OF FUELS

Heating fuels

Table A1: Energy content of heating fuels and minimum levels of taxation per 1 GJ of energy content

	1 GJ of energy content corresponds to	Minimum levels of taxation per 1 GJ (non-business use)	Minimum levels of taxation per 1 GJ (business use)
heating gas oil (1 GJ)	28 l	0,616	0,616
heavy fuel oil (1 GJ)	25 kg	0,375	0,375
kerosene (1 GJ)	25 l	0	0
LPG (1 GJ)	22 kg	0	0
natural gas (1 GJ)	25 m ³	0,3	0,15
coal (1 GJ)	40 kg	0,3	0,15

(Source: Commission services)

By expressing the current minima in terms of their value per 1 GJ of energy content for all heating fuels, the table confirms the findings mentioned earlier: newly taxable products are taxed at lower rates compared to mineral oils, on the other hand, zero minimum levels of taxation for LPG and kerosene are in consequence distorting.

The significantly higher minimum levels of taxation for heating gas oil must be interpreted with caution, as some Member States are still authorised to apply a monitoring charge only to this product. The amount of the monitoring charge is €10 per 1000l which roughly corresponds to €0,3 per 1 GJ of energy content. In practice, there is not much difference between the monitoring charge and effective minimum levels of taxation for gas oil equal to €10 per 1000l and therefore similar to value of 1 GJ of energy content of most of the other heating fuels. The only difference is that only very few Member States are allowed to apply such “reduced minimum levels of taxation” to heating gas oil.

As regards the “correct value” of the energy content, it must be pointed out that the levels of taxation were set at a rather low level for those products that became taxable for the first time in 2004. The objective however is that the levels of taxation would be progressively aligned on those applicable to mineral oils as, otherwise, distortions of competition on the internal market (the primary reason for extending the scope of the tax legislation) would not be removed. Therefore the rate shown in the non-business column above and, in particular, the rate applicable to heavy fuel oil (the most common equivalent mineral oil when it comes to business use) could serve as reference point.

Motor fuels

Hypothetically, 1 GJ of energy content would have the following value in terms of the minimum levels of taxation:

Table A2: energy content of motor fuels and minimum levels of taxation per 1 GJ of energy content

	GJ of energy content per 1000 units	Use as propellant Minimum levels of taxation per 1 GJ	Article 8 Minimum levels of taxation per 1 GJ
petrol (1000l)	34,9	10,3	-
diesel (1000l)	35,7	8,5	0,6
kerosene (1000l)	34,5	8,7	0,6
LPG (1000 kg)	46	2,7	0,9
natural gas (1 GJ)		2,6	0,3

(Source: Commission services)

It results from the table that for certain industrial and commercial uses (Article 8 of the directive), the minimum levels of taxation are rather close to the energy content approach adopted in the heating area (which confirms that competition considerations governed the setting of minimum rates in these two fields). The minimum levels of taxation set for natural gas are exactly the same as for non-business use of natural gas for heating purposes. Again, the table confirms rather the cautious introduction of taxation on new products (natural gas) compared to tax treatment of mineral oils. It however appears from the table an inconsistency in tax treatment of LPG for propellant and industrial use. Ideally the tax rate for LPG should be close to the rate for natural gas (which seems to be the case for propellant use).

As regards the “correct value” of the energy content in this case, it must be pointed out that the levels of taxation were set at a rather low level for the products that became taxable for the first time in 2004 with the aim of progressively raising them to the levels of taxation applicable to mineral oils as otherwise distortions of competition on the internal market (the outermost reason for the extension of the scope of the tax legislation) would not be removed. Therefore rather the value of €0,6 per 1 GJ of energy content could serve as reference point.

As far as use of motor fuels as propellant is concerned, the table confirms that the minimum levels of taxation in most of the cases (conventional motor fuels) reflect much more than simply the energy content of the fuels. Taking into account that for motor fuel use LPG and natural gas are considered much more environmental friendly compared to conventional fuels, it might be considered that the current minimum levels of taxation applicable to natural gas could represent the energy content equivalent of the minima.

