



## **Synthesis Report**

Addressing Climate Change within the post-Health Check  
Rural Development Programmes (2007-13)

December 2010



*Connecting Rural Europe*

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The European Network for Rural Development (ENRD) contributes to the efficient implementation of Rural Development Programmes throughout the European Union (EU).

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"Agriculture and forestry are at the forefront of the development of renewable energy and material sources for bioenergy installations. Appropriate agricultural and forestry practices can contribute to the reduction in greenhouse gas emissions and preservation of the carbon sink effect and organic matter in soil composition, and can also help in adapting to the impacts of climate change" **Council Decision of 20th February 2006 on "Community Strategic Guidelines for rural development (programming period 2007 to 2013)"**

# 1. Introduction to Climate Change and Renewable Energy Issues in Rural Development Policy 2007-2013

"Most of the observed increase in globally-averaged temperatures since the mid-20<sup>th</sup> century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations"

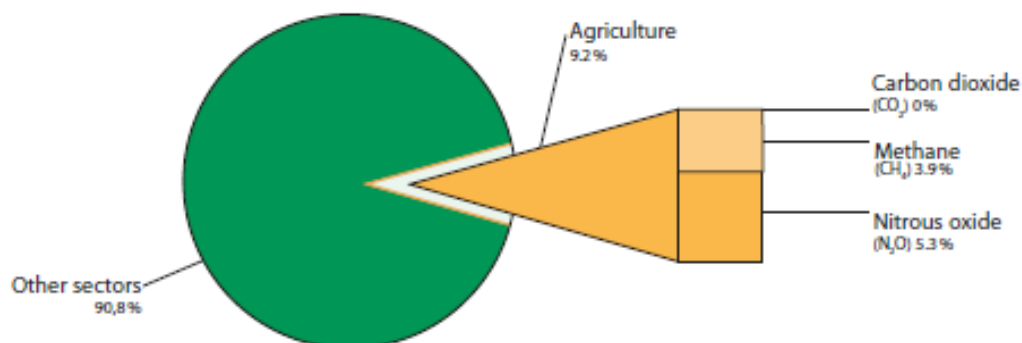
Climate change is a global problem which requires solutions from global to local-scale. Climate change presents a double challenge today – how to cut the emissions of greenhouse gases responsible for global warming (known as **mitigation**); and how to adapt to future climate change in order to lessen the adverse impacts or benefit from the beneficial changes (**adaptation**).

The EU has played a leading international role in finding global scale mitigation solutions through the development of the United Nations Framework Convention on Climate Change, the Kyoto Protocol and its follow-on, and has committed to reducing greenhouse gas (GHG) emissions by 20% by 2020 (compared to 1990 levels)<sup>1</sup>.

Agriculture is one of the sectors most exposed to climate change, as farming activities directly depend on climatic factors, but agriculture is also an important source of two powerful greenhouse gases – nitrous oxide (N<sub>2</sub>O) and methane (CH<sub>4</sub>). Agriculture emits nearly 475 million tonnes of CO<sub>2</sub>-equivalent of GHG, which represents about 9% of the total EU-27 GHG emissions in 2005 (Figure 1), although agriculture's share at the national level differs widely<sup>2</sup>.

Agriculture needs therefore to address this double challenge of reducing its GHG emissions while at the same time adapting to the projected impacts of climate change. The uneven effects of climate change across Europe are expected to amplify regional differences in Europe's agricultural conditions (Figure 2), and could exacerbate economic disparities between European rural regions. The EU's farmland, woods and forests cover about 90% of its territory and contain over 56% of its population. Regionally- and nationally-appropriate adaptation measures must therefore work towards reducing the vulnerability of the agricultural sector and increasing the resilience of rural areas from an environmental and an economic perspective.

**Figure 1:** Share of agricultural sector in total GHG emissions – 2005 (EU-27)



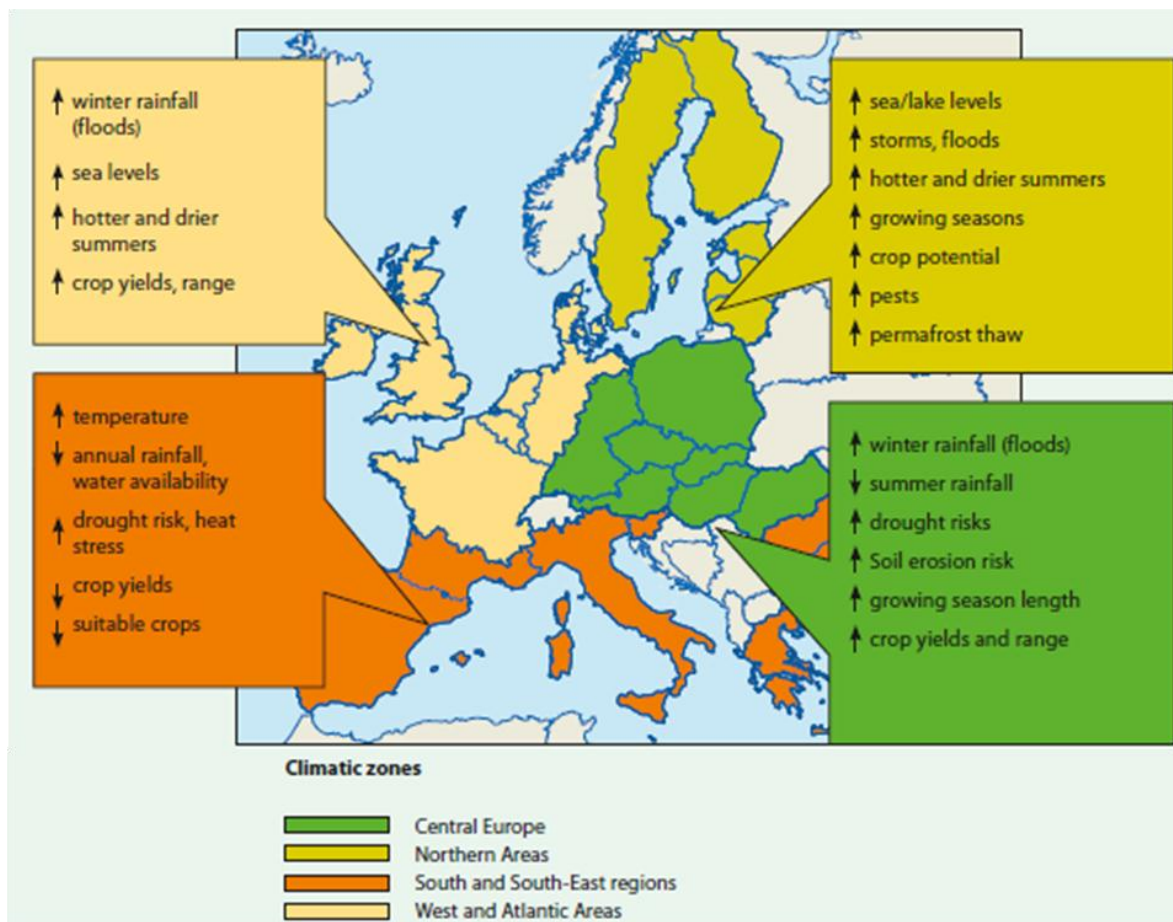
Source: Commission DG Agriculture elaboration based on EEA data<sup>3</sup> - taken from DG AGRI (2008): *Climate Change – the Challenges for Agriculture*

<sup>1</sup> COM (2007) 2 final, Commission Communication 'Limiting Global climate Change to 2 degrees Celsius – The way ahead for 2020 and beyond'

<sup>2</sup> European Commission (2008) 'Climate Change: The challenges for agriculture' [http://ec.europa.eu/agriculture/publi/fact/climate\\_change/2008\\_en.pdf](http://ec.europa.eu/agriculture/publi/fact/climate_change/2008_en.pdf)

<sup>3</sup> See: <http://www.eea.europa.eu/themes/agriculture/indicators>

**Figure 2:** Project impacts from climate change in different EU regions



Source: Commission DG Agriculture elaboration based on literature - taken from DG AGRI (2008): *Climate Change – the Challenges for Agriculture*

In order to respond to the diversity of situations and challenges facing the EU's rural areas, the EU's rural development policy is continually evolving as part of the development of the CAP, from a policy dealing with the structural problems of the farm sector to a policy addressing the multiple roles of farming and forestry in society and, in particular, the challenges faced in its wider rural context<sup>4</sup>.

