

Report B

Environmental Aspects in Bank Lending Decisions



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1. Introduction

How do banks consider environmental aspects in lending decisions? This is the question that this part of the report will aim to address. At first sight environmental risk in bank lending decisions sounds like a rather clear topic area. It is not. Different people understand environmental risk differently and even banks have different ideas of what constitutes an environmental risk. As a result banks also treat environmental risks in a different way.

Banks play a crucial role in the context of environmental risk. On the one hand they (co-)determine how we will produce in the future and thus which environmental risks we will be exposed to in the future. On the other hand environmental risks can have a negative impact on economic capital and it is their function to make sure that economic capital is shielded from the detrimental effect environmental risks can have. From that point of view environmental risks are quite simply just another business risk for banks.

The way risks are managed is at the heart of a bank's operations and of crucial importance for the success of a bank. In public a bank's risk management is usually not discussed in great detail. This also holds true for the way banks manage environmental risks. To some degree this might be due to the fact that banks see the way they manage environmental risks as part of their competitive advantage and it is this competitive advantage, which they do not want to lose.

The fact that some banks begin to see the way they treat environmental risks as part of their competitive advantage has another side effect. There is no standard way of treating environmental risks but banks choose different approaches.

A lack of uniformity of the approaches combined with a severe lack of transparency constitute of course a major stumbling block for a report that should ultimately help us to understand how banks can treat environmental risks.

This part of the report is structured as follows.

In chapter 2 we aim to define more clearly what can be understood by environmental risks. Obviously different understandings of environmental risks will result in a different way of dealing with environmental risks.

Chapter 3 will look at what banks can do about environmental risks in the lending process. Banks have one thing in common: They prefer less risk to more risk. However, they can deal with environmental risks in different ways and this chapter aims to structure the different possible responses.

In chapter 4 we aim to give a short introduction to the different tools that can be used to analyse environmental risks.

Any kind of risk analysis will need information about environmental risks. In chapter 5 we identify some of the sources that banks can tap to find out more about environmental risks.

Chapter 6 concludes this report.

1. What is environmental risk?

1.1 Environmental risks as environment-induced economic risks

The term environmental risk is used widely. Unfortunately the term environmental risk is used to describe a range of different and sometimes even conflicting concepts.

For example environmental risk is sometimes used as a synonym for environmental impacts. From this point of view a company would thus have a high environmental risk whenever it has high environmental impacts. Strictly speaking this does not qualify as an environmental risk as there is no notion whatsoever of risk. In finance we speak of risk whenever we do not know for sure what will happen in the future. If we know that a company will pollute heavily in the future then there is no environmental risk but environmental certainty!

Environmental risk is sometimes also used as a risk that corporate activities exert on the environment [1]. CO₂-emissions and climate change are a good example in this context. For instance companies emit CO₂ which in turn contributes to the environmental problem of climate change. At this stage we do not know what the exact impact, in both economic and environmental terms, of climate change will be. There is thus an environmental and an economic risk. The uncertain environmental impact is not usually at the forefront of lenders' attention. They are usually focussing on the economic losses due to environmental aspects. Strictly speaking this is not an environmental risk but an economic risk that is caused by environmental aspects. This could be called an environment-induced environmental risk (e.g. [2, 3]). Following widespread use we use this definition of risk in the following.

Barclays «Environmental and Social Risk Assessment in Lending»	“We also believe that taking due account of our environmental and social impacts is not only the right thing to do, but also makes good business sense.”
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1.2 Operational risks or risk of collaterals?

From a lender's perspective we must differentiate between two kinds of environmental risks. Banks can lose money due to environmental reasons for essentially two reasons. On the one hand environmental aspects can have a negative impact on the operational economic performance of lenders. This is the case when environmental aspects lead to a borrower being less economically successful. A food company that is unable to sell its product after a contamination problem is a good example. As a consequence the borrower might be unable to pay

back¹ his loans. The operational risk of the borrower thus translates into an economic risk for the lending bank. Banks often use collaterals or guarantees to secure their loans. Banks draw on collaterals, guarantees or similar whenever a lender is unable to pay back his loans.

WestLB New Thinking. Sustainability Report 2005	Convinced that sustainability increases the value of a company, we have refined our own rating system and included non-financial risks. Two years ago, we made sustainability ratings an integral element of our equity research publications. We thus inform our investment clients about potential non-financial risks that may impact the future value development of their investments.
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Collaterals offer therefore an additional safety net for banks. Environmental aspects can, on the other hand, have a negative impact on the value of these collaterals. The most prominent example is environmental contamination of real estate.

HVB Group «Sustainability Report 2004»	The primary task of environmental risk management is to minimize loan defaults and risks to the bank’s reputation. In particular with corporate customers we have seen that environmental risks may have a distinct impact on the credit rating of a customer and the value of collateral provided to the bank. For example controversial materials like asbestos and lead may be banned and can give rise to hefty claims for compensation. Obsolete plants and new environmental legislation can trigger high investment costs and even result in partial closure of some facilities. All this influences the credit standing of a customer and at worst can result in defaults.
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Environmental contamination (e.g. oil or asbestos) can have a great impact upon real estate prices thus lowering the value of collateral. According to some sources the average cost of cleaning up a contaminated site is about 10 times the size of an average small to medium business loan [4].

Risk of collateral	High	Low	<i>High</i>
	Low	Low	Low
		Low	High
Risk of debtor's operations			

¹ Here and in the following we are using the term “pay back” rather loosely to encompass both the ability to pay back the principle and to pay interest charges.

Figure 1: The role of operational risk vs. risk of collaterals (Source: Own figure)

It is important to understand the link between environmental operational risk of the debtor and environmental risk of the collateral. Collaterals are a kind of safety net for loans. They are only used in cases whereby debtors are unable to pay back their loans. If we can be sure that the debtor will pay back his loan we do not need any collateral and the environmental risk of the collateral is unimportant for the bank. The reverse also applies. If we can be sure that the debtor will be able to pay back his loan the (environmental) risk of the collateral becomes unimportant. This relationship between environmental operation risk and environmental risk of the collateral is depicted in figure 1.

Historically most banks have focussed on the environmental risk of collaterals. This is due to significant losses that banks have made in this field.

