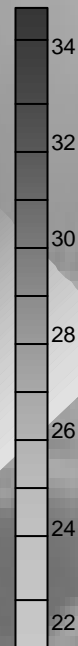


Climate Change

What every Asia Pacific company must know

Climate change is an emerging risk facing the industry sector in Asia Pacific. Every business will be impacted directly or indirectly and must understand available options to manage risks and maximise opportunities.



CLIMATE CHANGE

To be prepared, Directors of companies participating in the “Greenhouse Gas Emission

Reduction from Industry in Asia and the Pacific” (GERIAP) project should consider:

- Understanding climate change and Governments’ policy responses
- Assessing the risks and opportunities for the business
- Developing an appropriate response strategy to climate change

This paper aims to provide a starting point for Asia Pacific businesses, who want to understand how climate change will impact them and how they should respond.

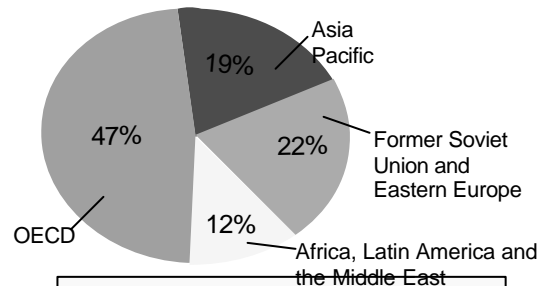
Understanding climate change and policy responses

Climate change occurs when an increase in greenhouse gas (GHG) emissions causes a rise in the Earth's temperature, thus increasing climate variability. Human activities generate GHG emissions, mostly through energy use by industry, transport and households that is generated from burning of coal, oil and gas.

Recognising the threat to the global economy and society, governments adopted the *UN Framework Convention on Climate Change* ("Convention") in 1992. In 1997, industrialised countries agreed to reduce GHG emissions through the *Kyoto Protocol*, which came into force in February 2005 (<http://unfccc.int>).

The Asia Pacific region contributed to 19% of global GHG emissions in 1990, but will be responsible for the largest growth

Regional distribution of GHG Emissions 1990



Source: www.pewclimate.org/global-warming-basics/facts_and_figures/regdist.cfm

Kyoto Protocol – key points

- Sets binding targets on Annex I (developed) nations to the Convention to reduce overall GHG emissions by 5.2% below 1990 levels over the period 2008-2012. Emissions are subject to in-depth review.
- Non-Annex I (developing) nations to the Convention have no binding targets but must report in general terms on their actions.
- Three market mechanisms may be used by Annex I nations to achieve targets.
- Non-Annex I nations can participate through Clean Development Mechanisms to facilitate sustainable development.
- Rules for the implementation of the Kyoto Protocol are worked out at annual Conference of Parties (COP) meetings.

market mechanisms

Emissions Trading (ET)

GHG emission reduction permits are bought, sold or exchanged by agreement between Annex I nations (listed as Annex B Parties in the Kyoto Protocol)

Joint Implementation (JI)

Annex I investors receive GHG emission credits by investing in a project in another Annex I nation which reduces GHG emissions

Clean Development Mechanism (CDM)

Annex I investors receive GHG emission credits by investing in a project in a non-Annex I nation which reduces GHG emissions

For more information please visit <http://unfccc.int>

Companies must look beyond the Kyoto Protocol and also assess established and developing national policy responses. These can be aimed at prevention of climate change (through GHG emission reductions) or adaptation to the consequences.

Types of measures and examples relevant to Asia Pacific region include:

- Legislation: In anticipation of enactment of federal legislation on energy management for industry, the State of Kerala in southern India, in 1998, made energy audits mandatory for large-scale, energy-consuming industries. <http://www.unescap.org/jecf/p05energy.htm>
- Taxes: The Finance Bureau and the Tax Bureau of China announced a 30% sales tax reduction until 2004 for light vehicles that could meet the European standard – UNEP "Tracking Progress: Implementing sustainable consumption policies", May 2002
- Taxes: Japan decision to increase the tariffs on coal and natural gas www.co2e.com/news
- CDM : The Finnish small-scale CDM project procurement program seeks to receive 1.2 Mton CO₂eq from 23 projects in developing countries. <http://pointcarbon.com/article.php?articleID=2346>
- Programs: "Promoting Industrial Energy Efficiency through a Cleaner Production / Environmental Management System Framework" project is implemented by UNEP in various countries including China, India and Vietnam. Its objective is to reduce GHG emissions by improving energy management practices and identifying investments in SMEs through a structured approach. <http://www.gefonline.org/projectDetails.cfm?projID=1340>

