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Baseline Assumptions in EC Impact Assessments

*Significance, Analysis
and Recommendations*

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Abstract

Impact assessments (IA) are an important tool for better regulation and thus one of the cornerstones of policy making in the European Union. IAs require a benchmark against which the policy options can be compared. This benchmark is usually referred to as baseline or baseline scenario. To the extent possible, baselines in different IAs should be consistent, i.e. the assumptions underlying the baselines should avoid logical and factual contradictions.

This report examines IAs from 2011 onwards with a view to check whether baseline assumptions are consistent. The baseline assumptions have been identified using text mining techniques. The focus is on model-based IAs considering that quantitative assumptions are expected to be found predominantly in IAs that make use of models.

The findings suggest that, within policy areas, there is a greater degree of consistency than across policy areas. Moreover, baseline assumptions vary more in the course of time than within one year. At the same time, there is still room for improvement as regards the documentation of baseline assumption.

1 Introduction:

On May 19 2015, the European Commission adopted its Better Regulation Agenda (BRA). The objectives of the Agenda, which has since then been updated and refined, are to ensure that:

- decision-making is open and transparent,
- citizens and stakeholders can contribute throughout the policy and law-making process,
- EU actions are based on evidence and understanding of the impacts,
- regulatory burdens on businesses, citizens or public administrations are kept to a minimum.

As part of the BRA, the Better Regulation Guidelines (BRG) ⁽¹⁾ set out the principles that the European Commission follows when preparing new initiatives and proposals and when managing and evaluating existing legislation, thereby establishing the mandatory requirements and obligations to be taken into account by the analyst in each step of the policy cycle. In addition, the Better Regulation Toolbox (BRT) ⁽²⁾ provides non-binding guidance and advice on various aspects of better regulation.

The BRG state that when designing the policy options the option of changing nothing should always be considered and used as the benchmark against which the policy options should be compared. This benchmark is usually referred to as baseline or baseline scenario. Occasionally, the term “reference scenario” is used in lieu of “baseline scenario”, but we take it that the two notions carry the same meaning.

According to guidelines published by the US Environmental Protection Agency (EPA), “[a] *baseline is defined as the best assessment of the world absent the proposed regulation or policy action. ... Because an economic analysis considers the impact of a policy or regulation in relation to this baseline, its specification can have a profound influence on the outcome of the economic analysis*” (EPA 2010).

“A proper baseline should [therefore] incorporate assumptions about exogenous changes in the economy that may affect relevant benefits and costs (e.g., changes in demographics, economic activity, consumer preferences, and technology), industry compliance rates, other regulations promulgated ... government entities, and behavioural responses to the proposed rule by firms and the public” (EPA 2010).

In common parlance, a baseline is often referred to as the *status quo*, but such an understanding of a baseline is only appropriate to the extent that the *status quo* has to, and as a matter of fact almost inevitably does, include intertemporal changes in many potential features of reality other than the policies that are to be assessed and thus describes an essentially dynamic environment.

In what follows, it is also useful to distinguish between baseline assumptions on the one hand and a baseline scenario on the other. Broadly speaking, baseline *assumptions* are all (implicit and explicit) assumptions which underlie a baseline forecast and which the analyst has made in order to develop and implement the forecasting methodology. More narrowly conceived, baseline assumptions are those assumptions concerning variables and parameters of a forecasting model, which *may* but not necessarily *do* change over the time horizon of the assessment. Hence, baseline assumptions imply a deliberate decision by the modeller or the model user to keep a variable or a parameter constant or to modify it.

A baseline *scenario*, by contrast, is a (hypothetical) forecast or projection of one or several variables produced by (and therefore endogenous to) a model or another type of

¹ http://ec.europa.eu/smart-regulation/guidelines/toc_guide_en.htm

² http://ec.europa.eu/smart-regulation/guidelines/toc_tool_en.htm

forecasting instrument and using the above baseline assumptions and *status quo* policies as input(s).

1.1 Why do Baseline Assumptions matter?

As already pointed out, the significance of a baseline scenario, and therefore of the baseline assumptions, stems from the fact that the impact of a policy measure must be analysed in relation to, i.e. compared with, a clearly defined baseline. Hence, if the baseline is different then so will be the effects that can be attributed to the policy action or regulation.

To illustrate this point, consider for instance a policy action that seeks to curb CO₂ emissions from road transport in absolute terms – the policy objective – by fostering the fuel efficiency of cars. If the analyst assumes that the total mileage (number of vehicles times kilometres driven) of cars remains by and large constant, then a 10% improvement of fuel efficiency should reduce emissions by approximately 10%. If, on the other hand, total mileage is assumed to increase by 20% – be it because there are more vehicles on the road or people drive more, then a 10% improvement of efficiency will not reduce emissions as required and additional measures may be needed (see Figure 1 for a graphical representation).

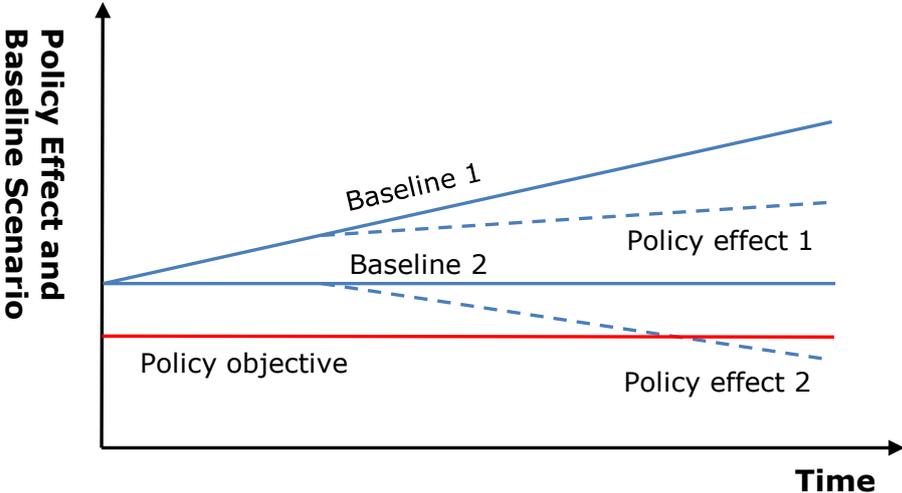


Figure 1: Baselines and policy effects

Moreover, baseline assumptions may also interact directly with the policy action in a way which thwarts the effectiveness of the action. If for instance a tax break for more fuel efficient cars incentivises customers not only – as intended – to buy a more fuel efficient model but also – as a consequence of (the size and direction of) the income effect⁽³⁾ – a more powerful car, then again the policy action will not (fully) achieve its objectives compared to a situation where the income effect is smaller or completely absent.

Importantly, since baseline assumptions are likely to evolve over time (for instance as a result of other on-going policies or other exogenous changes), changes in any of the endogenous variables which characterise the baseline scenario cannot be determined relative to the current situation (i.e. the situation in year $t=1$ or the *status quo*) but must be analysed relative to how the baseline scenario is likely to evolve over time in the absence of a new planned initiative. Concomitantly, possible interactions between a policy action and some features of the environment may not only influence the effectiveness of the action now but also at some future point(s) in time. After all,

³ By the income effect of a price change it is meant that as a result of a price reduction, real income increases. This income increase can be spent on the good or service whose price has gone down, or on other goods or services.

consumer preferences may change (and thus for instance the size and direction of the income effect) or there may be innovations which lead to new products or services, for which the proposed policy action is not necessarily well suited.

EC guidance on impact assessments ⁽⁴⁾, while in itself rather comprehensive, contains only few remarks on baselines despite their undisputed importance for policy analysis highlighted above. However, the guidance makes clear that IAs undertaken for proposed policy actions have to specify a baseline and therefore have to make assumptions about the variables and parameters which shape this baseline. Accordingly *“a baseline scenario should take into account lessons learnt as well as the foreseen evolution of the ‘exogenous’ factors, such as GDP [Gross Domestic Product] or employment levels. It should also reflect policy measures that have already been agreed, but which will come into force only in the future (including policies in other areas)”*. ⁽⁵⁾

While this recommendation is broadly in line with EPA guidance on the matter (EPA 2010), it still leaves open a number of issues:

- How should baseline assumptions be chosen and justified? Should they draw upon the best available evidence and scientific knowledge or should they also attempt to be creative by incorporating surprise events or other kinds of discontinuities? ⁽⁶⁾
- How detailed should the description of the baseline be? In other words, when should an assumption be recognised as a baseline assumption, and therefore be documented and treated as such and when can it be neglected?
- How often should baselines be up-dated? Should they be up-dated whenever new evidence becomes available or should they be kept constant for some time to ensure comparability?
- To what extent should baselines for different IAs used in the same or a similar policy making context be consistent? In other words, should they use by and large the same data and assumptions unless multiple baselines are called for (which then would suggest that different variants of the baselines for different models need to be consistent) or can data and assumptions differ?

It is the last two issues which motivate much of the work reported here. Before examining in more detail baseline assumptions in EU Impact Assessments, some comments and observations on this issue are in order.

1.2 What does “(in-)consistency” mean precisely?

To begin with, a set of baseline assumptions is meant to be consistent with another set if there are no logical and factual contradictions including significant differences between both sets.

To flesh out the picture further and understand better the nature of possible contradictions, it should be noted that the term “economic analysis” used above covers both cases where such an analysis is largely informal and qualitative, and cases where the analysis is based on, or makes use of, one or several economic and/or other kinds of formal models (engineering, biological, physical, geological etc.) in order to obtain quantitative information on the impact of the policy action.

It is the latter interpretation that is underlying the present analysis considering that such models, above and beyond the variables or parameters which represent the policy stance, contain or depend on parameters and other exogenous variables which establish the quantitative relationships within the model and which need to be specified

⁴ http://ec.europa.eu/smart-regulation/guidelines/ug_chap3_en.htm

⁵ http://ec.europa.eu/smart-regulation/guidelines/docs/br_toolbox_en.pdf

⁶ Discontinuities could for instance result from qualitative changes or from sharp changes (kinks) to a previously smooth trend.

(calibrated) before the model can be used. Hence the focus is on quantitative rather than qualitative assumptions. ⁽⁷⁾

Moreover, such quantitative assumptions often have a temporal dimension in the sense that they are assumed to take on a specific value at some point t in time or during some period $t-1, t$. This follows from the dynamic nature of IAs referred to above. As a consequence, assuming for instance a price of 50\$ per barrel of Brent oil on September 1 2018 is different from assuming the same price for the same commodity one year later.

Last but not least, IAs use mostly more than one quantitative assumption. In particular complex analyses in policy areas covering a wide range of possible impacts, use not just one but several models, each of which requiring in turn its own set of assumptions. Needless to say that these sets are neither necessarily disjunctive, nor are they necessarily congruent.

Against this background, several types of inconsistencies can be distinguished:

1. Same model – different instances (policy areas)
2. Same policy area – similar models (e.g. E3ME vs. GEM-E3)
3. Same IA – different models with overlapping assumptions (e.g. GEM-E3 vs. POLES)
4. Different IA with different models with overlapping assumptions
5. Same model – different points in time

The first inconsistency occurs if a model is used in impact assessments or analyses for different policy fields and if for each of these instances, baselines assumptions differ significantly. While one would normally expect modellers to avoid such inconsistencies, they may nevertheless occur if the client asks explicitly for modifications of the initial baseline.

The second inconsistency may occur if different but sufficiently similar models are used in the same (or again very similar) policy field(s) as the modellers may have used different data sources and/or data formats in order to populate their models. In addition, the modellers may also have made different choices when selecting parameter values for the respective models.

The third type of inconsistency may occur within the same impact assessment when this impact assessment makes use of various models whose underlying assumptions overlap to some extent, i.e. which share some of the variables of the other models used in this impact assessment.

The fourth type of inconsistency may occur if impact assessments for different policy fields use different models with nevertheless significantly overlapping assumptions and variables such as data on GDP or population trends.

The fifth type of inconsistency may occur if the same model is used repeatedly over time in order to analyse similar policy actions, each time with a different set of assumptions. Thus assumptions are modified in order to take into account newly available data or in order to adjust the model to a different timeframe of the analysis.

1.3 To what extent do inconsistencies matter?

Inconsistencies of the kind described in the preceding sections are neither always avoidable, nor necessarily problematic. So when do they matter and when not? In principle, inconsistencies should arguably be avoided because contradictions between baseline assumptions – unless duly justified – undermine the credibility of IAs. After all, if an IA for a specific policy action assumes a price of 50\$ per barrel while another IA,

⁷ There may of course also be inconsistencies between qualitative assumptions but these will not be examined in the current report considering that their identification and comparison is much more difficult.

undertaken at the same time for another policy action, assumes a price of 25\$ per barrel, then policy makers and stakeholders could put in question both, questioning why different assumptions have been made and arguing that the choice of the respective baseline assumption may have been motivated by the aim to favour a specific outcome of the IAs. Thus inconsistent baseline assumptions threaten to undermine the credibility of the instrument and ultimately of the institution, which has put forward the proposal. Obviously, this is even more virulent, but perhaps less likely to happen, within the context of the same IA. So if an IA uses not only one but several models, then the assumptions underlying these models should *a fortiori* avoid factual and logical contradictions.

While the avoidance of logical and factual contradictions could therefore be regarded as a general principle of good governance, there is another important reason why consistency should be aimed at, namely the comparability of IAs. Such comparisons can be undertaken along at least three dimensions:

- Horizontal
- Intertemporal
- Conceptual

By horizontal comparability, it is to be understood that IAs for different policy actions can be compared because their methodology in terms of criteria, models used and baseline assumptions is sufficiently similar to make such a comparison a meaningful exercise.⁽⁸⁾ Depending on the focus of the comparison, it is then recommendable that the values of the characteristics which are not the focus of the comparison do not differ significantly so as to be able to invoke a *ceteris paribus* clause for these characteristics.

By intertemporal comparability, it is understood that IAs for quasi identical policy actions which are carried out at different points in time can be compared because in particular time-invariant baseline assumptions remain unchanged so that only those assumptions will be modified for which a clear time trend has been identified.

By conceptual comparability, finally, it is understood that IAs which are carried out for identical policy actions but use different models in order to simulate the effects of a policy action can be compared meaningfully because it is the structure of the models that is assumed to make a difference, not the data that are fed into the models. Again, in order to be able to identify the effects of structural differences, a *ceteris paribus* clause is invoked on the grounds that underlying assumptions are consistent.

1.4 Justified inconsistencies

The arguments set out in the second part of previous section imply by way of inversion that baseline assumptions may in some situations not only differ incidentally, but out of necessity. The most obvious case concerns IAs which are carried out at different points in time as this may imply that

- Data take on (a) different value(s) at different points in time, e.g. because they follow a trend or show other regularities over time,
- New data become available and/or existing data become obsolete, e.g. because data are collected at certain intervals,
- Data collection or sampling methods (including measurement methods) change or are newly developed.

⁸ It may seem somewhat paradoxical to require similarity (which is arguably the outcome of a comparison) for comparability. However, similarity is not required for the values as such but for the characteristics along which the comparison is to be carried out. Thus it is possible to compare for instance a Fiat 500 and a Rolls Royce because both are cars and thus have certain characteristics in common, even though the values differ substantially. By contrast, comparing an A380 and a Rolls Royce is much more difficult in that the characteristics of a car and an airplane overlap to a much smaller degree.

Other reasons for justified inconsistencies include

- Different sectoral, temporal or spatial granularities of data, e.g. because more data are collected allowing for further differentiation among sampled entities,
- Different data requirements for the models used along the above dimensions of granularity, e.g. because some models allow for greater detail than others.

Against the background of the foregoing arguments, baseline assumptions of different IAs can be expected to exhibit some inconsistencies. Moreover, such inconsistencies are not per se problematic. The key questions to be addressed in the remainder of this report are thus twofold:

- To what extent can inconsistencies actually be observed? In other words, which baseline assumptions appear to be problematic at first sight and how many IAs submitted by the European Commission are affected?
- To what extent can inconsistencies actually be justified on one of the aforementioned grounds? In other words, which inconsistencies can and should be avoided?

2 Methodology

2.1 General approach

Each year, the European Commission carries out a substantial number of IAs spanning in the course of time basically all policy areas for which the Treaties accord the right of initiative to the Commission. Not all IAs undertake a quantitative assessment of the effects of a policy action; some do while others – for various reasons – do not, or do so for only some of the effects. Moreover, even purely qualitative IAs may make some quantitative assumptions while also predominantly quantitative IAs occasionally resort to qualitative assumptions, which by their very nature are more difficult to pin down and compare.

