A Challenging Climate

What international banks should do to combat climate change

BANKTrack

Content

Acknowledgment
This paper was prepared for BankTrack by Steve Herz and Johan Frijns, in conjunction with the BankTrack task group on climate and energy. This position paper was released on December 12 2007 during the COP 13 in Bali.

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Executive summary

Responding to climate change

Global climate change is the planet's greatest environmental challenge, directly threatening the prosperity, livelihoods and security of all people worldwide. If current trends continue, average global temperatures could rise by as much as 6.4°C by the end of this century, with devastating and irreversible effects for the planet and many of its inhabitants.[1] To avoid the most dangerous impacts of climate change, global average temperatures cannot be allowed to rise by more than 2°C over pre-industrial levels. To stay within the 2°C limit, global greenhouse gas (GHG) emissions will need to be reduced by over 80 percent by 2050 compared to 2000 levels.[2]

Governments, individually and collectively, have an obligation to set effective targets for reducing GHG emissions, and to craft policy frameworks in which those targets can be achieved. Long-time industrialized countries who have produced the bulk of greenhouse gases bear a much larger responsibility for causing climate change, therefore they will have to take action to drastically reduce their emissions and develop low/no-carbon technologies, in order to provide poor developing countries room for economic development within the boundaries of a stringent global carbon regime.

Until now public policy responses to climate change have been inconsistent and inadequate, with many governments refusing to responsibly address the problem. Action simply cannot wait until governments find the political will to do so. Every individual and every institution, within their spheres of influence must act to combat climate change.

The role of commercial banks

This is also true for international commercial banks. Through their large scale lending, investment, and other financial services, banks play an indispensable role in mobilizing and allocating financial resources for the private sector. BankTrack believes that with this influential position comes a special responsibility for banks to play a leadership role in the business community in addressing the challenges of climate change.

Accordingly, banks are in a unique position to either finance business as usual and be complicit in causing further climate change, or help catalyse the necessary transition to a new economy, with minimal GHG emissions resulting from wholesale energy efficiency and the use of renewable energy as replacement for fossil fuel.

Banks may place climate change within the logic of the "business case" for sustainability. Certainly, there are substantial opportunities to profit from investments in renewable energy production and energy efficiency. But market mechanisms and traditional business models alone will not be sufficient to the task. There remain ample opportunities for banks to maximize short term profits and shareholder value by

supporting investments -in for example the oil and gas industry- that contribute to climate change.

BankTrack calls upon all international commercial banks, in consultation with civil society organizations and other stakeholders, to develop an ambitious, publicly-available climate policy that will clearly address how the bank will reduce the climate impacts of its lending and investments and how it intends to contribute financing the transition to a low-carbon economy. This paper outlines the necessary elements of such a policy.

First, banks should take steps to **disentangle themselves from activities and projects that substantially contribute to climate change**. Towards this end, they should:

- End support for all new coal, oil and gas extraction and delivery;
- End support for all new coal-fired power plants;
- End support for the most harmful practices in other GHG-intensive sectors;

Second, banks should **minimize the extent to which their remaining activities and investments contribute to climate change**. Towards this end, they should:

- Assess and report on GHG emissions associated with all their loans, investments, and other financial services;
- Establish portfolio and business-unit emissions reduction targets in line with what is considered necessary, based on current science on climate stabilization;
- Develop a set of tools to address climate issues and reduce emissions across the full range of operations and services.

Third, banks should **increase their support for the development and use of climate-friendly technologies and production processes**. Accordingly, they should:

- Increase support for GHG emissions reduction technology, renewable energy production and energy efficiency in all business lines;
- Develop products and services to help retail customers address climate change.

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1. What on earth is happening? Climate change and its impacts

It is now beyond dispute that the global climate is changing, and will continue to change in the future regardless of what action is taken to limit the scale of change.

According to the Intergovernmental Panel on Climate Change (IPCC), the most authoritative interpreter of the scientific evidence on climate change, most of the increase in global average temperature since the mid-20th century is due to greenhouse gas emissions from anthropogenic sources.[3] The most important of these GHGs is carbon dioxide[4], which is produced mainly as a consequence of fossil fuel combustion.[5] Carbon dioxide concentrations in the atmosphere (currently about 379 ppm) are now significantly higher than at any time in the last 650,000 years, and are rising rapidly.[6]

The IPCC's projections of the scale and intensity of future anthropogenic climate change are truly alarming. The IPCC has calculated that world temperatures could rise between 1.1 –the temperature rise that is now considered already inevitable- and 6.4°C by the end of this century.[7] Such dramatic changes would cause extraordinary alterations in the global environment, and would likely have profound and potentially disastrous economic, social and health impacts on many human populations. While the World Health Organisation estimates that climate change *already* causes 160,000 deaths each year,[8] the IPCC anticipates "increasing deaths, injuries and illness from heat waves, floods, storms, forest fires and droughts."[9]

Some other impacts anticipated by the IPCC include:

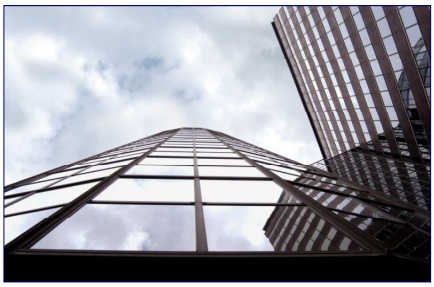
- Increased flooding risks for hundreds of millions of residents of coastal and riparian areas due to more extreme coastal weather events, sea level rise, altered rain fall patterns, and shorter run-off seasons;
- Altered rainfall patterns and adverse impacts on glacier and snow-pack fed water sources that could leave 2 billion people short of water by 2050;
- Significant changes in global food production patterns, including adverse affects on the agricultural production in many regions -especially in subsistence sectors at low latitudes- and overall global food production decreases after a 3° C temperature rise;
- Increased resource competition, large-scale internal displacements, and cross border migrations as the carrying capacity of vulnerable regions decreases;
- Adverse health impacts and increased mortality of millions of people due to increased malnutrition and new disease transmission vectors;
- Disproportionate adverse impacts on poor and subsistence communities, who may have more limited adaptive capacities, and are more dependent on climate-

sensitive resources such as local water and food supplies;
- A high risk of extinction for approximately 20-30 percent of plant and animal species; and
- Substantial losses of coral reefs, salt marshes, mangrove forests, tropical rainforests, glaciers, sea ice, and other vulnerable ecosystems.[10]

