CEE bankwatch network

Change the lending, not the climate

The European Investment Bank's dirty energy tendencies are eclipsing its advances on clean energy – and undermining EU climate targets

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List of abbreviations

ACP	countries in Africa, Caribbean, Pacific
CEE	Central and Eastern Europe
CHP	combined heat and power production
CIS	Commonwealth of Independent Countries (former Soviet Union)
EE	energy efficiency
EEA	European Economic Area (EU27 + Iceland, Norway, Lichtenstein)
EFTA	European Free Trade Area (EU27 + Switzerland, Iceland, Norway, Lichtenstein)
LAME	Latin America
Medi	countries in Mediterranean, outside the EU (North Africa, Middle East)
MW	megawatt
Mtoe	million tonnes of oil equivalent
post-2012	regime to replace expiring Kyoto Protocol after the year of 2012
PV	photovoltaics
RES, RE	renewable energy source
R&D	research and development
SEE	South East Europe
SMEs	small and medium enterprises
TENs	Trans-European Networks
TWh	terawatt-hour

Executive summary

The problem, policy solutions and finance

There is now a prevailing consensus that climate change is one of the most urgent global problems, requiring fast and strong action. The need to both stamp out fossil fuel addiction and to stimulate energy efficiency measures on a large scale are recognised as core solutions to climate change. As the Intergovernmental Panel on Climate Change put it in 2007 (backed up by a wide range of subsequent studies that have even gone further), **the economies of the world's developed countries need to be decarbonised by mid-century,** with mid-term reductions by 2020 of 25-40 percent of 1990 levels of carbon dioxide equivalent in the atmosphere.

Such vital, radical change, required to stabilise climate change at safe levels, encompasses a wide revolution in how the world's economies are organised and fueled. **This cannot happen without proper stimulation.** Policy incentives for clean business, prices for carbon, support from public funds and complex monitoring and compliance need to be established and implemented. Financial institutions, whether private or public, need to follow this path – including the European Investment Bank.

In recent years there has been a tremendous rise in the EU's energy and greenhouse gas regulations. Among the most important developments are **binding national targets** – to be achieved by 2020 – for EU Member States governing the share of renewable energy in final energy consumption. Improvements in energy efficiency are also required by EU regulation. By implementing these and additional targets, the EU as a group is looking to achieve at least a 20 percent reduction (based on 1990 levels) in greenhouse gas emissions by 2020. At the same time, individual states have their own greenhouse gas mitigation targets for the housing and transport sectors.

High targets come with high price tags

The current evidence on achieving the indicative targets for increasing the share of renewables in the energy mix (21 percent renewable electricity and 5.75 percent agrofuels by 2010) reveals that the Member States will need to make much greater efforts to meet their national targets. With the exception of Hungary, **it is largely the countries of central and eastern Europe (CEE)** whose progress the European Commission is not satisfied with and **which are set to miss their targets.** There are, however, more progressive states such as Germany, Denmark and the Netherlands that are on course to meet their targets. The binding targets for 2020, it should be kept in mind, are even more ambitious than the current ones which the CEE countries are largely in danger of missing.

With several of them being hit especially severely by the economic crisis, the CEE countries are encountering difficulties in attracting investors for green power production and in accumulating domestic capital for large investments. This general lack of finance for implementing the targets, aside from other factors, is creating a major obstacle and potentially undermining the achievement of the EU targets. The various cost estimates of the investments needed to reach the 2020 targets across the EU range from EUR 13 billion at the low end (estimated by the European Commission) **up to EUR 44 billion (estimated by the Dutch consultancy Ecofys) to be invested into energy infrastructure by 2020 on an annual basis.**

The EU's bank undermines EU policy

A supposed key player in supporting EU Member States to meet EU goals – including on perhaps the most pressing issue of all, climate change – is the European Investment Bank (EIB). Yet on the climate change challenge the EIB has thus far been taking a lukewarm approach. The EIB, now – according to its website – the ‚EU's bank', is in fact **the largest public lending institution in the world** in terms of loan volumes. Its annual lending portfolio has progressively climbed from EUR 39 billion in 2002 up to EUR 59 billion in 2008. Within this mushrooming portfolio over this period, 9-16 percent has been annually loaned to the energy sector. This is double the figure that the better known World Bank has been lending to energy. In 2009 the EIB's total lending has grown further, to over EUR 70 billion, because of economic crisis dictated imperatives to aid EU recovery.

In the **2002-2008** period, the EIB loaned more **than EUR 37 billion for energy projects.** In this period, the EIB's energy portfolio featured fossil fuel lending with nearly 50% invested into gas, including LNG, oil or coal. Transmission lending follows with an approximately 30 percent share. Other unsustainable energy sources (nuclear and large hydro sources) took a 4 percent share, while renewables accounted for roughly 16 percent. This ratio has not fluctuated significantly even since renewable energy targets for the EIB were introduced in 2006.

Some positive steps, but far from enough

Although the EIB has been setting renewable targets for itself, such as the annual target of EUR 600-800 million for renewable energy, these have not been ambitious enough. The more ambitious target of 50 percent renewable share at generation by 2010 requires the EIB to double its renewable investments of 2008, assuming – rather improbably – that its energy lending volumes remain the same in the upcoming years. More generally, **the current level of EIB investment of around EUR 1 billion per year into renewable energy needs to be set against the estimate of around EUR 40 billion per year required to meet EU targets over the next decades.**

From the data that is publicly accessible, it is not possible to scrutinize the EIB's lending for energy efficiency for the following reasons: it is spread across all sectors (such as transport or innovation); the EIB does not make available any accounting for energy savings when assessing the projects; and there are no targets for energy efficiency. While the EIB has been backing good energy efficiency initiatives in western Europe in recent years, **the grey area hanging over the EIB's energy efficiency efforts is very unfortunate given the enormous potential** for the bank to be making a distinct, measurable difference in this field.

First and foremost, there is enormous **potential for energy efficiency,** especially in the CEE region, which can substantially contribute to meeting EU targets and to mitigating climate change in the most efficient way – yet funding is not forthcoming in the required volumes. Second, improving energy efficiency in housing is widely viewed as one of the **best anti-crisis measures** – it creates new jobs, especially in regional SMEs, stimulates clean businesses and economic development and, ultimately, saves energy bills for households. It is also a cohesion measure as it alleviates energy poverty and strengthens energy security. Third, other public banks, such as the European Bank for Reconstruction and Development, have energy efficiency accounting already in place and scrutinize their projects on this basis before ultimate funding decisions.

Renewables put in the shade by gas, oil, coal, large hydro and nuclear

EIB lending between 2002 and 2008 for energy generation alone saw **unsustainable and fossil energy projects accounting for three quarters of all loans,** with renewables projects comprising the remaining quarter. In absolute terms this means that the EIB poured more than EUR 20

billion into gas, oil and coal, large hydro and nuclear projects between 2002 and 2008. The EUR 6 billion invested by the EIB for renewable energy generation in the same period has clearly been dwarfed by unsustainable energy lending, and the positive climate effects are thus being seriously undermined. On average since 2002, for every million spent on renewables, the EIB has provided 3.3 million to gas, oil, coal, nuclear or large hydro.

Financing for fossil fuels, then, has continued to be a major preoccupation of the EIB despite numerous calls from the European Parliament to stop it. The parliament has repeatedly urged the EIB to focus on renewable energy and energy efficiency and to account for the full impacts of its financed projects since 2003. However, the main leverage over the EIB remains with the European Commission, which has been using it very marginally.

Dirty dealings magnified in new Member States and the developing world

Analysis of the EIB's loans in the new Member States and in the Global South (mostly Africa and Mediterranean countries) reveals that the EIB has done very little to support renewable energy in regions other than the EU 15. **Out of EUR 1 860 million spent on energy projects in new Member States between 2004 and 2008, there was only one single loan of EUR 25 million for renewables.**When we look at whole new renewables portfolio of EIB between 2002 and 2008, we see that 89 percent of it went to old Member States of the EU.

EIB finance of EUR 7 billion for energy has gone outside the EU Member States in the 2002-2008 period. **In developing countries, the EIB's lending has been even less sustainable than inside the EU** – non-renewable energy and large transmission projects received EUR 6.5 billion or 93 percent in the period in question, with renewable energy representing a mere EUR 321 million. There has clearly been a deeply skewed approach from the EIB, resulting in a major imbalance of dirty energy investments outside the EU's core old Member States.

Recommendations

Climate change is an urgent challenge to us all and its effects are emerging with increasing acuteness around the world. It needs to be tackled primarily by a swift decline in domestic emissions from energy production. The EU's energy and climate targets for the next decade - although not yet sufficient - offer a practical framework to address the challenges. Some countries, especially those in the CEE region, have been struggling to meet the fast-approaching targets for renewable electricity by 2010. Yet there has been hardly any support from the EIB to the region in this regard. The EIB continues to be heavily involved in the fossil fuel sector, while at the same trying to plug into renewables. **Redirecting and boosting the EIB's investment billions into true solutions – solid renewable energy projects and energy efficiency schemes – is in Member States' interest, in the environment's interest, and it is in the EU's economic interest.** If the EIB and the EU are to lead the way into a low-carbon world, unequivocal changes in lending practices simply must happen.

Based on the findings of Bankwatch's analysis into EIB energy lending for the 2002-2008 period, the EIB has to start considering and implementing the recommendations below.

No more financing for fossil fuels:

- The EIB must adopt **a plan to phase out of fossil fuels** and for starting to decrease its gas lending immediately, in accordance with the recommendations of the European Parliament. At the same time, it should **redirect** fossil fuel and other unsustainable (such as nuclear and large hydro) loans **to energy efficiency and renewable energy.** This also applies to the EIB's operations in the Global South.

As a first step:

- The EIB needs to **significantly boost its renewable energy portfolio up to 2010** in order to safely meet its own target of 50 percent renewable energy share at energy generation. Large hydro power plants should not be counted as renewables due to their social and environmental impact, including high greenhouse gas emissions. The EIB should also go beyond this and propose and **implement annual renewable lending targets until 2020** which fully address the climate change challenge and investment needs. For that purpose, the EIB needs to establish and implement a **solid greenhouse gas and energy efficiency accounting methodology.**
- In transmission lending, the EIB should start lending to **smart grid and decentralised electricity systems** and to the improvement of transmission networks, as well as the interconnections demanded by increased penetration of renewables.

In new Member States:

- The EIB should primarily focus on **energy efficiency**. Such required lending for energy efficiency includes grant schemes for the major insulation of public buildings and housing, loans for improved energy management in industry, R&D in high-efficient technologies, and for the establishment of energy service companies particularly targeting savings in the industrial sector.

Change the approach:

- The EIB must **radically back away from old-fashioned, large-scale energy projects** and turn to small scale ones, in order to assist the 2020 targets.
- The EIB should develop **specific financial instruments for small enterprises and households** to exploit the most appropriate ways in individual Member States for delivering substantial cuts in greenhouse gas emissions.
- The EIB must substantially **boost its lending for renewable energy in the new Member States** and develop specific investment schemes into the sectors which deliver the most emission cuts.

Section 1: Climate change and the EIB

There is a prevailing consensus within the EU and world-wide that climate change is a serious global challenge, which requires immediate and radical action. Since December 2007, the countries of the world have been trying to come to an agreement on how to reduce and ultimately stop human-induced climate change in the coming decades. These efforts will peak at the climate summit in Copenhagen in December 2009. When compared to the first commitment period of the Kyoto Protocol finishing in 2012, there are immense tasks to be finalized in mitigation, adaptation, finance volumes and monitoring systems at **the Copenhagen Summit**.

As science has shown, global emissions of greenhouse gases should optimally peak only between 2013 and 2017 so that the increase of the global mean temperature will be stabilised below two degrees Celsius, and thus avoid reaching a tipping point of climate system stability. Therefore an immediate shift into energy efficient economies and low-carbon energy production is essential.

Moreover, emissions peaking is no longer required only in the developed but also in developing countries, whose emissions are expected to rise massively over this century. According to the World Energy Outlook 2008 prepared by the International Energy Agency[1], there will be a need for over USD 1 trillion for energy-supply annual investments across the world in order to stay below two degrees. **Delay** in action and, in particular, a delay in peaking global emissions will **lead to irreversible impacts on communities and ecosystems and it will hugely increase costs.** The longer the action takes and the smaller the emission cuts are, the more it will cost in terms of the inevitable consequences and adaptation. In other words, **the investment decisions of today do determine the future** – in regards to both impacts and costs of mitigation.

This study looks at European Investment Bank's investments with the background of the overall EU's targets in energy, renewable energy and climate. The European Investment Bank, though independent, is the main financial body of the EU and provides **substantial funding to six key sectors** (cohesion/convergence, transport/TENs, energy, environment, SMEs, R&D and innovation). In this report, we first list the various **EU targets** in energy, climate change also including the estimates for their achievement. It is clear that some part of these costs will need to come **from public budgets.**

We argue that the EIB as a public institution should play a role in the EU's effort to achieve mid-term energy and climate targets, and ultimately accomplish a full state of de-carbonisation. Secondly, we will look at **the past energy lending of the EIB** and analyse it in terms of quality and volumes invested. When looking at energy lending, we will check how much the EIB complies with the **targets for renewable energy** it has set for itself. The exact methodology, including the basic set of data of the analysis, is described in Annex 1.

When looking at the EU's aspirations and the EIB's actions, we conclude with a **set of recommendations** on how the EIB should change its policies and redirect its energy lending in order to bring their lending closer to EU policy.

How is the EIB lending?

Over the decades and due to a growing portfolio, the EIB has evolved to become **the largest public lending institution in the world.** Today its lending portfolio is twice as larger as that of the better

known World Bank. Between 2002 and 2008, the EIB lent an overall sum of EUR 325 billion, out of which more than **EUR 37 billion went to the energy sector.** The World Bank Group[2] loaned within the same time span about USD 23 billion for energy[3] only, which amounts to EUR 16 billion at 2009 exchange rates. Lending to energy was a substantive part of the EIB portfolio, oscillating between an **annual share of 9 and 16% of the overall EIB lending.** The EIB loans mainly target EU Member States; however, between 2002-08 **EUR 7 billion for energy** also went to developing countries **outside** the EU, including in Africa, the Pacific and Caribbean, Asia, and in Latin America.

The European Investment Bank offers **various loan formats** in support of energy investment, depending on project size and category:

- **Individual or framework loans:** aimed at projects or programmes with investment costs of at least EUR 25 million. The maximum loan amount is in general up to 50% of the total project cost.
- **Intermediated loans or global loans** (also called **credit lines**): aimed at investments of up to EUR 25 million, credit lines are arranged with other banks or financial institutions to support – at their own credit risk – smaller projects, typically undertaken by SMEs with fewer than 250 employees or local authorities. In the case of energy R&D, promoters of any size and ownership are eligible for allocations from credit lines. The maximum amount for allocations is generally up to 50% of the investment cost, but for energy RDI and investment in emissions reduction the maximum is 75%.
- **Mid-cap loans:** aimed at investments of up to EUR 50 million. Mid-cap loans are lines of credit in support of projects undertaken by intermediate-sized companies with fewer than 3 000 employees ("mid-caps"). The maximum amount for sub-loans under mid-cap loans is generally up to 50% of the investment cost.[4]

There are some **reservations linked to credit lines or global loans** provided by the EIB in energy (and in other sectors). As those loans go to financial intermediaries and the Bank usually does not provide any information, to help to identify the intermediary institution; it is almost impossible to check what purpose and what the money was ultimately used for on the ground. In the case of small-scale projects for SMEs, information on the purpose and the outcomes of projects would be especially helpful in order to assess the EIB's activities in renewable industry on a more solid basis.

