



**EXPERT EVALUATION NETWORK  
DELIVERING POLICY ANALYSIS ON THE  
PERFORMANCE OF COHESION POLICY 2007–2013  
YEAR 1 – 2011**

**TASK 1: POLICY PAPER ON RENEWABLE ENERGY AND  
ENERGY EFFICIENCY OF RESIDENTIAL HOUSING**

**FRANCE**

**VERSION: FINAL**

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Directorate–General Regional Policy**

**CONTENTS**

1. EXECUTIVE SUMMARY .....	4
2. NATIONAL POLICY .....	6
3. ERDF AND COHESION FUND SUPPORT AND CONTRIBUTION TO NATIONAL POLICY.....	8
4. RATIONALE FOR PUBLIC INTERVENTION.....	12
5. RATE OF SUPPORT AND PROFITABILITY.....	13
6. COSTS, PUBLIC SUPPORT AND PRICES .....	14
7. CONCLUSIONS .....	16
REFERENCES .....	18
INTERVIEWS .....	18
TABLES AND FIGURES.....	19

## LIST OF ABBREVIATIONS

- ADEME: Agence nationale de l'environnement et de la maîtrise de l'énergie
- AIR: Annual Implementation Report of the ERDF Operational Programmes
- ANAH: Agence nationale pour l'amélioration de l'habitat
- BBC : Bâtiment basse consommation (Low energy consumption building)
- BEPOS : Bâtiment à énergie positive
- CRE : Commission de régulation de l'énergie
- CSE: Conseil supérieur de l'énergie
- EEN: Expert Evaluation Network
- ERDF: European Regional Development Fund
- ESF: European Social Fund
- FIT: Feed-in tariff
- FNAIM: Fédération nationale de l'immobilier
- HPE: Haute performance énergétique (High Energy Efficiency)
- HQE: Haute qualité environnementale (High Environmental Quality)
- IEA: International Energy Agency
- MEEDAT: Ministère de l'Écologie, de l'Énergie, du Développement durable et de l'Aménagement du Territoire
- MEEDM: Ministère de l'Écologie, de l'Énergie, du Développement durable et de la Mer
- NSRF : National Strategic Reference Framework
- OP: Operational Programme
- PACA: the region Provence Alpes Côte-d'Azur
- PCET: Plan climat-énergie territorial
- PNACC: Plan national pour l'adaptation au changement climatique
- PRERURE: Plan énergétique régional pluriannuel de prospection et d'exploitation des énergies renouvelables et d'utilisation rationnelle de l'énergie
- PV: Photovoltaic (solar energy)
- R&D: Research & Development
- RE: Renewable energies
- RT: Règlementation thermique
- RTDI: Research, technological development and innovation
- SRCAE: Schéma régional pour le climat, l'air et l'énergie
- THPE: Très haute performance énergétique (Very High Energy Efficiency)
- VAT: Value added tax

## 1. EXECUTIVE SUMMARY

Support to renewable energies and energy efficiency was reinforced in 2007 following the public debate known as *Grenelle de l'environnement*, with the laws *Grenelle 1* (2009) and *Grenelle 2* (2010) which cover a wide spectrum of public interventions, establishing targets for renewable energies and the reduction in the energy consumption in buildings, together with the National Plan for the Promotion of Renewable Energies 2009–2020. Financial support comes from the *Fonds Chaleur* (production of heating from renewable sources, mainly for collective housing and economic activities), the *Grand Emprunt* (RTDI, centres of excellence, pilots, etc) and indirect support measures encouraging households and businesses to invest in RE and energy efficiency (tax credits, reduced VAT rate, 'eco-loans', FIT, reduced import duties in overseas regions, etc).

In Competitiveness & Employment regions, the main ERDF measures concerning RE support the development of RE *filières*, RTDI, collective projects and installations. Concerning energy efficiency, ERDF measures support information and promotion, diagnostics, feasibility studies. ERDF support in Convergence regions is globally similar, in particular concerning RE *filières*. 61.5% of total ERDF allocation to RE and energy efficiency (EUR 584 million) are dedicated to RE and 38.5% to energy efficiency. ERDF funding of RE benefits first biomass (40%), then solar energy (32%), hydro-electric, geothermal and other (17%), and wind (10%). The wind energy is the least supported, some OP indicate that the regulated FIT is sufficient for attracting investment.

There are important variations between regions: funding of RE varies from 2.8% of ERDF OP in Limousin to 23.9% in Poitou–Charentes, and support to energy efficiency from 1% (Limousin, Auvergne) to 12.4% in Picardie. There are also differences concerning support to the different types of RE, PACA is a leader for wind, Poitou–Charentes for solar energy and biomass, and Ile de France for geothermal. ERDF measures are globally consistent with and complementary to the national policy. Regions, through ERDF, mainly use direct support measures (grants, 'vouchers', etc).

The rationale for public intervention put forward in the OPs is common to all regions: it is necessary to make a larger use of RE and energy efficiency to meet the ever increasing energy needs (esp. residential and tertiary) while reducing emissions of greenhouse gases and combating pollution and climate change. The expected return on investment is mainly economic and social: development of related *filières* (in particular *bois-énergie*) and progress in related RTDI.

There is no explicit reference in the ERDF OPs to the profitability of investment in RE and energy efficiency. The support to the various sources of RE is through FIT. FIT for PV solar

was the highest until recently and benefits essentially households, but it is strongly reduced (moreover, PV solar production costs are very expensive). The FIT for offshore wind energy is the second highest, reflecting a government priority (through calls for tenders aimed at large-scale investors).

The French policy landscape for RE and energy efficiency is moving rapidly. There is some lack of 'stability' and consequently of predictability. The priorities seem to be offshore wind energy, biomass (especially biogas/methanisation, with rather low production costs), and, in spite of a reduced FIT, PV solar. However, budgetary constraints may entail a 're-dimensioning' of the overall *Grenelle de l'environnement* process. Moreover, after the Fukushima disaster, a real debate was opened on the future of nuclear energy which could lead to a stronger focus on RE.

## 2. NATIONAL POLICY

France is supporting the development of renewable energies and energy efficiency, in relation in particular to its international (Kyoto Protocol) and European (Gothenburg strategy, European Strategy on Climate Change,...) commitments, as illustrated in the NSRF<sup>1</sup> which makes reference to the 2005 *Loi d'orientation sur l'énergie* and *Charte de l'environnement*<sup>2</sup>. This support has been significantly enlarged since 2007 following a large consultation, known as the '*Grenelle de l'environnement*', with 2 laws (*Grenelle 1* and *Grenelle 2*) covering a wide spectrum of environment-related public interventions, including renewable energies, energy efficiency and the control of energy expenditure. The French National Action Plan for the Promotion of Renewable Energies 2009–2020, established in accordance with article 4 of the EU Directive 2009/28/EC, synthesises the overall French targets and the measures for achieving the targets.

