



Face the climate challenge.
Combine business and responsibility.

Climate Change Services.



The climate challenge

Climate change is currently one of the most pressing environmental issues facing the international community, the business world, and individual citizens.

Responding to the challenge demands a global effort and immediate action.

There is a broad scientific consensus on the gravity of climate change caused by global warming: a majority of the world's research community predicts that the global mean temperature will rise 1.4 to 5.8 degrees Celsius over the next 100 years.

Even the lower figure would have dramatic effects: melting glaciers, increased precipitation, more frequent and stronger hurricanes, rising sea

levels, and desertification.

Severe disruptions such as land use, food and water supply, spreading of diseases, and migration of people and animals will inevitably follow.

Researchers agree that human activities are the main cause for global warming, as we annually release billions of tonnes of carbon dioxide (CO₂) and other greenhouse gases through the burning of huge volumes of oil, natural gas and coal and the venting of industrial gases. In order to stabilise the concentration of CO₂ in the atmosphere and prevent accelerated temperature increase, the global CO₂ emissions need to be cut by 70–80%.

Our activities do not only have an impact on environmental and social aspects.

Economic growth will also be damaged if the climate challenge is ignored. The latest research concludes that “Climate change presents a unique challenge for economics; it is the greatest and widest-ranging market failure ever seen.”

Reducing emissions can be seen as an investment and must be viewed with economies of risk in mind. Acting now instead of waiting for the problem to escalate will, in the long run, reduce the total costs and also provide a number of opportunities for innovation, growth and development as we are

moving toward a carbon constrained future.

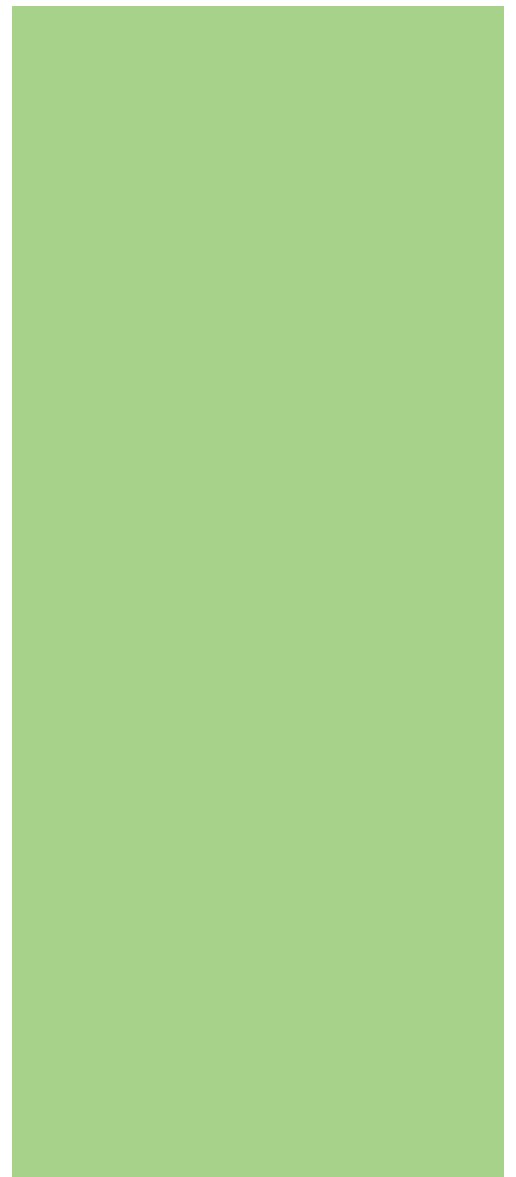
As members of the global community, we must be willing to accept economic costs now in order to avoid negative future consequences.

Think of it this way: it is estimated that today, each tonne of CO₂ emissions we release into the atmosphere cause us USD 85 worth of damages.

We currently have, however, opportunities to reduce these costs to less than USD 25 per tonne as demonstrated by emerging CO₂ programmes that allow people to trade their reductions.

Starting today has an effect tomorrow, making us all better off for the future.