In the light of these observations, we have decided to restrict our analysis to IAs which use models and which therefore, by definition, have to make at least some quantitative assumptions to calculate the baseline. These IAs have been identified on the basis of the Corporate modelling inventory and knowledge management system MIDAS. MIDAS provides an inventory of models that are in use in the European Commission for policy support, it gives access to model descriptions and links to related input and output data, impact assessments and other policy documents, as well as scientific publications and policy reports.

After selection of the IAs to be analysed, common baseline assumptions were identified (see Section 2.2) and for each a set of keywords was created (Annex 1). This set of keywords was used to screen the documents (manually and through text mining techniques), in order to identify the relevant information (see Section 2.3).

2.2 Which baseline assumptions have been identified and examined?

Depending on the policy area concerned, the proposed policy action, the methods used and the effects to be analysed, the kind of variable for which assumptions have been made in the IAs examined for the purpose of this study show a considerable degree of variation. Thus variables range from the exposure to a hazardous chemical at the workplace in a certain industry to GDP growth in the EU over the next decades. Moreover, the frequency with which certain kinds of variables have been invoked differs considerably, although it is often correlated to the policy area. That is, some variables are likely to be found more often, and they will be found more often in one policy area rather than another one.

Since inconsistencies, no matter whether justified or not, are less likely to be observed for rather “exotic” variables, and in order to identify the most salient cases in terms of presumed policy relevance, we started the selection of variables by undertaking a brainstorming exercise. This exercise was in turn informed by our previous reading of a number of IAs from various policy areas. As a result, we obtained a preliminary list of variables which we refined further using text mining methods in conjunction with theoretical and empirical considerations concerning the possible endogeneity of variables. With the latter it is meant that some assumptions may not only be causally linked to others, but also to policy variables. A case in point is the assumed price for CO₂ certificates, which arguably depends not only on other variables such as GDP growth, energy prices etc. but also, crucially, on the quantity of emission allowances that is available on the market.

Ultimately, we decided to include the following variables in our analysis:

- GDP
- Populations Trends
- Discount Rates

- Price Changes
- Energy Prices
- Innovation
- Technological Progress

Since our previous reading of a number of IAs had also shown that a variable may come in various guises, we also included in our analysis variable names, which we considered to be equivalent, or at least close, to those mentioned above (synonyms). The full list of search terms can be found in Annex 1.

2.3 Specific Review Method

On the basis of the above list of variables and their equivalents, we searched the previously identified IAs – those purportedly using models – for the variables and their synonyms. This search was helped by using text mining methods. The thus identified sections of text were then examined in order to investigate whether the authors of the IAs had made any substantial assumptions regarding the numerical values of these variables. If so, the respective values were noted.

Before presenting and discussing our findings, a note of caution is appropriate. Searching a text for key terms (or in this case variable names) produces results which are contingent upon the appropriate choice of terms and synonyms. It is therefore possible (although not very likely) that we missed some instances of baseline assumptions being made. Despite this risk, we believe this was the most consistent way to cover and screen all the documents analysed within a reasonable amount of time. In doing so, we were able to obtain a comprehensive and therefore representative picture of the current situation.

3 Examined BL-Assumptions

3.1 GDP

3.1.1 Main findings

Overall, 31% of the 75 IAs explicitly mentioned the assumptions which they used for the GDP growth rate. The remaining IAs either did not make any assumptions on GDP growth, or did not mention them explicitly. Different values for the GDP growth rate used for similar time frames were found, not only as a result of the use of different models, but also due to the use of different reference baselines.

The complete results of the keyword search are presented in Table 1. The main findings are presented below. By assumption, the GDP growth rates mostly refer to EU-27, thus excluding Croatia but still including the UK.

- In 2011, the use of four different GDP growth rates was identified:
 - 1.7% p.a on average
 - 1.5% p.a on average
 - 3% p.a (in nominal terms)
 - 2% p.a.
- In 2013, the use of three different GDP growth rates was identified:
 - 1.7% p.a on average
 - 1.4% p.a
 - 2.1% p.a.
- In 2014, the use of two different GDP growth rates was identified:
 - 1.7% p.a on average
 - 1.5% p.a on average
- In 2014 one of the IAs uses the EU Reference Scenario 2010, not consistent with the use of the latest Reference Scenario, in this case 2013.
- In 2016, the use of two different GDP growth rates was identified:
 - 1.4% p.a on average
 - 2% (nominal)

3.1.2 Discussion

In 4 years we found discrepancies in the GDP growth rates used by different impact assessments without clear explanation or justification. While there may be reasons why GDP growth assumptions differ from year to year, the analysis shows that IAs still need to be more transparent and explicit in documenting and motivating the baseline assumptions used.

At the same time, it should be emphasised that the present analysis did not take into consideration that for some models, an underlying GDP growth assumption might not make sense, for example, for pure environmental models (e.g. hydrological models). However, the study can be corrected if more detail knowledge on models becomes available.

3.2 Population Trends

3.2.1 Main findings

In 27% of the IAs analysed information concerning population growth rate assumptions for the baseline could be found. In many others, it would seem that at least implicit assumptions about population growth have been made.

The complete results of the keyword search are presented in Table 2. The main findings are presented below.

- In 2011, for the same time period 2010-2020, two different growth rates were identified: 0.2% and 0.3%.
- In 2014, for the same time period 2020-2030, two different growth rates were identified: 0.12% and 0.2%.

3.2.2 Discussion

As with technological progress discussed in section 3.7, discrepancies in population growth will normally be reflected in differences in dependent variables, like for example GDP. While some adjustments over the years might occur, this variable should be in principle more stable than purely economic variables. The reason for this presumption is that population trends depend in turn on other variables such as the birth rate or life expectancy, which tend to be rather stable. Moreover, changes in these variables are not immediately reflected in population growth. Rather it takes some time before the effects of changes fully play out.

There is one important exception though. Migration may follow a much more irregular path over time than birth rates or life expectancy given that migration is often driven by unforeseen and unexpected events such as wars, ethnic clashes or natural disasters. Hence migration figures may suddenly go up (and down again once the surprise event that triggered the flow has subsided). Recent experience has shown that Europe may be confronted more often with such events and should therefore integrate them in population projections.

3.3 Discount Rates

3.3.1 Main findings

Overall, 35% of the IAs explicitly mentioned the assumptions which they used for the discount rate (or at least for interest rates). The remaining IAs either did not make any assumptions about the discount rate, or did not mention such assumptions explicitly. ⁽⁹⁾

The complete results of the keyword search are presented in Table 3. The main findings are presented below.

- In 2011, values range between 0% and 17.5%
- In 2012, values range between 2.5% and 8%
- In 2013, values range between 4% and 10%
- In 2014, values range between 4% and 17.5%
- In 2015, no values have been found.
- In 2016, values range between 2% (interest rate) and 4% (discount rate), and 12%.

No strong and systematic relationship between the observed numerical values of the discount rates and the type of cost and benefit to which they were applied could be

⁹ Note that whenever costs and benefits are summed up over several years without applying a positive discount rate, then a zero discount rate is assumed implicitly.

observed, nor appear the changes over time to follow a discernible pattern. It would seem though that the highest discount rates tend to apply to consumers or private individuals whereas for companies and the public sector, discount rates are lower but still can assume any value between 0% and 12%.

3.3.2 Discussion

There are no *a priori* reasons why discount rates should differ from year to year or between IAs in any given year. Unlike for the case of GDP assumptions, discount rates are not subject to external influences which may change in the course of time. Instead, discount rates are assumed to reflect the intertemporal preferences of economic agents together with the fact that future events are inherently uncertain. Unless there are reasons to suggest that people's preferences have changed or that uncertainty is increasing, discount rates should remain stable over time. Indeed, our findings indicate that, for any given policy area, similar discount rates have been used whereas there are greater differences across policy areas.

However, EC guidance on impact assessments recommends a social discount rate of 4% and suggests that discount rates for households or companies should be higher. From the evidence we have reviewed, it is neither clear that these recommendations have always been adhered to, nor that deviations always go into the same direction. Thus a 0% discount rate for capital costs has been observed on several occasions as has a discount rate of 10% for capital costs.

Inconsistencies of this kind appear particularly problematic because they reveal incompatible normative views about both intertemporal preferences and uncertainty which are located at a more fundamental level than say, different opinions on next year's oil price. And since different discount rates affect the present value of both costs and benefits depending on how costs and benefits are distributed over time, they may also directly affect the ranking and hence the choice of the policy option.

3.4 Energy Prices

3.4.1 Main findings

Overall, 15% of the IAs explicitly mentioned the assumptions which they used for energy prices. The remaining IAs either did not make any assumptions about energy prices, or did not mention such assumptions explicitly.

The complete results of the keyword search are presented in Table 4. The main findings are presented below.

- Assumptions about energy prices have mostly been made in IAs dealing with energy and climate change policies and to a lesser extent in IAs dealing with transport policies.
- As a rule, IAs assume increasing prices for oil, gas and coal up until 2050 with assumed price increases for coal being somewhat below those for oil and gas.
- While the energy prices assumed for 2050 are substantially above those at the beginning of the forecasting period, they remain below 140 US\$ and are thus lower than the oil price peak reached in 2008.

3.4.2 Discussion

Since energy price assumptions are usually taken from the reference scenarios, baseline assumptions appear to be by and large consistent, taking into account that assumptions date from different years and may therefore be motivated by somewhat different considerations and second order assumptions.

It is nevertheless surprising that assumptions appear to be quite conservative in the sense that even in the long run, i.e. up to 2050, oil prices are not expected to exceed

those observed already in 2008. Thus the arguably inevitable peak(s) of energy production are either disputed or assumed to have no discernible effects on prices.

Another aspect which begs clarification is taxes. In particular for consumers, but also for some businesses, taxes and charges on energy products often make up a considerable proportion of final energy prices. Unless, these taxes and charges remain constant over time, changes in the market prices for oil products and energy carriers will not translate into equivalent consumer prices changes

3.5 Price Changes

3.5.1 Main findings

Information concerning price changes assumptions was present in 23% of the IAs analysed, different statistics were used across IAs.

The complete results of the keyword search are presented in

Table 5. The main findings are presented below.

- In 2011, two different inflation rates were used: 1.7% and 2%-3%. Different statistics were used, across IAs, to account for price changes: inflation rate, consumer prices index, GDP deflators (from AGLINK-COSIMO) and in some IAs prices were expressed in real terms.
- In 2012, again different approaches to deal with prices changes were used: monetary values expressed in constant terms and 2% inflation rate.
- In 2014, inflation rate (2%) and GDP deflators were used to account for prices changes.

3.5.2 Discussion

Overall, there was consistency in the rate of inflation used across time. However, how prices changes are measured (or not) in different IAs varies. While this may be driven by the demands of the analysis or the models concerned, baselines are more difficult to compare if different statistics are used to capture and account for what is presumably meant to be the same thing, namely the rate of inflation.

3.6 Innovation

3.6.1 Main findings

Overall, approximately half of the impact assessments refer at some point to innovation. In doing so, a significant number of IAs seems to make at least implicit assumptions about innovation in the sense that (the rate of) innovation (and increases thereof) can be measured and even quantified (see Table 6). While this is clearly our interpretation of what has happened in many IAs, it seems to be implied by statements to the effect that the envisaged policy actions are expected to foster or accelerate innovation. Such statements would not make sense if innovation was a purely qualitative activity or innovativeness a purely qualitative property of economic processes. However, we haven't found a single case where specific numbers were mentioned despite the fact that a considerable number of innovation indices exists.

3.6.2 Discussion

Innovation is a concept whose importance as growth driver in economic and social policy discourses is only surpassed by its general fuzziness. Thus, according to Edison, Ali, and Torkar (2013), innovation is "production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems." Accordingly, "[i]t is both a process and an outcome."

Possible measures (composite indicators) of innovation tend to focus therefore on both capacities for, and outcomes of innovation, and are characterised by a high degree of uncertainty with respect to the indicators that are to be included, the aggregation method and the resulting rankings. ⁽¹⁰⁾ While this would explain the reluctance of analysts to quantify innovation, it also implies that claims about the possible effects of policy actions on innovation are hard to verify empirically as both the baseline as well as the effect as such are difficult to identify.

There are thus reasons to suggest that baseline assumptions about innovation pose considerable problems, both conceptually and data-wise. It would go beyond the scope of this report (and the competences of its authors) to suggest solutions to these problems.

¹⁰ For instance the [Global Innovation Index](#) and the [Bloomberg Innovation Index](#) for 2016 differ not only in terms of the countries which both indices include among the top ten (they have 6 out of 10 in common), but also in terms of the ranking of these countries as reflected in a very low rank correlation coefficient (0.007).

However, analysts should clearly address them more openly, thereby documenting their awareness of the issues.

3.7 Technological Progress

3.7.1 Main findings

Overall, 16% of the IAs explicitly mentioned the assumptions which they used for technological progress or, at least, they indicated that such assumption had been made without specifying them. This figure is likely to underestimate the extent to which assumptions about technological progress have been made in IAs because assumptions on GDP growth rates are often derived from (or imply) assumptions about both population growth and technological progress. Moreover, some IAs do not give values for the rate of technological progress as such – usually equated with Total Factor Productivity (TFP) – but for either increases in labour productivity or decreases of capital cost. Finally, some IAs do not give values for technological progress in general but for improvements in an industry or for a specific type of product.

The complete results of the keyword search are presented in Table 7. The main findings are presented below:

- In 2011, values for capital costs decreases ranged between 0% and 3%
- In 2016, a value of 1% TFP growth has been assumed.

In the remaining years, no assumptions or only product specific assumptions have been observed.

3.7.2 Discussion

Technological progress, as its dizygotic twin innovation, is commonly regarded as one of the key drivers of growth and assumed to increase labour productivity or decrease capital costs. While both notions are thus related to technological progress, they are not fully equivalent. For instance, labour productivity may increase because more advanced machinery is used or because capital intensity increases. Concomitantly, capital costs may decrease because of advancements of production technology, or because redesigned capital goods are cheaper to produce. Unless the causes of increased labour productivity or lower capital costs have been identified, equating these with technological progress has to be taken with a grain of salt.

4 Assessment and Recommendations

Avoid inconsistencies across policy areas

The preceding analysis has shown that inconsistencies are more likely to be found across policy areas than within policy areas and that they occur more frequently within an intertemporal setting than within a horizontal setting. Thus, baseline assumptions are by and large consistent for energy and climate policies due to the development and use of the so-called reference scenarios. At the same time, and as discussed above, there are reasons to suggest that intertemporal inconsistencies are less problematic than inconsistencies across policy areas in that the former may be prompted by new or modified data whereas for the latter, new data will by definition not come forth. If anything, analysts may have started their investigations accidentally using different data sets.

This general conclusion has to be qualified for one key variable though. Discount rates, although in principle empirically deducible from consumer behaviour, are usually either an external datum for the analyst or follow from more general considerations of consumer preferences and firm behaviour. Put differently, since discount rates are not seen as a predominantly empirical variable, they will not be affected by new data. This view is supported by the guidance provided in the context of the Better Regulation Agenda which suggests a discount rate of 4% (higher for household and firms), but does so from a mainly normative point of view.

Use Reference Scenarios for all IAs

In order to avoid inconsistencies as much as possible, it seems advisable to develop and use an interrelated and therefore consistent set of Reference Scenarios covering all major policy areas of the Commission. The purpose of this set would be to provide common assumptions for the variables in the intersection of individual Reference Scenarios together with more policy specific assumptions as required by the methods and models used in each policy area.

Just as the current Energy Reference Scenarios provide a basic set of baseline assumptions for IAs in energy and climate policies, which have to be complemented depending on the policy action to be assessed, so would reference scenarios for other policy areas. In addition, however, these reference scenarios would be developed in a coordinated fashion so as to ensure that the shared assumptions are consistent.

Ensure more and better coordination

While commission-wide reference scenarios would be ideal, their development is likely to be time-consuming and may also not be very cost-effective for policy areas where only few if any quantitative IAs are undertaken. Thus as both, an alternative to comprehensive reference scenarios, and a precursor to the development of the latter, it may be useful to invoke the Community of Practice on Modelling. This CoP could facilitate the exchange of information about methods and their application at an early stage of IAs and would thus promote best practices and shared perspectives.

Make assumptions explicit and easy to find

A key challenge for the current report has been the way in which baseline assumptions have been documented in the IAs, which we have examined. In a nutshell, we found that neither a specific format nor a template were used to document and, if necessary, explain the baseline assumptions. Instead, each IAs used essentially its own approach. This made it often rather difficult to identify the baseline assumptions in the first place.