Apart from these social and environmental upheavals, the economic costs of unmitigated climate change could also be catastrophic. The participants in the UNEP Finance Initiative -the leaders of some of the world's largest financial service organizations- have warned that "[u]nless action is taken now to set in motion a worldwide transition to a low carbon economy... the world could experience annual economic losses as high as USD 1 trillion [by 2040]..."[11] In a similar vein, Nicholas Stern, a former chief economist at the World Bank, in his report to the British Government estimates that climate change could cost 5 to 20 percent of the world's annual gross domestic product, and would therefore be equivalent in scale to the Great Depression or each of the world wars. He also estimates that avoiding climate change would cost only a fraction of these costs (1 to 2 percent of world's gross domestic product) if action is taken without further delay.[12]

Climate change is a direct result of human activities and can therefore only be mitigated through our collective efforts. As the state signatories to the Kyoto Protocol concluded, our common challenge is to stabilize atmospheric GHG concentrations "at a level that would prevent dangerous anthropogenic interference with the climate system."[13]

2. Banks and climate change



Banks play an indispensable role in mobilizing financial resources for the private sector. In particular, large-scale infrastructure and capital investments -whether they are climate-friendly or climate damaging- often require the support of large banks.

Since these investments may remain in operation for decades, the current portfolio decisions of the banking sector can have enormous and lasting impacts on our ability to meet global GHG reduction targets and avert the most severe impacts of global climate change. This puts banks in a unique position -and gives them a special responsibility- to play a proactive role in helping to catalyze the necessary shift toward a low/no carbon economy.

To date, however, climate impacts have influenced portfolio decisions of banks only at the margins, if at all. Banks have traditionally found comfort in supporting incumbent industries and familiar technologies while scale advantages makes them geared towards financing projects that require substantial amounts of capital. As a result, GHG-intensive operations such as coal-fired power plants and oil and gas development have had ready access to the capital markets, with commercial banks financing a significant share of these investments. Indeed, according to two recent studies, some large banks indirectly

finance more greenhouse gas emissions than are emitted by entire countries.[14] By continuing on this path, banks are complicit in causing the environmental, social and economic harm associated with global climate change.

Fortunately, this is slowly beginning to change. Banks, like other private sector actors, are awakening to the myriad impacts that climate change will have on their business. For example, new national and international regulatory frameworks to address climate change will require their clients to reduce their greenhouse gas emissions while creating new opportunities for energy efficiency, and clean energy investments. In addition, the increased frequency and intensity of severe weather events will present additional property and casualty risks to a broad array of bank clients and thus on the portfolio stability of banks themselves. Finally, increasing public concern regarding global warming will add reputational risks to those institutions that are perceived as industry laggards.[15]

As a result, financial institutions are increasingly recognizing both the financial risks of business as usual and the profit-making opportunities associated with the transition to a climate-friendly economy. With regard to business risks, it is estimated that about 20 per cent of global GDP is now affected by climatic events and that "climatic risk in numerous branches of industry is more important than the risk of interest rates or foreign exchange risk."[16] The potential opportunities may be even greater. Already by 2020, the global renewable energy market may be worth US$ 1.9 trillion,[17] and the global carbon market may reach US$ 250 billion in value.[18]

Nevertheless, the 'business case' alone, will not catalyse sufficient action to quickly and dramatically lower GHG emissions and stabilize the global climate. The climate crisis is widely considered to be "the greatest and widest-ranging market failure ever seen."[19] In the absence of sufficiently stringent market-transforming regulatory interventions by governments, price signals, profit-maximization and other traditional drivers of business decision-making will not be adequate to the task of steering banks towards reducing their climate impact.

True, governments are primarily responsible for establishing ambitious emissions targets and timelines, regulatory initiatives and market frameworks, with industrialized countries taking on the additional responsibility in supporting less developed countries in their transition to a low carbon economy. But private sector initiative cannot simply wait until governments address these challenges. Banks must act now, even in the absence of government intervention. The remainder of this report addresses what BankTrack believes financial institutions should do to address the challenge of global climate change.

3. What the banking sector must do to combat climate change

In response to the challenges of climate change, all banks should develop, in consultation with civil society organizations and other stakeholders, a comprehensive, publicly available climate policy. This policy should include strategies to disentangle themselves from all activities that directly and substantially contribute to climate change; strategies and objectives to reduce the climate impacts of all remaining lending and investments, and plans on how the bank may positively contribute to the rapid transition to a low/no carbon economy.

3.1 Disentangling from climate destruction

End support for new coal, oil and gas extraction and delivery

Virtually all observers agree that the use of fossil fuel for energy generation and transport purposes must be drastically and rapidly reduced if the most serious impacts of climate change are to be avoided. The Stern Review has estimated that the global power sector must reduce carbon emissions by 60-75 percent by 2050 to stabilize atmospheric concentrations of CO_2 equivalent (CO_2eq) below 550 ppm.[20] Further reductions also in other sectors will be necessary to stabilize CO_2eq concentrations below 450 ppm, the level associated with a 60 percent probability of achieving the 2°C climate target.[21] Concentration targets below 450ppm will be necessary to increase the probability to 90% or higher of achieving the 2 degree C target.

The carbon content of all currently known, economically recoverable fossil fuel reserves already far exceeds the world's remaining carbon sink capacity.[22] Thus, even consuming only these currently known reserves would run an untenable risk of wreaking climate havoc. From a climate perspective then, it makes no sense and it is highly dangerous to continue to seek out and develop new fossil fuel reserves. Every new exploration and development of new reserves will only put greater pressure on the world's remaining carbon sink capacity, derailing any ongoing efforts to stabilize climate change.

Yet last year, global oil and gas companies spent approximately $200 billion developing new energy projects, pushing the oil and gas frontier into every remote corner of the world in order to reach hitherto economically unviable reserves.[23] Climate change aside, these exploration efforts in deep jungle areas, arctic refuges and underneath tropical seas often have profoundly adverse effects on the local environment and on populations living in the area.

Commercial banks are often key financiers of these highly lucrative undertakings.[24] Yet, if banks are to play a positive role in facilitating a transition to a low carbon economy, they must gradually, based on clearly defined timelines and targets, terminate their support for new oil, coal and gas extraction and associated delivery projects such as pipelines and loading stations.