Risks and opportunities to Asia Pacific industry

Debate on the best response to climate change and surrounding policy frameworks is fierce, as all scenarios result in winners and losers. However, each company will be impacted by climate change:

- Directly through climate change variability, including higher temperatures and extreme weather events, and resulting droughts, fires, floods
- Directly through policy measures and markets, including legislation, taxes/subsidies, and emissions trading
- Indirectly through the supply chain, when suppliers or customers are impacted by climate change or policy measures

It is therefore important that companies assess and quantify the risks and opportunities of climate change effectively, as they would for any other business risk, and assess how prepared they are. This will enable them to develop an appropriate response strategy.

“Losses as a result of natural disasters appear to be doubling every decade and have reached US\$1 trillion in the past 15 years. Annual losses in the next 10 years are projected to reach close to US\$150 billion if current trends continue.”

UN Report on Climate Change & the Financial Services Industry, 2002. www.unepfi.net

“Natural disasters, mostly caused by extreme weather, cost more than US\$60bn this year alone.”

BBC News Dec.2003 <http://news.bbc.co.uk/2/hi/american/3308959.stm>

Total annual costs for 5 major Fortune Top 500 Metal & Mining firms to cut 2001 CO2 emissions by 10% over 5 years, assuming uniform abatement cost of \$20 per tonne, are \$67 m. For the respective firms, this ranges from 0.3% to 1.5% of annual net income www.innovestgroup.com/pdfs/CDP_Report.pdf

Examples of the risks and opportunities for four GERIAP industry sector are summarised below. (Carbon Disclosure Project “Carbon Disclosure Project CDP 2002,” February 2003 <http://www.cdproject.net/>)

Industry	Risks	Opportunities
All GERIAP Sectors	<ul style="list-style-type: none"> ▪ Higher energy costs associated with carbon charges on electricity also raise operating costs for energy-intensive companies ▪ Prospects of facing direct emissions reduction requirements ▪ Exposure to national GHG emissions regulations ▪ Higher insurance costs against weather 	<ul style="list-style-type: none"> ▪ Demand for alternatives for reduction of energy costs ▪ Minimisation of financial liability associated with CO2 and creation of new businesses opportunities ▪ Additional income from emission reduction credits through emission trading and CDM ▪ Heightened demand for clean technology-related speciality materials
Pulp and Paper	<ul style="list-style-type: none"> ▪ Increased risk from fire, pest problems ▪ Decreased value of land assets 	<ul style="list-style-type: none"> ▪ Greater demand for biomass as clean energy form ▪ Possible enhanced opportunities to enhance cash flow from carbon sequestration in forest operations
Iron & Steel	<ul style="list-style-type: none"> ▪ Increase demand for greater auto efficiency and lower emissions may increased demand for lightweight aluminium in auto manufacturing, or nickel in hybrid battery/fuel cars. 	<ul style="list-style-type: none"> ▪ Opportunity to sell slag and fly ash (current waste materials) as substitutes for limestone in cement production
Chemicals	<ul style="list-style-type: none"> ▪ Altered market dynamics for agriculture products ▪ Higher transportation and distribution costs 	<ul style="list-style-type: none"> ▪ Heightened demand for clean technology-related specialty chemicals
Cement	<ul style="list-style-type: none"> ▪ Higher transportation and distribution costs ▪ Vulnerable to government policies because of its relatively high contribution to GHG emissions 	<ul style="list-style-type: none"> ▪ Market opportunity for cement with substitute for limestone ▪ Minimisation of cement company's financial liability associated with CO2 and creation of new businesses opportunities

How companies should respond to climate change

The response to climate change will be unique to each company and industry sector based on the differing risks and opportunities confronting them. However, the response process should be the same for each company and involves strategy development, implementation and regular evaluation.