Moreover, some assumptions were apparently not made explicit, even though it was clear from the context (e.g. the use of specific models) that they had been made, or they were acknowledged but no figures were given. Last but not least, some baseline

assumptions were “hidden” in supplementary reports or documents whose accessibility was not always guaranteed. ⁽¹¹⁾

These observations suggest that baseline assumptions should be documented in a more systematic and comprehensive manner than hitherto the case.

¹¹ In fact, not even these supplementary reports could always be relied upon to provide the sought after information.

5 Conclusions

Impact assessments have become a standard instrument for policy preparation in the EU and are one of the pillars of the Better Regulation Agenda. While, ideally, IAs should aim at quantifying the effect of a policy action, already the discussion of the possible costs and benefits (advantages and disadvantages) is intrinsically useful as it may help policy makers to form an opinion on a proposal.

The quality and reliability of IAs is determined by the quality and reliability of the inputs used. This seems obvious for models and methods, but applies in equal measure to the data used and assumptions made. This report argues that baseline assumptions are of particular importance in that they determine the baseline scenario and therefore the threshold which a proposal has to pass. Put differently, since the impact of a policy measure must be analysed in relation to, i.e. compared with, a clearly defined baseline, the choice of the baseline shapes also the choice of the preferred option.

The importance of baseline assumptions is in stark contrast to their treatment in many IAs, where their documentation and justification often plays a secondary role. Even if such allegations turn out to be unfounded, stakeholders may presume that baseline assumptions are chosen so as to favour a specific outcome. IA would therefore gain credibility if the treatment of baseline assumptions in IAs was more in line with their importance.

References

- Edison, H, N Bin Ali, and R Torkar. 2013. "Towards Innovation Measurement in the Software Industry." *Journal of Systems and Software*.
- EPA. 2010. "Guidelines for Preparing Economic Analyses."
[http://yosemite.epa.gov/ee/epa/ermfile.nsf/vwAN/EE-0516-01.pdf/\\$File/EE-0516-01.pdf](http://yosemite.epa.gov/ee/epa/ermfile.nsf/vwAN/EE-0516-01.pdf/$File/EE-0516-01.pdf).
- Maggio, G, and G Cacciola. 2012. "When Will Oil, Natural Gas, and Coal Peak?" *Fuel* 98: 111-23.

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Annexes

Annex 1: List of searched variable names

Cluster	Search terms
Price Changes	deflation deflation rate of deflation inflation inflation rate rate of inflation consumer price HICP
Discount Rate	discount factor discount rate interest rate rate of interest
GDP	gross domestic product gdp gross national product gnp growth rate rate of growth
Energy Prices	energy price price of energy fuel price price of fuel price of fossil fuel Brent oil price price of oil coal price price of coal gas price price of gas
Population	population growth growth of population demographic trend population trend
Technology	technical progress technological progress productivity productivity growth Total Factor Productivity

	TFP technical change technological change
Innovation	rate of innovation innovation rate

Annex 2: Overview tables

Table 1: GDP

YEAR	ID	CELEX	TOPIC	MODEL	GDP GROWTH RATE ASSUMPTION	PAGE
2011	1	52011SC0277	Energy / General principles and programmes / Rational utilisation and conservation of energy	PRIMES	2005-2030: 1.7%	18
	2	52011SC0279 (Annex to 277)	Energy / General principles and programmes / Rational utilisation and conservation of energy	PRIMES	1990-2000: 2.2% 2000-2010: 1.2% 2010-2020: 2.2%	7
	3	52011SC0288	Environment, consumers and health protection / Environment / General provisions and programmes	AGLINK-COSIMO (baseline provision), CAPRI, E3ME, G4M, GAINS, GEM-E3, GLOBIOM, POLES, PRIMES, PROMETHEUS	<p>CAPRI: PRIMES for EU FAO/IFPRI elsewhere G4M: consistent with POLES GEM-E3: EU-27: 2005-2010 - 0.6% p.a 2010-2030 - 2% p.a 2030-2050 - 1.5%</p> <p>GLOBIOM: consistent with POLES POLES: World 2005-2010: 3% p.a 2010-2020: 3.5% p.a 2020-2030: 2.8% p.a 2030-2040: 2.4% p.a 2040-2050: 2.2% p.a Annex 1 2005-2010: 0.9% p.a 2010-2020: 2.5% p.a 2020-2030: 2.1% p.a 2030-2040: 1.7% p.a 2040-2050: 1.5% p.a N-Annex 1 2005-2010: 5.9% p.a 2010-2020: 4.7% p.a 2020-2030: 3.6% p.a 2030-2040: 3% p.a 2040-2050: 2.8% p.a EU27 2005-2010: 0.7% p.a 2010-2020: 2.1% p.a 2020-2030: 1.6% p.a 2030-2040: 1.3% p.a 2040-2050: 1.3% p.a PRIMES: Consistent with GEM-E3</p>	127 128 45 109 109 103-104
	4	52011SC0315	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	CORTAX	Not explicit	
	5	52011SC0316	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	Summary of 52011SC0315		
	6	52011SC0358	Transport policy / General	GLOBIOM (biomass supply model mentioned), POLES, COPERT, GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, TRANSTOOLS, TREMOVE	EU-27: 1990-2000: 2.2% p.a 2000-2010: 1.2% p.a 2010-2020: 2.2% p.a 2020-2050: 1.6% p.a	15
	7	52011SC0409	Taxation / Indirect taxation / Excise duties	E3ME, PRIMES, QUEST,	Not explicit	

YEAR	ID	CELEX	TOPIC	MODEL	GDP GROWTH RATE ASSUMPTION	PAGE
				TREMOVE		
	8	52011SC0536	External relations / Development policy / Generalised system of preferences	SMART, CARIS	Not explicit	
	9	52011SC0779	Energy / General principles and programmes / Rational utilisation and conservation of energy	BEAM2, E3EM, PRIMES	EU-27 2000-2010: 1.2% 2010-2020: 2.2% 2020-2030: 1.7%	119
	10	52011SC0918	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GAINS, PRIMES	Not explicit	
	11	52011SC0949	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	QUEST, SYMBOL	Not explicit	
	12	52011SC0952	Right of establishment and freedom to provide services / Sectoral application / Service activities	No model use		
	13	52011SC1102	Taxation / General	QUEST (mentioned a DSGE model with calibration data from QUEST), SYMBOL	3% GDP growth per year	55 (Vol 16)
	14	52011SC1138	Regional policy and coordination of structural instruments / Economic and social cohesion fund / European Regional Development Fund (ERDF)	ASTRA, PRIMES, NEMESIS	Not explicit	
	15	52011SC1141	Regional policy and coordination of structural instruments / General principles, programmes and statistics	GTAP, QUEST, HERMIN, GMR	Not explicit	
	16	52011SC1165	Industrial policy and internal market / Internal market: approximation of laws / General, programmes	GTAP	Not explicit	
	17	52011SC1212	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	GEM-E3, PRIMES-TREMOVE, TREMOVE, PRIMES, PROMETHEUS, TRANSTOOLS	1.7% annual	19
	18	52011SC1212 R(01)	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	TRANSTOOLS, TREMOVE, PRIMES, PRIMES-TREMOVE, GEM-E3, PROMETHEUS	1.7% annual	19
	19	52011SC1427	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development / General principles	NEMESIS	Not explicit	
	20	52011SC1542	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	PAGE	Not explicit	
	21	52011SC1543 (annex to 542)	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	GEM-E3	Not explicit	
	22	52011SC1565	Energy / General principles and programmes	GAINS, PRIMES, PROMETHEUS, GEM-E3	2010-2050: 1.7 % on average	14
	23	52011SC0891	Fisheries / Common fisheries policy	EEIAA, BIRDMOD	Not explicit	
	24	52011SC1153	Agriculture / Agricultural structures / Social and structural measures	RURAL, EC MOD, CAPRI, AGLINK COSIMO, ESIM, LUISA	2% p.a	37 (Annex 1)
	25	52011SC1262	Industrial policy and internal market / Trans-European networks	PROMETHEUS, PRIMES, TRANS-TOOLS, PRIMES-TREMOVE, GAINS, GEM-E3, TREMOVE	2005- 2030: 1.7% per year	23

YEAR	ID	CELEX	TOPIC	MODEL	GDP GROWTH RATE ASSUMPTION	PAGE
2012	26	52012SC0041	Environment, consumers and health protection / Statistics	EPIC, EUFASOM, G4M, GAINS, GLOBIOM, PRIMES, EFFISCEN	Consisten with PRIMES (no value provided)	91
	27	52012SC0149	Energy / Other sources of energy	GREEN-X, PRIMES, ASTRA, NEMESIS, MULTIREG	Not explicit	
	28	52012SC0166	Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	QUEST, SYMBOL	1.2% for western European countries	163
	29	52012SC0212	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development	NEMESIS	Not explicit, but written it depends on the growth of knowledge	75
	30	52012SC0213	Transport policy / Inland transport / Structural harmonisation / Technical and safety conditions Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, TRANS-TOOLS	2010-2020: 2.21% p.a 2020-2030: 1.74% p.a 2030-2040: 1.5 % p.a 2040-2050: 1.45% p.a	40 (Part II)
	31	52012SC0343	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AGLINK-COSIMO, IFPRI-MIRAGE-BIOF MODEL, GLOBIO3	Not explicit	
	32	52012SC0364	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AnaFgas, EmIO-F Europe, GEM-E3, GTAP (no, the database is mentioned as a source for GEM-E3)	Not explicit	
	33	52012SC0382	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	WaterGAP (mentioned only in the intro)	Not explicit	
34	52012SC0398	Economic and monetary policy and free movement of capital / Economic policy Environment, consumers and health protection / Environment / General provisions and programmes	EFFIS, MITERRA, FATE, JRC soil model	Not explicit		
2013	35	52013SC0005	Transport policy / Transport infrastructure	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	2010-2020: 2.21% p.a 2020-2030: 1.74% p.a 2030-2040: 1.5% p.a 2040-2050: 1.45% p.a	56 (Vol 2)
	36	52013SC0065	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	LUISA	Not explicit	
	37	52013SC0108	Transport policy / Inland transport / Combined transport Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles	PRIMES-TREMOVE, TREMOVE	Not explicit	
	38	52013SC0132	Environment, consumers and health protection / Environment / General provisions and programmes	BioMA, GEM-E3, iMAP, LUISA, EUCS100, CAPRI, POLES, LISFLOOD, DIVA, HadCM3, ECHAM5, WaterGAP	Not explicit	
	39	52013SC0181	Transport policy / Transport infrastructure	PRIMES, TRANS-TOOLS, TREMOVE, NEAC Trade model	EU27 : 1.4% per annum up to 2030	80 (Vol 2)
	40	52013SC0199	Energy / Nuclear energy / Safeguards	ENSEMBLE	Not explicit	

YEAR	ID	CELEX	TOPIC	MODEL	GDP GROWTH RATE ASSUMPTION	PAGE
	41	52013SC0237	Transport policy / Shipping Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	PRIMES, TIMES	Developed regions: 2010-2030: 2.1% p.a Emerging markets: 2010-2030: 6.8% p.a Global: 2010-2030: 3.3% p.a	145 (Vol 2)
	42	52013SC0423	Environment, consumers and health protection / Environment / Pollution and nuisances / Nuclear safety and radioactive waste	ENSEMBLE	Not explicit	
	43	52013SC0430	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AERO-MS, PRIMES	Not explicit	
	44	52013SC0471	Law relating to undertakings / Economic and commercial law / Other economic and commercial provisions	NEMESIS (only referenced)	Not explicit	
	45	52013SC0519	Agriculture / Approximation of laws and health measures / Animal health and zootechnics	GLOBE, iMAP (not mentioned)	Not explicit	
	46	52013SC0528	Transport policy / General	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	2010-2020: 2.21% p.a 2020-2030: 1.74% p.a 2030-2040: 1.5% p.a 2040-2050: 1.45% p.a	
	47	52013SC0531	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	TM5 –FASST, GAINS, GEM-E3, PRIMES	Not explicitly shown but from Aging Report 2012	162
	48	52013SC0531 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	COPERT, TM5 –FASST, GAINS, GEM-E3, PRIMES	Not explicit	
	49	52013SC0535	Transport policy / General	NEMESIS	Not explicit	
	50	52013SC0064 (it is an EXECUTIVE SUMMARY)	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	No model use	Not explicit	
	51	52013SC0206	Transport policy / Air transport	E3ME	Not explicit	
2014	52	52014SC0015	Energy / General principles and programmes Environment, consumers and health protection / Environment / General provisions and programme	CAPRI, E3ME, GAINS, GEM-E3, PACE, POLES, PRIMES, PRIMES-TREMOVE, PROMETHEUS	EU 28: 2005-2010: 0.9% pa 2010-2020: 1.5% pa 2020-2030: 1.6% pa 2030-2050: 1.4% pa	24
	53	52014SC0021	Environment, consumers and health protection / Environment / Space, environment and natural resources / Management and efficient use of space, the environment and natural resources	POLES, E3ME, LISQUAL	Not explicit	
	54	52014SC0030	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	FSDA, QUEST, SYMBOL	Not explicit	
	55	52014SC0160	Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, VECTO	2010-2020: 2.2% pa 2020-2030: 1.7% pa 2030-2040: 1.5% pa 2040-2050: 1.45% pa	81
	56	52014SC0207	Environment, consumers and health protection / Environment / Space, environment and natural resources / Waste management and clean technology	EU Waste model	Not explicit	

YEAR	ID	CELEX	TOPIC	MODEL	GDP GROWTH RATE ASSUMPTION	PAGE
	57	52014SC0255	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / General provisions and programmes	E3ME, GAINS, GEM-E3, POLES, PRIMES	2010-20: 1.5% p.a. 2020-30: 1.6% p.a.	32
	58	52014SC0017	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	No model use		
2015	59	52015SC0017	Energy / General principles and programmes Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, POLES	Not explicit	
	60	52015SC0135	Energy / General principles and programmes / Rational utilisation and conservation of energy Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws Environment, consumers and health protection / Consumers / Consumer information, education and representation	E3ME, PRIMES, GEM-E3	Not explicit	
	61	52015SC0139	Right of establishment and freedom to provide services / Sectoral application / Business activities Industrial policy and internal market / Internal market: approximation of laws Environment, consumers and health protection / Consumers / General	PRIMES	Not explicit	
	62	52015SC0274 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GTAP	World 2020-2030: 3% EU 28 2020-2030: 2.01%	9
2016	63	52016SC0025	Energy / Oil and gas / Supplies and stocks	PRIMES	Not explicit	
	64	52016SC0027 R(01)	Energy / General principles and programmes / General	PRIMES	Not explicit	
	65	52016SC0064	Industrial policy and internal market / Internal market: approximation of laws / Fertilisers	GAINS	Not explicit	
	66	52016SC0247	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, GLOBIOM, PRIMES, G4M, GAINS, CAPRI, PROMETHEUS, PRIME-TREMOVE	2010-2020:1.2% 2020-2030: 1.4% 2030-2050: 1.5%	17, 117
	67	52016SC0249	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	CAPRI, GLOBIOM, PRIMES-TREMOVE, PRIMES, CAPRI, GAINS, G4M, GEM-E3, PROMETHEUS	1995-2010: 1.9% pa 2010-2020: 1.2% pa 2020-2030: 1.4% pa 2030-2050: 1.5% pa	98 (in the pdf pages)
	68	52016SC0303 R(01)	General, financial and institutional matters / Provisions governing the institutions Industrial policy and internal market / Industrial policy: sectoral operations / Information technology, telecommunications and data-processing	QUEST	2021-2025: 1.7% 2%	131, 178 (Vol 1)
	69	52016SC0341	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	CORTAX	Not explicit	

YEAR	ID	CELEX	TOPIC	MODEL	GDP GROWTH RATE ASSUMPTION	PAGE
	70	52016SC0377 R(01)	Right of establishment and freedom to provide services / Sectoral application / Service activities Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	SYMBOL, QUEST	Not explicit	
	71	52016SC0405	See revised version	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-E3, PROMETHEUS, PRIMES-TREMOVE	See revised version	
	72	52016SC0405 R(01)	Energy / General principles and programmes / Rational utilization and conservation of energy	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-E3, PROMETHEUS, PRIMES-TREMOVE	1995-2010: 1.9% pa 2010-2020: 1.2% pa 2020-2030: 1.4% pa 2030-2050: 1.5% pa	40 (Vol2)
	73	52016SC0410	General, financial and institutional matters / Provisions governing the institutions Energy / Electricity Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	PRIMES, GAINS, METIS	Not explicit	
	74	52016SC0414	Energy / General principles and programmes / Rational utilisation and conservation of energy Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	BEAM2, E3ME, PRIMES	Not explicit	
	75	52016SC0418	Environment, consumers and health protection / Environment / Space, environment and natural resources	GREEN-X, GLOBIOM, CAPRI, PRIMES, PRIMES-TREMOVE, PROMETHEUS, GEM-E3, G4M, GAINS, POLES, GTAP, E3ME	1995-2010: 1.9% pa 2010-2020: 1.2% pa 2020-2030: 1.4% pa 2030-2050: 1.5% pa	223

