EnAlgae policy landscape analysis for

France

Landscape analysis of national and regional policies of France that could have an impact in algae cultivation revealed a number of strategies, mandates, and economic incentives on climate change, bioenergy, and water. Although French aquaculture industry is an old and established sector among the EU countries, production of Energetic Algae (or algae for production of fuels and energy) is a new concept in France, and existing bioenergy and environmental strategies were not found to be actively supportive to energetic algae. The only exception to this is a regional policy for Bretagne that aimed at mitigation of environmental nuisance arising from excess wild green algae production in Bretagne coastline. The policy assists regional development and construction of AD projects for green algae.To identify policies that could affect energetic algae, research was focussed on generic biomass, bioenergy and environmental strategies.

Many of the identified national and regional policies in Franceare in fact response mechanisms to EU-level overarching strategies and targets. Nevertheless, France, like each EU member state, can set its own priorities and strategies in order to reach the EU targets. In regard to national energy targets, France has a primary obligation set in the EU Renewable Energy Directive (RED) to source 23% of energy from renewable sources, including 10% of transport fuels by 2020. In response to RED targets, France plans to source 27% of renewable electricity, 33% of heating and cooling consumption from renewable sources.

Technologies that French policies strategically support to reach renewable targets, include biogas from Anaeroboc Digestion (AD) of agricultural and food wastes, and bioelectricity and bioheat from combustion of wood and waste. Regarding waste, France wishesto invest mainly in the development of waste recovery technologies such as AD, and not in landfilling or waste incineration. France envisages positioning itself as the leader in AD technologies among others. Because 50% of solid biomass electricity comes from waste incineration, France wishes toinvest further in other bioenergy technologies like AD, biomass power or biomass CHP. Yet AD technologies have strong potential to use algae as biomass feedstock, especially if algae are produced in conjunction with wastewater or flue gas bioremediation.

To reach its targets France has issued several financial schemes for project development and capital investment, like funds for research and development, financial aids for creation of industrial demonstrations, installation or purchase of equipment in domestic and commercial sector, soft loans, etc. Additionallyto reach the renewable energy quotas, France has created policies like feed-in tariffs for bioelectricity and bioheat and tax exemptions for biofuels.

For transport biofuels, in order to reach the 10.5% renewable target, biofuels have to be blended with conventional fuels as defined for each fuel type. If the fuel suppliers do not follow the biofuels quota, they will enter in a higher tax-rate for polluting activities (TGAP).

Further on, findings from landscape analysis of French legislation are listed by topic. First are presented the overarching strategies and acts, which are then followed by targeting incentives.

# General Policy Framework

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| Policy | Key Measures/Aims |
| Grenelle de l’Environnement.  Grenelle Environment Law (2009,2010)[[1]](#footnote-3) | The Grenelle Environmental Law is based on the recommendations of the Grenelle Environment Forum, which was to establish France’s priorities for sustainable development. There have been two Grenelle laws, the first in 2009 and the second in 2010. One of the recommendations was to increase renewable energies by 50% in 2012 and 120% by 2020. The details of the Grenelle Environment law are summarised in the National action plan for the promotion of renewable energies 2009-2020. |
| National Renewable Energy Action Plan (2010).[[2]](#footnote-4)(In accordance with Article 4 of European Union Directive 2009/28/EC). | The National Renewable Energy Action Plan (NREAP) envisages an increase in the production of biomass electricity from 3.8 TWh in 2010 to 17.2 TWh in 2020, by doubling solid biomass electricity production (wood and household waste) and tripling biogas electricity production. The incineration of household waste (currently representing more than 50% of solid biomass electricity production) should remain the same; it is therefore wood and biogas that should provide the additional 13.4 TWh.  Various incentives and aid schemes have been established towards reaching these targets: financial aid for research and development projects, aid for the creation of industrial demonstrators, aid for the installation or purchase of equipment, soft loans, etc. France intends to position itself as the leader in technologies as diverse as wind power, maritime energies, solar photovoltaics and thermodynamic, the production of biogas units, etc.  The National Renewable Energy Action Plan sets a target of the share of renewable energies to be 23% in total, and broken down to 27 % in electricity sector, 33 % in heating/cooling sector, and 10.5 % in transport sector by 2020. |
| Decree of 15 December 2009 on the multiannual investment program of heat production[[3]](#footnote-5) | The multiannual investment program for bringing renewable heat technologies to the market for satisfying heating capacity targets. Strategic technologies are among others:  Power (co)generation from biomass (not through biogas): 2300 MW from the date of publication (11 January 2010)of this Order and till December 31, 2020. The development objectives of the heat production from renewable energies in France are as follows, in terms of overall production:  For heat produced by cogeneration from biomass:2,400 ktoe to 31 December 2020.With the renewable share of waste, 900 ktoe to 31 December 2020.  For biogas: 555 ktoeby 31 December 2020. |
| The Waste Action Plan 2009-2012 | The priority objectives are foremost source reduction of waste production and the development of recycling and recovery.The plan includes:  - 7% reduction in the production of household and similar waste per capita over the next five years, of the order of 1.5 million tons of waste avoided;  - Improving the recycling rate of organic matter to 35% in 2012 and 45% in 2015 for household waste and 75% in 2012 for corporate waste and packaging;  - Better use of waste to reduce by 15% of the amounts sent to incineration and landfill.  Support will be prioritized towaste prevention, for which €195 million for 2009-2011 (or 34% of furnd) will be allocated,waste recycling programs will receive €105 million (18%), organic recovery with 18% to €105 million. |