It is important to note that the kind of risk analysis/risk management that has to be conducted for both kinds of environmental risks differs significantly. Risk analysis covering collaterals focuses primarily on the “environmental health” of the collaterals. It aims to establish if the value of the collateral is compromised by environmental aspects. Environmental risk analysis of the debtors’ operational performance is much more similar to environmental financial analysis from an equity-perspective. From this point of view the threat that environmental aspects can lead to a lower economic performance or the opportunity that environmental aspects can have a positive influence on the economic performance of a debtor are analysed.

1.3 Systematic vs. unsystematic environmental risks

From a financial point of view it is furthermore important to distinguish between systematic and unsystematic environmental risks [5, 6]. Banks will usually give loans not to a single or very few lenders but to many different lenders at once. As a result some of the risks relating to their lending decisions can be diversified. Risks that can be diversified are usually called unsystematic risks. On a portfolio level diversifiable risks become irrelevant. While diversifiable risks cannot be predicted on an individual level with certainty they are certain on the level of the entire portfolio. A good example for an unsystematic environmental risk is the risk of an accidental release of a pollutant. A bank can diversify this risk by investing in many different companies. It is not known with certainty that a particular company will emit a pollutant. However, the probability that any company included in the portfolio will emit a pollutant can be forecasted with greater certainty.

Other risks, called systematic risks, cannot be diversified. Systematic risks are relevant both on an individual level as well as on a portfolio level. Systematic risks usually exist when all borrowers share a characteristic. A good example is energy use as all companies inevitably need energy. As a consequence all companies are affected when energy prices change. This risk, i.e. the possibility that energy prices change in the future, cannot be fully diversified by giving loans to many different companies.

CIBC «CIBC and the Environment»	“Where warranted in transactional relationships, our environmental due diligence includes an assessment of our clients’ exposure to costs and liabilities associated with meeting greenhouse gas emission mandates. Beyond this, we recognise that the broader implications of climate change risks to the financial sector need to be assessed to ensure sustainable growth. Consequently, through our membership in UNEP, we will be involved in the work of the UNEP FI Climate Change Working Group in 2005.”
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1.4 Environmental risks as social constructs

The term environmental risks leads us to believe that environmental risks are a purely natural phenomenon. We hereby interpret environmental risks as economic risks for a bank that are caused by environmental impacts. It must be noted that not all environmental impacts automatically translate into economic risks. However it is stakeholders that may react to environmental impacts in a way that creates an environmental risk first for the borrower and then for the lender. As a consequence there is no guaranteed link between environmental impacts and environmental risks for a bank. The question is if and how stakeholders translate environmental impacts into environmental risks [7]. Or, put in a more provocative way, environmental risks are social constructs [8-10]!

What constitutes an environmental risk will therefore depend to a large degree on the stakeholders that a borrower has. Analysing the links between a borrower and his stakeholders is therefore of crucial importance.

1.5 Different kinds of environmental risks

From the perspective of banks there can be different kinds of risk. A typical distinction is between [11, 12]

- Direct risks (1.5.1)
- Indirect risks and (1.5.2)
- Reputational risks (1.5.3)

1.5.1 Direct risks

It is possible, that banks are held directly responsible for the consequences of environmental incidents [13]. This can for example be the case when a bank decides to repossess a collateral after a borrower fails to meet his obligations and this collateral turns out to be contaminated. As a new owner of collateral, the bank might be obliged to clean up the contamination. The associated costs can exceed the nominal value of the collateral [14]. One option for the bank is to refuse taking over a contaminated collateral. However, as a consequence the loan will not be secured anymore.

Lloyds TSB	“There was a strong hint from government that it would look for banks to pay for environmental damage if their customers could not.” [4]
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Another way a bank can become directly responsible is through a “shadow directorship” [15, 16]. At times, especially in times of financial difficulties, banks might decide to take a leading role in the management of a company. By taking a leading role banks hope to be able to secure a company’s financial survival and hope thus to avoid losing money. However, by taking a leading role the responsibility linked to a management position might shift from the formal management in place to the de facto management role of the bank. As a consequence banks might become liable for the company’s actions including its environmental risks.

Another possibility is that a financing institution finances a piece of equipment or similar in such a way that it legally retains its ownership and is therefore assumed to be liable for its malfunctioning [17].

Direct risks and the circumstances under which they materialize depend to a large degree on the legislation that is in place. It is for this reason that direct risks are not considered in this report in more detail.

1.5.2 Indirect risks

From the perspective of bank lending funds are handed over to borrowers. Borrowers might be exposed to environmental risks and it is these environmental risks that can have a detrimental impact upon:

- the borrower’s ability to pay back a loan and/or
- on the value of the collateral or guarantee.

In these cases environmental risks will have an indirect impact on the lending bank as they impact the bank via their clients.

Indirect risks are far more common and far more important than direct environmental risks [11].

1.5.3 Reputational risks

A third kind of risk exists, reputational risks. Banks are increasingly identified with the kind of businesses or projects they help to finance. While the legal responsibility might be with the management or the shareholders of the borrower, stakeholders increasingly consider the financing of environmentally harmful businesses or projects as illegitimate.

HVB Group «Sustain- ability Report 2004»	“The primary task of environmental risk management is to minimize loan defaults and risks to the bank’s reputation.”
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A good example in case is the case of WestLB’s financing of an oil pipeline in Ecuador. For the most part the construction of this pipeline would run parallel to an existing pipeline although one particular section of the pipeline will be diverted through Andean cloud-forest within the Mindo-Nambillo reserve.

According to some accounts such an area is home to approximately 5% of the world’s bird species of which some are considered to be endangered [18]. In addition there remains a risk of damage to the proposed new pipeline through landslides and earthquakes. For instance during the period 1998-2001 around 145,000 barrels of

oil have been spilt from the existing state-owned oil pipeline in Ecuador as a result of landslides [18]. When combining these environmental risks with the fact that over 70% of the population in the Mindo-Nambillo reserve have jobs in eco-tourism, it became clear that serious reservations exist regarding the proposed pipeline [18].