YEAR	ID	CELEX	TOPIC	MODEL	POPULATION GROWTH RATE ASSUMPTION	PAGE
	8	52011SC0536	External relations / Development policy / Generalised system of preferences	SMART, CARIS	Not explicit	
	9	52011SC0779	Energy / General principles and programmes / Rational utilisation and conservation of energy	BEAM2, E3EM, PRIMES	EU-27 2000-2010: 0.4% 2010-2020: 0.3% 2020-2030: 0.1%	119
	10	52011SC0918	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GAINS, PRIMES	Not explicit	
	11	52011SC0949	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	QUEST, SYMBOL	Not explicit	
	12	52011SC0952	Right of establishment and freedom to provide services / Sectoral application / Service activities	No model use	Not explicit	
	13	52011SC1102	Taxation / General	QUEST (mentioned a DSGE model with calibration data from QUEST), SYMBOL	Not explicit	
	14	52011SC1138	Regional policy and coordination of structural instruments / Economic and social cohesion fund / European Regional Development Fund (ERDF)	ASTRA, PRIMES, NEMESIS	Not explicit	
	15	52011SC1141	Regional policy and coordination of structural instruments / General principles, programmes and statistics	GTAP, QUEST, HERMIN, GMR	Not explicit	
	16	52011SC1165	Industrial policy and internal market / Internal market: approximation of laws / General, programmes	GTAP	Not explicit	
	17	52011SC1212	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	GEM-E3, PRIMES-TREMOVE, TREMOVE, PRIMES, PROMETHEUS, TRANSTOOLS	Not explicit	
	18	52011SC1212 R(01)	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	TRANSTOOLS, TREMOVE, PRIMES, PRIMES-TREMOVE, GEM-E3, PROMETHEUS	Not explicit	
	19	52011SC1427	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development / General principles	NEMESIS	Not explicit	
	20	52011SC1542	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	PAGE	Not explicit	
	21	52011SC1543 (annex to 542)	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	GEM-E3	Not explicit	
	22	52011SC1565	Energy / General principles and programmes	GAINS, PRIMES, PROMETHEUS, GEM-E3	The population projections draw on the EUROPOP2008 convergence scenario (EUROpean POPulation Projections, base year 2008) from Eurostat, which is also the basis for the 2009 Ageing Report (European Economy,	49

YEAR	ID	CELEX	TOPIC	MODEL	POPULATION GROWTH RATE ASSUMPTION	PAGE
					April 2009)	
	23	52011SC0891	Fisheries / Common fisheries policy	EEIAA, BIRDMOD	Not explicit	
	24	52011SC1153	Agriculture / Agricultural structures / Social and structural measures	RURAL, EC MOD, CAPRI, AGLINK COSIMO, ESIM, LUISA	Not explicit	
	25	52011SC1262	Industrial policy and internal market / Trans-European networks	PROMETHEUS, PRIMES, TRANS-TOOLS, PRIMES-TREMOVE, GAINS, GEM-E3, TREMOVE	Not explicit	
2012	26	52012SC0041	Environment, consumers and health protection / Statistics	EPIC, EUFASOM, G4M, GAINS, GLOBIOM, PRIMES, EFFISCEN	No value but it is mentioned that it is consistent with PRIMES	91
	27	52012SC0149	Energy / Other sources of energy	GREEN-X, PRIMES, ASTRA, NEMESIS, MULTIREG	Not explicit	
	28	52012SC0166	Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	QUEST, SYMBOL	Not explicit	
	29	52012SC0212	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development	NEMESIS	Not explicit	
	30	52012SC0213	Transport policy / Inland transport / Structural harmonisation / Technical and safety conditions Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, TRANS-TOOLS	2010-2020: 0.29% p.a 2020-2030: 0.12% p.a 2030-2040: 0.0% p.a 2040-2050: 0.09% p.a	40 (Part II)
	31	52012SC0343	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AGLINK-COSIMO, IFPRI-MIRAGE-BIOF MODEL, GLOBIO3	Not explicit	
	32	52012SC0364	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AnaFgas, EmIO-F Europe, GEM-E3, GTAP (no, the database is mentioned as a source for GEM-E3)	Not explicit	
	33	52012SC0382	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	WaterGAP (mentioned only in the intro)	Not explicit	
	34	52012SC0398	Economic and monetary policy and free movement of capital / Economic policy Environment, consumers and health protection / Environment / General provisions and programmes	EFFIS, MITERRA, FATE, JRC soil model	Not explicit	
2013	35	52013SC0005	Transport policy / Transport infrastructure	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	2010-2020: 0.29% p.a 2020-2030: 0.12% p.a 2030-2040: 0.0% p.a 2040-2050: -0.09% p.a	56 (Vol 2)
	36	52013SC0065	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	LUISA	Not explicit	

YEAR	ID	CELEX	TOPIC	MODEL	POPULATION GROWTH RATE ASSUMPTION	PAGE
	37	52013SC0108	Transport policy / Inland transport / Combined transport Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles	PRIMES-TREMOVE, TREMOVE	Not explicit	
	38	52013SC0132	Environment, consumers and health protection / Environment / General provisions and programmes	BioMA, GEM-E3, iMAP, LUISA, EUCS100, CAPRI, POLES, LISFLOOD, DIVA, HadCM3, ECHAM5, WaterGAP	Not explicit	
	39	52013SC0181	Transport policy / Transport infrastructure	PRIMES, TRANS-TOOLS, TREMOVE, NEAC Trade model	Not explicit	
	40	52013SC0199	Energy / Nuclear energy / Safeguards	ENSEMBLE	Not explicit	
	41	52013SC0237	Transport policy / Shipping Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	PRIMES, TIMES	Not explicit	
	42	52013SC0423	Environment, consumers and health protection / Environment / Pollution and nuisances / Nuclear safety and radioactive waste	ENSEMBLE	Not explicit	
	43	52013SC0430	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AERO-MS, PRIMES	Not explicit	
	44	52013SC0471	Law relating to undertakings / Economic and commercial law / Other economic and commercial provisions	NEMESIS (only referenced)	Not explicit	
	45	52013SC0519	Agriculture / Approximation of laws and health measures / Animal health and zootechnics	GLOBE, iMAP (not mentioned)	Not explicit	
	46	52013SC0528	Transport policy / General	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	2010-2020:0.29 % p.a 2020-2030: 0.12 % p.a 2030-2040: 0.0% p.a 2040-2050:-0.09% p.a	76
	47	52013SC0531	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	TM5 –FASST, GAINS, GEM-E3, PRIMES	Not explicit but from Ageing Report 2012	162
	48	52013SC0531 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	COPERT, TM5 –FASST, GAINS, GEM-E3, PRIMES		
	49	52013SC0535	Transport policy / General	NEMESIS	Not explicit	
	50	52013SC0064 (it is an EXECUTIVE SUMMARY)	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	No model use	Not explicit	
51	52013SC0206	Transport policy / Air transport	E3ME	Not explicit		
2014	52	52014SC0015	Energy / General principles and programmes Environment, consumers and health protection / Environment / General provisions and programme	CAPRI, E3ME, GAINS, GEM-E3, PACE, POLES, PRIMES, PRIMES-TREMOVE, PROMETHEUS	Not explicit but from Ageing Report 2012	142
	53	52014SC0021	Environment, consumers and health protection / Environment / Space, environment and natural resources / Management and efficient use of space, the environment and natural resources	POLES, E3ME, LISQUAL	Not explicit	
	54	52014SC0030	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	FSDA, QUEST, SYMBOL	Not explicit	

YEAR	ID	CELEX	TOPIC	MODEL	POPULATION GROWTH RATE ASSUMPTION	PAGE
	55	52014SC0160	Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, VECTO	2010-2020: 0.29% pa 2020-2030: 0.12% pa 2030-2040: 0.0% pa 2040-2050: -0.09% pa	
	56	52014SC0207	Environment, consumers and health protection / Environment / Space, environment and natural resources / Waste management and clean technology	EU Waste model	Not explicit	
	57	52014SC0255	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / General provisions and programmes	E3ME, GAINS, GEM-E3, POLES, PRIMES	2010-20: 0.3% p.a 2020-30: 0.2% p.a.	32
	58	52014SC0017	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	No model use		
2015	59	52015SC0017	Energy / General principles and programmes Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, POLES	Not explicit	
	60	52015SC0135	Energy / General principles and programmes / Rational utilisation and conservation of energy Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws Environment, consumers and health protection / Consumers / Consumer information, education and representation	E3ME, PRIMES, GEM-E3	Not explicit	
	61	52015SC0139	Right of establishment and freedom to provide services / Sectoral application / Business activities Industrial policy and internal market / Internal market: approximation of laws Environment, consumers and health protection / Consumers / General	PRIMES	Not explicit	
	62	52015SC0274 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GTAP	Not explicit	
2016	63	52016SC0025	Energy / Oil and gas / Supplies and stocks	PRIMES	Not explicit	
	64	52016SC0027 R(01)	Energy / General principles and programmes / General	PRIMES	Not explicit	
	65	52016SC0064	Industrial policy and internal market / Internal market: approximation of laws / Fertilisers	GAINS	Not explicit	
	66	52016SC0247	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, GLOBIOM, PRIMES, G4M, GAINS, CAPRI, PROMETHEUS, PRIME-TREMOVE	2010-2030: 0.2% pa	17, 116
	67	52016SC0249	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	CAPRI, GLOBIOM, PRIMES-TREMOVE, PRIMES, CAPRI, GAINS, G4M, GEM-E3, PROMETHEUS	2010-2030: 0.2% pa	24, 98

YEAR	ID	CELEX	TOPIC	MODEL	POPULATION GROWTH RATE ASSUMPTION	PAGE
	68	52016SC0303 R(01)	General, financial and institutional matters / Provisions governing the institutions Industrial policy and internal market / Industrial policy: sectoral operations / Information technology, telecommunications and data-processing	QUEST	Not explicit	
	69	52016SC0341	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	CORTAX	Not explicit	
	70	52016SC0377 R(01)	Right of establishment and freedom to provide services / Sectoral application / Service activities Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	SYMBOL, QUEST	Not explicit	
	71	52016SC0405	See revised version	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-E3, PROMETHEUS, PRIMES-TREMOVE		
	72	52016SC0405 R(01)	Energy / General principles and programmes / Rational utilization and conservation of energy	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-E3, PROMETHEUS, PRIMES-TREMOVE	2010-2030: 0.2% pa	40 (Vol2)
	73	52016SC0410	General, financial and institutional matters / Provisions governing the institutions Energy / Electricity Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	PRIMES, GAINS, METIS	Not explicit	
	74	52016SC0414	Energy / General principles and programmes / Rational utilisation and conservation of energy Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	BEAM2, E3ME, PRIMES	Not explicit	
	75	52016SC0418	Environment, consumers and health protection / Environment / Space, environment and natural resources	GREEN-X, GLOBIOM, CAPRI, PRIMES, PRIMES-TREMOVE, PROMETHEUS, GEM-E3, G4M, GAINS, POLES, GTAP, E3ME	2010-2030: 0.2% pa	223

Table 3: Discount Rates

YEAR	ID	CELEX	TOPIC	MODEL	DISCOUNT RATES ASSUMPTION	PAGE
2011	1	52011SC0277	Energy / General principles and programmes / Rational utilisation and conservation of energy	PRIMES	Not explicit	6
	2	52011SC0279 (Annex to 270)	Energy / General principles and programmes / Rational utilisation and conservation of energy	PRIMES	--	
	3	52011SC0288	Environment, consumers and health protection / Environment / General provisions and programmes	AGLINK-COSIMO (baseline provision), CAPRI, E3ME, G4M, GAINS, GEM-E3, GLOBIOM, POLES, PRIMES, PROMETHEUS	Capital costs:0% Transport equipment costs: 0%	85 87
	4	52011SC0315	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	CORTAX	5%	134
	5	52011SC0316	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	Summary of 52011SC0315	--	
	6	52011SC0358	Transport policy / General	GLOBIOM (biomass supply model mentioned), POLES, COPERT, GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, TRANSTOOLS, TREMOVE	Capital costs: 0% Electric road infrastructure costs: 4% Additional costs: 4% Co-benefits: 4% Mitigation costs: 4%	57 83 83 84 84
	7	52011SC0409	Taxation / Indirect taxation / Excise duties	E3ME, PRIMES, QUEST, TREMOVE	--	
	8	52011SC0536	External relations / Development policy / Generalised system of preferences	SMART, CARIS	--	
	9	52011SC0779	Energy / General principles and programmes / Rational utilisation and conservation of energy	BEAM2, E3EM, PRIMES	Consumers: 9-10% Capital: 9-10%	Vol 4, 116
	10	52011SC0918	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GAINS, PRIMES	Interest rate: 9%	66
	11	52011SC0949	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	QUEST, SYMBOL	Not explicit	
	12	52011SC0952	Right of establishment and freedom to provide services / Sectoral application / Service activities	No model use	--	
	13	52011SC1102	Taxation / General	QUEST (mentioned a DSGE model with calibration data from QUEST), SYMBOL	Not explicit The loan interest rate is determined as a markup over marginal cost (the mark up factor is given by $1/(1-\epsilon L)$).	187
	14	52011SC1138	Regional policy and coordination of structural instruments / Economic and social cohesion fund / European Regional Development Fund (ERDF)	ASTRA, PRIMES, NEMESIS	--	
	15	52011SC1141	Regional policy and coordination of structural instruments / General principles, programmes and statistics	GTAP, QUEST, HERMIN, GMR	--	
	16	52011SC1165	Industrial policy and internal market / Internal market: approximation of laws / General, programmes	GTAP	4%	565

YEAR	ID	CELEX	TOPIC	MODEL	DISCOUNT RATES ASSUMPTION	PAGE
	17	52011SC1212	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	GEM-E3, PRIMES-TREMOVE, TREMOVE, PRIMES, PROMETHEUS, TRANSTOOLS	--	
	18	52011SC1212 R(01)	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	TRANSTOOLS, TREMOVE, PRIMES, PRIMES-TREMOVE, GEM-E3, PROMETHEUS	--	
	19	52011SC1427	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development / General principles	NEMESIS	Average interest rate on investments: 1.5%	Vol 2, 2^2 1
	20	52011SC1542	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	PAGE	4%	Vol 1, 41
	21	52011SC1543 (annex to 542)	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	GEM-E3	--	
	22	52011SC1565	Energy / General principles and programmes	GAINS, PRIMES, PROMETHEUS, GEM-E3	Industry: 12% Private individuals: 17.5% Tertiary: 12% Public transport: 8% Power generation sector: 9% Enabling role of ESCOs is reflected in lower discount rates for household consumers (from 17.5% to 16% in 2015, 14% in 2020, 13% in 2025 and 12% from 2030 onwards) and for industry, agriculture and services (from 12% to 11% by 2015 and to 10% from 2020 onwards)	Vol 1, 73 Vol 2, 4
	23	52011SC0891	Fisheries / Common fisheries policy	EEIAA, BIRDMOD	--	
	24	52011SC1153	Agriculture / Agricultural structures / Social and structural measures	RURAL, EC MOD, CAPRI, AGLINK COSIMO, ESIM, LUISA	Not explicit	Vol 7, 33
	25	52011SC1262	Industrial policy and internal market / Trans-European networks	PROMETHEUS, PRIMES, TRANS-TOOLS, PRIMES-TREMOVE, GAINS, GEM-E3, TREMOVE	--	
	2012	26	52012SC0041	Environment, consumers and health protection / Statistics	EPIC, EUFASOM, G4M, GAINS, GLOBIOM, PRIMES, EFFISCEN	--
27		52012SC0149	Energy / Other sources of energy	GREEN-X, PRIMES, ASTRA, NEMESIS, MULTIREG	--	
28		52012SC0166	Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	QUEST, SYMBOL	2.5%	192
29		52012SC0212	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development	NEMESIS	Not explicit	82

