



DYNAMIX

Decoupling growth from resource use
and environmental impacts

Report on qualitative assessment of social impacts



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DYNAMIX PROJECT PARTNERS



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List of Abbreviations

ARI	Acute respiratory infections
BaP	Benzo-a-pyrene
CAP	Common Agricultural Policy
EC	European Commission
EPR	Extended Producer Responsibility
EU-SILC	EU statistics on income and living conditions
GHG	Greenhouse gases
LULUCF	Land Use, Land Use Change and Forestry
NECD	National Emissions Ceilings Directive
OHCHR	Office of the High Commissioner for Human Rights
PES	Payment for Ecosystem Services
PM	Policy mix
SNAP	Selected Nomenclature for Air Pollution
WP	Work Package

1 Introduction

This report presents the results of a qualitative social impact assessment of the policy mixes developed in the DYNAMIX project (Ekvall et al. 2015). In total, 21 policy instruments from three policy mixes were assessed:

- **Land policy mix**
 - Stronger and more effective environmental and climate dimension for EU land management in the CAP
 - Revised emissions levels in the National Emissions Ceilings Directive (NECD) and additional measures for better management of the nitrogen cycle on farmland
 - Promotion of “Payment for Ecosystem Services” programmes
 - Regulation for Land Use, Land Use Change, and Forestry
 - Strengthened pesticide reduction targets under the Pesticides Directive, and provision of guidance to farmers on integrated pest management
 - Targeted information campaign to influence food behaviour towards: reducing food waste and changing diets
 - Development of food redistribution programmes/food donation
 - VAT on meat products
- **Metals policy mix**
 - Green fiscal reform: internalisation of external environmental costs
 - Green fiscal reform: materials tax
 - Promotion of sharing systems
 - Increased spending on research and development
 - Product standards
- **Overarching policy mix**
 - Circular Economy tax Trio
 - EU-wide introduction of feebate schemes for selected products categories
 - Reduced VAT for the most environmentally advantageous products and services
 - Boosting extended producer responsibility
 - Skill enhancement programme
 - Enabling shift from consumption to leisure
 - Step-by-step restriction of advertising and marketing
 - Local currencies for labour-based services

Chapter 2 presents the scope of assessment, including the description of conceptual framework and scoring system used in the report.

Chapter 3 contains detailed description of assessment results for three types of social impacts, related to labour market (subchapter 3.1), health (subchapter 3.2), and social inclusion (subchapter 3.3).

The report concludes with chapter 4, which presents overview of the assessment results, as well as pointers for revisions of the assessed policy mixes.

2 Scope of the assessment

This section describes the scope of the social impact assessment. It describes the approach to the selection process of social impacts to be qualitatively analysed in this report (section 2.1), presents the impacts selected (section 2.2) and the resulting conceptual framework of the report (section 2.3). It also describes a human rights approach to the social impacts assessment (2.4), which is a starting point for an in-depth analysis on each of the key impacts selected in the following chapters.

2.1 Methodological approach to the selection of impacts to be analysed

The following approach was taken in order to select the social impacts to be analysed.

- 1) A **long list of possible social impacts** was adopted from the impact assessment guidelines developed by the European Commission (European Commission 2009a). These guidelines were chosen as a starting point, as they cover a wide range of social impacts and provide consistency with the current framework of the European policymaking.
- 2) The long list of possible social impacts was combined with the full list of policy instruments prepared under WP4 to create a **social impact matrix**. The matrix provided a framework for the systematic screening of possible social impacts across all the policy mixes. Two researchers from WISE and FEEM qualitatively assessed the strengths of all the possible social impacts for all of the policies: the matrix was filled with the following scores: “0” (no impact), “1” (some impact), “2” (significant impact) or “3” (great impact). The final social impact matrix was computed by averaging the scores from the individual assessments, after a discussion on the differences between them.
- 3) The scores from the social impact matrix were used to identify a **short list of three key social impacts to be assessed**, taking into account the list of policy instruments selected for assessment in WP5, as well as possible overlaps with other tasks in Work Packages 5 and 6.

By establishing a long list of potential impacts and then selecting the several most important ones, this approach ensures a balance between comprehensiveness (i.e. it allows us to check whether an important type of impact has been omitted) and practicality (i.e. it allows us to focus the assessment and recommendations on the key social issues related to the policy mixes).

2.2 The impacts selected

The key results from the social impact matrix analysis are presented in tables 1 and 2.

Table 1 presents an aggregated social impact matrix, which was computed by taking average scores for each type of social impact and policy mix. Types of social impacts are listed in descending order based on the average score for all policy mixes. Detailed discussions on the nature of impacts (i.e. whether they are positive or negative) is presented in the following chapters.

The greatest impacts of the policies selected for analysis in WP5 are associated with public health and safety issues. The greatest impact was indicated for the metals policy mix, as 4 out of 5 policies from this mix were identified as having the potential to significantly affect health-related issues, and one (taxing externalities) offers incentives directly linked to the health impacts of resource use. One exception was support for R&D, which does not provide direct incentives to change production and consumption patterns affecting public health via changing levels of production-related pollution. The high health impact score of the land use mix is mainly explained by its potential effects on nutrition. Comparatively, the low average health impact score of the overarching policy mix stems from the inclusion of several policies which do not significantly affect public health (e.g. skill enhancement programme).

Social impacts related to employment and labour markets ranked second, while issues of job quality were ranked fourth. The highest employment-related impacts were associated with overarching policy mix, as it includes policies explicitly targeting the labour market (skill enhancement, labour-leisure shift). As a socio-economic transformation is necessary for decoupling, land use and metal policy mix, its introduction also results in the reallocation of workers to less resource-intensive sectors, changing technologies and responsibilities at the workplace.

Table 1: Aggregated social impact matrix – average score for policy mixes and types of social impacts

	Overarching Policy Mix	Land Use Policy Mix	Metals Policy Mix	All policy mixes
Public Health and Safety	0.6	0.8	0.9	0.8
Employment and Labour Markets	0.8	0.4	0.6	0.6
Social Inclusion and Protection of Particular Groups	0.6	0.3	0.6	0.5
Standards and Rights Related to Job Quality	0.5	0.1	0.3	0.3
Governance, participation, good administration, access to justice, media and ethics	0.3	0.1	0.1	0.2
Individuals, private and family life, personal data	0.2	0.1	0.2	0.1
Social Impacts in Third Countries	0.1	0.1	0.2	0.1
Access to and Effects on Social Protection, Health, and Educational Systems	0.2	0.1	0.1	0.1
Culture	0.0	0.1	0.0	0.1
Gender equality, equality treatment and opportunities, non-discrimination	0.1	0.0	0.0	0.0
Crime, Terrorism, and Security	0.0	0.0	0.0	0.0

Impacts related to social inclusion and protection of particular groups were ranked third. Here, the main drivers were policies affecting the prices of consumer goods (e.g. environmental and material taxes, product standards). As different groups have different consumption patterns, policy-induced price changes may affect some of them disproportionately. The health and employment outcomes may vary for different groups, and the risk of material deprivation may increase due to higher prices of material goods. One of the policies (supporting food redistribution programmes) directly addresses this problem.

Table 2 provides a more detailed overview of the social impacts with the highest average scores. These results confirm the relevance of impacts related to labour market, health and social inclusion. The impact with the highest ranking (“greater public awareness about a particular issue”) does overlap with other areas of qualitative analysis undertaken in WP5 (governance analysis in task 5.5). Thus, it will not be analysed in this report. Other specific impacts can be grouped together into three broader types in order to form a short list of key issues for further, in-depth analysis:

- 1) **labour market impacts** (including worker reallocation through job creation and destruction, changing job quality and innovations in the workplace),
- 2) **health impacts** (including both impacts related to changing levels of pollution and the socio-economic environment),
- 3) **social inclusion impacts** (including greater equality or inequality).

Table 2: Top 10 identified social impacts

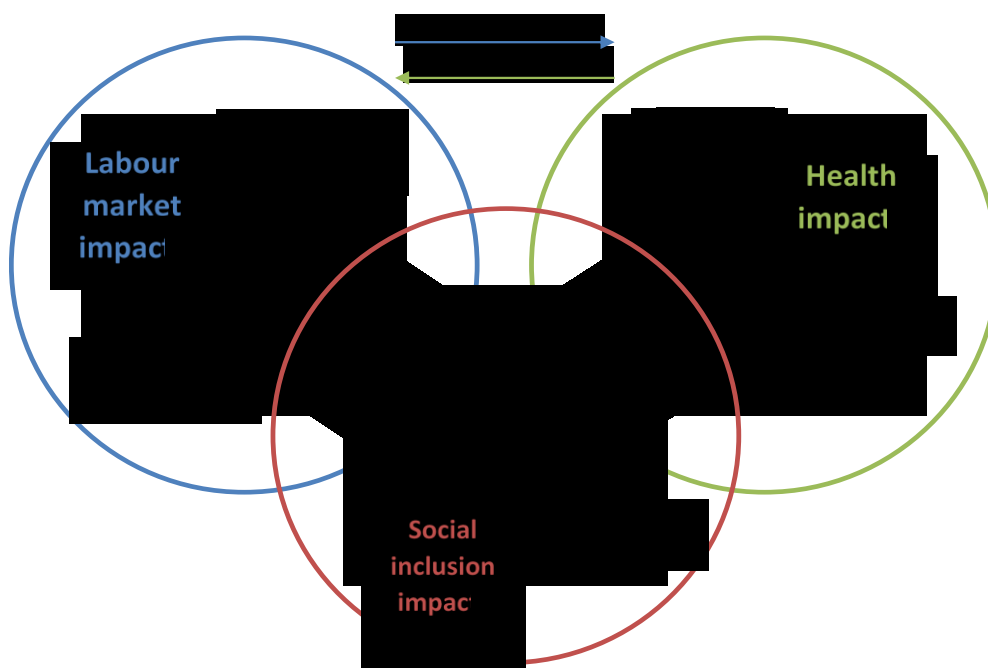
Social impact	Average score for all policy mixes
Greater public awareness about a particular issue	1.3
Effect on health due to changes in energy use and/or waste disposal	1.1
Negative consequences for particular professions, groups of workers, or self-employed persons	1.1
Job creation	1.0
Enabling or restriction of restructuring or adaptation to change, and the use of technological innovations in the workplace	1.0
Effect on health due to changes in the amount of noise, air, water, or soil quality	0.9
Effect on health and safety of individuals/populations through impacts on the socio-economic environment	0.9
Direct/indirect loss of jobs	0.9
Increase or decrease in the likelihood of health risks due to substances harmful to the natural environment	0.9
Direct or indirect promotion of either greater equality or inequality	0.8

Note: averages from tables 1 and 2 only for policy instruments selected for analysis in WP5

2.3 Conceptual framework for key social impacts

The assessment of three key social impacts needs to take into account their inherent complexity. First, as noted in the previous section, these broad categories each include several different, specific social impacts which should be taken into account during the in-depth analysis. Second, the assessment should reflect all relevant links between the three selected types of social impacts. The conceptual framework described below was constructed taking into account these requirements and building on the results from the social impact matrix analysis. It was then applied in the policy mix analysis in the following chapters.

Figure 1: The conceptual framework for key social impacts



An analysis of **labour market impacts** addresses two main issues. The first is the **dynamics of job creation and destruction**. Policy-driven shifts in consumption and production patterns, necessary for achieving decoupling, will affect the labour market. Demand for some types of jobs will grow (job creation), and for others it will fall (job destruction). While quantitative socio-economic modelling may provide estimates for the scale, pace and macroeconomic determinants of this transition, it inevitably operates on simplified assumptions. This is particularly true for the short- and mid-term transition phase, when the transition from an old to a new employment structure is being slowed by labour market imperfections. Thus, employment dynamics “beyond the model”, in particular labour market rigidities, is discussed in order to better reflect both the opportunities and risks associated with the analysed policy mixes. Another simplifying assumption of the quantitative models addressed in this qualitative assessment is the homogeneity of labour input, which ignores the **changing nature of jobs**. This includes both job quality and necessary skills, often linked to innovation introduced in the workplace.

In the case of **public health impacts**, the assessment takes into account the policy mixes’ impact on both production and consumption. This translates into an ex-ante health impact analysis of policy-induced changes in the levels of various types of **pollution** (air, water, soil), as well as shifts in **dietary patterns**.

The assessment of the policy mixes' impact on **social inclusion** takes into account the distributive effect of the policies, with particular focus on the most vulnerable groups. In this sense, it analyses the policy mixes' impact on the prevalence of **material deprivation**; it also takes into account the **differentiated structure of consumption expenditure**, which means that policy-induced price increases lead to a multitude of differing impacts on various groups in the EU.

The links between the three types of impacts are also taken into account. There is a significant distributive dimension in both labour market and health impacts. Job creation and destruction, as well as shifting demand for skills may create winners and losers from the implementation of the policy mixes. Health impacts from the restriction of resource use may differ for average European citizens and those already facing material deprivation. Recognising this overlap between the social impacts, we discuss **differentiated employment and health outcomes** in the section on social inclusion. There are also other, second-order impacts. For example, changing job quality may affect workers' health. Conversely, changes in the health and longevity of the general population affect the workforce supply and its productivity. In order to keep the assessment tractable, these effects are discussed only briefly.

2.4 Human rights approach to social impact assessment

The purpose of decoupling economic growth from natural resource use can be also viewed in terms of human rights protection, for both current and future generations. Resource exploitation affects the areas that we have selected for qualitative analysis (health, employment and social inclusion). This is more visible in terms of health, as economic activity results in pollution, which is dangerous not only for the environment, but also for humans. Employment is also going to face dramatic changes, both if unsustainable resource exploitation continues and if the economic transition towards absolute decoupling occurs. In this sense, the most vulnerable groups are more likely to be impacted by future changes due to a scarcity of available land, clean water, and air, as well as by the costs of transition aimed at avoiding these developments.

Protecting the rights of current and future generations requires making significant changes in the way natural resources are currently used. This might have short-term negative implications for certain categories of workers, as it may reduce the demand for certain jobs. Special attention has been given to assessing the balance in this area achieved by policy mixes, in order not to put those who are most vulnerable at a disadvantage by their introduction. We also assess whether the proposed policy mixes will create new job opportunities and allow a shift in the labour market without reducing employment. The final objective is to reach an environmentally sustainable economic growth that will also benefit people in terms of promoting their rights.

2.5 Qualitative scoring system

In order to ensure comparability of results both within this assessment and across all qualitative assessments in the DYNAMIX project, the qualitative scoring system was adopted. It assigns qualitative score for each key social impact to each instrument assessed. The system takes into account not only differentiated scale of impacts, but also associated uncertainty level.

Table 3: Qualitative scoring system as used within the assessment

	Social impact assessment
+++	Likely very positive
++	Likely positive
+	Likely rather positive
0	Likely neutral
-	Likely rather negative
--	Likely negative
---	Likely very negative
(++)	Assessment uncertain
((--))	Assessment very uncertain

3 Detailed description of the assessment findings

3.1 Labour market impacts

3.1.1 Employment: a human rights approach

Article 23 of the UN Declaration of Human Rights states: “(1) Everyone has the right to work, to free choice of employment, to just and favourable conditions of work and to protection against unemployment. (2) Everyone, without any discrimination, has the right to equal pay for equal work. (3) Everyone who works has the right to just and favourable remuneration ensuring for himself and his family an existence worthy of human dignity, and supplemented, if necessary, by other means of social protection. (4) Everyone has the right to form and to join trade unions for the protection of his interests.” The right to work is once again mentioned in the *International Covenant on Economic, Social and Cultural Rights* (OHCHR): **Article 6** “(1). The States Parties to the present Covenant recognize the right to work, which includes the right of everyone to the opportunity to gain his living by work which he freely chooses or accepts, and will take appropriate steps to safeguard this right. (2). The steps to be taken by a State Party to the present Covenant to achieve the full realization of this right shall include technical and vocational guidance and training programmes, policies and techniques to achieve steady economic, social and cultural development and full and productive employment under conditions safeguarding fundamental political and economic freedoms to the individual.”

The 1996 World Summit for Social Development reaffirmed the United Nations’ commitment to promoting employment, not as a general long-term objective, but rather as a priority: “We commit ourselves to promoting the goal of full employment as a basic priority of our economic and social policies, and to enabling all men and women to attain secure and sustainable livelihoods through freely chosen productive employment and work.” (UN 1996).

Despite such an open institutional commitment, the right to work has also been treated with some scepticism, and it is often still considered more a goal than a right: to many, providing decent jobs and favourable work conditions to all seems highly utopian. Even if the right to work is recognized at the international level, it is often overlooked in drafting policies and strategies aimed at reducing unemployment (Özden 2008). Yet, employment is necessary for subsistence of oneself and one’s family, and it contributes to the formation of the individual and to their social inclusion. It can therefore be fully considered as a basic right. A separate analysis should be dedicated to working conditions: safe and fair work conditions are indeed not only human rights, but also elements regulated by laws, codified by the International Labour Organization. This does not imply that such laws are equally respected everywhere, but at least there is no debate over their validity.

The right to work itself, despite its wide acceptance at the international level, remains a more critical issue. This is why, in the qualitative analysis of policy mixes, particular attention has been devoted to the effects of policies on the labour market to ensure that proposed policies would not increase unemployment. Some changes in the labour market are inevitably foreseen and somewhat necessary for reaching decoupling.

3.1.2 Decoupling and the labour market – an overview

Decoupling in this assessment refers to delinking economic output from resource use and environmental impacts (Umpfenbach 2013). This implies shifting demand and reallocating the production capacity of the economy towards:

- more resource-efficient solutions,
- less pollution-intensive solutions,
- solutions based on renewable resources.

The ways in which shifting demand both creates and destroys jobs in the economy are summarised in table 4. While the shift may be induced by different policy instruments, it always leads to job creation in certain areas while eliminating jobs in others. When rewards or penalties are involved, they not only affect demand for “green” goods and services and their substitutes, but they also affect the aggregate demand of households, firms and governments. Even in case of voluntary shifts stemming from changing preferences, demand for some goods and services will be negatively affected, as consumers will spend a smaller part of their budgets on items that are less resource efficient and cause more pollution. Furthermore, if sustainable solutions are more expensive, switching to them requires households, companies or governments to adjust their budgets. This will occur through decreases in the consumption of other goods and services. Likewise, if “green” solutions are cheaper, choosing them will increase budgets available for consuming other goods and services, which will create new jobs not directly linked to the effects of decoupling.

These demand-side observations are mirrored by the supply-side economic perspective: scarce production factors have to be reallocated towards resource-efficient, pollution-decreasing uses. This affects the entire economic equilibrium, not only the allocation between “green” and “brown” sectors. This approach is useful for tracing the net impact of decoupling policies. If a given resource-efficient alternative is more expensive (i.e. uses up more factors of production) than the current solution (either more resource/pollution-intensive technology or lack of any pollution/resource depletion control), then employing capital and labour in resource-efficient technologies will decrease the production capacities of the economy in other areas. This, in turn, will lower total factor productivity and decrease the extent to which the economy may meet customer needs expressed through market demand. It is not always the case, however, that resource-efficient solutions are less profitable and, therefore, less productive. These savings opportunities may remain untapped due to market and non-market barriers. For example, structural and behavioural barriers, such as credit constraints or information gaps, may block profitable energy efficiency measures (Hirst and Brown 1990, Gillingham et al 2009). In such cases, successful introduction of decoupling measures will increase the production capacities of the economy.

In a perfectly competitive labour market with no imperfections, the reallocation process would only affect productivity within the economy. The employment level would stay the same, though its structure would change. However, labour market imperfections make the impact of decoupling policies more nuanced.