Due to the amount of negative publicity that WestLB faced from NGOs and environmental pressure groups in relation to its financing of the Ecuadorian pipeline, the bank subsequently decided to adopt the Equator Principles in 2003. Today, in an effort to guard against reputational risks, projects requiring over US\$50m in finance are subjected to the Equator Principles at WestLB [19].

2. What can banks do about environmental risks in the lending process?

Banks can address environmental risks in different ways. Among the most important tools are

- Risk-adjusted Pricing
- Monitoring
- Covenants
- Refusal of loan
- Portfolio optimisation

1.6 Risk adjusted pricing

Banks are used to dealing with risks as all bank lending decisions are usually exposed to some degree of risk. Banks face the challenge to price loans accordingly [20]. The agreed interest on a loan consists of many different components. The most important components are:

- The risk free rate of interest
- Other costs
- Profit margin
- Expected net loss (on a portfolio level)
- Unexpected loss (on a portfolio level)

The risk free rate reflects the time value of money. It is commonly assumed that investors prefer to have money sooner rather than later and the risk free rate reflects this preference. Banks must obviously cover the costs (other than the costs for refinancing) that are linked to the lending decision. Additionally banks usually aim to make a profit, which is reflected by the profit margin.

Environmental risks can have an influence on the two components

- Expected net loss (on a portfolio level)
- Unexpected loss (on a portfolio level).

Banks know that some of their loans will not be paid back in full. Put differently, they expect to lose some money. The amount of money they expect to lose must be priced in. Strictly speaking this does not constitute a risk from the point of view of the bank. This is once again linked to the differentiation between systematic and unsystematic risks (→ 1.3). A bank that knows that it will lose 1% on average of the loans it gives out due to environmental reason will add 1% to the interest it agrees with its borrowers. It is unimportant in this context, if each particular loan loses 1% or if the loan portfolio in total loses 1%.

However, some environmental aspects have a systematic nature and environmental risks can therefore not be diversified away entirely. As a consequence the performance of the loan portfolio cannot be predicted with certainty; there is a risk that there might be unexpected losses. Even if banks do diversify, they are still exposed to this systematic risk. It is commonly assumed that banks, just like investors, are adverse to risk. Banks will therefore demand to be compensated for

taking on this risk. This risk will come about whenever there are systematic environmental risks.

Environmental risks can be linked to two out of the five components mentioned above. Pricing risks correctly into lending decisions is at the same time crucial and notoriously difficult. It is important to understand that environmental risks can impact credit pricing in two very different ways. Risk-adjusted pricing must on the one hand price in expected losses, i.e. the amount of money the banks expects to lose on average. This can be done for each loan in isolation. Risk-adjusted pricing must on the other hand consider the amount of non-diversifiable risk that a loan adds to the loan portfolio of the bank. This is notoriously difficult to do. The analysis of loan applications can thus be done both by looking at individual loan applications as well as by an analysis of the loan portfolio.

It is important to note that risk-adjusted pricing of loans does not reduce the actual amount of environmental risk. However, by giving the corresponding price signals banks can contribute to making sure that companies get the right incentive to reduce environmental risks.

1.7 Monitoring

In some cases environmental risks will develop over time. By reacting timely to an upcoming threat a bank's environmental exposure to environmental risks can be reduced. It can for example be useful to check regularly if a borrower who exerts an environmentally sensitive activity still complies with all relevant rules and regulations after the loan has initially been approved.

1.8 Covenants

In principle loans can be approved subject to terms and conditions. These terms and conditions are usually called covenants and can cover environmental aspects. It is for example possible that a bank will demand that a borrower trains his personnel with respect to environmental risks. Covenants are a way for banks to help reduce environmental risks.

1.9 Refusal of loan

Another possibility for banks is to not grant a loan in response to environmental risks. Obviously this is something that cannot be done every time there is a risk as most loans are subject to at least some risk. Not granting a loan is an option whenever risk-adjusted pricing cannot be practised.

1.10 Portfolio optimisation

As mentioned earlier we can distinguish between systematic and unsystematic environmental risks. Unsystematic environmental risks can be diversified. As a result they become expected net losses on a portfolio level. Systematic risks on the other hand cannot be diversified away as this is usually due to characteristics that all portfolio elements share. All companies use for example energy. An increase in energy prices will result in higher costs for all companies thus leading to a higher rate of energy price volatility. This situation will subsequently lead to a higher systematic risk for the entire portfolio.

This risk can be dealt with both on an individual as well as on a portfolio level. One possibility is to do a portfolio analysis of environmental risks. This portfolio analysis

will identify the key environmental characteristics of the environmental risks that an entire portfolio has been exposed to.

2. How can banks analyse environmental risks?

Banks use a number of different approaches to assess environmental risks. In this report we try to structure the different approaches that are in use today. In the context of this report we distinguish between

- Rating approaches,
- Screening approaches,
- Integrated analyses,
- Portfolio analyses and
- Staggered approaches.

A number of different terminologies are in use and there are overlaps between these approaches. The terminology used here reflects our own choice.

1.11 Rating approaches

The term Rating is usually used in the financial markets within the context of traditional financial risk. The idea of ratings is to assign a combination of letters and numbers to indicate the expected risk of default of a borrower. Ratings are best known for as products of companies like Moody's and Standard & Poors. Financial rating companies offer a service to providers of debt by signalling the expected probability of default. These financial ratings focus consistently on the perspective of providers of debt, i.e. they assess the probability of default of the borrower from the perspective of the lender.²

In the meantime ratings have now also been applied in a sustainability context [3, 21-24]. They are both used by banks internally as well as by specialised external eco-rating agencies that aim to follow the examples of conventional rating agencies that assess borrowers once for the benefit of several (potential) lenders.

A plethora of different rating approaches are used in this context. What these approaches have in common is that they assess the (potential) lenders with respect to a number of different criteria and usually assign some form of alphanumerical rating result (AAA, A1, points, or similar). The idea is that the performance of companies with respect to the assessment criteria becomes clear.

What differentiates ratings from other assessment tools is that a number of different lenders are assessed according to several criteria and that the result is usually expressed in a single mark or indicator. Companies can subsequently be compared or ranked according to their rating.

Environmental or Sustainability Ratings can have different explanatory powers and it is important to find out what the content of a rating is supposed to be. Ratings can for example be used to answer the following questions

- How green or sustainable is the company?