The law *Grenelle 1* (2009) sets various objectives, as a reduction in the energy consumption of buildings (– 38% by 2020), the reduced dependency on hydrocarbons (– 20% by 2020), an energy mix with a minimum of 23% from renewable energies, etc. Convergence regions face specific challenges (insularity, tropical climate, etc) and have accordingly enlarged competences in the field of energy<sup>3</sup>. For renewable energies, the focus is on offshore wind energy<sup>4</sup>, biomass and solar<sup>5</sup> energy, despite the reduction in the support to photovoltaic solar energy<sup>6</sup>. FIT constitute the main implementation tool for supporting RE together with calls for tenders (esp. for developing offshore wind facilities).

Law *Grenelle 2* (2010) specifies the modalities of implementation of *Grenelle 1*: establishment of a National Plan for the Adaptation to Climate Change (PNACC), a Regional Scheme for Climate, Air and Energy (SRCAE) in each region and, at operational level, by a '*Plan Climat-Energie Territorial*' (PCET).

For the control of energy expenditure and energy efficiency, there have been various 'Thermal Regulations' (RT) since the 1970s which have defined requirements in terms of thermal performance of new buildings and new parts of existing buildings<sup>7</sup>. Priority has been given to collective housing and public buildings<sup>8</sup>. The RT 2012, which will apply from

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<sup>1</sup> Pp. 51–52.

<sup>2</sup> The latter was integrated into the French Constitution.

<sup>3</sup> The 2000 *Loi d'Orientation pour l'Outre-Mer* requests the drafting, adoption and implementation of a regional plan for renewable energies and rational use of energy (PRERURE) in each overseas region.

<sup>4</sup> A call for expressions of interest is to be published soon with an objective of 1200 installations by 2020.

<sup>5</sup> E.g.: generalization of solar water heaters in the overseas regions.

<sup>6</sup> The buying back price by the national public utility company (EDF) has been strongly lowered.

<sup>7</sup> These RT have now entered the field of renovation of existing buildings.

<sup>8</sup> According to a principle known as that of the '*Etat exemplaire*' (exemplary State).

October 2011, intends to reduce the energy consumption of new buildings by 2/3<sup>9</sup>; three specific requirements are determined: minimum energy efficiency of construction, maximum energy consumption, norms related to 'summer comfort'. By 2020, the future RT 2020 should implement the concept of 'positive energy building' (BEPOS).

With respect to governance, law Grenelle 2 set up a monitoring committee for renewable energies at policy making level within the Higher Council for Energy (CSE). The main organisations in charge at operational level are ADEME, the national agency for the environment and energy efficiency. The control of the energy market is in the hands of the Commission for the Regulation of Energy (CRE).

With respect to financial support, a '*Fonds Chaleur*' has been set up, with EUR 1.2 billion for the period 2009–2013, to support the production of heating from renewable sources mainly for collective housing, but also for tertiary activities, agriculture and manufacturing industries. In addition, to combat the economic and financial crisis, in 2010 the French government decided to launch a 'Great Loan' ('*Grand Emprunt*') aimed at funding "investments for the future"<sup>10</sup> (centres of excellence, large scale projects, pilots, etc), and also investments to implement the objectives of laws *Grenelle 1* and *Grenelle 2*<sup>11</sup>. Beside these large investments, various measures encourage households and enterprises to invest in renewable energies and energy efficiency: tax credit 'sustainable development', reduced VAT rate, 'eco-loan' with a 0 interest rate, feed-in tariffs of electricity, ANAH<sup>12</sup> 'eco-subsidy' for low income households, etc, plus tax exemptions and reduced import duties ('*octroi de mer*') in the overseas regions.

It is very difficult to have a clear idea of the scale of public support provided in each case and for each source of RE. It is equally difficult to assess the respective importance of direct support (subsidies and grants to equipment and facilities) and indirect support (FIT, tax incentives and regulatory measures). Up to now, constraints on public finance seem to have had a negative effect only on support to PV solar energy.

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<sup>9</sup> A specific RT adapted to overseas regions applies from May 2011.

<sup>10</sup> '*Investissements d'avenir*'.

<sup>11</sup> E.g.: EUR 1.35 billion is dedicated to setting up pilots and technological platforms in the field of renewable and de-carbonized energies and 'green' chemistry.

<sup>12</sup> *Agence nationale pour l'amélioration de l'habitat*.

### 3. ERDF AND COHESION FUND SUPPORT AND CONTRIBUTION TO NATIONAL POLICY

#### Overview of the main measures in the ERDF OPs

##### *Competitiveness & Employment regions*

With regard to renewable energies, the main measures are: supporting the structuring, organisation and development of RE 'filières'<sup>13</sup>, and R&D and innovation, collective projects, installations and equipments. Within collective projects, measures also support the initiatives taken by local authorities and their follow up (e.g.: Auvergne). Some regions focus on support to 'exemplary production units'<sup>14</sup> (Poitou–Charentes) or projects for which the breakeven point cannot be reached in current market conditions (PACA). Measures supporting equipment sometimes explicitly exclude households<sup>15</sup>; however, in a few regions, households are eligible (Basse–Normandie for thermal solar, Corsica). In some regions, there are measures aimed at improving the level of information on RE. One region (Centre) is supporting RE through 'innovative financial engineering'.

Concerning energy efficiency, most regions have adopted measures for information and communication, 'animation', diagnostics, advice and feasibility studies, as well as promotion of HQE<sup>16</sup>, HPE<sup>17</sup>, THPE<sup>18</sup>, BBC<sup>19</sup> standards and norms (such as 'Passivhaus' or 'Minergie' in Basse–Normandie). Support to household investment in energy efficiency varies: Bourgogne is excluding such support while Picardie uses financial engineering (reduced interest rates), and Ile de France focuses on social housing.

##### *Convergence regions*

Measures regarding renewable energies, beside supporting their promotion, are supporting the development of new 'filières' (biomass, biofuels) and of more 'classical' ones (solar) as in Guadeloupe; they specifically favour the use of solar energy for heating water. In Guyane, where the hinterland is very sparsely populated, there are measures supporting the development of RE in isolated and non-connectable places and the connection to the electricity network wherever possible, in order to make the cost of energy bearable.