The EIB offers loans at fixed, variable or revisable **interest rates.** An advantage of EIB finance is the extended maturities of the loans – for energy infrastructure up to 20 years and longer. Borrowers may further benefit from appropriate grace periods, which in the case of R&D projects accommodate the generally longer time span between the start-up, market launch and payback stages. The EIB can adjust the conditions to the specific needs of the recipient.[5]

The EIB enjoys a special status – while it is independent, it is still controlled by EU institutions to some extent. The Council, the Commission and the Parliament execute limited control power over the EIB, while most of the decision-making remains with the bank's in-house structures of the Board of Governors and Directors, and the Management Committee. More details on the **control and decision-making in the EIB** are sketched out in **Annex 2** of this report.

To put the analysis of the EIB's energy lending into the context, it is important to note the role of the European Parliament, which is supposed to be the "voice of EU citizens". The EP can make comments on the annual reports of the EIB and has expressed itself in various resolutions upon the requests of the Bank. When it comes to the energy sector and sustainability, **the EP has requested the EIB to:**

- Stop funding fossil fuel projects
- Focus its lending on energy efficiency and renewable energy
- Make public a methodology to assess the climate impact of their investment and publish a set of criteria for refusing projects on the basis of their environmental impact.

Since November 2008, the EP has **co-decision power to adopt the EIB external lending mandate**, and can thus prevent the bank from entering other regions of the Global South.

Box 1: European Parliament demands on the EIB

On 2007 EIB annual report[6]
[the Parliament]
- Urges the EIB to **focus its energy lending** on energy efficiency, renewable energy and research and development investments in these two areas;
- Additionally calls on the EIB to establish and make **public a methodology to assess the climate impact** of the financed projects and to make public a set of criteria enabling the EIB to refuse projects for their negative impact on climate change;
- Urges the EIB to **increase substantially its support** for rail, urban public transport, intermodal transport, and transport management.

2007 Resolution on Trade and Climate Change[7]
[the Parliament]
- (29.) Calls for the **discontinuation of public support**, via export credit agencies and public investment banks, for fossil fuel projects and for the **redoubling of efforts to increase the transfer** of renewable energy and energy efficient technologies;
- (30.) Asks the Commission and the Member States to propose legislative instruments in order that Member State export credit agencies and the European Investment Bank take account of the **climate change implications** of the funded projects when making or guaranteeing loans and impose a moratorium on funding until sufficient data are available, in accordance with advice from the OECD, the G8 and the Extractive Industries Review;"

2005 EIB Annual Report[8]
[the Parliament]
- Welcomes the EIB's intention to draw up a **new energy action plan** incorporating the new EU energy objectives;
- Calls on the EIB to adopt **more ambitious financing objectives** both for renewable energies and for programmes to improve energy efficiency, above all in the new Member States and in the SME sector, where there is more scope for improvement;

2003 EIB Annual Report[9]
[the Parliament]
- Encourages the EIB to **prioritise** the funding of the Trans-European Networks;
- Supports the EIB's decision to **invest more in the renewable energy** sector and to make greenhouse gas emissions prevention an essential criterion in the selection of projects to be supported;

So far the EIB has not come close to fulfilling these calls from the European Parliament, neither has it publicly reacted to these recommendations. The scrutiny of the EP is in this case rather a symbolic than an executive one.

Section 2: EU's climate and energy targets

In recent years, the European Union has set for itself several **targets in the energy sector** that are supposed to start the transformation to an infrastructure that is less carbon-intensive and less dependent on external supplies. If these mid-term objectives are met, they can advance the EU's position in the new global economy of the manufacturing and deployment of low carbon technologies.

The targets are supposed to reduce the EU's share of man-made climate change and provide guidance for European domestic CO2 mitigation. They include a binding target for **20% renewable energy** share at final consumption, **10% renewables in transport,** an indicative target of a **20% decrease in energy demand,** and a **20% reduction in greenhouse gas** (GHG) emissions, all by 2020 (compared to 1990 levels). It is worth pointing out that currently the EU27 GHG emissions remain at nearly minus 10% to 1990 levels, and the share of renewables covers over 9% of final energy consumption.

It is important to stress that the renewable target is for **final energy consumption** and not only for electricity and therefore affects all sectors (electricity, heating & cooling and transport). While Member States are free to attain their target within which ever sector they see fit, 10% of transport fuel must come from renewable sources. Furthermore, this target is not equally apportioned to Member States, but the percentage is based on the current level of renewables in the energy mix, potential for renewable energy and conditions in the energy sector. To give two extreme examples, Sweden is expected to move from 39.8% of renewables in its energy mix in 2005 to 49% by 2020 (an increase of 9.2%) while Slovakia should go from 6.7% to 14% (an increase of 7.3%). The exact targets are all included in **Table 1** below.

Furthermore, the EU's strategy in energy aims at **energy supply diversification.** The gas reserves and resources in the EU/EEA represent a very modest share of world reserves. Gas reserves are mainly located in Norway, the Netherlands, the United Kingdom and Romania.

At current production rates, **the EU's proven reserves are between 14-15 years of domestic production.** Therefore, it is assumed that in the future both the percentage and actual level of imported gas will increase. Currently, the EU relies on **imports for about 50% of its gas consumption,** with Russia supplying half of this. By 2030, it is anticipated that the level of **imported gas will rise to about two thirds** of total consumption. Although the total volume will increase from Russia to about 200 billion cubic metres, the relative contribution is expected to shrink due to increased supply from the Middle East and Africa[10]. Recent experience has shown that extensive reliance on non-EU gas imports from politically unstable regions is **strategically risky.**

To address this, the Commission has drafted a Directive *"Concerning measures to safeguard security of gas supply"*[11] in 2004. The main objectives of the draft legislation are *"ensuring an adequate level for the security of gas supply, in particular in the event of a major supply disruption,"* and „contributing to the proper functioning of the internal gas market". Energy efficiency as a way to address the energy security challenge is discussed below in section on fossil fuel lending in the case of the planned **Nabucco gas pipeline.**

A. Aspirations versus opportunities: targets and potentials for renewable energy

Table 1 below shows the individual targets for Member States that make up the 2020 target and mid-term achievable potentials (as a percentage of the total consumption in 2020).[12] As it indicates **most Member States have to significantly increase their use of renewable energy.** It is in countries like Sweden and Denmark that are considered to have significant potentials to exploit renewable energy where the highest target increases are projected. However, targeted increases do not completely match the renewable potential – for example, in the case of the UK, there is a relatively high increase of 13.7%, while it has quite a low potential. The lowest targets can be found **in the new Member States,** which generally have less experience with the renewable sector but there is a huge potential in some individual countries (the Baltic states, Bulgaria and Romania).

These potentials are important indicators of the fact that there is enormous space for the development of renewables in the EU. The potentials vary not only between the Member States, but also across the sectors of electricity and heat generation.

In the last column of Table 1, we can see the targets for the Member States in the sectors not covered by the current Emission Trading Scheme (**housing, agriculture, transport, waste**), which are indicated in the effort sharing decision, adopted as a part the energy-climate package in 2008. The targets for the **new Member States** indicate that almost all of them **can increase their non-ETS emissions until 2020.** However, reductions below the target can be traded between the states so that early action gets rewarded.

Table 1: Member States Renewable Energy Targets and Potentials (all in %). Top figures are marked in bold.

EU Member State	RES in 2005	2020 RES target	% increase	RE potential in electricity	RE potential in heating	Non-ETS target
Austria	**23,30%**	**34%**	10,70%	**>70**	50-60	-16%
Belgium	2,20%	13%	10,80%	10-20	20-30	-15%
Cyprus	2,90%	13%	10,10%	30-40	30-40	-5%
Denmark	**17,00%**	**30%**	**13,00%**	**60-70**	50-60	**-20%**
Finland	**28,50%**	**38%**	9,50%	50-60	**>80**	-16%
France	10,30%	23%	**12,70%**	40-50	30-40	-14%
Germany	5,80%	18%	**12,20%**	30-40	30-40	-14%
Greece	6,90%	18%	11,10%	30-40	30-40	-4%
Ireland	3,10%	16%	**12,90%**	**60-70**	20-30	**-20%**
Italy	5,20%	17%	11,80%	30-40	30-40	-13%
Luxembourg	0,90%	11%	10,10%	50-60	**70-80**	**-20%**
Malta	0,00%	10%	10,00%	10	20	5%
Netherlands	2,40%	14%	11,60%	40-50	30-40	-16%
Spain	8,70%	20%	11,30%	50-60	30-40	-10%
Sweden	**39,80%**	**49%**	9,20%	**60-70**	**70-80**	-17%
UK	1,30%	15%	**13,70%**	30-40	20-30	-16%
CEE countries						
Bulgaria	9,40%	16%	6,60%	**60-70**	**>80**	+20%
Czech Republic	6,10%	13%	6,90%	10-20	30-40	+9%
Estonia	**18,00%**	25%	7,00%	**>70**	**>80**	+11%
Hungary	4,30%	13%	8,70%	20-30	30-40	+10%
Latvia	**34,90%**	**42%**	7,10%	**>70**	**>80**	+17%
Lithuania	**15,00%**	23%	8,00%	50-60	**70-80**	+15%
Poland	7,20%	15%	7,80%	20-30	40-50	+14%
Romania	**17,80%**	24%	6,20%	**60-70**	60-70	+19%
Slovakia	6,70%	14%	7,30%	20-30	50-60	+13%
Slovenia	6,70%	25%	9,00%	**>70**	**>80**	+4%
EU27	8,50%	20%	11,50%	N/A	N/A	-11%

The 2020 renewable energy targets are clearly challenging, however, they are still **achievable with the correct market conditions and incentives.** Furthermore, it is important to note that the 2020 target is not the end of the development of renewable energy, but just a midterm objective. Subsequently, **renewables** are expected to play an even more important role in energy supply up to the point when it is providing **virtually all, if not all, of Europe's needs in line with the sustainability principle.**

While the Fraunhofer studies[13] of energy potentials shows the **achievable potential for renewables,** a greater amount of energy could be acquired with different incentives and a different prioritisation of societal concerns. For example, the European Environment Agency[14] has assessed **the potential for offshore and onshore wind power.** It concludes that:

- The technical potential from wind power may be the equivalent to almost 20 times the energy demand projected in 2020, with the biggest onshore wind potentials in North-Western Europe and the greatest offshore wind potential in the North Sea, the Baltic Sea and the Atlantic Ocean also with some potential in the Mediterranean and the Black Sea.
- Wind energy available that is economically competitive amounts to more than three times the projected European energy demand in 2020.

B. Progress achieved so far

In 2007, the electricity generated from renewable resources amounted to 15.6% of the electricity consumption in the total of the EU27. **After 2002, electricity generation from renewable sources entered into an era of steady growth of average of 4% per year** – starting at generating 404 TWh in 2002 and rising up to 488 TWh in 2006.

When it comes to technologies, wind power was the fastest growing power generation technology in the EU in 2008 with 43% of all new energy installations. According to the industry association Global Wind Energy Council, the European wind turbine market was worth EUR 11 billion in 2008. Besides the leading countries like Germany (1 665 MW installed) and Spain (1 609 MW), the wind power sector grew quickly in Italy, France and the UK but even some of the new Member States such as Poland and Bulgaria jumped on-board. In solar power, Germany is currently very advanced with 3 063 MW of installed potential. **With its moderate climate, Germany is an outstanding example of how appropriate economic incentives and policy regulation can bring results.**

Although the 2020 target is the first binding EU target for renewable energy, two existing but indicative targets for 2010 are already in place, for electricity (22% renewable share at final consumption) and agrofuels (5.75% non-fossil fuels in fuel mix). Consequently, monitoring and assessments have taken place to determine the success that Member States have had in meeting these targets. **As the Commission's 2009 progress[15] report indicates, there is a worrying lack of progress made by a number of Member States in meeting their 2010 electricity target.**

In fact, seven countries have not increased at all over the past two years, or in absolute terms they have decreased their relative share of renewables. Despite this, there has been an absolute growth in the renewable electricity sector with an increase from 14.5% in 2004 to 15.7% in 2006. **However, the Commission suggests that without additional effort the 2010 21% target is unlikely to be met.** The Commission concludes that *"the growth of renewable electricity has been driven by a small number of Member States and the range of technologies used has also been limited."*

The main sector that the Commission is referring to is **onshore wind.** Electricity production from onshore wind equalled 79 TWh in 2006 compared to 7 TWh in 1997, which means a 30% annual increase. Electricity generation from biogas had a strong growth of 19% per year on average from 1997 to 2006. The highest average annual growth rate in this period was accomplished by solar

photovoltaics (PV), which grew on average by an impressive 56% over this nine-year period, from 0.04 TWh in 1997 to 2.2 TWh in 2006.

Growth in the renewable energy for heat was the slowest of the three sectors, which may reflect the importance of adopting targets. Since 1997 heat from biomass has grew only by 17% to 56 Mtoe in 2005, corresponding to an average annual growth rate in the period 1997-2005 of only 2% for the EU27. Only three countries showed an average annual growth rate of biomass heat higher than 10%, e.g. Bulgaria (15%), Czech Republic (18%) and Slovak Republic (71%). Solar thermal heat generation doubled from 0.3 Mtoe in 1997 to 0.7 Mtoe in 2005. In general, solar thermal heat developed modestly, the overall EU growth rate in the period 1997-2005 being 10% per year. There were only a few Member States that realised a (slightly) higher average annual growth rates during this period, e.g. Germany (18%), UK (22%), Netherlands (18%), Italy (14%) and Spain (13%).

C. What needs to be done to achieve the targets?

According to the European Commission Green Paper *"Energy for the Future - Renewable Sources of Energy"*, **the major obstacle to wider expansion of renewables is the cost associated with their exploitation.** Although their cost curve is dropping rapidly, it is still many times higher than the cost of conventional fuel cycles that do not reflect the full external costs. Another obstacle is the lack of confidence from investors, governments and users. This includes low levels of knowledge about technical and economic potential of renewables and a general resistance to change and new ideas. From a technical point of view, restructuring and modernization of the distribution grid and investment in coordination and safety measures will be necessary to enable more renewables without compromising energy security.

The best policy instruments, which have proven to be working well within national conditions and incentivised huge increases in renewable facility installations, are:

- **Decades long, guaranteed feed-in tariffs** for buying small-scale renewable electricity
- **Improvements of electricity grids** so that small scale renewable producers can easily plug-in
- **Reduced value added tax** on environmentally friendly renewable technologies
- **Simplified processes of allowing zoning permits**

By analysing the existing EU experience it is possible to identify, and therefore supposedly to **remove, some of the barriers** to the rapid scaling up of renewable energy, these include:

- Inadequate or uncompetitive access to the networks
- Excessive and protracted planning procedures
- Short term and inconsistent support schemes, which fail to give confidence to investors
- Supply chain bottlenecks
- Insufficient number of skilled staff

Fossil fuel subsidies and oil prices

As a recent report by Friends of the Earth Europe[16] discovered, in the past five years USD 8 billion of public money have gone to Europe's fossil fuel companies, mainly to the natural gas sector. In May 2009 the European Parliament approved an additional EUR 3.35 billion in subsidies as a part of Europe's EUR 225 billion economic recovery plan. **Fossil fuel subsidising still appears to be widespread which disadvantages alternatives on the market and continues to support old-fashioned, dirty production models.**

However, it is important to realise that currently the relative costs of renewables versus conventional sources are almost totally determined by **the oil price.** For its forecasts the Commission assumes that *"under a scenario with oil prices at $78/barrel by 2020 the additional average annual cost would fall to €10.6 billion. By comparison, the EU's total energy bill is expected to be about €350 billion that year. Bearing in mind the significant greenhouse gas savings that will occur as a direct consequence of an accelerated fuel switch from fossil fuels to renewable energies, carbon prices of €25 per tonne combined with high oil prices ($78) would almost entirely cover the additional cost associated with reaching the proposed share of renewable energy".*

If the oil price is moved to around USD 100 in 2020, it will more than cover the additional costs and prove to be the cheapest option. For this reason, phasing out the support for fossil fuels significantly impacts the costs of mitigation of climate change.