Rural development offers a range of possibilities to support farming and forestry practices and investments that can contribute to climate change *mitigation* efforts (including the increase in the use of *Renewable Energy* (RE) resources) and additionally provide *adaptation* benefits. Following the Health Check (HC) of the Common Agricultural Policy (CAP) and the European Economic Recovery Plan (EERP), additional funds have been made available for Member States (MS) to spend on the 'new challenges'<sup>5</sup> of Rural Development policy, which include 'climate change' and 'renewable energy'. As a consequence, these newly introduced Community priorities have been further strengthened in the recent revisions to the RDPs for the 2007-13 period.

This report provides an overview of how climate change mitigation and adaptation, as well as the increasing production of renewable energy, have been implemented within the original and revised Rural Development Programmes for the 2007-13 programming period across Europe.

<sup>4</sup> European Commission (2008) 'The EU Rural Development Policy: Facing the Challenges' [http://ec.europa.eu/agriculture/events/rurdevsem2/index\\_en.htm](http://ec.europa.eu/agriculture/events/rurdevsem2/index_en.htm)

<sup>5</sup> The budget allocated to the 'new challenges' includes the funds released by the Health Check of the CAP (including voluntary modulation and transfers according to Art. 136 of regulation (EC) N. 73/2009) and the European Economic Recovery Package (EERP)

## 2. Overview of the Position of Climate Change and Renewable Energy Issues within the Rural Development Strategies and Programmes for the EU-27 for 2007-2013

As already noted, the uneven effects of climate change across Europe and the regional differences in Europe's agricultural conditions necessitate regionally- and nationally-appropriate climate actions. EU rural development policy is useful in this respect since Member States establish their Rural Development Programmes (RDPs) at national and/or regional level by choosing those measures that best suit the needs of their rural areas and taking into account the priorities and strategy chosen in their National Strategy Plans on rural development<sup>6</sup>.

There are a total of 94 Rural Development Programmes (RDPs) for the period of 2007-2013. Member States have produced three types of RDP:

1. **National or Regional RDPs** – most Member States (including all 'new' Member States) chose to submit a single national RDP, while some Member States chose to submit either regional RDPs or sub-national programmes based on regions with territorial specificities (mostly islands) as a complement to national programmes. Regarding Regional RDPs, there are 2 for Belgium, 5 for France, 2 for Finland, 14 for Germany, 21 for Italy, 3 for Portugal, 17 for Spain and 4 for the United Kingdom. All other RDPs are implemented at Member State level;
2. **National Frameworks** – two Member States (Germany and Spain) also submitted National Framework Programmes designating a range of measures which can be implemented through their regional programmes;
3. **National Rural Network Programmes (NRNPs)** – Member States with regional RDPs had the option to submit for approval a programme for the establishment and the operation of their national rural network. Four Member States (Germany, Italy, Portugal and Spain) took this option and operate NRNPs. All other Member States have set up their networks under the umbrella of their national or regional programmes.

### Rural Development Strategies

A screening exercise of pre-Health Check RDPs indicated that the three dimensions of climate change (mitigation, adaptation and development of renewable energies) have been increasingly addressed in the rural development strategies and baseline analyses for most RDPs.

Mitigation was the best addressed of the three dimensions of climate change (Figure 3), being a key objective of approximately half of the rural development strategies, whilst renewable energy was a key objective of some 30% of them<sup>7</sup>. However, this misses important regional differences with, for example, the recent EU-12 states addressing renewable energy more comprehensively than the EU-15.

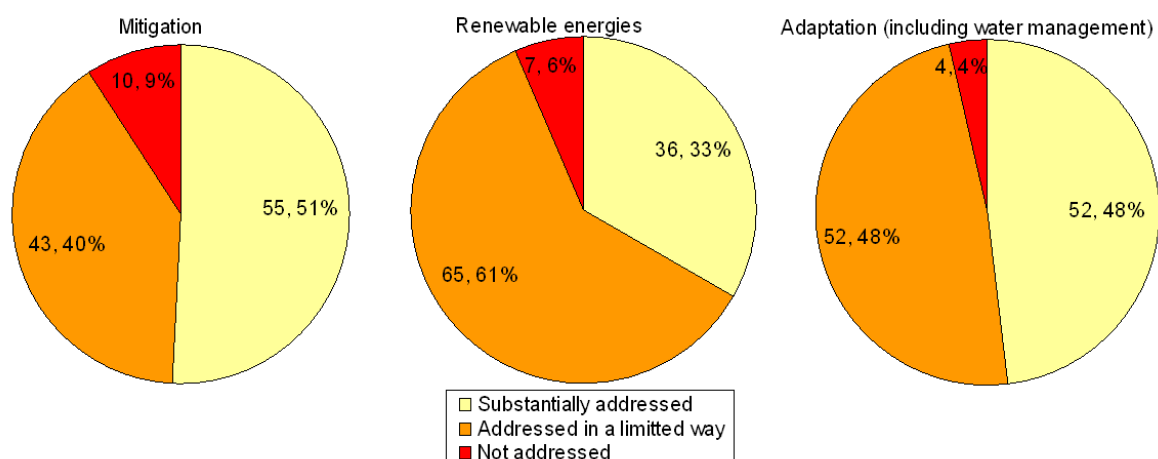
It is clear from this figure that Member States recognized in their Rural Development Strategies the challenges and opportunities that climate change poses for rural development.

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<sup>6</sup> European Commission (2008) The EU Rural Development Policy: Facing the Challenges

<sup>7</sup> ENRD (2010). *EU Rural Review* No. 4, p15

**Figure 3:** Evaluation of the extent to which climate change was addressed within the pre-Health Check Rural Development Strategies (figures refer to the number and percentage of strategies in each class)



### Rural Development Programmes before HC

A total amount of around €226 billion is foreseen to be made available (the private part is an estimation) over the period 2007-2013 for the 94 RDPs, including all public and private expenditure<sup>8</sup>. The EU's co-financing for these programmes, made from the European Agricultural Fund for Rural Development (EAFRD), amounts to €90.8 billion or 61% of the public expenditure. €12.7 billion of this came from compulsory and voluntary modulation (i.e. the transfer of funds from the Common Agricultural Policy's direct payments for bigger farmers to rural development policy). EU funding is supplemented by €57.7 billion of national co-financing. Rural development policy also attracts significant private investment for projects.

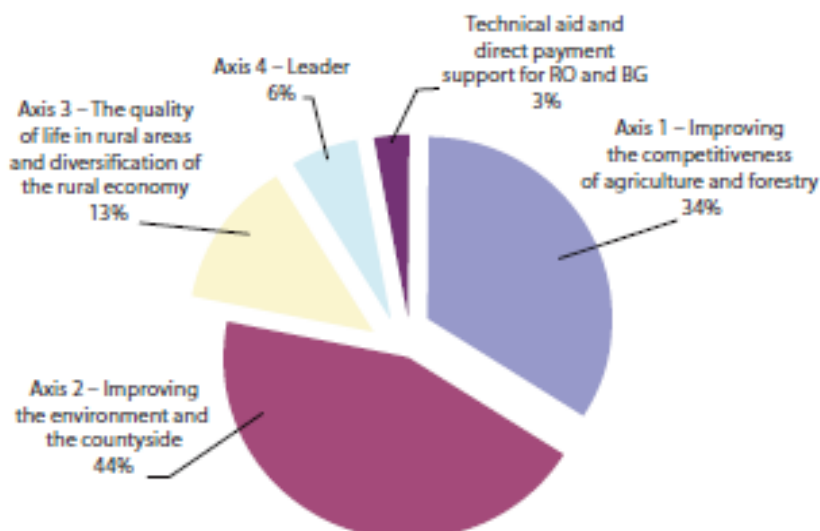
EC Regulation No. 1698/2005 on rural development calls for an appropriate balance of EAFRD expenditure between the axes corresponding to the core strategic objectives defined in the Community Strategic Guidelines on rural development. Figure 4 below shows the overall allocation of EAFRD resources by axis (all member states combined).

Member States made different choices regarding the distribution of funding between the four axes in response to their specific needs and situations. For example, 14 MS (including 8 'new' MS) committed an above average (i.e. over 34%) level of EAFRD resources to axis 1.