² The perspective taken might sound irrelevant at first glance. However, a borrower might for example have access to a state guarantee. In this case the probability that the lender will not be paid back is low, while the probability of the borrower not being able to pay back the loan himself might be high.

- How likely is it that a collateral is contaminated?
- How likely is it that a company will not be able to meet its financial obligations due to environmental reasons?

All of these questions will depend not on a single criterion as there are many different criteria that can have an impact. Companies will be assessed according to these criteria and the rating organisations can then come up with an overall assessment of the company.

Ratings are conducted in many different ways. However, we can identify some basic elements which are part of most ratings.

Firstly, most rating approaches structure the criteria they apply.

As previously mentioned, ratings apply across many different criteria. Most rating approaches subdivide the criteria they use into sub-groups. These subgroups are usually not arbitrary but reflect some kind of assessment logic. Subdividing criteria into subgroups has two main advantages. On the one hand the rationale of the criteria being used becomes clear. On the other hand by structuring criteria it is easier to keep an overview of the criteria that is being used in the rating.

Example	<p>Example: The rating approach of Inrate is a good example. The overall rating is subdivided into the subgroups</p> <ul style="list-style-type: none"> • Product, • Processes and • Management. <p>Each subgroup covers a range of different criteria (Source: www.inrate.ch, accessed Dec 11th, 2005).</p>
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Secondly, most rating approaches are sector or activity specific.

Eco-ratings aim to compare companies. However the activities performed by the companies can differ substantially. Eco-ratings thus face the challenge of comparing for example an energy supplier with a telecoms company. To alleviate this problem, most eco-rating organisations have approached this challenge by using sector- or activity-specific approaches. We can broadly distinguish between three different ways in which these rating approaches take into account the distinctiveness of different sectors.

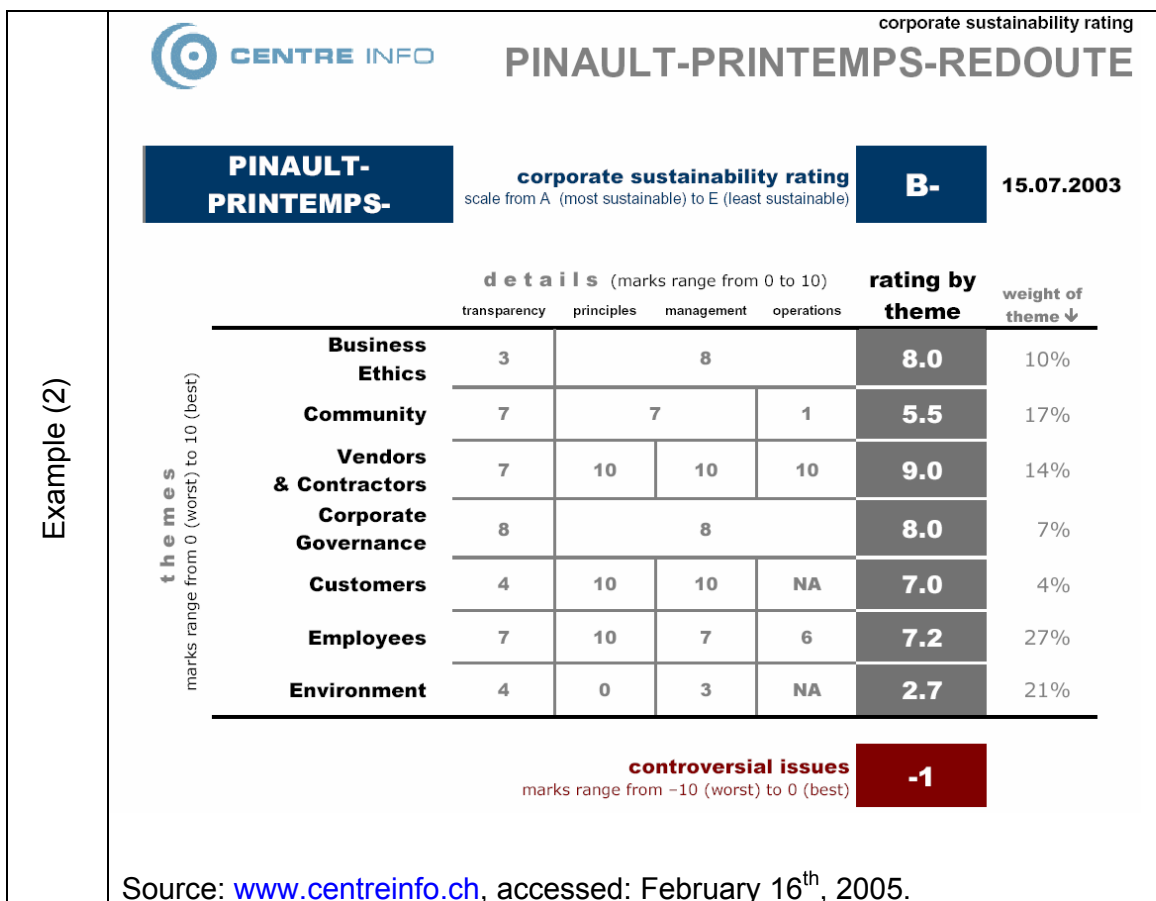
1. Some rating approaches use sector or activity-specific criteria/questionnaires. This allows considering specific areas of concern for each sector or activity.
2. Some rating approaches will include additional questions/criteria that cover any aspects that are specific to the sector or activity the company is involved in.
3. Some rating approaches give different weights depending on which sector or activity the company is part of. The rating could for example put more weight on all criteria being part of a sub-group processes, if the company employs harmful processes.

These three different alternatives can also be combined, i.e. some rating approaches will for example use sector-specific criteria and adjust the weights of the criteria based on the sector.

Thirdly, most rating approaches use a linear scoring system to aggregate the information.

Ratings aim to derive an overall mark or grade based on a multitude of criteria being used. For this purpose the performance regarding the different criteria must be aggregated to a single result with most rating approaches using a rather simple scoring systems to aggregate the information. Typically, each sub-group is assigned a percentage of the total points and analogously each criterion within the sub-groups is assigned a percentage. The percentage assigned to each sub-group or criterion will depend on its importance.

