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## Country Profile for GERMANY

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## 1. Introduction

### 1.1 SETatWork Country Profiles

This report is one of a set of Country Profiles produced by **SETatWork**. The global society is faced with a huge challenge in order to meet the threat given by global warming. The project **SETatWork - Sustainable Energy Technologies at Work** aims to meet this challenge through the collaboration and partnerships between organisations in EU, Asia and South America, supported by the EU's Seventh Framework Programme (FP7). The activities take place over two years from 1 September 2008 to 31 August 2010.

The aim of this country profile, is to provide an overview of the carbon markets in Germany with a focus on RTD (Research and Technological Development) needs, implementation options and perspectives associated with energy efficiency and savings in the carbon market (short term and medium-long term).

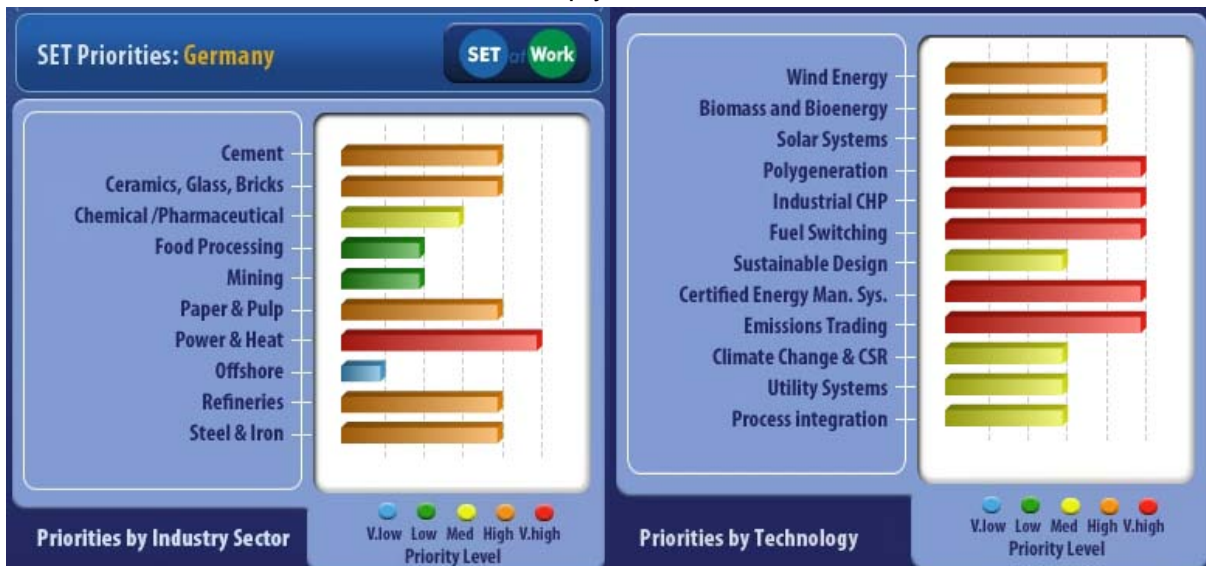
The main target groups for this country profile are companies (financial investors, project developers, technology providers, ESCOs, consultants, etc.), organisations and administrations that are interested in a short overview of relevant information in the development of carbon projects and markets in Germany. This information will also be relevant for readers from other countries that are interested in an overview of their own country as well as for other readers that wish to have information on developments in Germany.

SETatWork Country Profiles can be found online at: <http://www.setatwork.eu/countries.htm>

### 1.2 SETatWork Sustainable Energy Technology (SET) Priorities

In each country, companies and organisations were interviewed by SETatWork in order to identify indicative priority rankings for various Sustainable Energy Technologies (SET) and Industrial Sectors. The results of these interviews for each sector can be viewed on the following page: <http://www.setatwork.eu/maps/index.html>

The SETatWork Priorities for the Czech Republic are shown below. Where data is not yet available, the bar chart columns are left empty.



The main target industries in Germany for SETatWork indicated with very high and high have the highest amounts allocated for EU allowances of German industries compared to the number of companies and show the highest chances for the realisation of new projects.

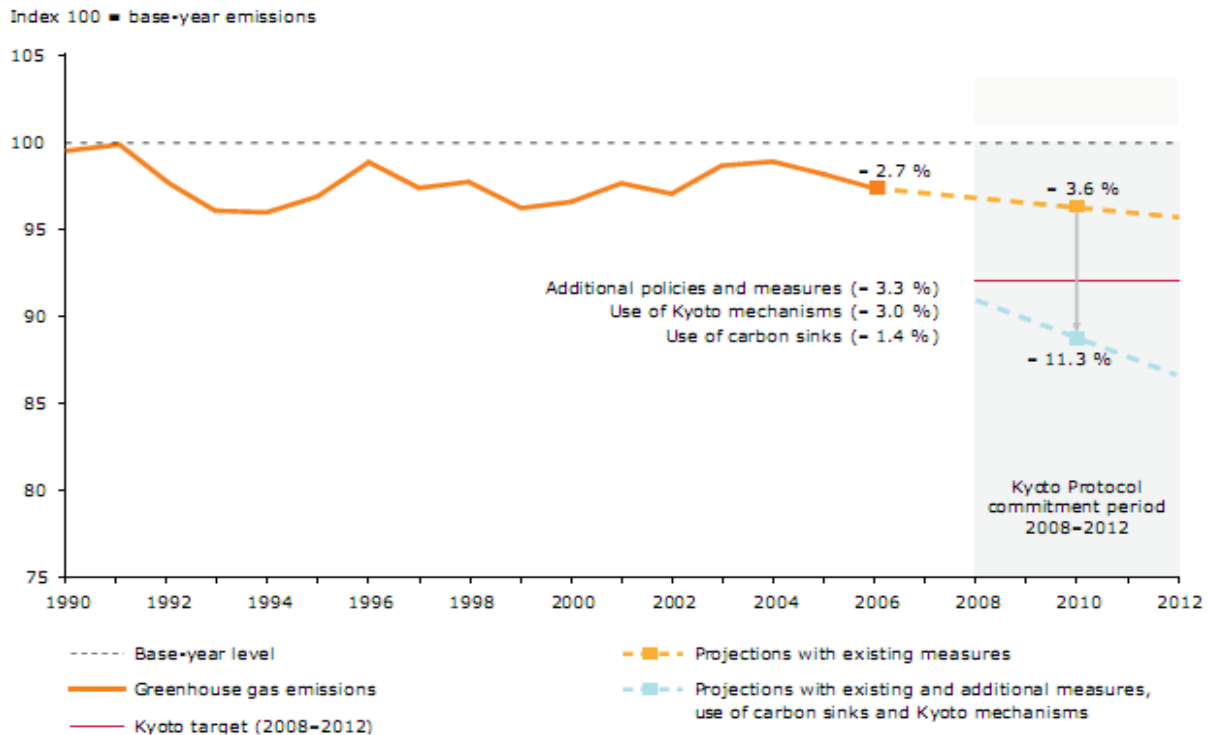
The key technologies in Germany indicated as very high offer the most opportunities regarding new projects; this can be seen in the numbers of applications for projects and planned new projects.

## 2. General Country Overview

The European Environment Agency (EEA) stated in 2006 that EU-15 emissions were above the Kyoto Protocol target of minus 8 %. However, projections from Member States for 2010 suggest that the target will be met by a large margin through further implementation of existing and additional measures including use of carbon sinks and Kyoto mechanisms. In addition, the EU ETS will result in further significant reductions that are not yet fully accounted for by Member States in their projections.

Figure 1 indicates the verified greenhouse gas emissions from 1990 to 2006 and the projections up to 2012 that include existing and additional measures, the use of carbon sinks and Kyoto mechanisms.

The existing German national climate protection programs and laws shall assure that Germany will be able to comply with the commitments made at the European and international level. At European level Germany committed itself to reduce its greenhouse gas emissions by 21 percent in between 2008-2012 compared to 1990 levels. With this ambitious target, Germany takes over the biggest share within EU. As latest figures show Germany achieved a relative emissions reduction of 23.9% in 2008 compared to the base year emissions of 1990/1995 and thus has already met the Kyoto target<sup>1</sup>. Figure 2 compares the German development with the emissions reduction situation of the EU-15.



