October 2011 N°17

SCOR Papers

EU regulation of greenhouse gas emissions: what solutions can insurance companies offer industry?

By **Cedric Wells**
Legal & Claims Manager,
SCOR Global P&C

Abstract

Restrictions on greenhouse gas (GHG) emissions imposed by European Regulations are being tightened. As of 2013 (beginning of Phase 3), GHG will generate both higher costs and new risks for the companies concerned.

Risks of accident-related non-compliance (insufficient allowances) are already partly covered by conventional insurance. But appropriate wording has not been introduced in the policies to take this into account, leaving the way open to disputes.

The risks associated with projects recognised by the Kyoto protocol (CDM/JI) which enable carbon offsets to be obtained, can be insured with the notable exception of regulatory risks.

With major institutional changes on the horizon, insurers need to have a better grasp of ETS mechanisms and anticipate their repercussions on the transition to Phase 3.

SCOR Global Risk Center

While the future of the Kyoto Protocol is highly uncertain, the European Commission has expressed its firm intention to pursue its policy of combatting climate change through the European Union Emissions Trading System (EU ETS) adopted in January 2005.

1. Regulatory framework

The Kyoto Protocol[1] was adopted on 11 December 1997 and came into force on 16 February 2005. It is an international agreement that sets binding caps on GHG emissions to industrialized countries and to the EU. The Emissions Trading System (ETS) allows States to trade surplus allowances and the carbon offsets that are generated per the so-called "flexible mechanisms" (see below).

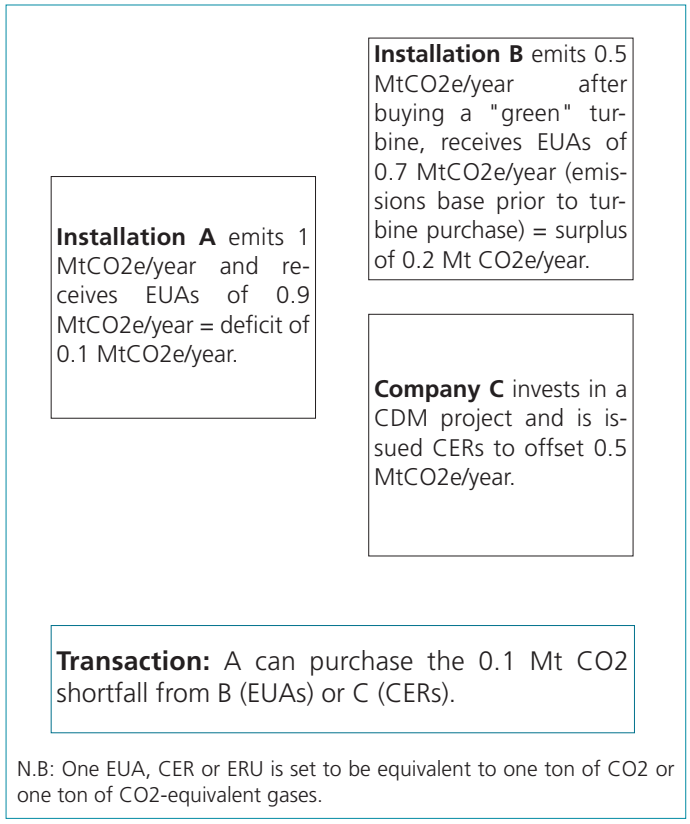
The EU transposed its commitments under the Kyoto Protocol via Directive 87/2003/EC[2] (revised by Directive 29/2009/EC[3]). The regulation imposes GHG emission caps on nearly 11,400 energy-intensive industrial and production installations located in the EU, Iceland, Norway and Liechtenstein. It covers about 50% of emissions in the EU, mainly applying to the power production, iron and steel, glass, cement and brick sectors.