Example (1)	The methodology used for the Dow Jones Sustainability Indexes are a good example for an assessment approach, that structures its criteria, uses a sector specific approach and uses a scoring approach to arrive at an overall assessment.		
	Dimension	Criteria	Weighting (%)
	Economic	Codes of Conduct / Compliance / Corruption & Bribery	4.8
		Corporate Governance	4.8
		Customer Relationship Management	4.2
		Investor Relations	4.2
		Risk & Crisis Management	4.8
		Industry Specific Criteria	Depends on Industry
		Environment	Environmental Policy / Management
	Environment	Environmental Performance (Eco-Efficiency)	6.0
Environmental Reporting*		2.4	
Industry Specific Criteria		Depends on Industry	
Social		Corporate Citizenship/ Philanthropy	3
Social	Stakeholders Engagement	4.2	
	Labor Practice Indicators	4.8	
	Human Capital Development	4.8	
	Social Reporting*	2.4	
	Talent Attraction & Retention	4.8	
	Industry Specific Criteria	Depends on Industry	
	*Criteria assessed based on publicly available information only		
Source: http://www.sustainability-indexes.com/html/assessment/criteria.html , accessed Dec 11 th , 2005.			



Eco-rating approaches are not only performed in-house by banks but there also exist many external eco-rating agencies. The following table gives some examples of existing external eco-rating agencies.

Name	Country	Website
Sustainable Investment Research Institute Pty Ltd	Australia	www.siris.com.au
Ethibel	Belgium	www.ethibel.be
Innovest Group	Canada/USA	www.innovestgroup.com
CFIE - Centre Français d'Information sur les Entreprises	France	www.cfie.net
Ethifinance	France	www.ethifinance.com
Vigeo	France	www.vigeo.fr
Ökom	Germany	www.oekom-research.de
Scoris	Germany	www.scoris.de
Imug	Germany	www.imug.de

Name	Country	Website
Südwind	Germany	www.suedwind-institut.de
Avanzi	Italy	www.avanzi-sri.org
E.Capital Partners	Italy	www.e-cpartners.com
The Good Bankers	Japan	www.goodbankers.co.jp
DSR – Dutch Sustainability Research	Netherlands	www.dsresearch.nl
Fundación Ecología y Desarrollo	Spain	www.ecodes.org
GES Investment Research	Sweden	www.ges-invest.com
Centre Info	Switzerland	www.centreinfo.ch
Inrate	Switzerland	www.inrate.ch
Eiris	United Kingdom	www.eiris.org
Serm	United Kingdom	www.serm.co.uk
Kinder, Lydenberg & Domini & Co. Inc. (KLD)	USA	www.kld.com

Table 1: External Eco-Rating Agencies (examples)

Today there is not just one single Eco-Rating approach but a multitude of different eco-rating approaches that exist. Eco-ratings are used for different purposes although today they are predominately used for asset management (Socially Responsible Investment – SRI or similar). However some of the ratings, for example the rating promoted by SERM, specifically address environmental risk.

1.12 Screening approaches

Screening approaches take a more radical stance. They include or exclude possible investments based on a list of predefined inclusionary or exclusionary criteria. In practice some banks define activities they would not like to be linked to i.e. exclusionary screens. For instance a bank might have a policy not to have any commercial relationship with tobacco companies. As a result every loan application is checked to see if the company is involved in tobacco. If a company fulfils such an exclusionary screen the loan application is automatically turned down.

Screening approaches appear quite easy to implement at first sight. However, there are a number of problems related to screening approaches.

An unambiguous definition of exclusionary criteria is difficult in practice. This can be explained using the example of companies involved in arms production. Some actors in the financial markets do not want to be involved in arms production. There are a number of problems related to this exclusionary criterion.

- While many people dismiss the use of arms by the military, most people accept the use of arms by a democratically legitimized police. As a consequence the production of weapons for use by the police is often accepted. However, the delimitation between both uses is difficult or even impossible in practice.

- There are many goods, termed 'dual use' goods that are used not only by the military but also in a civilian context. Vehicles are a good example in this context. Some actors in the financial markets reject any involvement in companies that produce products that are used in combination with weapons. Where these products are also used in a civilian context it is difficult to delineate arms-related products from civilian products.
- Many companies produce a range of products and arms-related products that may only constitute a small portion of their overall activities. In practice it is impossible to exclude every arms-related involvement independent of its relative importance. This is due to the following reasons. Firstly, by excluding companies with an even minor involvement too many companies are screened out. For instance a total ban on companies selling tobacco would screen out most supermarkets. Secondly, minor involvements are often not reported and thus can not be detected. In practice a hurdle rate, usually expressed as a percentage of sales, is defined above which a company is excluded.
- To really avoid the involvement of a bank with a particular activity it is necessary to also consider different levels of the activity's life cycle. To produce arms input materials are required. It could be argued that involvement with a supplier producing input materials needed for arms production constitutes an involvement in the production of arms. Obviously the further away a supplier is situated from the production itself the more difficult it is to identify links to the activity that is supposed to be excluded.

Screening approaches are especially useful when a bank needs to reduce its involvement with a particular sector or activity at any cost. This is especially the case when there are reputational risks at stake. For reasons of portfolio optimisation this can obviously not be extended to too many sectors.

Inclusionary screens are of a special importance in the context of lending decisions. Some specialised banks are giving preferential conditions to environment-friendly borrowers. A good example is the German Umweltbank. Umweltbank gives preferential conditions to lenders with an environment-friendly project. Umweltbank explicitly mentions among others photovoltaic, wind power, and hydropower projects. This can be considered to be an inclusionary screen.

1.13 Integrated analyses

Another possibility is to integrate environmental aspects fully into the lending process. This approach acknowledges that environmental aspects can have an impact on the outcome of the credit assessment and that there is essentially no difference between environmental aspects and other aspects considered in the credit assessment.

Uni Credito «Social and Environmental Report 2004»	The growing awareness of environmental factors and how they might affect a borrower's repayment ability prompted us, as early as 2000, to expressly introduce the environmental factor into our credit assessment system.
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Today, integrated analyses are most advanced with respect to environmental risks on collaterals. Many banks check for possible contamination of land they accept as collaterals as part of their standard loan process.