A climate change response strategy should seek to:

- Allocate climate change responsibilities
- Establish emissions for a baseline year and set targets
- Establish information systems for measuring and reporting energy use and GHG emissions
- Implement GHG reduction options
- Participate in CDM projects
- Implement adaptation options to climate change
- Integrate climate change considerations into business processes
- Liaise with stakeholders and participate in programs, such as GERIAP
- Participate in and organize training

GHG Protocol

An internationally accepted GHG accounting and reporting standard consisting of standards, practical guidance and calculation tools for different industry sectors. Sectors relevant to GERIAP include iron & steel, chemicals (nitric acid, ammonia, adipic acid), cement & lime, pulp & paper. The calculation tools are electronic Excel spreadsheets with accompanying step-by-step guidance. www.ghgprotocol.org/standard/tools.htm

Options for reducing GHG emissions

- Utilising energy efficient technologies
- Switching to less carbon intensive fuels
- Investment into tree plantations
- Energy demand management programs
- Process/product redesign
- Investment into GHG reduction projects (e.g. CDM)
- Supply/process chain reductions e.g. waste to energy

Integration into business processes

- Policies
- Organisational structure
- Staff training and awareness
- Information and management systems
- Communication and decision making processes

Many companies are already taking voluntary actions to address climate change – some examples include:

- **Holcim** Cement is one of the founding members of the “Cement Sustainability Initiative” programme that includes climate change component.
- **International Papers** has publicly committed to reduce total greenhouse gas emissions by 15% from 2000 to 2010. http://www.forbes.com/business/energy/2003/11/26/cz_ag_1126beltway.html
- **PT Siak Raya Timber** aims to install an energy plant, using its own wood residues as fuel, to meet its heat and power requirements. Based on the present diesel consumption and price, the annual savings in diesel purchase will be more than US\$ 1 million. <http://www.fao.org/waicent/faoinfo/sustdev/EGdirect/EGre0028.htm>
- **CEMEX** (cement) through its Eco-efficiency Program, reduced CO2 emissions by 263,000 tons, which is equivalent to the CO2 sequestered in one year by 33,000 hectares of pine forest. It reduced the use of electricity equivalent to metropolitan area with approximately 100,000 inhabitants for one year. The company has a presence in Asia Pacific which is the equivalent of 130,000 barrels of petroleum. <http://www.cemex.com>

Simply put, the business in Asia Pacific will be impacted by climate change and it is important to be prepared. Addressing climate change could therefore be an enormous opportunity for those companies who grab it, and a major risk for those who don't.

What is the Clean Development Mechanism?

This is a summary of "Introduction to the Clean Development Mechanism (CDM)" (UNEP publication).

The CDM is a market mechanism established under the Kyoto Protocol. It allows governments or private entities in Annex I countries to implement emission reduction projects in non-Annex I countries and receive credit in the form of "Certified Emissions Reductions" (CERs). The CDM strives to promote sustainable development in developing countries, while helping developed

CLIMATE CHANGE

Criteria

All Annex I and non-Annex I nations must meet three requirements for participation in CDM.

- Voluntary participation
- Establishment of National CDM Authority
- Ratification of Kyoto Protocol

In addition Annex I nations must establish:

- the assigned amount under Article 3 of the Protocol
- a national system for the estimation of GHG
- a national registry
- an annual inventory and
- an accounting system for the sale and purchase of emission reductions.