Table 4: Job creation and destruction through demand shifts induced by different types of policy instruments facilitating decoupling measures

How the shift is induced	Types of instruments	Job creation impacts	Job destruction impacts
Rewarding decoupling measures	Public investments, some market-based instruments (e.g. subsidies, payments for ecosystem services)	• jobs needed to provide supported goods and services • indirect and induced impacts of new demand for supported goods and services	• jobs lost in companies providing solutions substituted by supported goods and services • jobs lost across the economy due to decrease in demand resulting from redirecting public spending / increasing taxes on households and/or companies to support decoupling • indirect and induced impacts of reduced demand for substituted goods and services and redirected public spending / increased taxes
Penalising or eliminating possibility for resource inefficiency and pollution	Regulatory instruments (e.g. bans, standards), planning instruments (e.g. urban planning), some market-based instruments (e.g. taxes, charges)	• jobs needed to provide resource-efficient and less polluting substitutes for penalised goods and services • indirect and induced impacts of new demand for the substitutes • jobs needed to meet increased demand associated with higher public spending or reduced taxes on households and/or companies (if penalties on resource-inefficient and polluting activities are imposed in form of revenue-generating instruments)	• jobs lost in companies providing penalised solutions • jobs lost across the economy due to decrease in demand resulting from increased cost of satisfying needs • indirect and induced impacts of reduced demand for substituted goods and services
Mobilising voluntary decoupling measures	Cooperation- and information-based instruments	• jobs needed to provide goods and services for which demand increased because of a voluntary shift preferences shift • indirect and induced impacts of new demand for goods and services for which demand increased because of a voluntary preferences shift	• jobs lost in companies for which voluntary preference shift meant decreased demand for their goods and services (both direct competitors and other companies affected by the preference shift toward higher spending on resource-efficient and less polluting solutions) • indirect and induced impacts of job loss in these companies

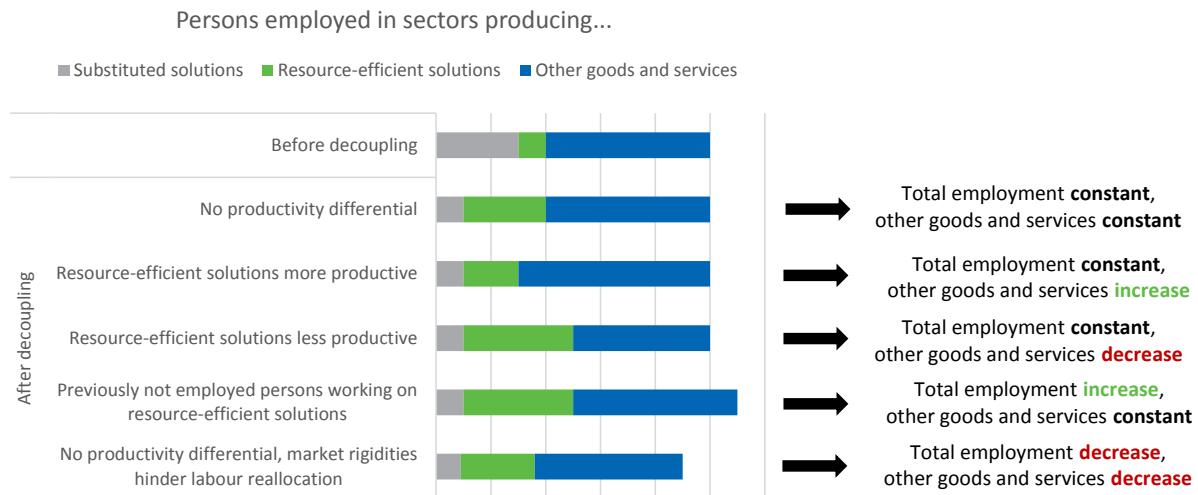
Note: the same company may create new jobs while eliminating others, as it restructures its offer to meet the demand shift

Source: own analysis; WISE Institute

First, wages do not immediately adjust to changing labour productivity levels, especially in the case of productivity drops, due to nominal wage rigidities, i.e. employees and employers not willing to decrease individual remuneration (Babecký et al 2009). A decrease in labour productivity together with lagging wage adjustment will lead to excess labour costs for companies facing new economic conditions. The result is lower demand for labour, lay-offs and a decrease in employment, as companies have limited ability to decrease labour costs

through wage cuts. Recently, this phenomenon was observed in the aftermath of the Great Recession (Daly et al 2013).

Figure 2: Example of employment reallocation from the supply side perspective, with results depending on relative productivity of resource-efficient and substituted solution, mobilisation of previously not employed persons and labour market rigidities



Source: own analysis; WISE Institute

Second, employment shifts are hindered by labour market rigidities, which include skill mismatches and spatial differences between created and destroyed jobs. Labour reallocation through the destruction and creation of jobs is constantly occurring across the economy. Recent studies suggest that the large, gradual shift towards sustainability (such as decarbonisation stretched across several decades) will add little to the “business as usual” pace of labour market change (OECD 2012, Cambridge Econometrics 2013). Nevertheless, these disruptions should be taken into account, because they add additional pressures to the already significant challenges for the EU labour market, including concerns about skill mismatches (Pouliakas 2012) and rising regional labour market disparities (EC 2014). The combination of skill mismatches, localised concentrations of eliminated jobs and differing geographical distribution between sectors which end up as the winners and losers of decoupling can create a “perfect storm” on some of the regional labour markets, while benefitting others. If new specialisations do not develop in the regions that currently depend on resource-intensive, polluting activities, these industrial centres may see long lasting increases in unemployment and eventual depopulation. This can cause strong opposition among the affected groups. On the other hand, decoupling may also create employment opportunities in places where they are currently scarce, through activities such as increased recycling or distributed power generation, which shifts jobs away from large industrial centres and more towards local communities (Morgan and Mitchell 2015, Alanne and Saari 2006). However, groups which stand to gain from decoupling will observe gains only in the future, and as such have lower motivation and capabilities to mobilise and provide organised support for the policy shift. Thus, labour market outcomes may matter beyond social impacts, by affecting public acceptability of decoupling policies.

Third, some environmental policies may alleviate or worsen labour market imperfections, which will indirectly affect employment. For instance, green tax reform, which shifts the tax

burden from the labour market to pollution and excessive resource use, will lessen the distortionary impact of taxes on the labour market. A negative example could be restricting the mobility of citizens by limiting non-sustainable ways of commuting while not providing sustainable alternatives, which would lower opportunities for finding jobs, especially in poorer and more sparsely populated areas.

Fourth, zero-sum reallocation arithmetic may change after taking into account the possibility of mobilising underutilised labour and capital. From the supply side, unemployed workers and idle plants provide potential for economic expansion, if they can be employed to provide the goods and services necessary for decoupling. From the demand side, mobilising unemployed and underutilised capital will provide additional wages and profits, which would then compensate for budget decreases elsewhere. In such case, workers and company owners trade their output with owners of underutilised capital and non-employed persons for their input required for decoupling. Total economic output and employment increase, as labour and capital do not have to be redirected from their current uses. This approach is at the heart of the “green stimulus” idea (Pollin et al 2008, Bowen et al 2009). However, if decoupling measures are assessed purely from a stimuli perspective aimed at maximising employment through public spending, they should be compared to a broader palette of measures, and not only to substitutes. For instance, while investment in renewables creates more jobs than investment in fossil fuels (Blyth et al 2014, Meyer and Sommer 2014), it is still a relatively capital-intensive venture, and more jobs can be created elsewhere for the same amount of public investment (Strand and Toman 2010). Furthermore, the efficient use of decoupling stimuli to increase employment faces challenges similar to other forms of stimuli, such as limited short-term impacts, mixed long-term historic record, and ineffectiveness for highly indebted countries and open economies (Ilizetzi et al. 2013). Overall, taking into account the long-term perspective of the analysed policy mixes, we do not include potential (and uncertain) short-term stimuli impacts of decoupling policies in this assessment. It should be noted, however, that creating a stable and predictable framework for future economic transition may help to address uncertainties in sectors at a crossroads (such as energy), which may mobilise private investment and increase employment, including through the additional effects of improved business expectations arising from improvements in learning-by-doing competitiveness (Jaeger et al 2011).

While assessing the impacts of decoupling policies on the labour market, it is important to take into account the long-term perspective. After short-term reallocation costs are borne, the key lasting impact on the labour markets will be a change in labour productivity. The assessment of productivity should take into account the total contribution of various economic activities to wellbeing over the long run. This means that while observed labour productivity (value added per hour worked) may fall as a result of decoupling policies, overall wellbeing will rise over the long run. This will result from addressing externalities (improved health, better environment), not to mention avoiding the future economic risks associated with staying on an unsustainable growth path.

Finally, the scale of the decoupling challenge requires constant, significant economic adjustment over several decades. This means that the effects of short-term reallocation will be felt for an extended period of time, and may even temporarily increase if the pace of change accelerates on the path to long-term goals. An alternative approach – introducing a sharp policy shift all at once – will create much greater economic shock, leaving both individuals and the institution unprepared for the adjustment.

3.1.3 Qualitative labour market impact assessment across policy mixes

Table 5: Assessment across all DYNAMIX policy mixes – social dimension, employment impacts

	Employment
PI1 Stronger and more effective environmental and climate dimension for EU land management in the CAP	(-/0)
PI2 Revised emissions levels in the National Emissions Ceilings Directive (NECD) and additional measures for better management of the nitrogen cycle on farmland	(-/0)
PI3 Promotion of “Payment for Ecosystem Services” programmes	+
PI4 Regulation for Land Use, Land Use Change, and Forestry	(0/+)
PI5 Strengthened pesticide reduction targets under the Pesticides Directive, and provision of guidance to farmers on integrated pest management	(-/0)
PI6 Targeted information campaign to influence food behaviour towards: reducing food waste and changing diets	+
PI7 Development of food redistribution programmes/food donation	0
PI8 VAT on meat products	-
Land policy mix – total	(-/0)
Pm1 Green fiscal reform: internalisation of external environmental costs	(-/0)
Pm2 Green fiscal reform: materials tax	(-/0)
Pm3 Promotion of sharing systems	0
Pm4 Increased spending on research and development	((+))
Pm5 Product standards	0
Metals policy mix – total	(-/0)
Po1 Circular Economy tax Trio	(-/0)
Po2 EU-wide introduction of feebate schemes for selected products categories	0
Po3 Reduced VAT for the most environmentally advantageous products and services	0
Po4 Boosting extended producer responsibility	0
Po5 Skill enhancement programme	+++

Po6 Enabling shift from consumption to leisure	((--/++))
Po7 Step-by-step restriction of advertising and marketing	0
Po8 Local currencies for labour-based services	0
Overarching policy mix – total	+

“P” = policy; “I” = indicator “; “c” = common; “s” = related to the social dimension; “o” = overarching policy mix; “l” = policy mix on land; “m” = policy mix on metals and materials

3.1.4 Land policy mix

PI1 Stronger and more effective environmental and climate dimension for EU land management in the CAP

Within this policy instrument several actions are proposed. Strengthening the eligibility criteria for the CAP support will reward farmers that comply with the new rules and punish those who are not able to adapt. The impact of such change on employment will probably be negative – farmers who are not able to introduce new farming methods or find them too expensive will lose their jobs.

The second area of interest within this policy is an increase in funding and support measures for semi-natural ecosystems and High Nature Value Farmland. Increased support for such activities will create new jobs that should absorb some of the job losses due to the strengthening of the eligibility criteria. The job impact of this instrument should be positive, provided that the total CAP budget remains unchanged and the funds for perceived actions will not be withdrawn from other sectors of the economy.

The total, combined impact of both instruments on employment is likely to be very small, although probably slightly negative due to reduced CAP support. Nevertheless, the ultimate influence will be highly dependent on the final shape of the instrument, as well as on the ability of farmers to adapt to the new conditions (changing farming methods, updating skills to benefit from the increased support for semi-natural habitats and High Nature Value Farmlands). One of the possible outcomes will be a consolidation of land holdings, which will have higher organisational capacities to adapt, with an associated decrease in agriculture employment.

PI2 Revised emissions levels in the National Emissions Ceilings Directive (NECD) and additional measures for better management of the nitrogen cycle on farmland

As this instrument is a command-and-control activity, its impact on employment should be negative. Introduction of additional regulations and caps on the use of fertilizers is likely to reduce productivity in agriculture, increasing labour input required to substitute fertilizers as a production factor in agriculture. While this will increase employment per unit of production in the sector, the net employment impact is likely to be negative, at least in the short term. A decrease in productivity will lead to the increases in unit costs, which will have two main consequences. First, it will lead to the substitution of domestically produced goods with imports from countries with less stringent policy rules. Second, the general demand for agricultural production should also fall leading to a decrease in employment in agriculture in the EU. In cases where demand for domestic agricultural production is inelastic (i.e. sales will

not drop despite price increases, because of, for example, the lack of substitutes), the share of disposable income available for expenditure on non-agricultural goods will drop, leading to smaller demand for domestic production outside of agriculture. Both effects imply the need for the reallocation of labour between agriculture and other sectors, which will likely lead to an increase in short-term unemployment, but – in the long run – should compensate for the productivity losses.

The reduction of nitrogen emissions requires educational and promotional campaigns, which can create some jobs. Better management of the nitrogen cycle in farmlands and research on the use of fertilizers can also affect employment in research institutions. Nevertheless, from the perspective of the economy as a whole, the employment impacts will be negligible, both because of the small scale of measure (demand for additional educational and research services) as well as indirect negative impacts (allocating funding for education and research will decrease demand for other goods and services).

The total impact of revised NECD on employment is likely to be marginal. The overall effect is dependent on both the ability of farmers to adapt to new farming methods and the precise definition of instruments to be introduced, which – according to the instrument description – will be decided on a Member State level.

PI3 Promotion of “Payment for Ecosystem Services” programmes

Promotion of PES programmes in rural areas impacts the labour market through several channels. The impact of this policy should be positive, but its scale will be rather marginal. From an economic perspective, the PES programmes are likely to reduce market imperfections by addressing the positive externality stemming up from the maintained natural habitats and farmlands. If this externality is reflected in market prices, its supply should increase resulting in new jobs in rural areas (possibly at the cost of municipal jobs or wages).

First and foremost, the promotion of PES in rural areas will create new employment opportunities. Within this instrument, farmers will be paid to maintain natural habitats that are attractive to tourists. This will create new jobs in horticulture and in the forestry sector, as the exploitation of forests will be reduced, and there will be a need to maintain and protect areas that attract tourists.

Secondly, it can increase employment in rural areas in the service sector through tourism. As more semi-natural ecosystems are protected, more and more people will be willing to visit such areas. This will create new jobs in hotels and restaurants in rural areas, as all new visitors will have to be served. These jobs however will be financed by higher prices or taxes paid by the city dwellers, effectively reducing the net employment or wages in the urban areas. This effect, however, will be negligibly small as the value added in the agriculture sector constitutes only a fraction of the value added in the rest of the economy.

Thirdly, addressing market imperfection by introducing PES should – in the long run – lead to improvements in the overall allocation in the economy, i.e. increased productivity, which in turn should have a positive impact on wages.

Finally, as PES ecosystems increase the attractiveness of living in rural areas, the broad labour market will have to adjust. More people will be willing to work from home, and employers will have to take this into consideration, especially with regard to specialists equipped with professional skills. Therefore, promotion of PES programmes can influence the

broad labour market and will affect the popularity of flexible arrangements that will allow for work from home and more leisure than standard contracts.

Summing up, PES programmes are likely to positively affect employment in rural areas, as well as improve broader labour market conditions. Their impact on jobs and wages in cities will be negative but very small. In general, due to the scale of impact, the effect of such programmes on the whole labour market will be limited.

PI4 Regulation for Land Use, Land Use Change and Forestry

This instrument has a similar effect on the labour market as the proposed CAP reform, as it will result in the reallocation of production inputs towards more sustainable activities within the broadly defined agriculture sector. There may be an additional, negative impact on local labour markets in cases when regulations hamper the development of new investments outside the agriculture sector.

There is an additional, significant impact of LULUCF regulation, which can be identified only from the perspective of overall decoupling goals. This instrument, if implemented effectively, will significantly broaden the portfolio of GHG mitigation measures. This, in turn, will make achieving long-term GHG reduction targets for the EU less costly. Increasing the economic efficiency of mitigation efforts will decrease the negative productivity shock to the economy, smoothing the EU's transition to a low-carbon economy. This feature makes LULUCF regulation an important instrument from the labour market perspective, especially over the longer term when other GHG abatement options will be limited, uncertain and costly. One limitation, however, is the complexity of this policy instrument, especially related to cost-efficient integration in broader climate policy. The positive labour impacts of LULUCF regulation remain uncertain, as they ultimately depend on whether their introduction will effectively decrease the mitigation burden put on the overall economy.

PI5 Strengthened pesticide reduction targets under the Pesticides Directive, and provision of guidance to farmers on integrated pest management

The labour impacts of this policy instrument are analogous to NECD revision, as it will limit the use of one of the environmental production inputs in the agriculture sector. The dynamics of the resulting labour reallocation within the agriculture sector, as well as between agriculture and other sectors, will depend on the same factors as in case of NECD revision, i.e. the elasticity of demand for various types of agricultural output and the adaptability of farmers to new requirements. Evidence indicates that due to various intangible barriers, farmers in Europe may be locked into inefficient practices (Vanloqueren and Baret 2008), which means that significantly reducing pesticide use may in fact be associated with relatively low costs or even economic benefits (Jacquet et al 2011, Boussemart et al 2012). Thus, effective provision of guidance to farmers in this area may improve labour market conditions by introducing more efficient agricultural practices. One additional dimension to consider is the integration of a pesticide tax into broader green tax reform (i.e. shifting the tax burden from the labour market to pollution), which should be beneficial for the whole labour market, although once again the possible scope of such an instrument and the size of the sector concerned will significantly limit the quantitative effects.

PI6 Targeted information campaigns to influence food behaviour towards reducing food waste and changing diets

Effective introduction of this policy instrument will impact the labour market in two key aspects. First, it will change the level and composition of food consumption. This shift in diet will require restructuring of the supply chain from agriculture to the food industry to match the new demand structure. This will require labour reallocation within these two sectors. The impact on total employment in agriculture and the food industry (i.e. reallocation between these two sectors and the rest of the economy) is uncertain, as it will be influenced both by the shifting structure of food consumption and fall in demand associated with the reduced food waste. If more well-informed consumers choose more expensive, labour-intensive foodstuffs, this may outweigh reduction in demand for labour in agriculture and the food industry, which will result from decreased over-purchasing. Second, by reducing food waste and healthcare costs associated with unhealthy diets, this instrument will increase overall economic productivity, which will improve labour market conditions in the long term.

Overall, this instrument will imply labour reallocation mainly within the food industry and agriculture, with a positive impact on productivity throughout the economy. The net impact on the entire labour market will be positive, albeit very limited due to the fact that the shift in total demand structure will be marginal.

PI7 Development of food redistribution programmes/food donation

The impact of the development of food redistribution programmes and donations on employment should be negligible. We may expect a net loss of jobs in the retail sector as recovered food may compete with products that are currently sold in shops. On the other hand, food redistribution programmes should create jobs in charities and organisations dealing with such schemes.

Two channels of impact have to be kept in mind while analysing food redistribution programmes. First of all, from an economic point of view, food redistribution leads to an increase in the efficiency of agriculture output use. Such change, however, requires greater labour input, as excessive food needs to be collected, sorted and supplied to specific shops or beneficiaries. Therefore, the impact of these instruments on employment in the food processing and trade sectors will be positive at the price of decreased productivity.

Assessing the impacts on other sectors is more complex, as it depends on level of demand saturation for agriculture production among the poorest households affected by the food redistribution programmes. The key question is whether redistributed food would be treated as a substitute for that which is bought on the market, or rather as an addition, allowing poorest households to increase the quantity and/or quality of consumed food. In the former case, demand will shift towards goods and services provided by other sectors, and employment reallocation will follow. In the latter case, demand structure will remain largely unchanged, with possible reallocation within food industry.

Summing up, the development of food redistribution programmes increases the efficiency of use of agriculture production factors at the cost of increase in demand for labour and decreased productivity in the whole supply chain (mostly in the service part of it). Moreover, this policy may lead to some reallocation of jobs both within the food industry and across the sectors. Therefore, we may expect a mixed economic impact from such schemes (higher

employment but lower labour productivity). The scale of these impacts would be – as before – rather small due to the scale of the industry.

PI8 VAT on meat products

Introduction of this policy instrument will result in a one-time increase in the consumption tax on meat products in most European countries. This price shock will decrease demand for meat, which will shift towards substitutes. The result will be reallocation of labour within the agriculture and food industries from meat production towards the production of other foodstuffs. This shift will likely cause an increase in unemployment in the short-term, as the price shock will be significant for the meat industry and will require its restructuring to adapt to new market conditions.

Indirect impacts on other sectors will also occur: when price elasticity of meat demand is low (i.e. the decrease in demand is smaller than the price increase), total expenditure on meat (including taxes) will increase. This, together with increased demand for meat substitutes, will raise the total share of food in each households' consumption expenditure. The demand for goods and services from other sectors will decrease, with an associated reduction in employment. While this impact directly follows from the increase in total tax on consumption, governments may offset this cost by using the additional revenue from the increased VAT on meat (i.e. by incorporating this policy instrument in the broader green tax reform).

3.1.5 Metals and materials policy mix

The main impacts of metals policy mix on the labour markets will come from the two green fiscal reform instruments: internalisation of external environmental costs and introduction of materials tax. Both instruments provide strong, broad fiscal incentives for labour reallocation by heavily taxing pollution and resource use. At the same time, they decrease labour taxation, which is likely to improve labour market outcomes.

Another significant labour market impact may come from increased spending on R&D. It is, however, highly uncertain and may materialise only in the long run, as innovative solutions that support decoupling measures will take time to reach the market. It is also not clear whether these potential new technologies or business models will match skills of European workers, as well as which groups on the labour market will be favoured by resource efficient innovations. Introduction of new product standards and promotion of sharing systems will likely have very limited impact on the labour market.