How much will it cost?

Even if these barriers are removed, there can be no increase in the use of renewable energy without far greater levels of investment. This will require a serious increase in the current level of expenditures. As the IEA notes *"(I)nvestments in power generation capacity besides wind and gas, or in transmission lines, have stagnated during the past decade. Liberalization slowly introduced incentives to improve the efficient use of existing capacities to the benefit of European electricity consumers. It is now time for the industry to start investing again to meet increasing demand and to replace ageing infrastructure".* **The EIB should lead and speed up its investments in low carbon and sustainable energy sources.**

Various assessments have been made of the expected costs to meet the 2020 target, which include:
Ecofys and others
- **EUR 672 billion** almost evenly spread over 2005-2020
- **EUR 44 billion** per year

Greenpeace Energy (R)evolution
- EUR 166 billion (2005-10) and EUR 469 billion (2010-20) – **EUR 635 billion in total**
- **EUR 42 billion per year**

European Commission[17]
- **EUR 300 billion** in the decade of 2011-2020
- **in the range of EUR 13-18 billion per year**

It is not clear why the Commission's estimate differs by half from the estimates done by others.

International Energy Agency in 2003[18]
- minimum level of **USD 1 000 billion** of investments by 2030
- on average **USD 30 billion every year, out of which** 66% should go into energy generation and the rest into transmission and distribution.

This would enable approximately 650 GW of new capacity to be installed, both to replace about 330 GW of existing capacity and to meet an expected increase in demand. This relates to a business-as-usual forecast – the scenario would significantly change with a greater reliance on renewables (with a higher amount of generating capacity required) and more management on the demand side reducing the need for additional capacity.

Section 3:
Past lending by the EIB

A. Totals in past years reviewed

Between 2002 and 2008, the EIB loaned a total of EUR 37.7 billion for altogether 337 energy projects of various types. This represents about 11.6% of the overall EIB lending portfolio, of which energy is the third largest portion after transport and credit lines through financial intermediaries.

The EIB energy portfolio consists mainly of gas, including liquid natural gas (LNG) lending, which reached 39% of the energy portfolio in 2002-2008. Another third in the lending portfolio consists of transmission systems and grids creating 29% of bank's energy lending. **New renewables (see Annex 3** for more explanation) received roughly the same support as oil and coal, nuclear, large hydro power plans and unclear projects together. The exact **methodology**, including the basic set of data of the analysis, is described in **Annex 1.**

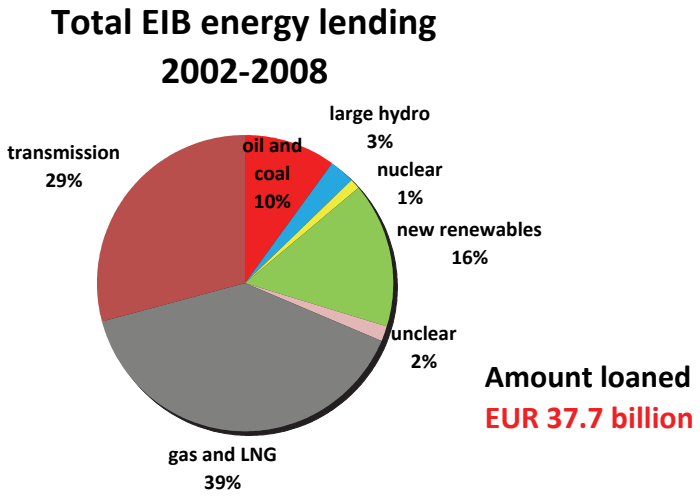

Figure 1: Overall structure of EIB energy lending accumulated for 2002-2008, including transmission.

After a closer look into the EIB's lending into energy generation, one can see that the EIB largely focused on **natural gas lending,** which created **more than half of all energy generation lending. Three quarters** of energy generation projects were either **fossil fuel,** or **unsustainable** sources of energy (nuclear and large hydro). This contrasts with the **22% support for generation from renewable sources of energy.**

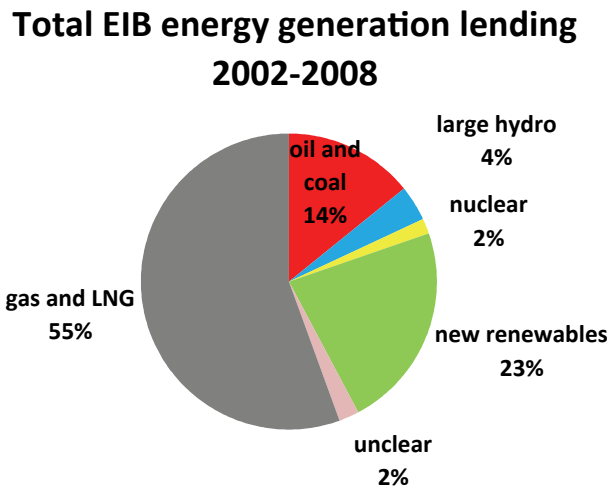

Figure 2: Total EIB lending for energy generation only, transmission excluded, 2002-2008.

In 2006 the EIB conducted its energy review and since then started to focus on targets for renewable energy. The totals during the period 2006-2008, however, show **no major change in the EIB energy portfolio.** Fossil fuel lendings and in other unsustainable energy (large hydro, nuclear) still form three quarters of the energy generation support, while renewable loans make up the rest (26%).

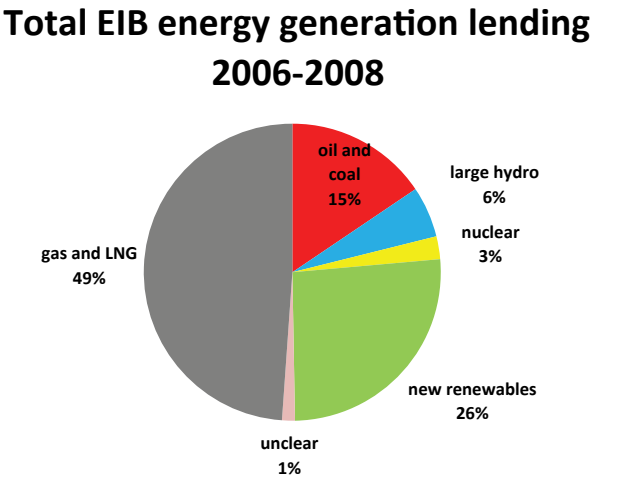

Figure 3: Total EIB energy generation lending, 2006-2008 accumulated.

Geographical diversity

Figure 4 below shows the extent to which lending **in both the renewable and non-renewable sectors are dominated by loans to old Member States of the EU (the EU15).** The graphic below shows the volumes of loans between 2004 and 2008 in old and new Member States.

There are obviously almost no renewable projects in the new Member States, while some old Member States enjoy considerable renewable lending from the EIB (Spain, Italy, or Germany). This fact can either be explained as a lack of demand for renewable lending on the side of the recipients,

or as a part of a standard EIB policy. As described below, this fact also relates to the EIB's non-EU lending. This phenomenon can be regarded **as applying a double standard to development** in the EU's core old Members States and everywhere else.

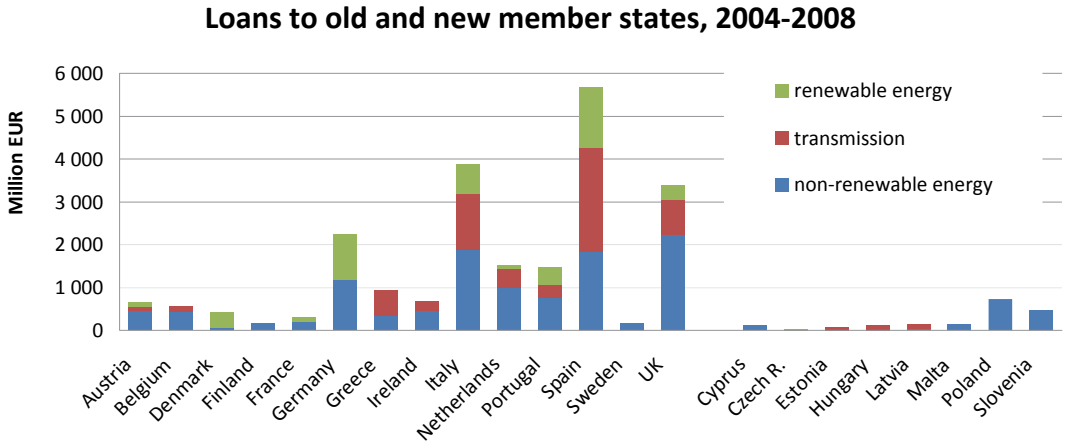

Figure 4: Energy Sector Loans in old and new Member States of the EU, 2004-2008 (million EUR)

Figure 5 shows a wider breakdown of the loans over the period of 2002-2008, which confirms the dominance of the EU, specifically the EU15, in the lending portfolio. This makes up three quarters of all the energy sector projects funded, by value. Furthermore, the graph shows that **the EIB finances hardly any renewable projects outside the EU, while a major chunk of the bank's investments go to non-renewable projects.**

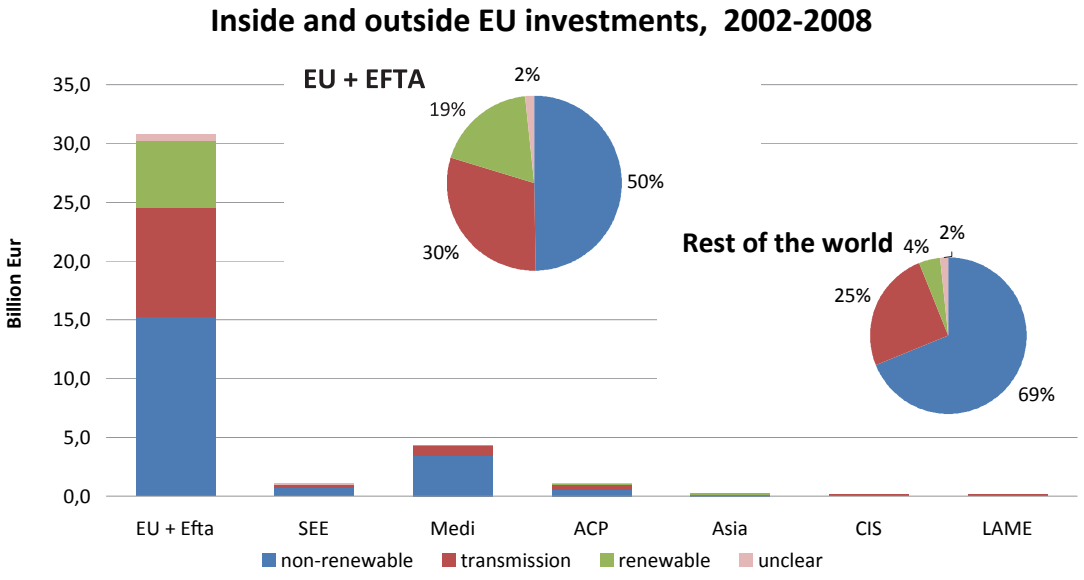

Figure 5: Inside and outside EU investments, 2002-2008 (billion EUR)

B. Electricity transmission lending

The second largest volume of energy lending after the natural gas and LNG part is for **electricity transmission.** It was granted **EUR 11 billion** to support in 83 projects during 2002-2008, which constitutes **29% of the EIB energy portfolio.** Since we count gas and LNG pipelines and storage systems as part of the gas category, the data on transmission would be much higher if gas pipelines were added.

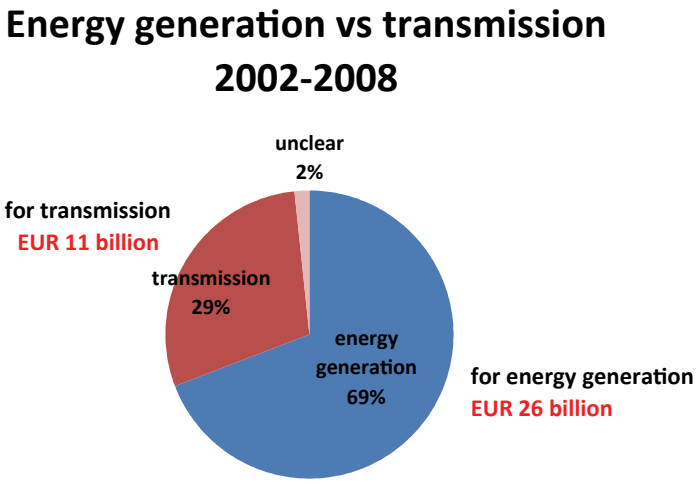

Figure 6: Electricity transmission vs generation, EIB energy lending 2002-2008

As the project description of those **infrastructure and power grid projects** does not provide a more detailed explanation, it is very difficult to assess the overall impact of transmission lending. While investments into decentralised smart-grids networks or renovations of transmission grids in order to improve their efficiency and interconnectivity are clearly desirable, there may be other types of investments in high voltage transmission lines between large utilities contributing to the long-term lock-in of carbon-intensive energy production. It is clear that the EIB's transmission lending should focus on the first, but from the provided information we cannot conclude whether the Bank is actually living up this requirement. Furthermore, the ratio between transmission and generation lending is something to be considered and carefully weighed.

C. Lending for renewables

Renewable targets of the EIB

Renewable energy has the advantage of addressing two major energy policy drivers simultaneously, energy and climate security. As outlined in Section B, the EU has adopted an ambitious renewable energy target, which requires 20% of the EU's energy to come from renewable sources by 2020. **The EIB is one of the most relevant institutions to assist the EU Member States to meet the challenge of achieving their renewable targets and changing their energy patterns.** However, even before the EU put in place its current platform of energy policies, the EIB was considering changes towards renewable energy.

In 2002, the EIB first introduced a target for renewable energy lending in the Corporate Operation Plan for 2004-2006. It set a target to double the share of renewable energy projects **from 7% to 15% in the overall** EIB energy sector financing over the six-year period **2002-2007**[19]. In 2004, the

EIB Board of Directors endorsed another target for renewable energy lending to reach at least **50% of the Bank's total financing** for new **electricity generation capacity in the EU during 2008-2010[20].** Since then the Bank has revised slightly its renewable energy lending target and in its 2006 EIB Energy Review it stated that the **average lending during the period of 2008-2010 would be up to 50% of total new electricity generation capacity (not only that in the EU).**[21] A slight change in formulation – *"at least 50%"* changed to *"up to 50%"* – suggests that the 50% target should be interpreted as a ceiling rather than a minimum limit for renewable lending.

In addition, the Energy Policy Review called for:

- Development of less mature renewable energy markets within the EU
- Development of underdeveloped renewables (particularly agrofuels) and new renewable energy technologies with good long-term prospects.

The 2007-2009 Corporate Operational Plan contained **an annual sub-target of EUR 600-800 million for renewable projects** and reiteration of a relative target of 50 % of EIB lending to electricity generation associated with renewable technologies. The absolute target of investments is rather insufficient in comparison to the overall portfolio and scale of investment needs.