In contrast integrated analyses of environmental risks on a lender's operational performance are currently not very advanced at this stage. Those banks that address these issues rely mostly on separate assessments which are then integrated at a later stage.

HVB Group «Sustainability Report 2004»	<p>“Violating environmental and social standards is a sure way to generate corporate risks, which means, in our case, credit risks. To manage these risks we’ve integrated them in our credit policy, our ratings and information tools, and our training programs. The optimization of environmental risk analysis is an ongoing process: one of our challenges is to implement them in our subsidiary banks in Central and Eastern Europe.”</p>
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1.14 Portfolio analyses

As mentioned above (→ 1.3) it is important to differentiate between systematic and unsystematic environmental risks. Unsystematic environmental risks can be diversified away and therefore do not constitute a risk on a portfolio level.³ However unsystematic environmental risks can only be diversified away if the loan portfolio is sufficiently diversified with respect to these risks. For example if the majority of a bank's loan portfolio consists of food companies and there exists an environmental risk related to the production of food then it is very likely that the portfolio will be negatively affected across the entire portfolio, if the risk materializes. Banks must therefore make sure that their loan portfolio is sufficiently diversified. In this respect there is a large overlap with existing traditional portfolio management of loan portfolios. Banks should therefore diversify their loan portfolio sufficiently to reduce unsystematic risks. To do this banks will for example cap the maximum amount that is given to companies of any particular sector. This way banks make sure that any sector specific risk will only affect a limited part of their entire loan portfolio.

What is not usually understood by banks in Europe up to this point is that environmental risks tend to have a different structure than conventional risks. Environmental risks often have a cross-cutting and systematic nature. For example climate change is a good illustration of this characteristic. It is assumed that CO₂-emissions are a major contributor to climate change with CO₂ being emitted by all companies that use fossil fuels. As all companies use fossil fuels they all contribute to climate change. If measures to reduce CO₂-emissions were adopted then all companies would be affected. However this risk cannot be fully diversified away as it

³ However, it is still important to price the expected environmental loss correctly.

constitutes a systematic risk. Portfolio analyses therefore face the very difficult challenge of reducing this systematic risk.⁴

What most banks do not fully understand up to this point is the crucial role of eco-efficiency [25-30] in this context. Eco-efficiency is usually related to the operational performance of companies [31-33]. What is not appreciated is that the more efficiently a lender uses an environmental resource the better he is shielded from a potential future scarcity of that resource and/or price fluctuations. By analyzing the eco-efficiency of the entire portfolio, systematic environmental risks can therefore be reduced.

1.15 Staggered approaches

The majority of European banks that integrate environmental aspects in their bank lending decisions seem to apply some kind of staggered approach. This could also be referred to as an environmentally-differentiated loan assessment approach (see for examples [34-36]).

However, environmental aspects will not have an impact on all loan applications. Some lenders are more likely to be affected by environmental aspects than others. Checking all loan applications for environmental aspects would thus be uneconomical and would distract resources from more relevant cases. As a consequence most banks that consider environmental aspects in loan applications operate some kind of staggered approach [37]. They use a kind of decision tree to decide if environmental aspects should be considered (for a generic decision tree of this kind see figure 2). The objective of this process is to use specialized questionnaires/criteria or to call in specialists only in the most relevant cases. We can largely distinguish between two main reasons that make a lender environmentally sensitive.

1. The lender is part of an environmentally damaging sector, conducts environmentally harmful activities, is situated in an area that makes it likely that environmental damage will occur or has already occurred, or similar.
2. Some of the initial questions in the loan applications suggest that environmental risks may exist.

The former aspect is not related to the individual borrower but to characteristics of the borrower that make it statistically more likely that the borrower is subject to environmental risks. The latter is related to the specific characteristics of the borrower. Below is an example of a list of environmentally sensitive sectors.

⁴ Obviously this risk is not the only risk that banks must manage and it is therefore not possible to minimize this risk as this might lead an increased level of other risks. Banks must try to minimize the overall level of risk. Systematic environmental risks only constitute a part of the overall risk.

Example	<ol style="list-style-type: none"> 1. Agriculture 2. Dry Cleaning 3. Electricity (production and supply) 4. Electro-plating and metal finishing 5. General engineering 6. Manufacture of basic metals and metal products 7. Manufacture and bulk storage of chemicals 8. Manufacture of electrical and optical equipment 9. Manufacture of food, beverages and tobacco products 10. Manufacture of leather and operation of tanneries 11. Manufacture of mineral products (glass, ceramics, bricks, cement and concrete) 12. Manufacture of pulp and paper, plus printing 13. Manufacture of rubber, plastic and derived products (with addendum on PVC manufacture and the chlorine industry) 14. Manufacture of textiles 15. Manufacture of wood products 16. Mining and quarrying 17. Oil and gas-extraction and refining 18. Petrol stations and bulk storage of fuel 19. Property development 20. Process and use of nuclear materials 21. Waste Management <p>Source: Slightly modified from Case 2000 [11]</p>
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Once a borrower has been identified as being environmentally sensitive different possibilities exist. Most lenders will as a result analyze the environmental risks in greater detail. Some banks operate a one step process while others stagger their approach into two steps or more. The idea is once again to adjust costs and efforts according to the exposure of the borrower to environmental risks. Further steps can encompass among others:

- Demand of additional information (for example via questionnaires),
- Commissioning of external rating reports,
- Commissioning of external auditors,
- Insurance of credit risks,
- Covenants,
- ...

How banks will deal with environmental risks in such a staggered approach will depend to a large degree on the banks' policies on environmental risks. They may range from a straight rejection of environmental risks to for example an adjusted-pricing or the inclusion of covenants.