End support for new coal-fired power plants

From a climate perspective, coal is the dirtiest fossil fuel, containing over 70 percent more carbon per unit of energy than natural gas (excluding liquid natural gas lifecycle emissions). Coal combustion produces 38 percent of global electricity output, but is responsible for 72 percent of global power sector emissions.[25] Coal is also a readily available energy source for energy hungry emerging economies such as China, Brazil, Russia, Ukraine and India.

As a result thereof, hundreds of new coal power plants are currently on the drawing board and under construction, with China, India, and the United States leading the way in new construction.[26] Yet, every plausible global GHG emission reduction strategy includes a dramatic reduction in reliance on coal. This must start now, as a new coal-fired power plant typically has a 'useful' lifetime of 50 years or more. As with fossil fuel exploration, banks therefore must immediately terminate their support for coal power plants.

End support for most harmful practices in other GHG-intensive sectors

While the burning of fossil fuels currently produces the lion's share of the world's GHG emissions, several other activities and economic sectors also cause significant climate impacts. Banks should take climate impacts into account when they are engaged in these activities and sectors, and should end their support for the highest impact activities within these sectors. Greenhouse gas intensive activities and sectors that require particular consideration include –but are not limited to-:

Deforestation/forestry. Deforestation is a critical driver of climate change. The burning and clearing of natural forests around the world contributes more to global GHG emissions each year than the entire transport sector.[27] In Brazil, one of the world's largest producers of GHG emissions, deforestation in the Amazon accounts for more than a third of national emissions.[28] In addition to producing emissions, deforestation also eliminates carbon sink capacity.[29]

Deforestation may be either the direct result of bank financed activities –such as logging operations and the conversion of forests into farmland or pulp plantations -or in the case of mangroves, fish ponds- or indirectly result from other activities –for example infrastructure projects that may open up forest frontiers to new settlers, or the disappearance of forests due to dam construction.

Because of the sink capacities of forests, sustainable forest practices offer substantial cost-effective mitigation opportunities. Banks should therefore require all their clients in the forest industry to adopt sustainable forestry practices. Banks should also refuse to finance any economic activity that directly or indirectly causes large-scale deforestation.

Agriculture. Agriculture accounts for a substantial percentage of total global anthropogenic emissions of GHGs. The IPCC has estimated that agriculture contributes about 10-12 percent of global GHG emissions.[30] For its part, the UN Food and Agriculture Organization estimates that deforestation, land use change, methane production, and other emissions from the livestock sector alone is responsible for 18 percent of anthropogenic emissions.[31] Accordingly, banks should refuse to finance the most GHG-intensive agricultural processes and practices, such as the industrial scale farming of cattle, in favor of more localized and organic methods of food production.

Transportation: As of 2004, transportation was responsible for 23 percent of global energy-related GHG emissions, and its GHG emissions were increasing at a faster rate than any other energy consuming sector.[32] Since trains, planes, trucks and cars are durable assets that can remain in service for decades, it is imperative that the transportation sector improve its energy efficiency in the near term. Banks should avoid financing the most energy intensive transportation options where sustainable transport alternatives exist or can be developed, and proactively seek to finance those more efficient transportation solutions and public transportation systems.[33]

3.2 Reducing the climate impact of all lending and investments

Measure and report GHG emissions associated with all financial services

The accurate public accounting of climate impact is essential for managing and reducing emissions in a transparent and accountable manner. To fully account for their climate footprint, banks should measure and report on the emissions associated with the financial services they provide to their clients. To enable more effective management of the climate impacts of their operations, such accounting should be done on both a business-unit and portfolio-wide basis.[34]

The increasingly accepted standard for accounting, measuring and reporting on direct and indirect greenhouse gas emissions for a large number of sectors and economic activities is the Greenhouse Gas Protocol (GHG Protocol), which is consistent with the guidelines issued by the IPCC for reporting on emissions at a national level.[35]

To facilitate the transfer of best practices, banks should require clients that produce

significant quantities of greenhouse gases to use the GHG Protocol accounting and reporting procedures as a condition of financing. In so doing, banks can also build upon the work of the Carbon Disclosure Project, a coalition of large institutional investors that asks the world's largest companies to report on their emissions and other climate-related information. Over 1,000 large corporations currently report on their emissions on the CDP website.[36]

Establish portfolio and business-unit reduction targets

Emissions reduction targets are fast becoming standard practice in many industries.[37] While many companies have used the Kyoto Protocol benchmarks as a corporate target (on average 5.2 per cent from 1990 levels by 2012), it is clear that to continue to use Kyoto-scale emissions reductions will not be sufficient to stabilize climate change at 2°C above pre-industrial levels. Rather, the IPCC estimates that this will require reducing overall greenhouse gas emissions by more than 80 percent from 2000 levels by 2050.[38]

To achieve such dramatic long term emission reductions, it is imperative that short- and medium-term reduction targets are sufficiently ambitious to make substantial progress and that banks and other industries wishing to make a real difference orientate themselves on these targets.

Some financial institutions have already adopted both portfolio and business-unit reduction targets. For example, the United States Overseas Private Investment Corporation (OPIC) has pledged to adopt annual emissions caps to reduce GHG emissions in its projects by 20 percent in the next ten years.[39] Following OPIC, banks should establish annual reduction targets to ensure progress towards longer-term stringent reduction objectives.[40]

In order to be able to compare reduction targets within the banking sector, banks, in conjunction with NGOs, business and other stakeholders must develop a joint standard on how to allocate responsibility for emissions caused by financed operations (indirect or embedded emissions) to the various financial institutions involved in that operation.

Develop a set of management tools to address climate issues

Banks should develop and implement appropriate tools to ensure that they meet or exceed their emission reduction targets, and to help transmit best climate practices to their customers and clients. These should include differentiated tools that can be applied to all segments of the banks' operations and services, including market research; asset management; retail, corporate and investment banking; project finance and insurance.[41]

For example, banks should develop: (1) refined climate risk assessment tools that are tailored to each business line; (2) emissions or efficiency requirements for all commercial real estate and project- and corporate finance clients; and (3) quality control guidelines for carbon trading markets to ensure genuine emission reduction effects.[42]

Critically, these tools must address real world climate impacts, not just climate-related business opportunities and risks. For example, offsets trading may be an attractive

business opportunity, even if the offsets being traded are of dubious quality and have little or no positive climate impact.[43] Similarly, many investors have seen great promise in investments in corn-based biofuel in the United States, even though the real climate benefits of such fuels may not be significant.