In June 2007, the Board of Governors made a new commitment through the policy document Clean Energy for Europe: A Reinforced EIB Contribution[22] which aims to increase the renewable energy's share financed by the Bank in the EU **from some 15% at present to 50% of total new electricity generation capacity by 2010, including a greater share for non-wind power.** Beside this aggregate target, the EIB has pledged to reach several specific targets:

- Annual target of minimum EUR 800 million lending to renewable energy projects
- Update of the selection criteria for renewable technologies
- Development of financial instruments, including framework facilities, for smaller-scale investments and use of structured finance and investment funds
- Introduction of a systematic review of EE issues when assessing projects to be supported by the Bank

A further revision of the Bank's renewable energy targets has been undertaken, in response to a changing EU energy policy. In March 2009 the EIB's Corporate Operational Policy stated that **"the Bank has also set a minimum floor that at least 20% of future loans to energy projects in the EU should cover renewable sectors"**[23] (not only new generation projects), which applies from 2009. The loans will include *"support to both mature and emerging technologies (e.g. offshore wind, solar photovoltaic and thermo plants) for which a growing number of loan applications are being considered"*[24].

Past renewable lending and meeting targets

During 2002-2008, the EIB financed 73 renewable energy projects (large hydro excluded) **with EUR 6 billion,** which meant a smaller amount and fewer projects were financed than before for transmission only. The lending to the renewable energy sector has increased considerably over the past few years as the graphic below shows.

Looking at the portion of renewable lending in all energy portfolios, **the EIB managed to achieve its target for 2002-2007.** New renewables, large hydro excluded, account altogether for 16% of the total amounts lent in energy during 2002-2007, which proves that the EIB achieved its 15% target within **a tight margin.** Lending by the EIB during consecutive years remained low, oscillating around 8-13% between 2002-2006.

Even if the overall EIB lending and energy portfolios were rising during this time, the same did not apply to renewables. In 2007, as **the EIB was facing the deadline** of reaching the set goal, it boosted its renewable portfolio substantially. Consequently, the loans for renewables in 2007 reached 27% of all energy. In 2008, however, they dropped back to 16%.

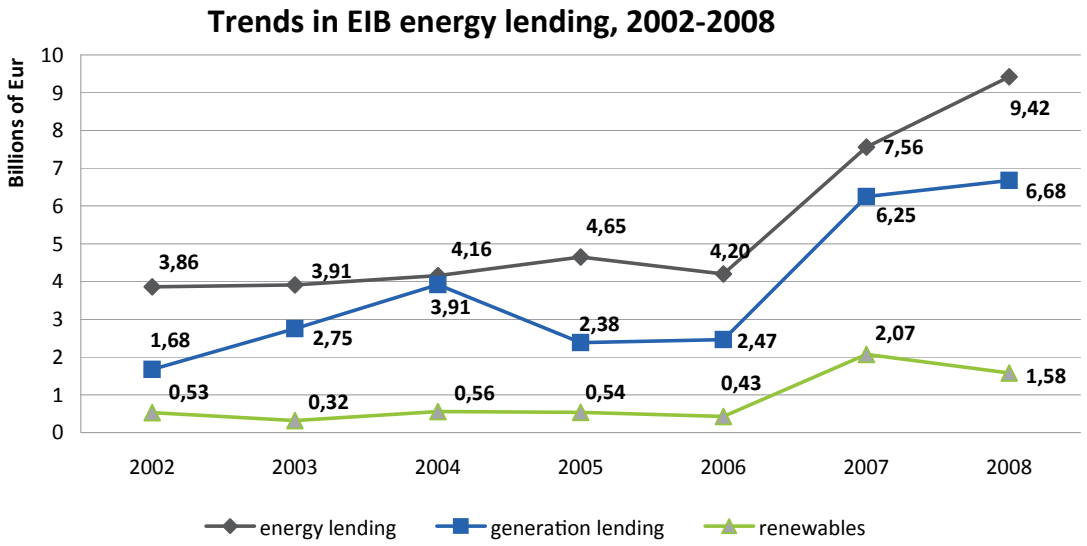

Figure 7: Trends in EIB lending to renewables on the background of all loans, 2002-2008

It seems that in 2007 the EIB boosted its renewable energy lending significantly **by one huge loan of EUR 450 million to Italian *Enel Energia Rinnovabile and Ambiente*** for "upgrading and new investment in renewable energy generation units and investment in environmental improvements"[25]. There are concerns linked to this particular loan. First, the type of renewable energy supported is not clear; secondly, it is not clear how much of this project was dedicated to renewable energy. Finally, it is highly questionable whether a company the size of Enel should be supported with public loans at all since it could easily access financing from other sources at reasonable rates. Because of this fact, **the achievement of renewable target in 2007 is slightly diminished.**

In 2008, renewables accounted for 30% of the EIB energy generation portfolio and 16% of all energy loans. Therefore, **it might not be so difficult for the EIB to achieve the 20% share of renewables at overall energy lending.** If we assume the same marginal increase in energy lending for this period as it was between 2006-2008 and we expect a constant share of 70% energy generation in the Bank's energy lending, we can arrive at a rough projection for 2009-2010. Figure 8 demonstrates how the EIB should need to increase its renewable lending in order to achieve 20% share of renewables in all energy lending.

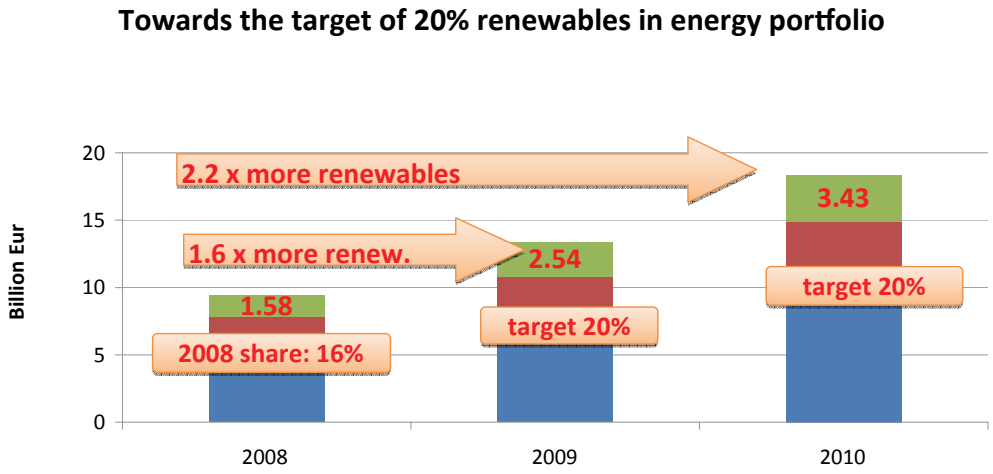

Figure 8: Towards the target of 20% renewables in energy overall

However, in order to get (at least) a 50% renewable share in electricity generation until 2010, the target that the Bank set for itself, the EIB will need to boost its renewable energy lending significantly in 2009 and 2010, as demonstrated in figure 9 below. Another way to achieve the 50% renewable generation target is to slow down the increase of the EIB's overall portfolio. **However, even though the EIB would keep the same energy lending as in 2008 over the upcoming two years, renewable lending would have to double in order to meet its 50% target. There are serious concerns whether the EIB will ultimately meet its target of achieving half of its lending for generation made up of renewable energy,** as this is not the pace by which the renewable lending has been growing.

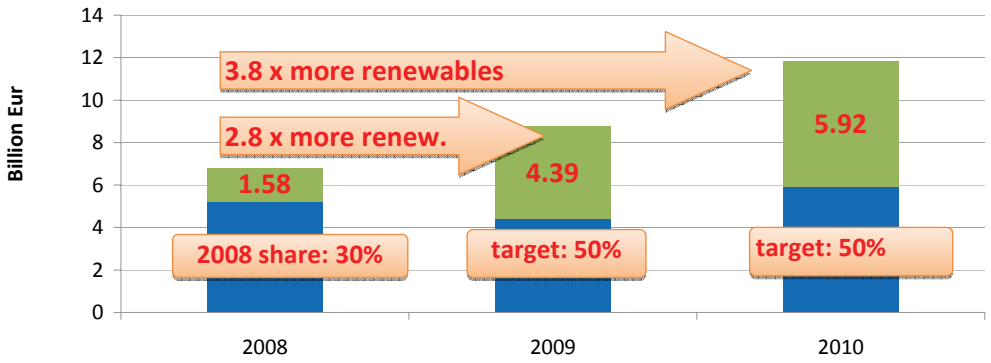

Figure 9: Towards the target of 50% renewables in energy generation

Regarding the structure of renewable energy loans, the largest share is taken by loans for wind renewable energy. Solar energy sits at the second place followed by geothermal and biomass. When classification of less than 10 MW is applied, there is no single small scale hydro energy project in 2002-2008. A large portion of renewable loans could not be categorised properly as they are either mixed, unclear or are contributions made to various funds.

wind	EUR 2 527 million	23 projects
unidentified renewable	EUR 2 237 million	15 projects
solar, photovoltaics	EUR 1 005 million	29 projects
geothermal	EUR 359 million	6 projects
biomass	EUR 40 million	1 project

Figure 10 shows the distribution of these loans over the last couple of years. As in case of overall energy lending, it is clear again that the older Member States dominate these loans and the CEE region receives no support at all in spite of its 5-year long EU membership, **which would not be in line with the EIB's 2006 Review to increase lending to the less developed renewable energy markets in the EU.**

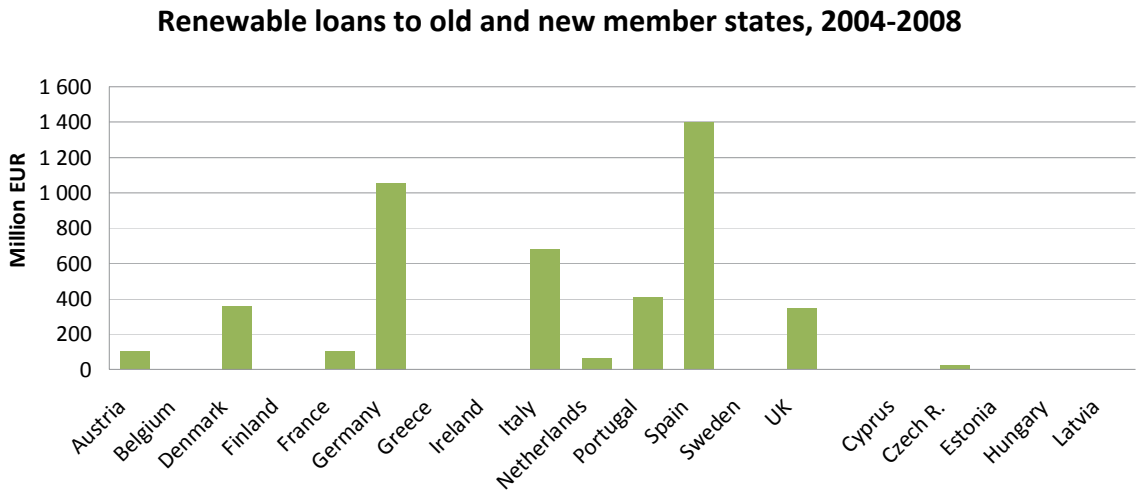

Figure 10: Renewable lending to old and new Member States, 2004-2008

As noted before, the increase in lending for renewable energy over the last two years is impressive. **However, it must also be noted that the increase in lending by the EIB is happening within the context of a general shift towards renewable energy.**

2008 was the first year that investment in new power generation capacity sourced from renewable energy technologies (approximately USD 140 billion including large hydro) was more than the investment in fossil-fuelled technologies (approximately USD 110 billion)[26]. While in the EU, a total of 23 851 MW of new power capacity was constructed in 2008, out of which 8 484 MW (36%) was wind power; 6 932 MW (29%) gas; 4 200 MW (18%) photovoltaics; 2 495 MW (10%) oil; 762 (3%) MW coal; 473 (2%) MW hydro and 60 MW (0.3%) nuclear power capacity[27]. **However, the generation projects of the EIB do not reflect, let alone lead, either these global or European trends.** In 2008 within the EU, the EIB loaned mostly to gas and LNG generation (57%), coal (11%), solar (10%), wind (9%), nuclear (3%) and hydro (2%).

Box 2 below summarises the EIB's renewables targets and its progress on the targets.

Box 2: Evolution of EIB renewable energy targets

Evolution of EIB renewable energy targets		
Date Document	***Target***	***Progress check***
2002 Corporate Operational Plan 2004-2006	**Renewable share in all energy increases from 7 to 15% between 2002-2007**	**✓completed, with tight margin and concerns**
2004 Decision of the Board of Directors	**Renewables reach at least 50% share of electricity generation in EU between 2008-2010**	**× failing so far, not on the right track**
2006 EIB Energy Review	**Renewables reach on average up to 50% share of electricity generation (EU, non-EU) between 2008-2010**	**× failing so far**
2006 EIB Energy Review	**Development of less mature renewable energy markets in the EU**	**× failing so far**
2006 EIB Energy Review	**Development of underdeveloped renewables (particularly agrofuels) and new renewable energy technologies, with good long-term prospects.**	**? unclear**
2006 Corporate Operational Plan	**Annual sub-target of EUR 600-800 million for renewable projects**	**✓ Completed, both in 2007 and 2008**
2007 Board of Governors adopted document Clean Energy for Europe: A Reinforced EIB Contribution	**Renewable energy's share in the EU should increase from 15% to 50% of total new electricity generation capacity by 2010, including a greater share for non-wind power.**	**× failing so far, not on the track to reaching**
Specific targets	- annual target of minimum EUR 800 million lending to renewable energy projects - update of the selection criteria for renewable technologies - development of financial instruments, including framework facilities, for smaller-scale investments and use of structured finance and investment funds - introduction of a systematic review of EE issues when assessing projects to be supported by the Bank	**✓ Completed** **? unclear, criteria are not public** **✓ completed though info is scarce** **× unclear – no data available**
2009 Corporate Operational Policy	**a minimum floor that at least 20% of future loans to energy projects in the EU should cover renewable sectors**	**✓ Completed**

D. Fossil fuel lending

We can also draw conclusions about the EIB's actions in energy by examining the other parts of the energy portfolio, especially fossil fuel lending for oil, coal and gas. If the EIB was seriously on a path to a 50% share of renewables on energy generation, as its latest renewable target indicates, it would need either to heavily increase lending for renewables, or start diminishing fossil fuel lending.

Yet fossil fuel lending, **with its 48% portfolio share, was the largest item in the EIB's total energy portfolio in 2002-2008.** In real terms, it means that fossil fuel loans amounted to **EUR**

18.6 billion over the past seven years. If one regards only energy generation, **fossil fuel lending amounts to an astonishing 71% of the bank's energy lending over the 2002-2008 period.**

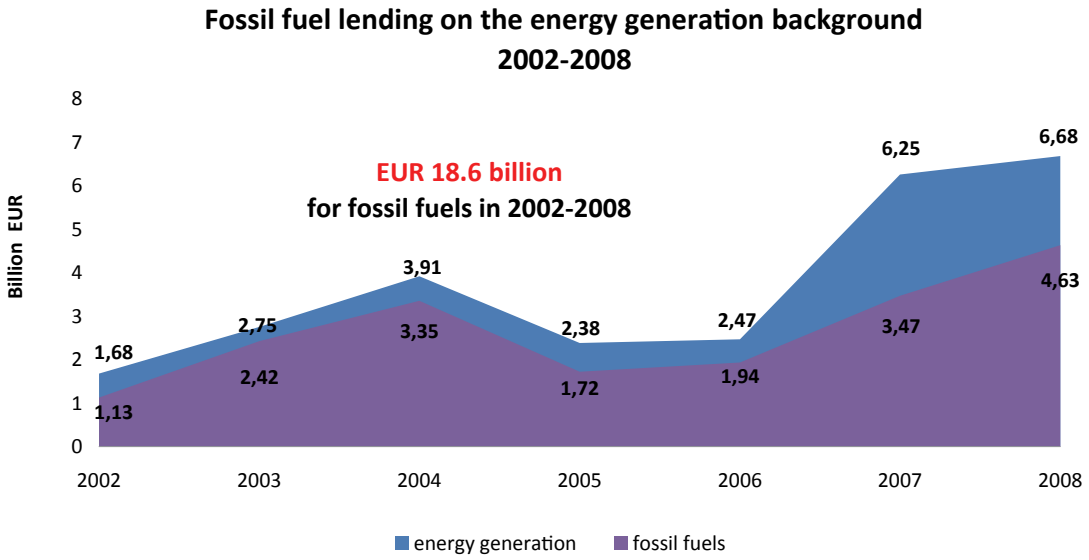

Figure 11: Fossil fuel lending as a part of energy generation, 2002-2008

In the period analysed, **no trend of decreasing volumes of fossil fuel lending can be detected.** In 2007 there was a slight decrease in oil and coal lending. However, gas lending shows a growing trend over the whole time span analysed, both in volumes and numbers of projects.