The caps are determined by the Member States for each company under a National Allocation Plan which has to be approved by the EU Commission. Any installation that exceeds its cap is fined (currently 100 EUR per tonne of CO2-equivalent) unless it is offset by the purchase of:

1. European Union Allowances (EUA) not needed by other installations subject to ETS; and/or

2. Kyoto type carbon offsets (CER/ERU) obtained from "flexibility" mechanisms (Clean Development Mechanisms (CDM[4]); Joint Implementation (JI[5])). Projects of this type should contribute to GHG emissions reduction or sequestration (principle of additionality). They mainly concern the destruction of industrial gases (HFC, N20), renewable energy and the improvement of energy performance. The projects involve the transfer of technology and know-how as well as investments. They are carried out by a company from a developed country in a developing country (CDM) or another developed country (JI) that has ratified the Kyoto Protocol.

Figure 1: description of emissions trading/carbon credits scheme between companies based on an example



N.B: One EUA, CER or ERU is set to be equivalent to one ton of CO2 or one ton of CO2-equivalent gases.

2. Phase 3 of the ETS: a turning point

ETS restrictions are a gradual process. After a trial period (2005-2007), Phase 2 (2008-2012) corresponds to the application period of the Kyoto Protocol. As yet, very few companies have experienced an allowance shortage. On the contrary, the free, abundant allocation of emissions allowances has enabled a large number of them to generate revenue by selling off their surpluses. Their real emissions have proved to be much lower than the estimated industrial production levels mainly due to environmental investments and the drop in production volumes resulting from the economic crisis.

(1) Full text available from http://unfccc.int/kyoto_protocol/items/2830.php

(2) Directive 2003/87/EC dated 13 October 2003. Full text available from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32003L0087:EN:HTML

(3) Directive 29/2009/EC dated 23 April 2009. Full text available from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0063:0087:EN:PDF

(4) Article 12, Kyoto Protocol.

(5) Article 6, Kyoto Protocol.

This situation may change, however, with the switchover to Phase 3 of the ETS (2013-2020) whose more stringent rules should enable the EU to meet its goal of a 20% reduction in GHG emissions by 2020. The following changes have been adopted:

- extension of the ETS to new industrial sectors (including aviation, petrochemicals, aluminium and ammonia) and new gases (nitrogen oxide and perfluorocarbons),
- linear reduction of GHS emissions caps and gradual replacement of the free trading allowance with the auction system, and
- more stringent applicable qualitative restrictions and conditions for using carbon offsets generated by CDM/JI projects.

3. New risks

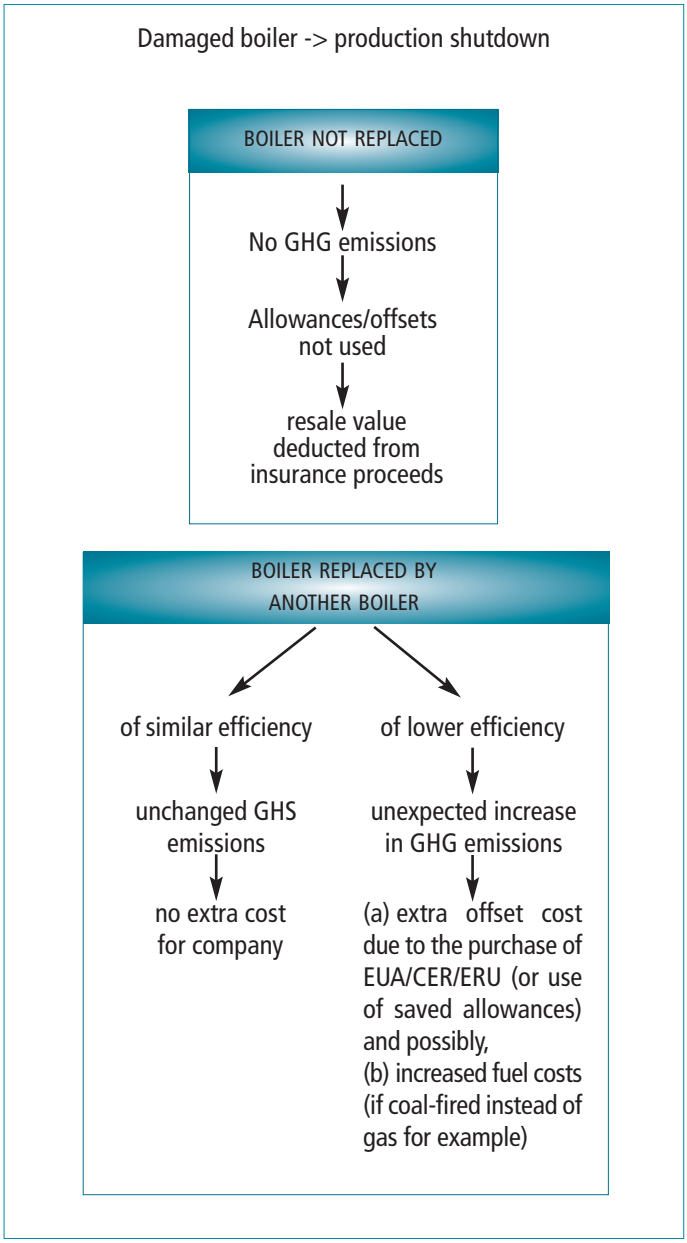
In view of these changes and while companies are devoting considerable efforts to containing energy costs, regulatory developments are exposing them to new risks: (1) the risk of non-compliance (emissions cap exceeded and not offset) and (2) for those participating in CDM and JI projects, the risk of non or late delivery of carbon offsets.