Climate management tools should be no less rigorous than the kinds of management tools and oversight mechanisms banks already use to ensure compliance with other corporate policies and strategic objectives, such as their credit rating and risk management frameworks or their human resources policies. Critically, they must also include mechanisms to align staff and management incentives with corporate emission reduction objectives.

3.3 Financing the transition to a low/no carbon economy

Substantial new investments in energy efficiency and renewable energy will be required to sufficiently *decarbonize* the energy sector in order to meet the IPCC emissions reduction targets. There is a huge potential for renewable energy to meet energy needs; one recent analysis of the deployment potential of renewable energies until 2050 for the 20 largest economies concludes that they could realistically contribute simultaneously at least half of all electricity generation in each of the large economies, in some countries like Australia, Brazil, Canada up to 90%; and 40% - 80% of the heating and cooling supply (not including passive solar) in every country analysed.[44] According to another estimate, $107 billion must be invested in renewable energy production each year through 2030 to meet these targets.[45]

While investment in renewable energy, energy efficiency and 'clean tech' sectors is currently undergoing dynamic growth, such investment remains small in comparison with investment in incumbent energy technologies. In 2006, investment in renewable power generation represented only about 18 percent of total power sector investment.[46] Investments in new oil and gas projects alone was almost three times higher than investments in the entire sustainable energy sector.[47]

Typically, renewable energy projects have low operating costs but relatively high up front capital needs, so finance related barriers and obstacles hinder renewable energy investments. For this reason, in June 2004, the 154 governments attending the International Conference for Renewable Energies called on the banking community to offer more financing for renewable energy, and more risk-hedging financial tools to reduce investment risks in this sector.[48]

Banks must lead the way in developing innovative financing solutions to facilitate investment in clean energy and energy efficiency technologies and projects. In particular, banks may need to develop new financing tools to accommodate the smaller scale, decentralised generation and efficiency initiatives that will likely be more prevalent in a low/no carbon economy.

Increase support for GHG emissions reduction technology, renewable energy and energy efficiency

Banks should develop a proactive strategy for investing in renewable energy and energy efficiency programs and projects. Just as banks may once have promoted themselves as 'Oil & Gas Bank'[49] and historically built much of their business on providing capital to oil companies to exploit fossil fuel reserves, banks should now vigorously start to compete to become the bank of choice for the clean-tech, renewable energy, and energy efficiency industries. Clearly, those banks that are first to develop a keen understanding of these industries and cultivate durable relationships with key players will enjoy significant competitive advantages as these industries mature.[50]

Of course, not all energy solutions that are marketed as climate-friendly or sustainable actually merit those appellations. Banks should focus on financings the best long-term energy options -including energy efficiency, solar, and wind. They should be more circumspect about supporting technologies that may have more mixed impacts such as biomass and biofuel, or may only be valuable as transitional, short-term solutions- such as natural gas power plants.

Banks should certainly refrain altogether from supporting projects such as nuclear power plants and large dams. These types of energy generation projects are currently promoted as solutions to the climate crisis but their environmental and social risks, dependence on public subsidies for economic viability, and in the case of large dams, adverse climate impacts, make them 'false solutions', even in a climate constrained world. Part 4 provides an overview of such 'solutions' and 'false solutions'.

Develop climate-positive retail products and services

Banks should develop a range of climate-sensitive products and services for their retail clients. These may include programs to help consumers purchase more energy-efficient homes and appliances, and to invest their deposits in more climate-positive ways.

For example, banks should expand the availability of consumer products that promote energy efficiency, such as "location efficient" and "energy efficient" mortgages.[51] A number of European banks already offer lower mortgage rates on homes that meet certain energy efficiency standards.[52] Other banks have created financing programs to help home owners install solar power systems, and to purchase more energy efficient homes.[53] Banks should also create savings and investment instruments that invest in such mortgages, or in other renewable energy and energy savings initiatives.

Commercial real estate: Commercial real estate is a major business line for many banks, and one of the most promising sectors for achieving substantial GHG reductions through energy efficiency. According to the IPCC, significant reductions in emissions from energy use in buildings can be achieved using mature technologies, and a large percentage of these savings can be achieved in ways that have a net positive return on investment.[54] To ensure that these opportunities are captured, banks should require their commercial real estate clients to meet rigorous efficiency benchmarks, and should work with clients to structure investments to improve energy efficiency.[55]

4. Conclusion

Climate change is already happening and affecting the lives of everyone living on earth today, yet not in equal fashion. While the adverse effects of climate change may be severe and disruptive for citizens of Northern industrialised nations, for many of the worlds' poor it may well become a direct threat to their livelihood and life itself. It is the moral imperative of our time for everyone to help prevent catastrophic climate change from unfolding, each within our own sphere of influence.

Banks will have to do their part in this effort. Leading financial institutions have already begun preparing themselves for a business climate in which figures about the direct and indirect GHG emissions of their operations will be equally important as traditional financial performance indicators. An increasingly critical public opinion will demand that banks do what they can to keep these GHG emission figures as low as possible.

This paper presents what BankTrack considers necessary steps for banks to take in order to reduce their climate impact. They include both taking measures that will provide new business opportunities, tapping into the vast market potential provided by the transformation to a low/no carbon economy, and measures that will force a bank to rethink its core business model and to make some hard choices on which sectors it wants to stay involved, and which ones it wants to leave behind.

BankTrack is fully aware that the total package of policy proposals, when implemented, will substantially change the way the banking business is currently operating. Yet, given the scale of the threat posed by climate change to all of us living today, such drastic changes we consider fully justified.

Annex 1. Energy alternatives and sustainability

Many energy sources are currently being presented to policy-makers and the public as climate-friendly alternatives to fossil fuels. But not all of these options actually offer the significant climate benefits that are claimed. Moreover, some 'alternatives' have such profound environmental and social costs that their climate benefits would be more than offset by the problems that they create in other areas.

The energy challenge is often presented as 'how to find a low/no carbon solution for the energy needs of today's world?' leading to the conclusion that renewable energy falls short on meeting those needs and that for the next foreseeable future other solutions (nuclear, big hydro, 'clean' coal etc) are needed. However, the challenge cannot be met without questioning overall (energy) consumption levels in today's industrialized world. A absolute reduction of consumption levels and their associated high energy use -during production and use of consumer products- is also the only viable option to ensure developing countries their rightful, increased share of GHG emission while the world as a whole reduces its GHG output.

This annex provides a brief overview of genuine candidates to fuel a low/no carbon economy as well as options that merely provide 'false solutions'.