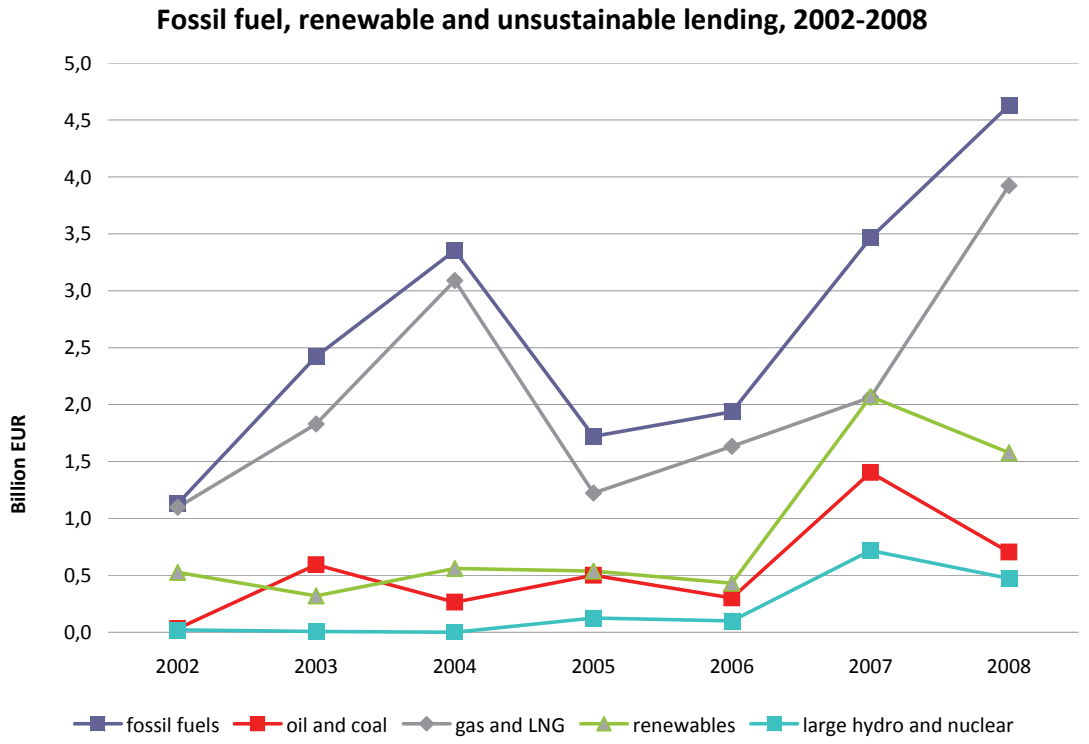

Figure 12: Fossil fuel, renewable and unsustainable lending, 2002-2008

The sheer volume of fossil fuel lending – even though gas can be seen as less CO2-intensive – can **cancel out efforts made to invest and support renewable energy,** as it has to remain at a small scale.

Lending to coal

Despite concerns over climate change impacts, the EIB continues to lend for unabated coal fired power stations, especially in Germany. **In a three month period at the end of 2007 and in early 2008, the EIB made a couple of loans for coal projects in Germany totalling nearly EUR 900 million supporting basically two projects** – a 750 MW coal power plant Du-Walsum near Duisburg and a similar thermal power plant in Karlsruhe.

It must be noted that the coal stations in question will be of a higher efficiency and therefore they will create lower emissions of CO2 per kWh than the average coal fired power station in the country concerned. Additional efforts have been taken to further increase the efficiency of stations by introducing combined heat and power. This is the case for the EUR 500 million loan for the Karlsruhe loan granted in January 2008. According to the website of the operator, it will produce 912 MW of electricity and 'as much as' 220 MW of heat. Furthermore, they state that it will have an electrical efficiency level of 46% compared with a global average of 33%[28]. **However, even with these efficiency improvements and the use of CHP the emissions will be above that of a modern gas fired power station.**

There is an acute dilemma facing the European power sector when it comes to coal. Coal is still a significant contributor to the electricity mix in Europe and is the third largest source providing around one fifth of the power needs. At the same time, it has the largest emission factor and it is the most detrimental in regards to the greenhouse effect and climate change. However, in some countries it provides a much larger share, for example in Poland it is around 90%. Furthermore, the majority (80%) of coal (and lignite) plants operating today had been commissioned before 1990, with the estimated average age of around 23 years. By 2030 it is forecast that between 100-200 GW of coal capacity will have to be replaced on their retirement.

If the EU is to reduce its emissions in line with the scientific requirements identified by the International Panel on Climate Change (IPCC) and it is to stand by its own targets, of ensuring that global mean temperatures do not exceed two decrees above pre-industrial levels, **these retiring stations should not be replaced even by these higher efficiency coal models.** Each of them will become a long-term lock-in into high-emitting facilities, which will complicate domestic and global climate change mitigation.

Carbon capture and storage

The realisation that the power sector must rapidly move towards zero emissions in order to comply with science has led to calls for the rapid, at scale, demonstration of carbon capture and storage (CCS). To date, both the analyses and the proposals, mostly revolve around its CCS use in coal-fired power stations, which emit the most CO2 per kWh produced. However, it could also be used for gas fired power station or biomass. The potential advantage of CCS use in biomass stations is that it would act as **a mechanism for taking CO2 out of the atmosphere**.

The EU has called for the **demonstration of the use** of this technology on a commercial scale in order to further understand crucial issues relating to the engineering, planning, economics and energy balance (the efficiency losses associated with its use). In order to facilitate this, two EU generated revenue streams have been made available for demonstration facilities: through the Emissions Trading Scheme and through the economic crisis stimulus package. Through the ETS, a total of 300 million emission credits will be made available (worth approximately EUR 6 billion

assuming a EUR 20 per tonne carbon price) and an additional EUR 1.25 billion for demonstration facilities in five Member States. **Clearly, the EIB is in the group of other MDBs focused on development and demonstration of CCS in the EU region.**

As an answer to the climate change challenge, carbon sequestration cannot be considered either as a remedy, or a good approach. There are serious questions from an economic, environmental and technical perspective. The particular concerns that have to be addressed include the economic costs per unit CO2 stored, long-term viability of CO2 storages, loss of efficiency (roughly 10-40%) due to CCS installation, and the commercial readiness of the technology, which will not be ready before 2020. **Until proven in these three areas, it is a high risk strategy to base future supply forecasts on its availability; otherwise, it only supports business-as-usual and distracts attention from real solutions, such as energy efficiency.** Being financed from public sources, it distracts attention from small-scale, truly sustainable and decentralised energy measures and it puts finance for win-win solutions into risk of being crowded-out. **For these reasons, CCS technology cannot be considered a public benefit and therefore does not deserve any public funding.**

Lending to gas production and pipelines

Natural gas fired power stations produce less than half the CO2/kWh than even a modern, unabated, coal station. It is clear that gas use is preferable to coal, from a climate security perspective. **However, from a security of supply perspective, the use of natural gas raises a number of concerns, both in the short and in the long term.**

In the long term, the domestic supply in the EU is declining sharply. Consequently, the percentage of gas imported is forecast to rise from current levels of around 60% to 80% in 2030. In recent years Russia and Ukraine have suffered a series of disputes over the payment and the supply of gas. Most recently, in January 2009 this resulted in the disruption of gas supply from Ukraine, which caused a disruption of heat supply in mid-winter with a serious impact on the general public. Resolving this conflict about natural resources requires substantial diplomatic efforts and created a dangerous precedent for the future. **Some of the EIB lending is clearly designed to improve the diversity of natural gas supply for the EU,** in particular, through the construction of infrastructure for liquid natural gas (LNG), which can be transported by tankers from around the world. Though, recent studies show that the **life cycle carbon footprint of LNG is much higher** than natural gas transported by pipelines. The additional energy needed for natural gas liquidification, transport and gasification makes LNG's climate impact close to that of coal[29].

The switch from coal use to natural gas, with the aim to reduce emissions, is envisaged in a number of carbon reduction scenarios. In Greenpeace's Energy [R]evolution scenario, the use of coal is reduced by about half between the reference and carbon reduction scenario by 2030, while the use of natural gas remains largely the same and it even increases. Other 'lower carbon' scenarios, such as those from the European Commission and the International Energy Agency, promote the use of gas in a future energy mix. Recently there has been intense pressure **to diversify and increase the gas supply for Europe, which also is the driving force behind the presently discussed Nabucco gas pipeline project.**

However, apart from supply-side, the best tool to increase the security of supply is energy efficiency. 44% of gas use in the EU comes from the domestic sector, which mainly goes to heating. Currently available technologies can significantly reduce the amount of heating required in households, which would free up gas for other uses, such as electricity generation which as a replacement for coal could significantly reduce emissions. According to the European Insulation Manufacturers Association, simple and cost effective energy efficiency measures like better insu-

lation, glazing and more efficient lighting could deliver savings equivalent to 500 million cubic metres of gas per day in the EU countries.[30]

This amount is almost six times more than the planned Nabucco gas pipeline could ever deliver. If adopted, this approach could make the EU less dependent on imported fossil fuels and create new jobs. From a climate change perspective, there are more emissions released by huge pipeline projects, due to methane leaks associated with gas extraction and transport, than with the projects of household insulation. Last but not least, public money used for big fossil fuel pipelines crowd out smaller investment projects supporting renewables and give backing to big energy companies and oligopolies, which disadvantages small clean energy enterprises on the market. The EIB's leading role as a guide for various investors cannot be underestimated – where the EU's money primarily goes, private money then will follow. Though gas may play a role in the transition towards a decarbonised economy, it should by no means receive support from public money, including from the IFIs.

E. Energy efficiency

It is unclear at this point how the EIB accounts for its energy efficiency portfolio, or for the energy efficiency components of its various projects, as there is no detailed project information readily available. Although this is a particular target of the Bank, so far it has not been able to provide reliable data on energy efficiency loans and accounting across different sectors (industry, transport, housing, etc). **Since the energy efficiency projects are realised across other various sectors of the EIB's lending, it is not clear how this data is stored and analysed within the bank and how it relates to the whole energy lending portfolio.**

As with other EU institutions, the EIB also argues that *"effective energy efficiency EU policies are therefore a top priority in Europe."* The background for this conclusion is the recognition that energy efficiency *"is the best way to tackle the key energy objective of the EU,"*[31] namely security of supply, economic competitiveness and the reduction of greenhouse gases.

The economic advantage of this energy efficiency target was clearly emphasised in October 2006, in the European Commission's Energy Efficiency Action Plan. This plan proposed that the EU should increase its energy efficiency by 20% by 2020, resulting in an impact that would *"if successful, this would mean that by 2020 the EU would use approximately 13% less energy than today, saving EUR 100 billion and around 780 millions tonnes of CO2 each year".*

In recognition of this target, the Bank has set for itself a number of goals and objectives in energy efficiency in the EIB Energy Review in 2006[32]. These include:

1. The bank can help to achieve a convergence of the energy intensity within the EU, by financing energy efficiency investments, particularly in the more energy intensive countries
2. Support the objectives of the Directive on EE for end users and energy saving
3. Support the Development of CHP and the upgrading of existing district heating
4. Wide use of energy monitoring and audits.

The important task of reducing energy intensity will not be achieved overnight since it requires large investments in both heavy energy consuming sectors and in the wider society. The scale of the task at hand and the opportunities linked to it should not be underestimated. **However, current volumes of lending within key sectors do not suggest that there is sufficient prioritisation of energy efficiency projects in the new Member States of the EU,** which has already been noted for energy generation lending. In the industrial sector, just 12 of the 91 projects approved in 2008 were in central and eastern Europe and of those to only four countries - Hungary, Poland, Romania and Slovenia. In financial terms this relates to around 6% of the finance made available.

Likewise, the urban infrastructure lending to new Members States falls well below that of the older Members with only six of the 22 projects located in central and eastern Europe (18% of the finance), including projects in the Czech Republic, Hungary, Latvia, Poland and Slovakia, for a range of developments, such as public transport, environmental protection, sewage treatment and national heritage.

The assessment of the potential for energy efficiency can be done on a **country-by-country basis.** It is largely assumed that *"with existing technologies, energy savings of **up to 30% are already feasible."***[33] However, the Member States have submitted their National Action Plans on energy efficiency, which show how they intend to meet their efficiency targets, to the Commission. Overall, the EU expects to improve its energy intensity by about 9% by 2016. Despite already having higher levels of energy intensity, **only Romania put forward a significantly more ambitious energy efficiency target** of 13.5% than the EU average[34].

The EIB states that it already examines whether the projects submitted for financing meet the requirement of using *"the most modern technology"* available. However, in the context of the new energy policy *"the Bank is taking this one step further."* In all of the bank's future operations, it will make energy efficiency considerations more explicit, together with the aim of promoting the adoption of the most energy efficient solutions. *"Realisation of the EE potential of selected projects will be supported through energy audits"*[35].

Other international financial institutions are more explicit about the role of energy efficiency for the whole of their lending portfolios. For example, the Energy Efficiency Team of the European Bank for Reconstruction and Development screens all projects at an early stage of the project cycle and it assesses the potential for energy savings. When a project with a good energy-saving potential is identified, the client is asked to provide basic information on energy consumption and usage patterns. This information enables the Bank to make more informed assessments for potential energy savings[36].

Due to the inconsistency in the information made public about each project it is not possible to make a more detailed assessment regarding energy efficiency. In some cases there is only a small amount of information available about the scope of the loan in broad terms. Although these may mention improvements in the energy efficiency of the infrastructure and equipment, there are no indications of the extent to which the loan will focus on these aspects and the results that it is expected to bring.

F. Other unsustainable lending

Nuclear power

Between 2002 and 2008, the EIB loaned a seemingly low sum of EUR 420 million for the improvement of nuclear power stations and uranium enrichment. However, **the EIB is one of the few international financial institutions with a policy for largely unrestricted lending for nuclear power.**

In a 2007 strategic document[37] the EIB stated that: *"The Bank notes the right of individual Member States to determine their energy mix and to appreciate the potential contribution of nuclear energy to reduce CO2 emissions and to enhance energy security. It also recognises the importance of the sector for Europe's R&D. At the same time, the Bank is fully aware of the important "pending issues", such as those related to decommissioning and nuclear waste. EIB financing may be requested for investments in new generation capacity, in the nuclear fuel cycle and in research activities".*

On the other hand, the **World Bank** has not provided financing for a nuclear power project since 1959. Consequently, only a small amount of recent material on the Bank's lending policy on nuclear power can be found. However, the most comprehensive document[38] claims: *"Nuclear plants are thus uneconomic because at present and projected costs they are unlikely to be the least-cost alternative. There is also evidence that the cost figures usually cited by suppliers are substantially underestimated and often fail to take adequately into account waste disposal, decommissioning, and other environmental costs."*

The **Asian Development Bank** (ADB), although in the process of reviewing its energy policy, has recently restated its "policy of non-involvement" in the financing of nuclear power:[39]

"Nevertheless, in spite of its sustainable and operational benefits, nuclear power development faces a number of barriers, such as public concerns related to nuclear proliferation, waste management, safety issues, high investment costs, long lead times, and commercial acceptability of new technologies. Overcoming these barriers is difficult and open public debate will be required to convince the public about the benefits of nuclear power. In view of concerns related to nuclear technology, procurement limitations, proliferation risks, fuel availability, and environmental and safety concerns, ADB will maintain its current policy of non-involvement in the financing of nuclear power generation".