# Bioenergy

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| Policy | Ambitions | Policy Measures | Financial Incentives |
| Feed-in-tariffs of Renewables Obligation (2011)  (Obligation d’Achat des Énergies Renouvelables)[[4]](#footnote-6) | Promote the uptake of renewable power. | All the energy suppliers (including the national power supplier EDF) are to get premium tariffs when producing electricity generated by renewable sources of electricity or cogeneration. Both private and public suppliers are eligible for these tariffs.  Tariffs vary according to technology used, the origin of biomass, and if additional energy efficiency measures are taken. These renewable energy technologies are not subject to a cap.  Except a fixed base rate a premium can be assigned according to criteria of power, resource use and energy efficiency. | Biomass combustion:  Fixed rate for 20 years:4.34 c€/kWh plus a premium of energy efficiency between 7.71 and 12.53 c€/kWh  Biogas:  Fixed rate for 15 years between**8.121-9.745 c€/kWh** depending on the power plus a premium energy efficiency between **0 and 4 c€/kWh**  Biomethane injected to the grid:  A fixed tariff of between 11.19-13.37c€/kWh for 15 years with a premium of between 0-2.6 c€/kWh for utilisation of livestock effluent and 0-4 c€/kWh for energy efficiency. |
| Sustainable development Income tax credit 2005-2012[[5]](#footnote-7),[[6]](#footnote-8)  (Créditd´impôt) | This measure contributes to the achievement of French targets in energy saving and renewable energiesin the domestic sector. | The income tax credit is granted to tax payers, who pay expenditure forequipment for their main residence that for increasingenergy efficiency and use of renewables.In particular, eligible equipmentfor production of renewable energy are: heating appliancesoperating on wood or other biomasseswith a maximum capacity of 300 MW, equipment for the production of electricity operating on biomass.Plants that generate more than 3 kW are eligible only if the electricity consumption of the building is higher than half of the nominal installed capacity.  The tax credit was valid until 2012. However, it is extended until 2015 for installations carried out in buildings completed before two years ago. | End-users that install renewable energy plants at their principal residence may claim32% of the net hardware costs from tax.  The ceiling for eligible expenditure, fixed at €8,000 for a single person and €16,000 for couples subject to joint taxation, plus €400 per dependant. |
| Reduced VAT rate[[7]](#footnote-9),[[8]](#footnote-10) | This measure contributes to the achievement of theFrench targets in energy saving and renewable energies in the domestic sector. | Aimed for funding work on residential buildings that are more than 2 years old, for purchasing and setting upelectricity and heat production equipment in the existing residential sector, e.g. biomass plants.  The following renewable energy technologies are eligible: boilers, heat pumps, fireplace inserts, wood-burning stoves, solar water heaters | On the French mainland and in Corsica, the reduced VAT rate is 7%. In the overseas departments and regions of Guadeloupe, Martinique and Réunion, the VAT amounts to 2.10% (Art. 296, Code general des Impôts) |
| Zero percent-interest loan (Éco-prêt à tauxzéro) 2009[[9]](#footnote-11) | Renewable heating and/or hot water (bioenergy/wood heating).  It allows the financing of work aiming at improving the energy performance of the housing built before 1990 | One of the conditions in order to benefit from the loan is to carry out the installation of a heating plant or of a sanitary hot water system using biomass.  Only one loan can be granted per housing unit. | The amount of the zero percent-interest loan equals the amount of the costs of the works undertaken and shall not exceed:   * €20,000 if two categories of work are carried out and with reimbursement within 10 years. * €30,000 if at least three categories of work are carried out and with reimbursement within 15 years. |
| Tenders (Appels d´offres)[[10]](#footnote-12)[[11]](#footnote-13) | Promotion of production of electricity from renewables | A promotional tariff may be awarded to the winners of tenders for the construction of renewable energy plants (biomass and biogas among others). Tenders are invited at irregular intervals to reach the target production of electricity from renewable sources, which is specified in the multi-annual investment plant (PPI). The calls for tenders are published in the official gazette of the European Union. | The actual payment to be awarded is calculated in accordance with the successful tenderer's finance plan. |