Solutions

Energy efficiency

Energy is not a commodity that is desirable for its own sake. But for the services it provides, such as lighting and heating our house or moving us from place to place. In many cases, energy services can be provided far more efficiently than is currently the case. Indeed, end-use energy efficiency improvements are often the easiest, least expensive and greenest way to meet the demand for energy services. To a surprising degree, efficiency gains can be realized at very high financial rates of return.[56]

According to research by global consultancy firm McKinsey, nearly one half of the GHG emissions abatement needed to cap atmospheric concentrations between 450 – 550ppm can be achieved through investments in energy efficiency with internal rates of return greater than 10 percent.[57] For these reasons, energy efficiency is one of the most appealing sources of emissions reductions.

Wind power

The theoretical potential of wind energy is staggering; estimates are that wind generated power may cover up to six times current global electricity consumption. Wind energy has considerable advantages as a power source -it is carbon-free, clean, abundant, locally available, and scalable.

While wind was until recently considered to be a fringe source of energy, it has become a competitive and rapidly expanding global industry. Generation costs have fallen by 50 percent over the past 15 years, and now approach the costs of conventional sources. Over the past ten years, global wind power capacity has grown at a rate of over 28 percent per annum. By 2010, the global installed wind capacity is expected to more than double its 2006 capacity.[58]

Solar power

Solar power is currently only a niche power source, but is fast becoming mainstream. In its most straightforward application, such as with a large scale introduction of solar cookers in tropical rural areas it could provide the perfect replacement for firewood and other sources of fuel, the use of which is both a threat to human health and to the climate. In specific areas with an abundance of sunshine, Solar photovoltaic power (PV) may also provide energy to communities unconnected to the power grid.

Solar photovoltaic power has potential even in the temperate climate zones, for on-site residential and commercial applications and for meeting peak demands on summer afternoons.[59] Grid-connected solar photovoltaic grew by 60 percent per year from 2000 to 2004, and the solar PV industry invested record amounts in new plant and equipment (about $6 billion) in 2005. The PV industry is expected to continue to grow by more than 30 percent annually over the next several years.

New innovative forms of solar power also have great potential for cost reductions driven by technology research and development and manufacturing innovation. Concentrating Solar Thermal (CST) systems for example use lenses or mirrors and tracking systems to focus a large area of sunlight into a small beam. Each concentration method is capable of producing high temperatures and high efficiencies, but they vary in the way they track the sun and focus light.[60] Such systems make it possible to generate electricity on a large scale, requiring the sort of investments that make them attractive for financial institutions geared towards providing large scale loans.

Small hydro

Small hydro (usually understood as a hydro scheme with a capacity below 10MW but this is very site specific) can, if responsibly implemented, be environmentally and socially low-impact and provide many of the benefits of renewables, in particular providing power and related development benefits to dispersed rural communities. If badly implemented it can replicate many of the negative effects of larger schemes. To ensure that small hydro schemes have low impacts and meet community priorities it is imperative that they are planned, built and operated in line with the recommendations of the World Commission on Dams.[61]

Experimental energy technology

Lately, a number of exciting energy technologies are being developed and tested. Some examples of such technologies are wave energy, generating renewable electricity from ocean waves[62], energy kite technology, harvesting wind power on high altitudes[63], advanced non conventional bio mass systems and various forms of technology based on geothermal heating and subterranean energy storage.[64] These and other technologies are, or may soon add to the range of investment options for main stream financiers but their further development would benefit tremendously from increased access to venture capital and support from innovative mainstream banks.

Biomass

Biomass in this context refers to biodegradable waste that can be burnt as fuel or otherwise used for energy generation. The potential climate benefits of biomass use depend on whether they actually replace previous fossil fuel consumption, how they are sourced and produced and on where and how they are being used. Biomass use by small-scale farmers in the developing world may have the potential to provide affordable, home grown, environmentally sustainable bio-power. Depending on local circumstances (local availability, transport, guarantees for local producers etc) the use of agricultural residues, organic waste (for example used timber) or even purpose grown crops may be a viable option for sustainable energy generation.

False Solutions

Nuclear energy

Globally, nuclear energy currently provides about 370 gigawatt of power, or about 16 percent of the world's electricity supply. Nuclear power is intensely controversial and generally uncompetitive without massive public subsidies. Nevertheless, because nuclear power produces relatively low carbon emissions, some have come to reconsider nuclear power as an attractive option for large-scale energy production in an increasingly carbon-constrained world. The climate benefits of nuclear power, however, are more than offset by its unacceptable economic, environmental and social costs. These include:

Costs. Nuclear energy is very expensive. This is especially true when the full costs of storing radioactive waste, insuring against catastrophic failure, decommissioning reactors, and securing materials and technology to prevent proliferation are fully internalised. Indeed, nuclear energy is rarely viable in competitive energy markets without significant public subsidies.

Nuclear power is therefore not a cost-effective solution to climate change. Investments in end-use energy efficiency can produce 2-10 times as much reduction in GHG emissions per unit spent as investing in new nuclear energy production.[65]

Danger. Nuclear power is dangerous. First, there is the risk of an accidental radioactive release such as occurred at Chernobyl and Three Mile Island, or a more 'minor' release such as the one caused by the recent earthquake in Japan. Even more troubling is that the nuclear power industry heightens the dangers of nuclear proliferation and terrorism. Civilian nuclear power production helps facilitate weapons proliferation by creating and legitimizing a global trade in dual use technologies that can be used in the production of nuclear weaponry. It is also a potential source of the raw materials for nuclear terrorism.[66]

Waste There is no adequate long-term solution for the storage of nuclear waste. Even after nearly fifty years of experience with commercial nuclear power and numerous experiments, good long-term disposal options are still non-existent. Many facilities just store their nuclear waste on-site until a more suitable long-term solution can be developed.

Large-scale hydro

Hydropower is often assumed to be a source of power that emits virtually no GHGs. However, there is a growing body of evidence that the rotting of organic material in large tropical reservoirs is a globally significant emitter of carbon dioxide and methane.