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<sup>13</sup> The concept and word 'filière' have no real equivalent in English. A *filière* can be defined as a cluster of all activities related to the same sector (e.g.: wind energy production), from production (including equipment and facilities) to commercialization, along a 'vertical' approach.

<sup>14</sup> Small-scale plants.

<sup>15</sup> E.g.: Auvergne, Bourgogne.

<sup>16</sup> *Haute qualité environnementale* (High Environmental Quality).

<sup>17</sup> *Haute performance énergétique* (High Energy Efficiency).

<sup>18</sup> *Très haute performance énergétique* (Very High Energy Efficiency).

<sup>19</sup> *Bâtiment basse consommation* (Low Consumption Building).



Measures involving energy efficiency are globally similar to those of the Competitiveness & Employment regions.

### Support to specific forms of renewable energies and specific means of improving energy efficiency<sup>20</sup>

**Table A – Allocation of ERDF to renewable energies and energy efficiency (end 2009)**

Allocation of ERDF	Allocation (EUR million)	% of total ERDF funding
Wind (FOI code 39)	37.5	0.5 (10.4% of total RE)
Solar (FOI code 40)	115.0	1.4 (32.0% of total RE)
Biomass (FOI code 41)	146.4	1.8 (40.7% of total RE)
Hydroelectric, geothermal and other (FOI code 42)	60.8	0.8 (16.9% of total RE)
<b>Total RE</b>	<b>359.6</b>	<b>4.5</b>
<b>Energy efficiency, co-generation, energy management (FOI code 43)</b>	<b>224.8</b>	<b>2.8</b>
<b>Total ERDF</b>	<b>8,054.7</b>	<b>100.0</b>

The total ERDF allocation to renewable energies and energy efficiency amounts to about EUR 584 million, of which 61.5% to RE and 38.5% to energy efficiency (of which a part only for residential housing).

In most regions, ERDF support is dedicated to specific forms of renewable energies. The table below indicates the number of regions for which there is an indication of support to a specific form.

**Table B – Number regions supporting a specific form of RE**

	FOI code		Number of regions
	Environment and energy	39	Renewable energy: wind
40		Renewable energy: solar	20
41		Renewable energy: biomass	23
42		Renewable energy: hydroelectric, geothermal and other	19

ERDF support benefits firstly to biomass (in particular to the *filière bois-énergie* supported by a number of regions<sup>21</sup> with about 40% of ERDF allocation to RE), secondly to solar energy

<sup>20</sup> See Annex Figure 1 and 2.

(32%), and much further behind to hydroelectric, geothermal and other sources (17%) and wind (10%). Some OPs indicate that wind is not a priority since the regulated FIT is sufficient for attracting investment<sup>22</sup>; moreover, offshore wind energy is one of the State policy priorities.

### Scale of ERDF support to RE and energy efficiency

ERDF support to RE and energy efficiency represents a small proportion of the total amount of ERDF support under OPs: 4.46% for RE and 2.79% for energy efficiency.

#### *Renewable energies*<sup>23</sup>

There are very important differences between regions. Support varies from 2.8% of ERDF OPs in Limousin to 23.9% in Poitou–Charentes. Four regions dedicate more than 10% of their OP to RE – Bourgogne (11.9%), Corsica (15.6%), Ile de France (10.1%) and Poitou–Charentes (23.9%). Convergence regions dedicate a smaller part of ERDF support to RE, ranging from 1.3% in Guadeloupe and La Réunion to 4.3% in Martinique.

**Wind energy:** 6 regions dedicate between 0.5% and 2% of their OP to it: Poitou–Charentes, Languedoc–Roussillon, Martinique, Midi–Pyrénées, Haute–Normandie and PACA, the first by far. If we consider the percentage “ERDF OP dedicated to wind energy / total ERDF dedicated in France to wind energy”, PACA comes first again (16%) followed by Midi–Pyrénées and far behind by two Convergence regions (Martinique and La Réunion).

**Solar energy:** Poitou–Charentes is a clear leader with 10.7% of its ERDF OP, and more than 18% of the national ERDF support. Martinique comes second (with respectively 3% and about 10%) together with Ile de France (4.2% and 5.5%).

**Biomass:** With 12.1% of its ERDF OP dedicated to biomass and 16% of national ERDF support, Poitou–Charentes is again leader. Corsica comes second (11.8% and almost 8%) together with Bourgogne (9.7% and about 12%). Aquitaine, Lorraine and Languedoc–Roussillon also invest significant amounts of their ERDF money in biomass.

5 regions have allotted a share of ERDF support to **other sources of RE**: Languedoc–Roussillon (14%), Aquitaine and Ile de France (10.5%), PACA (10%) and Lorraine (9.5%).

#### *Energy efficiency*<sup>24</sup>

There are again important differences between regions. In Competitiveness & Employment regions, support varies from about 1% of ERDF OPs (Limousin, Auvergne) to 12.4% in Picardie, the only region which has dedicated more than 10% of its ERDF OP to energy

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<sup>21</sup> Alsace, Aquitaine, Bourgogne, Bretagne, Franche–Comté, etc.

<sup>22</sup> Auvergne, Basse–Normandie.

<sup>23</sup> See Annex Figure 3, 4, 5 and 6.

<sup>24</sup> See Annex Figure 7.

efficiency. Three regions have dedicated between 5% and 10%: Centre (5.1%), Alsace (9.7%) and Corsica (9.7%). The highest shares of support to energy efficiency in proportion to the national ERDF support to energy efficiency are found in Nord Pas-de-Calais (11.5%) and in Picardie (11%). Thus, Picardie appears to be the region with the strongest policy in favour of energy efficiency, including a cluster strategy (“Sustainable Building”).

### ERDF OPs measures and national measures

It is very difficult to single out the scale of the overall national support to RE and energy efficiency. Fragmentary information is however available, e.g. the financial grant of the State to the *Agence de l’Environnement et de la Maîtrise de l’Energie* (ADEME) amounts to EUR 832 million in 2010, with 50% dedicated to the strand “energy-climate”.

The State is mainly supporting R&D and innovation projects (with the so-called “investments for the future”, a part of which is dedicated to RE and energy efficiency) and using indirect support measures (tax credits, ‘eco-loans’, reduced VAT rates, etc) and FIT. The regions are mainly using direct support measures (grants, ‘energy vouchers’) and they also support RE production equipment.

Accordingly, national and regional support measures, along with ERDF OPs support, appear as complementary in Convergence as well as in Competitiveness & Employment regions. Moreover, some measures are co-funded (a characteristic of the French public intervention framework<sup>25</sup>): e.g.: ADEME-Regions partnership agreements supporting information and communication or energy efficiency actions; support to ‘*filières*’.