<b>EU indicative rural development budget 2007-13, all sources</b>	
EU Contribution (EAFRD):	€ 90.8 billion
National co-financing:	€ 57.7 billion
Private expenditure:	€ 64.8 billion
National top-ups	€ 12.4 billion
<b>Total:</b>	<b>€ 225.7 billion</b>

<sup>8</sup> European Commission (2008). The EU Rural Development Policy: Facing the Challenges

**Figure 4:** Total EAFRD expenditure 2007-13 by axis



Source: EU Commission, Directorate General for Agriculture and Rural Development, based on indicative approved budget

About one-third of RDPs have measures specifically tailored towards climate-related activities. Approaches vary between Member States and regions, reflecting the fact that all three thematic axes of current EU rural development policy provide possibilities to help in curbing greenhouse gas emissions, promoting climate-friendly energy use and the use of renewable energy. Within each axis, Member States allocate funding to a suite of pre-defined Measures (see Table 1 below), for which eligible activities or investments are defined within the RDP.

A large range of farm and business operations which have the potential to contribute to addressing the three dimensions of climate change are included within the Measures supported by the RDPs. A screening exercise of the pre-Health Check RDPs<sup>9</sup> identified a number of generic climate-friendly operations which could be funded through the RDPs. There were 18 focused on mitigation (ranging from investments in equipment for better application of nutrients, to organic farming to energy saving investments); 17 on adaptation (including for example, conserving genetic resources, on-farm water storage and improvements in animal welfare), and; 7 on renewable energy (such as investments for on-farm production and use of biogas, processing of biomass for renewable energy and investments to support local energy supply). When the implementation of these 42 operations within measures were summed across all of the national and regional RDPs, 56% of the possible mitigation operations, 44% of the adaptation operations and 53% of renewable energy operations were supported by RDP measures.

**Measures** – defined as a “set of operations” contributing to implementation of the priority axes defined in Council Regulation (EC) No 1698/2005 on support for rural development from the European Agricultural Fund for Rural Development (EAFRD). Each measure has a code (e.g. the modernisation of agricultural holdings is Measure 121), whilst some Member States and regions also define standard sub-measures.

**Operations** – defined as a “project, contract, arrangement or other action” selected and programmed within a Measure. For examples, investments in more efficient farm equipment are an operation within Measure 121. An operation commonly covers an ensemble of specific projects carried out at farm/local level.

<sup>9</sup> Unpublished data



**Table 1:** Thematic RDP Axes and Associated Measures

<b>Axis 1 - Improving the competitiveness of the agricultural and forestry sector</b>	<i>Promoting knowledge and improving human potential</i>	<b>111</b>	Vocational training and information actions
		<b>112</b>	Setting up of young farmers
		<b>113</b>	Early retirement
		<b>114</b>	Use of advisory services
		<b>115</b>	Setting up of management, relief and advisory services
	<i>Restructuring and developing physical potential and promoting innovation</i>	<b>121</b>	Modernisation of agricultural holdings
		<b>122</b>	Improvement of the economic value of forests
		<b>123</b>	Adding value to agricultural and forestry products
		<b>124</b>	Cooperation for development of new products, processes and technologies in the agriculture and food sector and in the forestry sector
		<b>125</b>	Infrastructure related to the development and adaptation of agriculture and forestry
		<b>126</b>	Restoring agricultural production potential
	<i>Quality of agricultural production and products</i>	<b>131</b>	Meeting standards based on Community legislation
		<b>132</b>	Participation of farmers in food quality schemes
		<b>133</b>	Information and promotion activities
	<i>Transitional measures</i>	<b>141</b>	Semi-subsistence farming
<b>142</b>		Producer groups	
<b>143</b>		Providing farm advisory and extension services	
<b>Axis 2 - Improving the environment and the countryside</b>	<i>Sustainable use of agricultural land</i>	<b>211</b>	Natural handicap payments to farmers in mountain areas
		<b>212</b>	Payments to farmers in areas with handicaps, other than mountain areas
		<b>213</b>	Natura 2000 payments and payments linked to Directive 2000/60/EC
		<b>214</b>	Agri-environment payments
		<b>215</b>	Animal welfare payments
		<b>216</b>	Non-productive investments
	<i>Sustainable use of forestry land</i>	<b>221</b>	First afforestation of agricultural land
		<b>222</b>	First establishment of agroforestry systems on agricultural land
		<b>223</b>	First afforestation of non-agricultural land
		<b>224</b>	Natura 2000 payments
		<b>225</b>	Forest-environment payments
		<b>226</b>	Restoring forestry potential and introducing prevention actions
		<b>227</b>	Non-productive investments
<b>Axis 3 - The quality of life in rural areas and diversification of the rural economy</b>	<i>Diversify the rural economy</i>	<b>311</b>	Diversification into non-agricultural activities
		<b>312</b>	Support for business creation and development
		<b>313</b>	Encouragement of tourism activities
	<i>Improve the quality of life in rural areas</i>	<b>321</b>	Basic services for the economy and rural population
		<b>322</b>	Village renewal and development
		<b>323</b>	Conservation and upgrading of the rural heritage
		<b>331</b>	Training and information
	<b>341</b>	Skills-acquisition and animation measure with a view to preparing and implementing a local development strategy	
<b>Axis 4 - Leader</b>	<i>Implementing local development strategies</i>	<b>411</b>	Competitiveness
		<b>412</b>	Environment/land management
		<b>413</b>	Quality of life/diversification
		<b>421</b>	Implementing cooperation projects
		<b>431</b>	Conservation and upgrading of the rural heritage

Overall, the dominant climate change measure appears to be Measure 214 (agri-environmental payments) which delivers a wide range of operations which provide mitigation and adaptation benefits. This measure also receives by far the greatest proportion of the funding devoted to Axis 2 across the EU. The implementation of mitigation is primarily through operations supported by measures 121 (farm modernisation) and 214 (agri-environmental payments), and to a lesser extent 221 (first afforestation of agricultural land). The delivery of adaptation is primarily seen through Measure 214 (agri-environmental payments) and, to a lesser extent, 121 (farm modernisation).

The development or use of renewable energy is most commonly supported by Measures 121 (farm modernisation) and 311 (diversification into non-agricultural activities) and, to a lesser extent 123 (adding value to agricultural and forestry products), 312 (support for business creation and development) and 321 (basic services for the economy and rural population). There is an apparent focus within the renewable energy measures on using existing by-products from agriculture and forestry as energy sources, rather than growing specific energy crops e.g. short rotation coppice (SRC), *miscanthus*. Such a focus on developing added-value from existing biomass resources, rather than allocating agricultural land to its production, is consistent with the increasing importance of avoiding conflict with food security objectives.

Unsurprisingly, there are important geographic differences in the emphases placed within the RDPs, which also extends to differences between regional RDPs. For example, RDPs reflect the importance of:

- afforestation of unsuitable or abandoned agricultural land in central and northern Europe to both sequester carbon and provide biomass resources, and in some parts of southern Europe to combat desertification and erosion;
- agricultural drainage to alleviate water-logging in the wetter and cooler countries of northern and eastern Europe;
- addressing water shortages in the south of Europe including the Island Member States, given the hot, dry climate and importance of agricultural irrigation;
- greenhouses in northern Europe (which provide valuable opportunities for the production of high value horticultural crops within these cooler countries) and in parts of southern Europe;
- Addressing the adverse effects of forest fires in the hot dry areas of southern Europe;
- renewable energy from biogas in Member States with important livestock sectors, such as Lithuania and Latvia;
- renewable energy from biomass in forest-rich countries, particularly in northern Member States, notably Sweden, Finland, and the Baltic States. This arises from identified needs to transform domestic energy policy, to exploit untapped reserves of bio-energy and to contribute to addressing climate change.

Despite the large number of individual operations which contribute to addressing the challenges posed by climate change and which were supported by the pre-Health Check RDPs, 55% of supported mitigation operations, 61% of supported adaptation operations and 47% of supported renewable energy operations within the RDPs were not specifically targeted to climate change. This meant that many of the RDPs chose not promote those important 'win-win' operations that provide both climate change and direct economic benefits to the agricultural and rural communities.

Although the lack of clear targeting may not have affected the uptake or effectiveness of these measures in combating climate change and its impacts, it does not fully recognise the contributions that rural development policy and the agricultural, forestry and rural sectors are making to the important climate change-related challenges.

### **Balancing the three dimensions of climate change**

Within the original Danish RDP for 2007-13, all three dimensions of climate change were well considered and correspondingly addressed in detail within the measures. Measure 214 (agri-environment payments) is the main measure used for addressing mitigation and adaptation, whilst Measure 121 (modernisation of agricultural holdings) encompasses the key support for renewable energies. In each case, although there is a primary measure, the three climate change components of mitigation, adaptation and renewables are also addressed across a number of additional measures within the plan. These measures cover aspects such as physical infrastructure, technology, product development, management, co-operation and efficiency, through direct financial assistance but also training, information and advice.