Eligible Projects

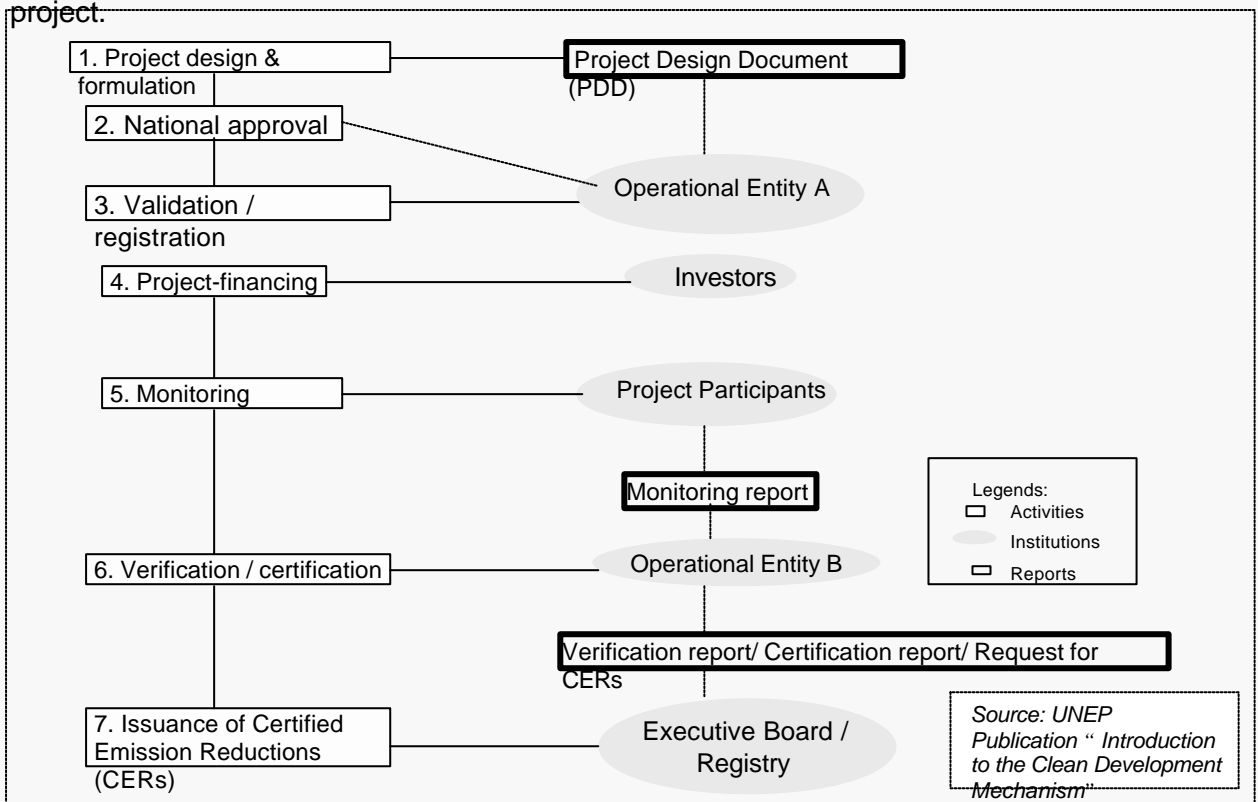
The CDM can include projects the following projects:

- End-use energy efficiency improvements
- Supply-side energy efficiency improvement
- Renewable energy
- Fuel switching
- Agriculture (reduction of CH₄ and N₂O emissions)
- Industrial processes (CO₂ from cement etc., HFCs, PFCs, SF₆)
- Sinks projects (only afforestation and reforestation)

Note: Annex I nations must refrain from using CERs generated through nuclear energy to meet their targets

Project cycle for the CDM

The CDM Cycle as shown on the figure has seven basic stages. The first four are performed prior to the implementation of the project, while the latter three are performed during the lifetime of the project.



CDM project cycle continued...

1. Project design and formulation

The first step in the CDM project cycle is the identification and formulation of potential CDM projects. This step establishes that the CDM project is real, measurable and additional.

2. National approval

The National CDM Authority in the non-Annex I nation evaluates and approves the project and serves as a point of contact. Together with the investor, the host country must prepare a Project Design Document (PDD).

3. Validation / registration

A designated operational entity (e.g. auditing or accounting firms) will review the PDD and after public comment decide whether or not it should be validated.

4. Project-financing

The public funding for CDM projects must not result in the diversion of funds for official development assistance. The CERs generated by CDM projects will be subject to 2% levy, to help particularly vulnerable developing countries adapt to the adverse effects of climate change.