| The Heat Fund Biomass 2008  (Fonds Chaleur)[[12]](#footnote-14),[[13]](#footnote-15) | Support between 2009 and 2020 the production of renewable  heat up to 5.5 Mtoe, or more than a quarter of the renewable energy production target set by the Grenelle Environment Forum. | €1.2 bn fund between 2009-2013 is available for the development of large scale projects (over 1,000 toe/yr) for production of heat in services, agriculture, and industrial sectors through biomass plants. | The payment to be awarded is calculated in accordance with the successful tenderer's finance plan and with consideration of the relation between the amount of support asked for and the amount of renewable heat produced. |
| Purchase of Injected Biogas (2010)[[14]](#footnote-16) | Aims to increase biomethane injection into the grid stimulating heat, electricity and biofuels production. | €200M per year has been set aside for 2020. Gas suppliers premium tariffs for biomethane injected into natural gas grids:  - For installations of less than 12 MWe cogeneration, there are feed-in tariffs regulated.  - Facilities that produce biomethane and inject into the network can by November 2011 purchase a guaranteed tariff.  - For installations combining cogeneration and injection, there is a purchase price, called price "double recovery."  - Separateaid that is fixed at the territorial level:Funding supplement, if necessary, for biogas projects andproject guidance to the most attractive valuations. | Tariffs depend on installation size and feedstock used to produce the biomethane.  Non-hazardous waste facilities may purchase rates for injected biomethane between 4.5 and 9.5 c€/kWh depending on the size of the installation.  Other biogas plants’ purchase rates of injected biomethane consist of a base rate between 6.4-9.5 c€/kWh depending on the size of the facility, which may be added a premium calculated according to the nature of the feedstock(input) processed by anaerobic digestion used. This premium is between 2-3 c€/kWh, if the input is waste products from agricultureor agribusiness, or it is 0.5 c€/kWh, if theinput household waste.  When inputs are "mixed" (co-digestion), the premium is weighted prorated amounts of inputs used by the installation. |
| Energy Performance Plan for farms(EPP) - Plan de Performance Énergétique (PPE)[[15]](#footnote-17) 2009-2013 | Reduction of GHG emissions from farms through increase of energy generation on farm from renewables and reduction(direct and indirect) of energy consumption, so that 30% of agricultural enterprises should be low energy by 2013. | The area 5 of the program that promotes the production of renewable energy provides for aid forinvestments for the installation ofsolar water heaters, biomass boilers, thermal exchangers andheat pumps, and for AD units and equipment linked to the production of electricityon an isolated site not connected to the network, or linked to the production of electricity on an isolated site not connected to the network. | Investment in AD units is limited to €500,000.  The energy performance plan has a budget for 2009 of €35 million. A further€7 million was released for AD projects in 2010. |
| Support plan  for waste policies (ADEME) for the development of methanisation facilities | In line with the priorities of the Grenelle Environment Forum to move from landfills of wastes towards material and organic recycling: From24% of household and similar waste to 35% in 2012, and then to 45% in 2015. | Support for AD projectsis provided in particular through evaluation of existing units, in particular by their environmental, energy and sanitaryperformance, and by technical and financial support for operations exemplifying the methanisation of biowaste or agricultural effluent.  Only the "biogas production" aspect will be taken into account in the aid assessment (not the recovery of biogas). | In this context, AD equipment may benefit from an aid of 30% maximum, calculated from an assessment basis of the amount of the operation with a ceiling of € 10 million before tax. |