**Figure 1:** EU-15 greenhouse gas emissions and projections for the Kyoto period 2008-12<sup>2</sup>.

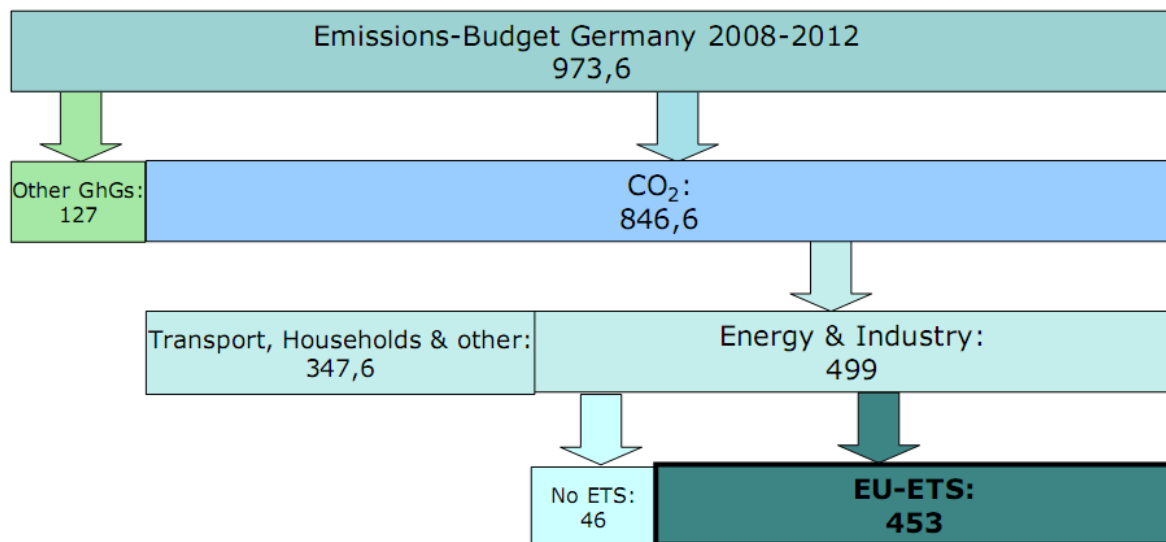
<sup>1</sup> See a recent study of the Federal Ministry of Economics and Technology.  
<http://www.bmwi.de/Dateien/Energieportal/PDF/energie-in-deutschland,property=pdf,bereich=bmwi,sprache=de,rwb=true.pdf>

<sup>2</sup> Source: EEA Report, No 5/2008

**Table 1: Germany's current and projected progress towards 2008-2012 Kyoto targets<sup>3</sup>.**

Current and projected progress towards the 2008-2012 Kyoto targets*	Absolute (Mt CO <sub>2</sub> eq.)	Relative to BY emissions (%)	EU-15 Average (%)
Base-year (BY) emissions	1232.4	0.0	0.0
GHG target under the Kyoto Protocol	973.6	-21.0	-8.0
2006 emissions	1004.8	-18.5	-2.7
Average GHG during the last 5-year period (2002-2006)	1016.9	-17.5	-2.0
Projected 2010 emissions (existing measures in place)	955.1	-22.5	-3.6
Projected effect of the (planned) additional measures	-40.9	-3.3	-3.3
Projected effect of carbon sink activities	-4.5	-0.4	1.3
Projected use of Kyoto mechanisms	0.0	0.0	3.0
Projected 2010 emissions, taking into account existing and additional measures, carbon sinks and Kyoto mechanisms	909.7	-26.2	-11.3
In 2006, Germany's emissions were 18% lower than the base-year, slightly above its burden-sharing of minus 21% for the period 2008 – 2012. According to Germany's projections, with the existing policies and measures, emissions will decrease further to reach a level 22% below base-year emissions by 2010. The implementation of additional measures and carbon sink activities could further reduce emissions to levels 26% below base-year emissions. Germany therefore expect to achieve its target			
*The projection data represents annual averages for the Kyoto commitment period 2008 - 2012			

The German GHG target under the Kyoto Protocol is 973.6 million CO<sub>2</sub> equivalents. This amount implies the above mentioned emissions reduction of 21% against 1990 level of the greenhouse gases CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFC, PFC and SF<sub>6</sub>. The distribution of the German emissions budget to different sectors is illustrated in figure 2. As the sectors energy and industry are covered by the emissions trading, the National Climate Protection Programme focuses on measures within the sector transport and private households.



**Figure 2: GHG distribution within the German emissions budget<sup>4</sup>.**

<sup>3</sup> Source: [www.umweltbundesamt.de/klimaschutz/veroeffentlichungen/CountryProfileGermany.pdf](http://www.umweltbundesamt.de/klimaschutz/veroeffentlichungen/CountryProfileGermany.pdf)

<sup>4</sup> Source: BMU, all data in Mio. t CO<sub>2</sub>e

The German government aims at achieving a 40% greenhouse gas emissions reduction by 2020 compared with 1990. To this end the German cabinet adopted its "Integrated Energy and Climate Programme (IEKP)" on 5 December 2007. This contains a set of measures, e.g. expansion of renewable energies and increases in energy efficiency, by which Germany makes crucial contributions to achieve European and international climate protection goals.

Since the beginning of 2008 the German Federal Environment Ministry (BMU) has made available up to 400 million euro, generated by the sale of emissions allowances, for a Climate Protection Initiative. The Climate Protection Initiative consists of national measures (280 million Euro) and international measures (120 million Euro) and makes a valuable contribution to achieving Germany's climate protection target. The goal is to tap existing major potentials for reducing emissions in a cost-effective way and on a large scale, and to advance innovative model projects. Specifically, the BMU promotes climate protection measures for increased energy efficiency and greater use of renewable energies. Furthermore, the International Climate Protection Initiative also supports measures for adapting to climate change in developing and newly industrialising countries. It aims to bring new momentum to negotiations on an international climate protection agreement for the post-2012 period. The initiative thus visibly promotes the realisation of ambitious climate protection targets in Germany, Europe and worldwide.

For the transport sector it is worth noting in particular the changes that have taken place in the traffic sector in Germany where emissions were reduced by 15 million tonnes between 1999 and 2003. This contrasts with the situation within the EU as a whole.

The positive results in Germany were achieved through adoption of instruments such as the ecological tax reform as well as by strengthening the public transport system (e. g. Law on the Regionalisation of Public Transport).

Recently the reform of vehicle tax to one based on pollutant and CO<sub>2</sub> emissions was agreed and will come into force on 1 July 2009. For new vehicles, the new tax will be calculated on the basis of a vehicle's emissions rather than engine capacity as before. In addition, owners of older cars will receive a scrapping bonus if they buy a new car in 2009.

The Renewable Energies Heat Act (EEWärmeG) stipulates that by 2020 14% of Germany's heat must be produced by renewable energies. From 1 January 2009 owners of newly erected buildings must use renewable energies to satisfy their heat requirements. All owners are subject to this obligation, whether private individuals, the state or businesses.

The German government has set itself the ambitious goal of reaching a 40% reduction in greenhouse gas emissions by 2020 compared with 1990. To this end the German cabinet adopted its "*Integrated Energy and Climate Programme (IEKP)*" on 5 December 2007. This includes a number of measures including expansion of renewable energies and increases in energy efficiency through which Germany is making an important contribution to attaining European and international climate protection goals. The guiding principles remain the three objectives of security of supply, economic efficiency and environmental protection.

Since the beginning of 2008 the German Federal Environment Ministry (BMU) has made available up to 400 million euro from the sale of emissions allowances for a Climate Protection Initiative. The Climate Protection Initiative includes both national measures (280 million Euro) and international measures (120 million Euro) making a valuable contribution to achieving Germany's climate protection target. The aim is to tap the existing major potential for reducing emissions in a cost-effective way and on a large scale while advancing innovative model projects.

Specifically, the BMU promotes climate protection measures for increased energy efficiency and greater use of sources of renewable energy.

In addition, the *International Climate Protection Initiative* also supports measures for adapting to climate change in developing and newly industrialising countries. It aims to bring new momentum to negotiations on an international climate protection agreement for the post-2012 period. The initiative is making an important contribution to reaching ambitious climate protection targets in Germany, Europe and worldwide.

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### 3. Legislation

In the last years numerous measures were created in the field of CO<sub>2</sub>-emissions reduction, Energy Efficiency and Renewable Energies. The existing mechanisms range from promotional programs to a binding Legislation. The following overview includes already implemented legal acts in the area of securing energy supplies, economic efficiency and environmental compatibility as well as those acts that are still being developed.