Pm1 Green fiscal reform: internalisation of external environmental costs and

Pm2 Green fiscal reform: materials tax

Both instrument descriptions and modelling exercises suggest that two key instruments of proposed green fiscal reform (internalisation of external costs and the materials tax) will have a broad impact across the industries, especially in manufacturing. This is due to the central position of metal consumption for many industries. The combination of externalities and material taxes should result in a relatively high tax rate on material use and production processes. While policy design protects the industries located in the EU from losing

competitiveness, it leads to deep contraction of market demand across the entire supply chain of material-intensive goods. The large scale of economic adjustment resulting from green fiscal reform provides the biggest challenge for the labour market among all the assessed instruments. It should be noted, however, that the impacts of tax reform are in line with the goal of achieving absolute decoupling of the European economy, and as such are designed in a way that minimise the negative impacts of transition on the labour market. First, they provide consistent, gradually strengthening price signals across the whole economy, which incentivises decoupling. This will allow companies and individuals to prepare for transition and choose cost-efficient instruments, thus reducing the waste of economic inputs (stranded assets) and providing time for retraining the labour force. Second, by explicitly linking the introduction of material and environmental taxes to labour taxation reform, the proposed policies should reduce labour market frictions, which in turn will ease the transition for affected workers and increase labour supply. Furthermore, the strengthening of incentives for decoupling and increasing labour reallocation will be firmly linked to a decrease in labour taxation, thus avoiding an uneven balance between the negative and positive labour market impacts of the proposed policies. To sum up, while the proposed policies will likely decrease employment due to the large scale of necessary reallocation of labour, they are well designed to minimise any unavoidable short-term negative impacts of decoupling. Employment should increase in services and decrease in manufacturing – therefore significant changes in the employment structure should be expected.

Pm3 Promotion of sharing systems

Sharing systems are aimed at a broadly understood increase in the use of materials. As shared cars or equipment can satisfy needs similar to owning machines, such systems can lead to an increase in efficiency at the cost of additional labour needed to provide sharing services.

At the beginning, the impact of sharing systems on the number of jobs in manufacturing will be marginal. As more and more people learn how to use sharing schemes, this influence will gradually rise but probably will remain at a limited level, given the progressive automation of the industry sector. Moreover, the gradual nature of this impact will give manufacturing workers enough time to adapt and reallocate to other sectors of the economy (e.g. to service sharing systems).

On the other hand, sharing systems in their current form are quite labour intensive - borrowed items need to be registered, inspected, and serviced. Also, widespread sharing systems will highly affect the demand for transport, as shared machines and equipment require transport from one customer to another (unless they are neighbours). Therefore, the introduction and promotion of sharing systems is likely to increase employment in the service sector.

Summing up, the impact of sharing systems on the labour market may be positive – this mechanism increases the efficiency of material use at the cost of increased labour input. Moreover, such systems allow for overcoming market imperfections such as asymmetric information and transaction costs that prevent people from sharing things instead of owning them. Consequently, as sharing systems reduce inefficiency, it should lead to an increase in welfare and decrease in prices of services. Nevertheless, the impact of such instruments on the labour market is rather small due to the small share of affected sectors in the economy.

Pm4 Increased spending on research and development

When effective, increased spending on R&D should smooth the transition on the labour market resulting from other policies. Technological and organisational improvements associated with decoupling-focused R&D should make it less costly to achieve policy targets. This means increased productivity and smaller necessary reallocation of labour across the sectors.

While impacts of this instrument are likely to be positive, there are several uncertainties. First, the impact of R&D investments in general are highly uncertain. The large scale and broad scope of support programmes should increase the probability of achieving significant improvements in resource efficient solutions, but the exact extent of feasible progress remains unknown. Second, new solutions may result in skill mismatches, as currently employed workers will have to learn how to implement them. Third, breakthrough technologies and business models may disrupt whole supply chains and even industries, which will result in larger necessary reallocation of labour compared to incremental improvements.

Pm5 Product standards

The direct impact of this policy instrument on the labour market will be limited, as it will be focused on relatively few types of goods. Some labour reallocation will occur within companies and industries supplying the components and raw materials needed to produce goods to which new standards will apply. Significant negative labour impacts are likely to occur in local economies dependent on outdated products. Their scale depends on the mismatch between newly introduced standards and the current industrial capabilities of each region, as well as the costs of modernisation needed to meet the new standards. The policy may also have indirect impacts (reallocation of labour between other sectors of the economy) if it affects composition of total demand through an increase in price of affected products.

3.1.6 Overarching policy mix

Po1 Circular Economy tax Trio

Introduction of a circular economy tax trio will result in a significant, concentrated shock for local economies dependent on mining, though the impacts on the whole labour market will be limited in most countries due to the low share of mining jobs in total employment. For affected local economies the same argument applies as for the whole economy in the case of green tax reform: while the transition will be challenging and a temporary spike in unemployment may occur, this is a consequence of general policy targets rather than policy instrument design.

Another notable direct impact of the tax trio will be a decrease in employment in waste disposal and incineration and an increase in employment in recycling. While the net direct impact on the number of jobs will be positive, as the recycling is more labour-intensive than disposal and incineration (Murray 1999, Goldstein et al. 2011), the total labour market impact depends on the potential for productivity improvements associated with increased recycling rates. If the tax trio unlocks previously underutilised potential for the cost-efficient recycling, it will lead to overall increase in labour productivity. If, however, increased recycling rate require

more labour and capital inputs to acquire useful resources than the current approach, the productivity will decrease, with associated negative short-term impact on the employment.

Po2 EU-wide introduction of feebate schemes for selected products categories and

Po3 Reduced VAT for the most environmentally advantageous products and services

Both feebate schemes and reduced VAT will encourage demand shift within given product categories towards more environmentally advantageous solutions. The resulting impacts on the labour market should be limited because the range of affected products will be limited, and most labour reallocation should occur within the affected companies and industries that produce both environmentally advantageous and disadvantageous products and therefore are able to absorb the shock within the given sector. On the other hand, the overall impact of the mix strongly depends on the elasticity of demand price for the selected products, and neither effect – negative or positive – cannot be conclusively excluded.

Po4 Boosting extended producer responsibility

The ultimate impact of the boosted EPR on the labour market depends on the scope of the instrument. If it is limited to the relatively small number of sectors or branches with a small share in the value added, the economic effects of this instrument will also be small. New employment opportunities appear in affected industries, at the cost of job destruction in the rest of the economy associated with a demand shift caused by an increase in the cost of products affected by the regulation. If the number of sectors covered by the EPR policy instrument is large, these effects can be quite large, but this is very hard to assess without ex-ante knowledge on the details of the instrument composition. If EPR addresses market imperfections associated with resource use and externalities occurring during the lifecycle of affected products, it will increase total economy productivity, and thus improve conditions on the labour market.

Po5 Skill enhancement programme

Skill enhancement programmes are important ingredients of any environmentally-oriented policy mix, as they allow people to adapt to a green(er) economy, improve matching on labour market and hence mitigate the negative impacts on employment that other instruments could have.

The most important impact of skill enhancement programmes on the labour market will be a potential increase in the efficiency of matching between employers demanding “green” skills and the employees newly equipped with these types of qualifications. Consequently, the process of job searching will shorten, and the level of frictional unemployment should fall. Furthermore, if such programmes reach farmers who might lose their jobs due to effects from the land policy mix, we should expect structural change in the economy (although limited to scale by the size of agriculture employment) and positive impacts on aggregate employment. Nevertheless, although the potential for improvement on the labour market due to the considered policy may be substantial, in practice its scale will remain small due to the limited effectiveness of instruments that will ultimately be introduced.

The direct effect stemming from the need for trainers and lecturers is likely to be quite small, but not negligible. Successful skill enhancement programmes will require large numbers of highly qualified trainers and scholars, and thus will lead to an increase in employment in the training and education sectors. However, as these constitute only a small part of the total employment, the scale of impact on the labour market would be marginal.

Po6 Enabling shift from consumption to leisure

Although the direct effect of a shift from consumption to leisure on the number of hours worked would be unequivocally negative, the proposed policy arrangements to reach this goal indicate opportunities for an increase in aggregated employment. However, to use this opportunity, the shift from consumption to leisure should be introduced on a voluntary basis enabling the flexibility of European labour markets.

The basic and probably most efficient way to achieve the expected outcome is to introduce flexible labour market regulations and empower part-time working arrangements such that they can be applied even for a highly qualified workforce. Such reforms, apart from entitling willing employees to part-time work or longer holidays, will facilitate labour market entry for students and young mothers who have enough time for a part-time job, but not for a full-time job. The other groups that will benefit from such regulations include parents, who will be able to return to the labour market earlier, and younger pensioners, who are still able to work part-time, but may no longer have the vitality to take a full-time job. Therefore, if a shift from consumption to leisure were enabled through more flexible labour markets and empowering part-time workers, the effects of such changes on employment should be positive.

However, a shift from consumption to leisure can also be achieved through instruments which are involuntary for companies, such as shortening the workweek or increasing statutory vacation time without any other changes (e.g. adjusting minimum wage). As such changes reduce the productivity of workers, and wages cannot adjust (e.g. due to arrangements with trade unions or minimum wage), they will lead to a decrease in employment.

Summing up, introduction of instruments that will make the labour market more flexible may enable a shift from consumption towards leisure, while at the same time increasing the number of people employed. On the other hand, if policies to be introduced (e.g. shortening the workweek or increase in statutory vacation time) are mandatory for companies, they may lead to lay-offs and a decrease not only in employment but also in productivity and wages. As voluntary agreements are much more efficient, they should be preferred over the latter.

Po7 Step-by-step restriction of advertising and marketing

Step-by-step restrictions of advertising and marketing should lead to a decrease in employment. However, as limitation of advertising and marketing will decrease the pressure on material status, this shift will be, to some extent, voluntary.

Nevertheless, restrictions on advertising and marketing will affect the labour market through two main channels – direct and indirect. Firstly, such instrument will directly lead to a decline of advertising and marketing, and consequent job loss in that sector. In Europe in 2014 more than one million people were employed in the advertising and market research sector, not even mentioning those working for advertising branches in other sectors, such as the publishing and creative sectors.

The second, indirect, channel through which step-by-step restrictions of advertising and marketing will impact the employment are by expected changes in demand. As consumers (partly) refrain from consuming certain products, aggregate demand will fall and jobs will be lost. The scale of indirect impact is very difficult to assess, even using quantitative models, as we do not know to what extent advertising and marketing impact aggregate consumption.

Summing up, the impact of this policy on employment will be negative. Apart from direct and indirect effect resulting from the decline of the advertising industry and a decrease in private consumption, the change in the labour supply will further compress employment. However, as the exact impact of advertising on both consumption and labour supply is unknown, the scale of indirect effects is difficult to estimate.

Po8 Local currencies for labour-based services

The impact of local currencies on employment is hard to assess ex-ante. As such changes will decrease the relative price of locally produced services also the employment in such sectors should increase.

The impact of local currencies on employment would be rather positive, as they will reduce the relative prices of services, that are, in general more labour intensive than economy on average. Two caveats, however, need to be kept in mind. Firstly, the impact of this instrument on the labour market would be rather local, confined to small areas. Secondly, local, labour-based services require a less qualified workforce. Therefore, the introduction of such policy can induce unwelcome shifts in the qualification structure of the workforce. This could also lead to the decreased labour productivity and through this to less welfare.

3.2 Health impacts

3.2.1 The ethical importance of protecting health: a human rights approach

The right to health means that governments must generate conditions in which everyone can be as healthy as possible. Such conditions range from ensuring availability of health services, healthy and safe working conditions, adequate housing and nutritious food. The right to health does not mean the right to be healthy (WHO 2013).

The right to health was first mentioned in the United Nations' 1948 Declaration of Human Rights, Article 25, (1): "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care". More precise formulations of the right to health have followed over the years, such as, in 1976, by the OHCHR (Office of the High Commissioner for Human Rights) International Covenant on Economic, Social and Cultural Rights. Article 12 states: (1). The States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health. (2.) The steps to be taken by the States Parties to the present Covenant to achieve the full realization of this right shall include those necessary for: (a) The provision for the reduction of the stillbirth-rate and of infant mortality and for the healthy development of the child; (b) The improvement of all aspects of environmental and industrial hygiene; (c) The prevention, treatment and control of epidemic, endemic, occupational and other diseases; (d) The creation of conditions which would assure to all medical service and medical attention in the event of sickness." The consideration of health as a fundamental human right was also promoted by the World Health Organization, whose Constitution (1948) reads, "The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition."

The right to health, despite the central role it has gained in the past decades, has traditionally been considered as part of those "social and economic rights" that, even from a legal perspective, are considered less binding for governments, and are conceived as aspirations rather than proper rights (Neier 2006). This is because their implementation involves the mobilisation of economic resources. This view has been widely criticised by philosophers, who have suggested that everything that is fundamental for human basic capabilities and minimum subsistence has to be treated as a basic right to which priority has to be given (Nussbaum 2000; Shue 1996). But it is not only philosophers who have remarked this – the WHO has in fact stated that, "The right to health is NOT only a programmatic goal to be attained in the long term. The fact that the right to health should be a tangible programmatic goal does not mean that no immediate obligations on States arise from it. In fact, States must make every possible effort, within available resources, to realize the right to health and to take steps in that direction without delay." (WHO 2008). A sort of duty to guarantee health has therefore been acknowledged - even for governments in developing countries (WHO 2008).

The right to health is not limited to healthcare: rather, it includes all the elements that are required to lead a healthy life, such as (but not restricted to) access to unpolluted natural resources. Air, water, and soil **pollution** can in fact hinder the enjoyment of the right to health (WHO 2008). This has been underlined especially in the case of water: many diseases are attributable to unsafe water, lack of sanitation and hygiene, and poor agricultural practices

(Prüss-Üstün et al. 2004). As concerns air pollution, it is also responsible for a wide range of diseases: particulate matter (PM - a mixture of toxic components found in the air) is linked with serious health effects, such as cardiopulmonary disease in adults, and lung cancer and acute respiratory infections (ARI) in children. It has been estimated that air pollution in urban areas worldwide, in terms of concentrations of PM, causes about 3% of mortality attributable to cardiopulmonary disease in adults, about 5% of mortality attributable to cancers of the trachea, bronchus, and lungs, and about 1% of mortality attributable to ARI in children (Cohen et al. 2004).

As concerns **nutrition**, the right to minimum essential and nutritious food is also considered one of the basic components of the right to health (WHO 2013). Among the 10 main health risk factors in EU countries, the most serious are high blood pressure, alcohol use, smoking, high cholesterol, and obesity. It is interesting to note that the sixth factor (in a list of fifteen) is the low consumption of fruit and vegetables, responsible for 4.4% of deaths (WHO 2005). Risk factors which increase the likelihood of developing non-communicable diseases include weight gain, high blood sugar and increased triglycerides and cholesterol in the blood – most of which are due to poor nutrition habits. In 2004 hypertension caused 13% of deaths worldwide, hyperglycaemia was responsible for 6%, and weight gain and obesity together were responsible for 5% of global deaths (WHO 2009). Better nutrition habits significantly reduce the risk of contracting a non-communicable disease, and moderate metabolic-physiological risk factors.

If the right to health has to be met by governments, pollution and nutrition are key factors to which proper attention has to be devoted. Most of the proposed policies are aimed at generally promoting the human right to health by improving health conditions, specifically for what concerns natural resource safety, pollution and nutrition.

3.2.2 Pollution

This section reviews literature on air pollution in Europe. Soil pollution is a related subject and may also affect health, however it is not reviewed here as studies of these impacts remain in their infancy (EC, 2013).

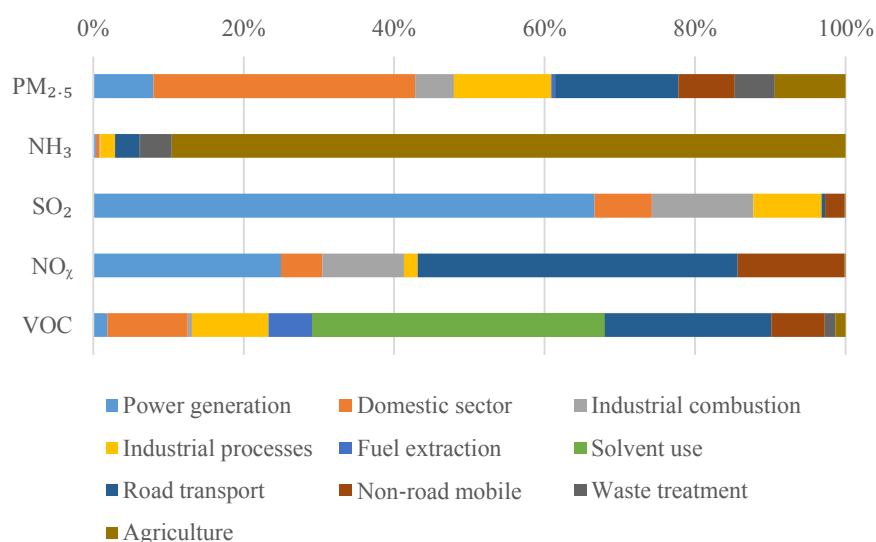
Air pollution originates from a myriad of natural and anthropogenic sources and remains the top environmental risk factor for premature death in Europe. Natural sources of pollutants include sea salt, naturally suspended dust and volcanic ash (EEA, 2014a; Kiesewetter and Amann et al., 2014). As natural sources are typically beyond human control, and as such will not be affected by the introduction of policy mixes, the following discussion focuses on anthropogenic sources.

The EEA (2014a) categorizes air pollutants into 4 main groups: main air pollutants, heavy metals, organic compounds, and carbon dioxide. Each pollutant has a different unit and aggregate impact on human health in the EU. The relative importance of air pollution sources also varies significantly depending on the compound, so sectoral policies and mixes will have a disproportionate effect on the levels of different pollutants. For instance, effective land use policy mix might be expected to primarily reduce ammonia emissions, while not directly affecting sulphur dioxide emissions mainly associated with power generation.

The main air pollutants, in order from highest to lowest unit emission costs, consist of particulate matter (PM), ammonia (NH₃), nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOCs) and sulphur oxides (SO_x). Even though these pollutants do not belong

to the most harmful per emission unit, they are emitted on a large scale and tend to be difficult to limit, and therefore generate the greatest aggregate damages. Their anthropogenic sources are given in Figure 3.

Figure 3: Anthropogenic emissions in EU-28 in 2005 by compounds and SNAP sectors



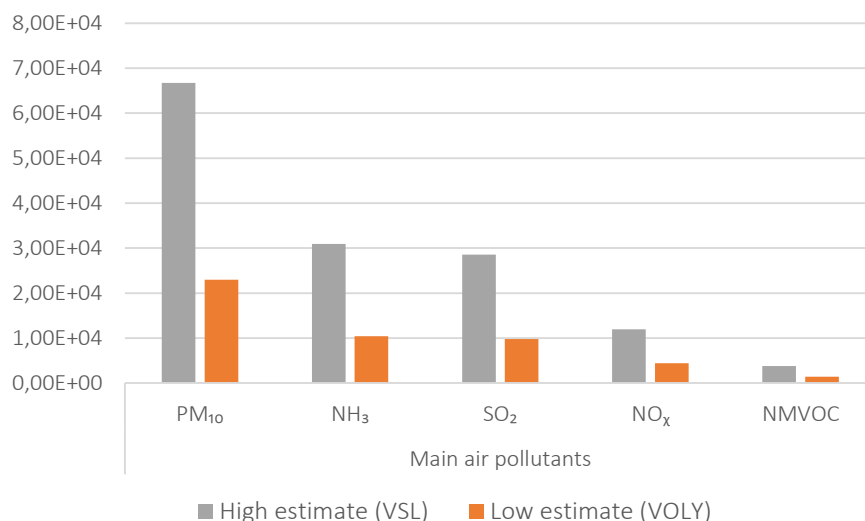
Source: WISE Institutes' own elaboration based on Amann et al. (2014) data

Heavy metals, in order from highest to lowest unit emission cost, are lead, mercury, arsenic, chromium, cadmium, and nickel. Pollutants from this group are highly harmful, but as they are primarily discharged in various industrial processes, and controlling their emissions is relatively easy with end-of-pipe technologies.

Organic compounds, in order from highest to lowest unit emission cost, are dioxins and furans, polycyclic aromatic hydrocarbons (PAH) and benzene. These pollutants are especially harmful, as each of them is suspected to have carcinogenic effects on humans. Like heavy metals, they are emitted from various industrial processes (combustion of fuels and waste), which makes it possible to limit them relatively effectively.

Carbon dioxide (CO₂) is emitted in high quantities, but its' harmful effects come from climate change impacts, mostly in the distant future, rather than direct, instant harm for human health. The primary sources of CO₂ emissions are the combustion of fossil fuels in energy sector, industry and transport.

Figure 4: Estimates of the European damage cost per tonne emitted for the main air pollutants (2005 prices)



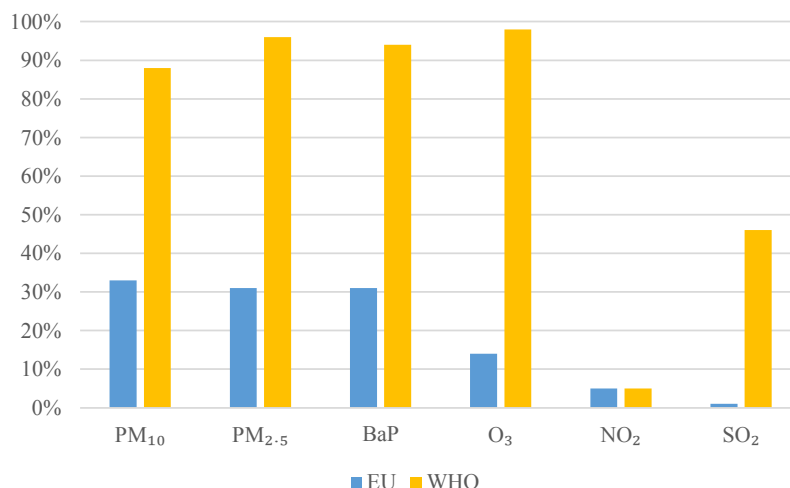
Source: EEA (2014b)

Figure 3 shows the current average damage costs per tonne of pollutant emitted in the EU. The impact of particular pollutants is typically valued by two complementary approaches: the value of statistical life (VSL) and value of a life year (VOLY). The former is an estimate of the amount that people are willing to pay to reduce the risk of death, while the latter is based on a loss of life expectancy (OECD, 2012). For the main pollutant group, VSL is used as the high cost estimate and VOLY as the low cost estimate.