# Biofuels

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| Policy | Ambitions | Policy Measures | Financial Incentives |
| The partial tax exemption for biofuels in France -‘La DefiscalisationPartielle des Biocarburants’2011-2015[[16]](#footnote-18)[[17]](#footnote-19) | Increase the proportion of renewable transport fuels in the transport fuel pool by stimulating the market for biofuels. | Ethanol in gasoline incorporated in pure form of ETBE and vegetable oil methyl esters (FAME) in diesel receive benefits through a reduction of taxation. Since 2006, the ethyl esters of vegetable oils (VOEE), the methyl esters of animal oils (EMHA), the methyl esters of waste oils (EMHU) and synthetic biodiesel also benefit from a tax exemption too.  Biofuels must confirm to the EU Renewable Energy Directive rules on biofuel GHG and sustainability, including GHG savings of 35% compared to fossil fuel equivalents. | The level of tax reduction varies by fuel and has decreased gradually since 2007. In 2012 and 2013, tax reductions are as follows: ETBE, ethanol and vegetable oil derived FAME have a tax reduction of €14 per hectolitre (100 litre). Biodiesel, hydrogenated vegetable oil, FAME from animal oils and FAME from used cooking oils have a tax reduction of€8 per hectolitre. |
| Biofuel quota (reduction of the tax on polluting activities (réduction de la taxegénéralesur les activitéspolluantes))[[18]](#footnote-20) | The national biofuels development plan has set a target of 10% of biofuels in the total fossil fuels production by 2015. | In France, energy products are subjected to a tax on polluting activities, called TGAP (TaxeGénéralesur les ActivitésPolluantes).  The quota of biofuels to be blended within conventional fuels is defined for each fuel type. | In case companies are supplying fuel for consumption and do not respect the biofuels quota, they are submitted to a higher rate of the tax on polluting activities (TGAP).  The increased rate of TGAP, which amounts to 7% since 2010, is reduced according to the proportion of biofuels contained in the fuel sold.  The TGAP on fuels amounts to between €17.29-63.96 according to the fuel type. |

# Aquaculture/Wastewater

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| Policy | Ambitions | Policy Measures | Financial Incentives |
| AssainissementCollectif | Rural wastewater sanitation systems | Any French township of more than 2,000 inhabitants has an obligation to have a municipal waste water treatment plant. Below that number, it is a choice. Many small villages will remain with only a small municipal plant for the village centre and the remainder will be private systems. |  |
| ‘Plan to Fight Green Algae’ (Plan de Lute Contre les AlguesVertes)  2010-2015 [[19]](#footnote-21), [[20]](#footnote-22). | Mitigate the nuisance of green algae washed up on beaches of Bretagne (in 2015 reduce flow of nitrates from 30 to at least 40% compare to 2010) Part of the project aims to establish AD plants which should be developed in the next 3 years. | This programme runs from 2011-2015 and encompasses a raft of measures to reduce nuisance of algae on beaches in Brittany, including research on how green algae grow, analysis of environmental and health risks, support for collection of algae, targets to reduce nitrogen fertilizer use by 30% by 2015 and 60% by 2027 in affected watersheds and infrastructure development to use the algae.  AD is supported as a route to generate energy and provide a digestate product which can be used in place of nitrogen fertiliser. The aim is to replace 50% of mineral fertilisers in affected watersheds by digestate between 2010 and 2015. AD of wastes including animal waste, and residual grain is in the plan. | State participation in the program:   * Knowledge:€200,000(50%) * Collection: maximum€700,000(50%) * Experimentation:€ 140,000(30%) * Treatment:platforms (3) €8M(80%) * Operationin 2010:€500,000(50%) * Methanationconditions to assisttwenty projects * Agricultural measures: €16M /year for 5 years.   The 2nd call for proposals was in 2012 had a total fund of €4Mfor development of AD plants. This funding is limited to those localities most affected by green algae. |