5 – 7. Monitoring verification / certification and issuance of Certified Emission Reductions (CERs)

- Once the project is operational, participants prepare a monitoring report, including an estimate of CERs generated.
- An operational entity will verify CERs that confirm that the CERs have resulted according to the guidelines and conditions agreed upon in the initial validation of the project
- The operational entity provides a certification report that gives written assurance that a project achieved the reduction as verified. Unless a project participant or three Executive Board members request a review within 15 days, the CERs are issued.

What is a Project Design Document (PDD)?

To submit a project a developer/company prepares a PDD to demonstrate that the project meets the validation requirements of the CDM. The PDD includes:

- A general description of the project
- A baseline derived from an approved baseline methodology
- The estimated lifetime of the project and the crediting period
- A demonstration of how the project generates emission reduction that are additional to what would have occurred without CDM
- An analysis of the environmental impacts
- A discussion of the stakeholder consultation process and how stakeholder comments were taken into account
- A monitoring and verification plan that uses an approved monitoring methodology

The link between CDM and GERRAP

The GERRAP project identifies potential CP-EE options, with the aim to have participating companies implement CP-EE options that “make business sense” during 2004, which means that they are economically, technically and environmentally feasible.

CDM projects can only be options that do not “make business sense”. This means that in order for a company to participate in CDM it must demonstrate that normally it would not implement the option/project, but only if an Annex I country will pay money for the Certified Emission Reductions (CERs) through the CDM process. For example, switching from coal to gas in a cement plant would not happen if high investment costs and long payback periods apply, unless there is an additional income from CERs. This is called “additionality”.

For GERRAP options identified that are not (economically) feasible the company could check if they meet the CDM criteria (please note that additionality is only one criteria). So although the GERRAP project mainly focuses on options that

What is Additionality?

The project is expected to result in GHG emission reductions, which is additional to any that would occur in the absence of the certified project activity, i.e. it should not be included in the baseline. The additionality should be shown by following the additionality part of the methodologies approved by the Executive Board.

Case studies of CDM projects in the Asia Pacific region

A register of CDM projects is available on the CDM Watch website www.cdmwatch.org/
This page includes some case studies:

Case Study 1

Indocement Efficiency Project

Category: Energy Efficiency

Location: Indonesia

Description of Project :

Use of alternative fuels and various process optimisation techniques to reduce CO₂ emissions from Indocement's operations in Citeureup, Cirebon and Tarjun

Participants (including financial assistance): World Bank Prototype Carbon Fund (PCF)

Heidelberg Cement

Gas reduced/sequestered :

CO₂

GHG reductions claimed (in TCO₂e) :

1,000,000/year

Status :

Under consideration by the PCF. A Project Idea Note (PIN) is available on the PCF

Further Information :

www.prototypecarbonfund.org

Indocement ovind.hoidalen@indocement.co.id

Heidelberg Cement:

www.heidelbergcement.com

Case Study 2

Fushun Steam System Efficiency Project

Category: Energy Efficiency

Location: China

Description of Project :

Efficiency improvements in seven industrial facilities owned by Fushun Petrochemical

Participants (including financial assistance) :

Fushun Petrochemical

Armstrong International

QualityTonnes

Gas reduced/sequestered :

CO₂

GHG reductions claimed (in TCO₂e) :

827,282

Crediting period (years) :

10

Status :

The developer is still seeking approval for the baseline and monitoring methodology for this project (as of 1.9.03)

Comments :

There is currently no Annex I buyer of the CERs from this project

Case Study 3

TA Sugars cogeneration and fuel switch project

Category : Fuel Switching Energy Efficiency

Location : India

Description of Project :

The project in Tamil Nadu consists of two components:

1. Capacity augmentation at project plants;
2. Coal/lignite to biomass fuel switch at project plants

Participants (including financial assistance) :

World Bank Prototype Carbon Fund (PCF)

TA Sugars

Gas reduced/sequestered :

CO₂

GHG reductions claimed (in TCO₂e) :

From capacity augmentation: 1,784,314; from fuel switch: 4,304,518

Crediting period (years) :

10

Status :

Seeking baseline methodology approval as of Sept 25

Further Information :

Case Study 4

OSIL waste heat power project

Category : Energy Efficiency

Location : India

Description of Project :

Use of waste heat from kilns at the Orissa Sponge Iron iron and steel billets plant to generate electricity

Participants (including financial assistance) :

Orissa Sponge Iron Limited (OSIL)

Gas reduced/sequestered :

CO₂

GHG reductions claimed (in TCO₂e) :

314,404

Crediting period (years) :

10

Status :

seeking baseline methodology approval as of Sept 25

Comments :

This is an example of a non-additional project, because the captive power plant has been operational since July 2001 and the project documentation does not give any explanation of why this was because of the CDM.