Risk of non-compliance

In the aftermath of an industrial incident (and not a corporate decision, which is foreseeable), a company can sustain not only physical damage but also a business interruption loss depriving it of income. In order to cut losses and fill customer's orders, it may decide to replace a production unit that is no longer available with another installation that emits larger quantities of GHG, thus exceeding its allocated emissions cap.

The following case illustrates a problem that is already a reality: a machinery breakdown occurs on a "green" turbine specifically purchased to reduce GHG emissions. Although the production shutdown will theoretically lead to a subsequent interruption in GHG emissions, the decision to temporarily replace the turbine with another less efficient one (coal-fired, for example, and thus emitting more carbon) in order to restore production, would have a negative impact on the insured party. That insured would then have to use any spare allowances or offsets and possibly purchase the balance on the spot market to offset the increase in GHS emissions.

Figure 2: Post-incident possibilities and their repercussions



Based on the EUA price in September 2011 (13 EUR/MtCO2e), a deficit of one million units would cost 13M EUR.

Risk of non-delivery of carbon offsets

The carbon credit market (hereafter referring to EUAs, CERs and ERUs) has enormous potential. CDC Climat estimates[6] that demand for CERs will fluctuate between 2.3 and 4.4 billion during the period of 2008 to 2020 (including 1.3 to 2.2 billion within the ETS) and that supply, limited to 1.1 billion CER in 2013, could reach 4 billion in 2020.

When they invest in and develop CDM/JI projects, carbon offset suppliers are exposed to three types of risks according to their degree of insurability:

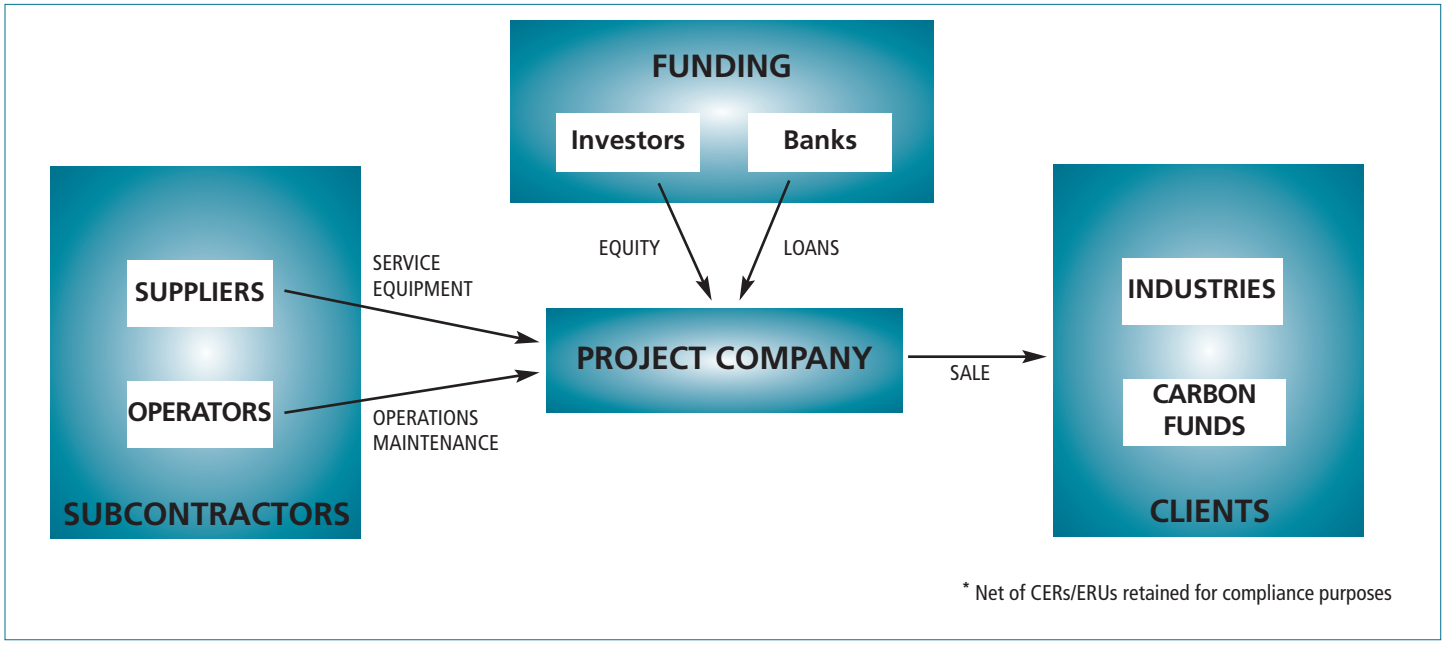
- traditional project risks, relating to the construction and operation of industrial projects (climate, natural events, fire, technological failure, design errors, insolvency, etc.): these are generally well-known;
- political risks, which are more complex, relating to the particular situation of the country in which the project is being carried out (civil war, confiscation of credits, etc.);
- risks of evolving regulations, which is very high, both in the countries hosting projects and on an international level (regulations and decisions of control bodies: UNFCCC, European Commission, etc.).

The non or late delivery of carbon offsets can ruin any hope of a return on investment (or reimbursement in the case of lenders). For instance, the aim of a CDM project might be to obtain 10,000,000 CERs, with the hope of selling them at 14 EUR/tCO2. If one of the above perils should occur, the loss of income would be 140,000,000 EUR.

Carbon offset purchasers (mainly industry and carbon funds), for their part, run the risk of not receiving the offsets they need to respect the regulations. Often these credits have been bought even before they are emitted, with numerous projects being financed by the future sale of offsets.

(6) Carbon Credits and Insurance: can insurance address the current and future needs of the industries?, C. Wells, May 2011: http://www.enass.fr/PDF/travaux_recherche/mba_enass_c-wells_carbon-credits-insurance_2011.pdf

Figure 3: Stakeholders in CDM/JI projects



4. Risk transfer solutions

The "Carbon Credits and Insurance" survey[7] shows that the companies subject to the EPS have a good knowledge of the carbon regulations and anticipate what they are going to cost. However, most of them have not thought of transferring their carbon-related risks which they consider to be production costs (and to be passed on to their customers if possible). The higher, more volatile costs that will come with Phase 3 could change this approach.

Even before carbon insurance appeared, the carbon markets proposed derivatives such as swaps, options and futures to cover the volatility risk of carbon credit prices. Companies with trading platforms have naturally delegated to them the management of their emissions permits in order to generate profit (sale of surpluses) or reduce costs (purchase for compliance or speculative purposes).

Other types of risk transfer solutions can be found for carbon credits on the insurance market.