### 3. Overview of the Revision of Rural Development Strategies and Programmes following the CAP Health Check, including Allocation of Additional Resources

The RDPs that were agreed at the beginning of the 2007-13 programming period already included a range of operations which addressed the climate change challenges, although discerning the climate-related operations was not always straightforward as the objectives of programmed measures often served multiple purposes. Climate change mitigation or adaptation was often a co-benefit, rather than being the targeted benefit of many measures.

The full potential of this RDP climate action portfolio increased recently following amendments to the RDPs as a result of the Health Check of the Common Agricultural Policy<sup>10</sup> and the European Economic Recovery Plan<sup>11</sup>. The CAP Health Check was agreed by the EU agriculture ministers on the 20<sup>th</sup> November 2008. Ministers also agreed to increase modulation, whereby direct payments to farmers are reduced and the money transferred to the Rural Development fund. This was intended to allow a better response to the new challenges and opportunities faced by European agriculture, including climate change, the need for better water management, the protection of biodiversity, and the production of green energy. The strategic aims of the Recovery Plan are to help Europe prepare for when growth returns.

Overall, about €3.9 billion was released following agreement of the CAP Health Check and a further €1.0 billion from the European Economic Recovery Plan. The RDPs were amended to channel this additional €4,945.7 million of rural development funds into a list of new priorities presented by the revised Community Strategic Guidelines<sup>12</sup>. These new priorities included direct support for addressing climate change, as well as related investments in renewable energy, water management and biodiversity (Figure 5). RDP budget allocations for dairy restructuring and broadband support were also increased.

“The CAP Health Check and the European Economic Recovery Plan have both put new money on the table to help deal with pressing problems such as fighting climate change. It’s up to Member States and regions to use this money wisely”. **Mariann Fisher Boel, former Commissioner for Agriculture and Rural Development**

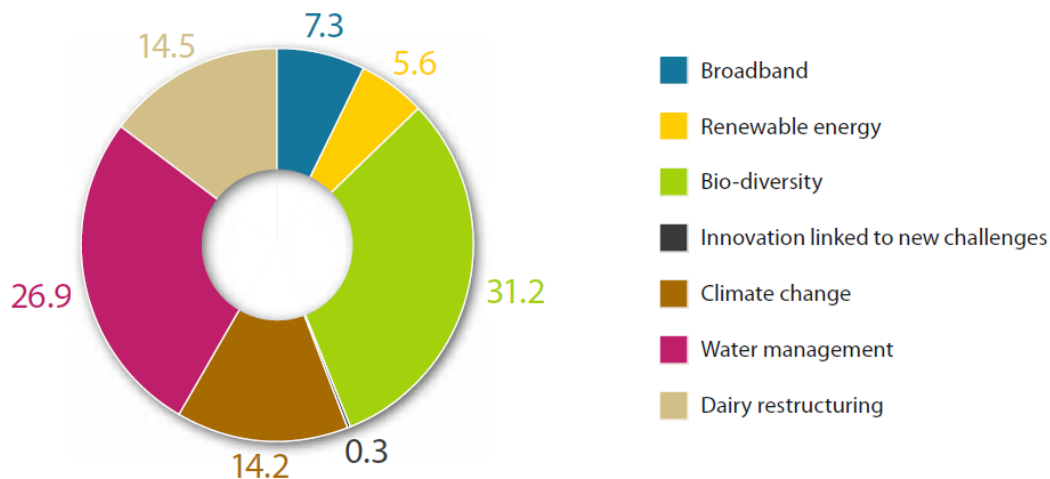
The Health Check will modernise, simplify and streamline the CAP and remove restrictions on farmers, thus helping them to respond better to signals from the market and to face new challenges. **European Commission**

<sup>10</sup> COM (200) 722 final, Brussels 20.11.2007

<sup>11</sup> Communication from the Commission to the European Council, A European Economic Recovery Plan, COM (2008) 800 final.

<sup>12</sup> ENRD (2010) Overview of the CAP Health Check and the European Economic Recovery Plan Modifications of the RDPs

**Figure 5:** Overall percentage distribution of CAP Health Check and EERP funds across priorities based on the approved RDP modifications



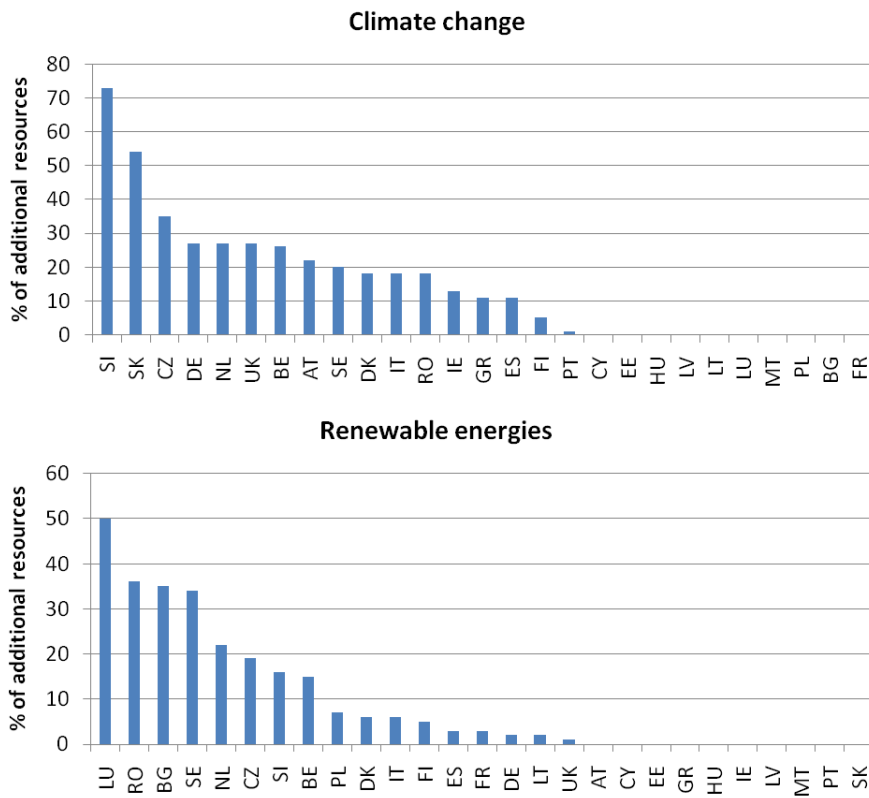
Source: DG AGRI/G1

How these additional funds were allocated between the new challenges was left to the individual Member States to decide<sup>13</sup>. Accordingly, the proportion allocated to each of the new challenges by the Member States differs greatly (Figure 6), as they take into account the challenges facing their rural and agricultural sectors and their original allocation of money to measures which supported these challenges within their original RDPs. In almost all cases, Member States have not added new measures to support climate change or renewable energies within their RDPs, but have increased the financial support to measures which provide these benefits. A few Member States have added additional sub-measures. The overall breakdown between the different axes remains broadly unaffected compared to the pre HC and EERP situation<sup>12</sup>.