YEAR	ID	CELEX	TOPIC	MODEL	DISCOUNT RATES ASSUMPTION	PAGE
	30	52012SC0213	Transport policy / Inland transport / Structural harmonisation / Technical and safety conditions Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, TRANS-TOOLS	Private discount rate: 8% Societal discount rate: 4% End users private discount rate: 8%	Vol 1, 19 Vol 1, 20
	31	52012SC0343	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AGLINK-COSIMO, IFPRI-MIRAGE-BIOF MODEL, GLOBIO3	--	
	32	52012SC0364	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AnaFgas, EmIO-F Europe, GEM-E3, GTAP (no, the database is mentioned as a source for GEM-E3)	General discount rate: 4% Cost estimates: 8%	Vol 1, 19 Vol 1, 20
	33	52012SC0382	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	WaterGAP (mentioned only in the intro)	--	
	34	52012SC0398	Economic and monetary policy and free movement of capital / Economic policy Environment, consumers and health protection / Environment / General provisions and programmes	EFFIS, MITERRA, FATE, JRC soil model	--	
2013	35	52013SC0005	Transport policy / Transport infrastructure	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	4 %	Vol 1, 48
	36	52013SC0065	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	LUISA	Not explicit	48
	37	52013SC0108	Transport policy / Inland transport / Combined transport Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles	PRIMES-TREMOVE, TREMOVE	4 %	xlix
	38	52013SC0132	Environment, consumers and health protection / Environment / General provisions and programmes	BioMA, GEM-E3, iMAP, LUISA, EUCS100, CAPRI, POLES, LISFLOOD, DIVA, HadCM3, ECHAM5, WaterGAP	--	
	39	52013SC0181	Transport policy / Transport infrastructure	PRIMES, TRANS-TOOLS, TREMOVE, NEAC Trade model	--	
	40	52013SC0199	Energy / Nuclear energy / Safeguards	ENSEMBLE	8 %	Vol. 2, 23
	41	52013SC0237	Transport policy / Shipping Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	PRIMES, TIMES	Private discount rate: 10% Social discount rate: 4%	Vol 1, 40 Vol 1, 40
	42	52013SC0423	Environment, consumers and health protection / Environment / Pollution and nuisances / Nuclear safety and radioactive waste	ENSEMBLE	--	
	43	52013SC0430	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AERO-MS, PRIMES	--	

YEAR	ID	CELEX	TOPIC	MODEL	DISCOUNT RATES ASSUMPTION	PAGE
	44	52013SC0471	Law relating to undertakings / Economic and commercial law / Other economic and commercial provisions	NEMESIS (only referenced)	--	
	45	52013SC0519	Agriculture / Approximation of laws and health measures / Animal health and zootechnics	GLOBE, iMAP (not mentioned)	--	
	46	52013SC0528	Transport policy / General	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	--	
	47	52013SC0531	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	TM5 –FASST, GAINS, GEM-E3, PRIMES	4%	Vol 4, 335
	48	52013SC0531 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	COPERT, TM5 –FASST, GAINS, GEM-E3, PRIMES	--	
	49	52013SC0535	Transport policy / General	NEMESIS	--	
	50	52013SC0064 (it is an EXECUTIVE SUMMARY)	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	No model use	--	
	51	52013SC0206	Transport policy / Air transport	E3ME	--	
2014	52	52014SC0015	Energy / General principles and programmes Environment, consumers and health protection / Environment / General provisions and programme	CAPRI, E3ME, GAINS, GEM-E3, PACE, POLES, PRIMES, PRIMES-TREMOVE, PROMETHEUS	household consumers: 17.5%; 12% from 2020, 11 % in 2025, 10% in 2030 and 9% from 2040 onwards	164
	53	52014SC0021	Environment, consumers and health protection / Environment / Space, environment and natural resources / Management and efficient use of space, the environment and natural resources	POLES, E3ME, LISQUAL	--	
	54	52014SC0030	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	FSDA, QUEST, SYMBOL	Not explicit	
	55	52014SC0160	Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, VECTO	Not explicit	
	56	52014SC0207	Environment, consumers and health protection / Environment / Space, environment and natural resources / Waste management and clean technology	EU Waste model	4%	Vol 6, 19
	57	52014SC0255	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / General provisions and programmes	E3ME, GAINS, GEM-E3, POLES, PRIMES	Residential sector: from 12% in 2020 progressively to 10.2% (by 2050) Tertiary sector: from 10% to 9% (by 2050)	26
	58	52014SC0017	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	No model use	Not explicit	46
2015	59	52015SC0017	Energy / General principles and programmes Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, POLES	Not explicit	

YEAR	ID	CELEX	TOPIC	MODEL	DISCOUNT RATES ASSUMPTION	PAGE
	60	52015SC0135	Energy / General principles and programmes / Rational utilisation and conservation of energy Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws Environment, consumers and health protection / Consumers / Consumer information, education and representation	E3ME, PRIMES, GEM-E3	Not explicit	12
	61	52015SC0139	Right of establishment and freedom to provide services / Sectoral application / Business activities Industrial policy and internal market / Internal market: approximation of laws Environment, consumers and health protection / Consumers / General	PRIMES	Not explicit	30
	62	52015SC0274 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GTAP	Not explicit	
2016	63	52016SC0025	Energy / Oil and gas / Supplies and stocks	PRIMES	--	
	64	52016SC0027 R(01)	Energy / General principles and programmes / General	PRIMES	--	
	65	52016SC0064	Industrial policy and internal market / Internal market: approximation of laws / Fertilisers	GAINS	4%	
	66	52016SC0247	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, GLOBIOM, PRIMES, G4M, GAINS, CAPRI, PROMETHEUS, PRIME-TREMOVE	EUCO27 Households: reduction from 12% to 11.5%. EUCO30 Households: reduction from 12% to 11.5% EE30 Residential sector: from 12% in 2020 progressively to 9% (by 2050) Tertiary sector: 10% to 8.5% (by 2050)	137 138 141
	67	52016SC0249	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	CAPRI, GLOBIOM, PRIMES-TREMOVE, PRIMES, CAPRI, GAINS, G4M, GEM-E3, PROMETHEUS	--	
	68	52016SC0303 R(01)	General, financial and institutional matters / Provisions governing the institutions Industrial policy and internal market / Industrial policy: sectoral operations / Information technology, telecommunications and data-processing	No mode use	--	
	69	52016SC0341	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	CORTAX	Long-term nominal Interest rate: 7.1% Real interest rate: 5%	49 115
	70	52016SC0377 R(01)	Right of establishment and freedom to provide services / Sectoral application / Service activities Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	SYMBOL, QUEST	--	
	71	52016SC0405	See revised version	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-	See revised version	

YEAR	ID	CELEX	TOPIC	MODEL	DISCOUNT RATES ASSUMPTION	PAGE
				E3, PROMETHEUS, PRIMES-TREMOVE		
	72	52016SC0405 R(01)	Energy / General principles and programmes / Rational utilisation and conservation of energy	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-E3, PROMETHEUS, PRIMES-TREMOVE	CAPEX end-consumers: 10% EUCO30 Households: Reduction from 12% to 11.5%	47 69
	73	52016SC0410	General, financial and institutional matters / Provisions governing the institutions Energy / Electricity Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	PRIMES, GAINS, METIS	3.5% 4%	113 Vol 5, 372
	74	52016SC0414	Energy / General principles and programmes / Rational utilisation and conservation of energy Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	BEAM2, E3ME, PRIMES	Not explicit, but sector and partially country specific. Interest rates for consumption loans: 6% (households), 2-3% (non-financial corporations)	53 65
	75	52016SC0418	Environment, consumers and health protection / Environment / Space, environment and natural resources	GREEN-X, GLOBIOM, CAPRI, PRIMES, PRIMES-TREMOVE, PROMETHEUS, GEM-E3, G4M, GAINS, POLES, GTAP, E3ME	CAPEX: 10% Consumer goods: 9.5%-12%	Vol 3, 226-227

Table 4: Energy Prices

YEAR	ID	CELEX	TOPIC	MODEL	ENERGY PRICES ASSUMPTION	PAGE
2011	1	52011SC0277	Energy / General principles and programmes / Rational utilisation and conservation of energy	PRIMES	--	
	2	52011SC0279 (Annex to 270)	Energy / General principles and programmes / Rational utilisation and conservation of energy	PRIMES	--	
	3	52011SC0288	Environment, consumers and health protection / Environment / General provisions and programmes	AGLINK-COSIMO (baseline provision), CAPRI, E3ME, G4M, GAINS, GEM-E3, GLOBIOM, POLES, PRIMES, PROMETHEUS	Oil: 138 \$ (08)/barrel in 2050 Gas: ~98 \$ (08)/boe in 2050 Coal: ~30 \$ (08)/boe in 2050.	
	4	52011SC0315	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	CORTAX	--	
	5	52011SC0316	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	Summary of 52011SC0315	--	
	6	52011SC0358	Transport policy / General	GLOBIOM (biomass supply model mentioned), POLES, COPERT, GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, TRANSTOOLS, TREMOVE	Oil: 127 \$ (08)/barrel in 2050 (Reference Scenario) Oil: 212 \$ (08)/barrel in 2050 (High oil price environment) Oil: 118\$ (08)/barrel in 2050 (Low oil price environment)	
	7	52011SC0409	Taxation / Indirect taxation / Excise duties	E3ME, PRIMES, QUEST, TREMOVE	--	
	8	52011SC0536	External relations / Development policy / Generalised system of preferences	SMART, CARIS	--	
	9	52011SC0779	Energy / General principles and programmes / Rational utilisation and conservation of energy	BEAM2, E3EM, PRIMES	--	
	10	52011SC0918	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GAINS, PRIMES	Not explicit	
	11	52011SC0949	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	QUEST, SYMBOL	--	
	12	52011SC0952	Right of establishment and freedom to provide services / Sectoral application / Service activities	No model use	--	
	13	52011SC1102	Taxation / General	QUEST (mentioned a DSGE model with calibration data from QUEST), SYMBOL	--	
	14	52011SC1138	Regional policy and coordination of structural instruments / Economic and social cohesion fund / European Regional Development Fund (ERDF)	ASTRA, PRIMES, NEMESIS	--	
	15	52011SC1141	Regional policy and coordination of structural instruments / General principles, programmes and statistics	GTAP, QUEST, HERMIN, GMR	--	
	16	52011SC1165	Industrial policy and internal market / Internal market: approximation of laws / General, programmes	GTAP	--	

YEAR	ID	CELEX	TOPIC	MODEL	ENERGY PRICES ASSUMPTION	PAGE
	17	52011SC1212	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	GEM-E3, PRIMES-TREMOVE, TREMOVE, PRIMES, PROMETHEUS, TRANSTOOLS	--	
	18	52011SC1212 R(01)	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	TRANSTOOLS, TREMOVE, PRIMES, PRIMES-TREMOVE, GEM-E3, PROMETHEUS	--	
	19	52011SC1427	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development / General principles	NEMESIS	--	
	20	52011SC1542	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	PAGE	--	
	21	52011SC1543 (annex to 542)	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	GEM-E3	--	
	22	52011SC1565	Energy / General principles and programmes	GAINS, PRIMES, PROMETHEUS, GEM-E3	106 \$/barrel in 2030 and 127 \$/barrel in 2050 (in year 2008 dollars)	
	23	52011SC0891	Fisheries / Common fisheries policy	EEIAA, BIRDMOD	--	
	24	52011SC1153	Agriculture / Agricultural structures / Social and structural measures	RURAL, EC MOD, CAPRI, AGLINK COSIMO, ESIM, LUISA	--	
	25	52011SC1262	Industrial policy and internal market / Trans-European networks	PROMETHEUS, PRIMES, TRANS-TOOLS, PRIMES-TREMOVE, GAINS, GEM-E3, TREMOVE	--	
2012	26	52012SC0041	Environment, consumers and health protection / Statistics	EPIC, EUFASOM, G4M, GAINS, GLOBIOM, PRIMES, EFFISCEN	--	
	27	52012SC0149	Energy / Other sources of energy	GREEN-X, PRIMES, ASTRA, NEMESIS, MULTIREG	--	
	28	52012SC0166	Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	QUEST, SYMBOL	--	
	29	52012SC0212	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development	NEMESIS	--	
	30	52012SC0213	Transport policy / Inland transport / Structural harmonisation / Technical and safety conditions Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, TRANS-TOOLS	Energy import prices: A) Oil (\$10 dollar per barrel oil equivalent) 2010: 85.2 2020: 89 2030: 106.6 2040: 116.9 2050: 127.6 B) Gas (\$10 dollar per barrel oil equivalent) 2010: 53.8 2020: 62.5 2030: 77.1 2040: 87.4 2050: 99 C) Coal (\$10 dollar per barrel oil equivalent) 2010: 22.8 2020: 28.9	

YEAR	ID	CELEX	TOPIC	MODEL	ENERGY PRICES ASSUMPTION	PAGE
					2030: 32.8 2040:32.8 2050: 33.7	
	31	52012SC0343	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AGLINK-COSIMO, IFPRI-MIRAGE-BIOF MODEL, GLOBIO3	--	
	32	52012SC0364	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AnaFgas, EmIO-F Europe, GEM-E3, GTAP (no, the database is mentioned as a source for GEM-E3)	--	
	33	52012SC0382	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	WaterGAP (mentioned only in the intro)	--	
	34	52012SC0398	Economic and monetary policy and free movement of capital / Economic policy Environment, consumers and health protection / Environment / General provisions and programmes	EFFIS, MITERRA, FATE, JRC soil model	--	
2013	35	52013SC0005	Transport policy / Transport infrastructure	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	Energy import prices: A) Oil (\$10 dollar per barrel oil equivalent) 2010: 85.2 2020: 89 2030: 106.6 2040: 116.9 2050: 127.6 B) Gas (\$10 dollar per barrel oil equivalent) 2010: 53.8 2020: 62.5 2030: 77.1 2040:87.4 2050: 99 C) Coal (\$10 dollar per barrel oil equivalent) 2010: 22.8 2020: 28.9 2030: 32.8 2040:32.8 2050: 33.7	
	36	52013SC0065	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	LUISA	--	
	37	52013SC0108	Transport policy / Inland transport / Combined transport Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles	PRIMES-TREMOVE, TREMOVE	--	
	38	52013SC0132	Environment, consumers and health protection / Environment / General provisions and programmes	BioMA, GEM-E3, iMAP, LUISA, EUCS100, CAPRI, POLES, LISFLOOD, DIVA, HadCM3, ECHAM5, WaterGAP	--	
	39	52013SC0181	Transport policy / Transport infrastructure	PRIMES, TRANS-TOOLS, TREMOVE, NEAC Trade	Not explicit	

YEAR	ID	CELEX	TOPIC	MODEL	ENERGY PRICES ASSUMPTION	PAGE
				model		
	40	52013SC0199	Energy / Nuclear energy / Safeguards	ENSEMBLE	--	
	41	52013SC0237	Transport policy / Shipping Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	PRIMES, TIMES	Not explicit	
	42	52013SC0423	Environment, consumers and health protection / Environment / Pollution and nuisances / Nuclear safety and radioactive waste	ENSEMBLE	--	
	43	52013SC0430	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AERO-MS, PRIMES	--	
	44	52013SC0471	Law relating to undertakings / Economic and commercial law / Other economic and commercial provisions	NEMESIS (only referenced)	--	
	45	52013SC0519	Agriculture / Approximation of laws and health measures / Animal health and zootechnics	GLOBE, iMAP (not mentioned)	--	
	46	52013SC0528	Transport policy / General	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	From Reference Scenario	
	47	52013SC0531	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	TM5 –FASST, GAINS, GEM-E3, PRIMES	--	
	48	52013SC0531 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	COPERT, TM5 –FASST, GAINS, GEM-E3, PRIMES	--	
	49	52013SC0535	Transport policy / General	NEMESIS	--	
	50	52013SC0064 (it is an EXECUTIVE SUMMARY)	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	No model use	--	
	51	52013SC0206	Transport policy / Air transport	E3ME	--	
2014	52	52014SC0015	Energy / General principles and programmes Environment, consumers and health protection / Environment / General provisions and programme	CAPRI, E3ME, GAINS, GEM-E3, PACE, POLES, PRIMES, PRIMES-TREMOVE, PROMETHEUS	Oil (\$10 dollar per barrel oil equivalent) 2010: 60-80 2020: 89-115 2030:93-121 2050: 110-143 Gas (\$10 dollar per barrel oil equivalent) 2010: 60 2020: 89 2030:93 2050: 63 Coal Oil (\$10 dollar per barrel oil equivalent) 2010: 16 2020: 23 2030:24 2050: 31	
	53	52014SC0021	Environment, consumers and health protection / Environment / Space, environment and natural resources / Management and efficient use of space, the environment and natural resources	POLES, E3ME, LISQUAL		
	54	52014SC0030	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	FSDA, QUEST, SYMBOL		