A global response

As a response to the climate change threat and following the evidence of human impact on climate, the United Nations Framework Convention on Climate Change (UNFCCC) was established in 1992. Governments realised that stronger commitments were needed to mitigate climate change. Following years of negotiations, the Kyoto Protocol entered into force on February 16, 2005. It established legal commitments for participating countries to reduce emissions.

THE KYOTO PROTOCOL

The Kyoto Protocol requires the signatory countries to reduce or limit their emissions relative to their base year. Each country has been given a target related to the base year (normally 1990), and the combined effect of this should reduce these countries' greenhouse gas emissions

by 5% per year in the period 2008–2012. The Kyoto Protocol has three separate market-based mechanisms that help countries achieve targets.

A Clean Development Mechanism (CDM) project is a co-operation between a company in a country with reduction commitments and a company in a developing country without commitments.

The idea is that the company in the sponsoring country should support implementation of project activities that cost-effectively reduce emissions of a company in the host country and also give sustainable development benefits.

The reductions must be additional to any that would have occurred without the project taking place. Certified emission reductions (CERs) generated can be used to meet reduction commitments or be traded.

A Joint Implementation (JI)

project represents a co-operation between two countries that both have reduction commitments. The idea is to reduce the emissions in the place where it costs least to establish the project and to share technology know-how.

In most cases, the host country would be an EIT country (Economy in Transition) as it is usually cheaper to achieve emission reductions in these countries. JI projects must show that the achieved emission reductions or removals would not have occurred without the project.

Emission reduction units (ERUs) occurring from the project can be traded or used to increase the investors emission allowance.

Emissions trading is a co-operation between two countries that have reduction commitments.

Any country that has reduced its emissions below the commitment can sell its surplus assigned amount units

(AAU) to another country that may find it more difficult to reduce its greenhouse gases.

VOLUNTARY ACTIONS

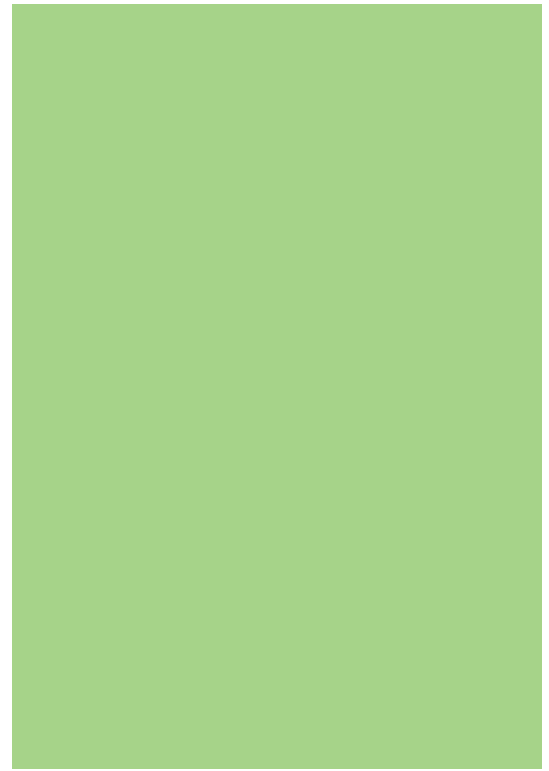
The idea behind the mechanisms in the Kyoto Protocol is to reduce emissions where it is cheapest, consequently reducing the overall cost of climate change mitigation.

However, the protocol only represents a small step on the way to reach the total reductions needed for greenhouse gas stabilisation. Other mechanisms and efforts are needed to increase the mitigation effort.

This is why voluntary programmes and efforts outside the Kyoto Protocol are emerging. Companies and individuals concerned about climate change are increasingly looking into options to offset their corporate or individual carbon footprints.

Robust and reliable methodologies are already in place or under development to ensure the credibility of these initiatives.