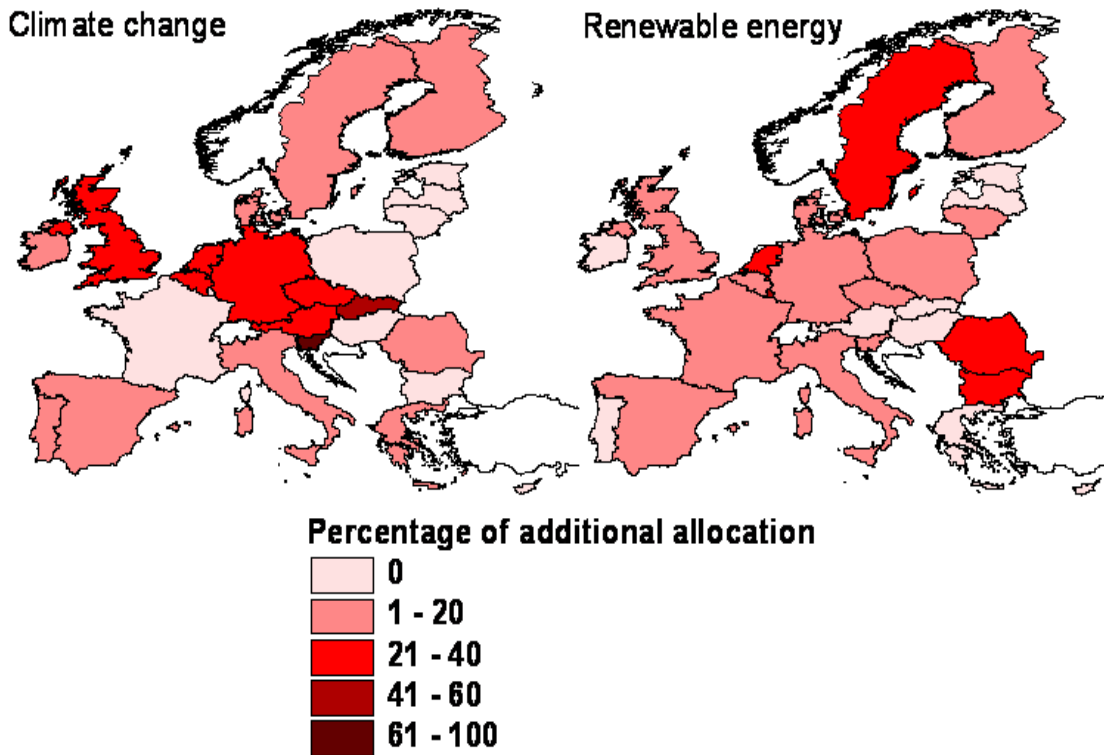
The allocation of additional resources to climate change is generally more widespread than for renewable energy (Figure 7). The allocation of additional funds to the climate change challenge is generally greatest through north-west and central Europe (Slovenia, Slovakia, Czech Republic, Germany, Netherlands, UK, Belgium and Austria) and least in eastern Europe. In the cases of the Baltic States, Poland, Hungary, Bulgaria, France and the Island Member States, none of the additional allocation within the revised RDPs is explicitly targeted at climate change.

<sup>13</sup> ENRD (2010). *Overview of the CAP Health Check and the European Economic Recovery Plan - Modifications of the RDPs*

**Figure 6:** Allocation of additional Health Check and EERP funding to the climate change and renewable energy challenges within Member States



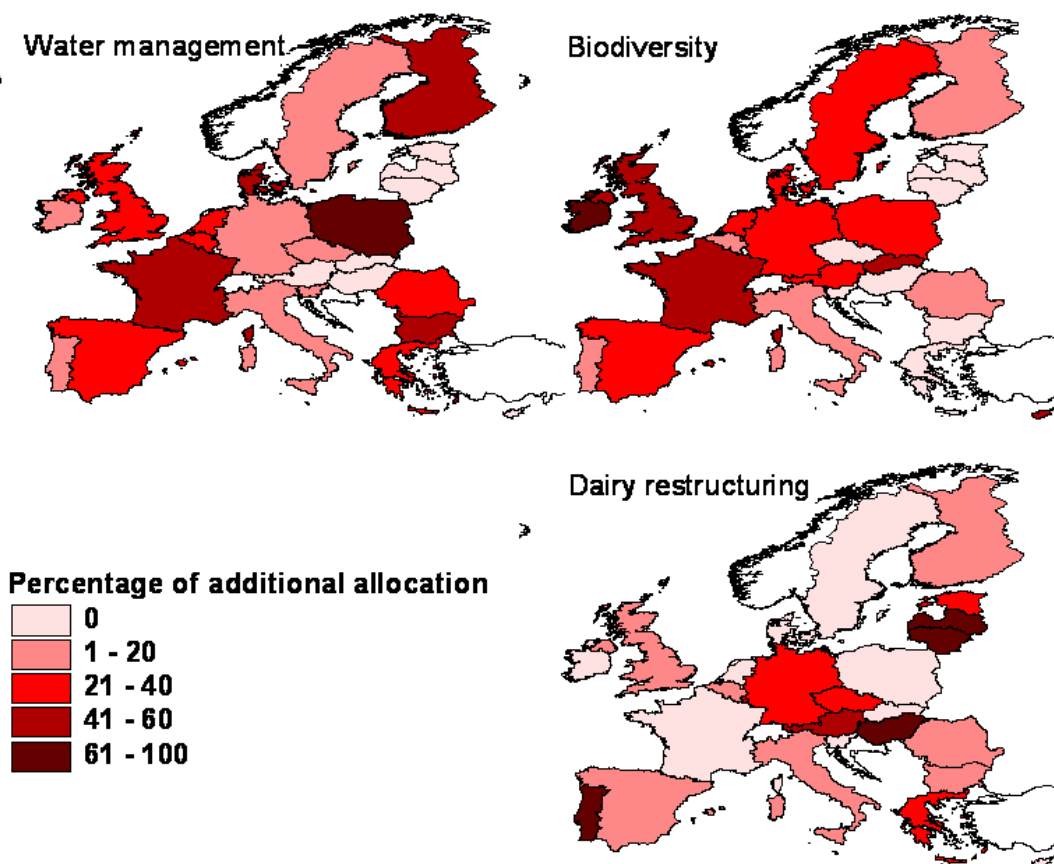
**Figure 7:** Allocation of additional Health Check and EERP funding to the climate change and renewable energy challenges within Member States



Luxembourg, Romania, Bulgaria and Sweden allocate the greatest proportion of their additional resources to the renewable energies challenge, whilst 10 countries (Austria, Cyprus, Estonia, Greece, Hungary, Ireland, Latvia, Malta, Portugal, and Slovakia) allocate no additional resources to this challenge (Figure 7).

Estonia, Latvia, Hungary and the islands of Malta and Cyprus are the only countries to allocate no additional resources to either climate change or renewable energies. However, as with the original RDPs, many of the operations supported by the allocation of the additional funds to some of the other new challenges (water management, biodiversity, and dairy restructuring - Figure 8) provide climate change and renewable energy co-benefits. For example, the additional funding in Hungary aims to support the restructuring of the dairy sector through funding improvements in animal welfare including decreasing stocking densities and improving housing conditions which may produce mitigation and adaptation benefits, respectively.

**Figure 8:** Allocation of additional Health Check and EERP funding to non-climate challenges which may deliver climate co-benefits within Member States<sup>14</sup>

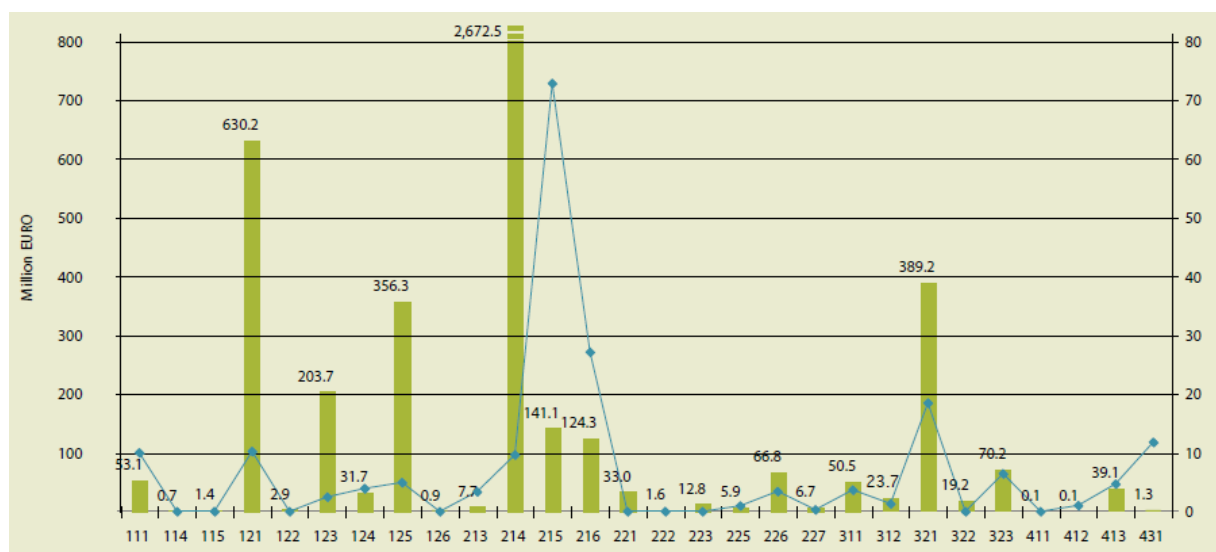


<sup>14</sup> In France, water management and biodiversity have been allocated a combined 81% of its HC/EERP funding. Within Figure 8, it has been assumed that 40.5% has been allocated to each.