One recent study found that the world's 52.000 large dams may release 104 million metric tonnes of methane each year -the largest single source of human-caused methane emissions- and contribute more than 4 percent of the total warming impact of human activities.[67] Because of the uncertain risks of anthropogenic emissions from reservoirs, the Executive Board of the UN Framework Convention on Climate Change (UNFCCC) has excluded hydropower projects with significant water storage from eligibility for Clean Development Mechanism financing.[68]

In addition, large hydropower projects are often beset by profound environmental, social, and economic problems. According to the World Commission on Dams (WCD), large dams have displaced between 40 and 80 million people worldwide. Millions more have been ousted by the construction of canals, powerhouses and other associated infrastructure.[69] Many of these people have not been satisfactorily resettled or been given adequate compensation, and those who have been resettled have rarely had their livelihoods restored.[70]

With respect to the environment, dams have fragmented and stilled 60 per cent of the world's rivers, leading to profound and often irreversible impacts on riverine and

adjoining terrestrial environments.[71] Meanwhile, the economic benefits of large dams have often been elusive. Large dams tend to under-perform their targets for power generation, and lengthy construction delays and large cost overruns are routine.[72]

Moreover, a changing climate could drastically impact the performance and safety of large dams. Increases in the severity and frequency of droughts will reduce hydropower production and water storage. This may already be occurring in some critical watersheds, such as the Colorado River in the United States.[73] Conversely, higher peak floods could threaten dam safety and increase reservoir sedimentation. As rainfall and runoff trends increasingly diverge from historical patterns, uncertainties in feasibility, impacts, and economic assessments for future dams will only increase.

Biofuels

Agrofuels (often called biofuels) are liquid fuels, notably bio diesel and bio ethanol. So-called first generation agrofuels are derived from food crops such as cereals, soybean, rapeseed oil, sugar cane and palm oil. Second generation, which are currently under development, are aimed at using agricultural residues, trees (willow, eucalyptus) and straw, and may involve industrial technologies such as genetically modified micro organisms, crops and trees. Both generations set out to provide fuel on an industrial and large scale for electricity production and transportation.

The potential *climate* benefits of biofuels critically depend on whether they actually replace previous fossil fuel consumption, how they are sourced and produced and on where and how they are being used. On the other hand, the rapid expansion of unsustainable, industrial scale monocultures for biofuel production has significant adverse social and environmental impacts. The use of food crops to produce, and arable land on which to grow biofuels has already helped to push the price of some staple crops to record levels, threatening food security for the poor in the Global South. The UN special rapporteur on the right to food has therefore called biofuels production on arable lands a "crime against humanity," and recommends a five year ban on further investments.[74]

Moreover, while a country like Brazil has a advanced sugar cane ethanol program, the sector is notorious for its appalling labor practices, with many examples of slave-like working conditions.[75] The increased cultivation of biomass crops in the form of monocultures also causes deforestation, soil erosion, loss of biodiversity and increased pesticide and fertilizer pollution. It can even end up causing more climate impacts than traditional fuels. Conversion of Indonesian peat swamps to oil palm plantations, for instance, has released massive amounts of greenhouse gases stored in the soil.

As long as there is so much uncertainty about the climate impact of biofuel and as long as the severe negative environmental, social, human rights and food related impacts

have not been properly addressed, banks should refrain from financing operations in the biofuel sector.*

Natural gas

Natural gas produces lower carbon emissions per unit of energy than coal or oil. Replacing coal with natural gas can therefore reduce short- and medium-term emissions, and buy more time to implement renewable solutions.[76] But the combustion of natural gas still causes significant GHG emissions, and the benefits of natural gas may be overstated when life-cycle emissions are considered.

For one thing, natural gas is primarily methane—a GHG that is 21 times more potent than carbon dioxide. As a result, even relatively small fugitive emissions throughout the gas life-cycle can significantly reduce the GHG benefits of gas.[77] For another, the lifecycle emissions of natural gas rise significantly when it is converted to liquefied natural gas (LNG). The liquefaction, transport, and re-gasification of natural gas can push lifecycle GHG emissions far closer to that of life-cycle GHG emissions from coal.[78]

Ultimately, long-term stabilization targets will not be reached if natural gas use is greatly expanded.[79] For this reason, liquid natural gas schemes should be avoided and other new gas fired plants should only be brought on line to replace coal, and should not be considered where they would impede or crowd out the development of renewable fuel sources.

Carbon capture and storage

Carbon capture and storage (CCS) is a process in which most of the CO_2 released from combustion in a fossil fuel power plant is captured and stored underground or in the oceans. In theory, power plant generated CO_2 emissions could be reduced by a net 87 percent through carbon capture.

However, CCS has major problems. As of yet it is still in the research phase; the verdict is still out on whether it will become a viable technology able to capture the amount of GHG emissions predicted. More importantly, application of this technology may well provide a disincentive to limit conventional energy production en GHG emissions in the first place, further delaying the necessary switch to low/no carbon fuel sources. Given this uncertainty surrounding the future applicability of CCS and the continued lock in effect on fossil fuel use BankTrack considers CCS development a false solution that banks should abstain from financing.

* In Brazil, where a major part of the transport sector is dependent on sugar cane ethanol for 30 years already banks should refrain from financing the expansion of the sector until the afore mentioned problems are resolved

Notes

[1] Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Working Group I Report "The Physical Science Basis": Summary For Policymakers*, at 13 (2007).

[2] Intergovernmental Panel on Climate Change (2007), Fourth Assessment Report: *Working Group III Report:* Mitigation of Climate Change: Summary For Policymakers, at p. 15; European Commission (2007), Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions - Limiting global climate change to 2 degrees Celsius - The way ahead for 2020 and beyond.

[3] Intergovernmental Panel on Climate Change, Fourth Assessment Report: *Working Group I Report "The Physical Science Basis"* Summary For Policymakers, at 2 (2007) ("Global atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values…"); UNEPF FI, Declaration on Climate Change by the Financial Services Sector, (June 2007) ("Unequivocally, human activity is a fundamental driver of climate change.")

[4] Other greenhouse gases are methane (CH_4), nitrous oxide (N_2O), hydro fluorocarbons (HFCs), per fluorocarbons (PFCs), and sulphur hexafluoride (SF_6).

[5] Intergovernmental Panel on Climate Change, Fourth Assessment Report: *Working Group I Report "The Physical Science Basis"*: Summary For Policymakers, at 2 (2007).

[6] Intergovernmental Panel on Climate Change, Fourth Assessment Report: Summary For Policymakers, at 10 (2007) ("The atmospheric concentration of carbon dioxide in 2005 exceeds by far the natural range over the last 650,000 years (180 to 300 ppm))."

[7] Intergovernmental Panel on Climate Change, Fourth Assessment Report: Summary For Policymakers, at 13 (2007).