#### 3.1 The Renewable Energy Sources Act (EEG)

The Act on Granting Priority to Renewable Energy Sources (Renewable Energy Sources Act - EEG), entered into force in January 2009 and replaces the previous Energy Sources Act of 2004. The Renewable Energy Sources Act serves to implement Directive 2001/77/EC of the European Parliament and of the European Council of 27 September 2001 on the promotion of the electricity produced from renewable energy sources in the international electricity market.

The Act regulates the prioritization of grid-supplied electricity from renewable sources. The Renewable Energy Sources Act supports the Government's goal, incorporated in the "Integrated Energy and Climate Programme" adopted in Meseberg 2007, to increase the share of renewables in the electricity sector from the current level of over 13% to 25-30% by 2020. Crucial changes in the new EEG include attractive re-powering arrangements, improved conditions for offshore wind power and an improved grid integration structure for installations generating electricity from renewable energies, including provisions on feed-in management.

#### 3.2 Combined Heat and Power Act (KWKG)

The Act on the Preservation, Modernisation and Extension of the Cogeneration of Heat and Power (Combined Heat and Power Act - KWKG) from April 2002, was amended 2008 in accordance with the Meseberg decisions.

The aim of the Act is the protection, modernization and expansion of the resource-conserving and environmentally friendly form of power generation in a combined heat and power installation as well as the market introduction of fuel cell. The new provisions ensure, in accordance with the installation category, a degressive premium rate for energy from cogeneration. The operator obtains this temporary premium paid by the network provider in addition to the market price for the energy.

By the amendments of the Act in 2008, in force since 1 January 2009, based on the Meseberg decision package, the government promotes the expansion of cogeneration. In order to use fuel efficiently, the share of high-efficiency combined heat and power (CHP) plants in electricity production will be doubled by 2020 from the current level of 12% to

around 25%. The amendment to the Combined Heat and Power Act, which promotes the construction of new CHP plant and heat grids, is an important component in achieving this goal.

### **3.3 The Renewable Energies Heat Act (EEWärmeG)**

The Renewable Energies Heat Act (EEWärmeG), in force since January 2009, stipulates that by 2020 14% of Germany's heat must come from renewable energies. The Act intends to conserve resources and to ensure a secure and sustainable energy supply by reducing greenhouse gas emissions. The Act tackles three aspects:

- The obligation to use renewables: from 1 January 2009 on owners of new buildings must use renewable energies for their heat requirements. All owners are subject to this obligation, whether private individuals, the state or businesses. All forms of renewables, or combinations of them, can be used. Renewable energies include solar radiation, geothermal energy, ambient heat and biomass. Those who do not wish to use renewable energies can take other climate protection measures: improve the building insulation, obtain heat from district heating systems or use heat from combined heat and power generation (CHP).
- Financial support: the use of renewable energies will continue to be financially supported. The government will provide further funds into the existing market incentive program, up to 500 million Euro per year. By this measure the framework for investment planning could be strengthened.
- Heat grids: the Act makes it easier for heat grids to be extended. It makes provision for local authorities to prescribe connection to and use of such a grid in the interests of climate protection.

### **3.4 Greenhouse Gas Emission Trading Act (TEHG)**

The Greenhouse Gas Emissions Trading Act which came into force in July 2004 transposes the Directive 2003/87/EC into the German law and is the legal basis for the trade with greenhouse gas emissions. The Act includes regulations of the allocation procedure, issuing, surrender and validity of allowances, their trading and penalties as well as provisions concerning details of the permit, verification and monitoring of greenhouse gas emissions. The Greenhouse Gas Emissions Trading Act sets the scope of the licensing procedure for the participation of industrial installations into the emissions trading system. The Act sets up also a new Department in the German Environment Agency dealing with the emissions trading (The German Emissions Trading Authority - DEHSt).

In July 2009 an Amendment on the TEHG came into effect and provides, along with the Data Collection Ordinance 2020 (Datenerhebungsverordnung 2020 - DEV 2020), the legal foundation for the inclusion of the aviation sector in the emissions trading system and for data collection of those industries and those plants that are new to the emission trading system. The DEV 2020 aims at determining the budget for those 'newcomers' to the system.

### **3.5 Allocation Act 2012 (ZuG 2012)**

Through the Allocation Act 2012 (Zuteilungsgesetz 2012 – ZuG 2012) which came into force in August 2007 the German Government has laid the legal bases for the second period of trade with CO<sub>2</sub>-emissions. An ambitious reduction target has been implemented for the years 2008 to 2012: the number of allowances allocated to installations subject to emissions trading will effectively be 453 Mio. tons which implies an allowance reduced by over 11% compared to the first trading period.

The benchmarking system for energy installations represents a switch to an intelligent allocation system, which rewards efficient installations and penalises the polluters. This is significantly speeding up the modernisation process in the German energy industry.

The Allocation Act 2012 requires a lower reduction performance from the manufacturing industry than from the energy industry. This distinction between the sectors takes into account their different competitive circumstances and reduction potential. Furthermore, small-scale emitters with less than 25,000 tons CO<sub>2</sub> per year are completely exempt from reduction obligations. This effectively lifts the burden from small and medium-sized enterprises.

The Allocation Act 2012 creates framework conditions for using the two project-based Kyoto mechanisms: Clean Development and the Joint Implementation Mechanisms. This framework enables German companies to engage in low-cost climate protection projects abroad and promotes the urgently needed transfer of innovative technologies to developing and newly industrialising countries.

Furthermore, the German Government has decided that as of 2008, 40 million emissions allowances will be sold each year so that Germany will auction the largest share of allowances in an EU-wide context. A larger share is not possible in the second trading period, as the EU Emissions Trading Directive clarifies that a maximum of 10% of the total allocation volume can be auctioned during the years 2008 to 2012.

In the course of the debate on how to structure the auctioning scheme, energy intensive industries and energy suppliers argued that a sale of allowances would lead to higher electricity prices. However this is not to be expected. The experience made in the first trading period showed that the energy supply companies had already incorporated the free allocation of allowances into the electricity price. This led and still leads to additional profits amounting to billions. A further price effect on the electricity market arising from auctioning is therefore not anticipated, as the market value of the allowances has already entered the electricity price.

### **3.6 Project Mechanisms Act (ProMechG)**

The Act on the Introduction of Project-based Mechanisms in Accordance with the Kyoto Protocol came into effect in September 2005 and creates the necessary national foundations for the generation of credits for emission reductions that are achieved through projects in the framework of Joint Implementation and the Clean Development Mechanism. It regulates in particular provisions on the procedures and prerequisites for the official approval of a planned project activity required according to international provisions.

Furthermore, these emissions credits can be used for EU emissions trading. In amending the Greenhouse Gas Emissions Trading Act, this Act enables operators of an installation subject to emissions trading to fulfill their obligation by surrendering emissions credits from such projects. This Act also implements the provisions of an EU Directive that describes the conjunction of project-based mechanisms of the Kyoto Protocol to the emissions trading system.

The authority responsible for the enforcement of the Project Mechanisms Act (ProMechG) is the German Emissions Trading Authority (DEHSt) within the Federal Environmental Agency (UBA).

With the Amendment of the ProMechG in 2008, the maximum of emission reduction credits generated by JI and CDM projects that can be surrendered within the EU-ETS was fixed at a

22% level per plant for the second trading period. This quota is the highest among the EU Member States. During the first trading period a quota was not in place.

### **3.7 Meseberg: Intergrated Energy and Climate Programme (IEKP)<sup>5</sup>**

In spring 2007, under the German presidency, the EU heads of state and government set the signals for an integrated energy and climate policy. With the increased use of renewable energies and strengthening of energy efficiency ambitious targets for climate protection were defined. On this basis the Federal Government accepted an ambitious “Integrated energy and climate programme” of 29 key points in Meseberg in August 2007. In December 2007 the Cabinet presented an extensive package of 14 laws and ordinances. A second smaller package with further laws and ordinances followed in 2008.

The package from Meseberg supports Germany's climate protection efforts to achieve 40% greenhouse gas emissions reduction by 2020, compared to 1990 levels. By 2007, greenhouse gas emissions were already reduced by 20%. The German climate protection target under the Kyoto Protocol is to reduce emissions by 21% between 2008 and 2012.