1. <http://www.developpement-durable.gouv.fr/-Le-Grenelle-de-l-environnement-de-.html> [↑](#footnote-ref-3)
2. <http://ec.europa.eu/energy/renewables/action_plan_en.htm> [↑](#footnote-ref-4)
3. <http://www.legifrance.gouv.fr/affichTexte.do;jsessionid=B8159E9B779A93928734F471FCDC158D.tpdjo13v_3?cidTexte=JORFTEXT000021645823&dateTexte=20130212> [↑](#footnote-ref-5)
4. <http://www.developpement-durable.gouv.fr/Les-tarifs-d-achat-de-l,12195.html> [↑](#footnote-ref-6)
5. <http://www.res-legal.eu/search-by-country/france/single/s/res-e/t/promotion/aid/tax-regulation-mechanisms-i-credit-dimpot/lastp/131/> [↑](#footnote-ref-7)
6. <http://www.res-legal.eu/search-by-country/france/single/s/res-hc/t/promotion/aid/tax-regulation-mechanism-credit-dimpot-developpement-durable/lastp/131/> [↑](#footnote-ref-8)
7. <http://www.res-legal.eu/search-by-country/france/single/s/res-e/t/promotion/aid/tax-regulation-mechanisms-ii-value-added-tax-reduction/lastp/131/> [↑](#footnote-ref-9)
8. <http://www.res-legal.eu/search-by-country/france/single/s/res-hc/t/promotion/aid/tax-regulation-mechanisms-ii-value-added-tax-reduction-1/lastp/131/> [↑](#footnote-ref-10)
9. <http://www.res-legal.eu/search-by-country/france/single/s/res-hc/t/promotion/aid/loan-eco-pret-a-taux-zero/lastp/131/> [↑](#footnote-ref-11)
10. <http://www.res-legal.eu/search-by-country/france/single/s/res-e/t/promotion/aid/tenders-appels-doffres/lastp/131/> [↑](#footnote-ref-12)
11. <http://www.cre.fr/documents/appels-d-offres> [↑](#footnote-ref-13)
12. <http://www2.ademe.fr/servlet/KBaseShow?sort=-1&cid=96&m=3&catid=25160> [↑](#footnote-ref-14)
13. <http://www.developpement-durable.gouv.fr/Presentation-generale,25027.html> [↑](#footnote-ref-15)
14. <http://www.developpement-durable.gouv.fr/Dispositif-de-soutien-a-la-filiere> [↑](#footnote-ref-16)
15. <http://agriculture.gouv.fr/plan-performance-energetique-des> [↑](#footnote-ref-17)
16. <http://www.developpement-durable.gouv.fr/La-defiscalisation-partielle-des.html> [↑](#footnote-ref-18)
17. <http://ldhcibp.wordpress.com/2012/10/10/agrocarburants-le-cadeau-de-54-millions-deuros-au-president-de-la-fnsea/> [↑](#footnote-ref-19)
18. <http://www.res-legal.eu/search-by-country/france/single/s/res-t/t/promotion/aid/biofuel-quota-reduction-of-the-tax-on-polluting-activities-reduction-de-la-taxe-generale-sur-le/lastp/131/> [↑](#footnote-ref-20)
19. <http://www.ademe.fr/bretagne/upload/communique/fichier/147fichier.pdf> [↑](#footnote-ref-21)
20. <http://agriculture.gouv.fr/IMG/pdf/plan_lutte_contre_les_algues_vertes_0.pdf> [↑](#footnote-ref-22)