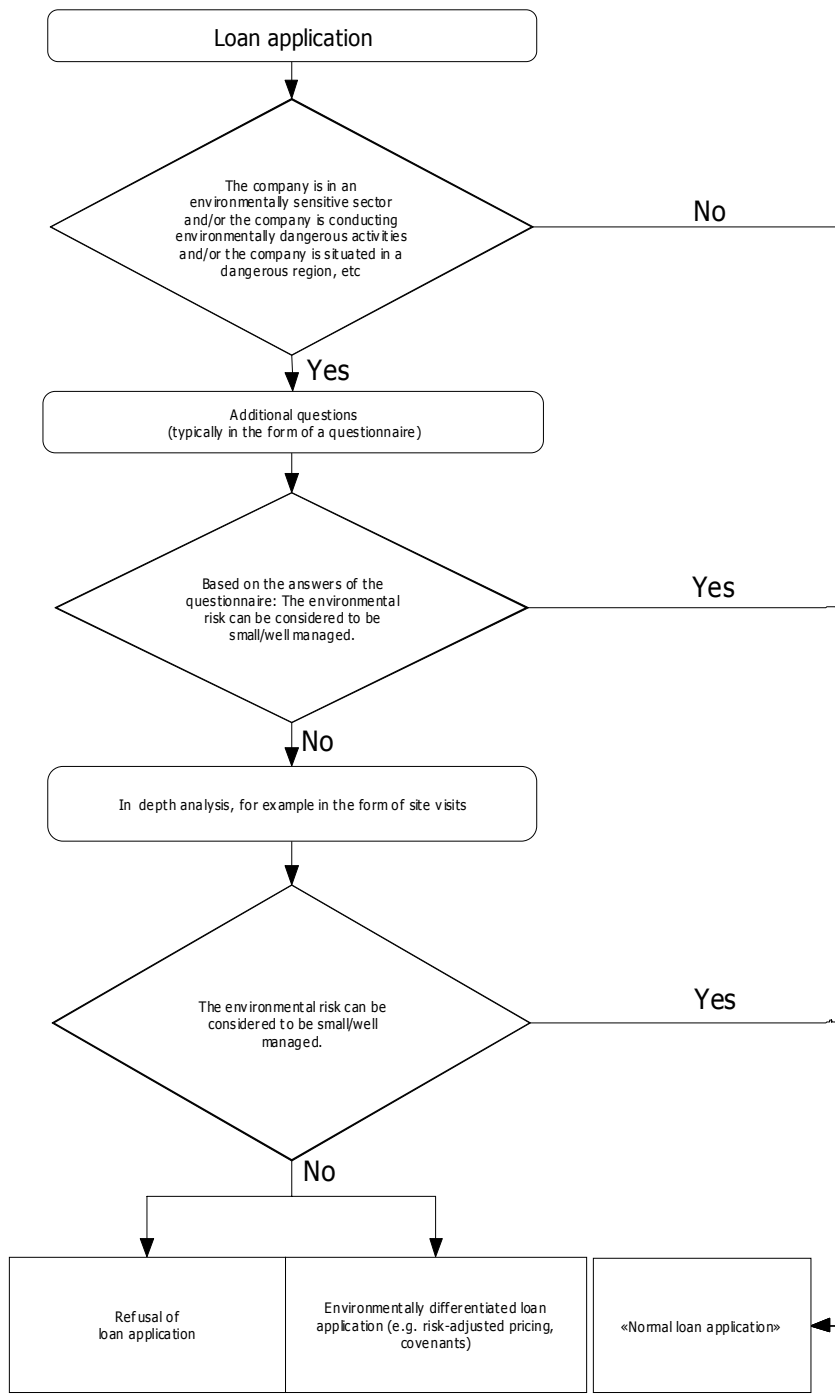


Figure 2: A generic decision tree

There seems to be widespread agreements amongst the banks that a staggered approach makes good economic sense when dealing with environmental risks.

Such a staggered approach has also been chosen for the Equator Principles.

Example	<p>The Equator Principles are a set of voluntary guidelines for managing environmental and social aspects in project finance lending above US\$50 million. It is assumed that the Equator Principles now cover about 80% of the market for project finance worldwide [38]. They were adopted by ten banks in 2003. As of the end of 2005 they have been adopted by 36 banks from 16 countries (Source: www.equator-principles.com, last accessed December 11th, 2005).</p> <p>While they are not primarily targeted at risk assessment it is believed that they have a positive impact on risk assessment. Project finance projects tend to be very visible to the public eye due to their size and the fact that they are often infrastructure projects or similar. Some critical stakeholders assert that banks have signed up or are signing up to the principles due to the reputational risks that they are exposed to [38-40].</p> <p>The Equator principles do not prescribe exactly how banks should analyse or manage environmental risks. Instead they provide a framework that leaves room for banks to implement the guidelines within their existing lending processes.</p> <p>The Equator Principles use a staggered approach. They distinguish between three categories (A, B and C) of projects. Projects are categorized as category A projects if they are “likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented.” Category B projects, if they have “potential adverse environmental impacts on human populations or environmentally important areas-including wetlands, forests, grasslands, and other natural habitats-are less adverse than those of Category A projects.” Category C projects are “likely to have minimal or no adverse environmental impacts” (Source for all quotes: http://www.equator-principles.com/exhibit1.shtml, last accessed Dec 11th, 2005).</p> <p>The Equator principles prescribe steps that are to be taken based on the categorization of the projects. Banks must complete an Environmental Assessment for category A and B projects and define issues that need to be addressed in the Environmental Assessment. For all category A projects (and category B projects as considered appropriate by the lender) an Environmental Management Plan must be prepared. The Equator Principles also prescribe among other things that relevant stakeholders have to be consulted and that the borrowers must covenant among other things to comply with the Environmental Management Plan.</p> <p>The Equator Principles provide a unifying framework for the participating banks. However, it should be noted that the Equator Principles do not ban banks from financing environmentally damaging projects.</p> <p>More detailed information about the Equator Principles can be found here: www.equator-principles.com</p>
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1.16 Discussion

Banks have different instruments at their disposal for the treatment of environmental risk. All instruments mentioned above are in use by at least one bank. Which instrument(s) a bank decides to use depends among others on their definition of environmental risk and the kind of lending a bank makes. None of the instruments is a “one size fits all” instrument.

A bank that is primarily concerned with its reputation might for example use screening. Stakeholders are unlikely to accept involvement with a company they reject on the basis that it scores high on an environmental rating. On the other hand a bank that aims to focus on specific sectors with a positive environmental contribution might want to use inclusionary screens.