Risk of non-compliance

The risk of non-compliance as the result of a fortuitous event is generally covered by the Increased Cost of Working section of conventional property damage and business interruption policies. Such a situation has seldom occurred to date because companies which had sustained accidents generally had a large emissions allowance surplus. Their unused quotas have actually been deducted from insurance proceeds as part of salvage value.

When Phase 3 comes into force, reducing emissions caps, property insurers may have to redefine the scope of their contracts and/or revise their prices to include the higher value of carbon in their customers' accounts.

(7) Carbon Credits and Insurance: can insurance address the current and future needs of the industries?, C. Wells, May 2011: http://www.enass.fr/PDF/travaux_recherche/mba_enass_c-wells_carbon-credits-insurance_2011.pdf.

Risk of non-delivery of carbon offsets

The first comprehensive policy covering CDM/JI projects arrived on the market in 2005. However, today there are still only a handful of insurers on the market, some of whom only offer partial coverage to the exclusion of regulatory risks.

Very little specific carbon credit insurance has been sold as yet, mainly due to insufficient communication on the part of insurers, prices considered to be excessive and too many limitations and exclusions. Neither have the stakeholders in this niche market managed to attract the necessary co-insurance capacity for the projects of interested customers.

5. Are carbon offset-related regulatory risks insurable?

The ETS still lacks credibility due to instability related to both its youth and the adaptations rendered necessary by certain fraudulent practices observed over the course of time. By way of example, Euronext suspended the trading of carbon credits for three days in 2011 due to VAT fraud which has cost billions of EUR to several states in the EU.

In terms of the Kyoto Protocol, only a little more than half the CDMs are effectively able to issue CERs. The complex stages of project preparation, validation, verification, certification and registrationpresent various obstacles at national and international level. According to the UNFCCC, the official pipeline for CDM/JI projects, it takes on average thirty months from the moment a project is first submitted to the moment the first CER/ERU are issued.

In addition to changes in legislation, companies may find their offsets cancelled (or reduced) if the principle of additionality is not respected. This is what will happen to operators involved in industrial projects concerning HFC23 and N20 emissions from the production of adipic acid. After 1st May 2013, these activities, which today produce more than two-thirds of the world's CERs, will no longer be able to offset GHG[8].

(8) Regulation (EU) No 550/2011 on determining, pursuant to Directive 2003/87/EC of the European Parliament and of the Council, certain restrictions applicable to the use of international credits from projects involving industrial gases came into force on 8 June 2011. Full text available from http://eur-lex.europa.eu/JOHtml.do?uri=OJ:L:2011:149:SOM:EN:HTML.

From an actuarial viewpoint, there is currently no meaningful data to model the regulatory risks associated with CDM/JI projects for several reasons. The first is due to the very wide diversity of CDM/JI projects and the absence of measuring standards for GHG emissions (lack of homogeneity). Second, more than three quarters of CDM projects are concentrated in China, India and Brazil alone (very low risk dispersion). Third, there is insufficient historical perspective. To overcome these obstacles, insurers who offer regulatory risk coverage extrapolate the available data, adjusting their risk assessment according to the qualities and defects (technical, financial, legal, etc.) of each project studied (scoring system). Other types of modelling derived from "special" risks can also be used.