The **European Bank for Reconstruction and Development** is specifically mandated to make its resources available for nuclear lending. Importantly, while the EBRD lends for nuclear power it does not make funding available for the construction of new reactors.

Its 2006 energy policy states that:[40] *"With regard to the use of its own ordinary capital resources to complete or upgrade nuclear plants, the Bank will generally continue to adhere to the policy for nuclear energy expressed in the 1995 Energy Operations Policy with a modification: while the Bank will not consider providing financing to new reactors, it may provide financing to an operating facility in relation to nuclear safety improvements, or for the safe and secure management of radioactive waste and spent nuclear fuel, as well as for decommissioning, without a direct link to the closure of high risk reactors".*

The EIB has made financing available from its own resources of **around EUR 7.2 billion since 1967 for both nuclear electricity generation and for fuel cycle services.** Since 2006, four fuel cycle facility projects have been funded, worth around EUR 600 million, two in France (EUR 200 million both in 2008 and 2009) and one each in Netherlands (EUR 60 million in 2007) and the UK (EUR 140 million in 2007).

Public opinion finds that nuclear energy is even more controversial than oil and gas pipelines. Besides the detrimental social and environmental effects of nuclear power plants, there is an economic argument that claims that major nuclear energy projects have a crowding out effect on public financing. Even if loans are not directly used for building nuclear plants or supplying them with uranium, but rather only for improved efficiency, they do serve as a support for an industry, which considered to be highly environmentally unsafe and economically inefficient. **Therefore, public institutions such as the EIB should totally abandon nuclear support.**

Lending for large hydro

The EIB does not have an explicit policy on the types of hydro projects it funds, despite the clear environmental and social damage that some of these projects can cause. In the past seven years, the EIB has supported hydro projects and the limited information available suggests that **none of them comply with the sustainability criteria set up for small scale renewable hydro energy by the World Commission on Dams.** Furthermore, the analysis shows that most of the hydro

loans went to countries **outside the EU.** Large hydro cannot be considered sustainable because of the serious environmental, greenhouse gas, ecosystem and social consequences unless a wide range of conditions are met – those are in detailed in Annex 3.

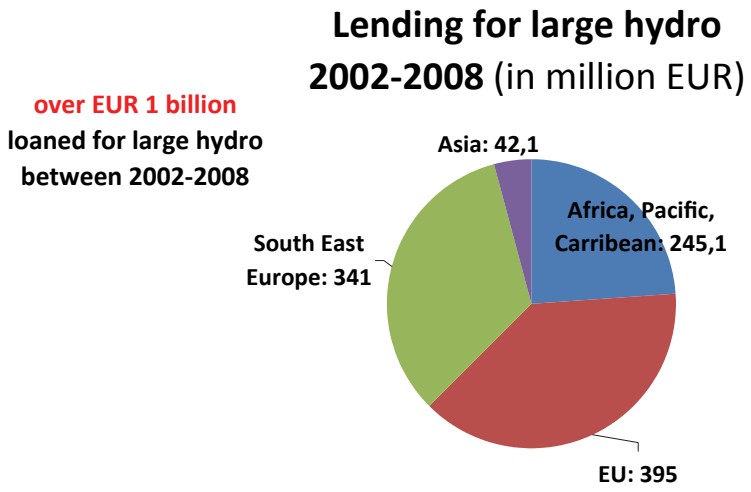

Figure 13: Lending for large hydro, 2002-2008.

Box 3: Bad examples – large hydro projects.

The EIB also provided a co-financing loan for construction and operation of a 250 MW hydro-electric project on the upper Nile at Bujagali. The World Bank also funded the project and concerns were raised by the National Association of Professional Environmentalists (NAPE), a Ugandan non-governmental organization. Their concerns resulted in the Inspection Panel's investigation of the World Bank's compliance with its operational policies on potential environmental, economic, and social impacts. The Panel also found many instances of non-compliance with several policy provisions, such as in the assessments of Project alternatives and cumulative impacts, excluding Lake Victoria from the Project's area of influence, and also in the assessment of Project costs, risks, and impacts on electricity tariffs. The Panel found that the Project did not meet Bank policy requirements to achieve livelihood restoration for the people displaced several years ago during the first Bujagali project. Furthermore, it was discovered to have followed an inadequate approach to address and mitigate the flooding of a significant cultural property of high spiritual value to the local Basoga people[41]. In June 2009, the NAPE stated that the hydropower unit had been delayed due to a new discovery during construction. The revised design will raise the cost of Bujagali project to USD 900 million[42].

Huge projects, like large dams, pose serious environmental and social consequences on the region, e.g. resettlements, loss of ecosystems, changes in the local climate, disruptions in the water cycle, and sometimes the loss of drinking water resources. It has been discovered that large hydro power plants in Africa or in the warm Mediterranean climate largely suffer from decreasing water supplies. In addition, latest research also shown that large dams are major source of methane due to decomposing vegetation, whose radiation effect can be 25-100 times larger than that of CO2, depending on the time span of releasing and staying in atmosphere. **Therefore, large hydro-electric power generation is no answer to climate, but in reality a source of more problems than of solutions.**

G. Carbon credit funds

In recent years, the EIB has been increasingly active in carbon finance funds. It accounts potential to generate carbon credits as a part of the appraisal process and also manages several carbon credit funds. To date, four main vehicles have been established:

The EBRD – EIB **Multilateral Carbon Credit Fund** (MCCF): Countries and companies that become members of the Fund can buy carbon credits from emission reduction projects financed by the EIB or EBRD. MCCF eligible projects include: industrial energy efficiency, power plant and district heating renovation, renewable energy (biomass, wind and mini-hydro) and landfill gas extraction.

The World Bank – EIB **Carbon Fund for Europe** (CFE): The Fund will purchase greenhouse gas emission reductions through the Kyoto Protocol's Clean Development Mechanism (CDM) and Joint Initiative (JI) from climate friendly investment projects of the EIB's or World Bank's portfolios. This also includes self-standing projects to assist companies interested in meeting EU allowance allocation obligations.

KfW – EIB **Carbon Purchase Programme** to support the development of projects through the acquisition of carbon credits that the projects generate. The programme is designed to reinforce stage two of the ETS.

The **Post-2012 Carbon Credit Fund** is designed to support environmentally beneficial projects from 2012 onwards. It has been established in collaboration with Caisse des Dépôts, Instituto Crédito Oficial, KfW, and the Nordic Investment Bank. The Fund will focused on purchasing Kyoto-compliant carbon credits generated after 2012, potentially up to 2020. For this purpose, it will enter into forward agreements with project owners for the delivery of Certified Emission Reductions and Emission Reduction Units generated under the Clean Development Mechanism and joint Implementation of the Kyoto Protocol.

The current trading scheme Clean Development Mechanism includes many inherent and irreparable flaws. The fact that most of the projects are not additional causes a major concern – they would occur even without the support of the CDM credits, and, therefore, there is no additional emissions reduction. Carbon trading in such a form also supports business-as-usual, e.g. carbon intensive patterns in developed countries, who are the buyers of CDM credits. Moreover, the carbon market can be a place where financial speculations take place, as it is very difficult to prove the link between emissions reduced and the price paid. **By running carbon funds, the EIB is supporting the carbon business and profits generated from imperfect rules. Investing in carbon funds has very little to do with environmental protection, per se, but it is rent seeking.**

Section 4: Conclusions and recommendations

Our analysis of past EIB energy lending has shown what the EIB has done in the last seven years, how it intends to change its portfolio in upcoming years and it lists the future challenges awaiting the EIB in the context of EU climate and energy targets.

A. Financing obligation of the EIB

The current level of EIB investment into renewables, which is around EUR 1 billion per year within the EU, needs to be contrasted against the anticipated need for approximately EUR 40 billion per year. If these investments do not occur, the European energy infrastructure will keep fueling dangerous climate change with all of its negative domestic and international impacts. The EIB, the EU's Bank, should play **a leading role** in the transition to a low-carbon economy, which is the only way to fight both climate change and the current economic crisis.

The EIB needs to seriously reconsider its portfolio whether it truly assists in implementing the EU's targets and policies. The EIB's role is not only in delivering absolute volumes of finance, but also to be a leader for business, which is supposed to contribute significantly to financing the climate change transition.

- Therefore, the EIB finance should be guided by the Commission's assessments of mitigation needs and pathways towards 2020. The Bank should develop **specific financial instruments to exploit the most sustainable ways for delivering deep cuts in greenhouse gas emissions.** Climate mitigation investments must be evenly disbursed across the EU27.
- In order to assist the EU in achieving the 2020 targets, the EIB must **radically back away from old-fashioned, large-scale energy projects of the past and turn to small scale ones instead.**
- The EIB should **actively promote such approach with its partner banks and institutions.**

B. Recommendations on information provision

The EIB has yet to disclose **information** on the final beneficiaries of credit lines through financial intermediaries. Therefore, so far it has been impossible to assess what has been achieved by such loans in renewable energy and energy efficiency projects. In some cases of energy projects, the EIB does not provide enough information to judge the type of energy which was supported. **Information** about the climate impact of the EIB's projects on its webpage is **missing**. If the EIB is to be regarded as a transparent and accountable public institution, it must **improve its public project information disclosure significantly.**

The EIB should systematically disclose **carbon footprints** of direct and indirect emissions induced by its projects, and/or their **energy efficiency potential.**

C. Lending in new Member States and outside the EU

The EIB's energy balance sheets show an unbalanced support for the new Member States since their entry in 2004. Some of these countries have received **no EIB support** for energy (Lithuania, Slovakia), while others received only very small amounts compared to volumes dispersed to old Member States. It is clear from the European Commission's renewable energy reports on the subject that if the EU's target is to be met then all Member States must be more active in deploying renewable energy.

The EIB's non-EU portfolio shows that **the EIB's standards in non-EU countries are rather different from how the EIB lends to Member States** – there are hardly any sustainable energy loans disbursed in the Global South, yet there are many highly controversial investments in gas and large hydro.

- **The EIB must substantially boost its sustainable energy lending to new Member States and develop specific investment schemes in the sectors that address specific CEE potential for energy efficiency.**

For current **lending outside the EU**, the EIB should take the practical development impact of its projects into consideration:

- Every project must establish whether there are **direct benefits for the local population** and in particular it should address the needs for the rural population without electricity access. This should result into exclusion of EIB financing of power generation projects that are directed only at exporting energy or that provide energy only for energy intensive industries like mining.
- All projects will go through an adequate appraisal process: including **full consultation with the local population, transparency** (revenues, monitoring, evaluations) and an **independent external evaluation** of each of the projects
- The EIB also needs to substantially increase its **capacity and expertise** to deal with projects within developing countries

D. Fossil fuel projects

When looking at overall EIB energy lending, it was discovered that lending for unsustainable and/or fossil fuel projects remains prominent on the EIB agenda and continues to rise. **Between 2002-2008, for each EUR 1 million loaned for renewables roughly EUR 3.3 million was loaned for oil, coal, gas or large hydro and nuclear.** In relative terms, half of the overall energy portfolio is made up of fossil fuel loans, and when only the energy generation balance sheet is examined, fossil fuels received an **astonishing 70% of energy lending** in the last seven years. M**oreover, fossil fuel lending displays an increasing rather than a decreasing trend,** even though the EIB has adopted renewable targets since 2006. **Unsustainable energy** (fossil fuels, nuclear and hydro) **still accounted for three quarters of energy generation, while renewables represented the remaining quarter.**

According to the analysis, **gas lending is on a steep rise** (from EUR 1 billion in 2002 to EUR 3.9 billion in 2008), which is driving the overall energy portfolio. An enhanced focus on gas and LNG lending is aimed at diversification of gas supply and decreasing of oil imports and dependency. **However, the massive uptake of gas can easily cancel out efforts made in renewable energy and energy saving.** Moreover, investments in gas reproduce **current carbon intensive patterns,** increasing debt and material dependence.

- The EIB must adopt **a plan to phase-out of fossil fuels by 2012** and start decreasing gas lending immediately, in accordance with the recommendations of the European Parliament. Instead, it should **redirect loans** from fossil fuel and other unsustainable energy (such as nuclear and large hydro) to energy efficiency and renewable energy projects. This is valid for all EIB lending, including the lending in Global South.
- **From 2010, the EIB should stop financing:**
  - the most polluting fossil fuel projects: coal, oil, including tar sands, projects involving gas flaring or liquefied natural gas
  - fossil fuel projects located in sensitive or threatened area: UNESCO World heritage sites, area protected under UN conventions, wetlands protected under Ramsar convention, protected areas and critical natural areas (zones I-IV of the UICN), areas of important cultural, sacred or heritage value;
  - fossil fuel projects in conflict zones and potential conflict zones
  - fossil fuel projects located in indigenous territories where indigenous communities did not give their free prior informed consent to the project.
- Assessing the **GHG implications over a projects lifetime** should be done and publicly available for all EIB projects. The climate impact in terms of emission savings and released emissions should be an integral part of project assessments and approval of the Bank's projects. When monetised and properly reflected in project costs, this would give advantage to low- and zero-carbon renewable projects.
- The EIB must therefore finance **only the sectors** which can deliver **the true, unambiguous change to resource and energy management, rather than to simply reproduce the status quo or to promote the better of two bad solutions.**

E. Transmission

This analysis has revealed that **one third of all energy lending** goes to infrastructure projects and energy transmission. Taking into account that pipelines and storage systems were included under the gas category, transmission and distribution accounts for a major part of EIB loans.

- In transmission lending, the EIB should start lending to **smart grid and decentralised electricity systems** and to improvement in **transmission networks,** as well as interconnections demanded by increased penetration of **renewables.**

F. Renewable energy

In renewable energy, the EIB has been setting for itself a number of renewable energy targets in accordance with the current developments in EU climate policy and global uptake of renewable energy. When pursuing these targets, the Bank has also accelerated its lending for renewable energy over the past few years, especially for offshore wind.

To summarise, the EIB has been **able to achieve some of these targets. However, these achievements are rather insufficient** when compared to the overall EIB energy lending and the scale of the climate change challenge. This applies to the 15% renewable target between 2002-2007, which was achieved by a slight margin and with some concerns in regards to one tapping loan at the end of 2007. Regarding the **more difficult targets, it can be seen that the EIB is not on the track to achieve these.** As for the target of a 50% renewable share in energy generation, the EIB needs to **double its renewable portfolio while energy volumes lent remain stable.** If energy lending is assumed to increase, at least at the same pace (which is highly likely due to the rising

role of the EIB in times of economic crisis), renewable volumes will need to be boosted even more (by a factor of 3.8 for a 50% target).

There have been positive developments recorded **in both wind and solar** (or photovoltaics) lending, where the EIB has invested EUR 2.5 and 1 billion respectively. Despite this, the EIB needs to further diversify its lending in the renewable energy field. In particular, it needs to look at the other sectors, such as heat and transport, and should increase its lending for small scale **biomass**, given its important role in meeting the 2020 target.

It should be pointed out that loans for renewable energy worth EUR 2.2 billion were distributed to various investment funds, via financial intermediaries, or to projects with an unclear categorisation.