YEAR	ID	CELEX	TOPIC	MODEL	ENERGY PRICES ASSUMPTION	PAGE
	55	52014SC0160	Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, VECTO	Euro 2010 per boe Oil: 2010: 85.2 2020: 89 2030: 106.6 2040: 116.9 2050: 127.6 Gas: 2010: 53.8 2020: 62.5 2030: 77.1 2040: 87.4 2050: 99 Coal: 2010: 22.8 2020: 2.9 2030: 32.8 2040: 32.8 2050: 33.7	
	56	52014SC0207	Environment, consumers and health protection / Environment / Space, environment and natural resources / Waste management and clean technology	EU Waste model	--	
	57	52014SC0255	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / General provisions and programmes	E3ME, GAINS, GEM-E3, POLES, PRIMES	--	
	58	52014SC0017	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	No model use	--	
2015	59	52015SC0017	Energy / General principles and programmes Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, POLES	--	
	60	52015SC0135	Energy / General principles and programmes / Rational utilisation and conservation of energy Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws Environment, consumers and health protection / Consumers / Consumer information, education and representation	E3ME, PRIMES, GEM-E3	Energy prices: + 4% per year up to 2020, + 0.5% from 2020 onwards	
	61	52015SC0139	Right of establishment and freedom to provide services / Sectoral application / Business activities Industrial policy and internal market / Internal market: approximation of laws Environment, consumers and health protection / Consumers / General	PRIMES	--	
	62	52015SC0274 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GTAP	--	
2016	63	52016SC0025	Energy / Oil and gas / Supplies and stocks	PRIMES	--	
	64	52016SC0027 R(01)	Energy / General principles and programmes / General	PRIMES	--	
	65	52016SC0064	Industrial policy and internal market / Internal market: approximation of laws / Fertilisers	GAINS	--	

YEAR	ID	CELEX	TOPIC	MODEL	ENERGY PRICES ASSUMPTION	PAGE
	66	52016SC0247	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, GLOBIOM, PRIMES, G4M, GAINS, CAPRI, PROMETHEUS, PRIME-TREMOVE	Oil price (\$ 2013): 87 \$ /barrel in 2020; 113 \$ /barrel in 2030; 130 \$ /barrel by 2050	
	67	52016SC0249	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	CAPRI, GLOBIOM, PRIMES-TREMOVE, PRIMES, CAPRI, GAINS, G4M, GEM-E3, PROMETHEUS	--	
	68	52016SC0303 R(01)	General, financial and institutional matters / Provisions governing the institutions Industrial policy and internal market / Industrial policy: sectoral operations / Information technology, telecommunications and data-processing	No mode use	--	
	69	52016SC0341	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	CORTAX	--	
	70	52016SC0377 R(01)	Right of establishment and freedom to provide services / Sectoral application / Service activities Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	SYMBOL, QUEST	--	
	71	52016SC0405	See revised version	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-E3, PROMETHEUS, PRIMES-TREMOVE	See revised version	
	72	52016SC0405 R(01)	Energy / General principles and programmes / Rational utilisation and conservation of energy	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-E3, PROMETHEUS, PRIMES-TREMOVE	--	
	73	52016SC0410	General, financial and institutional matters / Provisions governing the institutions Energy / Electricity Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	PRIMES, GAINS, METIS	--	
	74	52016SC0414	Energy / General principles and programmes / Rational utilisation and conservation of energy Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	BEAM2, E3ME, PRIMES	--	
	75	52016SC0418	Environment, consumers and health protection / Environment / Space, environment and natural resources	GREEN-X, GLOBIOM, CAPRI, PRIMES, PRIMES-TREMOVE, PROMETHEUS, GEM-E3, G4M, GAINS, POLES, GTAP, E3ME	Oil price (\$ 2013): 87 \$ /barrel in 2020; 113 \$ /barrel in 2030; 130 \$ /barrel by 2050	

Table 5: Price Changes

YEAR	ID	CELEX	TOPIC	MODEL	PRICE CHANGES ASSUMPTION	PAGE
2011	1	52011SC0277	Energy / General principles and programmes / Rational utilisation and conservation of energy	PRIMES	Not explicit	
	2	52011SC0279 (Annex to 270)	Energy / General principles and programmes / Rational utilisation and conservation of energy	PRIMES	Not explicit	
	3	52011SC0288	Environment, consumers and health protection / Environment / General provisions and programmes	AGLINK-COSIMO (baseline provision), CAPRI, E3ME, G4M, GAINS, GEM-E3, GLOBIOM, POLES, PRIMES, PROMETHEUS	From FAO/IFPRI (but no specified)	128
	4	52011SC0315	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	CORTAX	Not explicit	
	5	52011SC0316	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	Summary of 52011SC0315	Not explicit	
	6	52011SC0358	Transport policy / General	GLOBIOM (biomass supply model mentioned), POLES, COPERT, GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, TRANSTOOLS, TREMOVE	Not explicit	
	7	52011SC0409	Taxation / Indirect taxation / Excise duties	E3ME, PRIMES, QUEST, TREMOVE	E3ME: 1.7% PRIMES: between 2013 and 2030 assuming 2-3% inflation	52 (Vol 1) 61 (Vol 2)
	8	52011SC0536	External relations / Development policy / Generalised system of preferences	SMART, CARIS	Not explicit	
	9	52011SC0779	Energy / General principles and programmes / Rational utilisation and conservation of energy	BEAM2, E3EM, PRIMES	Consumer prices: 2000-1.0 2010 - 1.24 2015 - 1.42 2020 - 1.62	20 (Vol 1)
	10	52011SC0918	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GAINS, PRIMES	Not explicit	
	11	52011SC0949	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	QUEST, SYMBOL	Not explicit	
	12	52011SC0952	Right of establishment and freedom to provide services / Sectoral application / Service activities	No model use	Not explicit	
	13	52011SC1102	Taxation / General	QUEST (mentioned a DSGE model with calibration data from QUEST), SYMBOL	2% inflation rate (?)	7 (Vol 11)
	14	52011SC1138	Regional policy and coordination of structural instruments / Economic and social cohesion fund / European Regional Development Fund (ERDF)	ASTRA, PRIMES, NEMESIS	Not explicit	
	15	52011SC1141	Regional policy and coordination of structural instruments / General principles, programmes and statistics	GTAP, QUEST, HERMIN, GMR	Not explicit	

YEAR	ID	CELEX	TOPIC	MODEL	PRICE CHANGES ASSUMPTION	PAGE
	16	52011SC1165	Industrial policy and internal market / Internal market: approximation of laws / General, programmes	GTAP	Not explicit	
	17	52011SC1212	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	GEM-E3, PRIMES-TREMOVE, TREMOVE, PRIMES, PROMETHEUS, TRANSTOOLS	Not explicit	
	18	52011SC1212 R(01)	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	TRANSTOOLS, TREMOVE, PRIMES, PRIMES-TREMOVE, GEM-E3, PROMETHEUS	Not explicit	
	19	52011SC1427	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development / General principles	NEMESIS	2%	4 (Part 10)
	20	52011SC1542	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	PAGE	Not explicit	
	21	52011SC1543 (annex to 542)	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	GEM-E3	Not explicit	
	22	52011SC1565	Energy / General principles and programmes	GAINS, PRIMES, PROMETHEUS, GEM-E3	2%	51 (Vol 1)
	23	52011SC0891	Fisheries / Common fisheries policy	EEIAA, BIRDMOD	All prices, costs and values are expressed in real terms (i.e. with no inflationary component) relative to the reference period (2005-2007)	35 (Vol 2)
	24	52011SC1153	Agriculture / Agricultural structures / Social and structural measures	RURAL, EC MOD, CAPRI, AGLINK COSIMO, ESIM, LUISA	Land rents were adjusted for inflation based on a GDP deflator used in AGLINK The real interest rate is calculated subtracting on the Global Insight HCPI inflation rate from the Global Insight long term interest rate	33 (Annex 10)
25	52011SC1262	Industrial policy and internal market / Trans-European networks	PROMETHEUS, PRIMES, TRANS-TOOLS, PRIMES-TREMOVE, GAINS, GEM-E3, TREMOVE	Not explicit		
2012	26	52012SC0041	Environment, consumers and health protection / Statistics	EPIC, EUFASOM, G4M, GAINS, GLOBIOM, PRIMES, EFFISCEN	Not explicit	
	27	52012SC0149	Energy / Other sources of energy	GREEN-X, PRIMES, ASTRA, NEMESIS, MULTIREG	Not explicit	
	28	52012SC0166	Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	QUEST, SYMBOL	Not explicit	
	29	52012SC0212	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development	NEMESIS	2%	77

YEAR	ID	CELEX	TOPIC	MODEL	PRICE CHANGES ASSUMPTION	PAGE
	30	52012SC0213	Transport policy / Inland transport / Structural harmonisation / Technical and safety conditions Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, TRANS-TOOLS	In PRIMES and PRIMES-TREMOVE models all monetary values are expressed in constant terms (Without inflation).	41 (Vol 2)
	31	52012SC0343	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AGLINK-COSIMO, IFPRI-MIRAGE-BIOF MODEL, GLOBIO3	Not explicit	
	32	52012SC0364	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AnaFgas, EmIO-F Europe, GEM-E3, GTAP (no, the database is mentioned as a source for GEM-E3)	Not explicit	
	33	52012SC0382	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	WaterGAP (mentioned only in the intro)	Not explicit	
	34	52012SC0398	Economic and monetary policy and free movement of capital / Economic policy Environment, consumers and health protection / Environment / General provisions and programmes	EFFIS, MITERRA, FATE, JRC soil model	Not explicit	
2013	35	52013SC0005	Transport policy / Transport infrastructure	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	Not explicit	
	36	52013SC0065	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	LUISA	Not explicit	
	37	52013SC0108	Transport policy / Inland transport / Combined transport Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles	PRIMES-TREMOVE, TREMOVE	Not explicit	
	38	52013SC0132	Environment, consumers and health protection / Environment / General provisions and programmes	BioMA, GEM-E3, iMAP, LUISA, EUCS100, CAPRI, POLES, LISFLOOD, DIVA, HadCM3, ECHAM5, WaterGAP	Not explicit	
	39	52013SC0181	Transport policy / Transport infrastructure	PRIMES, TRANS-TOOLS, TREMOVE, NEAC Trade model	Not explicit	
	40	52013SC0199	Energy / Nuclear energy / Safeguards	ENSEMBLE	Not explicit	
	41	52013SC0237	Transport policy / Shipping Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	PRIMES, TIMES	"Inflation is kept at bay"	144 (Part 3)
	42	52013SC0423	Environment, consumers and health protection / Environment / Pollution and nuisances / Nuclear safety and radioactive waste	ENSEMBLE	Not explicit	
	43	52013SC0430	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AERO-MS, PRIMES	Not explicit	

YEAR	ID	CELEX	TOPIC	MODEL	PRICE CHANGES ASSUMPTION	PAGE
	44	52013SC0471	Law relating to undertakings / Economic and commercial law / Other economic and commercial provisions	NEMESIS (only referenced)	Not explicit	
	45	52013SC0519	Agriculture / Approximation of laws and health measures / Animal health and zootechnics	GLOBE, iMAP (not mentioned)	Not explicit	
	46	52013SC0528	Transport policy / General	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	Not explicit	
	47	52013SC0531	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	TM5 –FASST, GAINS, GEM-E3, PRIMES	Not explicit	
	48	52013SC0531 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	COPERT, TM5 –FASST, GAINS, GEM-E3, PRIMES	Not explicit	
	49	52013SC0535	Transport policy / General	NEMESIS	Not explicit	
	50	52013SC0064 (it is an EXECUTIVE SUMMARY)	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	No model use		
	51	52013SC0206	Transport policy / Air transport	E3ME	Not explicit	
2014	52	52014SC0015	Energy / General principles and programmes Environment, consumers and health protection / Environment / General provisions and programme	CAPRI, E3ME, GAINS, GEM-E3, PACE, POLES, PRIMES, PRIMES-TREMOVE, PROMETHEUS	2%	143
	53	52014SC0021	Environment, consumers and health protection / Environment / Space, environment and natural resources / Management and efficient use of space, the environment and natural resources	POLES, E3ME, LISQUAL	Not explicit	
	54	52014SC0030	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	FSDA, QUEST, SYMBOL	Not explicit	
	55	52014SC0160	Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, VECTO	Not explicit	
	56	52014SC0207	Environment, consumers and health protection / Environment / Space, environment and natural resources / Waste management and clean technology	EU Waste model	GDP deflators presented	20 (Vol 6)
	57	52014SC0255	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / General provisions and programmes	E3ME, GAINS, GEM-E3, POLES, PRIMES	Not explicit	
	58	52014SC0017	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	No model use	Not explicit	
2015	59	52015SC0017	Energy / General principles and programmes Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, POLES	Not explicit	

YEAR	ID	CELEX	TOPIC	MODEL	PRICE CHANGES ASSUMPTION	PAGE
	60	52015SC0135	Energy / General principles and programmes / Rational utilisation and conservation of energy Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws Environment, consumers and health protection / Consumers / Consumer information, education and representation	E3ME, PRIMES, GEM-E3	Not explicit	
	61	52015SC0139	Right of establishment and freedom to provide services / Sectoral application / Business activities Industrial policy and internal market / Internal market: approximation of laws Environment, consumers and health protection / Consumers / General	PRIMES	Not explicit	
	62	52015SC0274 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GTAP	Not explicit	
2016	63	52016SC0025	Energy / Oil and gas / Supplies and stocks	PRIMES	Not explicit	
	64	52016SC0027 R(01)	Energy / General principles and programmes / General	PRIMES	Not explicit	
	65	52016SC0064	Industrial policy and internal market / Internal market: approximation of laws / Fertilisers	GAINS	Not explicit	
	66	52016SC0247	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, GLOBIOM, PRIMES, G4M, GAINS, CAPRI, PROMETHEUS, PRIME-TREMOVE	Not explicit	
	67	52016SC0249	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	CAPRI, GLOBIOM, PRIMES-TREMOVE, PRIMES, CAPRI, GAINS, G4M, GEM-E3, PROMETHEUS	Not explicit	
	68	52016SC0303 R(01)	General, financial and institutional matters / Provisions governing the institutions Industrial policy and internal market / Industrial policy: sectoral operations / Information technology, telecommunications and data-processing	No mode use	Not explicit	
	69	52016SC0341	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	CORTAX	2%	115
	70	52016SC0377 R(01)	Right of establishment and freedom to provide services / Sectoral application / Service activities Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	SYMBOL, QUEST	Not explicit	
	71	52016SC0405	See revised version	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-E3, PROMETHEUS, PRIMES-TREMOVE	See revised version	
	72	52016SC0405 R(01)	Energy / General principles and programmes / Rational utilisation and conservation of energy	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-E3, PROMETHEUS, PRIMES-TREMOVE	Not explicit	

YEAR	ID	CELEX	TOPIC	MODEL	PRICE CHANGES ASSUMPTION	PAGE
	73	52016SC0410	General, financial and institutional matters / Provisions governing the institutions Energy / Electricity Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	PRIMES, GAINS, METIS	Not explicit	
	74	52016SC0414	Energy / General principles and programmes / Rational utilisation and conservation of energy Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	BEAM2, E3ME, PRIMES	Not explicit	
	75	52016SC0418	Environment, consumers and health protection / Environment / Space, environment and natural resources	GREEN-X, GLOBIOM, CAPRI, PRIMES, PRIMES-TREMOVE, PROMETHEUS, GEM-E3, G4M, GAINS, POLES, GTAP, E3ME	Not explicit	