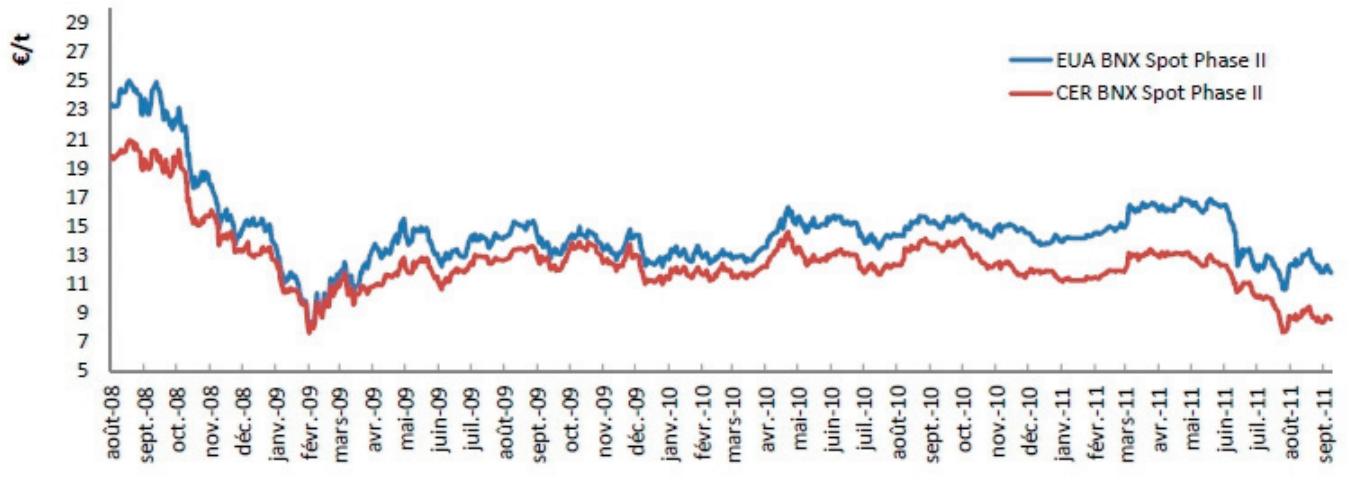
6. Volatility of carbon prices

Both supply and demand on the carbon credits market are highly dependent on the political orientation given by its regulators. Phases 1 and 2 of the ETS were marked by the high volatility of carbon prices. The announcement of a global surplus of allowances in May 2006 and the fact that credits could not be banked beyond Phase 1 contributed greatly to the collapse in prices. A certain degree of stability returned in the spring of 2009.

Only a few months ago, the market consensus was that there would be a short-term increase in CER/ERU demand with a CO2 price of 25-30 EUR in 2020. However, recent announcements have led to increased fluctuation of allowance prices, both upward (decreasing popularity of nuclear energy, qualitative restrictions on HFC23and N2O credits, etc.) and downward (refusal of Poland to increase its CO2 emissions reduction goal from 20 to 25% by 2020, proposal of an energy efficiency directive announcing a reduction in emissions by 2020, etc.).

Coverage for the volatility of EUA and CER/ERU can be afforded provided it is limited by a monetary ceiling or a predefined fluctuation rate. This solution is very widely practised in industry (particularly mining) and can therefore be easily transferred to carbon credits.

Figure 4: Price of EUAs and CERs between 2005 and 2011



NB: The spread between EUAs and CERs (4 EUR in May 11) can mainly be explained by the capping of CER/ERU credits to offset GHG emissions

Source: CDC Climat based on Bluenext and ECX data

7. Future Prospects

While the international community is not able to agree on a text to follow the Kyoto Protocol, it cannot be denied that the European model has been followed not only on a national level (New Zealand[10], Japan[11]), but also a regional (California[12], New South Wales[13]) and inter-regional level (RGGI[14] and WCI[15] in North America). Other countries such as China also plan to set up regulatory carbon markets. Despite their differences, all these systems are intended to eventually be linked together.

In terms of demand for insurance to cover the non-delivery of carbon offsets, the economic crisis and drop in production volumes (and therefore emissions) have resulted in the freezing of most CDM/JI projects. Sales, however, should slowly increase, driven by more stringent regulatory restrictions, bwhich are expected will encourage the growth of CDM/JI projects.

The need for insurance will no doubt be felt first and foremost by the captives of major industrial groups (to cover claim peaks), consortiums (carbon funds) and investment funds for the portfolio's catastrophe risk. Nationalisation by China, for example, of all the methane sequestration projects on its territory would have serious repercussions for an investor having sunk funds into a large number of projects.

Also, the need to cover allowance theft, which is not available today, could offer interesting growth prospects to insurers.

(10) New Zealand Emissions Trading Scheme.
http://www.climatechange.govt.nz/emissions-trading-scheme/about/basics.html

(11) Japanese Voluntary Emissions Trading System.