The German government's guiding principles aim at providing reliable and competitive framework conditions for investments undertaken by energy suppliers and industry. At the same time, consumers need cost-efficient solutions and transparent, reliable conditions for their purchasing and investment decisions. The legislative proposals presented ensure such conditions by defining targets and measures until 2020 for the respective areas.

The package implementing the “Integrated Energy and Climate Program” comprises the approval of the following legislative proposals:

#### **3.7.1 Measures in the area of the energy efficiency**

- Amendment to the Combined Heat and Power Act (KWKG)
- Amendment to the Energy Industry Act (EnWG) on liberalising metering: the Amendment came into effect in January 2009 and intends to liberalise electricity metering in order to facilitate and promote innovative metering methods and demand-related, time-variable tariffs. This will enable consumers to reduce their energy costs and will improve the efficiency of the power generation sector.
- Report and Draft Amendment to the Energy Saving Ordinance (EnEV): in order to increase energy efficiency in buildings, energy standards will be tightened by an average 30% by October 2009 compared to the EnEV standard 2007. As a second step (planned for 2012), these efficiency standards will be tightened by a further 30%. The Cabinet has adopted corresponding key elements.
- Clean power plants: by amending the 37th Ordinance on the Implementation of the Federal Emission Control Act (BImSchV), ambitious standards will be laid down for nitrogen oxide emissions from new power plants. This will make sure new plants work more efficiently and in a cleaner way than old power plants.
- Guidelines on the procurement of energy-efficient products and services: with the adoption of guidelines on environmentally friendly and energy-efficient procurement, the German government is setting a good example for others to follow. Energy-

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<sup>5</sup> The given summary of the IEKP is based on information presented at [www.bmu.de](http://www.bmu.de) and [www.bmwi.de](http://www.bmwi.de)

efficient appliances and services will be promoted by priority procurement. Furthermore, money for electricity and fuels will be saved.

### **3.7.2 Measures in the area of renewable energies in the electricity and heat sectors**

- Amendment to the Renewable Energy Sources Act (EEG)
- Renewable Energies Heat Act (EEWärmeG)
- Amendment to the Gas Grid Access Ordinance: the amendment to the Gas Grid Access Ordinance came into effect in 2008 and ensures that biogas can be fed into the natural gas grid to a greater extent. A share of 10% biogas is possible by 2030. Biogas will thus be widely available and will not necessarily be primarily used at production sites.

### **3.7.3 Measures in the area of biofuels**

- Amendment to the Biofuel Quota Act: As a contribution to achieving the government's energy and climate policy goals, the share of biofuels will increase and from 2015 on, the focus will be put on reducing greenhouse gas emissions. The Amendment will contribute to a rise in the biofuels' share to around 20% by volume (17% by energy content) by 2020.
- Sustainability Ordinance: when biomass is used for biofuel production, minimum requirements for sustainable management of agricultural land and for the conservation of natural habitats have to be fulfilled. Furthermore, the entire production, processing and supply chain must show a certain potential for reducing greenhouse gases.
- Fuel Quality Ordinance: the amended Ordinance will increase the blending limit of bioethanol in petrol fuels from 5% to 10% volume. For biodiesel in diesel fuels, this blending limit will be altered from 5% to 7% volume.
- Hydrogenation Ordinance: by approving biogenic oils that are hydrogenated together with mineral oil based oils in a refinery process, compliance with the increased blending quotas will be considerably easier in future.

### **3.7.4 Measures in the area of transport**

As mentioned above the vehicle tax reform entered into force on 1 July 2009. For new vehicles, this tax will be calculated on the basis of a vehicle's emissions rather than engine capacity as before.

### **3.7.5 Non-CO<sub>2</sub> greenhouse gas emissions measures**

Chemicals Climate Protection Ordinance: this Ordinance will introduces provisions on the labelling of installations and on recovery and return of used refrigerants and will therefore contribute to the reduction of emissions of fluorinated greenhouse gases from mobile and stationary cooling installations.

### **3.7.6 Other individual measures**

- Energy Grid Expansion Act: the Act, in force since August 2009, speeds up the realisation of high-priority grid constructions projects. These projects are crucial both for EU-wide electricity trading and the integration of power generated from wind energy and new, highly efficient conventional power plants. The Act also paves the

way for the use of new technologies such as high voltage direct current (HVDC) transmission. Additionally, new electrical energy storage systems will be exempted, for a period of 10 years, from network fees for the purchase of electricity. This regulation intends to set incentives for the development of new storage technologies that are significant for the use of wind energy.

- Amendment to Act on the Levying of Distance-Related Charges for the Use of Federal Motorways by Heavy Goods Vehicles and Toll Level Regulations: in line with the new infrastructure costs assessment a greater differentiation of the lorry toll based on emission was introduced in January 2009. The toll differentiation between the lowest and highest toll category was doubled from a 50% difference to a 100% one. For this reason the Amendment increases the environmental steering effect of the toll system.
- Ordinance on Electricity and Gas Meters: the Ordinance, in force since October 2008, specifies the requirements for the introduction of smart metering. Smart metering aims at increasing transparency of energy consumption and thus provides information on energy consumption and cost saving potential. Based on the ordinance and corresponding law providers can offer more variable prices based on consumption.
- Amendment to Heating Costs Ordinance: due to the Ordinance 70% of heating costs in buildings with several rental apartments have to be split up according to consumption instead of being evenly distributed among all apartments (previously: at least 50%). Thus, incentives for energy saving behaviour are set.
- Key elements for changing basis of vehicle tax: the federal cabinet also decided to agree on exchanging rights to tax revenues with the Federal States within the Framework of the Federal Reform II in order to ensure that the vehicle tax can be based on CO<sub>2</sub> emissions from January 2010.

### **3.7.7 CO<sub>2</sub>-Impact of the measures**

The Federal Environmental Agency has drawn up calculations on the climate protection impacts of the integrated energy and climate programme.

As the table shows, the programme possesses a considerable emissions reductions potential of more than 36% by 2020 compared with 1990 emissions levels. According to these calculations almost 220 million tons CO<sub>2</sub> will be saved with the existing and planned measures. The program therefore represents a very crucial element towards the target to reduce greenhouse gas emissions by 40%. Major reductions in CO<sub>2</sub> will be achieved by the expansion of renewable energies in the electricity sector (54 million tons), increased energy efficiency in buildings (31 million tons) and reduced electricity consumption (25 million tons). The package of measures for the transport sector and reductions of other greenhouse gases will also contribute a reduction of more than 30 million tons.

**Table 2: Impact of the Meseberg energy and climate programme<sup>6</sup>.**

Title of measure	CO <sub>2</sub> saving by 2020 in mt
<b>Modernising fossil power plants</b>	<b>-15.0</b>
Emissions trading	
<b>Electricity from renewable energy sources</b>	<b>-54.4</b>
Amendment to the Renewable Energy Sources Act, support concept on re-powering onshore wind power, Power Grid Development Act, designation of priority areas for offshore wind power, feed-in regulation for biogas	
<b>Combined heat and power</b>	<b>-14.3</b>
Combined Heat and Power Act, promoting CHP in the Renewable Energy Sources Act	
<b>Modernisation of buildings and heating systems</b>	<b>-31.0</b>
Building modernisation programme, amendment to the Energy Saving Ordinance, amendment to the Heating Costs Ordinance, facilitating contracting, energy-efficient modernisation of social infrastructure, programme for the energy-efficient modernisation of federal buildings	
<b>Heat from renewable energies</b>	<b>-9.2</b>
Renewable Energies Heat Act, market incentive programme for heat from renewable energies in existing buildings	
Title of measure	CO <sub>2</sub> saving by 2020 in mt
<b>Savings in electricity</b>	<b>-25.5</b>
“Top-runner” approach towards implementing the Eco-Design Directive, support programme for climate protection and energy efficiency, energy consumption labelling of appliances, replacement of night-storage heaters, smart metering for electricity consumption, guidelines for public procurement for energy-efficient products and services.	
<b>Transport</b>	<b>-33.6</b>
CO <sub>2</sub> strategy for passenger cars, expansion of biofuels, CO <sub>2</sub> -based vehicle tax, energy labelling for passenger cars, reinforcing the influence of the HGV toll, including aviation in emissions trading, measures in the field of shipping, expansion of electric mobility	
<b>Other greenhouse gases (methane, N<sub>2</sub>O, F-gases)</b>	<b>-36.4</b>
Chemicals Climate Protection Ordinance, ending the storage of untreated wastes, decline in emissions from mining.	
<b>Total</b>	<b>219.4</b>
<b>In percent compared with base year</b>	<b>-36.6</b>

## 4. Financial Market

The carbon financial market in Germany is well developed due to big German utilities and industrial companies as major emitters in Europe. The most active trading companies are the trading division from the utilities E.on, RWE, Vattenfall, EnBW and Evonik. The commercial banks like UniCredit Group and Deutsche Bank are active traders. At international level active institutions are Société Générale, Barclays and J.P. Morgan. German project investors are KfW, E.on, RWE, Evonik, OneCarbon, FirstClimate, Green Stream, Ecolutions and others.