Table 6: Innovation

YEAR	ID	CELEX	TOPIC	MODEL	INNOVATION	PAGE
2011	1	52011SC0277	Energy / General principles and programmes / Rational utilisation and conservation of energy	PRIMES	Not explicit	
	2	52011SC0279 (Annex to 270)	Energy / General principles and programmes / Rational utilisation and conservation of energy	PRIMES	--	
	3	52011SC0288	Environment, consumers and health protection / Environment / General provisions and programmes	AGLINK-COSIMO (baseline provision), CAPRI, E3ME, G4M, GAINS, GEM-E3, GLOBIOM, POLES, PRIMES, PROMETHEUS	Not explicit	
	4	52011SC0315	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	CORTAX	--	
	5	52011SC0316	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	Summary of 52011SC0315	--	
	6	52011SC0358	Transport policy / General	GLOBIOM (biomass supply model mentioned), POLES, COPERT, GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, TRANSTOOLS, TREMOVE	Not explicit	64
	7	52011SC0409	Taxation / Indirect taxation / Excise duties	E3ME, PRIMES, QUEST, TREMOVE	--	
	8	52011SC0536	External relations / Development policy / Generalised system of preferences	SMART, CARIS	--	
	9	52011SC0779	Energy / General principles and programmes / Rational utilisation and conservation of energy	BEAM2, E3EM, PRIMES	--	
	10	52011SC0918	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GAINS, PRIMES	Not explicit	28
	11	52011SC0949	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	QUEST, SYMBOL	--	
	12	52011SC0952	Right of establishment and freedom to provide services / Sectoral application / Service activities	No model use	--	
	13	52011SC1102	Taxation / General	QUEST (mentioned a DSGE model with calibration data from QUEST), SYMBOL	--	
	14	52011SC1138	Regional policy and coordination of structural instruments / Economic and social cohesion fund / European Regional Development Fund (ERDF)	ASTRA, PRIMES, NEMESIS	Not explicit	Vol 1, 18
	15	52011SC1141	Regional policy and coordination of structural instruments / General principles, programmes and statistics	GTAP, QUEST, HERMIN, GMR	Not explicit	Vol 1, 13
	16	52011SC1165	Industrial policy and internal market / Internal market: approximation of laws / General, programmes	GTAP	--	

YEAR	ID	CELEX	TOPIC	MODEL	INNOVATION	PAGE
	17	52011SC1212	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	GEM-E3, PRIMES-TREMOVE, TREMOVE, PRIMES, PROMETHEUS, TRANSTOOLS	Not explicit	50
	18	52011SC1212 R(01)	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	TRANSTOOLS, TREMOVE, PRIMES, PRIMES-TREMOVE, GEM-E3, PROMETHEUS	Not explicit	50
	19	52011SC1427	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development / General principles	NEMESIS	Not explicit	Vol 1, p9^14 1
	20	52011SC1542	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	PAGE	--	
	21	52011SC1543 (annex to 542)	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	GEM-E3	--	
	22	52011SC1565	Energy / General principles and programmes	GAINS, PRIMES, PROMETHEUS, GEM-E3	Not explicit	Vol 1, 34
	23	52011SC0891	Fisheries / Common fisheries policy	EEIAA, BIRDMOD	Not explicit	Vol 2, 19
	24	52011SC1153	Agriculture / Agricultural structures / Social and structural measures	RURAL, EC MOD, CAPRI, AGLINK COSIMO, ESIM, LUISA	Not explicit	49
	25	52011SC1262	Industrial policy and internal market / Trans-European networks	PROMETHEUS, PRIMES, TRANS-TOOLS, PRIMES-TREMOVE, GAINS, GEM-E3, TREMOVE	Not explicit	49
2012	26	52012SC0041	Environment, consumers and health protection / Statistics	EPIC, EUFASOM, G4M, GAINS, GLOBIOM, PRIMES, EFFISCEN	--	
	27	52012SC0149	Energy / Other sources of energy	GREEN-X, PRIMES, ASTRA, NEMESIS, MULTIREG	Not explicit	15
	28	52012SC0166	Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	QUEST, SYMBOL	--	
	29	52012SC0212	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development	NEMESIS	Not explicit	5
	30	52012SC0213	Transport policy / Inland transport / Structural harmonisation / Technical and safety conditions Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, TRANS-TOOLS	Not explicit	Vol 2, 59
	31	52012SC0343	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AGLINK-COSIMO, IFPRI-MIRAGE-BIOF MODEL, GLOBIO3	Not explicit	109
	32	52012SC0364	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AnaFgas, EmIO-F Europe, GEM-E3, GTAP (no, the database is mentioned as a source for GEM-E3)	--	

YEAR	ID	CELEX	TOPIC	MODEL	INNOVATION	PAGE
	33	52012SC0382	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	WaterGAP (mentioned only in the intro)	Not explicit	56
	34	52012SC0398	Economic and monetary policy and free movement of capital / Economic policy Environment, consumers and health protection / Environment / General provisions and programmes	EFFIS, MITERRA, FATE, JRC soil model	Not explicit	Vol 6, 70
2013	35	52013SC0005	Transport policy / Transport infrastructure	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	--	
	36	52013SC0065	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	LUISA	--	
	37	52013SC0108	Transport policy / Inland transport / Combined transport Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles	PRIMES-TREMOVE, TREMOVE	--	
	38	52013SC0132	Environment, consumers and health protection / Environment / General provisions and programmes	BioMA, GEM-E3, iMAP, LUISA, EUCS100, CAPRI, POLES, LISFLOOD, DIVA, HadCM3, ECHAM5, WaterGAP	Not explicit	Vol 2, 17
	39	52013SC0181	Transport policy / Transport infrastructure	PRIMES, TRANS-TOOLS, TREMOVE, NEAC Trade model	--	
	40	52013SC0199	Energy / Nuclear energy / Safeguards	ENSEMBLE	Not explicit	Vol 2, 37
	41	52013SC0237	Transport policy / Shipping Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	PRIMES, TIMES	Not explicit	39
	42	52013SC0423	Environment, consumers and health protection / Environment / Pollution and nuisances / Nuclear safety and radioactive waste	ENSEMBLE	--	
	43	52013SC0430	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AERO-MS, PRIMES	--	
	44	52013SC0471	Law relating to undertakings / Economic and commercial law / Other economic and commercial provisions	NEMESIS (only referenced)	Not explicit	14, 139
	45	52013SC0519	Agriculture / Approximation of laws and health measures / Animal health and zootechnics	GLOBE, iMAP (not mentioned)	Not explicit	169
	46	52013SC0528	Transport policy / General	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	--	
	47	52013SC0531	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	TM5 –FASST, GAINS, GEM-E3, PRIMES	--	
	48	52013SC0531 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	COPERT, TM5 –FASST, GAINS, GEM-E3, PRIMES	--	
	49	52013SC0535	Transport policy / General	NEMESIS	--	
	50	52013SC0064 (it is an EXECUTIVE SUMMARY)	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	No model use	--	

YEAR	ID	CELEX	TOPIC	MODEL	INNOVATION	PAGE
	51	52013SC0206	Transport policy / Air transport	E3ME	Not explicit	43
2014	52	52014SC0015	Energy / General principles and programmes Environment, consumers and health protection / Environment / General provisions and programme	CAPRI, E3ME, GAINS, GEM-E3, PACE, POLES, PRIMES, PRIMES-TREMOVE, PROMETHEUS	Not explicit	41
	53	52014SC0021	Environment, consumers and health protection / Environment / Space, environment and natural resources / Management and efficient use of space, the environment and natural resources	POLES, E3ME, LISQUAL	--	
	54	52014SC0030	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	FSDA, QUEST, SYMBOL	Not explicit	15
	55	52014SC0160	Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, VECTO	Not explicit	4
	56	52014SC0207	Environment, consumers and health protection / Environment / Space, environment and natural resources / Waste management and clean technology	EU Waste model	Not explicit	Vol 2, 32
	57	52014SC0255	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / General provisions and programmes	E3ME, GAINS, GEM-E3, POLES, PRIMES	Not explicit	15
	58	52014SC0017	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	No model use	Not explicit	15
2015	59	52015SC0017	Energy / General principles and programmes Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, POLES	Not explicit	
	60	52015SC0135	Energy / General principles and programmes / Rational utilisation and conservation of energy Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws Environment, consumers and health protection / Consumers / Consumer information, education and representation	E3ME, PRIMES, GEM-E3	--	
	61	52015SC0139	Right of establishment and freedom to provide services / Sectoral application / Business activities Industrial policy and internal market / Internal market: approximation of laws Environment, consumers and health protection / Consumers / General	PRIMES	--	
	62	52015SC0274 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GTAP	--	
2016	63	52016SC0025	Energy / Oil and gas / Supplies and stocks	PRIMES	--	
	64	52016SC0027 R(01)	Energy / General principles and programmes / General	PRIMES	--	

YEAR	ID	CELEX	TOPIC	MODEL	INNOVATION	PAGE
	65	52016SC0064	Industrial policy and internal market / Internal market: approximation of laws / Fertilisers	GAINS	Not explicit	223
	66	52016SC0247	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, GLOBIOM, PRIMES, G4M, GAINS, CAPRI, PROMETHEUS, PRIME-TREMOVE	--	
	67	52016SC0249	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	CAPRI, GLOBIOM, PRIMES-TREMOVE, PRIMES, CAPRI, GAINS, G4M, GEM-E3, PROMETHEUS	--	
	68	52016SC0303 R(01)	General, financial and institutional matters / Provisions governing the institutions Industrial policy and internal market / Industrial policy: sectoral operations / Information technology, telecommunications and data-processing	No mode use	--	
	69	52016SC0341	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	CORTAX	Not explicit	
	70	52016SC0377 R(01)	Right of establishment and freedom to provide services / Sectoral application / Service activities Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	SYMBOL, QUEST	--	
	71	52016SC0405	See revised version	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-E3, PROMETHEUS, PRIMES-TREMOVE	See revised version	
	72	52016SC0405 R(01)	Energy / General principles and programmes / Rational utilisation and conservation of energy	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-E3, PROMETHEUS, PRIMES-TREMOVE	Not explicit	
	73	52016SC0410	General, financial and institutional matters / Provisions governing the institutions Energy / Electricity Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	PRIMES, GAINS, METIS	Not explicit	
	74	52016SC0414	Energy / General principles and programmes / Rational utilisation and conservation of energy Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	BEAM2, E3ME, PRIMES	Not explicit	7
	75	52016SC0418	Environment, consumers and health protection / Environment / Space, environment and natural resources	GREEN-X, GLOBIOM, CAPRI, PRIMES, PRIMES-TREMOVE, PROMETHEUS, GEM-E3, G4M, GAINS, POLES, GTAP, E3ME	Not explicit	7

Table 7: Technological Progress

YEAR	ID	CELEX	TOPIC	MODEL	TECHNOLOGICAL PROGRESS	PAGE
2011	1	52011SC0277	Energy / General principles and programmes / Rational utilisation and conservation of energy	PRIMES	--	
	2	52011SC0279 (Annex to 270)	Energy / General principles and programmes / Rational utilisation and conservation of energy	PRIMES	--	
	3	52011SC0288	Environment, consumers and health protection / Environment / General provisions and programmes	AGLINK-COSIMO (baseline provision), CAPRI, E3ME, G4M, GAINS, GEM-E3, GLOBIOM, POLES, PRIMES, PROMETHEUS	Capital costs of mature technologies: -3% 2010-2050 Capital costs of new technologies: -30% -70% 2010-2050 PV costs: -60% in 2030 and -70% in 2050	
	4	52011SC0315	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	CORTAX	--	
	5	52011SC0316	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	Summary of 52011SC0315	--	
	6	52011SC0358	Transport policy / General	GLOBIOM (biomass supply model mentioned), POLES, COPERT, GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, TRANSTOOLS, TREMOVE	Higher productivity growth in catching up MS	
	7	52011SC0409	Taxation / Indirect taxation / Excise duties	E3ME, PRIMES, QUEST, TREMOVE	--	
	8	52011SC0536	External relations / Development policy / Generalised system of preferences	SMART, CARIS	--	
	9	52011SC0779	Energy / General principles and programmes / Rational utilisation and conservation of energy	BEAM2, E3EM, PRIMES	--	
	10	52011SC0918	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GAINS, PRIMES	--	
	11	52011SC0949	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	QUEST, SYMBOL	--	
	12	52011SC0952	Right of establishment and freedom to provide services / Sectoral application / Service activities	No model use	--	
	13	52011SC1102	Taxation / General	QUEST (mentioned a DSGE model with calibration data from QUEST), SYMBOL	--	
	14	52011SC1138	Regional policy and coordination of structural instruments / Economic and social cohesion fund / European Regional Development Fund (ERDF)	ASTRA, PRIMES, NEMESIS	--	
	15	52011SC1141	Regional policy and coordination of structural instruments / General principles, programmes and statistics	GTAP, QUEST, HERMIN, GMR	--	
	16	52011SC1165	Industrial policy and internal market / Internal market: approximation of laws / General, programmes	GTAP	--	

YEAR	ID	CELEX	TOPIC	MODEL	TECHNOLOGICAL PROGRESS	PAGE
	17	52011SC1212	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	GEM-E3, PRIMES-TREMOVE, TREMOVE, PRIMES, PROMETHEUS, TRANSTOOLS	--	
	18	52011SC1212 R(01)	Transport policy / Transport infrastructure / Coordination and investment Industrial policy and internal market / Trans-European networks	TRANSTOOLS, TREMOVE, PRIMES, PRIMES-TREMOVE, GEM-E3, PROMETHEUS	--	
	19	52011SC1427	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development / General principles	NEMESIS	Not explicit	
	20	52011SC1542	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	PAGE	--	
	21	52011SC1543 (annex to 542)	General, financial and institutional matters / Financial and budgetary provisions Environment, consumers and health protection / Environment	GEM-E3	--	
	22	52011SC1565	Energy / General principles and programmes	GAINS, PRIMES, PROMETHEUS, GEM-E3	--	
	23	52011SC0891	Fisheries / Common fisheries policy	EEIAA, BIRDMOD	--	
	24	52011SC1153	Agriculture / Agricultural structures / Social and structural measures	RURAL, EC MOD, CAPRI, AGLINK COSIMO, ESIM, LUISA	--	
	25	52011SC1262	Industrial policy and internal market / Trans-European networks	PROMETHEUS, PRIMES, TRANS-TOOLS, PRIMES-TREMOVE, GAINS, GEM-E3, TREMOVE	--	
2012	26	52012SC0041	Environment, consumers and health protection / Statistics	EPIC, EUFASOM, G4M, GAINS, GLOBIOM, PRIMES, EFFISCEN	--	
	27	52012SC0149	Energy / Other sources of energy	GREEN-X, PRIMES, ASTRA, NEMESIS, MULTIREG	--	
	28	52012SC0166	Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	QUEST, SYMBOL	--	
	29	52012SC0212	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / Research and technological development	NEMESIS	--	
	30	52012SC0213	Transport policy / Inland transport / Structural harmonisation / Technical and safety conditions Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, TRANS-TOOLS	Car emissions and fuel efficiency: -0.1 to -0.2% per year	
	31	52012SC0343	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AGLINK-COSIMO, IFPRI-MIRAGE-BIOF MODEL, GLOBIO3	--	
	32	52012SC0364	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AnaFgas, EmIO-F Europe, GEM-E3, GTAP (no, the database is mentioned as a source for GEM-E3)	--	

YEAR	ID	CELEX	TOPIC	MODEL	TECHNOLOGICAL PROGRESS	PAGE
	33	52012SC0382	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	WaterGAP (mentioned only in the intro)	--	
	34	52012SC0398	Economic and monetary policy and free movement of capital / Economic policy Environment, consumers and health protection / Environment / General provisions and programmes	EFFIS, MITERRA, FATE, JRC soil model	--	
2013	35	52013SC0005	Transport policy / Transport infrastructure	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	--	
	36	52013SC0065	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	LUISA	--	
	37	52013SC0108	Transport policy / Inland transport / Combined transport Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles	PRIMES-TREMOVE, TREMOVE	--	
	38	52013SC0132	Environment, consumers and health protection / Environment / General provisions and programmes	BioMA, GEM-E3, iMAP, LUISA, EUCS100, CAPRI, POLES, LISFLOOD, DIVA, HadCM3, ECHAM5, WaterGAP	--	-
	39	52013SC0181	Transport policy / Transport infrastructure	PRIMES, TRANS-TOOLS, TREMOVE, NEAC Trade model	--	
	40	52013SC0199	Energy / Nuclear energy / Safeguards	ENSEMBLE	--	
	41	52013SC0237	Transport policy / Shipping Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	PRIMES, TIMES	--	
	42	52013SC0423	Environment, consumers and health protection / Environment / Pollution and nuisances / Nuclear safety and radioactive waste	ENSEMBLE	--	
	43	52013SC0430	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	AERO-MS, PRIMES	--	
	44	52013SC0471	Law relating to undertakings / Economic and commercial law / Other economic and commercial provisions	NEMESIS (only referenced)	Not explicit	
	45	52013SC0519	Agriculture / Approximation of laws and health measures / Animal health and zootechnics	GLOBE, iMAP (not mentioned)	Productivity in milk production will continue to grow at 1.5% p.a.	
	46	52013SC0528	Transport policy / General	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS	Productivity growth is assumed but not specified	
	47	52013SC0531	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	TM5 –FASST, GAINS, GEM-E3, PRIMES	--	
	48	52013SC0531 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	COPERT, TM5 –FASST, GAINS, GEM-E3, PRIMES	--	
	49	52013SC0535	Transport policy / General	NEMESIS	--	