The damage costs of pollutants result not only from their harmfulness per unit of emission, but also in the total amount of emissions. For instance, while recent estimates (EEA, 2014b) suggest that heavy metals are 41-110 times more harmful per tonne than NO_x, their total emissions from industrial facilities are 3211 times lower, which results in much lower total health impacts.

Marginal costs of pollutants vary at different concentration levels. This means that avoiding additional tonnes of emission will have an increasing (if marginal cost of pollutants decrease with concentration) or decreasing (if marginal cost of pollutants increase with concentration) positive impact on human health. This implies that the impact of policy mixes on health will vary depending on the stage of the transition towards decoupling.

Figure 5: EU urban population exposure to harmful levels of air pollution in 2011, according to EU and WHO norms



Source: EEA

Figure 5 presents the shares of the EU-28 urban population exposed to harmful levels of air pollution according to EU and WHO reference values. Primary risks are posed by particulate matter (PM) and ground-level ozone (O₃), both of which are major sources of premature mortality in Europe. EEA (2014a) estimates 430 000 premature deaths from PM_{2.5} and 16 160 from O₃ in 2011 in EU-28. PM causes cardiovascular and lung diseases, as well as cancers (Lauby-Secretan et al., 2013). It is typically classified by particle size, with the smallest PM_{2.5} particles contributing more health damage than PM₁₀. Traffic on busy roads generates even smaller, ultra-fine particulate matter, but it is not yet being measured. Anthropogenic PM emissions stem from both direct emissions (primary) and chemical reactions from precursor gases SO₂, NO_x, NH₃ and NMVOCs (secondary). O₃ affects human health through lung diseases. Unlike other listed pollutants, it is a secondary compound, formed only in chemical reactions in the troposphere from precursor gases NO_x, NMVOC, CO and CH₄. Its concentrations are thus highly affected by weather conditions; in particular, sunlight and high temperatures increase levels of O₃.

Concentrations of both of these compounds are exacerbated by transboundary emissions. Indeed, Kiesenwetter and Amann (2014) found that the transboundary contribution of PM_{2.5} in 2009 was above the WHO guidelines, rendering individual policies of the Member States insufficient. In several Member States, including Belgium, Czech Republic, Netherlands, Hungary, and Austria this was found to be a major source of urban PM_{2.5}.

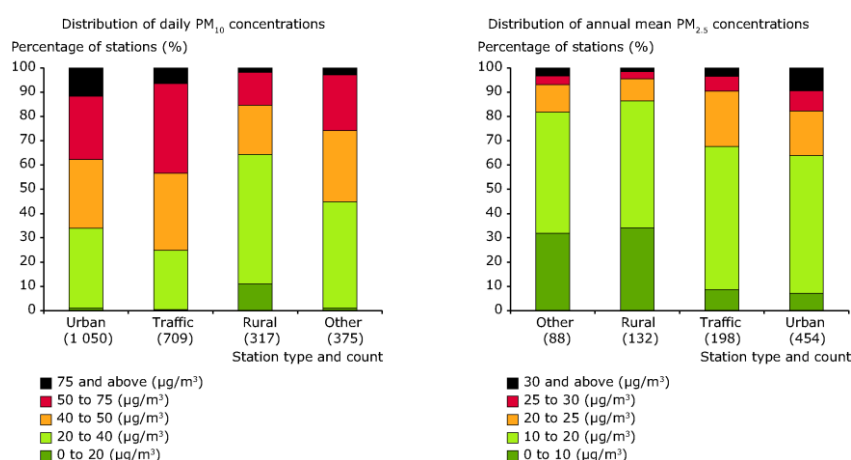
Air pollution is the top environmental risk factor for premature death in Europe (EEA, 2014a). The categories of generated adverse health effects are listed in Table 6.

Table 6: Adverse health effects generated by the most costly air pollutants in Europe

Compounds	Adverse health effects
PM	Can cause or aggravate cardiovascular and lung diseases, heart attacks and arrhythmias, affect the central nervous system, the reproductive system, and cause cancer. The outcome can be premature death.
O₃	Can decrease lung function and aggravate asthma and other lung diseases. Can lead to premature mortality.
NO_x	Can affect the liver, lungs, spleen, and blood. Can aggravate lung diseases leading to respiratory symptoms and increased susceptibility to respiratory infection.
SO_x	Aggravates asthma, can reduce lung function, and inflame the respiratory tract. Can cause headache, general discomfort, and anxiety.
PAHs, in particular Benzo-a-pyrene (BaP)	Carcinogenic. Other effects may be irritation of the eyes, nose, throat, and bronchial tubes.

Source: EEA (2013)

Due to traffic concentration, domestic heating, and tall chimneys of industrial facilities, air pollution is unequally concentrated in Europe. However very high heterogeneity makes it difficult to measure these effects precisely in the EU-28, i.e. regions differ with respect to urban layouts, climate, population susceptibility, vehicle fleet, and fuel used. Some of this heterogeneity with respect to PM is described by Figure 6.

Figure 6: Concentration status for daily limit value of PM₁₀ (left) and for annual target value of PM_{2.5} (right) in 2011

Source: EEA (2013)

According to Perez, et al. (2013), living in close proximity to busy roads exerts detrimental effects on human health, specifically due to the concentrations of ultra-fine, near-road

compounds. Ultra-fine PM is smaller than PM₁₀ and PM_{2.5}, and appears to have more adverse effects. In addition to experimental studies, its' distribution correlates with a range of chronic pathologies. Multiple studies link busy road proximity to the development of childhood asthma. Other studies draw links to cardiovascular diseases, including coronary heart disease. At the same time, the association of PM_{2.5} and PM₁₀ is far less clear (Perez et al., 2013; HEI, 2010). Furthermore Perez et al. (2013) investigated 10 EU cities, finding that 31% of the urban population lives 75m from busy roads, which increases to as high as 53% at 150m. While the exact estimates vary between studies, European urban areas are apparently far more dense than urban areas in the USA, implying a larger scale of adverse effects.

According to the EEA (2014a), public policy in some EU Member States may have exacerbated these effects by directly and indirectly supporting diesel-fuelled vehicles, which typically emit more PM and NO_x (particularly NO₂) compounds than their petrol equivalents. First, some Member States applied lower taxes to diesel in order to fight CO₂ emissions. Second, the high taxation of fossil fuels favoured diesel, since it has a higher energy content than petrol and is thus more efficient (similarly diesel vehicles were popular in the USA during the oil crises in the 1970s). This is an example of health risks and uncertainties related to the introduction of resource efficiency and environmental policies.

Another factor influencing the geographic distribution of pollution in Europe are the emissions from domestic heating and high industrial chimneys. Domestic heating has been rising in the recent decade and is the largest single source of fine particulate matter in Europe (Amann et al., 2014; Kiesenwetter and Amann, 2014). These emissions come from low chimneys (typically below 20 meters), thus resulting in relatively high concentrations of pollutants. First, the trend towards domestic heating, particularly with wood, in Europe has been attributed to government policy, which favoured renewable energy sources and raised the relative prices of other sources of energy. Second is the public's misperception of wood as a clean energy source. Third, in response to recession, some households, particularly in Greece and Italy, have reverted to heating with wood as a cheaper option. The increase in the emissions of BaP in the EU-28 is partially attributed to this source (EEA, 2014a). On the other hand, emissions from high industrial chimneys, e.g. fossil fuel power stations, disperse pollution more evenly. Also they are often sited in more rural areas. This contributes to improved air quality in Europe, but also leads to transboundary air pollution.

The case of biomass use for heating is another example of a possible conflict between resource efficiency and health improvements, as renewable resources or more efficient technologies may not be always less harmful than currently prevailing solutions. This issue should be taken into account when the specific instruments are designed. Public intervention design and analysis on the level of the policy mix instead of policy-by-policy may help to avoid such conflicts by providing incentives for both a decrease in harmful emissions and non-renewable resource use.

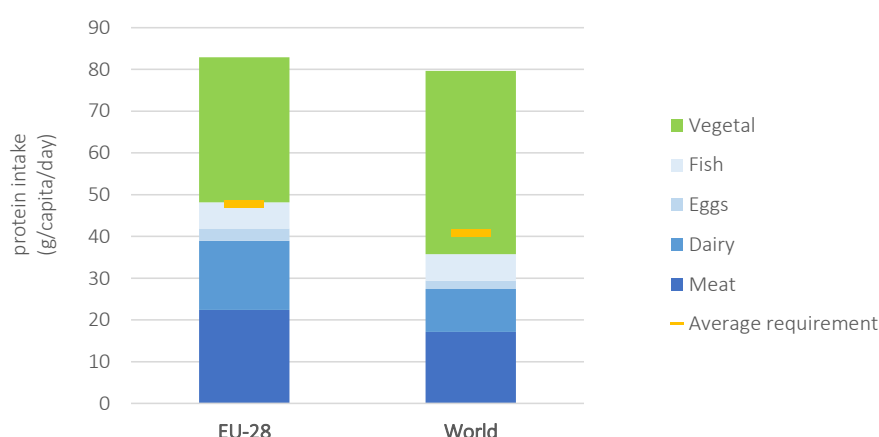
Concentrations of all the considered air pollutants, apart from benzo(a)pyrene emissions, have generally been dropping in Europe for the past decade. Nevertheless significant uncertainties exist in this respect. First, meteorology and topography contribute to the scale of pollutant concentrations in a given time. Second, reductions in anthropogenic emissions do not always translate into proportionally lower concentrations, e.g. because uncertainties exist with respect to emissions from commercial, institutional, and household fuel combustion. Third, international and even intercontinental (e.g. windblown desert dust from Africa)

transmission of emissions may make reductions in a particular area insufficient to affect concentrations.

3.2.3 Nutrition

Diets in Europe, similar to other highly developed regions of the world, are characterised by intake of protein above reference levels (Elmadfa, 2009). This may not be a risk in itself, as (1) the causes of rising European obesity levels are a more complex issue and (2) EFSA (2012) have failed to establish any recommended maximum protein intakes for the European Union. However some researchers believe, that if Europeans adopted diets structured differently from the present, their protein value would not need to match the current one (Erb et al., 2009).

Figure 7: Protein supply in 2011 in the EU and globally



Source: WISE Institute's own elaboration based on FAO raw data, EFSA (2012), Eurobarometer (2006)

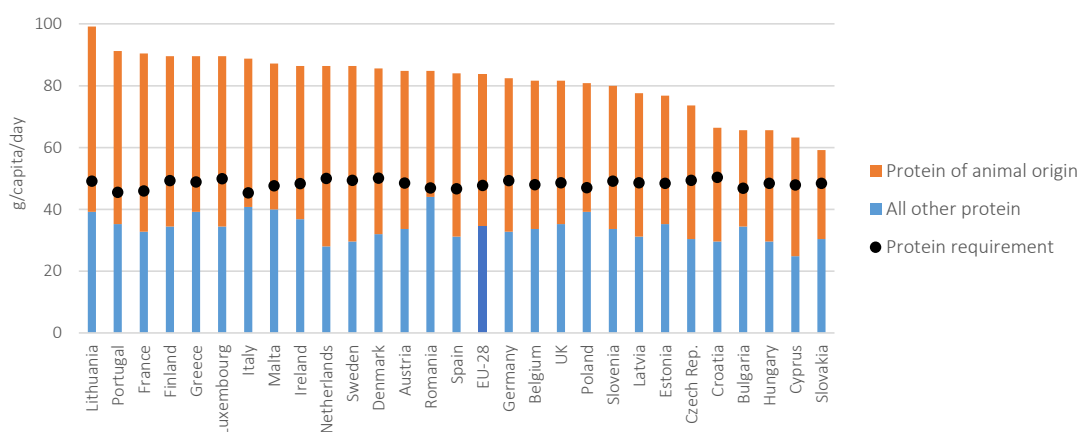
The view that Europeans should adopt a different diet has recently been promoted primarily by the advocates of reducing dependence on animal food products (Westhoek et al., 2014). According to FAO data, in 2011 the diet of an average EU-28 citizen comprised of 58% animal proteins from all protein consumed, while the same share globally amounted to just 39%. The motivations for curtailing the share of animal proteins include animal welfare arguments, the adverse health effects of red meat and saturated fats, and environmental concerns.

Diets rich in animal protein are usually associated with the so-called *Western diet*. Non-western countries appear to converge to higher meat consumption as their incomes per capita rise as well.¹ With the rapid GDP growth in the developing world, increasing

¹ Note that this is not necessarily always the case. FAO data between 1987 and 2011 shows drops in average animal protein supply, which generally moves together with the average intake, for France and Ireland. Meat production has been subsidised in the former Soviet bloc (McMichael et al, 2007) and despite massive GDP growth, many countries that underwent political system change in 1989, i.e. Bulgaria, Hungary and Poland, experienced a very significant drop.

environmental stress is created in the forms of land demand and CO₂ emissions (Westhoek et al., 2014; Porter et al., 2014; Westhoek et al., 2011; Erb et al., 2009).

Figure 8: EU-28 average protein intake per person per day and average protein requirement² in 2011



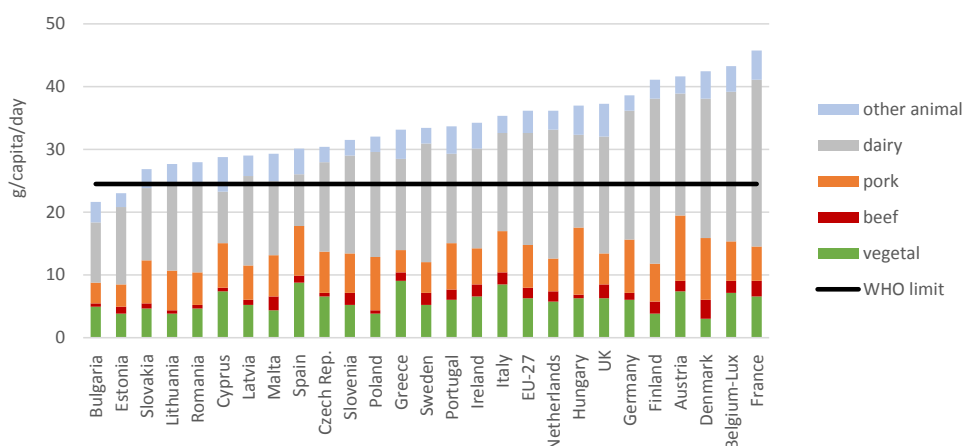
Source: WISE Institute's own elaboration based on FAO raw data, EFSA (2012), Eurobarometer (2006)

In 2011, there was not a single EU-28 country where average citizens' non-animal protein intake fully covered average protein requirements. The current average total protein consumption in the EU-28 is around 76% above the minimum requirements. This high protein intake, however, may still be considered safe (EFSA 2012). An adverse effect of high animal protein consumption on health in Europe comes from the associated intake of red meat and saturated fats. According to McMichael et al. (2007), Friel et al. (2009) and Pan et al. (2012), these are associated with increased incidence of cardiovascular disease and, to an apparently lesser extent, certain kinds of cancer. Moreover high-fat diets are also associated with the risk of obesity. McMichael et al. (2007) cited the association of meat consumption subsidies in the former Soviet Union with increased incidence of vascular disease as a more anecdotic evidence of the relationship.

Figure 9 presents data on the sources of saturated fat intake in the EU-27. Only the populations of Estonia and Bulgaria remain below the safe limit proscribed by the WHO (2003). A Friel et al. (2009) case study found that a 30% reduction in livestock production in the UK, assuming it would translate into an equal reduction in saturated fats and cholesterol intake, would "reduce the total burden from ischaemic heart disease by 15% in disability-adjusted life-years (DALYs), by 16% in years of life lost, and by 17% in number of premature deaths".

² Average protein intake has been estimated based on the average supply found in FAO (production + import – export) corrected minus 20% for losses, the same percentage has been assumed by Westhoek et al. (2011). Westhoek et al. (2011) crosschecked this data with survey findings reported in Elmadfa (2009). Average protein requirement has been calculated based on EFSA (2012) and average weight in population (Eurobarometer, 2006).

Figure 9: EU-27 intake of saturated fats in grams per person per day in relation to WHO proscribed limits in 2007



Source: WISE institute's own elaboration based on Westhoek et al. (2011) data

Additionally, a number of indirect health benefits from reduced animal protein intake may appear in the form of (1) increased fruit and vegetable consumption, which is below reference levels in most of EU countries (Elmadfa, 2009)³, (2) decreased risk from antibiotic-resistant bacteria, which are contracted through meat consumption (Marshall and Levy, 2011), (3) improved air quality, as livestock production is associated with particulate matter formation through NH_x emissions (Moldanova et al., 2011), and (4) improved water quality, although there is no consensus whether and to what extent water contamination by nitrates from livestock production is detrimental to human health (Powlson et al., 2008).

Overall, the evidence suggests that decoupling policies will have associated health benefits related to nutrition, in particular regarding animal protein consumption. Nevertheless, a certain risk from reducing animal protein intake exists, which is related to possible heterogeneities in the nutrition patterns across the population. For example, according to Elmadfa (2009) European women receive low and, in some countries, below reference values in amounts of iron, for which meat is an important source. Differentiated nutrition impacts related to income distribution will be discussed in subchapter 5.3.

While there will be synergies between promoting healthy diets and resource efficiency, some trade-offs between nutritional recommendations and environmental impacts may also occur. For example, while the dairy sector has relatively high nitrogen and GHG emissions, dairy products contribute essential nutrients to the diet. Unfortunately, they also contain large quantities of saturated fats, thus it is recommended to consume low-fat dairy products. As

³ According to Elmadfa (2009) of all EU countries for which data had been available, only Poland, Germany, Italy, and Austria meet the recommendation of consuming at least 400 g of fruits and vegetables per person daily.

80% of the population adheres to this recommendation, the removed cream may be wasted. It would be counterproductive to use it in other kinds of food, as it would simply re-enter the diet. Another example would be the consumption of only lean meat and thus wasting the rest of the animal (Macdiarmid, 2012).

The globalisation of the food industry, which has taken place in the recent decades, has contributed to a greater array of consumer choice and thus improved nutrition, e.g. in Northern Europe⁴ the per capita supply of fruit increased by 79% from 1961 to 2011. As seen in Table 7, the greatest growth in supply has taken place in respect to fruits non-indigenous to the Northern European climate.

Table 7: Fruit supply in Northern Europe⁴ [g per capita per day]

Category	1961	2011	Growth
Apples and products	34.6	52.5	51%
Bananas	15.3	24.9	63%
Citrus, Other	0.5	1.2	157%
Fruits, Other	53.8	62.7	17%
Grapefruit and products	2.1	7.9	276%
Grapes and products (excl. wine)	16.0	21.9	37%
Lemons, Limes and products	3.0	5.6	87%
Oranges, Mandarines	26.2	87.1	232%
Peas	2.5	2.8	10%
Pineapples and products	1.6	8.9	441%

Source: WISE Institute's own elaboration based on FAO supply data and Eurostat population figures supplemented by U.S. Census data

Consumption of out of season food tends to increase greenhouse gas emissions due to the increased number of "food miles" or greater agricultural inputs, e.g. use of heated greenhouses (Watkiss et al., 2005; Garnett, 2008). This to some extent implies a trade-off between public health and environmental impact. Engelhaupt (2008) in a comment to Weber and Matthews (2008) has suggested that as only 11% of greenhouse gas emissions from food consumed in the United States comes from transportation, the problem is overall of a minor importance. Still the overall emissions of agriculture are significant, as in the recent years they represented a stable 10% of all EU-28 greenhouse gas emissions according to the EEA based on MITERRA model (Westhoek, 2011).

⁴ Defined as Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Poland, Sweden, and the United Kingdom. Definition partly due to data scarcity. Calculations based on FAO supply data, as well as Eurostat population figures supplemented by U.S. Census data.

3.2.4 Qualitative health impact assessment across policy mixes

The proposed policies would influence the health of Europeans through multiple channels, primarily through reduced emissions of air pollutants directly and indirectly due to improved resource efficiency, as well as positive and negative impacts on food prices. The net effect on food prices will be difficult to ascertain without detailed policy description. The land policy mix would work mostly by reducing agricultural pollution and affecting food prices, with some of the instruments exerting a positive impact on the quality of foodstuffs. Both metals and overarching policy mixes would improve health by indirectly reducing industrial air pollution due to improved resource efficiency.