<sup>6</sup> Source: Federal Environmental Agency (2007)

The following carbon program and carbon insurance approaches are presented in more detail due to their relevance for project developer and developing countries.

#### **4.1 EIB-KfW Carbon Programme<sup>7</sup>**

In conjunction with the European Investment Bank (EIB) KfW Bankengruppe has launched the second procurement programme for emission certificates. The programme enables German and European enterprises to participate in order to acquire certificates for their own use.

The EIB-KfW Carbon Programme is a programme for acquiring greenhouse gas emission certificates ("Certificates") with a programme volume of 100 million Euro. Certificates of this Carbon Programme include Emission Reduction Units (ERUs) and Certified Emission Reductions (CERs), and must be applicable under the EU Linking Directive for use in Phase II of the EU Emissions Trading Scheme.

The aim of the programme is twofold: by providing additional cashflow to projects the implementation of those projects that contribute to global greenhouse gas emissions reduction is facilitated. In addition to this the program opens the market to companies that do not have any market access to CDM and JI projects so far. These companies can use the cost-effective certificates to fulfil their obligations under the EU ETS.

Eligible project types are renewable energy, land fill gas, coal mine methane, coal bed methane, fuel switch, energy efficiency, carbon sequestration, carbon capture and storage (CCS) as well as land use, land use change and forestry.

#### **4.2 Munich Re - a first steps towards a climate insurance scheme**

Munich Re has launched a new insurance product on climate projects: Kyoto Multi Risk Policy (KMR). KMR insures against the non-delivery of carbon credits (JI & CDM), i.e. emissions reductions of any one of six greenhouse gases.

Munich Climate Insurance Initiative (MCII) has submitted a proposal of a 10 billion risk management scheme to the AWG-LCA<sup>8</sup>. The proposed scheme shall help mitigate expected climate change impacts, especially on vulnerable societies in development regions. Based on figures of the NatCatService of Munich Re the frequency of natural disasters has tripled during the last three decades.

The MCII risk management module (Figure 3) includes an insurance, as well as an (interlinked) prevention pillar, for risk reduction. The necessary 10 billion funding for both pillars could be obtained by Annex-I countries (Norway proposal on adaptation funding) or along defined criteria (Switzerland proposal).

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<sup>7</sup> [www.kfw-foerderbank.de/EN/Home/KfW\\_Carbon\\_Fund/Pdf\\_documents\\_carbon\\_fund/Term\\_Sheet\\_EIB\\_KfW\\_2\\_Jan2008\\_engl.pdf](http://www.kfw-foerderbank.de/EN/Home/KfW_Carbon_Fund/Pdf_documents_carbon_fund/Term_Sheet_EIB_KfW_2_Jan2008_engl.pdf)

<sup>8</sup> This is an abbreviation for Ad Hoc Working Group on Long-term Cooperative Action und the Convention.

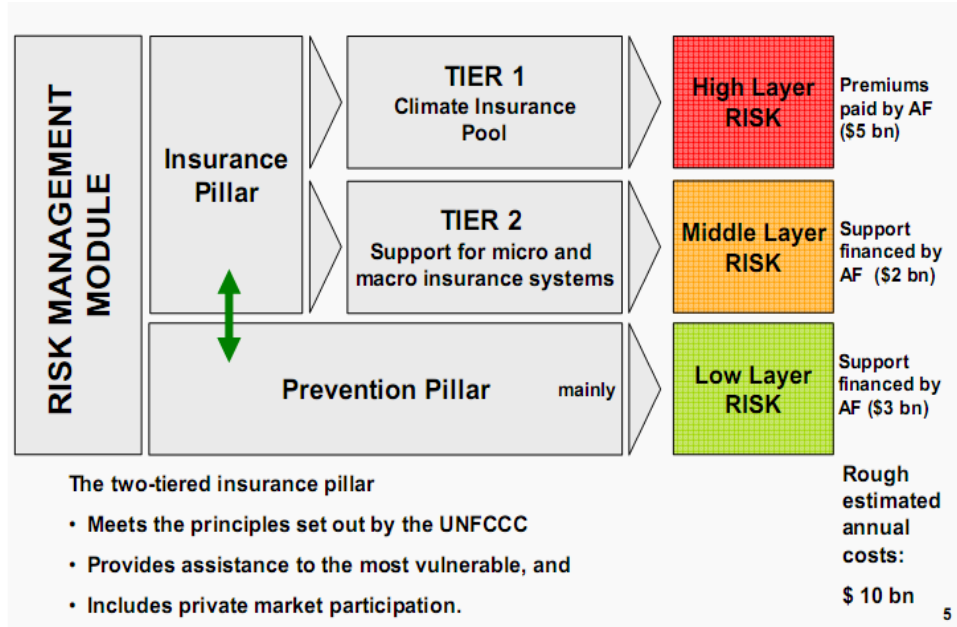


Figure 3: The MCII Proposal<sup>9</sup>.

## 5. National situation in the carbon markets

To meet its obligations to reduce greenhouse gas concentrations under the Kyoto Protocol, the European Union established an Emissions Trading System (ETS) that started in January 2005. The scheme is based on Directive 2003/87/EC<sup>10</sup> which entered into force on 25 October 2003.

The EU-ETS is a 'cap and trade' system. This implies that the overall level of allowed emissions is capped, but, within that limit, participants in the system can buy and sell allowances - European Union Allowances (EUA). These allowances are the common trading 'currency' at the heart of the system. One allowance entitles the holder to emit one ton of CO<sub>2</sub>. The cap of the total number of allowances is meant to create scarcity in the market, however an allowance surplus of about 150 Mio. EUA could be observed during the first trading period<sup>11</sup>.

### 5.1 European Emission Trading System (EU-ETS) and National Allocation Plan (NAP)

As figure 3 indicates, the sectors energy and industry are covered by the emissions trading. Based on the EU-ETS two Emissions Trading Periods were established. The first period comprised three years – from 2005 to 2007. The new emissions trading period runs from 2008 to 2012.

The first period was seen as an experimental phase which is mirrored by the strong fluctuation of certificates' prices and the already mentioned allowance surplus.

<sup>9</sup> Source: [www.climate-insurance.org](http://www.climate-insurance.org)

<sup>10</sup> Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

<sup>11</sup> See Future Camp, 2008: Emissionshandel und Klimastrategien.

For each trading period the member states had to develop a National Allocation Plan (NAP I 2005–2007 and NAP II 2008-2012)<sup>12</sup>. The plans defined the installations included in the EU-ETS and the overall cap of the CO<sub>2</sub> emissions (table 3).

**Table 3:** Overall emissions cap in Germany in the NAP I and NAP<sup>13</sup>.

	<b>Germany's CO<sub>2</sub>-Allowance Budget 2005-2007</b>	<b>Germany's CO<sub>2</sub>-Allowance Budget 2008-2012</b>
<b>Over-all cap</b>	499 Mio. t/a	453 Mio. t/a
<b>Reserve</b>	3 Mio. t/a	23 Mio t/a
<b>Budget for existing Installations</b>	499 Mio. t/a -3 Mio. t/a Reserve <b>= 496 Mio. t/a</b>	453 Mio. t/a -23 Mio. t/a Reserve -11 Mio. t/a additional installations = 419 Mio. t/a -40 Mio. t/a Auction <b>= 379 Mio. t/a</b>

A considerable decrease of the German emissions budget could be observed for the second trading period. 40 Mio. tons will be auctioneered and a reserve for new installations/capacities of 23 Mio. tons/a in 2008-2012 is included in the amount. The additional emissions amount of roughly 11 Mio. tons/a that was included in period 2008-2012 but not in 2005-2007 has to be deducted from the allowance budget.