### Conclusion

By the end of 2009, the ERDF commitment level was of about 8–9% with 2 groups of regions:

- Regions with a relatively high commitment level: Poitou-Charentes (41.2%), Bourgogne (30.3%), Picardie (22.9%), not surprisingly regions which have a well characterised policy in the field of RE and energy efficiency;
- Regions with a low or very low commitment level: Languedoc-Roussillon and Limousin for RE; Aquitaine, Auvergne, Languedoc-Roussillon again, Lorraine and Midi-Pyrénées; in the Convergence regions, the commitment level is low in general with the exception of Guyane for RE.

Delay in commitment is reported in a number of 2009 Annual Implementation Reports (AIR). Organisations in charge of renewable energies and energy efficiency seem less experienced in using ERDF than those in charge, for instance, of innovation and enterprise support. On

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<sup>25</sup> In particular through the *Contrats de Plan Etat-région*.

the other hand, the first projects supported by ERDF money are often small ones and there may have been difficulties in promoting actions and sensitising potential beneficiaries<sup>26</sup>. Some AIRs report that the crisis has made the implementation of projects more difficult.

Moreover, laws *Grenelle 1* and *Grenelle 2* were adopted in 2009 and 2010, so their impact will only become evident from now on. Government decisions favouring the use of ERDF to support energy efficiency have been aligned with the EU Recovery Plan on energy efficiency<sup>27</sup>, but no important effects were visible at the end of 2009.

#### 4. RATIONALE FOR PUBLIC INTERVENTION

While the policies carried out by the regions are often highly contrasted, the rationale for public intervention put forward in the ERDF OPs is largely common to all of them and can be summarised as follows:

- there has been a strong increase of the energy consumption for over a decade, mainly due to residential consumption and tertiary activities, and in some cases industry (Haute-Normandie); in Guyane, the increase is due to a high rate of demographic growth, and in La Réunion, it is attributed to a rapidly improving standard of living;
- in order to meet these growing energy needs, it is thus necessary to reduce the emissions of greenhouse gases, since fossil fuels are predominant, to combat pollution and climate change.

Within this perspective, a number of ERDF OPs makes reference to the 2005 *Loi d'orientation sur l'énergie* and the regional *Plans climat-énergie*.

In addition, six Competitiveness & Employment regions as well as all Convergence regions explicitly indicate the reduction of regional energy dependency (security of energy supply) as a reason for supporting RE and energy efficiency.

In general, the expected returns on investment are economic and social and concern:

- the structuring and development of *filières* (especially the *filière bois-énergie*) which may create jobs, contribute to developing know-how and skills, and improve the competitiveness of the region;
- progress in R&D and innovation, including breakthrough innovation (hydrogen platform in Nord Pas-de-Calais, capture of CO<sub>2</sub> in Ile de France).

No real distinction is made with respect to the profitability of investment between the different types of RE and the different ways of improving the energy efficiency of housing,

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<sup>26</sup> E.g.: Bretagne.

<sup>27</sup> COM(2008)800 final, 26 November 2008, 'A European Recovery Plan'.

apart from: the low priority given to wind energy for the existing FIT are sufficient to attract private investment; the support to the *filière bois-énergie* with a strong regional economic development dimension.

The 2007 debate known as the *Grenelle de l'environnement* allowed outlining the major orientations of the national policy for the next few years, with a first phase of dialogue through 6 thematic working groups, then, a public consultation (regional meetings and an Internet forum), and an overall synthesis. The *Grenelle de l'environnement* paved the way for measures fostering RE and energy efficiency in the 2 laws *Grenelle 1* and *Grenelle 2*. Apart from this exercise of institutionalised '*démocratie participative*', there has been for years a much less publicised debate on the key role of nuclear energy in France, under the pressure of the Greens political party. However, the Fukushima disaster recently led to a shift in public opinion against nuclear energy and in favour of RE.

## 5. RATE OF SUPPORT AND PROFITABILITY

ERDF OPs make no specific reference to the profitability of investment in RE and energy efficiency, with maybe the exception of the Guyane OP (with a concrete approach to the financial and technical problems related to each source of RE), and of the Midi-Pyrénées ERDF OP (profitability of bio-fuels due to high oil prices); the Midi-Pyrénées OP is the only text that explicitly refers to changes in the cost of fossil fuels.

The National Action Plan emphasises that there are large disparities in maturity between the RE energy production sectors and that the incentive mechanisms put in place differ accordingly and should periodically be adapted to new technical and economic developments. For mature and capitalistic technologies (water power and onshore wind power), the purchasing prices are aimed at protecting investors and at ensuring a guaranteed return on investment. When particular technical or environmental criteria apply, as is the case for biomass or offshore wind power, the use of calls for tenders is favoured. For largely decentralised sectors such as photovoltaic (PV), the incentives are mainly aimed at reducing the initial investment. More global measures such as the zero rate 'eco-loan' are intended to encourage beneficiaries to carry out the complete renovation of buildings and combine energy efficiency and RE production.

The following table provides an overall approach of the rate of support to the various RE sources through the level of feed-in tariffs.

**Table C – Synthesis of measures to support RE in electricity generation**

Electricity prices (per KWh 000)		Measures						
Domestic	Industry	Biomass	Biowaste	PV solar	Thermal solar	Small hydro	Wind onshore	Wind offshore
92.5	63.3	Calls	FIT* 75–90 (excl. energy efficiency and methanis. bonif., 15 years)	FIT 328–437 (20 years)		FIT 60–71 (guaranteed 20 years, bonus)	FIT 82 (guaranteed 15 years, tariffs decreasing every 5 years)	Calls FIT 130 (guaranteed 15 years, tariffs decreasing every 5 years)

\* FIT: Feed-in tariffs. Source: Applica/Ismeri – without latest updating<sup>28)</sup>

The FIT for wind energy, in particular offshore, are high, in relation to the recent State strategy<sup>29)</sup>, which explains the low priority given to wind energy in the ERDF OPs.

There are some variations in the rate of support linked to geographic conditions for wind energy and PV solar, i.e. to the expected profitability: for wind, “depending on the sites” after the initial period for which the FIT is guaranteed (2008); for PV solar facilities which are not integrated into constructions, adjustments depend on the average sunshine of the area (+0% to +20%). For biomass and geothermal energy, there is in general an ‘energy efficiency bonus’ on top of FIT. Only one variation of the rate of support, which is related to the changes in the cost of fossil fuels and concerns co-generation (price of gas), is mentioned.