YEAR	ID	CELEX	TOPIC	MODEL	TECHNOLOGICAL PROGRESS	PAGE
	50	52013SC0064 (it is an EXECUTIVE SUMMARY)	Environment, consumers and health protection / Environment / Pollution and nuisances / Water protection and management	No model use	--	
	51	52013SC0206	Transport policy / Air transport	E3ME	--	
2014	52	52014SC0015	Energy / General principles and programmes Environment, consumers and health protection / Environment / General provisions and programme	CAPRI, E3ME, GAINS, GEM-E3, PACE, POLES, PRIMES, PRIMES-TREMOVE, PROMETHEUS	--	
	53	52014SC0021	Environment, consumers and health protection / Environment / Space, environment and natural resources / Management and efficient use of space, the environment and natural resources	POLES, E3ME, LISQUAL	--	
	54	52014SC0030	Right of establishment and freedom to provide services / Sectoral application / Service activities / Banks	FSDA, QUEST, SYMBOL	--	
	55	52014SC0160	Industrial policy and internal market / Internal market: approximation of laws / Motor vehicles Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, PRIMES, PRIMES-TREMOVE, PROMETHEUS, VECTO	Constant labour productivity	
	56	52014SC0207	Environment, consumers and health protection / Environment / Space, environment and natural resources / Waste management and clean technology	EU Waste model	--	
	57	52014SC0255	Energy / General principles and programmes / General Environment, consumers and health protection / Environment / General provisions and programmes	E3ME, GAINS, GEM-E3, POLES, PRIMES	--	
	58	52014SC0017	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	No model use	--	
2015	59	52015SC0017	Energy / General principles and programmes Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, POLES	--	
	60	52015SC0135	Energy / General principles and programmes / Rational utilisation and conservation of energy Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws Environment, consumers and health protection / Consumers / Consumer information, education and representation	E3ME, PRIMES, GEM-E3	--	
	61	52015SC0139	Right of establishment and freedom to provide services / Sectoral application / Business activities Industrial policy and internal market / Internal market: approximation of laws Environment, consumers and health protection / Consumers / General	PRIMES	--	
	62	52015SC0274 R(01)	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GTAP	--	

YEAR	ID	CELEX	TOPIC	MODEL	TECHNOLOGICAL PROGRESS	PAGE
2016	63	52016SC0025	Energy / Oil and gas / Supplies and stocks	PRIMES	--	
	64	52016SC0027 R(01)	Energy / General principles and programmes / General	PRIMES	--	
	65	52016SC0064	Industrial policy and internal market / Internal market: approximation of laws / Fertilisers	GAINS	--	
	66	52016SC0247	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	GEM-E3, GLOBIOM, PRIMES, G4M, GAINS, CAPRI, PROMETHEUS, PRIME-TREMOVE	TFP growth: 1%	
	67	52016SC0249	Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	CAPRI, GLOBIOM, PRIMES-TREMOVE, PRIMES, CAPRI, GAINS, G4M, GEM-E3, PROMETHEUS	TFP growth: 1%	
	68	52016SC0303 R(01)	General, financial and institutional matters / Provisions governing the institutions Industrial policy and internal market / Industrial policy: sectoral operations / Information technology, telecommunications and data-processing	No mode use	Labour productivity: +0.8% step between 2020 and 2025 Not explicit	
	69	52016SC0341	Taxation / Direct taxation / Corporation tax Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	CORTAX	--	
	70	52016SC0377 R(01)	Right of establishment and freedom to provide services / Sectoral application / Service activities Economic and monetary policy and free movement of capital / Economic policy / Institutional economic provisions	SYMBOL, QUEST	--	
	71	52016SC0405	See revised version	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-E3, PROMETHEUS, PRIMES-TREMOVE	See revised version	
	72	52016SC0405 R(01)	Energy / General principles and programmes / Rational utilisation and conservation of energy	POLES, PRIMES, BEAM2, CAPRI, E3ME, G4M, GLOBIOM, GAINS, GEM-E3, PROMETHEUS, PRIMES-TREMOVE	--	
	73	52016SC0410	General, financial and institutional matters / Provisions governing the institutions Energy / Electricity Industrial policy and internal market / Internal market: approximation of laws / Other sectors for approximation of laws	PRIMES, GAINS, METIS	--	
	74	52016SC0414	Energy / General principles and programmes / Rational utilisation and conservation of energy Environment, consumers and health protection / Environment / Pollution and nuisances / Monitoring of atmospheric pollution	BEAM2, E3ME, PRIMES	--	
	75	52016SC0418	Environment, consumers and health protection / Environment / Space, environment and natural resources	GREEN-X, GLOBIOM, CAPRI, PRIMES, PRIMES-TREMOVE, PROMETHEUS, GEM-E3, G4M, GAINS, POLES, GTAP, E3ME	--	

Annex 3: Models summary

Model acronym	Full title	Main purpose and area of application
AERO-MS	Aviation Emissions and evaluation of Reduction Options Modelling System	Aviation-specific model used to quantify any economic and environmental impacts of possible measures related to the air transport system.
AGLINK-COSIMO	AGLINK-COSIMO partial equilibrium model for global agriculture	This is a partial equilibrium model used to simulate development of annual supply, demand and prices for the main agricultural commodities produced and traded worldwide. It is recursive-dynamic because current economic decisions are reached by taking into account lagged information on prices and quantities.
AnaFgas	No details available	
ASTRA	ASsessment of TRAnsport Strategies	ASTRA is an integrated assessment model for strategic policy assessment in the transport and energy field.
BEAM2	Built-Environment-Analysis-Model	The model creates a comprehensive summary of energy demands, GHG emissions and costs for space heating and cooling, hot water and auxiliary energy in buildings throughout a defined building stock at country, regional or city level. It is a tool to gauge the implications and consequences that policies and measures set in motion today will have in the future.
BioMA	Biophysical Model Applications modelling platform	The BioMA modelling framework integrates various crop models (e.g. WOFOST, WARM, CropSyst), difference forcing from near-real time observations to climate scenarios, tools to calibrate and optimize, models and means to analyse model output. BioMA can provide tailored modelling solutions ready to run be applied in a research and operational context (e.g. MCYFS). It is currently applied in the agricultural domain to produce spatially explicit estimates of crop yield and climate indices.
BIRDMOD	No details available	
CAPRI	Common Agricultural Policy Regional Impact Analysis	The CAPRI model is the key tool for detailed analysis of the CAP and increasingly climate change policies. Latest usage for Effort Sharing Decision & LULUCF and Greening evaluation.
CARIS	No details available	
COPERT	Computer model to calculate emissions from road traffic	COPERT is a European emission inventory model to calculate emissions from road transport and assess the progress towards emission targets
CORTAX	Corporate Tax Model	The CGE model CORTAX is used to simulate options for corporate tax policy, such as the common corporate tax base (CCTB), the common consolidated corporate tax base (CCCTB) and addressing the "debt-bias" often present in corporate tax systems.
DIVA	Dynamic Interactive Vulnerability Assessment model	The DIVA Model assesses biophysical and socio-economic consequences of sea-level rise and socio-economic development.
E3ME	Energy - Environment - Economy Model for Europe	The model serves to simulate the medium to long-term effects of environmental and economic policies for Europe.
ECHAM5-HAM	ECHAM - European Centre Hamburg Model (Global Aerosol Climate Model)	To quantify the aerosol radiative effects and their impacts on the global climate system for present day and future conditions.
ECMOD	No details available	
EEIAA	No details available	
EFFIS	European Forest Fire Information System	EFFIS is a platform composed of several models that monitor wildfires and assess their impact at the European scale. EFFIS coverage includes Europe, North Africa and Middle East countries.

EFFISCEN	No details available	
EmIO-FEurope	No details available	
ENSEMBLE	A web based platform for the online evaluation of atmospheric transport and dispersion models.	Ensemble is a web based platform, created in the year 2000, for the online evaluation of atmospheric transport and dispersion models.
EPIC	Environmental impact calculator	EPIC simulates approximately eighty crops, predicting effects of management decisions on soil, water, nutrient and pesticide movements, and their combined impact on soil loss, water quality, and crop yields for areas with homogeneous soils and management.
ESIM	European Simulation Model	ESIM is a recursive-dynamic partial equilibrium model of agricultural production, consumption of agricultural products, and some first-stage processing activities.
EU Waste model	European Reference Model on Municipal Waste Management	The European Reference Model on Municipal Waste Generation and Management seeks to evaluate how Member States (MSs) are performing, and how they seem likely to perform in future, in the area of waste generation and management. In this manner, the model can serve an Early warning system function aimed at identifying potential future problems of implementation of the main European recycling, recovery and landfill diversion targets.
EUCS100	EUClueScanner	The land use model EUClueScanner allows the exploration of future policies and impact assessments of alternative scenarios compared through a set of indicators.
EU-FASOM	European Forest and Agricultural Sector Optimization Model	EUFASOM explores welfare maximizing total land-use strategies, including greenhouses gas emission control and carbon sink strategies that meet wider environmental objectives on inter alia soil, water and biodiversity protection.
FATE	No details available	
FSDA	Forward Search for Data Analysis	A data modelling system that uses methods from robust statistics to ensure a model output unaffected by anomalies in the provided raw data or deviations from model assumptions.
G4M	Global Forest Model	The G4M model compares the income derived from forests with the income that could be derived from an alternative use of the same land.
GAINS	Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS)-Model	The Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) model is an integrated assessment model dealing with costs and potentials for air pollution control and greenhouse gas (GHG) mitigation, and assessing interactions between policies. It explores cost-effective emission control strategies that simultaneously tackle local air quality and greenhouse gases so as to maximize benefits at all scales.
GEM-E3	General Equilibrium Model - Economy, Energy, Environment	The GEM-E3 model is a macro-economic tool for modelling Energy, Climate and Air Quality policies.
GLOBE	The GLOBE model	The model provides a full economic framework for CAP (budget), trade, bioenergy and climate change policies.
GLOBIO3	No details available	
GLOBIOM	Global Biosphere Management Model	GLOBIOM is a global, recursive dynamic, linear programming, partial equilibrium model covering the sectors of agriculture, forestry and bioenergy including economic as well as bio-physical aspects
GMR	No details available	
GREEN-X	Model to derive increased electricity generation from renewable energy sources	Assessing the impact of electricity generation from renewable energy on the EU energy market.

GTAP model	Global Trade Analysis Project	A multiregion, multisector, computable general equilibrium model, with perfect competition and constant returns to scale.
HadCM3	Hadley Centre Coupled Model, version 3	HadCM3 is a coupled atmosphere-ocean general circulation model designed for climate predictions
HERMIN	No details available	
IFPRI-MIRAGE-BIOFMODEL	No details available	
iMAP	integrated Modelling Platform for Agro-economic Commodity and Policy Analysis	iMAP is a platform containing a number of partial equilibrium (PE) and Computable General Equilibrium (CGE) models with a particular focus on agro-economic modelling.
JRC soilmodel	No details available	
LISFLOOD	LISFLOOD hydrological model	The LISFLOOD model is a GIS-based hydrological rainfall-runoff-routing model that is capable of simulating the hydrological processes that occur in a catchment. It is the core model of the flood and drought simulation systems developed at JRC (EFAS, GloFas, EDO). Also used for climate impact studies and water quantity analysis with the Water-Energy-Food-Energy nexus studiesA sho at river basin, European and global scale
LISQUAL	The LISQUAL model	A model for integrated simulations of water quantity and quality on continental and sub-continental scale. (the functions are gradually being integrated in the LISFLOOD model)
LUISA	LUISA Territorial Modelling Platform	The LUISA Territorial Modelling Platform is primarily used for the ex-ante evaluation of EC policies that have a direct or indirect territorial impact. It is based on the concept of 'land function' for cross-sector integration and for the representation of complex system dynamics. Beyond a traditional land use model, LUISA adopts a new approach towards activity-based modelling based upon the endogenous dynamic allocation of population, services and activities. Applications: status and trends of European Cities and Regions, Impact assessment of cohesion policies, evaluation of resource efficiency, energy regulations, transport and accessibility.
METIS	Markets and Energy Technologies Integrated Software	METIS is a mathematical model which can provide highly detailed analysis of the whole European energy system for electricity, gas and heat. It can simulate the operation of both energy systems and markets for electricity gas and heat on an hourly basis for a whole year, while also factoring in uncertainties like weather variations. For example, it can analyse the impact of higher shares of renewable energy down to the hour.
MITERRA	No details available	
MULTIREG	No details available	
NEAC Trademodel	No details available	
NEMESIS	New Econometric Model of Evaluation by Sectoral Interdependency and Supply	NEMESIS is a multi-country macro-sectoral econometric model for EU27 (plus USA and Japan), which can be used for assessment of structural policies, mainly environmental and research and development policies. The main mechanisms of the model are based on the behaviour of representative agents: enterprises, households, government and outside.
PACE	Policy Analysis based on Computable Equilibrium	PACE is a flexible system of computable general equilibrium (CGE) models which integrates the areas of economy, energy, and environment.
PAGE	Global Integrated Assessment Tool to derive Climate Change Impact and the Social Cost of Carbon	An integrated assessment model in the area of climate change. It covers the main drivers of GHG emissions, and computes the abatement costs and climate damages of specific scenarios.
POLES	Prospective Outlook for the Long term Energy System	POLES is a world energy and GHG model used for international energy and climate policy assessment.

PRIMES	PRIMES Energy System Model	PRIMES provides detailed projections of energy demand, supply, prices and investment to the future, covering the entire energy system including emissions for each individual European country and for Europe-wide trade of energy commodities.
PRIMES-TREMOVE	PRIMES-TREMOVE Transport Model	<p>The PRIMES (Price-Induced Market Equilibrium System) energy system model provides detailed projections of energy demand, supply, prices and investment to the future, covering the entire energy system (including emissions) for each individual European country and for Europe-wide trade of energy commodities.</p> <p>The PRIMES-TREMOVE Transport Model produces projections covering the entire transport sector (e.g. transport activity, stock turnover of transport means, technology choice, energy consumption by fuel and emissions and other externalities). The PRIMES-TREMOVE model can be run either as a stand-alone tool or fully integrated in the rest of the PRIMES energy systems model. When coupled with PRIMES, interaction with the energy sector is taken into account in an iterative way.</p>
PROMETHEUS	PROMETHEUS model	<p>The PROMETHEUS model provides detailed projections of energy demand, supply, power generation mix, energy-related carbon emissions, energy prices and investment to the future covering the global energy system.</p> <p>PROMETHEUS is a tool for the generation of stochastic information for key energy, environment and technology variables.</p>
QUEST	Macroeconomic model QUEST III	QUEST is a macro-economic -model (Dynamic Stochastic General Equilibrium) to analyse and understand the state of the EU economy.
RURAL EC MOD	Ex ante Spatial Policy Impact Analysis of the RDR	RURAL EC MOD models the economic interactions between the different actors - firms, government and households - in the short and medium run, allowing for a split between urban and rural areas.
SMART	No details available	
SYMBOL	Systemic Model of Banking Originated Losses	SYMBOL estimates the probability and magnitude of important economic losses and liquidity shortfalls occurring in the banking sector.
TIMES	EU TIMES-SET plan MODEL	An economic model generator for local, national or multi regional energy systems.
TM5-FASST	Fast Scenario Screening Tool for impact analysis of air pollutant emissions on air quality and short-lived climate pollutants	The purpose of the TM5-FASST model is to make swift air quality-related impact assessments (health, crop yield, near-term climate) of past, present and future pollutant emission scenarios, on a global to regional scale.
TRANS-TOOLS	TRANS-TOOLS European transport network model	A European transport network model covering passengers and freight, and intermodal transport.
TREMOVE	TREMOVE economic transport and emissions model	TREMOVE is a policy assessment model, designed to study the effects of different transport and environment policies on the emissions of the transport sector.
VECTO	Vehicle Energy Consumption calculation Tool	VECTO is a vehicle simulation software created to support CO2 emissions monitoring from Heavy Duty Vehicles (HDV) in Europe and serve as the official CO2 calculation tool in a possible future certification scheme.
WaterGAP	Water - Global Analysis and Prognosis	Integrated-environmental model, combining socio-economic drivers and climate change in a single, integrated framework to model water availability, use and quality on a global level.

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