Table 8: Assessment across the DYNAMIX policy mixes – social dimension, health impacts

	Health
PI1 Stronger and more effective environmental and climate dimension for EU land management in the CAP	++
PI2 Revised emissions levels in the National Emissions Ceilings Directive (NECD) and additional measures for better management of the nitrogen cycle on farmland	+
PI3 Promotion of “Payment for Ecosystem Services” programmes	+
PI4 Regulation for Land Use, Land Use Change, and Forestry	0
PI5 Strengthened pesticide reduction targets under the Pesticides Directive, and provision of guidance to farmers on integrated pest management	(0/+)
PI6 Targeted information campaign to influence food behaviour towards: reducing food waste and changing diets	+
PI7 Development of food redistribution programmes/food donation	+
PI8 VAT on meat products	+
Land policy mix – total	++
Pm1 Green fiscal reform: internalisation of external environmental costs	+++
Pm2 Green fiscal reform: materials tax	+
Pm3 Promotion of sharing systems	+
Pm4 Increased spending on research and development	((++))
Pm5 Product standards	+
Metals policy mix – total	+
Po1 Circular Economy tax Trio	++

Po2 EU-wide introduction of feebate schemes for selected products categories	+
Po3 Reduced VAT for the most environmentally advantageous products and services	+
Po4 Boosting extended producer responsibility	0
Po5 Skill enhancement programme	0
Po6 Enabling shift from consumption to leisure	0
Po7 Step-by-step restriction of advertising and marketing	0
Po8 Local currencies for labour-based services	0
Overarching policy mix – total	+

“P” = policy; “I” = indicator; “c” = common; “s” = related to the social dimension; “o” = overarching policies mix; “l” = policy mix on land; “m” = policy mix on metals

3.2.5 Land policy mix

The instruments pertaining to land policy mix will affect public health through several channels, primarily agricultural pollution and food prices. Effects are predominantly positive, even though limited information on the exact design of policy instruments makes it challenging to provide a detailed assessment. There are also several caveats related to health-environment trade-offs, which would require careful assessment during the actual rollout of the proposed policy mix.

First, some of the promoted agricultural techniques are expected to decrease environmental externalities, e.g. a reduction in synthetic fertilizer use, its more efficient use, and better manure management would reduce emissions of nitrates into air and water. Nitrate compounds are not only air pollutants directly harmful to humans, but also belong to the precursor gases of particulate matter and ground-level ozone, the two most harmful air pollutants in Europe (EEA, 2014a). Nevertheless, beneficial net outcomes would have to be carefully estimated as EXIOPoL (2011), for example, found that reducing cattle in favour of pork and poultry yields €120 million gains in terms of reduced GHG emissions, while €3,200 million costs of non-GHG emissions in the EU-27. Furthermore, encouragement of afforestation could lower harmful pollution, as forests remove air and water pollutants (Nowak et al., 2006), although effects outside of cities may not be large.

Second, the promoted agricultural techniques typically achieve better environmental performance at the cost of overall productivity, e.g. organic farming (Seufert et al., 2012). It is to be expected that lower productivity will eventually lead to higher consumer prices. As even in Europe around 5% of the population faces the risk of malnutrition (Reisch et al. 2013), higher food costs would lead to lower nutritional intake among the most vulnerable groups, as well as the range of available nutritional choices, and thus likely have negative health impacts. Only one of the proposed land policies is likely to work in the opposite direction by increasing food availability to the poorest households, namely the introduction of food redistribution programmes. From the perspective of health impacts, it is therefore an

important element of the mix, potentially offsetting at least the most severe negative aspects of other proposed policies.

PI1 Stronger and more effective environmental and climate dimension for EU land management in the CAP

The proposed CAP revisions would affect health outcomes primarily through higher food prices and lower emissions of pollutants, as described in the summary of the policy mix. Another likely effect would be the production of healthier food, e.g. by reducing the use of synthetic fertilisers, some of which may be harmful and even carcinogenic to food and water consumers (Hunt, 2011; EEA, 2010). Furthermore, water could be made safer for consumers. Reduced use of synthetic fertilisers and increased fertiliser use efficiency would result in lower nitrate water contamination, which is associated with some adverse effects on humans (e.g. Scheidleder (2003) points to impacts on infants less than two months of age), although it remains unclear whether these harmful effects are significant (Powlson et al, 2008).

PI2 Revised emissions levels in the National Emissions Ceilings Directive (NECD) and additional measures for better management of the nitrogen cycle on farmland

The instruments would improve management of the nitrogen cycle on farmland, thus leading to similar outcomes to the revision of the CAP (PI1) by (1) imposing less profitable farming techniques that drive up food prices, (2) decreasing agricultural pollution, and (3) providing potentially healthier foodstuffs. Impact of the first two mechanisms on health is described in the summary of the policy mix, while of the third in PI1.

PI3 Promotion of “Payment for Ecosystem Services” programmes

Payments for Agricultural Services (PES) would empower localities, corporations and other stakeholders to decrease pollution in their area and thus engineer better health outcomes, e.g. water utilities incentivising farmers for lower water pollution. Pollution could be also lowered if PES were used to promote afforestation (as described in the summary of the policy mix).

PI4 Regulation for Land Use, Land Use Change, and Forestry

The instrument would affect health outcomes indirectly, through the encouragement of afforestation, which could lower air and water pollution (as described in the summary of the policy mix). Key impacts, however, will be related to climate change mitigation and not to human health improvements in the short term.

PI5 Strengthened pesticide reduction targets under the Pesticides Directive, and provision of guidance to farmers on integrated pest management

Reduced pesticide use would affect health by, first, increasing the prices of foodstuffs in Europe, and second, improving their quality.

First, price increases would come from short- and long-term effects. In the short-run, agricultural losses would be likely as farmers switch to non-pesticide pest management techniques, although whether such losses occur depends on the specific design of the policy (i.e. voluntary change in the production process or change through fiscal incentives or command-and-control instruments). A more long-term effect would be due to the fact that

pesticide use is a generally cheaper method of securing high crop yields. The mechanism through which food prices affect health is described in the summary of the policy mix.

Second, Fantke et al. (2012) based on 2003 data, estimate that health costs from the use of 133 pesticides (which constituted half of pesticide mass applied in that year) in 24 EU Member States are rather limited, amounting to €78.4 million yearly (€12 per capita over lifetime). Some pesticides are thought to have carcinogenic effects (Bassil et al., 2007). However 33 of the 133 pesticides quantified by Fantke et al. (2012) amounting to 20% of health impacts have been already banned in the EU. As the health effects of pesticides are relatively low, e.g. in comparison to air pollution, and compounds suspected of carcinogenic effects have been successively banned, the gains from their further reduction are likely to not be very significant. However, a large uncertainty exists as to the exact scale of these effects, due to the wide range of chemicals used.

PI6 Targeted information campaign to influence food behaviour towards reducing food waste and changing diets

If successful, the campaign would affect health through a number of channels. First, less food waste would likely eventually translate into lower food production in Europe (unless offset by the design of the CAP), thus lowering agricultural emissions of pollutants and increasing afforestation. Second, lower food waste would limit the amount of foodstuffs going to landfills, which emit air pollutants. Third, more environmentally sustainable diets could have mixed outcomes, depending on specific recommendations. While lower meat intakes could on average have positive health effects (see description in instrument PI8), conflicts could arise between environmental sustainability and healthy nutrition, as discussed in the nutrition impacts overview in subchapter 5.2.2.

PI7 Development of food redistribution programmes/food donation

This instrument would exert a positive health impact among the most economically disadvantaged by enabling them to obtain part of their food from food banks or to buy it at social supermarkets, thus effectually decreasing food prices. First, this would improve their nutrition, and second, provide them with wider nutritional choices.

PI8 VAT on meat products

A meat tax would affect European health by providing choices towards (on average) healthier nutritional choices, decreasing the environmental impacts of livestock production, and increasing food prices.

The European diet is associated with high meat intake, which is connected with some adverse health consequences, including risks associated with saturated fats, high fat diets, and possibility of contracting anti-biotic resistant bacteria. At the same time, most European countries do not meet recommendations regarding the amounts of fruits and vegetables consumption. Therefore, on average, the instruments that promote less meat and more fruit and vegetable consumption ought to have positive impacts on the health of the EU citizens. However, significant heterogeneities exist between the Member States in terms of average protein intake, average share of animal protein intake, average saturated fat intake, and fruit intake. This means that the instruments will yield different health effects in the particular Member State populations, and in some may have adverse consequences.

Second, if the lowering of meat consumption in Europe, resulting from a meat tax, would lower livestock production in Europe, pollutant emissions resulting from this activity would also fall, translating into health improvements. These effects would be akin to the other instruments in the policy mix, which seek to lower agricultural emissions, as a large chunk of agricultural products are consumed by livestock. Therefore, reduced meat consumption – a consequence of VAT increase – should result in lower nitrate emissions and improved water quality (Moldanova et al., 2011).

Third, a tax on meat would effectively increase prices, as it is intended, and thus it would be necessary to offset this outcome among the most economically disadvantaged groups to avoid the negative health effects of malnutrition. This would be particularly important in the Member States with much lower protein intake than the majority.

From a human rights perspective, PI1, PI2, PI3, and PI5 are important as they concern a government's negative duty to remove obstacles to a safe environment and healthier food. This might result in a general price increase, which in turn means partially failing to meet the positive duty to provide people with sufficient nutrition – if prices are higher, more people risk malnutrition.

Yet negative duties that avoid inflicted damage to both people and the environment, are considered stronger than positive duties – which can be conceived as “duties to help” (Foot 1967). Furthermore, as pollutants and pesticides can put at risk people's very lives, reducing potentially harmful synthetic fertilisers and generally decreasing agricultural pollution looks like a primary duty that overrides the positive duty to provide food.

PI4 cannot be said to promote the right to health, especially in the short-run. Yet, like all instruments aimed at mitigating climate change, its goal is rather to promote human safety in a broader sense, which also includes a less polluted environment and food.

PI6 mainly promotes the right to health by lowering agricultural emissions and air pollutants emitted by food waste. Encouraging lower meat intakes on one hand should promote the shift to a healthier diet, which is expected also by PI8. Yet both instruments raise the issue of malnutrition, as they might result in a lack of protein intake.

The development of food redistribution program (PI7) is instead the only policy that meets the positive duty to provide needy people with adequate nutrition.

3.2.6 Metals and materials policy mix

All of the proposed instruments in the metals policy mix aim to improve resource efficiency. In principle, if successful this should be expected to lower industrial pollution, especially harmful air emissions, and thus improve health outcomes. Furthermore some of the instruments would also work more directly towards limiting pollution from industrial facilities, explicitly targeting the externalities of economic activity, including those related to human health. In this sense those policies fully promote the right to health.

The energy sector alone in the EU-27, Norway, and Switzerland emits pollution amounting to a cost of €217-700 billion, while the manufacturing sector adds €45-130 billion (EEA, 2014b). Better resource efficiency ought to decrease these amounts, as fewer externality-generating inputs would be required for a stable level of output, especially as processing virgin metals is typically energy intensive. For instance, Shapiro and Walker (2015) found a clear negative relationship between plant-level pollution per unit of output and productivity in US

manufacturing between 1990 and 2008. However the alignment between resource efficiency and emissions will be imperfect. Some industrial processes could decrease the use of non-renewable resources without being superior in terms of pollution, e.g. photovoltaics, unlike nuclear power, do not require fuel, but emit much more sulphur dioxide and nitrogen oxide lifecycle emissions per kWh (Bruckner et al., 2014). Another issue is a rebound effect: a decrease in the cost of resource use through efficiency gains tends to increase the quantity demanded. In theory this effect could lead to an actual increase of resource use – and resulting pollution – after the introduction of more efficient technologies. However empirical studies show that it is typically not that strong (Gutowski, 2010). The metals policy mix design makes a rebound even less likely, as material tax and internalisation of externalities increase the costs of pollution and material use. Finally, reduction of the amount of materials is associated with downstream impacts: landfill use and accompanying air pollution (particularly methane) is reduced.

Pm1 Green fiscal reform: internalisation of external environmental costs

Taxes on environmental externalities are among the most beneficial policy instruments in the three analysed mixes in terms of the health impacts. It will yield positive health outcomes by directly penalising economic agents for the harmful effects of their activities. The policy instrument states that the level of increased environmental taxes and fees would roughly equal 100% of estimated external costs, not only including purely environmental, but also human health externalities. This is an important point, as health impacts constitute a significant share of total external costs, together with climate change impacts (e.g. EXIoPOL 2011). As a price-based policy, green fiscal reform avoids challenges related to the lifecycle health impact assessment inherent for command-and-control instruments. Instead, it creates a price signal, which propagates along the supply chain providing incentives to switch towards more overall healthy alternatives. The key challenge is setting the tax/fee level, as well as balancing the relative harm of different health and environmental impacts.

Pm2 Green fiscal reform: materials tax

The policy aims to incentivise agents to conserve materials through taxation, particularly targeting the energy (production of materials is highly energy intensive) and manufacturing industries, which are also the industries producing the largest pollutant emissions in the EU.

Pm3 Promotion of sharing systems

Sharing systems conserve resources by enabling the more efficient consumption of existing goods and though affecting health outcomes through the mechanism described in the summary of the metals policy mix. An additional minor positive health outcome may come from the promotion of bicycle riding, as bicycle sharing systems are so far among the most successful.

Pm4 Increased spending on research and development

The instrument would fund research and development in the areas of resource efficiency and recycling. The former would exert a positive effect on health akin to the other instruments included in the mix, as described in the summary. Though the latter would also limit emissions

of pollutants through some other channels. First, recycling would make it possible to lower the production of virgin materials, which is typically more energy intensive and thus emits more pollutants than recycling. Second, it would limit the growth of landfills, which also emit air pollutants.

Pm5 Product standards

Product standards would limit the amounts of materials used in particular products, thus facilitating greater resource efficiency in the manufacturing industry, similarly to other instruments in the policy mix.

3.2.7 Overarching policy mix

The overarching policy mix would predominantly affect health indirectly through improved resource efficiency and thus lower industrial emission of pollutants, akin to the mechanism described in the metals policy mix. Some of the proposed instruments would also act to limit industrial pollution, affecting health in this way.

Po1 Circular Economy tax Trio

Taxes on the extraction of virgin materials, landfills and waste incineration would work to improve health outcomes by, first, improved resource efficiency, and second, reduced pollution from landfills and waste incineration; in particular solid waste disposal sites emit methane, while waste incineration expends methane and nitrous oxide (Bhide et al., 2000). Better resource efficiency would exert impact on health working through the mechanism described in the summary of the metals policy mix.

Po2 EU-wide introduction of feebate schemes for selected products categories

The proposed scheme would encourage the purchase of goods with lower environmental impacts. Health gains would come from the promotion of products that yield lower emissions of pollutants, particularly air pollutants as the most harmful group in the EU. Such a scheme would also provide an additional incentive to develop low-pollutant technologies. The size of the impact would be dependent on the range of products covered by the scheme, as well as the extent of price reductions and fees.

Po3 Reduced VAT for the most environmentally advantageous products and services

The instrument would reduce VAT rates for environmentally advantageous products and services, affecting resource efficiency, and through this channel would have advantageous health impacts, akin to the mechanism described in the metals policy mix. If reduced rates were extended to low-pollution products and services, health gains would also come through this channel.

Po4 Boosting extended producer responsibility

Extended producer responsibility would improve health outcomes by providing incentives for improving resource efficiency, similarly to the mechanism described in the metals policy mix.

Po5 Skill enhancement programme

A skill enhancement programme which disseminates knowledge about solutions that decrease environmental impacts could have some effect on propagation of these technologies (e.g. solar power) and thus some minor indirect impacts on health through lower environmental pollution.

Po6 Enabling shift from consumption to leisure

Enabling a shift from consumption to leisure, particularly by improving work flexibility, could help improve work-life balance, thus improving health outcomes in terms of psychological wellbeing, as well as perhaps physical health measured by sickness absence (Michie and Williams, 2003).

Po7 Step-by-step restriction of advertising and marketing

Although some have suggested that restricting advertising might have some positive impact on children's wellbeing (e.g. a qualitative study by Nairn (2011)), as well as the economically disadvantaged, empirical evidence might be rather weak at the moment. It might be prudent not to expect a significant health impact from the instrument in this respect before more in-depth studies are available. However, if the policy is successful in reducing consumption, it might induce people to shift time from work to leisure, which could yield positive health impacts (described in Po6).

Po8 Local currencies for labour-based services

If successful, the introduction of local currencies for labour-based services could, to a limited degree, improve material efficiency by tilting consumption to less material intensive goods and services, thus lowering industrial pollutant emissions and improving health outcomes, as described in the summary of the metals policy mix.

3.3 Social inclusion impacts

3.3.1 Environmental justice

When analysing the impact of policy mixes on social inclusion, we generally considered the impact on the most vulnerable groups, such as children, women, the disabled or elderly, and immigrants. We were specifically interested in making sure that the policies proposed would not aggravate the condition of those who are worse-off. In this sense we adopted a distributive-justice perspective, making sure that the weakest were, if not specifically protected, at least not harmed.

There is no specific right in the Human Rights Declaration that expressly addresses the need to protect the weaker segment of the population. The 1948 UN *Declaration* simply claims that, “Everyone is entitled to all the rights and freedoms set forth in this Declaration, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status. Furthermore, no distinction shall be made on the basis of the political, jurisdictional or international status of the country or territory to which a person belongs” (Article 2). The concept of equality is again mentioned in article 10, regarding the right to a fair trial (“Everyone is entitled in full equality to a fair and public hearing by an independent and impartial tribunal, in the determination of his rights and obligations and of any criminal charge against him”), but no mention is made regarding the necessity to promote equality in the form of giving special attention to those in need.

The OHCHR *International Covenant on Economic, Social and Cultural Rights* somewhat fills some the gaps of the HR Declaration, but only regarding children and women: “(Article 10) (2). Special protection should be accorded to mothers during a reasonable period before and after childbirth. During such period working mothers should be accorded paid leave or leave with adequate social security benefits. (3). Special instruments for protection and assistance should be taken on behalf of all children and young persons without any discrimination for reasons of parentage or other conditions. Children and young persons should be protected from economic and social exploitation. Their employment in work harmful to their morals or health or dangerous to life or likely to hamper their normal development should be punishable by law. States should also set age limits below which the paid employment of child labour should be prohibited and punishable by law.”

Vulnerable groups are often considered in separate OHCHR conventions that are focused on single elements of vulnerability, such as the *Convention on the Elimination of All Forms of Discrimination Against Women* (CEDAW, 1979); the *Convention on the Rights of the Child* (CRC, 1989); the *International Convention on the Elimination of All Forms of Racial Discrimination* (CERD, 1966), and the *Convention on the Rights of Persons with Disabilities* (SCRPD, 2006).

In our analysis, we were most interested in the promotion of greater equality – or reduction of inequality – with a specific eye on vulnerable groups.

3.3.2 Distribution of costs and benefits of decoupling policies

Decoupling policies affect social inclusion in numerous ways. This not only includes distribution of costs and benefits of action, but also the distribution of avoided costs and benefits of inaction. In both cases, distribution may be progressive (poorer households are

relatively better off), regressive (poorer households are relatively worse off) or proportionate (no relative change in the situation of various income groups).

Low-income households have limited capacity to adapt to external shocks, so they are disproportionately affected by hikes in resource prices and natural disasters. Thus, decoupling policies that decrease the risk of such outcomes (by reducing environmental and resource pressures stemming from the economy) are – from this perspective - more beneficial for the most fragile parts of society. This holds for any effective decoupling policy design: achieved benefits are more significant for low-income, fragile households. The cost distribution of the decoupling measures depends, however, on the policy mix design. Therefore, ensuring neutral or progressive distribution of the costs of given policy will also mean that its total impact will be progressive. One important caveat is a potential shift in environmental pressures towards low-income households.