## 6. COSTS, PUBLIC SUPPORT AND PRICES

### Current amount of public support given to each type of renewable energy

As stressed above, PV solar gets the maximum support through FIT, followed by wind offshore. However, the targets differ, since PV solar FIT benefits mainly households while wind offshore FIT benefits investors. Apart from the specificities of ERDF-funded measures in each OP, the differences between the regions with respect to public support only involve overseas regions and Mayotte for PV solar facilities not integrated into constructions (2010); these regions benefit from a premium of more than 25%.

No figure is available for the total amount of public support dedicated to each type of renewable energy.

### Current costs of producing electricity from each source of renewable energy

<sup>28)</sup> <http://www.developpement-durable.gouv.fr/Les-tarifs-d-achat-de-l,12195.html>

<sup>29)</sup> Call for tender in June 2011. The target by 2020 is 1200 offshore facilities.

In 2008 the ministry in charge of Ecology and Energy<sup>30</sup> edited a synthesis of a study on the costs of electricity production<sup>31</sup>. The study is based on IEA forecasts and a scenario based on the price of gas (at French border) at 6.55\$<sup>32</sup> MBtu, the price of the ton of coal (CIF) at 60\$, the price of oil barrel (Brent) at 55\$, the price of uranium at 52\$/lb.

**Table D – Synthesis of current costs of producing electricity from each source of renewable energy**

		Costs			
Source	Type of unit	Total (EUR/MWh)	Investment	costs	Taxes
Biomass	–	103 > 181	24%	20% <sup>33</sup>	4%
Biowaste	7 MW <sup>34</sup>	44.5 > 56	60%	30%	10%
PV solar <sup>35</sup>	3kWc capacity	400 <sup>36</sup>	82%	15%	3% <sup>37</sup>
	10 MWc capacity	228 <sup>38</sup>	–	–	–
Small hydro	'low fall' (1 MW)	64.8 > 96.4	66%	22%	12%
	'high fall' (1 MW)	64.6 > 99	71%	16%	13%
Wind	Onshore <sup>39</sup>	74 <sup>40</sup>	69%	19%	12%
	Offshore <sup>41</sup>	117,9 <sup>42</sup>	–	–	–
	Overseas regions (onshore)	107,2 <sup>43</sup>	–	–	–

### Energy efficiency in residential housing (interviews to be carried out)

The “*Baromètre 2010 sur l'éco-performance des bâtiments*”<sup>44</sup> indicates that, while reporting by real estate professionals on property energy efficiency performance is making progress, the linkage between this performance and the market prices of residential housing has not

<sup>30</sup> Directorate General for Energy and Climate.

<sup>31</sup> *Synthèse publique des coûts de référence de la production électrique.*

<sup>32</sup> 1 EUR = 1,-. \$15.

<sup>33</sup> And combustible: 52%.

<sup>34</sup> Household waste incineration unit.

<sup>35</sup> With an incidence of solar energy of 1950 kWh/kWc/year.

<sup>36</sup> By 2020, the cost should be 262 EUR/MWh (due to technological innovation which is expected to reduce the investment cost).

<sup>37</sup>By 2020, respectively 71% and 16% (taxes: 13%).

<sup>38</sup> By 2020, the cost should be 171EUR/MWh.

<sup>39</sup> Full operating duration: 2,400 hrs/yr.

<sup>40</sup> 61.7 EUR/MWh by 2020.

<sup>41</sup> Full operating duration: 3,000 hrs/yr.

<sup>42</sup> 98.2 EUR/MWh by 2020.

<sup>43</sup> 89.4 EUR/MWh by 2020.

<sup>44</sup> [www.novethic.fr/novethic/upload/etudes/Barometre\\_2010.pdf](http://www.novethic.fr/novethic/upload/etudes/Barometre_2010.pdf). The document is edited by a subsidiary of the public financial institution *Caisse des Dépôts et Consignations*.

been so far confirmed by statistical data (by lack of track record), but is notwithstanding anticipated by the market actors.

## 7. CONCLUSIONS

The French policy landscape for renewable energies and energy efficiency is changing rapidly. Considering the investment ‘bubble’ in PV solar energy, the government has recently decided to reduce the FIT for this renewable source<sup>45</sup> quite drastically, while some regional authorities are considering the possibility of compensating the reduction of State support. On the other hand, the governmental decision may also be interpreted as a result of budgetary constraints<sup>46</sup>. Officially, PV solar remains a priority, behind wind offshore and biomass. Anyway, it is highly probable that budgetary constraints will entail a ‘re-dimensioning’ of the overall *Grenelle* process.

The most recent indications (official speeches of the Minister in charge of the Environment) signal a strong focus on offshore wind energy, with powerful investors, such as the public nuclear energy company Areva, prepared to make proposals in response to calls for tenders. It also seems that the government is intending to make biomass, and especially biogas (methanisation) a major source of RE by 2020: in May 2011, the FIT for biogas produced by small and mid-size farms was increased by 20%<sup>47</sup>. The ‘stability’ of the policy measure is a fundamental issue essential for investors.

It is considered that hydropower has already been widely exploited and that there remain relatively few ‘good’ sites for onshore wind facilities (which moreover benefited from a favourable FIT).

In general, it must be underlined that sectoral (or *filières*) economic issues and environmental issues remain strongly interrelated at regional level. We have for instance two types of regional reactions to the reduced support to PV solar energy: Aquitaine, which had strongly supported PV solar energy from 2008 to 2010<sup>48</sup>, is planning to shift its support to housing isolation works with the objective of developing a regional *filière* of expertise; in March 2011, Poitou-Charentes, a region strongly active in the field of RE adopted a new plan in favour of solar energy with a “*Fonds de résistance photovoltaïque*” aimed at tackling “the national measures which are penalising the PV *filière*, in order to maintain its profitability and non-displaceable jobs”, and targeted at enterprises, local authorities and households.

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<sup>45</sup> It was recently decided to organise calls for tenders for units with a capacity higher than 100 MW (first call expected by summer 2011).

<sup>46</sup> Or in some cases technical limitations related to intermittent energy sources (solar, wind).

<sup>47</sup> Expected cost: EUR 300 million/year for about 100 projects.

<sup>48</sup> 5,000 facilities supported (for a total of 15 MW, which equals a small ground solar unit).



With the crisis, social issues are also up on the agenda with various initiatives (national with ANAH, regional as in Basse-Normandie or Centre) aimed at supporting diagnostics, construction or renovation of housing to the benefit of low income households.