The following industries and activities are included in the EU ETS:

- Energy activities and oil refineries
- Coke ovens, production and processing of ferrous metals
- Mineral industry (production of cement clinker, manufacture of glass, ceramic products)
- Industrial plants for the production of pulp from timber or other fibrous materials, paper and board
- Chemical Industry (installations for production of propylene, ethylene and carbon black).

As illustrated in table 3, installations of the ceramic and paper industry represent almost a 50% of all installations obliged to take part in the EU-ETS.

<sup>12</sup> [http://www.dehst.de/cln\\_011/nn\\_476596/DE/Emissionshandel/Gesetze\\_20und\\_20Verordnungen/Gesetze\\_20und\\_20Verordnungen\\_node.html?\\_nn=true#doc476618bodyText10](http://www.dehst.de/cln_011/nn_476596/DE/Emissionshandel/Gesetze_20und_20Verordnungen/Gesetze_20und_20Verordnungen_node.html?_nn=true#doc476618bodyText10)

<sup>13</sup> Source: ZuG 2007 and ZuG 2012. Law on the National Allocation Plan on the Greenhouse Gas Emissions Allowances for the 2005-2007 Allocation Period (ZuG 2007), August 2004; Law on the National Allocation Plan on the Greenhouse Gas Emissions Allowances for the 2008-2012 Allocation Period (ZuG 2012), August 2007.

**Table 4:** Number of Germany installations in the EU ETS for the second trading period 2008 – 2012.<sup>14</sup>

Installations obliged to Emissions Trading	1,665
Installations with free allocation	1,625
Installations of energy industry	1,072
Industrial installations	553
Lowest annual allocation on an installation	4 EUAs/a
Highest annual allocation on an installation	19.6 Mio. EUAs/a
Small-scale emitter (Installation with combustion heat capacity smaller than 25 MW)	792 installations; 8.1 Mio. EUAs/a; 2% of the budget
Large-scale emitter	80 Installations; 257 Mio. EUAs/a; about 60% of the budget

**Table 5** Type and number of industrial installations on the territory of Germany included in the EU ETS for the second trading period 2008–2012<sup>15</sup>

Type of Installation	Number of installations obliged to emissions trading	Amount of the allocated EU -allowances to the industry's installations (Mio. EUAs/a)
Ceramic	139	1.98
Paper	125	6.41
Glass	85	4.03
Lime	68	9.29
Iron and Steel	44	59.89
Cement	39	20.58
Refineries	27	24.26
Mineral Fibre	8	0.35
Propylene/Ethylene	8	5.5
Cellulose	5	0.47
Carbon black	5	0.80

## 5.2 Clean Development Mechanism (CDM) opportunities, requirements and SET transfer demand

Every EU Member State committed to the EU-ETS has to define its CO<sub>2</sub>-emissions in its NAP. The NAP sets out the maximum amount of JI/CDM-project certificates that installations on German territory and included in the EU-ETS may use in order to fulfil their obligation. In the second trading period German installations can surrender 22% of the total amount of certificates needed to meet EU-ETS requirements by JI/CDM-projects' certificates.

As a developed country Germany is listed in the Annex B of the Kyoto Protocol so that CDM projects cannot be implemented within Germany. However German companies and institutions can invest in the PDDs of CDM projects. Figure 5 highlights the survey of application results for CDM and JI project activities to the German Emissions Trading Authority (DEHSt).

<sup>14</sup> Source: DEHSt, May 2008 - Emissions Trading: the Allocation of the EU-Allowances in the 2008-2012 trading period, German Emissions Trading Authority (DEHSt), May 2008, [http://www.dehst.de/nn\\_476194/DE/Home/Textbausteine/Auswertung\\_Zuteilung\\_2008-2012.html?\\_nnn=true](http://www.dehst.de/nn_476194/DE/Home/Textbausteine/Auswertung_Zuteilung_2008-2012.html?_nnn=true)

<sup>15</sup> *ibid.*

**Table 6 Applications for CDM and JI project<sup>16</sup>.**

	Total	CDM	JI Abroad	JI Germany
<b>Total</b>	265	153	10	102
<b>Applications for Endorsement (LoE)</b>				
Requests	67	13	9	45
Finished procedure	50	12	8	30
Approved	43	12	8	23
<b>Applications for Approval (LoA)</b>				
Requests	198	140	1	57
Finished procedure	182	129	0	53
Approved	137	129	0	8
<b>Project Categories</b>				
Biogas	13	7	0	6
Biomass	37	30	3	4
Solar Energy	3	3	0	0
Hydro Power	46	46	0	0
Wind Power	24	22	2	0
Fuel Switch/Energy Efficiency	57	28	3	26
Landfill gas	9	8	0	1
HFC23 Destruction	3	3	0	0
N <sub>2</sub> O Destruction	18	6	1	11
Geothermal Energy	1	0	0	1
PFC Destruction	2	0	0	2
Mine Gas	52	0	1	51

### 5.3 Joint Implementation (JI) opportunities and requirements

Joint Implementation and Clean Development Mechanism (CDM) projects are both part of the project-based flexible Kyoto mechanisms. JI is based on Article 6 of the Kyoto Protocol and offers industrial countries the opportunity to reduce greenhouse gases in host industrial countries, as pledged in the Kyoto Protocol. Companies can also participate in JI projects and utilize the certificates issued in these projects. JI climate projects are only open to countries named in Annex B of the Kyoto Protocol and companies based in those countries.

#### 5.3.1 Criteria for the Participation in JI projects

It is important for the states involved in JI projects to fulfil the Kyoto mechanism participation criteria, as laid out in the Marrakech Accords. These include:

1. Ratification of the Kyoto Protocol
2. Calculation of Assigned Amount Units, AAUs, in compliance with Kyoto Protocol Annex B
3. Established national system for the evaluation of greenhouse gas emissions and carbon sinks

<sup>16</sup> Source: German Emissions Trading Authority (DEHSt)

4. Established computer-based national registry
5. Timely submission of annual emissions inventories
6. Submission of additional information on the Assigned Amount

An investor country must fulfil criteria 1 to 6. In order to participate in the JI mechanism, a host country must fulfil criteria 1, 2 and 4. A host country that fulfils the above-mentioned criteria 1 to 6 will be authorized to verify the reduction of greenhouse gases output or their storage in sinks and to issue the relevant Emission Reduction Units (ERU). To a large extent the host country can make its own decisions on the implementation of JI climate project requirements and stages. This procedure is easier for the states involved and known as JI Track 1.

Where the host country fulfils only criteria 1, 2 and 4, the JI project will be supervised by the JI Supervisory Committee (JISC). This procedure is quite similar to the CDM one and known as JI Track 2. Host countries that fulfill the criteria for track 1 can still opt for track 2.

### **5.3.2 Joint Implementation in Germany**

Joint Implementation is supported by the German Emissions Trading Authority (DEHSt) under track 1. Project activities can be implemented in existing facilities which are not covered by the EU-ETS, e.g. in the sectors transport or households. DEHSt applies Annex 38/39 decisions from CDM but alleviates certain procedures, e.g. monitoring regulations. The DEHSt approved three JI-PoAs so far: JIM NRW, RWE WVE Heat pump programme and EcoBonus Bayerngas. JI is limited to 2012, nevertheless more JI-PoA are under development.<sup>17</sup>

Critical aspects regarding additionality are the relation of JI to promotional mechanisms (renewable energy law) and the dynamic energy efficiency obligations due to German regulations (BImSchG). Additionality can also be a controversial issue if the applied technology is regarded as common practice.

Joint Implementation in Germany is a success story and other industrial countries should consider JI as supplementary in conjunction with other climate measures under a national climate strategy.

Green Investment Schemes (GIS) are not relevant for Germany.

## **5.4 Voluntary markets (VER) opportunities and requirements**

Voluntary projects (VER projects = Verified Emission Reduction Project) for the generation of Verified Emissions Reductions (VERs) might be a viable alternative to CDM and JI projects if:

- the emissions reduction project is hosted in countries, which did not ratify the Kyoto Protocol (e.g. Turkey)
- the emissions reduction project is hosted in a Kyoto country, but a regulatory framework for CDM/JI projects does not exist
- the emissions reduction project is too small to be developed under CDM/JI due to high transaction costs
- Pre-CDM registration as VER, if the CDM/JI project cycle is delayed (e.g. longsome procedures)

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<sup>17</sup> For further information please contact [info@future-camp.de](mailto:info@future-camp.de).