[8] World Health Organization, The World Health Report 2002 (2002). Available at http://www.who.int/whr/2002/chapter4/en/index7.html. World Health Organization, Climate Change and Human Health--Risks and Responses (2003).Available from http://www.who.int/globalchange/climate/en/ccSCREEN.pdf. Alistair Doyle "160,000 die yearly from global warming." Reuters, September 30, 2003. Available at http://unfccc.int/press/releases/WHO-story-01oct03.pdf.

[9] Intergovernmental Panel on Climate Change, Fourth Assessment Report: Working Group II Report "Impacts, Adaptation and Vulnerability": Summary For Policymakers, at 7 (2007).

[10] Climate Change 2007: Impacts, Adaptation and Vulnerability - Working Group II Contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report, IPCC, Geneva, 13 April 2007.

[11] UNEPF FI, Declaration on Climate Change by the Financial Services Sector, (June 2007).

[12] Nicholas Stern, Stern Review: The Economics of Climate Change, at x (2007); Conversely, the Stern Review found that investment in mitigation measures that could avert the most dangerous climate change scenarios would require only around 1% of global GDP by 2050. Id., at xii.

[13] Kyoto Protocol to the United Nations Framework Convention on Climate Change, Article 2.

[14] Milieudefensie – Investing in Climate Change (2007), PLATFORM – The Oil & Gas Bank (2007). http://www.milieudefensie.nl/klimaat/publicaties/rapporten/investinginclimatechange2007.pdf

[15] Due to the visible market presence and intangible product offerings of banking institutions, they are particularly vulnerable to the reputational risks of being associated with climate-harming investments. The Carbon Trust, Brand Value (2005).

[16] Answer to Carbon Disclosure Project Greenhouse Gas Emissions Questionnaire, AXA Insurance, Paris, April 2004.

[17] Government of the United Kingdom, Investing in the Future - Background Paper for European Conference on Corporate Social Responsibility and the Financial Sector, London, December 2005.

[18] Climate Change and the Financial Sector: An Agenda for Action, Allianz & WWF, June 2005.

[19] Nicholas Stern, Stern Review: The Economics of Climate Change, at i (2007).

[20] Nicholas Stern (2007), Stern Review: The Economics of Climate Change, at vii.

[21] M.G.J. den Elzen, M. Meinshausen (2005) Meeting the EU 2°C climate target: global and regional emission implications, Netherlands Environmental Assessment Agency.

[22] B. Hare, (1999) Fossil Fuels and Climate Change: The Carbon Logic, Greenpeace International, at 56.

[23] J. Mouawad, "A Quest for Energy in the Globe's Remote Places," New York Times, (October 9, 2007).

[24][24] See also www.banktrack.org climate section

[25] UNFCC Background Paper on Analysis of existing and planned investment and financial flows relevant to the development of effective and appropriate international response to climate change. Downloaded August 24, 2007
http://unfccc.int/files/cooperation_and_support/financial_mechanism/application/pdf/background_paper.pdf

[26] Mark Clayton, "New Coal Plants Bury 'Kyoto'", Christian Science Monitor, December 23, 2004. http://www.csmonitor.com/2004/1223/p01s04-sten.html

[27] Nicholas Stern (2007), Stern Review: The Economics of Climate Change, Summary of Conclusions.

[28] BBC Online, "Brazil in top ten for greenhouse gas emissions" 22 July 2004. Available at http://www.scidev.net/News/index.cfm?fuseaction=readNews&itemid=1508&language=1

[29] Intergovernmental Panel on Climate Change, Fourth Assessment Report: *Working Group III Report:* Mitigation of Climate Change, at 544 (2007).

[30] Intergovernmental Panel on Climate Change, Fourth Assessment Report: *Working Group III Report:* Mitigation of Climate Change, at 499 (2007).

[31] FAO, 2006. Livestock's Long Shadow. http://www.virtualcentre.org/en/library/key_pub/longshad/A0701E00.pdf

[32] Intergovernmental Panel on Climate Change, Fourth Assessment Report: *Working Group III Report:* Mitigation of Climate Change, at 325 (2007).

[33] http://www.nytimes.com/2007/11/04/opinion/04friedman.html?_r=1&oref=slogin ; http://www.gdrc.org/uem/sustran/sustran-principles.html ; http://www.vtpi.org/wellmeas.pdf

[34] Bank of America, for example, assesses and reports on greenhouse gas emissions from its energy and utilities portfolio. This is a useful start, but at a minimum should be extended to other GHG intensive sectors such as transportation, manufacturing and agriculture, and to overall portfolio impacts. Bank of America Climate Change Position, www.bankofamerica.com/environment/index.cfm?template=env_clichangepos

[35] The GHG Protocol, developed by the World Resources Institute and the World Business Council for Sustainable Development, has already been adopted by a number of companies. In accordance with this protocol, Banks should report the emissions resulting from their loan and investment products as Scope 3 emissions.[0] Website GHG Protocol (www.ghgprotocol.org), Viewed in May 2007.

[36] http://www.cdproject.net/

[37] Website WWF Climate Savers www.wwfus.org/climate/projects/climatesavers/companies.cfm, Viewed in May 2007.

[38] Intergovernmental Panel on Climate Change, Fourth Assessment Report: *Working Group III Report:* Mitigation of Climate Change: Summary For Policymakers, at 15 (2007).

[39] www.opic.gov. Bank of America has committed to reduce the GHG emissions of its energy and utilities portfolio by seven percent by 2009. Bank of America Climate Change Position, www.bankofamerica.com/environment/index.cfm?template=env_clichangepos

[40] These reduction targets should be defined in absolute terms. However, intensity targets may also be a useful indicator of performance in certain circumstances. For example, energy efficiency improvements in commercial real estate divisions may be better expressed in terms of CO_2/m2 of financed projects than in overall emissions from financed projects.

[41] Some banks are beginning to become more sophisticated in their management of climate issues. For example, JP Morgan Chase has committed to "quantify the financial cost of greenhouse gas emissions and integrate them into financial analysis" of power sector projects, and has stated that "[i]nternalizing the cost of carbon in this way may alter [its] investment choices..." (JP Morgan Chase, Environmental Policy http://www.jpmorganchase.com/cm/cs?pagename=Chase/Href&urlname=jpmc/community/env/policy/clim). Bank of America has similarly committed to "evaluate the level of financial sector risk through the finance of GHG emission intensive industries." (Bank of America Climate Change Position, www.bankofamerica.com/environment/index.cfm?template=env_clichangepos). Others are beginning to integrate climate and carbon risk assessments into their equity analysis and investment advisory services. For example, a Citigroup analyst recently cited the extreme regulatory risks facing the coal industry in downgrading U.S. coal company stocks. (Reuters, "Greens rejoice as analyst sours on U.S. coal, July 20, 2007 http://www.alertnet.org/thenews/newsdesk/N2089702.htm).