The breakdown of the additional HC and EERP funds at the level of measures (Figure 9) shows that the majority of the additional budget is allocated to measure 214 (agri-environment payments) which accounts for more than 54% of the additional funding (EUR 2,672 million). Measure 121 (Modernisation of agricultural holdings) with EUR 630 million, Measure 321 (Basic services for the economy and rural population) with EUR 389 million and Measure 125 (Infrastructure related to the development and adaptation of agriculture and forestry) with EUR 356 million are the next most significant beneficiaries of the additional funding. Combined, these 4 measures have been allocated over 80% of the additional budget.

Target output indicators for each of the new challenges for the HC and EERP budget defined in the RDPs have been aggregated at the EU level. Table 2 summarizes these to illustrate how the challenges are being addressed.

**Figure 9:** Allocation of additional funds per measure (million EUR) and variation with respect to the previous budget allocation (%)



Source: DG AGRI - taken from ENRD (2010): *Overview of the CAP Health Check and the European Economic Recovery Plan - Modifications of the RDPs*

### Linking national climate change strategies through to RDP measures

One of the aims of the Irish Rural Development Programme is “to mitigate the effects of climate change and protect Ireland’s natural resources”. Given that Ireland’s National Climate Change Strategy, published in 2000, provides for a reduction in methane emissions from the national herd equivalent to a reduction in livestock numbers by 10% below 2010 projected levels, the national RD Strategy ensures that RD will play an important supporting role in delivering this by containing an explicit indicator of “Climate change: GHG emissions from agriculture”. This includes a target to reduce emissions of methane from agriculture from 11.4 to 9.8 million tonnes of CO<sub>2</sub> equivalent.

To deliver this, Measure 121 (Modernization of Agricultural Holding) has a specific objective to “..... reduce overall greenhouse and trans-boundary gas emissions from the agriculture sector”. To maximise effectiveness, all farmers are eligible to participate in this measure. Whilst investment is provided for a range of contributory activities, the aid for manure processing facilities under this measure has a specific objective to “assist in the reduction of greenhouse gas emissions”. The revised Irish RDP, despite budget cuts owing to the contraction of the Irish economy, continues the strong links to climate change mitigation.



**Table 2:** Selection of main relevant target indicators (outputs) per priority for the HC/EERP budget defined in the Rural Development Programmes

<i>Priority / Indicators</i>	<i>Unit</i>	<i>Target</i>
<b>Climate Change</b>		
Improvement of energy efficiency	Total volume of investments <sup>15</sup> (million EUR)	243
Improve efficiency of nitrogen fertiliser use	Total volume of investments (million EUR)	104
Number of participants in training activities	% of participants in CC related topics	40%
Soil management practices (measure 214)	Number of ha supported (million ha)	1.4
Extensive livestock (measure 214)	Number of ha supported (million ha)	2.6
Afforestation and the establishment of agro-forestry systems	Number of ha supported (million ha)	10,000
	Programmed expenditure (EAFRD – million EUR)	47
<b>Renewable energy</b>		
Installations/infrastructure for renewable energy using biomass and other renewable energy sources (solar and wind power, geothermal)	Total volume of investments (million EUR)	248
Processing of agricultural/forest biomass for renewable energy	Total volume of investments (million EUR)	197
Biogas production using organic waste (on farm and local production)	Total volume of investments (million EUR)	62
<b>Water management</b>		
Water storage (including water overflow areas) – Axis 1	Total volume of investments (million EUR)	184
Water savings technologies (e.g. efficient irrigation systems) – Axis 1	Total volume of investments (million EUR)	568
Wetland restoration (measure 216)	Total volume of investments (million EUR)	119
Meandering rivers (measure 323)	Total volume of investments (million EUR)	71
<b>Biodiversity</b>		
Extensive forms of livestock management (measure 214)	Number of ha supported (million ha)	1.65
Integrated and organic production (measure 214)	Number of ha supported (million ha)	1.58
Land use change (extensive grassland management) (measures 216 and 323)	Total volume of investments (million EUR)	76

*Source: ENRD (2010) Overview of the CAP Health Check and the European Economic Recovery Plan Modifications of the RDPs*

<sup>15</sup> Total amount (= the sum of all public and private expenditure) of all the tangible and/or intangible investments related to the supported operations

## 4. Summary of Measures used for/relevant to Mitigation

**Mitigation** – with respect to Climate Change, mitigation means implementing policies to reduce greenhouse gas emissions and enhance carbon sinks.

The RDPs primarily support climate change mitigation through operations under two main measures – Measures 121 (farm modernisation) and 214 (agri-environmental payments), and to a lesser extent 221 (first afforestation of agricultural land). Generally, there are few targeted mitigation measures implemented through Axis 3, although a number of renewable energy measures are targeted through this Axis. There were many eligible activities within these (and other) Measures in the pre-Health Check RDPs for which climate mitigation is a co-benefit, but these were often not identified in the programmes.

The Health Check and the new challenges have brought the deliberate targeting of climate change mitigation to the fore in many more RDPs. The Health Check and EERP funding is largely allocated to pre-existing measures thereby strengthening existing priorities and measures, rather than creating new measures. Following the Health Check, additional funds targeted at climate change mitigation have been allocated particularly to three important areas:

- Modernization of holdings and equipment (measure 121 and 123);
- Agri-environment schemes (measure 214), and;
- Training (measures 111 and 114).

A diverse range of investments are supported under the associated Measures under pre- and post-Health Check RDPs which will reduce the emissions of each of the GHGs emitted by the agricultural sector. Farm modernisation supports investments in more efficient equipment, facilities and buildings. Also supported are improvements in manure storage and management (reducing methane emissions), improvements in the efficiency of nitrogen fertiliser use and application (reducing nitrous oxide emissions, and with important co-benefits for water quality) and increased energy efficiency in agricultural buildings and rural businesses (leading to reduced emissions of carbon dioxide).

Investments in equipment for better application of mineral fertilisers and manure were not included in Measure 121 in almost half of pre-Health Check RDPs, although over three-quarters included support for improved efficiency of fertiliser use. This represented an identified need to support better nutrient management rather than investment in improved application, but delivers valuable mitigation co-benefits. However, a large number of the pre-Health Check RDPs also supported improved manure management (including storage), with a quarter of them targeting better control of emissions of the greenhouse gas methane from livestock farms. Following the Health Check, additional targeting of manure storage for climate change mitigation is included in more RDPs including Ireland, Luxembourg, Czech Republic, Slovenia and Spain.

The improvement of energy efficiency of farm buildings under Measure 121 was supported in almost three-quarters of pre-Health Check RDPs given the associated cost savings, but was a targeted mitigation measure in only around one-third. This resulted in important 'win-win' opportunities to provide both environmental (emissions savings and climate mitigation benefits) and direct economic (cost saving) benefits to the agricultural and rural communities being only partially promoted. Following the Health Check, more RDPs are targeting the mitigation benefits of energy efficiency (including Belgium and Luxembourg. Whilst most of the climate change mitigation benefits of measure 121 are associated with reducing emissions, Ireland for example, has included investments in short rotation coppice within its revised RDP.

Within many eastern European Member States, the mitigation benefits of modernizing the agricultural sector (whilst also maintaining traditional non-intensive or extensive agricultural practices) are recognized within their RDPs. As a result, significant resources are devoted to Measure 121 to help modernize agricultural holdings and improve energy efficiency and manure management (with consequent beneficial impacts on greenhouse gas emissions), whilst also providing funding through Measure 214 (agri-environment payments) to preserve or maintain environmentally-friendly farming systems.

As well as seeking to directly reduce emissions of GHG through farm modernisation, the pre- and post-Health Check RDPs support a diverse range of operations within agri-environment schemes supported under Measure 214 which provide mitigation benefits through reduced fertiliser usage and increased carbon storage in agricultural soils.

Organic farming is the most widely supported mitigation operation, being included under Measure 214 in almost all RDPs. More than half of the pre-Health Check RDPs reported that organic farming contributes to mitigation. The important role of agricultural soil conservation techniques to contribute to carbon sequestration is acknowledged with over 80% of pre-Health Check RDPs supporting this operation. The limited support for the reduced use / restoration of organic soils (peat land) reflects the limited geographic coverage of extensive organic soils which are mostly in northern Europe (especially UK, Netherlands, Finland and, to a lesser extent, Ireland and Sweden).

Carbon sequestration through agricultural land use change (converting arable land to grassland or to long term fallow) was poorly represented within the original RDPs, but there was significant targeted support for conversion into forest in central and eastern Europe. Measures 221 and 223 for the first afforestation of agricultural and non-agricultural land, respectively, are supported in the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, as well as in Scandinavia (Denmark and Finland).