For the future, the target is to have 23% of final gross energy consumption (heating and cooling, electricity and transport<sup>49</sup>) coming from renewable sources by 2020, with particularly strong expectations for wind energy (1,5% of total electricity generated by RE in 2005 and 37,3% by 2020). However, the main source of improvement is expected from thermal performance of residential and tertiary buildings: the *Grenelle de l'environnement* set a target at 38% reduction in consumption by housing by 2020. With this respect, a key issue is the recent debate, opened by Fukushima, about the future of nuclear energy, since the main opposition parties are advocating an agenda for reducing the share of nuclear energy to the benefit of RE – or (Greens) programming the closing of the nuclear energy plants.

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<sup>49</sup> National Action Plan for the Promotion of Renewable Energies 2009–2020 in accordance with Article 4 of EU Directive 2009/28/EC), *Ministère de l'Ecologie, de l'Energie, du Développement durable et de la Mer*, ed. 2010, pp. 10–12.

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## INTERVIEWS

Christine LAVARDE, chef du Département « Dispositifs de soutien aux énergies renouvelables et aux consommateurs » (Direction développement des marchés), Commission de Régulation de l'Énergie

Esther PIVET, Directrice du développement des marchés, Commission de Régulation de l'Énergi

## TABLES AND FIGURES

Annex Table A – Allocation and Commitments by region

Region	FOI code 39 – Wind		FOI code 40 – Solar		FOI code 41 – Biomass		FOI code 42 – hydro+geo		Allocation FOI code 39-42 / % of total ERDF	Committed end 2009 : Allocation 39-42 / % of total ERDF	FOI code 43 – Energy efficiency	
	Allocation (%)	Committed (%)	Allocation (%)	Committed (%)	Allocation (%)	Committed (%)	Allocation (%)	Committed (%)			Allocation (%)	Committed (%)
Alsace	0.0	0.0	2.6	0.6	4.6	5.7	0.3	0.0	7.5	6.3	6.7	9.6
Aquitaine	0.3	0.0	2.0	5.6	3.1	0.4	1.6	0.0	7.0	6.0	3.0	0.4
Auvergne	0.0	0.0	1.5	0.3	2.9	3.6	1.0	0.1	5.3	4.0	1.0	0.4
Basse-Normandie	0.0	<i>ND</i>	0.8	<i>ND</i>	3.3	<i>ND</i>	0.8	<i>ND</i>	5.0	<i>ND</i>	3.3	<i>ND</i>
Bourgogne	0.3	0.0	1.6	19.3	9.7	9.8	0.3	0.0	11.9	29.1	2.2	1.2
Bretagne	0.3	0.0	0.7	0.4	1.7	3.1	0.3	0.1	3.0	3.6	3.3	1.0
Centre	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	1.2
Champagne-Ardenne	0.0	0.0	0.0	0.0	3.2	4.6	0.0	0.0	3.2	4.6	2.7	0.0
Corse	0.0	<i>ND</i>	0.0	<i>ND</i>	11.8	<i>ND</i>	3.8	<i>ND</i>	15.6	<i>ND</i>	9.7	<i>ND</i>
Franche-Comté	0.0	0.0	0.0	0.0	3.4	2.9	0.0	0.0	3.4	2.9	4.4	2.0
Haute-Normandie	1.2	0.0	1.2	0.0	1.2	0.0	1.2	0.0	5.0	0.0	2.3	5.4
IDF	0.0	<i>ND</i>	4.2	<i>ND</i>	1.7	<i>ND</i>	4.2	<i>ND</i>	10.1	<i>ND</i>	4.4	<i>ND</i>
Languedoc-Roussillon	0.7	0.3	1.5	0.4	4.1	0.1	3.3	0.1	9.6	0.8	3.9	0.7
Limousin	0.4	0.0	0.4	0.1	2.0	0.5	0.0	0.0	2.8	0.6	0.8	1.3
Lorraine	0.0	0.0	1.3	0.1	3.3	5.5	1.7	0.1	6.4	5.7	0.0	0.6
Midi-Pyrénées	1.2	0.0	1.2	4.1	1.2	1.7	1.2	0.3	4.7	6.1	1.6	0.7

Nord-Pas-de-Calais	0.3	ND	1.1	ND	1.1	ND	0.3	ND	2.9	ND	3.7	ND
PACA	2.0	ND	2.0	ND	2.0	ND	2.0	ND	7.9	ND	2.0	ND
Pays-de-la-Loire	0.4	0.0	0.9	5.1	2.6	3.0	0.4	0.2	4.3	8.3	4.3	1.1
Picardie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.4	22.9
Poitou-Charentes	0.5	0.0	10.7	24.9	12.1	12.6	0.5	0.9	23.9	38.3	2.9	2.9
Rhône-Alpes	0.0	0.0	0.9	0.2	2.7	5.4	0.0	0.0	3.6	5.7	3.6	2.4
Guadeloupe	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	1.3	0.0	0.3	0.0
Martinique	0.7	0.0	3.0	3.7	0.2	0.0	0.2	0.0	4.3	3.7	1.0	0.0
La Réunion	0.3	2.0	0.5	0.0	0.1	0.0	0.4	0.0	1.3	2.0	0.2	0.0
Guyane	0.0	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	4.2	0.2
<i>Average</i>	<i>0.3</i>	<i>0.5</i>	<i>1.5</i>	<i>3.1</i>	<i>3.0</i>	<i>2.8</i>	<i>0.9</i>	<i>0.1</i>	<i>5.8</i>	<i>6.5</i>	<i>3.4</i>	<i>2.6</i>