[42] For example, WWF has developed a best practice "Gold Standard" for to identify carbon credits that produce verifiable reductions in CO_2 emissions and sustainable development benefits. www.cdmgoldstandard.org)

[43] Currently, weak standards and unscrupulous practices have eroded public confidence in voluntary offset markets. For this reason, a coalition of leading banks has proposed a verification system in which consumer credits would only qualify if emissions have already been reduced and are additional, measurable, verificable, and permanent. International Herald Tribune, Banks Seek Tougher Carbon Trading Standards, June 28, 2007.

[44] Renewable energy Policy Network release November 29 2007 http://www.ren21.net/atStake/forum.asp?id=1

[45] A.R. Ballesteros, J. Coequyt, et al (2007), Futu[r]e Investment: A Sustainable Investment Plan for the Power Sector to Save the Climate, at 10 (European Renewable Energy Council and Greenpeace International).

[46] Greenwood,C.; Hohler,A.; Liebreich,M Global trends in sustainable energy investment 2007: analysis of trends and issues in the financing of renewable energy and energy efficiency in OECD and developing countries United Nations [UN] Environment Programme, at 17 (2007)

[47] Oil and gas companies invested $200 billion in new projects in 2006, while only $70.9 billion was invested in the renewable energy sector. Greenwood,C.; Hohler,A.; Liebreich,M Global trends in sustainable energy investment 2007: analysis of trends and issues in the financing of renewable energy and energy efficiency in OECD and developing countries United Nations [UN] Environment Programme (2007); J. Mouawad, "A Quest for Energy in the Globe's Remote Places," New York Times, (October 9, 2007).

[48] Policy Recommendations for Renewable Energy, International Conference on Renewable Energy, Bonn, June 2004, p. 18.

[49] Slogan of the Royal Bank of Scotland. RBS recently dropped this marketing slogan after intense campaigning by groups such as Platform.

[50] Towards this end, Citi recently announced that it will provide $3.1 billion a year over the next 10 years in financing and investment to support the commercialization and growth of alternative energy and clean technology. However, to put this in perspective, Citi had $63 billion of its corporate credit portfolio allocated to the utilities and petroleum sectors in 2006. http://www.citigroup.com/citigroup/environment/data/climatechange.htm, http://www.citigroup.com/citigroup/fin/data/k06c.pdf

[51] Location efficient mortgages increases the amount that urban homebuyers are able to borrower by taking into account the money that they can save on transportation costs. See, http://www.nrdc.org/cities/smartGrowth/qlem.asp. Similarly, energy efficient mortgages make it easier for borrowers to qualify to purchase homes with specific energy efficient improvements. See, http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.energy_efficient_mortgage

[52] http://www.konsuminfo.ch/pdf/16460.pdf

[53] http://www.citigroup.com/citigroup/environment/data/climatechange.htm; JP Morgan Chase, Environmental Policy http://www.jpmorganchase.com/cm/cs?pagename=Chase/Href&urlname=jpmc/community/env/policy/climate

[54] Intergovernmental Panel on Climate Change, Fourth Assessment Report: *Working Group III Report:* Mitigation of Climate Change, at 391 (2007).

[55] An example of a useful set of targets is those of Architecture 2030, which call for fossil fuel reduction standards in new construction starting at 50 percent below regional averages for comparable building types, and rising over time. http://architecture2030.com/home.html

[56] David. B. Goldstein, Saving Energy, Growing Jobs: How Environmental Protection Promotes Economic Growth, Profitability, Innovation and Competition, 6-7 (2007).

[57] McKinsey and Company. Curbing Global Energy Demand: The energy productivity opportunity. May 2007,

[58] Global Wind Energy Council, Global Wind 2006 Report. http://www.gwec.net/uploads/media/gwec-2006_final.pdf

[59] http://www.environmentcalifornia.org/energy/million-solar-roofs/fact-sheet

[60] http://en.wikipedia.org/wiki/Solar_power#Solar_thermal

[61] Twelve Reasons to exclude large hydro from renewable initiatives, http://internationalrivers.org/files/12Reasons.pdf

[62] http://www.pelamiswave.com/

[63] http://www.ockels.nl/

[64] http://en.wikipedia.org/wiki/Geothermal_heating

[65] Amory Lovins, Nuclear Power and Climate Change, http://www.rmi.org/images/PDFs/Climate/C07-09_NuclearPwrandClimate.pdf, (August 27, 2007).

[66] William Langewiesche, The Atomic Bazaar: The Rise of the Nuclear Poor (2007).
[67] Ivan B.T. Lima et al. (2007) "Methane Emissions from Large Dams as Renewable Energy Resources: A Developing Nation Perspective," Mitigation and Adaptation Strategies for Global Change, published online March 2007.
[68] Intergovernmental Panel on Climate Change (2007), Fourth Assessment Report: *Working Group III Report:* Mitigation of Climate Change, at 274.
[69] World Commission on Dams, Dams and Development: A New Framework for Decision-making, www.dams.org., at 104 (2000).
[70] Ibid., at 17-18, 129.
[71] Ibid., at 73.
[72] Ibid., at xxxi.
[73] Jon Gertner, "The Future is Drying Up," New York Times Magazine (October 21, 2007).
[74] http://news.bbc.co.uk/2/hi/americas/7065061.stm
[75] See for example the Pagrisa Dodgy deal at www.BankTrack.org
[76] WWF (2007), Climate Solutions: WWF's Vision for 2050, at 14.
[77] WWF (2007), Climate Solutions: WWF's Vision for 2050, at 14.
[78] P. Jaramillo, W.M. Griffin, and H.S. Matthews (2007), Comparative Life-Cycle Air Emissions of Coal, Domestic Natural Gas, LNG and SNG for Electricity Generation.
[79] B. Hare, (1999) Fossil Fuels and Climate Change: The Carbon Logic, Greenpeace International, at 56; WWF (2007), Climate Solutions: WWF's Vision for 2050.