In general, there was very little targeted implementation of capacity building operations in the pre-Health Check RDPs, with little implementation of Measure 114 and 115 to build adaptive capacity through the setting up of Advisory Services. There was significant implementation of Measure 111 (training, demonstration projects, information activities), but very few RDPs were targeting their activities to demonstrate the climate change benefits to be derived and so failing to identify win-win opportunities. Following the Health Check, reducing emissions has become a stated objective of the training under measures 111 and 114 supported by the Health Check Funding in Scandinavia (Finland and Sweden), regions of Spain (Canarias, Cantabria and Castilla La Mancha) and Saarland (Germany).

### **Taking a diversity of approaches to reducing greenhouse gas emissions**

The revised Netherlands RDP for 2007-13 takes a multi-faceted approach to mitigation ranging from reducing direct emissions to increasing the use of renewable energies. Examples include:

- Investing in energy efficiency, particularly in greenhouses, is further supported under Measure 121 in the revised RDP;
- Reducing carbon losses from peat soils by compensating farmers for maintaining high groundwater tables under Measure 212;
- Increasing carbon sequestration through supporting the conversion of agricultural land into forest (afforestation) under Measure 221;
- Operations to reduce emissions, such as ammonia from stables, through improved manure management under Measure 214;
- The CAP Health Check funding further supports Measure 124 (cooperation for development of new products, processes and technologies in the agriculture, food and forestry sector) to provide multiple innovative initiatives to help mitigate climate change;
- An initiative to make new greenhouses energy neutral or even net producers of energy by 2020 through Measures 111 (supporting demonstration projects related to renewable energy and energy saving), 121 and 125 (both supporting investment support for on-farm use of other renewable energies for electricity and heating);
- Using organic by-products for energy production, largely through measure 121 and 123 to support investments for on-farm production and use of biogas and the processing of agricultural/forest biomass for renewable energy (e.g. biofuels).

## 5. Summary of Measures used for/relevant to Adaptation

**Adaptation** – adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Although all pre-Health Check RDPs supported some measures which contributed to climate change adaptation within farm or rural businesses, the support for adaptation was generally less than for mitigation. A significant proportion of operations which could potentially usefully contribute to the adaptation of farm or rural businesses had no associated measures implemented.

The delivery of adaptation in the pre-Health Check RDPs was primarily seen through Measure 214 (agri-environmental payments) and, to a lesser extent, 121 (farm modernisation). Agri-environment measures are a compulsory part of RDPs and have been allocated a large proportion of the overall EU rural development budget. Climate objectives were rarely explicit within most of the pre-Health Check RDPs, but this measure supports a wide range of operations which are beneficial for improving adaptive capacity, for example:

- **Preserving genetic diversity** - the importance of conserving genetic diversity is seen, with 84% of pre-Health Check RDPs having supporting measures. For example, the original RDP for Cyprus included support for the protection of traditional vine varieties under threat of extinction and the protection and preservation of local sheep and cattle breeds. The revised RDPs for Belgium allocate additional resources to protecting genetic diversity under measure 214;
- **Soil management** – a range of supported activities can increase the resilience of agricultural soils through the diversification of crop rotations, improved soil management and protection, hedgerow management; integrated, organic and extensive agricultural systems etc.;
- **Water management** – creation of wetlands and natural buffers in a number of northern European RDPs.

### Maintaining plant and animal genetic diversity

Maintaining genetic diversity and local plant and animal variants are important adaptation responses for the agronomic challenges of climatic change. A number of operations are included within the regional Spanish RDPs under Measure 214 to help conserve local genetic diversity. These include to:

- create a gene bank with climatic control in order to conserve seeds and tubers and/or dedicated land for the conservation of permanent crops (e.g. Canary Islands and Extremadura);
- maintain an active collection of seeds or vegetation material in sufficient quantity and viability in order to address scientific or education requests (e.g. Canaries);
- commit to cultivate in a regular manner for 5 years any variety among a defined list as a means of preserving genetic resources (e.g. Murcia);
- support farmers to conserve *in situ* the genetic wealth and diversity of plants through compensation for income losses from not cultivating other productive varieties (e.g. Catalunya and Andalucia). In Andalucia, farmers must maintain the cultivation of these varieties until seeding or until the reproduction organ is viable and must reserve 5% of the genetic material for use in the Action Programme in Phytogenetic Resources;
- promote conservation *in situ* and utilisation of genetic resources in the agricultural sector through information, dissemination and advisory activities for NGOs (e.g. Extremadura);
- characterise and evaluate the genetic resources of animals; collect and conserve these resources *in situ*, through the design, elaboration and development of a breeding programme and the creation of a modern information control system (e.g. Galicia).

The importance of water management for adaptation to the threats of droughts, soil waterlogging and floods, which are expected to be enhanced due to climate change in many areas of Europe (Figure 2), is clearly seen within both the pre- and post-Health Check RDPs. Latvia, Estonia and Lithuania fund drainage improvements under measures 121 and 125. Improvements in irrigation and water storage are extensively supported in Central Europe, with Estonia, Romania, Czech Republic, Slovakia, Hungary supporting such operations under the same measures. With Health Check funding, additional operations are funded to reduce flooding (through wetland restoration under measure 214 and 216 in Belgium and Denmark, respectively, and dyke restoration under measure 126 in Denmark; water retention under measure 125 in the Czech Republic) and drought risk (through water harvesting and/or storage under measure 121 in Ireland and Slovenia).

Given the greater reliance of the agricultural sector on irrigation within southern Europe, much irrigation is based upon large-scale rather than farm-level schemes. As a result, investments in infrastructure for water storage and distribution (construction of dams, pumping stations etc) are supported under Measure 125 in some countries within pre- and post-Health Check RDPs (e.g. Greece, Spain). In Spain, for example, 15 of the 17 pre-Health Check RDPs supported improvements and development in irrigation infrastructures, and 9 of these allocated additional HC funding to this. Funding is also provided for improvements to on-farm irrigation systems.

There was an apparent focus within the adaptation measures in most RDPs on operations that increase the capacity for agriculture to adapt to the gradual effects of climate change. Operations that either seek to reduce the risk (e.g. flood prevention, water overflow areas), reduce the exposure (e.g. hail netting, flood-tolerant crops) or assist the recovery from extreme events were poorly represented in the original 2007-13 RDPs. Given that the increased frequency and severity of extreme events is confidently predicted by climate scientists, the Health Check provided an important opportunity to address the need for risk- and exposure-reduction to extreme climatic events and thereby provide immediate potential benefits to agriculture and the wider society.

### **Avoiding mal-adaptation**

The limited freshwater resources of the island of Malta are expected to be put under further pressure from climate change. Sustainable use of natural resources is therefore part of the overall aim of the RDP for Malta. In line with the national strategic priorities for adaptation of agriculture to climate change, three clearly targeted operations address the challenge of reducing freshwater and growing demand. However, there are explicit links to the Water Framework Directive to prevent mal-adaptation.

Measures 121 (Modernisation of Agricultural Holdings) and 125 (Infrastructure related to the development and adaptation of agriculture) aims to improve irrigation equipment and water storage capacities.

Measure 121 supports, *inter-alia*, "investments in irrigation projects (...) and water facilities" provided that "it is demonstrated that they result in reduction of reliance on groundwater supply, and (...) respect the provisions of the Water Framework Directive". Support to investments in water storage facilities, including reservoirs, shall only be granted "on condition that it can be demonstrated that the water shall be harvested or collected rather than abstracted from the groundwater".

Measure 125 supports operations to increase the harvesting of rainwater, and also the use of treated sewage effluents for irrigation. Finally, further support to reduce water demand is provided by Measure 123 (Adding Value to Agricultural Products) through investments in the agri-food processing sector to reduce dependence on natural resources by improving conservation, rationalising use and recycling renewable resources such as run-off water.

### **Preventative actions against forest fires and climate-related natural disasters**

In Slovakia, funds from the HC/EERP will be used to support the existing Measure 226 (Restoring forestry potential and introducing prevention actions) in view of the climate change priority. Climate change is believed to be already affecting Slovak forest health due to reduced precipitation, increased droughts and maximum daily temperatures and increased outbreaks of bark beetles.

Additional HC/EERP funding is further supporting protection against forest fires and climate-related natural disasters, and in particular the development of improved forest road networks and the re-forestation of cleared areas with more disease-resilient trees.