The corporate road to mitigation

In order to successfully implement greenhouse gas mitigation efforts, certain guiding principles have been defined regarding validation and verification of reduction projects and related offsets or credits. These principles are **Accuracy, Completeness, Comparability, Consistency, Cost-effectiveness, Reliability, Validity, and Transparency.**

Any company validating or verifying projects or credits must have the necessary expertise and understanding related to:

- UNFCCC requirements and processes
- relevant environmental issues and environmental auditing methodologies
- technical aspects of baseline establishment, monitoring for emissions, and other environmental impacts
- methodologies for accounting for greenhouse gas emissions and emission reductions

Finding the right independent partner can help ensure the quality and success of your projects.

DNV has extensive competence in, complies with, and incorporates the above principles.

We are therefore in a position to guide you through the relevant processes. Our goal is to help you manage your

carbon assets in the best possible way.

DNV'S SERVICES

DNV's climate change services can assist companies, organisations, and governments in their efforts to mitigate emissions.

They range from the three Kyoto Protocol mechanisms and voluntary emission reductions efforts, to other related services that can help you face the climate challenge:

- Clean Development Mechanism (CDM) projects
 - Validation
 - Verification and certification
- Joint Implementation (JI) projects
 - Determination
 - Verification
- Emissions trading
 - Annual emission verification (EU ETS, National schemes)
- Voluntary emission reductions
 - Corporate inventory verification
 - Verification of project based reductions
 - Verification of voluntary credits
- Renewable energy sources
 - Feasibility studies
 - Qualification of new technology
 - Certification of tidal and wave energy converters
 - Risk and reliability assessments

- Wind energy
 - Accredited type certification of wind turbines
 - Accredited project certification of wind farms (on- and offshore)
 - Due diligence
 - Second and third party verification services and technology qualification
- Alternative energy carriers (hydrogen, bio fuels, etc.)
 - Feasibility studies
 - Research and development
- Carbon capture and storage
 - Feasibility studies
 - Environmental impact assessments
 - Qualification of new technology
 - Technical verification
 - Risk and reliability assessments
- Training

The following overview should help you understand which climate change services are most relevant for your company or organisation.

CLEAN DEVELOPMENT MECHANISM (CDM) PROJECTS

A CDM project is initiated from a country with reduction commitments under the Kyoto Protocol and implemented in a developing country without such commitments. Under the Kyoto Protocol all CDM projects must be subjected to validation and

verification/certification by a designated operating entity (DOE), i.e. a third party verifier such as DNV.

Validation is an assessment of the design of your CDM project and its estimated reductions before it becomes operative. It shall ensure that the project will fulfil the CDM requirements and generate tradable credits. Getting the CDM project validated is a requirement in order to have it accepted and registered.

Registration is a prerequisite for later verification and certification of emission reductions generated by your project.

Verification and certification takes place after your CDM project is implemented. Verification is a periodic review to determine actual emission reductions generated in addition to verifying continued compliance with the criteria defined under the Kyoto Protocol. Based on a successful verification, the designated operating entity will determine and certify the emission reductions (CERs) generated and request the CDM Executive Board to issue your certified credits.

JOINT IMPLEMENTATION (JI) PROJECTS

A JI project is a co-operation between two industrialised (Annex 1) countries. The Kyoto Protocol requires that certain JI projects are subjected to determination and/or verification by an independent entity (IE), i.e. third party verifier such as DNV.



Determination is an assessment of your project design documentation, including the project technology, baseline study, and monitoring plans. It is conducted before the project is implemented. If the host country has not established greenhouse gas inventory and reporting procedures in accordance with the Kyoto Protocol, determination is mandatory.

Verification determines emission reductions or removals generated by your project. It also verifies compliance with applicable Kyoto Protocol criteria. Verification of your JI project is mandatory when the host country does not meet applicable methodology and reporting requirements.

EMISSIONS TRADING

A number of countries have established emissions trading systems as a consequence of the Kyoto Protocol. Trading programmes help countries meet Kyoto commitments and reduce emissions in a cost-efficient manner. Under most programmes, annual emissions and compliance with applicable requirements must be verified by an independent assessor such as DNV.

Annual Emission Verification determines whether your company is in compliance with your annual emissions allowance. DNV has developed a robust audit process for the verification of

corporate greenhouse gas monitoring and reporting systems.