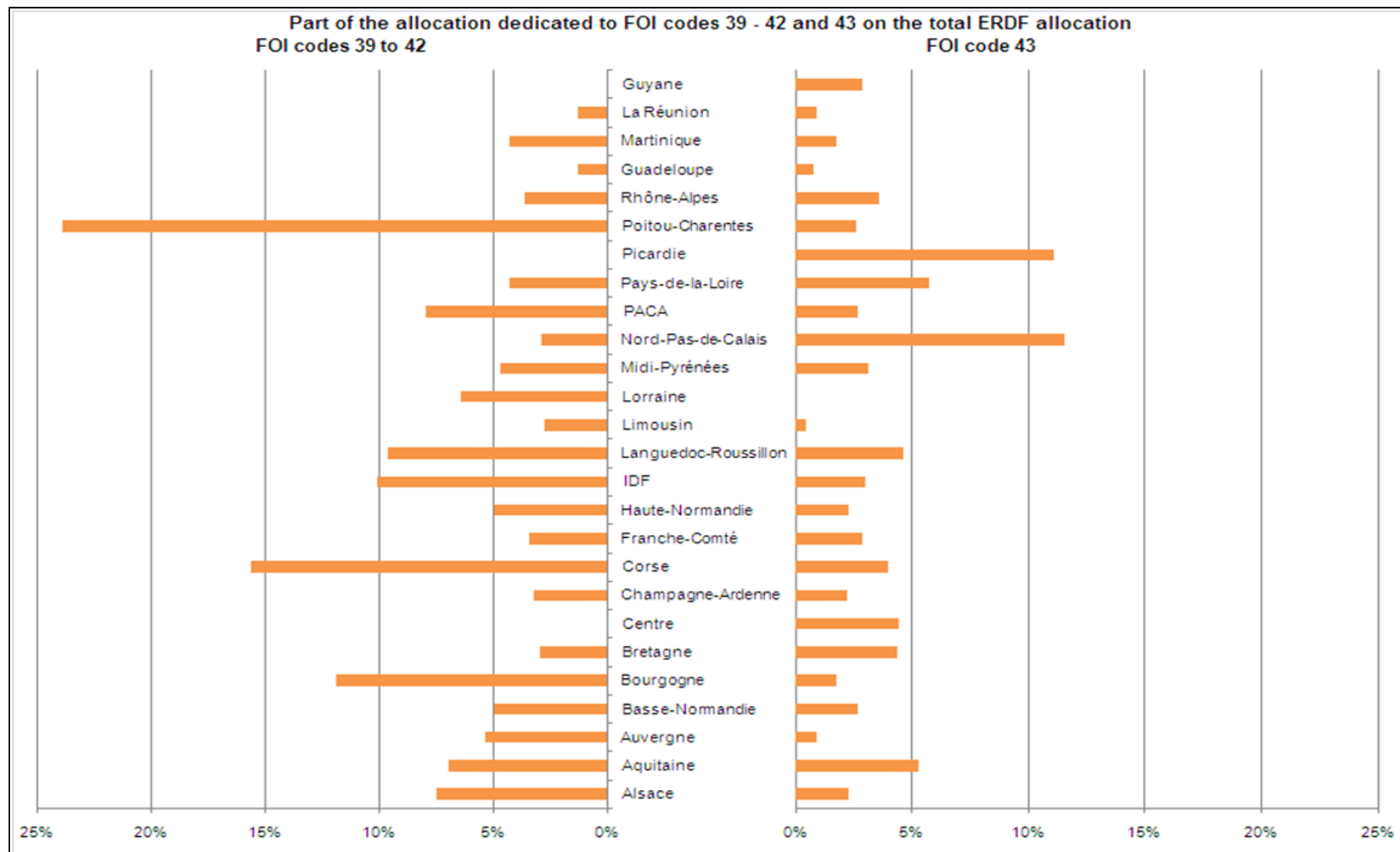
Annex Table B – Table 2: Number of regions allocating ERDF funding to a specific form of RE

FOI code		Number of regions	
Allocation (FOI code 39–42)	39	Renewable energy: wind	14
	40	Renewable energy: solar	20
	41	Renewable energy: biomass	23
	42	Renewable energy: hydroelectric, geothermal and other	19
Allocation (FOI code 43)		Energy efficiency, co-generation, energy management	25

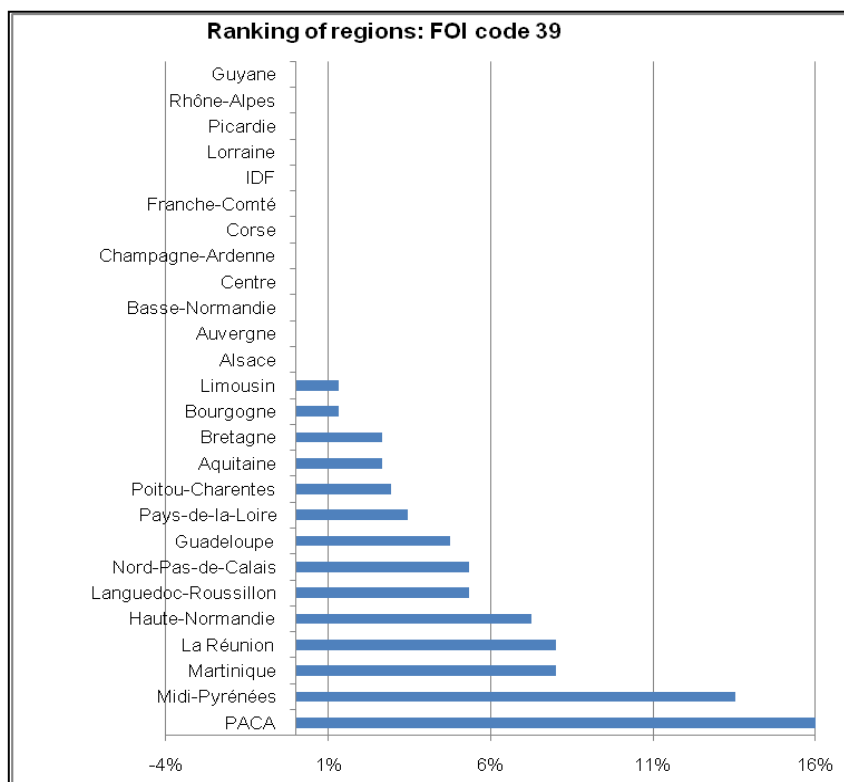
Annex Figure 1 – ERDF allocation and committed