Electricity

The directive establishes the output taxation rule for electricity as this rule suits indirect tax policy best (it ensures easily that taxation accrues to the country of consumption) and the needs of the internal market. It does not allow for tax differentiation according to the environmental impacts of its production. This rule however allows for tax differentiation according to the consumer (business, non-business) in line with the approach adopted for other newly taxable products.

The minimum levels of taxation are set for electricity at the level of €1 per 1 MWh; comparable to harmonised rates applicable to 1 GJ of energy content of natural gas and coal. The minimum levels of taxation differentiate between business and non-business use.

Table A3: Minimum levels of taxation for electricity

	Minimum levels of taxation per 1 MWh (non-business use)	Minimum levels of taxation per 1 MWh (business use)
Electricity	1,0	0,5

**ANNEX 3 - RELEVANT LEGAL PROVISIONS ON THE USE OF MARKET-BASED INSTRUMENTS
UNDER VARIOUS COMMUNITY DIRECTIVES ON ENVIRONMENTAL POLICY**

*Directive 2000/60/EC of 23 October 2000 establishing a framework for Community action in
the field of water policy*

Article 9

Recovery of costs for water services

1. Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs, having regard to the economic analysis conducted according to Annex III, and in accordance in particular with the polluter pays principle.

Member States shall ensure by 2010

- that water-pricing policies provide adequate incentives for users to use water resources efficiently, and thereby contribute to the environmental objectives of this Directive,
- an adequate contribution of the different water uses, disaggregated into at least industry, households and agriculture, to the recovery of the costs of water services, based on the economic analysis conducted according to Annex III and taking account of the polluter pays principle.

Member States may in so doing have regard to the social, environmental and economic effects of the recovery as well as the geographic and climatic conditions of the region or regions affected.

2. Member States shall report in the river basin management plans on the planned steps towards implementing paragraph 1 which will contribute to achieving the environmental objectives of this Directive and on the contribution made by the various water uses to the recovery of the costs of water services.

3. Nothing in this Article shall prevent the funding of particular preventive or remedial measures in order to achieve the objectives of this Directive.

4. Member States shall not be in breach of this Directive if they decide in accordance with established practices not to apply the provisions of paragraph 1, second sentence, and for that purpose the relevant provisions of paragraph 2, for a given water-use activity, where this does not compromise the purposes and the achievement of the objectives of this Directive. Member States shall report the reasons for not fully applying paragraph 1, second sentence, in the river basin management plans.

...

ANNEX III

Economic analysis

The economic analysis shall contain enough information in sufficient detail (taking account of the costs associated with collection of the relevant data) in order to:

(a) make the relevant calculations necessary for taking into account under Article 9 the principle of recovery of the costs of water services, taking account of long term forecasts of supply and demand for water in the river basin district and, where necessary:

- estimates of the volume, prices and costs associated with water services, and
- estimates of relevant investment including forecasts of such investments

(b) make judgements about the most cost-effective combination of measures in respect of water uses to be included in the programme of measures under Article 11 based on estimates of the potential costs of such measures.

Directive 2004/12/EC of 11 February 2004 amending Directive 94/62/EC on packaging and packaging waste

Article 15

Economic Instruments

Acting on the basis of the relevant provisions of the Treaty, the Council adopts economic instruments to promote the implementation of the objectives set by this Directive. In the absence of such measures, the Member States may, in accordance with the principles governing Community environmental policy, inter alia, the polluter-pays principle, and the obligations arising out of the Treaty, adopt measures to implement those objectives.

Directive 2006/66/EC of 6 September 2006 on batteries and accumulators and waste batteries and accumulators

Article 9

Economic instruments

Member States may use economic instruments to promote the collection of waste batteries and accumulators or to promote the use of batteries and accumulators containing less polluting substances, for instance by adopting differential tax rates. If they do so, they shall notify the measures related to the implementation of those instruments to the Commission.