There is a noticeable change in emphasis within a number of the revised RDPs, with Health Check and EERP funding operations to increase the resilience of the agricultural and forestry sector to extreme events (fires, droughts, flooding) or which will assist the sectors in recovering from extreme events. Examples include:

- **Greece** – measure 226 allocates additional funding to preventing forest fires and natural disasters, whilst measure 126 restores agricultural production damaged by natural disasters and 121 supports investments to protect natural capital from drought to fire;
- **Slovenia** – measure 121 provide new funding to support the installation of hail nets and water saving measures;
- **Slovakia** – increased support through Measure 226 for the prevention of forest fires and climate related disasters and for the restoration of affected areas;
- **Czech Republic** – further support has been provided for increased water retention, including flood storage areas under Measure 125 and for measures to prevent or address flood-related impacts in forest areas under Measure 226;
- **Denmark** – the restoration of dykes to improve flood defences are supported by Measure 126 and 216 (non-productive investments), and increasing flood storage through wetland creation, wet meadow restoration and periodic flooding of farmland is also supported by Measure 216.

Improved animal welfare appeared poorly represented under Measure 214 in the Pre-Health Check RDPs, but this was compensated for by the common untargeted implementation of Measure 121 (modernisation of agricultural holdings). However, Hungary allocated its Health Check funding to improving animal welfare through Measure 215.

There was once again little implementation of Measure 114 and 115 to build adaptive capacity through the setting up of Advisory Services and very little targeted implementation of capacity building activity, although there was significant non-targeted implementation of Measure 111 (training, demonstration projects, information activities) within the pre-HC RDPs. However, as with mitigation, climate change adaptation is now a stated objective of the training under measures 111 and 114, supported by the Health Check funding, in Belgium, Finland, Sweden, regions of Spain (Canarias, Cantabria and Castilla La Mancha), Italy (Piemonte) and Saarland (Germany).

### **Integrating climate change into training and capacity building**

One of the overall objectives of the RDP for England is “to build profitable, innovative and competitive farming, food and forestry sectors, that meet the needs of consumers and make a net positive contribution to the environment”. Training and capacity building, through Measures 111 and 115, are important components of delivering this in the context of climate change.

Measure 111 (vocational training and information actions) lists a range of specific training which will form the focus of support under the measure that includes:

- climate change adaptation and mitigation;
- resource use, including waste reduction, waste management, water use (including diffuse water pollution), energy efficiency;
- bio-energy, information on production and utilisation, including training;
- environmental land management topics, including environmentally sensitive methods of harvesting bioenergy.

In addition, one of the stated Objectives of Measure 115 (setting up of farm and forestry advisory services) is to “help farmers and forest holders to adapt to changing circumstances (including market changes, environmental changes and regulatory changes)” and will cover support for the growing, harvesting, processing and end-use of renewable energy crops.



## 6. Summary of Measures used for/relevant to Renewable Energies

**Renewable energy** (RE) - energy which comes from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are naturally replenished.

The development or use of renewable energy is most commonly supported by measures 121 (farm modernisation) and 311 (diversification into non-agricultural activities) and, to a lesser extent 123 (adding value to agricultural and forestry products) and 321 (basic services for the economy and rural population). Within the pre-Health Check RDPs, measures related to renewables tended to focus on biomass from agriculture and forestry and bioenergy from biogas (generated from livestock wastes).

The processing of agricultural/forest biomass for renewable energy is included in most RDPs, and was a targeted operation in almost half of the pre-Health Check RDPs, along with a focus on promoting the use of agricultural and organic by-products for bioenergy. Additional Health Check funding is applied in Belgium (measure 123), Finland (measure 123 and 124) and through afforestation (measure 221) in Romania and Estonia.

However, investment in the on-farm production and use of biogas (Measure 121) was poorly represented in many of the pre-Health Check RDPs, although targeted within a number of countries with important livestock sectors (such as the Baltic States). Support for on-farm biogas production is strengthened in the revised RDPs for Slovenia, Netherlands and Denmark under Measure 121.

The planting of specific perennial energy crop plantations is poorly represented within the majority of the pre-Health Check RDPs. However, the revised RDPs within Lithuania and Ireland both support the establishment of energy crop plantations (short-rotation coppice and *miscanthus*) under Measure 121.

Furthermore, the emphasis on the source of renewable energies which focused on bioenergy in many pre-Health Check RDPs, has been broadened. For example, renewable energy support in Finland has been extended from bioenergy (mostly forestry biomass and livestock biogas) to other renewable energies, namely solar, wind and geothermal. Similarly support has been extended from biomass and permanent energy crops in Sweden to other renewables. The revised RDPs for Galicia and the Basque Country also include additional funding for renewable energy from solar, wind and geothermal.

The wider support for the increased production, use and distribution of renewable energy is enhanced under axis 3 measures (311, 312, 321, 322) following the Health Check, mostly in northern, central and eastern Europe.

The island Member States or regions have taken contrasting options towards supporting renewable energies. Cyprus for example has only a single measure which supports biogas production from livestock and poultry wastes. In contrast, the Maltese RDP supports biomass, wind and solar energy production. In the overseas territories of France and Corsica, renewable energies have received significant additional support following the CAP HC with, for example, Guyane and Guadeloupe allocating 71% and 47 % of their additional funding to RE, respectively. Guyane has an explicit focus on support for production of solar energy, biogas from organic waste and bioenergy from agricultural/forest biomass under Measure 121, while additional funding under Measure 321 targets autonomous electricity generation in inland areas from thermal, solar and hydraulic resources.

### **Supporting the development of a diverse range of renewable energy sources**

The Scottish Executive has set a target of 50% of electricity generation to come from renewables sources by 2020. The Scottish Executive is also committed to produce a Renewable Heat Strategy, to which heat production from renewable systems will contribute. Renewable energies are therefore supported within the revised Scottish RDP across a range of measures with a focus on micro-generation.

The key measures for supporting renewable energy are Measures 121 (agriculture) and 122 (forestry), encompassing:

- support for the establishment of short rotation coppice crops (willow or poplar) which must be used to develop a fuel supply for renewable energy products, thereby encouraging the movement of cost-effective processing closer to the rural timber resource and helping to support associated local businesses;
- support for renewable energy in agriculture and forestry. This specifically supports contributions towards the eligible costs of purchase and installation, construction, upgrading or development of infrastructure and/or equipment to enable agricultural and forestry businesses to develop a wide range of small-scale renewable energy capacity. This includes wind turbines, hydro-electric, solar, biogas (anaerobic digestion of slurry and other agricultural by-products) and bio diesel.

Measure 125 (infrastructure adaptation and development) also supports upgrading of energy supplies to make them more efficient and/or sustainable, whilst Measures 312 (business creation) and 321 (basic services) explicitly support renewable energy projects, in particular micro-generation.

## 7. Conclusions

Climate change provides both threats and opportunities to the agricultural, forestry and rural sectors of Europe. The Rural Development Programmes at regional and national levels provide invaluable support in helping to reduce both the causes and consequences of climate change.

Prior to the Health Check and the EERP, the original RDPs for the planning period 2007-13 included a wide range of measures which addressed all three dimensions of climate change – mitigation, adaptation and renewable energy. The most important measures for delivering these benefits were Measures 121 (farm modernization - delivering mitigation, renewable energy and adaptation benefits), 214 (agri-environment payments - delivering mitigation and adaptation benefits), 221/223 (first afforestation - delivering mitigation and renewable energy benefits) and measures 321, 311 and 312 (providing increased renewable energy generation and use from farm to market). However, climate change mitigation and adaptation were often co-benefits of the funded measures, rather than being the intended target, so that the potential opportunities were not maximized and the actual benefits not identified.

The allocation of the Health Check and EERP financial resources within the amended RDPs has shown that Member States have explicitly prioritized the climate and environmental challenges - about 20% of funding has been directly allocated to climate change and renewable energy and almost 60% to water management and biodiversity which deliver important climate co-benefits. These will result in reduced greenhouse gas emissions and an increased capacity to cope with the impacts of climate change throughout Europe's rural areas.

The revisions to the Rural Development Programmes for the 2007-13 period, following the allocation of the additional Health Check and EERP financial resources, will ensure that agriculture, forestry and the wider rural sector will play an increasingly important role in addressing the challenges posed by climate change within Europe and also contribute significantly to the Europe's international role in finding global scale mitigation solutions. The priorities defined by the HC/EERP will thus remain valid beyond 2013<sup>16</sup>.

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<sup>16</sup> ENRD (2010). *Overview of the CAP Health Check and the European Economic Recovery Plan - Modifications of the RDPs*.