Further information about climate

Important Organizations

Intergovernmental Panel on Climate Change (IPCC) has been established by World Meteorological Organisation and UNEP to assess scientific, technical and socio-economic information relevant for the understanding of climate change, its potential impacts and options for adaptation and mitigation. <http://www.ipcc.ch/>

United Nations Framework Convention on Climate Change (UNFCCC) supports cooperative action by nations to combat climate change and its impacts on humanity and ecosystems. The UNFCCC website provides organizational support and technical information for the Parties to the Convention on Climate Change and observers participation in the intergovernmental negotiations and related activities to combat climate change. <http://www.unfccc.int>

United Nations Environment Programme (UNEP) undertakes substantive work on climate change and has a dedicated website for information sources on climate change <http://www.climatechange.unep.net>

International Emissions Trading Association (IETA) is a non-profit organization created to establish a functional international framework for trading GHG emission reductions. Members include leading international companies from across the carbon trading cycle. <http://www.unfccc.int>

World Business Council for Sustainable Development is a global network of more than 170 international companies. It advocates to provide business leadership as a catalyst for change towards sustainable development and to promote the role of eco-efficiency, innovation and corporate social responsibility. The

Publications

- Carbon Disclosure Project & Innovest Strategic Value Advisor, "Carbon Disclosure Project Report CDP 2002", 2003 www.cdproject.net/
- CDM Watch, "The Clean Development Mechanism (CDM) Toolkit, a resource for stakeholders, activists and NGOs", www.cdmwatch.org/files/CDM%20Toolkit%20English%20final.pdf
- IPCC "Climate Change 2001: Mitigation" www.grida.no/climate/ipcc_tar/wg3/index.htm
- OECD, "Managing Climate Change Risks", 2003 www.oecd.org/dataoecd/6/12/19519189.pdf
- UNFCCC, "Climate Change Information Kit", 2002 <http://unfccc.int/resource/uckit/>
- UNFCCC, "Caring for climate – a guide to the climate change convention and the Kyoto Protocol", 2003 http://unfccc.int/resource/cfc_guide.pdf
- The UNEP project CD4CDM, "CDM Information and Guidebook", 2003 www.cd4cdm.org/Publications/cdm_guideline.pdf
- UNEP, "Climate change Information Kit", 2001 www.unep.ch/conventions/info/ccinfokit/Infokit%20-%202001.htm
- UNEP DTIE, "UNEP Guidelines for Calculating Greenhouse Gas Emissions for Business and Non-Commercial Organizations," 2000 www.unepdtie.org/energy/act/ef/ghg/in/docs/GHG_Indicator.pdf

Climate Change Newsletters – free subscription!

- UNEP's "GERIAP News" www.geriap.org/publications.htm
- "Carbonbank" www.carbonbank.com.au/
- Climate Business Network's "CDM Investment Newsletter" www.climatebusiness.net/newsletter.htm
- Greenhouse Gas Protocol's "Greenhouse Gas Protocol Initiative" www.ghgprotocol.org/newsletters.htm
- International Emissions Trading Association's "IETA Environmental News Update" www.ieta.org/ under "Library and Links"
- International Institute for Sustainable Development's "Climate-L Digest" www.iisd.ca/email/climate-L.htm
- Point Carbon's "Carbon Market News" www.pointcarbon.com/
- UNFCCC's "CDM News" <http://cdm.unfccc.int/CDMNews/>

This paper was prepared as a part of the GERIAP project which aims to support Asian businesses to address climate change by becoming more energy efficient, and thereby reducing greenhouse gas emissions and costs. For further information on the project, climate change, energy efficiency and cleaner production visit the GERIAP website www.geriap.org or contact:

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