A lender that is primarily concerned about systematic risks might want to check his portfolio concerning unusual high concentrations of these environmental risks. A portfolio-based instrument is therefore of primary interest for these lenders.

Rating approaches are very popular for environment-oriented equity investments. They are now also used by some banks in their lending operations. Where the companies are fairly large, usually multi-national companies external ratings might already exist that can be considered.

Most banks that consider environmental risks in their lending decisions operate some kind of staggered approach. These approaches allow banks to concentrate on the most pertinent cases of environmental risks.

Fully integrative approaches that are able to price environmental risks and allow a full integration are still the exception.

3. What information sources are available for banks?

Obviously, one of the main challenges for lenders is to receive the necessary information to assess environmental risks. We can broadly distinguish between two kinds of information in this context.

On the one hand lenders will need information about the environmental challenges that borrowers of a particular sector or conducting a particular activity face. Put simply, borrowers must understand the environmental problems related to each sector or activity.

On the other hand banks need information about the environmental characteristics of their respective clients. Both areas are of course related. To know what kind of information to look for concerning a client, banks must first of all understand the activities of the sector that the client operates in.

1.17 Sector-activity-specific information sources

It is difficult to generalize information sources for sectors and/or activities. For each sector there are special-interest associations or similar that can provide relevant information. Some organizations have also developed handbooks for different sectors and activities. Some of these handbooks are listed below.

- One European example is the European Integrated Pollution Prevention and Control Bureau (<http://eippcb.jrc.es/>). They have for example published some reference documents on Best Available Techniques in different industries.
- Another example is a UK government funded programme called Envirowise (www.envirowise.gov.uk). Envirowise also gives some sector specific information that points to some of the main environmental issues of different sectors.
- The U.S. Department of Energy runs an Industrial Technology Program (www.eere.energy.gov/industry), which focuses very much on energy-related question. They especially provide advice for energy-intensive sectors (for example, aluminium, petroleum refining) and for energy-intensive processes (for example combustion processes).
- Another American example is the Envirosense programme (sometimes also referred to as Enviro\$en\$e). Envirosense gives some Industry Sector Business Assistance for a few sectors/activities (currently: Metal Finishing, Electronics and Computer Manufacturing, Petroleum Refining and Printing). It consists to a large degree of a collection of links and additional information sources.
- Another (partly) US-EPA funded programme is the Pollution Prevention Resource Exchange (P2Rx™ - www.p2rx.org). It is a consortium of eight regional pollution prevention information centres. On its website it offers both specialised advice for some sectors (for example agriculture and construction) and for some topics (for example hazardous waste).
- The Canadian Pollution Prevention Information Clearinghouse (www.ec.gc.ca/cppic/en/index.cfm) has on its website a very detailed sector related search tool. The search tool only distinguishes between a great

number of sub-sectors but also allows to search for particular activities in the sector.

- The United Nations Environment Programme's (UNEP) Production and Consumption Branch (www.unepie.org/pc/cp/home.htm) of UNEP's Division of Technology, Industry, and Economics has published some interesting studies about cleaner production in a few sectors (primarily food and paper-related sectors).
- A rather comprehensive resource is the sector notebooks (www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/) published by the US-EPA. Sector notebooks portray among other things an environmental profile of the sector.
- Furthermore a good resource exists in the form of the World Bank Pollution Prevention and Abatement Handbook (available as PDF-file from the worldbank website).
- A good meta-source for pollution prevention resources (www.p2gems.org) is supported by Northeast Waste Management Officials' Association and the Toxics Use Reduction Institute. It allows a listing of resources by sector.

It is impossible to list each available resource for every sector. However, the resources mentioned above will allow for a first overview of the environmental characteristics of each sector and will point to further sources.

Another way banks find information about a sector is to look at the environmental impacts created (and reported) by other companies of the same sector. Different countries have more or less stringent law on the reporting of environmental impacts and most environmental reporting is unfortunately far from providing a reliable picture of a company's environmental impact. An excellent resource for a list of available corporate environmental reports that also lists companies by sector is Corporate Register (www.corporateregister.com).

Some countries ask companies to report their emissions and make this information publicly available. A good example is Scorecard – The Pollution Information Site (www.scorecard.org). This website allows to query environmental impacts by individual companies as well as featuring a list of toxic waste sites.

With the help of this sector information banks are able to identify the major environmental challenges that their (potential) lenders face. This information can then be used to analyse if and to what degree they are likely to be subject to environmental risks.

1.18 Company-specific-information sources

To assess the environmental risk of a (potential) borrower, banks must of course gather environmental information about the borrower. Some of the information sources typically used by banks are listed below.

- Many banks use questionnaires to gather information. Typically these questionnaires are sector- or activity-specific based on sector information.
- Some companies publish environmental or sustainability reports or similar. However, this applies mostly to large companies and a lack of standardization makes interpretation difficult.

- Some companies use processes that require special permits. By checking in specialised databases to see if the companies have applied for these permits, banks can subsequently check to see if the companies undertake activities that could be linked to environmental risks.
- Another source of information are media sources (newspaper, specialised journals, TV, internet, etc).
- Some of the information sources listed for sector specific information can also be used to gather company-specific information. A good example is www.scorecard.org that lists individual sites of companies.
- Collaterals play an important role in environmental risk assessment of banks. Land registry offices are an important source of information in this context. By finding out more information about the current and previous owner of a piece of land, the probability and kind of possible contamination can be assessed more easily.

4. Conclusion

This report has aimed to structure what is being done by banks concerning environmental aspects in lending decisions today. Today banks deal with environmental risks in different ways. This depends largely on

- what is understood by environmental risks,
- how banks have decided to deal with (environmental) risks, and
- the information that banks have at their disposal.

This report has been structured accordingly.

It is impossible to propose a standard way of dealing with environmental risks. A state-owned bank that is asked to contribute actively to the environmental performance of a country will have a different definition of environmental risk than a bank that aims to concentrate on the benefit of its shareholders. A bank that makes a limited number of large ticket loans approaches environmental risks in a different way than a bank that processes a large number of fairly small loans.

Each lender has to decide individually how to address environmental risks. Ideally this report will contribute to structuring the decision-making process and give a rough but hopefully well structured overview over the options lenders have.

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