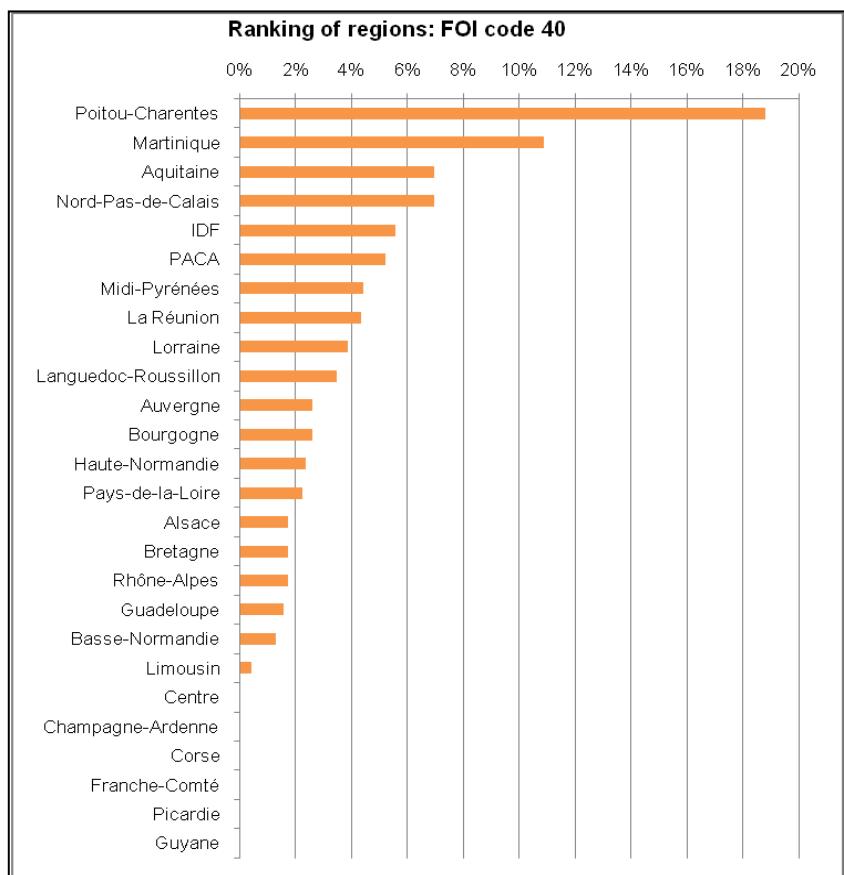
Annex Figure 1 – Part of the allocation dedicated to FOI codes 39 – 42 and 43 on the total ERDF allocation



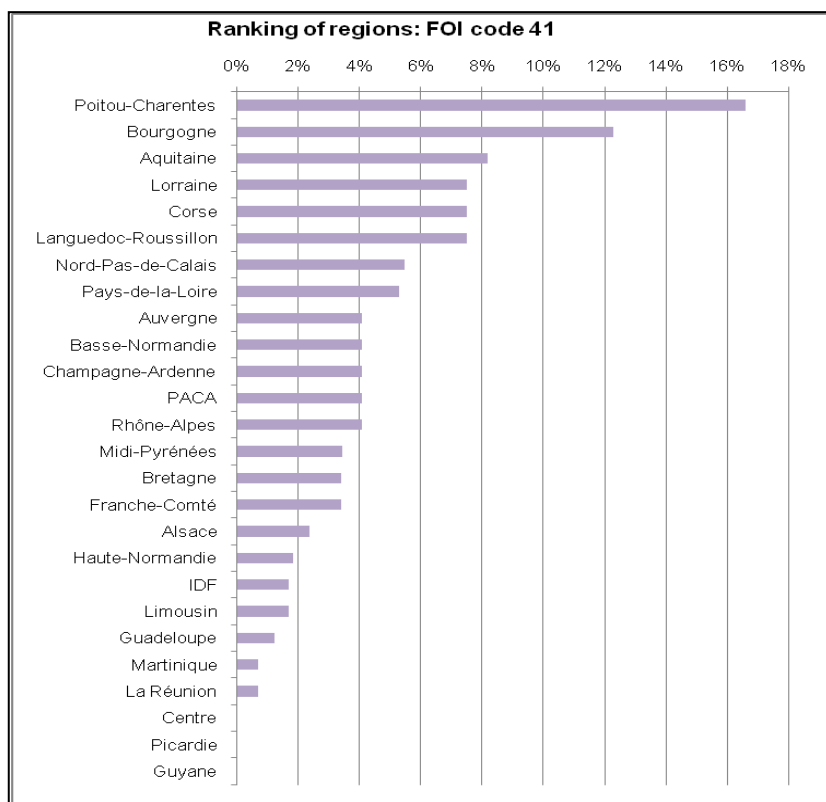
**Annex Figure 2 – Share of total national ERDF dedicated to wind energy (FOI code 39)**



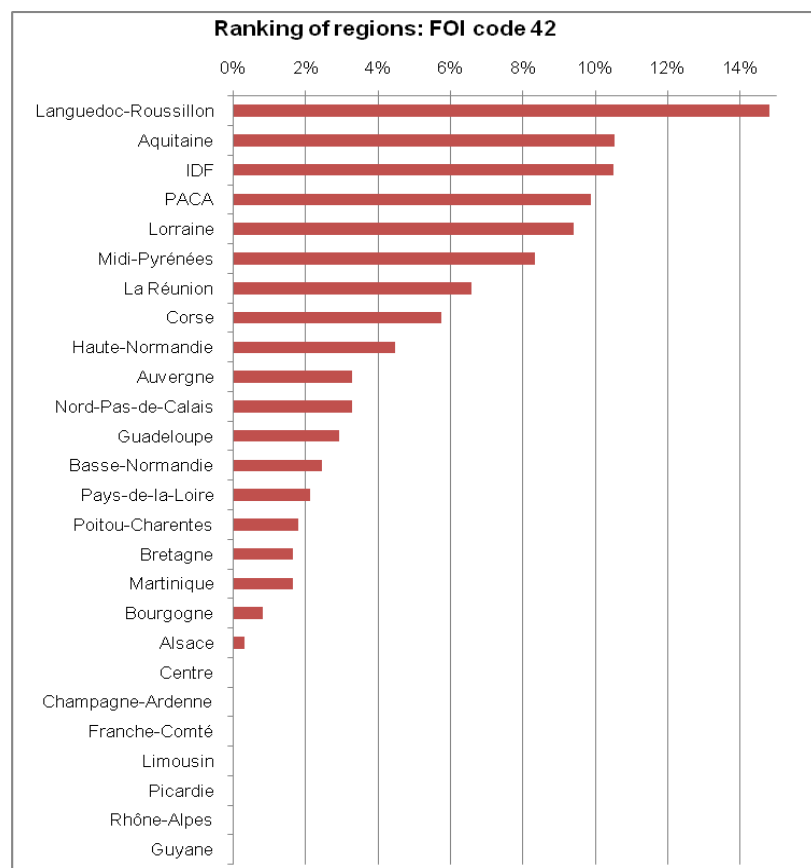
**Annex Figure 3 – Share of total national ERDF dedicated to solar energy (FOI code 40)**



**Annex Figure 4 – Share of total national ERDF dedicated to biomass (FOI code 41)**



**Annex Figure 5 – Share of total national ERDF dedicated to hydroelectric, geothermal, etc (FOI code 42)**





**Annex Figure 6 – Share of total national ERDF dedicated to energy efficiency (FOI code 43)**