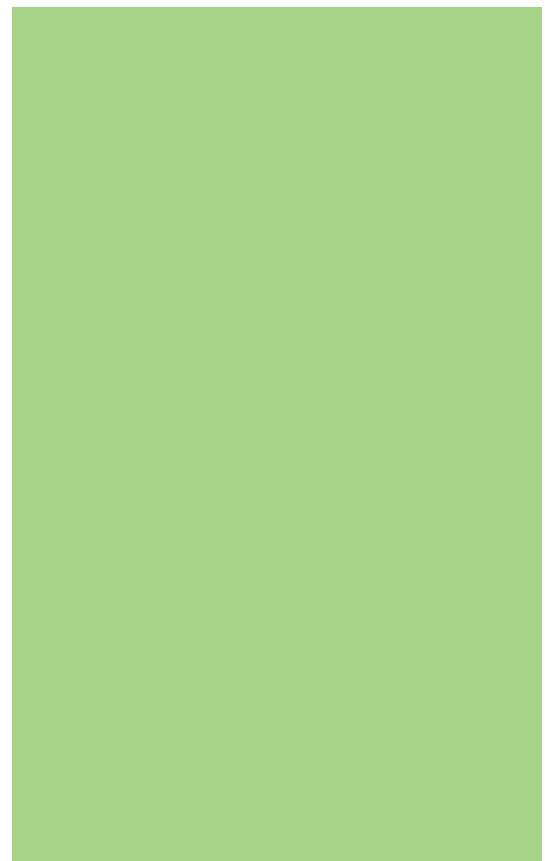
The **European Directive on Emissions Trading** (EU ETS) is the European trading system covering thousands of companies with CO₂ emissions in the energy, metals, minerals, and pulp and paper sectors. Under EU ETS, an annual emission verification is mandatory. This is an assessment of whether your company is monitoring and reporting your greenhouse gas emissions according to the EU guidelines and can include a mid-year review to assess whether you are on track to meet your obligations or not. DNV also offers annual emission verification services for companies under national programmes.

VOLUNTARY EMISSION REDUCTIONS

Voluntary emission reduction actions must comply with certain regulations and standards. This is to guarantee the quality of your projects and actions and to ensure that they generate greenhouse gas offsets or credits. To support the creation of credible voluntary programmes, DNV has taken part in the development of the WRI/WBCSD GHG protocols, the ISO 14064 standards for inventory and project reporting and verification, and the Voluntary Carbon Standard (VCS). DNV provides a range of services related to the above standards and protocols in addition to services related to systems

such as the California Climate Action Registry and Chicago Climate Exchange.

Corporate Inventory Verification by an independent party is the first step as it helps you establish the greenhouse gas inventory of your company. A corporate inventory verification can include a review of your greenhouse gas monitoring and reporting system, an emissions baseline verification, and assessment of your current emissions inventory. DNV has developed a robust audit process for the verification of corporate **greenhouse gas (GHG) monitoring and reporting systems**. The review assesses if your company is monitoring and reporting the GHG emissions as prescribed by the selected criteria, whether company specific or internationally recognised ones, such as the ISO 14064 standard. This is done in advance of the formal verification, allowing time for improvements to ensure that your systems are in good shape before starting emission reporting. A verification of your base year emissions will increase the credibility of the emission data, which may be used by national authorities in future allowance allocations for your company. An independent **emission baseline verification** can provide you with validated arguments that authorities can take into account during allowance allocations. An assessment of your **current emission inventory** gives an



overview of your business' current emissions and your mitigation options.

Verification of project based reductions is a way to verify reductions generated by smaller projects; projects that do not qualify as CDM or JI activities, or projects for which you do not want to go through the Kyoto Protocol mechanisms. Project emission reductions may generate verified emission reductions (VERs) or voluntary carbon units (VCUs) that can be traded in the respective voluntary markets.

Verification of voluntary credits by an independent party enables you to register your voluntary credits in recognised registries. This gives you an opportunity to gain financially from your voluntary project whilst you make a quantifiable contribution to reduce emissions. DNV has experience in all relevant industry sectors and use recognised international standards as verification criteria.