In Annex B countries (such as Germany) VER projects can only generate VERs if these certificates result in conversion of Assigned Amount Units (AAUs). As such conversion has not been observed since 2008<sup>18</sup>, VER projects are located in non Kyoto or none Annex B countries.

Independent from their corresponding standard VERs can only be used in the “Voluntary Carbon Market”. This market is also called the “Non-Regulated Market”, because individuals, businesses or institutions voluntarily offset their emissions by purchasing and selling emission reduction certificates. Furthermore, the Voluntary Carbon Market operates independently and is not linked to the Kyoto Protocol or to any other legislation. Unlike to the Compliance Market the demand side is not covered with binding market regulations and procedures.

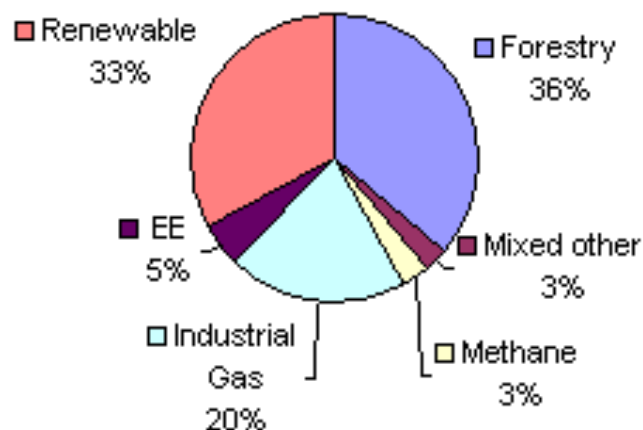
### 5.4.1 Standards

As carbon offsetting increased, the need for transparency and quality criteria regarding carbon offsetting has led to “Voluntary Standards” for VER project development:

- Gold Standard (GS) → Gold Standard VER Registry
- Voluntary Carbon Standard (VCS) → Registry planned
- VER+ → Blue Registry

These Standards (the standards listed are the most acknowledged ones) provide additional guidance and requirements how to generate VERs related to their standard which enables account holders to trade and retire VERs.

7. As there’s no central registry for all kind of VERs it is not possible to portray a complete and comprehensive list about all existent VERs so far. But according to a recent report<sup>19</sup>, the trading volume in total was around 13 Mio. tons CO<sub>2</sub> in 2006. Figure 6 shows the distribution of registered VER project activities by scope.



**Figure 6:** VER project activities by scope<sup>20</sup>.

<sup>18</sup> Before 2008 Annex B countries did not have binding caps, thus VER projects could have been developed by the end of 2007.

<sup>19</sup> Source: WWF: Making Sense of the Voluntary Carbon Market (2008)

<sup>20</sup> Source: State of the Voluntary Carbon Market 2007

### 5.4.2 Example: VER market in Turkey

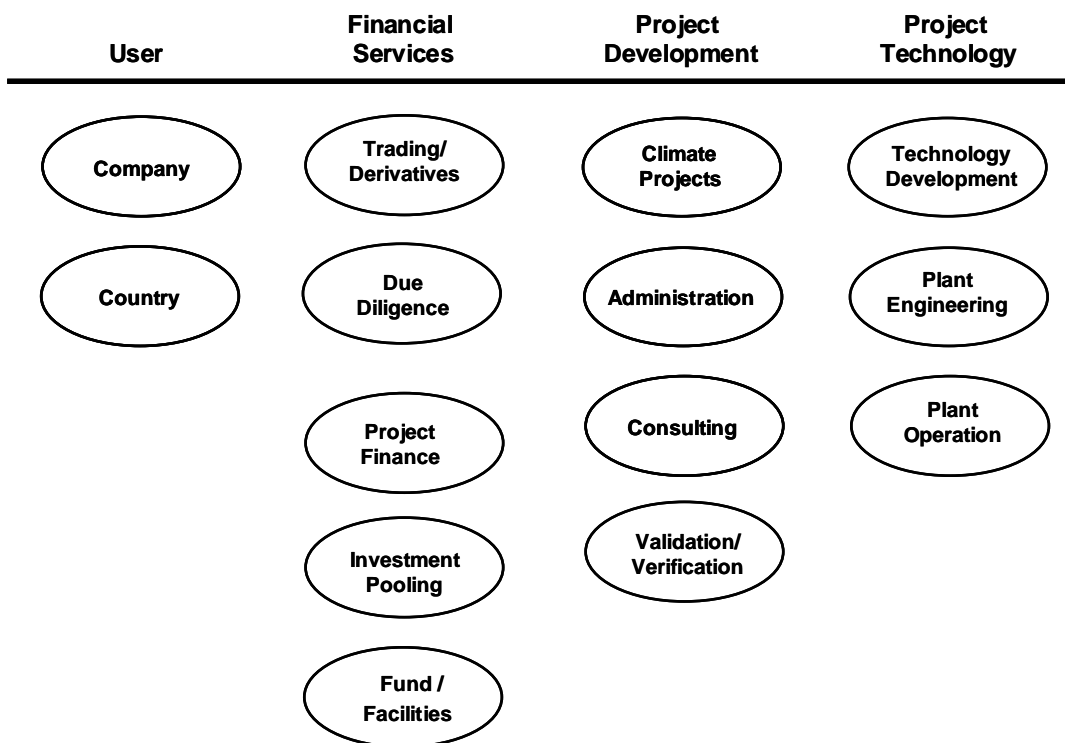
Some 23 projects in the renewable energy sector were announced in early 2008 from the Turkish Focal Point “Rec Turkey<sup>21</sup>”. Currently six VER projects hosted in Turkey are registered in the Gold Standard Registry whereas 26 more projects are additionally listed. This demonstrates not only the market growth in Turkey. After the Gold Standard foundation launched their Voluntary Carbon Standard in 2006 the project list currently increased to some 60 projects worldwide.

FutureCamp as a leading consultancy in the Turkish VER market developed amongst others the first Gold Standard Geothermal VER Project in Turkey<sup>22</sup>.

### 5.4.3 Conclusion voluntary market

Over the last years the Voluntary Carbon Market increased and further market growth is expected according to market observations run by Future Camp and other experts. Standards and other quality criteria on both sides of the market<sup>23</sup> contribute to more transparency and market dynamics in the Voluntary Carbon Market.

## 6. Companies in the Carbon Markets



**Figure 7: The Carbon value chain, its players & TOP 25 installations in Germany.**  
 Source: FutureCamp 2009.

<sup>21</sup> For further information please see [www.rec.org.tr](http://www.rec.org.tr)

<sup>22</sup> For more information about this project named “Tuzla 7.5 MW Geothermal Power Plant (GS353)” please access <https://gs1.apx.com/myModule/rpt/myrpt.asp>.

<sup>23</sup> On the demand side standards for calculating emissions are existent.

**Table 7: TOP 25 installations in Germany and emissions in t CO<sub>2</sub>e, Source: CITL 2008.**

1	ThyssenKrupp Steel AG ThyssenKrupp Stahl AG	19622025
2	RWE Power Aktiengesellschaft	14558503
3	Vattenfall Europe Generation AG & Co. KG Vattenfall Europe Generation AG & Co. KG	12230895
4	RWE Power Aktiengesellschaft	10629761
5	Salzgitter Flachstahl GmbH Salzgitter Flachstahl GmbH	9276102
6	Hüttenwerke Krupp Mannesmann GmbH Hüttenwerke Krupp Mannesmann GmbH	8655981
7	Vattenfall Europe Generation AG & Co. KG Vattenfall Europe Generation AG & Co. KG	8584197
8	RWE Power Aktiengesellschaft	8379517
9	RWE Power Aktiengesellschaft	8171598
10	Vattenfall Europe Generation AG & Co. KG Vattenfall Europe Generation AG & Co. KG	8124378
11	E.ON Kraftwerke GmbH	7967325
12	ROGESA Roheisengesellschaft Saar mbH ROGESA Roheisengesellschaft Saar mbH	7238004
13	Großkraftwerk Mannheim Aktiengesellschaft Großkraftwerk Mannheim Aktiengesellschaft	5867797
14	ArcelorMittal Bremen GmbH	5832055
15	Vattenfall Europe Generation AG & Co. KG Vattenfall Europe Generation AG & Co. KG	4348029
16	Vattenfall Europe Generation AG & Co. KG Vattenfall Europe Generation AG & Co. KG	4270087
17	Kraftwerk Voerde oHG der Evonik Steag GmbH und RWE Power AG	4124360
18	ArcelorMittal Eisenhüttenstadt GmbH EKO Stahl GmbH	3988491
19	RUHR OEL GmbH RUHR OEL GmbH	3604377
20	E.ON Kraftwerke GmbH	3582535
21	Vattenfall Europe Berlin AG & Co.KG Bewag AG & Co. KG	2550371
22	E.ON Kraftwerke GmbH	2497458
23	Evonik Steag GmbH STEAG AG	2484096
24	Rheinkalk GmbH Rheinkalk GmbH	2433104
25	RWE Power Aktiengesellschaft	2410310

## 7. R&D Priorities

Energy research must be seen within the wider context of the Federal Government's overall energy policy goal of ensuring a viable and subsidy-free energy supply.