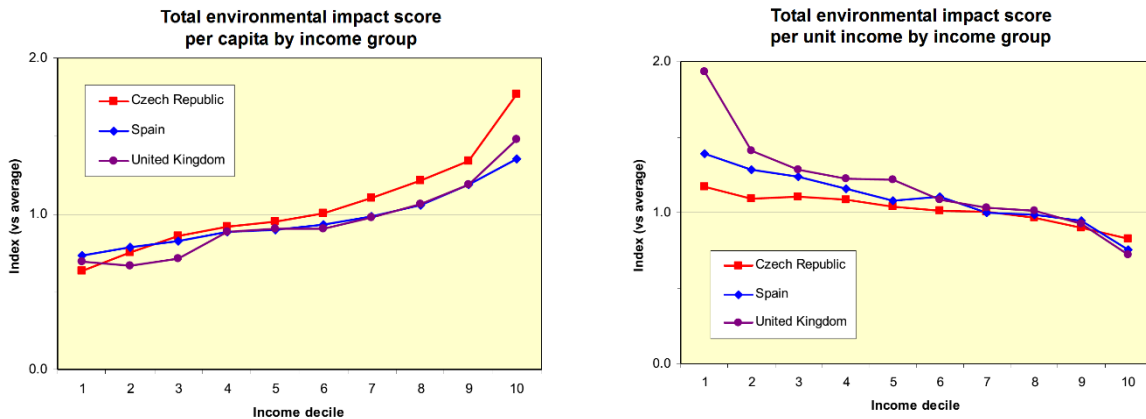
Table 9: Key positive and negative impacts of decoupling policies on social inclusion

Positive impact on social inclusion	Negative impact on social inclusion
Decreased long-term risk of resource price hikes and natural disasters (low-income households have limited capability to adapt to external shocks)	Induced costs of adapting to new policies, regressive distribution of relative policy cost burden (higher share of resource-intensive goods in low-income household consumption expenditures)
New labour market opportunities linked to circular economy	Induced labour reallocation, including large adverse local shocks
Reduced health impacts of pollution (low-income households are typically disproportionately exposed to environmental problems), but only if the policy mix does not shift environmental pressure to the most vulnerable communities	Increased risk of malnutrition and material deprivation (due to increase in price of resource-intensive goods and services)

Source: own analysis; WISE Institute

The assessment of the social inclusion impact of decoupling policies should take into account the distribution of costs and benefits of proposed actions. First, policy instruments which increase the cost of resource-intensive, environmentally harmful consumption are regressive by default, i.e. without additional instruments they pose a greater burden for low-income households than for high-income ones. While low-income households' total expenditures on resource-intensive goods are below average, their share in the total consumption tends to be higher (Pye et al 2008). In some countries and for some pollutants, however, the environmental pressures per unit of expenditure may rise with household incomes (Kerkhof et al 2008, Kerkhof et al 2009). Food and shelter – two of the three key areas of resource inefficiency identified by the DYNAMIX project (Tan et al. 2013) – are among the basic necessities. When income increases, households are able to increase spending on non-essential goods and services, as well as on increasing the quality of necessities. This includes an increased physical scale of consumption (e.g. more electrical appliances) and associated waste (OECD 2008), but also the rising quality and variety of consumed goods and services. As shown by Girod and de Haan (2010), taking into account the monetary value of the quality of goods supports the notion that the average pollution intensity of consumed goods decreases with income.

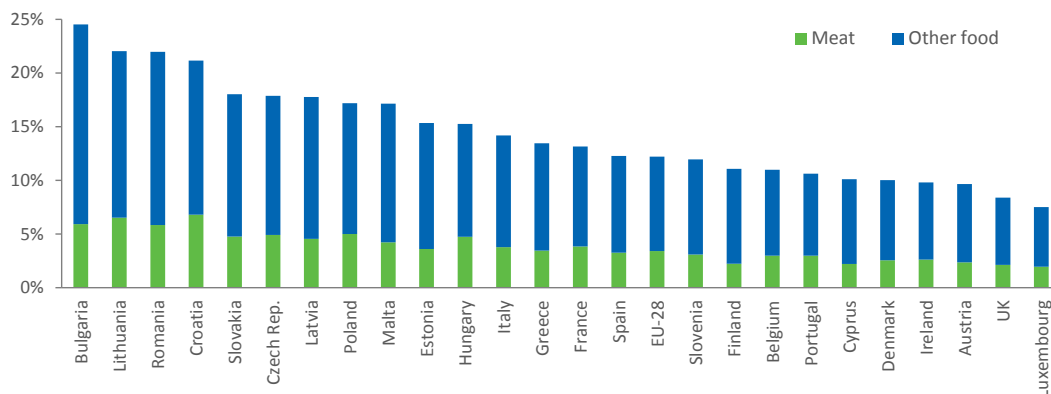
Figure 10: Relative environmental impact per capita and per unit income by income group in selected European countries



Source: Pye et al (2008)

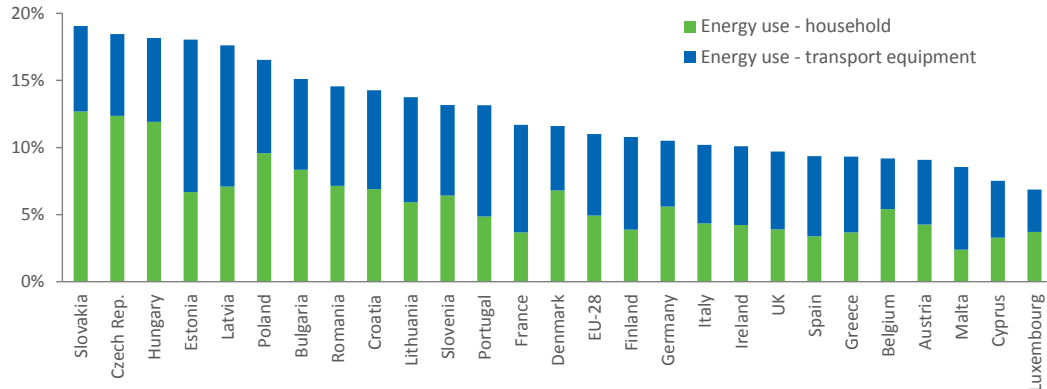
Similar income effects are observable at a country level. For instance, the share of food and energy in total household expenditures is higher in Central and Eastern Europe than in the rest of the EU, which is attributable to relatively low levels of GDP per capita. This implies that uniform decoupling measures will have different impacts on the citizens across the Member States: they will likely be more pronounced in countries with lower GDP per capita because of higher resource intensity of households' consumption.

Figure 11: Share of food expenditures in total mean consumption expenditure per household in EU countries in 2010



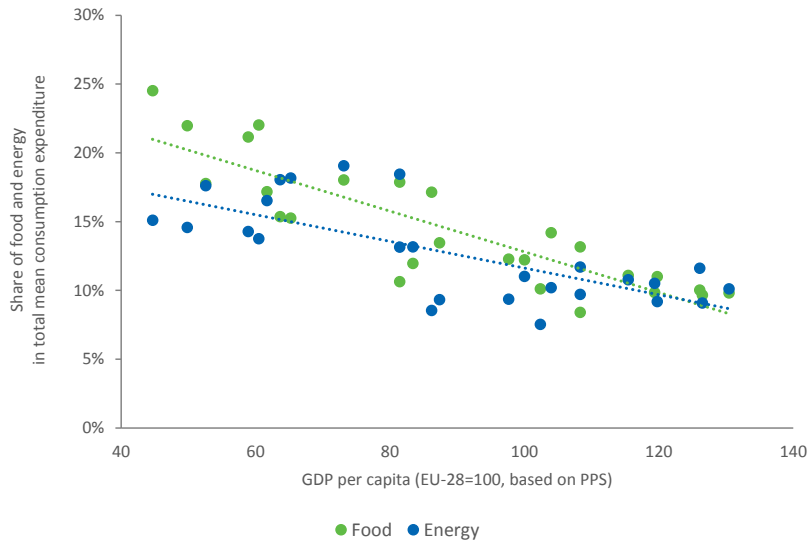
Source: own calculations based on Eurostat data; WISE Institute

Figure 12: Share of energy expenditures in total mean consumption expenditure per household in EU countries in 2010



Source: own calculations based on Eurostat data; WISE Institute

Figure 13: GDP per capita and share of food and energy expenditures in total mean consumption expenditure per household in EU countries in 2010



Source: own calculations based on Eurostat data; WISE Institute

Adapting to decoupling policies is also more difficult for low-income households. First, they have limited ability to raise necessary funds when investments are required. Even when choosing costlier, more resource efficient equipment brings an overall net financial benefit over its lifetime, the initial financial burden may be prohibitive for low-income households. Second, low-income households tend to have higher discount rates (Sutherland 2006), i.e. they are less willing to forego current consumption to ensure future savings. This is because they face higher opportunity costs – they have to forego consumption of essential goods and services in order to be able to invest in resource efficient, capital-intensive appliances. The

same reasoning applies to command and control instruments. Even if long-term savings make resource-efficient products economically beneficial from the perspective of a typical household, low-income households may still prefer to choose cheaper products to avoid high initial expenditures. Finally, the ability of low-income households to adapt to decoupling policies is further reduced due to information gaps. Poverty is associated not only with material deprivation, but also with the lack of access and ability to process the information (World Bank Group 2015), which is necessary for adaptation to decoupling policies.

The higher relative burden faced by low-income households together with their lower ability to adapt to decoupling policies, if unabated, is likely to result in the increased material deprivation. The material deprivation rate – an indicator in the EU-SILC (EU statistics on income and living conditions) survey – captures the inability to afford certain items considered by most people to be desirable or even necessary to lead an adequate life. It measures the percentage of population unable to afford at least three of the following nine items (Eurostat 2015):

1. to pay their rent, mortgage or utility bills;
2. to keep their home adequately warm;
3. to face unexpected expenses;
4. to eat meat or protein (including vegetarian equivalents) regularly;
5. to go on holiday;
6. a television set;
7. a washing machine;
8. a car;
9. a telephone.

In turn, the severe material deprivation rate measures the percentage of the population unable to afford at least four of the above items.

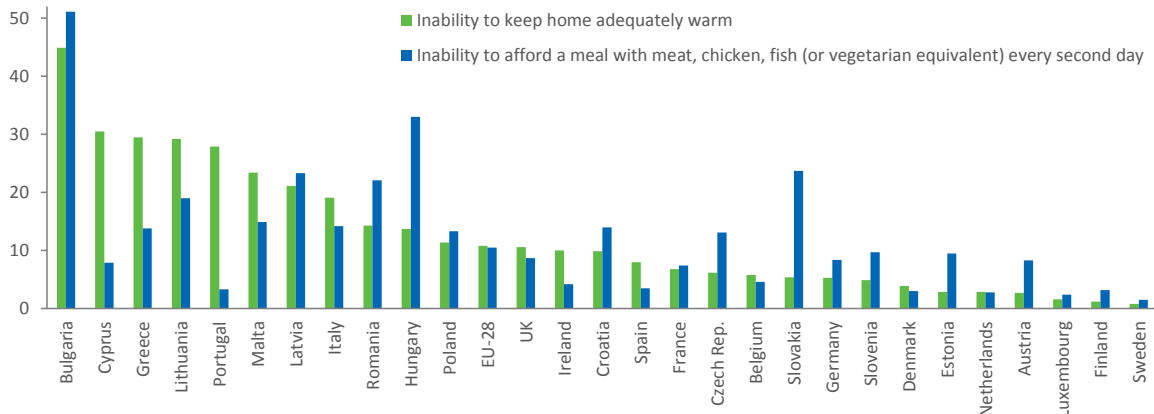
The availability of most of the items on the list will be affected by decoupling policies. Housing-related consumption, including energy use, is one of the key areas of resource inefficiency they will address (Tan et al. 2013). The land policy mix will affect the affordability of meat and other proteins, both directly (increased VAT on meat) and indirectly (production-side instruments). Tourism transport has a significant environmental impact (Peeters et al. 2007), so the affordability of holidays will also be affected (although this may be somewhat mitigated by the availability of local holiday opportunities). Both regulatory and market-based instruments will influence the price of cars, appliances, and electronics. Overall, by increasing the cost of resource use and environmental pressures, decoupling policies are likely to decrease the affordability of most of the listed items, increasing material deprivation.

The material deprivation rate distinguishes between those who cannot afford certain durables, and those who do not want or do not need them (Eurostat 2015), so changing consumption patterns (i.e. dematerialisation) may somewhat alleviate this problem. This is especially the case when “greener” substitutes for material-intensive goods and services are currently available or may be introduced as a part of policy mixes (e.g. sharing systems).

A closer look at material deprivation indicators reveals that the affordability of items varies across the countries. The data suggests that expenditures on food and energy are more challenging for European households than occasional investments in appliances, especially in the Southern, Central, and Eastern European countries. This implies that product standards, subsidies and feebate schemes will have a limited impact on the material deprivation rates, with the exception of the most expensive items, especially cars. Policy instruments increasing

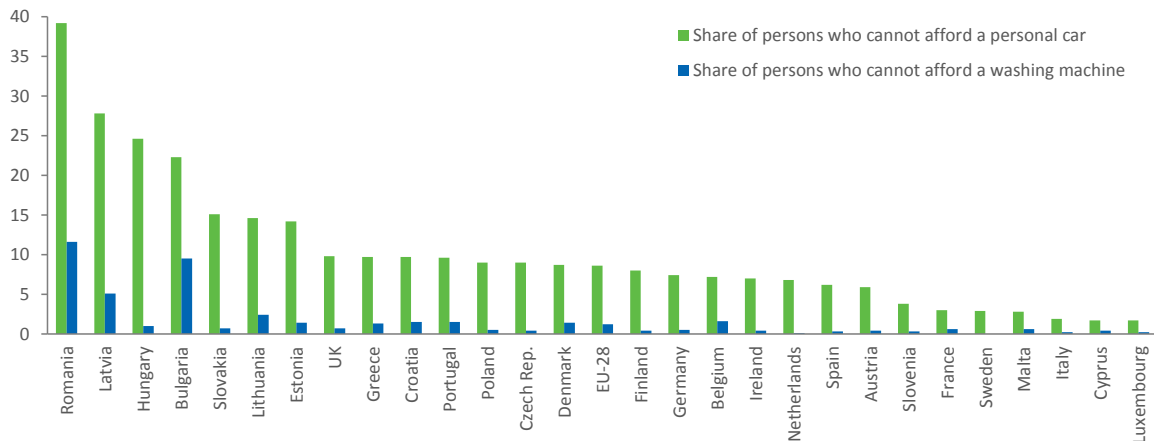
the prices of energy and food will, however, have a significant impact on the material wellbeing of low-income European households.

Figure 14: Percentage of total population unable to keep home adequately warm and unable to afford a meal with meat or equivalents in EU countries in 2013



Source: own elaboration based on Eurostat data; WISE Institute

Figure 15: Percentage of total population unable to afford a personal car and a washing machine in EU countries in 2013

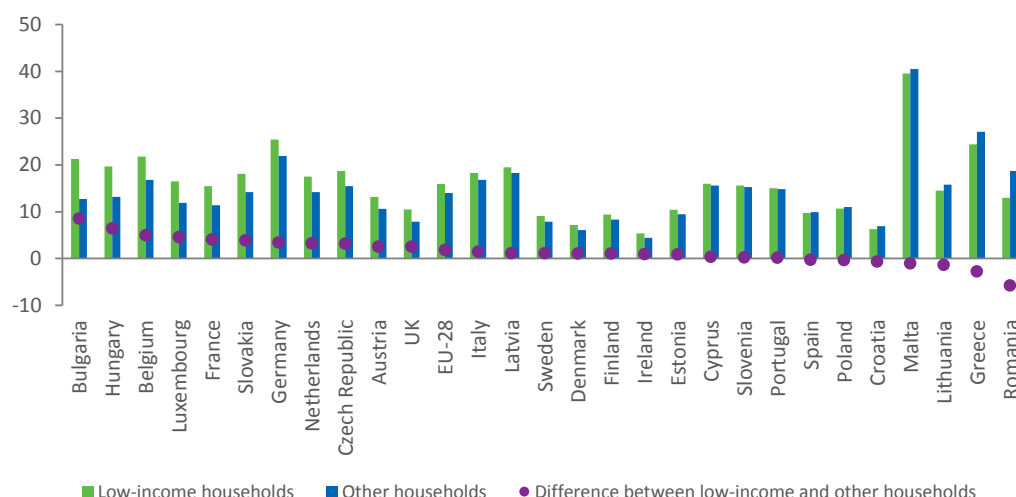


Source: own elaboration based on Eurostat data; WISE Institute

Decreased availability of food and energy can be an important indirect impact channel of decoupling policies on health. Other health-related inequalities are related to the distribution of the health benefits of decoupling policies. There are several potential sources of inequality in this area: 1) richer regions and communities tend to be early adopters of eco-innovations, which leads to spatial concentration of environmental and health benefits in wealthier neighbourhoods, 2) low-income households may be late to comply with new policies or fail to comply at all, 3) concentration of environmentally problematic parts of circular economy value chains in deprived neighbourhoods. The last phenomenon may occur both through localisation decisions favouring neighbourhoods which are already better off, as well as through the impact of increased local pollution on housing prices (i.e. deprived households moving in to area with lower prices) (Richardson et al. 2010).

Historic results of the EU-SILC survey provide evidence of the unequal distribution of environmental quality in the EU. In most Member States, low-income households are currently more exposed to environmental problems than the rest of population. Furthermore, the change in exposure since 2005 – part of which may be attributed to environmental policies – has also been less favourable for low-income households. At the same time, there are few examples of countries in which low-income households have seen worsening of environmental conditions while the exposure of the rest of population to environmental problems has decreased. This suggests that inequality of health and environmental outcomes is typically relative rather than absolute. Furthermore, as discussed earlier, deprived households are especially vulnerable to external shocks. This means that decrease in exposure to environmental problems may result in greater welfare gains for this group, even if it is smaller than for the rest of population.

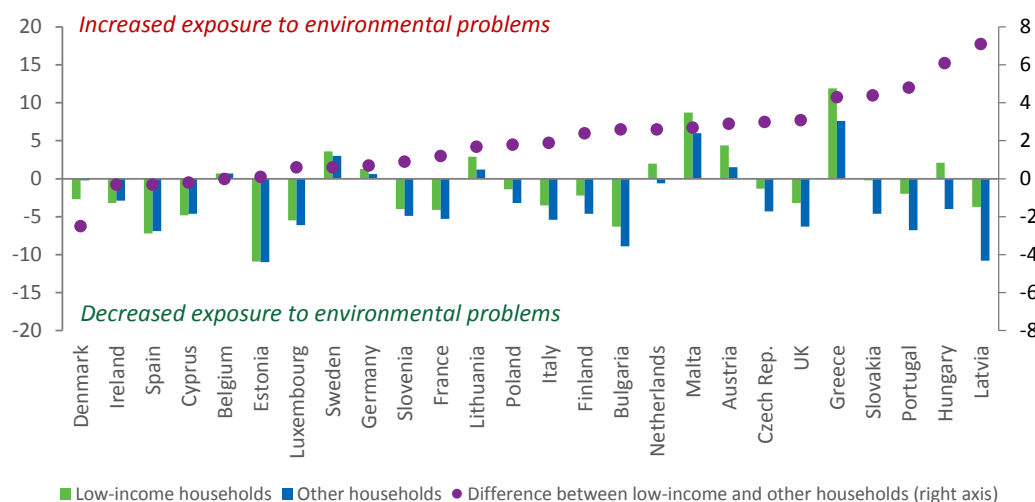
Figure 16: Percentage of total population exposed to pollution, grime or other environmental problems in EU countries in 2013



Note: low-income households = households with equivalised income below 60% of the median

Source: own elaboration based on Eurostat data; WISE Institute

Figure 17: Change in percentage of total population exposed to pollution, grime or other environmental problems in EU countries, 2005-2013



Note: low-income households = households with equivalised income below 60% of the median

Source: own calculations based on Eurostat data; WISE Institute

There is significant overlap between the employment and social inclusion impacts of decoupling policies. First, activity status is one of the key determinants of the material deprivation rate in the EU. It is more than twice as high among not employed persons as it is among the employed, and four times higher among the unemployed (without work, but seeking employment) than among employed. Policies which result in reallocation of labour in the economy may thus have a negative impact on social inclusion through a (temporary) increase in unemployment (see overview of labour impacts in chapter 4.1.2).

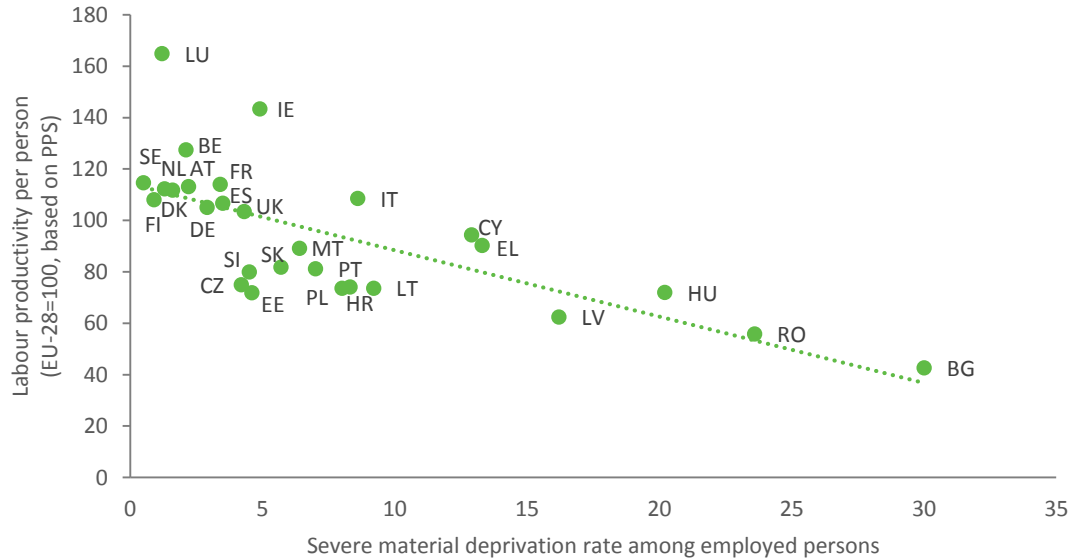
Table 10: Severe material deprivation rate by most frequent activity status in the EU-27, 2005-2013

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Employed persons	7.3	6.6	6.0	5.7	5.5	5.4	5.7	6.3	6.1
Not employed persons	13.8	12.9	12.0	11.0	10.5	10.7	11.4	12.6	12.4
Unemployed persons	28.4	27.0	26.6	24.2	23.4	23.9	25.1	26.6	27.1
Material deprivation among unemployed persons relative to employed persons (=100%)	389%	409%	443%	425%	425%	443%	440%	422%	444%

Source: own elaboration based on Eurostat data; WISE Institute

Second, policy instruments that decrease labour productivity and/or limit working hours will put negative pressure on total wages. This will exacerbate the problem of the working poor, defined as employed persons whose income nevertheless falls below the poverty threshold. Currently, material deprivation among employed persons is most severe in Member States with low labour productivity.