RENEWABLE ENERGY SOURCES

Renewable options such as tidal and wave energy, wind energy, solar energy, and biomass are seen as green solutions to the climate challenge. While wind energy and biomass are viable today, large efforts are put into other energy sources that are commercially competitive. Central to the development of new

solutions is trust that investments made are the best options for the future. DNV contributes to building trust through feasibility assessments, project risk management, qualification of new technology, and other services for managing risk.

WIND ENERGY

Securing safe installation and operation of offshore wind farms is critical. To ensure quality, type certification of the wind turbine is often a contract condition from developers, investors, and/or insurance companies. A site specific project certification by an independent verifier such as DNV can help you identify, understand, and manage risk. The certification covers the total technology solution as well as particular challenges related to the installation. Our wind energy services can help you combine total project safety with efficient installation and operation. Prior to acquisition of a wind farm, a due diligence study will often be required by the investor, which DNV can provide for both on- and offshore wind farms.

ALTERNATIVE ENERGY CARRIERS

Alternative energy carriers are explored as a potential means to build a sustainable society. DNV is participating in international efforts to develop certification schemes that promote the

sustainable production of bio fuels, introduction of hydrogen, and promotion of solar energy.

CARBON CAPTURE AND STORAGE

Carbon capture and storage makes climate change mitigation possible by capturing CO₂ from large point sources into natural storage facilities. DNV offers services related to the development and operation of power plants utilising this mechanism, including the use of enhanced oil recovery from CO₂ injection. The services include development of accepted criteria for decisions on technology and business model, in addition to technology qualification and verification. DNV is developing new guidelines to qualify technologies for natural gas power generation that capture or limit CO₂ emissions. These new guidelines are based on DNV's existing recommended practice "Qualification Procedures for New Technology", which supports energy companies in their efforts to develop, test, and implement novel solutions.

TRAINING

Training can be an important element contributing to the success of your climate change efforts. DNV can also offer customised courses related to our climate change services, such as CDM projects or the ISO 14064 standards.





Why partner with DNV?

DNV is a leading independent greenhouse gas verifier operating globally. We believe in a partnership approach that benefits you and your organisation.

Our greenhouse gas specialists are used by companies, organisations, and governments across a wide range of industry sectors.

With the following qualities, we are well-equipped to satisfy your organisation's greenhouse gas validation, verification, and certification needs:

- DNV is an international foundation, established in 1864, with the primary objective to **safeguard life, property, and the environment**.

DNV has no shareholders, and all net income is invested back into DNV's research and business development projects.

- DNV is a market leader in third party certification and assessment services with a global reputation for excellence. We operate from more than 300 offices

worldwide; our employees speak your language and know your local needs, customs, and markets.

- We have **personnel** with broad greenhouse gas verification, certification, and specific industry knowledge and experience.

- We have developed robust, risk-based audit systems combining financial audit rigour with **technical/environmental expertise**.

- DNV is accredited by the **UNFCCC** (the United Nations Framework Convention for Climate Change) as Designated Operating Entity (DOE) under the **Clean Development Mechanism** (CDM).

We were the first DOE accredited for the verification of all major CDM scopes.

- We are an approved certifier under the **California Climate Action Registry** and the **Chicago Climate Exchange** in the US.

- DNV took part in the development of the WRI/WBCSD GHG project protocols, the ISO 14064 standards for project reductions, and the Voluntary Carbon Standard (VCS).

- We were instrumental in the development of Prototype Carbon Funds (PCFs) and International Emissions Trading Association's (IETA) Validation and Verification Manual.

- DNV was instrumental in developing monitoring, reporting and verification principles for the UNFCCC, the World Bank's PCF and the Dutch GHG programmes.



DNV - PROVIDING TRUST AND CONFIDENCE

DNV is an independent and autonomous foundation working to safeguard life, property and the environment.

We are a knowledge-based company and our prime assets are the creativity, knowledge and expertise of our people.

As a world-leading certification body and a global provider of solutions for managing risk, we work to help our customers safely and responsibly improve performance.

To learn more, visit climatechange.dnv.com
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