Priorities in the energy research sector are:

- Reduction of energy consumption,
- Increase of energy efficiency, and
- Promotion of renewable energy sources.

A profound and detailed summary of R&D policy in basic energy research is currently available on the homepage of the Federal Ministry of Education and Research (BMBF 2010).

### 7.1 National organisations for energy funding

On the federal level, several public authorities are sharing responsibilities in energy research:

- The Federal Ministry for Economy and Technology (BMWi) is taking the “programme responsibility” on the whole energy research policy. It is also in charge for project funding in the areas of non-nuclear energy research (excluding renewable energies), rational energy conversion, nuclear safety and repositories.
- The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) is responsible for project funding in the area of renewable energies.
- Project funding in the area of bioenergy is coordinated by the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV).

- The Federal Ministry of Transport, Building and Urban Affairs is in authority for the area of transportation and has partial responsibility with respect to building and housing.
- The Federal Ministry of Education and Research (BMBF) is responsible for project funding of fundamental research of energy technologies.

## 7.2 Funding priorities in R&D of energy

The BMBF recently published the “Basic Energy Research 2020+” funding concept in order to support research work into efficient energy generation and conversion, including energy storage, transmission and consumption, as well as the reduction of greenhouse gases (Federal Ministry of Education and Research 2010). The funding concept for basic research focuses on these topics:

- Utilisation of next generation solar energy, in particular photovoltaic and biomimetic hydrogen production,
- Bioenergy generation and conversion,
- Sustainable CO<sub>2</sub> storage and use.

This concept is containing a list of specific technology-related funding notices, which are available from federal organisations in Germany.

The main energy research centres in Germany being funded by the BMBF in the field of basic energy research are:

- Hahn-Meitner-Institute, Berlin
- Jülich Research Centre
- Fraunhofer Institute for Solar Energy Systems

The Hahn-Meitner-Institute and the Jülich Research Centre are organized in the Helmholtz Association. Under this association, a programme on “Renewable Energies” was established. One main focus is research on photovoltaic (e.g. polycrystalline thin-film solar cells, new thin-film concepts at Hahn-Meitner, thin-film solar cells based on silicon and amorphous microcrystalline alloys at Jülich Research Centre). The Fraunhofer Institute is specifically researching on wafer-based silicon solar cells.

In the field of biomass and bioenergy conversion, the research goal is to optimise existing processes, to combine techniques (cascade utilisation) and to develop new processes for utilising the limited quantities of biomass raw material as efficiently and sustainable as possible. On the federal level, basic research on biomass is primarily carried out by the Karlsruhe Institute of Technology (KIT). In biomass research, the following topics have been defined to be addressed in future cooperation with both universities and industries:

- Basic molecular principles of biomass production
- Biomass preparation
- Biomass recovery using thermochemical and biotechnological methods
- Environmental impact, system analysis and technology impact assessment

Another important area of energy research is “efficient conversion and use of energy.” Three centres of the Helmholtz association are involved in this field: German Aerospace Centre (DLR), Karlsruhe Institute of Technology (KIT) and Jülich Research Centre (FZJ). Individual programmes are funding several activities in the following areas (Federal Ministry of Education and Research 2010):

- Power plant technology (efficient and environmentally friendly power generation)
- Fuel Cells (decentralised and environmentally friendly power generation)
- Superconductivity (reduction of electrical transmission losses in the grid)

In all these areas future research is to be extended. Priorities will be the equipping and upgrading of existing power plants to incorporate CO<sub>2</sub>-capture facilities.

In comparison to the BMBF, the project funding of the BMU and the BMWi is rather application-oriented. In the area of sustainable CO<sub>2</sub> storage and use, the BMWi is funding modern power plant technologies incl. CO<sub>2</sub> capture as part of its COORETEC programme. Further information on the inclusion of the COORETEC project into international activities can be found on the project homepage (<http://www.coorettec.de>). Apart from this, the BMBF focuses on research and development work into underground storage of CO<sub>2</sub> within the scope of the Federal Government's CCS strategy.

In the framework of the National Integrated Energy and Climate Change Strategy, the BMU is specifically focussing funding activities on biomass pilot and demonstration projects. Funding in this field is targeted at the optimization of the energetic use of biomass. The BMU is supporting seven issues of this task. From the perspective of SETatWork, four of them are relevant:

- Funding Priority 1: Improvement and advancement of the general framework and technologies for the efficient utilization of biogenic residues, e.g. by best practices of different flow patterns for materials and component substances
- Funding Priority 2: System studies and international cooperation projects for the development of best practises in the field of sustainable supply of biomass and bioenergy resources
- Funding Priority 3: Development and demonstration of gasification technologies for combined heat and power appliances based on the use of biomass
- Funding Priority 4: Development and demonstration of an European Biomethane Strategy (supply and import of biomethane from Middle and Eastern Europe via transnational gas grid)

In the period from 2008 to 2010, the focus of funding was on the provision of an adequate data basis for respective projects. Another priority is the elaboration of concepts and feasibility studies. In the second funding period (2011-2012) the implementation and monitoring of promising pilot and demonstration projects will receive funding.

## 8. Links to relevant and related websites

CDM Bazaar: <http://www.cdmazaar.net/>

EEX: <http://www.eex.com/de/>

EU-ETS: [http://ec.europa.eu/environment/climat/emission/index\\_en.htm](http://ec.europa.eu/environment/climat/emission/index_en.htm)

Federal Environmental Agency (UBA): <http://www.umweltbundesamt.de/>

Federal Ministry of Economics and Technology: <http://www.bmwi.de>

Federal Ministry for Environment, Nature Conservation and Nuclear Safety:  
<http://www.bmu.de>

Federal Ministry of Food, Agriculture and Consumer Protection: <http://www.bmelv.de>

Forschungszentrum Jülich: <http://www.fz-juelich.de>

Fraunhofer Institute for Solar Energy Systems (ISE): <http://www.ise.fraunhofer.de>

German Aerospace Centre (DLR): <http://www.dlr.de>

German Emission Trading Authority DEHSt):  
[http://www.dehst.de/EN/Home/homepage\\_node.html?\\_nnn=true](http://www.dehst.de/EN/Home/homepage_node.html?_nnn=true)

Hahn-Meitner-Institute: <http://www.helmholtz-berlin.de>

Karlsruhe Institute of Technology (KIT): <http://www.kit.edu>

JIKO: <http://www.jiko-bmu.de/english/aktuell/489.php>

NAP I: [http://ec.europa.eu/environment/climat/emission/emission\\_plans.htm](http://ec.europa.eu/environment/climat/emission/emission_plans.htm)

NAP II: [http://ec.europa.eu/environment/climat/emission/2nd\\_phase\\_ep.htm](http://ec.europa.eu/environment/climat/emission/2nd_phase_ep.htm)

UNEP RISOE: <http://www.cd4cdm.org/>

UNFCCC: <http://unfccc.int/2860.php>

### Literature

BMU (2009): Hintergrundpapier zur Bekanntmachung über die Förderung von Vorhaben zur Optimierung der energetischen Biomassenutzung, available online:  
[http://www.bmu.de/klimaschutzinitiative/nationale\\_klimaschutzinitiative/foerderprogramm\\_bio\\_energienutzung/doc/41774.php](http://www.bmu.de/klimaschutzinitiative/nationale_klimaschutzinitiative/foerderprogramm_bio_energienutzung/doc/41774.php)

Federal Ministry of Education and Research (2010): Basic Energy Research 2020+, The Funding of Energy Research by the Federal Ministry of Education and Research, available online: [http://www.bmbf.de/pub/basic\\_energy\\_research\\_2020.pdf](http://www.bmbf.de/pub/basic_energy_research_2020.pdf)