Figure 18: Severe material deprivation rate among employed persons and labour productivity in European countries, 2013



Source: own elaboration based on Eurostat data; WISE Institute

The regressive impacts presented above may be balanced by redistributive instruments within the policy mix, especially regarding spending of additional revenues raised from green taxes on social transfers to the poor. It is, however, necessary to explicitly target the intervention to support the social inclusion of the most vulnerable groups. For instance, green tax reform, which will shift the tax burden from the labour market to resource use and pollution, is regressive by default: while labour taxes are typically progressive, green taxes are regressive. In order to balance this effect, labour tax decreases would have to be greater for less affluent households. Furthermore, simply lowering labour tax rates will have limited impact on low-income households, as many of them may be unemployed, inactive, or already fall below minimum taxed income levels.

3.3.3 Qualitative social inclusion impact assessment for the overall policy mix

Table 11: Assessment for the overall policy mix – social dimension, social inclusion impacts

	Social inclusion
PI1 Stronger and more effective environmental and climate dimension for EU land management in the CAP	((-/++))
PI2 Revised emissions levels in the National Emissions Ceilings Directive (NECD) and additional measures for better management of the nitrogen cycle on farmland	(-/0)
PI3 Promotion of “Payment for Ecosystem Services” programmes	++
PI4 Regulation for Land Use, Land Use Change and Forestry	(0/+)
PI5 Strengthened pesticide reduction targets under the Pesticides Directive, and provision of guidance to farmers on integrated pest management	(-/0)
PI6 Targeted information campaign to influence food behaviour towards: reducing food waste and changing diets	0
PI7 Development of food redistribution programmes/food donation	+
PI8 VAT on meat products	-
Land policy mix – total	(-/0)
Pm1 Green fiscal reform: internalisation of external environmental costs	(-/0)
Pm2 Green fiscal reform: materials tax	(-/0)
Pm3 Promotion of sharing systems	++
Pm4 Increased spending on research and development	((+))
Pm5 Product standards	0
Metals policy mix – total	(-/0)
Po1 Circular Economy tax Trio	(-/0)
Po2 EU-wide introduction of feebate schemes for selected products categories	(-/0)
Po3 Reduced VAT for the most environmentally advantageous products and services	0
Po4 Boosting extended producer responsibility	0

Po5 Skill enhancement programme	+++
Po6 Enabling shift from consumption to leisure	((-/++))
Po7 Step-by-step restriction of advertising and marketing	0
Po8 Local currencies for labour-based services	0
Overarching policy mix – total	+

“P” = policy; “I” = indicator “; “c” = common; “s” = related to the social dimension; “o” = overarching policies mix; “l” = policy mix on land; “m” = policy mix on metals

3.3.4 Land policy mix

PI1 Stronger and more effective environmental and climate dimension for EU land management in the CAP

The social impact of the stronger and more efficient environmental and climate dimension of Common Agricultural Policy is very highly dependent on the final shape of this policy instrument.

In general, the policies under consideration will mainly affect rural areas, which in some countries may be underdeveloped in comparison to the rest of the economy or to the EU as a whole. Moreover, less educated farmers and smaller holdings may find it difficult to adapt and fulfil new eligibility criteria for the support. Therefore, this policy may increase inequalities and social strains in rural areas of Europe and the society as a whole.

On the other hand, the policy can, in principle, be designed in a way that will take into account the handicaps of low-income farmers. As their holdings are usually less equipped in machinery and their farming methods less intensive, it may be easier for them to switch to proposed farming regimes and benefit from the increase in payments. In such a situation, the impact of the policy on social inclusion will be positive. Proper definition of the addressees of promotional and education campaigns as well as a support for tourism may also improve the social conditions of agriculture holdings.

Summing up, stronger and more effective environmental and climate dimensions for EU land management within the Common Agriculture Policy can improve the social position of farmers. However, to enable this, proposed instruments have to directly target vulnerable groups. In particular, specific actions need to be undertaken to protect them against the negative impacts of the policy on their incomes and risk of poverty.

PI2 Revised emissions levels in the National Emissions Ceilings Directive (NECD) and additional measures for better management of the nitrogen cycle on farmland

While emission levels in NECD will be set at the EU level, the specific instruments will have to be decided in the member states. As a result, the social impact assessment of the NECD directive can be both positive or negative depending on how the instruments will be implemented by each country.

Small, low-income farms tend to use less nitrogen fertilizers than larger ones. They are naturally favoured by policies aiming at reducing the use of nitrogen. To empower economically weaker rural areas, special instruments targeting small farms within these

policies should be introduced. These may include education and promotional campaigns that should, first of all, increase the awareness of the benefits from the potentially better management of the nitrogen cycle on farmland.

PI3 Promotion of “Payment for Ecosystem Services” programmes

There are two channels of impact of PES programmes on the social situation in the rural areas.

First of all, farmers will receive payments for the maintenance of semi-natural habitats and High Nature Value Farming. Therefore, the flow of money will increase their revenues. Such payments will constitute a flow from businesses (e.g. tourist or utilities corporations) to low-income households (farmers), which will contribute to the reduction of income inequalities within the society. This conclusion is especially relevant for the New Member States, where the material deprivation of the rural areas is especially intensive. On the other hand, part of these transfers may go to the farmers that are relatively well-off, diminishing the redistributive aspect of the policy.

Secondly, support for PES programmes will impact social inclusion in rural areas through labour market channel. New jobs in tourism, forestry or horticulture will likely be more productive and provide higher wages than cultivating the land. That will affect their social position and contribute to the reduction in inequalities.

Summing up, the social impact of promotion of PES programmes is unequivocally positive. It should help to empower low-income, rural households and contribute to the reduction in inequalities.

PI4 Regulation for Land Use, Land Use Change and Forestry

The social impact of LULUCF is yet unclear and depends on several aspects of the projected policies. Relevant regulations will be introduced in order to decrease net emissions from that sector. Therefore, land use will be more strictly regulated, which may to some extent affect social inclusion.

First of all, LULUCF regulations will impact development possibilities, which may push the price of housing upwards, especially affecting poorer households. Limitations on development that will increase the price of housing and hence limit affordability may lead to social problems and disruptions. Furthermore, as LULUCF regulations will mainly affect rural areas, they can affect the incomes of farmers as they will not be able to cultivate their land as before.

On the other hand, such regulations may affect the broader labour market through a decrease in the overall costs of mitigation of GHG emissions. As some of GHG will be abated through the LULUCF, industrial companies will be less affected. Also, the price of energy will rise less in comparison to the baseline mitigation policy without LULUCF instruments. Therefore, the introduction of this policy will mitigate the economic impact of the overall climate policy and limit changes in the relative position of various social groups.

At the same time the scope of the influence of the LULUCF policy package on society is limited and depends of specific instruments implemented in the member states. As it will limit the possible of land development, it can affect housing prices in certain regions that will especially hurt young people entering the labour market. Also, additional limitations on land use in rural areas can decrease the income of the poorest farmers. Therefore to prevent rising

inequalities and assure that LULUCF regulations do not affect housing affordability, some additional policy instruments should be introduced.

PI5 Strengthened pesticide reduction targets under the Pesticides Directive, and provision of guidance to farmers on integrated pest management

The instruments to be introduced will be decided on a Member State level, so the distributional impacts will vary across the EU. While they will likely be minor due to the limited scale of this intervention, most likely the only instrument in the package that could indisputably be regressive is the introduction of pesticide taxes. Studies show that for pesticides the price elasticity of demand is low (Skevas et al 2013) due to various factors preventing farmers from switching to alternatives, notably lock-in effects (Wilson and Tisdell 2001, Vanloqueren and Baret 2008). This results in the low effectiveness of pesticide taxation (Skevas et al 2012) as an instrument of environmental policy. Moreover, income inequality in society will probably increase, since low-income farms may face especially high barriers in the switch towards sustainable alternatives, finding it difficult to avoid imposed taxation by improved efficiency. Alternative instruments such as command and control instruments and subsidies (Skevas et al 2013, Jacquet et al 2011), as well as provision of guidance to farmers proposed in the instrument description may decrease the risks of policy burden falling on the most vulnerable farmers.

PI6 Targeted information campaign to influence food behaviour towards reducing food waste and changing diets

Information campaigns probably belong to the softest instruments under consideration. Both macroeconomic and distributive impacts should therefore be limited due to the supplementary nature of this policy. In fact, one may even argue that if households change their behaviour as a result of media advocacy, social welfare may only increase due to the voluntary character of this shift. At the same time, however, this will produce both winners and losers such as any other process that results in structural change within the economy. Nevertheless, the probable distributive impact of the policy package will remain small, as the scope of the policy is limited.

PI7 Development of food redistribution programmes/food donation

Development of food redistribution programmes will bring significant improvement to the low-income households. Such programmes will increase their standard of living through improved affordability of food. In that way it should help to reduce inequality.

However, these improvements come with some caveats. First, such institutions do not permanently solve the problem of poverty. Although they mitigate its effects, they do not affect the poverty-at-risk or social exclusion. This policy instrument does not create employment opportunities or empower the low-income households. Second, the beneficiaries of food banks may be stigmatised, so their social position may not improve as a result of this instrument.

PI8 VAT on meat products

This instrument will disproportionately affect low-income households, which spend higher proportion of their income on meat products. In addition to potential malnutrition problems discussed in chapter 4.2.5, the food consumption profile of the poorest groups may shift towards lower quality products, increasing the daily intake of carbohydrates and fats. This may strengthen the long-term public health problems already observed in the OECD countries, including epidemics of obesity and diabetes. In the case of more affluent middle- and high-income families, this effect will be probably much weaker, resulting in the proposed policy package having an undesirable distributive impact within society.

3.3.5 Metals policy mix

Green fiscal reform instruments will likely have the greatest impact on social inclusion among all the instruments in the metals policy mix. Increased taxation of pollution and resource use will negatively affect the households twofold: directly, through reduced affordability of large share of the goods in the consumption basket (especially for low-income households), and indirectly, through challenges related to labour market shift towards less polluting and resource intensive sectors. At the same time, there will be two important positive effects of green fiscal reform related to decrease in labour taxation. First, this will increase disposable income of wage earners. Second, it will ease the transition on the labour market induced by decoupling policies.

Increased support for R&D may lower the total costs of achieving decoupling measures, which will make it easier to minimise its burden on low-income households. Yet, effectiveness of R&D activities and inclusiveness of developed innovations are highly uncertain. Promotion of sharing systems is an important part of the mix from a social inclusion perspective because it provides affordable alternatives to resource-intensive goods. This is crucial for low-income households, which may not be able to afford environmentally friendly and resource efficient products, but may instead choose sharing systems to avoid increased taxation.

Pm1 Green fiscal reform: internalisation of external environmental costs

Internalisation of negative environmental externalities by increased taxation of emissions that will thereafter be balanced in the form of reduced labour taxes should lead to an increase in employment, and through that to lower unemployment in the long term. In this way, the projected instrument should contribute to social integration within the EU, at the same time shifting consumption from less to more environmentally desirable goods. As in the case of material taxation (see below), this might be accompanied by an adverse effect in the form of negative shocks in the short term, in particular in local labour markets where the tax impact will not be (in a given area) offset by reduced labour tax. The ultimate social impact of the proposed policy mix on a local scale will depend on the taxation level and may be offset by other instruments like R&D or investment support for projects located in areas affected by the adverse effects of the environmental costs of internalization.

Pm2 Green fiscal reform: materials tax

Indirect taxation of materials should lead to increased costs of final goods and limit consumption of those that are the most resource intensive. Producers of these goods will probably adjust either by changes in product design or – if their market power is strong – by shifting the costs of the instrument onto their subcontractors or employees. In both cases certain groups of workers or consumers will be affected more than others, worsening social cohesion in the affected member states. In practice, these effects will probably be limited to local labour markets and economies: only some communities may require support during the transition phase if taxation leads to a spike in unemployment on a local scale. Therefore, the ultimate social impact of the proposed policy mix should be rather limited, unless the level of taxation is very high and the potential of other instruments like sharing systems or R&D support in mitigating these negative effects is not strong enough.

Pm3 Promotion of sharing systems

Promotion of sharing systems can be associated with a significant social impact as it increases the availability of products and services, and hence contributes to reduction in inequalities in terms of living standards. As people do not have to bear high upfront capital costs, more individuals will enjoy access to cars or specific machinery. Car sharing increases mobility and allows for lowering transport costs, allowing for social inclusion of the poorest households. Also, deepening the market for sharing will make it more likely that cheaper and more attractive options will develop, as potential consumers will not only include poorest households. The impact of sharing systems on social inclusion should thus be positive.

Pm4 Increased spending on research and development

The history of the last 200 years proves that over the long run, technological progress increases the living standards of low skilled workers even more than others (Clark 2008). This is because mechanisation vastly improves labour productivity in industry, agriculture, and other branches of the service sector that traditionally employs relatively less skilled workers. On the other hand this conclusion may not hold with respect to shorter, although still relatively long, periods of time, when technological change may be biased with respect to certain sectors and skills, significantly affecting the distribution of benefits from R&D in the economy (Acemoglu 2002).

Having this in mind one may expect that increased spending on R&D should, in the long run, positively affect not only the resource efficiency of the economy, but also the well-being of the society and social inclusion. At the same time, however, in the short to medium term its impact on income inequality and the living standards of the weakest parts of society remain ambiguous, as the distribution of benefits from increased productivity may or may not be labour augmenting in the medium term. Moreover since results of any R&D activity is inevitably uncertain, the pure fiscal effect of the policy may, in the short run, worsen social cohesion in the EU, failing to deliver the expected benefits over a longer time perspective. This – of course – does not provide arguments against public R&D expenditures, but rather underlines the need to finance them from an increased public deficit or progressive income taxation. If so, in the long run one may expect the instrument to bring positive effects, whereas the transition burden should be minimal and equally distributed among society.

Pm5 Product standards

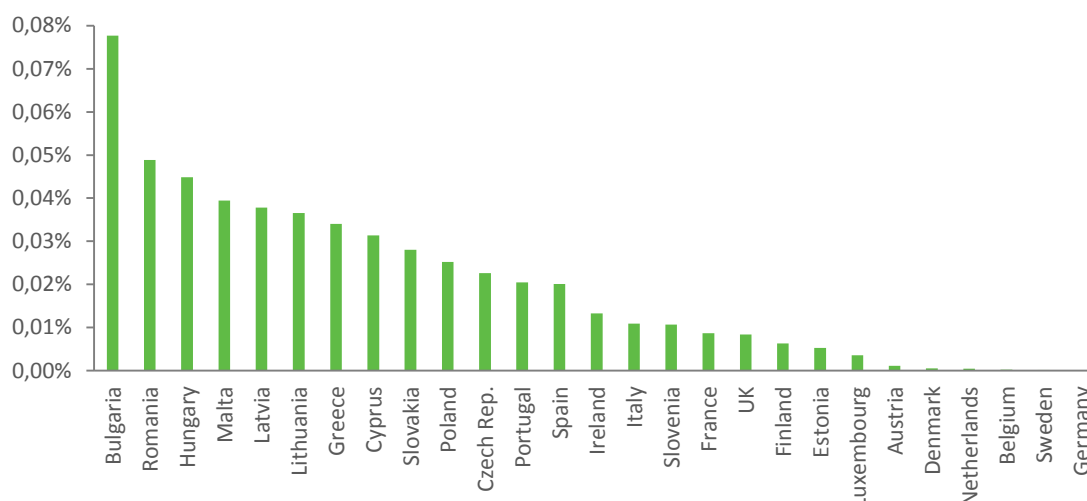
Product standards should not significantly affect household budgets, as most industries will probably adjust to them internally. In some cases – if projected standards are very demanding from a technological perspective - this conclusion may be questioned. The instrument description suggests, however, that this will not be the case as standards should be set on ambitious, but achievable level. Therefore, the overall direct and indirect impact of the policy on social inclusion should be neutral.

3.3.6 Overarching policy mix**Po1 Circular Economy tax Trio**

The circular economy tax Trio (virgin raw materials, landfill and incineration tax) is intended to increase recycling and limit resource use in the European economy. Within this policy mix, local impacts related to the labour market are of primary concern. Although the mining sector's share in employment and value added in the EU member states' economies is rather limited, it can still significantly contribute to the economy on the local level. Therefore, some communities may require support during the transition phase if the demand for virgin materials drops significantly. At the same time, the instrument description suggests that the impact of the proposed policy mix on the affordability of material goods will be rather limited. The unanticipated introduction of a high landfill tax might, however, be problematic for poorer households located in Central and Eastern Europe, because of relatively low incomes and high rates of landfilling waste. In their case, the unemployment and poverty at risk might rise in certain regions, especially if taxation reduces jobs not only in the mining sector but also in other resource-intensive industries based on local raw materials which are expensive to transport.

Taxation of waste in the form of landfill and incineration taxes will mostly affect the poorest households in a disproportionate way (OECD 2008) through higher prices of relevant municipal services. This may be problematic in some member states because of the significant income differentiation within the EU, while consumer-side taxation would lead to leakage. The net impact should, however, be low, due to the limited macroeconomic scale of the instrument and the possible switch to other waste treatment options. For high landfill tax levels, equalisation across the EU may be problematic due to the varying impact on household budgets. Therefore command and control instruments may become a useful alternative for limiting the export of waste to cheaper landfills abroad. In the case of municipal waste, taxation based on countries of origin instead of countries of destination might also be considered as a more socially inclusive alternative.

Figure 19: Landfill tax set at 10 EUR/t as a percentage of final consumption expenditure of households per capita, simulation based on 2013 data



Source: own calculations based on Eurostat data; WISE Institute

Po2 EU-wide introduction of feebate schemes for selected products categories

Credit constraints form one of the major barriers that limit the potential involvement of low-income households in the resource efficient investments. While the instrument description claims that feebate schemes for selected product categories should partially overcome this problem, this is not evident. In fact budget neutrality (fee and rebates combined) implies that some (environmentally harmful) products will have to become more expensive in order to make others cheaper. Moreover, someone will have to buy them if the support for the poorer households should materialise. If so, the redistributive impact of the policy mix depends on the motives of those buying non-efficient products. One option is that resource-intensity is connected to the size of the product (e.g. bigger cars or appliances) or its additional, non-essential features (e.g. some display panels on electronic devices). In this case, the feebate scheme taxes luxury consumption, while decreasing the costs of smaller, basic devices. Another possibility is that higher production costs are associated with resource efficiency, and there is a trade-off between investment and operational costs (e.g. hybrid cars, more energy efficient appliances). In this case, low-income households will, in fact, be taxed by the feebate schemes, as they will not be able to afford acquiring more expensive products. It is important to note that in this case, the feebate scheme is unlikely to be able to lower investment costs for resource efficient goods below the costs of inefficient ones and stay budget-neutral. Few consumers will choose products that are more expensive to both buy and to use, so the scheme would not likely be able to raise sufficient revenue. This does not apply to the first case, when additional features may still make taxed products attractive to some consumers.

Impacts over the long run may involve a faster pace of innovation, making it easier for low-income households to adapt to decoupling. This, however, may be achieved by other policies stimulating deployment of resource efficient solutions, e.g. reduced VAT. From the perspective of social inclusion, the key issue is the distribution of the costs of financing these policies. When feebates are introduced for mostly homogenous products, their burden is likely

to fall on the low-income households. In such cases, it may be preferable to finance the subsidies from other sources, which may be less regressive or already available as a result of broader green tax reform.

To sum up: the overall negative or, at best, neutral social outcome of the policy depends on the product. For harmonised products with the same functions and sizes, the instrument is probably regressive as investment costs are linked to efficiency. For products with highly variable additional features and similar efficiency levels, it should be progressive, however if feebates are to be focused on the promotion of more efficient technologies rather than more austere consumption, this is unlikely to be the case. When both additional features and efficiency varies considerably, the net outcome is difficult to predict and lies in between the two cases above. In this case its impact on social inclusion will probably be limited.

Po3 Reduced VAT for the most environmentally advantageous products and services

The impact of this policy on social inclusion depends on the distribution of benefits and costs across different social groups. Distribution of benefits is mainly affected by the types of products and services that will be subsidised, and their relation to their closest substitutes. If these goods and services are similar in most non-environmental aspects (e.g. energy efficient and non-efficient appliances), the subsidy should directly incentivise resource efficient choices. This is especially important for low-income households that would like to choose resource efficient solutions in order to achieve long-term savings even if the up-front investment costs are higher. Another possibility is that environmentally friendly options are already cheaper than their alternatives, but they are not preferred by some households for other reasons like consumer preferences or habits (e.g. some consumers may tend to buy paper books instead of e-books). In such case, the subsidy will serve as an additional price signal promoting environmentally advantageous, efficient solutions. This will be especially beneficial for low-income groups, which are more price-sensitive and thus are more likely to use resource efficient solutions even before it is subsidized. In this case the subsidy will serve as a social transfer and not environmental policy per se. Finally, subsidised goods and products may have additional, costly features not directly associated with resource efficiency (e.g. luxury electric vehicles). In such case, reduced VAT will support wealthier households increasing inequality, but at the same time staying in line with the environmental policy goal. Distribution of policy costs depends on the financing mechanism, which may be progressive, regressive, or neutral. If the instrument under consideration is assessed in the context of broader green tax reform (i.e. financed by revenues from green taxation), the alternative uses of the tax revenues should be taken into account.