- **The EIB should redirect all its energy lending to renewable energy and energy efficiency by 2012.**
- The EIB should **substantially boost its renewable energy portfolio** (on account of loans to gas, oil and coal) **if it is to achieve its target of a 50% renewable share of energy generation by 2010.** This would be a clear indication to developers and investors alike and also to the sector as a whole of the EIB's intention to play a major role in the coming decades.
- The EIB needs to adopt **more ambitious renewable targets,** which are in line with the challenge of climate change mitigation and with the scale of investments needed in the EU. **The EIB should propose and implement annual renewable lending targets up to 2020.**
- The EIB needs to diversify its support of various renewable energy sources and encourage a wide range of **demonstration** and commercial projects. These should explore a variety of renewable heat options, such as the wider use of **ground source heat pumps, hot rock geothermal and municipality wide solar roof programmes.**
- The EIB must expand its lending for renewables **in all new Member States.**
- The EIB must provide far **more information on investment programs and loans to intermediaries** in renewable energy.
- The EIB must expand its staff dedicated to its **renewable energy portfolio.**
- The EIB must adopt all necessary measures in order to **ensure that renewable projects are truly sustainable** (see Annex 3):
  - Financing geothermal energy for massive aluminium smelters in the wild areas of Iceland, for example, is contributing to environmental damage even if the energy itself is renewable.
  - Large hydro-dams are not renewable and small scale, locally managed projects need to be carefully assessed for their biodiversity and water supply impacts.
  - Waste incineration cannot be considered renewable energy. Instead, biodegradable waste should be composted to the largest extent possible, while other minimized waste must be recycled to the largest extent possible.[43]
  - The EIB should carefully assess wind farm localisations. Those farms situated in nature protection areas, especially in bird protection Natura 2000 sites, endanger biodiversity in Europe.

G. Energy efficiency

The EIB emphasises the important role that energy efficiency plays in meeting EU policy objectives. Efficiency is widely recognised as the cornerstone of any security of supply and of an environmental energy policy. However, the Bank **is not sufficiently stringent on this most important issue. Its current statement** that it will make *"energy efficiency considerations more explicit,"* **is woefully inadequate.**

While the EIB maintains that improved efficiency of combined heat and power production is the proper investment, our analysis has pointed out that even energy efficiency improvements in coal power plants are not enough to meet the climate change challenge.

- In order to make the energy efficiency claims real, the EIB should establish **an energy auditing unit.** All projects, from whatever sector, should undergo **a preliminary analysis on their energy saving potential. These submitted potentials** should be compared to what is technically feasible. This process should be directly included in the project cycle and **fully considered as a part of the project's approval procedure.**
- Therefore this body should **provide solid and public data on EIB energy efficiency targets,** their assessment, monitoring and achievement.
- The desired lending for energy efficiency includes **grant schemes for massive insulation of public buildings, households and housing (especially in CEE countries), loans for improved energy management in industry, R&D in high-efficient technologies,** and for the establishment of energy service companies particularly targeting savings within the industrial sector.
- The EIB should **stop giving energy efficiency loans for electricity and heat generation from fossil fuels which expand capacity or extend lifetimes.** This kind of lending preserves the status quo instead of giving incentives for the transformation towards a green economy.

H. Other unsustainable support: nuclear and agrofuels

The EU, through the Euratom loan facility, already has a dedicated credit line available for nuclear power and does not need **the additional facility of the EIB. The EIB remains one of the few public banks that finances the highly controversial nuclear energy sector.** Furthermore, public sector finances should be made available for those technologies that have widespread public support.

The EIB should **cease its lending for nuclear power, adopt a ban on future loans to nuclear,** and instead focus on investments which are truly environmentally sustainable.

Annex 1: Methodology and data set

Basic set of data

Volumes and number of projects in EIB lending by sectors (in million EUR, number of projects)

	2002	2003	2004	2005	2006	2007	2008	2002-08
total EIB projects signed	39 618	42 332	43 204	47 204	45 761	47 820	59 292	325 231
energy signed	**3 861**	**3 913**	**4 157**	**4 645**	**4 200**	**7 558**	**9 417**	**37 753**
no of energy projects	38	41	38	40	38	63	79	337
renewable (RES)	**526**	**320**	**560**	**537**	**429**	**2 069**	**1 577**	**6 168**
no of RES projects	3	5	9	5	4	19	28	73
oil and coal	**32**	**593**	**263**	**499**	**302**	**1 403**	**705**	**3 798**
no of oil/coal projects	2	5	4	4	2	15	4	36
gas and LNG	**1 097**	**1 828**	**3 090**	**1 221**	**1 633**	**2 062**	**3 923**	**14 857**
no of gas/LNG projects	9	17	21	11	16	12	22	108
transmission	**1 907**	**1 142**	**220**	**2 186**	**1 735**	**1 210**	**2 610**	**11 012**
no of transm. projects	20	12	3	13	11	8	16	83
nuclear	**20**	**0**	**0**	**0**	**0**	**200**	**200**	**420**
no of nuclear projects	1	0	0	0	0	2	1	4
hydro	**0**	**7**	**0**	**125**	**100**	**518**	**274**	**1 023**
no of hydro projects	0	1	0	4	5	5	4	19
unclear	**278**	**22**	**23**	**75**	**0**	**95**	**128**	**620**
no of unclear projects	3	1	1	3	0	2	4	14

Methodology used for the analysis

For the purpose of this analysis, the publicly available database of energy projects published at the official EIB website and the Annual Statistical reports in the period 2002-2008[b] were used to check and refine the list of EIB's energy lending. Hence, there is no data on 2009 lending analysed yet though a revision of this study is envisaged as soon as the official statistical data for 2009 are released. The data, carefully checked and compared, show therefore a somewhat different analysis than the EIB usually presents.

Unfortunately, the EIB does not provide any sub-sector **categorization** on the type of project it supports. For the rough guidance on projects, project description can be used; however, in a large number of cases the project description does not provide for sufficient information in order to fully understand the impacts and type of the project. It is not exceptional that a project worthy of one hundred thousand euro support is on the official website described by one sentence or a short phrase only. This was mostly the case of EIB investments to various funds like investments into *Emerging Europe Convergence Fund*[44] in 2005 or *Dexia Southern EU Infrastructure Fund*[45] in 2006. Contributions to the funds that could not be specified more closely were left out from the analysis. In the case of some power plants, provided documentation (EIA assessments) or further research helped to identify the type of project.

Another issue is the fact that the **information provision** about the project is rather scarce. In the case of 13 projects out of 337 analysed, we were unable to categorise those projects. In terms of

volumes, this reaches to Eur 432 million of loans where there is no publicly available information on what the Bank's money was used for, in addition to contributions to various funds with unclear spending and loans to financial intermediaries.

Some energy or energy related projects are **not** categorized **as energy but rather as environment** in official accounts. This way some major loans to oil refineries and relief or cleaning of oil spills were discovered. For differences between EIB online database and Annual Reports see Annex 2. The online database of projects contains some **significant differences** to the Annual Reports. For example, in case of *RWE Solar Modules*[46] project costs according to the database about 21 million Eur, in the Statistical report those were two projects in the amount of 70 million Eur. In the cases of this kind discrepancies data from Annual Report was used.

In cases of mixed projects, one could assort into two or even three categories or they already feature in more than one category. In such cases, the project description was examined and the project was categorised according to the overwhelming energy type in the project. For example, the loan to *Saturn Energy Company*[47] in 2002 aimed at modernisation of **combined heat and power plant,** by adding a biomass boiler to a coal power plant. The project documentation does not provide any information on generation capacity of the power plant or information how big the biomass component could be. In this case, we categorize such a loan as a loan for coal as it conserves the current status quo and backs up the already existing coal power plant. Such a loan cannot be considered as energy efficiency category. Similar approach was applied for other combined heat and power projects. On the other hand, contributions to various funds aimed at promoting renewable energy or energy efficiency, rarely appearing in EIB's lending, were counted under renewable category though their exact purpose might not have been totally clear.

Another example is **hydro power plants** as in case of a loan to *Electric Power Reconstruction II* in Bosnia and Herzegovina in 2007. After a closer examination, it is clear that the hydro power plant to be rehabilitated is a system of eight hydro power plants with total installed capacity of about 2800 MW. To consider this an investment into new renewable hydro energy, the plants need to comply with the criteria laid out in Annex 3. This project is therefore sorted out as hydro category, which mainly brings together loans for large plants and hydro pump storage projects. More details on what counts as renewable hydro project is included in Annex 3.

The following two figures offer comparison of data on renewable energy lending provided by the bank in a document called Energy Policy and the EIB and independent calculations carried out by Bankwatch. They show a clear difference in accounting for renewables in 2008 (for more explanation see section on renewable lending in 2nd part), minor differences in 2004 and 2007.

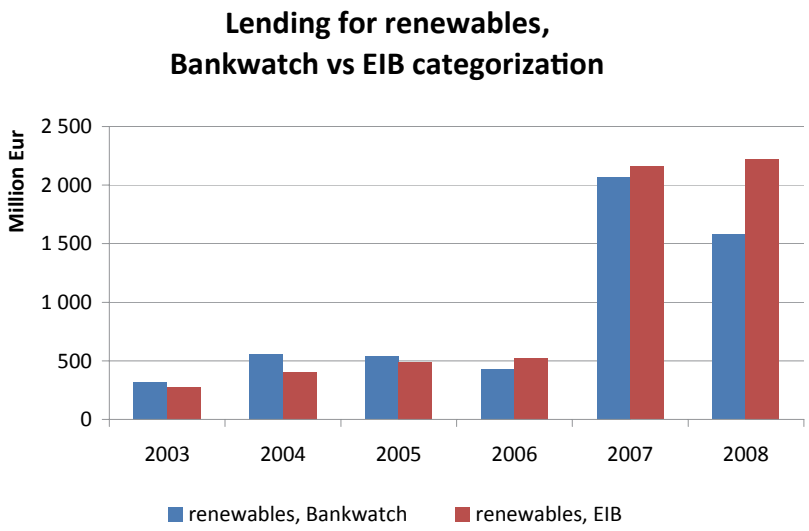

Figure 14: Lending for Renewable Energy, EIB and Bankwatch Categorization, 2003-2008
Source: EIB personnel communication and EU and Energy Policy and the EIB

In the case of **retrofits** for coal and gas power plants, the projects were categorised as coal or gas respectively. There is a large number of projects for improving transmission infrastructure. We have looked at what kind of infrastructure was supported – oil and gas pipelines were labelled oil and gas respectively, as they finally end up combusted, whereas electricity lines were put into transmission category.

Investment into **waste projects** like incineration were taken out of the analyses though they are listed under energy according to EIB's methodology. In the same manner, **energy efficiency** investments were not examined as it seems that there is no way to calculate the EIB's energy efficiency portfolio on the basis of publicly available information.

For the purposes of this analysis, we used following categories listed and described below.
Category of fossil fuels or unsustainable energy:

- *coal:* projects include construction of new coal power plants, modernization of old powerplants
- *gas and LNG:* projects include gas power plant construction, extension, rehabilitation, gas fields exploration, gas transmission infrastructure (lines, storages, terminals)
- *oil:* projects include oil pipelines and storages, oil refineries, oil spills
- *nuclear:* projects include enrichment of uranium
- *hydro:* In this category, hydro projects over 10 MW of installed capacity are included.

Category of electricity transmission:

- *transmission:* projects include upgrading, construction, extension of electricity transmission infrastructure and distribution grids

New renewables: funding for programs to support renewable energy, investment funds, construction of all kinds of renewable energy production units (**wind, solar, photovoltaic, biomass, geothermal plants**). Hydro plants are considered renewable only if small, i.e. under 10 MW installed capacity. The EIB uses the term of renewables for all hydro, including big dams projects. Criteria for using renewable sources of energy in a sustainable way are in detail elaborated in Annex 3.

Unclear: contributions to various investment and credit funds, projects with unclear description.

Annex 2: Control and decision-making in the EIB

The EIB was founded by the Treaty of Rome in 1958 and its mission is to further the policies and objectives of the European Union, by making long-term finance available for sound investment. The EIB operates as a bank and raises on the capital markets the bulk of the resources that it deploys to finance projects meeting the Union's objectives. As a major international borrower, the EIB is consistently awarded a first-class credit rating (AAA) by the main rating agencies. The EIB is **financially autonomous** and does not come under the EU budget. The shareholders are the EU Member States; and the highest governing body, Board of Governors, is composed of the Ministers of these States. The Board of Directors and Management Committee, the two remaining EIB's governing bodies, are appointed by the Board of Governors. The highest executive body of the Bank is Management Committee.

The EIB's **mandate** to finance energy projects is derived from a mixture of the EIB's statute, EU energy policy, environmental policy and agreements with non-EU countries. The challenge for the EIB is to assess 1) which policies demand infrastructure investments, 2) whether these are compatible with the other policies - particularly environmental ones, and 3) whether they should be supported by loans from public banks. A key problem is that the bank's energy lending portfolio indicates that EIB finances any sector featured in EU policy documents. In fact, it should finance **only those projects** of interest to EU Member States **that for some reason cannot raise funds from other sources, and that do not contradict environmental or development policies of the EU.**

In reality, though, **the EIB has not been very careful with these criteria** and has financed both environmentally harmful projects and those that could have been financed from private sources. It is crucial that the EIB begins to learn the difference between a project being legal and a project being deserving of public financing. **EIB support is more than a low-interest loan.** It serves to reduce the political risk of a project or sector, sending a signal to commercial investors and to the market that it is safe and desirable to get involved. Thus, the EIB serves as a political and economic back-up to cover risks, which can either used to the good – for not proven or mass used technologies, such as renewables, or to the bad – to cover risks of controversial projects, which face opposition from environmental and social reasons.

Control of the EIB

The main documents setting up the Bank are the founding **Treaty of Rome and the Statute.** The Bank was founded as one of the EU bodies; however, enjoys full decision-making independence. The highest decision-making lies within the **Board of Governors,** formed of Ministries of individual Member States, who manage policy guidelines, approve the annual accounts and balance sheet, and decide on the Bank's participation in financing operations outside the European Union as well as on capital increases. The Board is in charge of appointing rest of the bodies of the EIB. The **Board of Directors** meets ten times a year and deals with the approval process of projects. Management Committee is the highest permament decision-making and executive body in the Bank. It consists of nine members who oversee a running of the Bank. There are controlling and auditing structures in place as well. Given the volumes of financial means the Bank is managing, **the number of staff is considerably low.** It was employing 1 613 staff in 2008. To compare with, the World Bank with its all regional offices and even smaller portfolio employs about 10 000 per-

sonnel. The approval process with the unstable Board meeting couple of times a year only is also not appropriate to the responsibility and volumes managed by the Board.

The European **Commission** does have limited powers to control the EIB. The head of Directorate General for Finance is entitled to take part in the Board of Directors and in the Board of Governors. The European Commission nominates its representative to the Board of Directors. The DG ECFIN is also in charge of the formulation of the Commission's position on the strategic orientation of the EIB. In particular, it prepares briefings for the Director and Governor (and their Alternates) before they participate in the respective board meetings. According to the Article 21 of the EIB Statute, all proposals to give an EIB loan must be submitted for a Commission opinion before being presented to the EIB Board of Directors for approval[48]. However, the experience shows that so far **the opinions of the Commission have been largely positive** also due to the insufficient project description provided by the Bank[49].

Another controlling power over the EIB is exercised by Member States via the Council of European Union. The Community has given the EIB a number of mandates to perform certain lending operations under a Community guarantee. The **Council approved the latest mandate,** covering the period 2007-2013, in December 2006. The Commission's DG ECFIN assures the review of existing mandates and prepares new ones[50].