(12) California Global Warming Solutions Act (AB 32). See http://www.arb.ca.gov/cc/docs/ab32text.pdf.

(13) New South Wales Greenhouse Gas Abatement Scheme. See http://www.greenhousegas.nsw.gov.au.

(14) Regional Greenhouse Gas Initiative. See http://www.rggi.org.

(15) Western Climate Initiative. See http://www.westernclimateinitiative.org.

8 What actions should be taken?

Phase 3 is approaching. Many uncertainties remain both on a regulatory level (certain key application conditions are still waiting to be defined) and in terms of how companies will react. However, insurers still have to understand the fundamental aspects of the regulations and assess the costs for their clients: it is not too early to heighten awareness of the problem among underwriters, actuaries and claims managers in particular.

Both immediately and for future underwriting, insurers would be well advised to identify the carbon regulation related risks to which their clients are exposed. When carbon credit coverage exists in some form or another, appropriate wording must be used to answer questions such as the following:

- which variables should be used in calculating a loss?
- which price should be used to calculate the value of lost carbon credits?
- at which date should losses be valued? ?
- should an insured use up spare allowances rather than purchase new ones at a higher cost?

Failing this, the absence of specific definitions, accounting standards and assessment rules applying to carbon credits will be an unavoidable source of dispute. It will also concern increasingly large amounts of money.

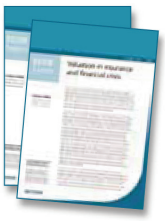
9. Sources and useful links

- Texts: Kyoto Protocol, EU ETS Directive revised (29/2009/EC)

- Studies: World Bank (State and trends of the carbon market 2010 http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/State_and_Trends_of_the_Carbon_Market_2010_low_res.pdf) ; CDC Climat (www.cdcclimat.com)

- Corporate information: Carbon Disclosure Project (www.cdproject.net)

SCOR Papers



SCOR Paper N°1 - September 2008
Using Capital Allocation to Steer the Portfolio towards Profitability

SCOR Paper N°2 - August 2008
La bancassurance : généralisation ou déclin du modèle ?

SCOR Paper N°3 - December 2008
Valuation in insurance and financial crisis

SCOR Paper N°4 - March 2009
Modern Companies and Extreme Risks

SCOR Paper N°5 - July 2009
Securitization, Insurance and Reinsurance

SCOR Paper N°6 - January 2010
Adapting the solvency regulations to times of crisis, accepting the riskiness of the situation

SCOR Paper N°7 - January 2010
The Influence of Risk Measures and Tail Dependencies on Capital Allocation

SCOR Paper N°8 - March 2010
Principle-based Solvency: A Comparison between Solvency II and the Swiss Solvency Test

SCOR Paper N°9 - December 2010
Aging: a Global Phenomenon

SCOR Paper N°10 - December 2010
PrObEx: a New Method for the Calibration of Copula Parameters from Prior Information, Observations and Expert Opinions

SCOR Paper N°11 - December 2010
Development Risk

SCOR Paper N°12 - December 2010
Study of the impact of inflation and GDP growth on property-liability and life insurance premiums over the last 30 years: case of the G7 countries

SCOR Paper N°13 - March 2011
Preparing for Solvency II: Points of debate in the Standard Formula

SCOR Paper N°14 - April 2011
Modelling operational risk in the insurance industry

SCOR Paper N°15 - May 2011
Why do the French not purchase more long-term care cover?

SCOR Paper N°16 - Juin 2011
A new method for modeling dependence via extended common shock type model

SCOR Global Risk Center

SCOR Papers, edited by SCOR, are one of the tool supporting the SCOR Global Risk Center.
The SCOR Global Risk Center gathers and analyses the most interesting resources about risks. It operates as a dual resource center, based both on data and resources produced by SCOR itself, and on all other resources available selected specifically by SCOR. Publications will be available in English, French and/or German.
SCOR Global Risk Center is available at www.scorglobalriskcenter.com or on SCOR's website – www.scor.com.