Summing up, the proposed policy may produce both more inclusive and exclusive results. At the same time the net impact is likely to be limited, because the scope of instrument and its ambiguous redistributive impacts are highly dependent on the supported goods.

Po4 Boosting extended producer responsibility

The social impact of extended producer responsibility will probably be minor. Firstly, the scope of intervention is expected to be small and as such also its impact on inequalities should be limited. Secondly the instrument should affect both the price of goods sold and their robustness. On the one hand it should increase the costs of certain products, but on the other it should improve their durability. This means that some of the affected goods might be harder

to purchase for the poorest households, but at the same time the need to replace them quickly will diminish. If we take into account that the most vulnerable groups rarely purchase new durables relying rather on the second hand market, the proposed instrument may in practice support the social cohesion of European societies. Moreover, in the long run, production costs of even the improved goods should decrease following the overall trend of productivity growth in the economy, and the overall consumer surplus will be positive.

Po5 Skill enhancement programme

The social effect of skills enhancement programmes transmits mainly through the labour market channel. This impact can be twofold.

Firstly, skills enhancement programmes reduce the frictional unemployment, shortening the period of unemployment after a lay-off. As unemployment is usually stressful and difficult, skills enhancement programmes alleviate the negative social effects of labour market frictions. If they are effective, they can constitute significant support for standard labour market policies.

Secondly, if skills enhancement programmes are targeted at poor people in rural areas, they can contribute to poverty reduction through an increase in labour market participation. In particular, if they are paired with other actions undertaken within the social support system, they can support the reduction of social exclusion in rural areas and contribute to the empowerment of farmers. In addition, they can mitigate the negative social impacts implied by other policies (e.g. by regulation in LULUCF sector).

Po6 Enabling shift from consumption to leisure

The social impacts of a shift from consumption to leisure to a large extent depend on the policy design. Although, an increase in social engagement and reduction of social exclusion are within the main aims of this policy, the effects may not be positive.

As mandatory shortening of the work week and an increase in statutory holidays may lead to decreased productivity and consequently increased unemployment, it will primarily affect less qualified workers. Therefore, mandatory changes aiming at a shift from consumption to leisure may not only be counterproductive, but also induce social strains.

On the other hand, instruments that will enable a voluntary shift to leisure (such as introduction of voluntary flexible labour market arrangements) will exert the whole palette of positive social impacts. First, they would enable people to spend more time with their families and can contribute to an increase in social participation. Second, as a more flexible labour market will enable young pensioners to stay longer in the labour market, the social benefits from part time pensions, for example those experienced in Sweden, will be observed. Aquino et al. (2006) find that work increases the life satisfaction of pensioners even when controlling for health and financial status. Gallo et al. (2010) argue that work has important effects on both the physical and mental health of pensioners. Therefore, enabling gradual, part-time pensions that will be a side effect of increased flexibility in the labour market, will improve the social situation of pensioners. The same can be said about mothers, who will be able to return to work earlier. Klein et al. (1998) found that long maternity leaves are correlated with depression. Consequently, if introduced instruments are voluntary, they will positively impact social inclusion through both channels – enabling people to spend more time with their families and increasing labour market participation with consequent benefits.

Summing up, the overall effect of a shift from consumption to leisure is, to large extent, dependent on the specific policy design.

Po7 Step-by-step restriction of advertising and marketing

Step-by-step restrictions of advertising and marketing can increase unemployment with the consequent impact on the society as a whole. In Europe, employment in sectors that are connected to the advertising and marketing is estimated at 1% of the total GDP (see D5.2). An increase in unemployment will exert fairly strong pressure on the European social systems. It would also decrease social participation, and through smaller incomes affect health (see e.g. Economou et al. (2008) for evidence). This would, in turn, exert pressure on health systems in European countries.

On the other hand, the main aim of this instrument is to reduce consumerism, which should support a shift from consumption to leisure. If such effect after introduction of restrictions of advertising and marketing is indeed observed, people will have more time for social life and their families. That will positively affect social capital in European countries.

In conclusion, the social impact of step-by-step restrictions of advertising and marketing will be twofold. It will negatively affect society through an increase in unemployment, but it can also increase social capital through the reduction of consumerism. As the former effect is likely to outweigh the latter, the social impact of this instrument as a whole is likely to be negative.

Po8 Local currencies for labour-based services

One of the important reasons behind the introduction of local currencies is the idea that, “A person's balance of alternative currency could stand as a instrument of social contribution - because it shows that they are working for the community.” (see Ekvall et al. 2015). Therefore, according to the authors, the main channel through which local currencies influence society is its impact on social life in rural areas.

As the use of local currencies would be confined to labour based services, it could indeed affect local communities. As the relative price of labour based services falls, more vacancies will probably emerge, especially in rural, impoverished areas. Also, it should lead to the development of local services and tourism, which should positively affect labour markets. Therefore, it may, to some extent, contribute to a reduction in inequality and the demand for the other social protection instruments.

Although it may be expected that local currencies will positively affect both social life and income inequalities in rural area, its influence will at best be limited. This is due to the local character of this policy instrument and its limited impact on the society as a whole.

4 Summary and pointers for revisions

4.1 Land policy mix

Table 12: Summary assessment of likely social impacts – land policy mix

	Likely labour market, health and social inclusion impacts	Total score
PI1 Stronger and more effective environmental and climate dimension for EU land management in the CAP	- Uncertain, likely neutral or rather negative impact on the labour market; depends on specific provisions and adaptability of farmers to the new requirements. - Significant positive health impacts are very likely to occur through reduction of harmful pollution and production of healthier food, which likely outweigh the possible negative impacts of increased food prices. - Highly uncertain impact on social inclusion (rather negative or rather positive); depends on whether specific provisions will take into account vulnerable groups of farmers. ➔ Overall assessment: assessment uncertain, likely neutral or rather positive. Positive health impacts of this instrument are likely to balance or even outweigh the possible limited negative impacts on employment and social inclusion.	(0/+)
PI2 Revised emissions levels in the National Emissions Ceilings Directive (NECD) and additional measures for better management of the nitrogen cycle on farmland	- Uncertain, likely neutral or rather negative impact on the labour market; depends on specific provisions and adaptability of farmers to the new requirements – similar to PI1, but smaller in scale. - Likely rather limited positive health impacts related to decrease in agricultural pollution and production of healthier foodstuffs, which likely outweigh the possible negative impacts of increased food prices – similar to PI1, but smaller in scale. - Highly uncertain impact on social inclusion (rather negative or rather positive); depends on whether specific provisions will take into account vulnerable groups of farmers – similar to PI1. ➔ Overall assessment: uncertain, limited, likely rather negative or neutral impact; possible negative employment and social inclusion impacts are likely to outweigh or balance the potential limited health improvements resulting from the mix.	(-/0)
PI3 Promotion of “Payment for Ecosystem Services” programmes	- Likely rather positive labour market impacts, limited to the rural areas where new employment opportunities may be unlocked. - Likely rather positive health impacts; PES programmes will likely unlock local potential for decreasing both environmental and health problems (e.g. water pollution). - Likely positive social inclusion impacts, as the programmes may provide new sources of income for vulnerable households in rural areas. ➔ Overall assessment: likely positive social impacts; PES programmes provide opportunities for win-win solutions (improving both local	++

	environment and economy).	
PI4 Regulation for Land Use, Land Use Change, and Forestry	- Uncertain, likely rather positive indirect employment impacts related to the reduced overall costs of decarbonisation measures. - Likely neutral, as this instrument affects mainly net GHG emissions, rather than local harmful pollutants (although indirect positive impact is possible through encouraging afforestation). - Uncertain, likely rather positive indirect social inclusion impacts related to the reduced overall costs of decarbonisation measures. ➔ Overall assessment: uncertain, likely rather positive impact; the key uncertainty is whether LULUCF regulation will be effective in lowering the total costs of climate change mitigation.	(0/+)
PI5 Strengthened pesticide reduction targets under the Pesticides Directive, and provision of guidance to farmers on integrated pest management	- Uncertain, likely neutral or rather negative impact on the labour market; depends on specific provisions and adaptability of farmers to new requirements – similar to PI2. - Uncertain, likely neutral or rather limited positive health impacts related to a decrease in pesticide use. - Uncertain impact on social inclusion (rather negative or neutral); depends on whether the guidance for farmers will be effective (i.e. it will allow them to optimise pesticide use in order to avoid increased taxation). ➔ Overall assessment: uncertain, limited, likely rather negative or neutral impact; possible negative employment and social inclusion impacts are likely to outweigh or balance the potential limited health improvements resulting from the mix – similar to PI2.	(-/0)
PI6 Targeted information campaign to influence food behaviour towards: reducing food waste and changing diets	- Likely rather positive impact on employment through improvements in labour productivity which in the long term will outweigh labour reallocation challenges; the scale of impact will likely be very limited. - Likely rather limited positive health impacts; changes in food behaviour will likely both reduce pollution and improve nutrition outcomes, but the scale of voluntary shifts will likely be limited. - Likely neutral impact on social inclusion due to the limited scope and voluntary nature of the instrument. ➔ Overall assessment: likely rather positive social impact related to the potential productivity improvements and healthier consumption patterns.	+
PI7 Development of food redistribution programmes/ food donation	- Likely neutral labour market impacts; possible slight increase in employment is likely to be offset by a decrease in labour productivity. - Likely positive health impact through improvement in nutrition, but limited to the low-income households. - Likely rather positive social inclusion impacts; this instrument directly supports low-income households, but does not permanently solve the underlying problem of social exclusion. ➔ Overall assessment: likely rather positive social impact, which alleviates the possible negative impacts of other policies on the standard of living of the low-income households, but does not solve	+

	the root causes of social exclusion (e.g. through creating new employment opportunities).	
PI8 VAT on meat products	• Likely rather negative impact on the labour market; shift in consumption expenditure will require a reallocation of labour across the economy, which is likely to decrease employment in the short term. • Likely rather positive health impact through a beneficial (for an average EU citizen) decrease in meat consumption. • Likely rather negative impact on social inclusion; this instrument will disproportionately affect low-income households. ➔ Overall assessment: likely rather negative social impact; possible slight average health improvements are outweighed by social inclusion concerns related to the nutrition and labour reallocation challenges.	-

4.2 Metals and materials policy mix

Table 13: Summary assessment of likely social impacts – metals policy mix

	Likely labour market, health and social inclusion impacts	Total score
Pm1 Green fiscal reform: internalisation of external environmental costs	• Limited net labour market impacts in the long run; challenging labour reallocation during the transition phase, supported by decreased labour taxation. • Significant positive health impacts are very likely to occur because this instrument directly taxes externalities. • Disproportionate taxation burden on low-income households, but it is likely to be balanced at least in part by decreased labour taxation. ➔ Overall assessment: assessment uncertain, likely (rather) positive. Positive health impacts outweigh potential negative impacts on the labour market and social inclusion.	(+/++)
Pm2 Green fiscal reform: materials tax	• Limited net labour market impacts in the long run; challenging labour reallocation during the transition phase, supported by decreased labour taxation – similar to Pm1. • Rather limited positive health impacts, this instrument targets material use, while Pm1 already addresses externalities. • Disproportionate taxation burden on low-income households, but it is likely to be balanced at least in part by decreased labour taxation – similar to Pm1. ➔ Overall assessment: assessment uncertain, likely rather negative or neutral. Limited positive health impacts do not outweigh potential negative impacts on the labour market and social inclusion.	(-/0)
Pm3 Promotion of sharing systems	• Likely neutral for the labour market, as employment reallocation will be limited and gradual. • Likely rather positive health impacts related to shift towards less polluting consumption patterns.	++

	Positive social inclusion impacts - this instrument provides affordable alternatives to resource intensive consumption patterns without the need for upfront investments (which are challenging for low-income households). ➔ Overall assessment: likely positive. Sharing systems will likely enhance social inclusiveness and effectiveness of transition towards absolute decoupling.	
Pm4 Increased spending on research and development	- Highly uncertain, rather positive impact on the labour market; innovations may ease the employment shift, but also increase skill mismatches. - Highly uncertain, positive impact on health; R&D may unlock new solutions which will decrease both resource footprint and negative health impacts of the economic activity. - Highly uncertain, rather positive impact on social inclusion; innovations may decrease the costs of transition, but also increase inequalities or favour more affluent early adopters. ➔ Overall assessment: highly uncertain, positive impact. In general, R&D increases the number of available decoupling measures, thus lowering the costs of achieving any given resource efficiency goals for the society. Its outcomes are, however, highly uncertain – both in terms of effectiveness of research and development efforts as such, as well as the impacts of resulting innovations on the labour market and inequalities.	((++))
Pm5 Product standards	- Likely neutral for the labour market, as employment reallocation will be limited and gradual. - Likely rather positive health impacts related to shift towards less polluting products. - Likely neutral for social inclusion, as its impact on the affordability of the consumer basket will likely be marginal. ➔ Overall assessment: likely rather positive. This instrument will likely have no significant impact on the labour market and social inclusion, while at the same time decreasing harmful pollution related to the production and use of affected products.	+

4.3 Overarching policy mix

	Likely labour market, health and social inclusion impacts	Total score
Po1 Circular Economy tax Trio	- Uncertain, rather negative or neutral labour market impact; significant shocks affecting local economies will pose a challenge for an efficient labour force reallocation. - Likely positive health impacts related to a decrease in harmful pollution from waste disposal sites and production of new materials. - Uncertain, rather negative or neutral social inclusion impacts depending on the success of labour market restructuring and limited, but disproportionate tax burden on the low-income households.	(0/+)

	→ Overall assessment: uncertain, neutral or rather positive social impacts, depending on the extent to which likely health improvements will be balanced by potential negative employment and social inclusion outcomes.	
Po2 EU-wide introduction of feebate schemes for selected products categories	• Likely neutral impact on employment due to the limited scope of the instrument and possibility of labour reallocation within enterprises. • Likely rather positive health impacts related to the promotion of environmentally friendly and resource-efficient products; impacts limited by the scope of instrument. • Uncertain, rather negative or neutral impacts on social inclusion; feebates tend to impose disproportionate burden on low-income households, but their impact depends on the products affected. → Overall assessment: uncertain, rather negative or neutral impacts; possible negative impacts on low-income households may outweigh limited positive health outcomes.	(-/0)
Po3 Reduced VAT for the most environmentally advantageous products and services	• Likely neutral impact on employment due to the limited scope of the instrument and possibility of labour reallocation within enterprises – similar to Po2. • Likely rather positive health impacts related to the promotion of environmentally friendly and resource-efficient products; impacts limited by the scope of the instrument – similar to Po2. • Likely neutral impact on social inclusion due to the limited scale of the intervention; similarly to Po2, the small net effect may be either positive or negative, depending on the characteristics of demand for a given product or service. → Overall assessment: likely rather positive social impact, this instrument is less regressive than Po2, while also offering (limited) positive health outcomes.	+
Po4 Boosting extended producer responsibility	• Likely neutral impact on employment due to the limited scope of the instrument and possibility of labour reallocation within enterprises – similar to Po2 and Po3. • Likely neutral impact on health due to the limited scale of the intervention. • Likely neutral impact on social inclusion due to the limited scale of the intervention. → Overall assessment: likely neutral social impact due to the limited scale of the intervention.	0
Po5 Skill enhancement programme	• Likely very positive impact on the labour market; this instrument directly supports efficient shift towards employment in less resource-intensive sectors on the labour market. • Likely neutral health impacts; this instrument supports restructuring on the labour market rather than decreases harmful pollution, possible limited indirect positive impacts related to a decrease in poverty and unemployment. • Likely very positive impact on social inclusion through support to transition on the labour market, which is especially important for vulnerable, low-income households lacking own resources for reskilling.	+++

	➔ Overall assessment: likely very positive social impact, both direct (labour market) and indirect (social inclusion).	
Po6 Enabling shift from consumption to leisure	• Highly uncertain, negative or positive labour market impact depending on whether the exact provisions will promote voluntary employment flexibility or impose additional labour costs on companies (e.g. increasing statutory vacation time). • Likely neutral health impacts; this instrument affects labour market rather than decreases harmful pollution, possible limited indirect impacts related to changes in psychological wellbeing, unemployment and incomes. • Highly uncertain, rather negative or rather positive social inclusion impacts, depending on labour market impacts. ➔ Overall assessment: highly uncertain social impacts which depend on the specific instruments which will be chosen to enable shift from consumption to leisure.	((-/+/))
Po7 Step-by-step restriction of advertising and marketing	• Uncertain, likely (rather) negative impact on employment both through direct and indirect channels. • Likely neutral health impacts, rather weak evidence on positive impacts on the psychological wellbeing. • Uncertain, rather negative or neutral social inclusion impacts; negative impact related to increased unemployment is not likely to be outweighed by a potential increase in social capital and reduction of consumerism. ➔ Overall assessment: likely rather negative social impacts, as negative labour market outcomes will probably be more significant than potential benefits from increased social capital.	-
Po8 Local currencies for labour-based services	• Likely neutral impact on the labour market; limited number of new employment opportunities is likely to be balanced by a decrease in labour productivity and qualification of labour force, which is problematic in the long term. • Likely neutral health impacts due to the limited scope of the instrument. • Likely neutral social inclusion impacts due to the limited scope of the instrument. ➔ Overall assessment: likely neutral social impact due to the limited scope of the instrument.	0

4.4 General conclusions

Policy mixes under consideration to a large extent reflect key social issues: inclusiveness of the taxation system (green fiscal reform), new skill formation, promoting sustainable and cheap alternatives to the resource intensive consumption, decreasing environmental and health externalities through taxation and command and control instruments. Their introduction will probably lead to challenges in terms of social inclusion, unemployment and labour supply. Accordingly, policy mixes can be tailored to minimize social costs and ease the transition period. Redistributive impacts that depend not only on the instruments employed, but also on their match to the regulated area should be highlighted here. In particular, it can be expected that all packages should have positive impact on public health. In the longer perspective, however, it should be taken into account that some trade-offs between significant limiting of resource use and further limiting harmful pollution may be hard to avoid. At the same time, some areas where net social impacts can be improved by careful use of already proposed instruments and adding new emphasis on supporting the local economies and low-income household during the transition can be identified. Discussion on them follows in the next section.

4.5 Pointers for revisions

Policy mixes under consideration to a large extent reflect key social issues: inclusiveness of the taxation system (green fiscal reform), new skill formation, promoting sustainable and cheap alternatives to the resource intensive consumption, decreasing environmental and health externalities through taxation and command and control instruments. Their introduction will probably lead to challenges in terms of social inclusion, unemployment and labor supply. At the same time policy mixes can be tailored to minimize these costs and ease the transition period. This is especially the case of their redistributive impacts, as they depend not only on the instruments employed, but also on their match to the regulated area. In particular, we expect that all packages should have positive impact on public health. In the longer perspective, however, one should take into account that some trade-offs between significant limiting of resource use and harmful pollution may be hard to avoid especially if the high levels of decoupling are to be achieved. At the same time there are some areas where net social impacts can be improved by careful use of already proposed instruments and adding new emphasis on supporting the local economies and low-income household during the transition.

When analyzing the consequences of individual policy mixes for social inclusion and labor market it can be noticed that many of them overlap one with another. Number of tax and command and control instruments in the mix may result in redundant amplification of some economic incentives or lead to conflicting price signals and/or regulations. These overlaps should be avoided as overtaxing or overregulating will increase the economic costs of transition and encourage suboptimal allocation of resources. On the other hand, it may result in negative social effects in areas of the labor market particularly. At the same time, proper aligning of policy instruments with the area of intervention that will take into account redistributive impacts may be helpful. In fact, the same instrument may have different redistributive impacts depending on the type of product that will be taxed or regulated. Therefore, it is essential to take into account price and income elasticities of demand when designing the ultimate policy mix. In some cases, like promoting labour to leisure shift our

analysis showed that voluntary instruments which support but not enforce the transition on labor market will be most optimal.

Congruent consideration of alternative policies is necessary if their impact on social inclusion of the most vulnerable groups: children, disabled, women, elderly or immigrants is to be well understood. In particular, the resource-efficient shift should be reinforced among the low-income households. While direct support may be challenging to be introduced, public policy should rather focus on supporting the transition in the low-income neighborhoods by providing sustainable alternatives to current consumption patterns. Two examples are aforementioned in the report: support for deep retrofits and improving mobility through public transport development. The transition towards circular economy on the regional level may also be supported. These instruments may focus on assisting regions which are currently dependent on the resource-intensive sectors, such as mining or heavy industry. This can be done, for example, through existing framework of structural funds and therefore bring benefits for the poorest regions within the Union especially. Additional funds from green fiscal reform can be channeled towards new programmes, or those already in place may be used after 2020, similar to the decarbonisation support from the European funds in the current perspective.

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