Annex 3: Where "renewables" can go wrong

This Annex identifies the **potential negative impacts of renewable energy projects** (which we would exclude from the renewable category) and establish a minimum set of criteria to ensure that international financial institutions do not support such investments. The environmental impacts of renewable energy are site specific, but generalisations are still possible. Renewable energy is usually more environmentally friendly than conventional energy sources, especially with regard to air emissions, and life-cycle emissions from renewable energy use are small compared with those from fossil fuel plants. Renewable energy projects should be considered within a framework for sustainable development that integrates energy demand reduction and efficiency, a mix of renewable energy sources to meet an increasing proportion of overall energy demand and the protection of biodiversity and communities.

Renewable energy technologies vary in terms of efficiency and environmental acceptability. Each individual project design should, therefore, be **screened against the alternatives to identify the most suitable technology for each specific application.** In project development stage, the same significance needs to be given to social and environmental aspects as to technical, economic and financial aspects and the assessment needs to cover the full range of policy, programme, and project options. Strategic impact assessments and life cycle analysis need to be integrated and undertaken as an initial step in the process and give demand-side options the same significance as supply options. Renewable energy must be supported in order to enter energy markets, but the support must be limited to renewable energy that is produced in sustainable ways.

A. Hydro power

Small and mini hydropower systems that produce between 100 kW and 10 MW of electricity often produce enough electricity to be fed into a grid. These facilities do not require reservoirs and do not disrupt the flow of the river or stream, and they can be very effective in supplying energy to the grid in areas where there is flowing or falling water.

Large hydro causes concerns over watershed management, landscape disturbances, impacts on flora and fauna, greenhouse gas emissions (methane released from flooded lands), water quality (changes in dissolved nutrient and oxygen levels, presence of toxic substances, temperature and pH changes, turbidity, etc.), and noise and visual impacts for residents. Large dams can displace hundreds of thousands of people, disrupting lives and communities. Providing adequate compensation, resettlement, and rehabilitation has proven to be very difficult, and in many cases, communities affected by these projects have been left worse off than they were prior to the projects. **According to the latest research, the world's 52,000 large dams contribute more than 4% of the total warming impact of human activities. In some cases emissions from a reservoir can be equal to or greater than those from a coal or gas-fired power station; emissions are highest in shallow, tropical reservoirs.**

The hydrological cycle is renewable, but large hydro are fuelled by reservoirs, not just stream flow, and reservoirs are exhausted sometimes very rapidly (worldwide, reservoirs are losing their capacity to the sediments at an average rate of 0.5-1% per year).

Dams with "run-of-river" characteristics – those which don't store significant amounts of water and depend mainly on simultaneous river flow for their power output – can usually pass incoming sediments. It should be stated that the term run-of-river is an ill-defined one, and is increasingly used as a synonym for "low impact," which is often far from the truth. So hydropower may technically be renewable, potentially renewable, or non-renewable depending on the characteristics of each individual project.

Specific criteria for renewable hydro:
1. the project is under 10 MW;
2. the project does not involve dam, reservoir and resettlement;
3. the project does not affect the water flow regime and wildlife circulation;
4. the project does not affect biodiversity, nor people's water needs;
5. the project does not affect possible investments to rehabilitate and increase efficiency of existing units in the project area.

B. Solar power

Solar power including concentrating solar systems that use reflective materials such as mirrors to concentrate the sun's energy and to then convert the heat into electricity, is becoming increasingly cost effective to feed into electricity grids, although it is still more costly than alternative technologies. Solar photovoltaic (PV) systems, which turn sunlight directly into energy, are particularly useful for rural electrification in areas not well-suited for micro-hydropower. Solar PV systems can be used for electricity, water pumping and treatment, health care systems, and communication. Photovoltaic systems have few effects when in operation, but the manufacture of PV cells needs to be carefully controlled due to the use of potentially toxic or hazardous materials.

A highly cost effective option is the use of solar colectors to obtain thermal energy. Heating and hot water costs can account for up to 60% of a building's total energy costs. One can cover 50 to 65% of the yearly hot water demand with solar energy and a properly dimensioned system. In the summer, the entire demand for hot water can be, in most cases, provided for by solar heating systems. Then the conventional heating system can be completely shut off. This is particularly advantageous, because in this time period it only works with a low rate of capacity utilisation due to the lack of heating demand.

No significant environmental or social impact for solar technologies have been identified so far. Land issues may appear though – siting should avoid valuable agricultural land. Potential impact on wildlife should be addressed.

C. Wind energy

Wind energy is generally a cheaper option than solar power in locations with average wind speeds larger than four meters per second during the least windy times. Although there are concerns over wind intermittency, this issue can be overcome by mixing wind resources with other renewables resources like solar power and hydropower.

Wind-power generation has very low emissions on a life cycle basis, but has a number of environmental effects that may limit its potential. The most important effects on the environment are:

- *Visual effects:* Wind turbines must be installed in exposed areas and are therefore highly visible. They may be considered unsightly by some people, and concerns have increased with the larger size of new generation turbines.
- *Noise:* Wind turbines produce aerodynamic noise, from air passing over the blades and mechanical noise from the moving parts of the turbine, especially the gearbox. Better designs have reduced noise though. Wind farms developed far from highly populated areas are, by definition, less offensive.
- *Electromagnetic interference:* Wind turbines may scatter electromagnetic signals causing interference to communication systems. Appropriate siting (avoiding military zones or airports) can minimise this impact.
- *Bird safety:* Birds get killed when they collide with the rotating blades of a turbine. Migratory species are at higher risk than resident species. Siting the turbines away from migratory routes reduces the impact.

Criteria:
1. the project is not developed in a nature protected area;
2. the project is not developed along a bird migration route;
3. the project does not impact bat populations (besides collision and habitat disturbance, the issue of ultrasound emission will be dealt with);
4. wind farm projects will be based on biodiversity baseline studies and will undergo environmental impact assessment, as any industrial project;
5. wind projects will have post-commissioning monitoring programmes to ensure there is no negative impact on communities and wildlife;
6. the project will use state-of-the-art equipment, in order to minimise noise, vibration and electric and magnetic fields; old, used installations will not receive funding from IFIs;
7. off-shore wind projects will be based on a thorough analysis of potential impact on both birds and mammals, including their habitats and feeding areas and sources.

D. Geothermal

Geothermal energy is a clean, renewable resource that provides thermal and electric energy around the world. It is considered a renewable resource because the heat emanating from the interior of the Earth is essentially limitless. Geothermal energy can be used for electricity production, for direct use purposes, and for home heating efficiency (through geothermal heat pumps). Geothermal relies on a readily available, constant source of heat for generation, and is therefore considered a baseload resource. Because some renewable energy sources can only operate under favorable weather conditions, they are often considered to be limited in their ability to meet the looming large-scale power needs of the twenty-first century. Geothermal, however, has the potential to provide reliable sources of electricity while still offering significantly lower emissions levels than fossil fuel sources and avoiding problems of radioactive waste disposal. Geothermal's availability factor is about 95%. This means that geothermal electric-power plants are available for generation 95% of any given time, based on decades of observations by plant operators. Geothermal's capacity factor ranges from 89 to 97%, depending upon the type of geothermal system in place.

Geothermal plants may release gaseous emissions into the atmosphere during their operation. These gases are mainly carbon dioxide and hydrogen sulphide with traces of ammonia, hydrogen, nitrogen, methane, radon, and the volatile species of boron, arsenic and mercury. Emissions can be managed through strict regulations and by control methods used by the geothermal industry to meet these regulatory requirements. Hydrogen sulphide abatement systems reduce environmental damage but are costly to install.

Criteria:
1. the project uses injects the water back to the ground, there aren't discharges that could thermally pollute river or lake systems;
2. equipment is in place to eliminate harmful emissions of green house gases, hydrogen sulphide and other gases in the thermal water.

E. Biomass

Biomass is a renewable energy resource derived from various human and natural activities. It is derived from numerous sources, including the by-products from the timber industry and agricultural crops. Biomass does not add carbon dioxide to the atmosphere as it absorbs the same amount of carbon in growing as it releases when consumed (but energy consumption during transport/processing needs to be considered). Its advantage is that it can be used to generate electricity with the same equipment in power plants that are now burning fossil fuels. Biomass is an important source of energy and the most important fuel worldwide after coal, oil and natural gas.

The production of biomass for energy implies the use of large areas, which linked to current monoculture practices, generates significant environmental impacts on biodiversity and modes of production. Thus, the use of plant residues for generation of electricity, heat and agrofuels, whether from sugarcane, rice husks and crop wastes, forestry activities and production of vegetable oils, etc., are among the best ways to produce sustainable energy, as long as they don't prevent other important uses of agricultural wastes, such as soil conservation, for example. Methane recovery from the decomposition of urban wastes (in sanitary landfills) or agricultural wastes (swine and poultry manure, for example) for energy production can also be a sustainable alternative, depending on the previous type of management of these wastes. Burning – incineration – of urban and industrial wastes is not acceptable, because such processes produce a range of polluting emissions that are highly hazardous to human health and the environment, and whose adoption implies less sustainable and socially just decisions in comparison with other alternatives for the management of solid wastes.

Solid Biomass: organic, non-fossil material of biological origin which may be used as fuel for heat production or electricity generation.
Wood, Wood Waste, Other Solid Waste: purpose-grown energy crops (poplar, willow etc.), a multitude of woody materials generated by an industrial process (wood/paper industry in particular) or provided directly by forestry and agriculture (firewood, wood chips, bark, sawdust, shavings, chips, black liquor etc.) as well as wastes such as straw, rice husks, nut shells, poultry litter, crushed grape dregs etc.
Charcoal: Covers the solid residue of the destructive distillation and pyrolysis of wood and other vegetal material.
Biogas: Gases composed principally of methane and carbon dioxide produced by anaerobic digestion of biomass and combusted to produce heat and/or power.
Liquid Agrofuels: Bio-based liquid fuel from biomass transformation, mainly used in transportation applications.

5.1. Dedicated crops

Theoretically any plant material may be used to produce bioenergy, but those grown specifically for the purpose produce large volumes of biomass and have high energy potential. Bioenergy can take many forms, including bioelectricity and agrofuels. Biogas and biodiesel are fuels produced from plants, which can be used in much the same way as natural gas or gasoline. When agrofuels are produced from native plants, or from plants that grow without fertilizer and do not need irriga-

tion, this type of fuel can produce significantly fewer emissions than conventional gasoline. When produced and used locally, agrofuels can also help local economies.

Agrofuels present a comparatively clean alternative to oil as a source of fuel, and could be particularly useful for use in transportation. They have the potential to provide a fuel that emits a small fraction of the carbon produced by conventional fossil fuels; they also usually produce less of other pollutant emissions than fossil fuels. However, the environmental impacts of producing and using agrofuels on a large scale must be carefully considered, including the impacts of agrofuel production on local ecosystems. For example, forests may be cut down for agrofuel plantations, and these plantations may use large quantities of water or require harmful applications of fertilizers and pesticides. The fuel inputs required to produce certain agrofuels may cancel out, or nearly cancel out, the greenhouse gas benefits from use of the agrofuel. As one of the few alternatives available to conventional oil use, however, agrofuels must be considered, albeit carefully, as an alternative source of fuel.

Bioethanol is ethanol (C2H5OH) produced by the biological fermentation of carbohydrates derived from plant material. In terms of fuel use, ethanol is mainly of interest as a petrol additive or substitute. Both synthetic ethanol and bioethanol are suitable for fuel use, but synthetic ethanol is classed as a fossil fuel.

Biodiesel is a fuel that performs like a mineral diesel, but is derived from a renewable energy source. In the UK interest is mainly focussed on producing biodiesel from oilseed rape. The technical term for the resulting fuel is rape-methyl ester. Any vegetable oil, including used frying oil, generally has potential for the production of biodiesel. Crude rape seed oil undergoes the process of esterification, which removes the glycerin allowing the oil to perform like mineral diesel. Biodiesel can be mixed with normal diesel, so vehicles require no modifications to use it. No significant differences in engine performance were recorded when comparisons were made between biodiesel and conventional diesel. Glycerol is a valuable by-product of the reaction, and it is used in over 1,500 applications and products, including drugs, polymers, paints and textiles. The sale of glycerol can offset some of the production costs. Biodiesel is significantly safer than petroleum-derived diesel; it has a lower flashpoint, and so does not ignite easily, does not produce explosive vapours and even has a low degree of toxicity to humans and animals if ingested. It is biodegradable, so if spilled will not cause lasting damage to the environment. Emission benefits include less particulate matter (the soot associated with diesel vehicles), reduced levels of carbon monoxide and total hydrocarbons, and an improved odour. In contrast to conventional diesel, it is also essentially free of aromatic compounds and sulphur, both of which are toxic and subject to legislation.

Criteria (applying to both crops for biomass to be combusted in energy purposes, and crops for agrofuel production):

1. the design and layout of plantations promotes the protection, restoration and conservation of natural forests, and does not increase pressures on natural forests or nature protected areas;
2. a biomass origin certification system is in place;
3. the plantations do not have a negative impact on natural habitats;
4. the crops exclude genetically modified organisms;
5. native species are preferred over exotic species in the establishment of plantations and the restoration of degraded ecosystems. Exotic species, which shall be used only when their performance is greater than that of native species, shall be carefully monitored to detect unusual mortality, disease, or insect outbreaks and adverse ecological impacts;
6. the project brings about improvements in soil structure, fertility and biological activity;
7. the project does not involve the use of harmful fertilizers and insecticides;

8. the project does not bring about adverse impacts on water availability and quality, or impact on river and lake systems for that matter;
9. no species is planted on a large scale until local trials and/or experience have shown that they are ecologically well-adapted to the site, are not invasive, and do not have significant negative ecological impacts on other ecosystems;
10. the project does not raise land ownership, use or access issues;
11. the project is not a theat to food security on any level (energy plantations drastically reducing/ eliminating food crops in the area);
12. the project does not involve an increase in GHG emissions;
13. the biomass resource is of local origin (no imports of biomass from 3rd world countries);
14. the project cannot create social conflicts;
15. biomass production must have a substantial positive energy balance (energy output versus input).
16. exploitation of energy biomass from production forests has to be in accordance with rules of sutainable forestry (all loppings and 30 cubic meters per hectare should not be removed from the forest)

Recommendation: use primarily degraded land areas and improve them in the process.

5.2. Biogas is the gas that is produced from the decomposition of biological (organic) waste whether the decomposition takes place in a landfill, closed vessel anaerobic digester, or wastewater treatment plant. The recovery of this unconventional source of waste gas not only benefits the environment, but also dairy farmers. Through the use of digesters, animal waste can be transformed into valuable liquid natural gas (LNG), fiber and fertilizer. Biogas, whether as a by-product from digester brewery hops or more commonly from digested animal waste is an excellent energy source after the largely methane gas product is purified. LNG from biogas can be a locally-produced, clean, sustainable and renewable low-cost source of energy, making it an attractive option for dairy operators and local LNG end users.

By-products from the biogas plants should be used as a fertiliser only under condition of independent certification (for example in case of biogas plants which use wastes from slaughter and meat processing factories as an input material).

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46 Project link: http://www.eib.org/projects/loans/2001/20010576.htm
47 Project link: http://www.eib.org/projects/loans/2001/20010605.htm
48 DG ECFIN webpage: http://ec.europa.eu/economy_finance/financial_operation_instruments/coordination_eib81_en.htm
49 Based on personal conversation with DG ECFIN staff.
50 DG ECFIN webpage: http://ec.europa.eu/economy_finance/financial_operation_instruments/coordination_eib81_en.htm

"If the EU is to achieve its targets and prevent dangerous climate change, public finance must follow and support these targets. There is no other option for the EIB, the EU's bank, but to turn completely to renewables and energy efficiency lending."

CEE bankwatch network

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