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Editor's Note - Keeping the CDM alive

Recently, the CDM Executive Board (EB) announced that it had registered the 6000th CDM project. These projects are located in over 80 non-Annex I countries. Moreover, over one billion Certified Emission Reductions (CERs) have been issued by the Board. Next to projects, the Board also registered 75 programmes of activities. In a nutshell, these figures demonstrate how big the CDM has grown in less then 7 years time after the entry into force of the Kyoto Protocol.

Underneath the figures are several other benefits. First, according to CDC Climat Research (Igor Shishlov, Tendences Carbone, December 2012, No.75), the CDM managed to leverage over US$200 billion of mostly private investment for climate change mitigation. Second, experience with CDM projects has resulted in a large set of methodologies for the accounting of GHG emission reductions. The challenge was to determine baselines for GHG emissions in the absence of CDM projects and to develop procedures for monitoring of the project results. CDM early movers invested in development of such methodologies. In the course of time, the CDM EB invested in consolidating these methodologies for project categories. Similar experience has been built up for determining the additionality of the emission reductions.

It is clear that there is also scope for improvement. There has been criticism that the CDM has resulted in investments that would have taken place anyway. Also, around 5,000 out of 6,000 registered projects are located in five non-Annex I countries only, and least developed countries have benefited relatively little from the CDM. Finally, and related to that, CDM project choices have largely been determined by the potential for low-cost CER generation and less by sustainable development considerations.

The CDM is currently in an uncertain situation. In order to have projects registered before 1 January of this year (and have CERs tradable for, e.g., the EU ETS), designated operational entities had to work day and night. Now that these hectics are behind us, the CDM market profile is rather bleak with a CER price below 2 euro, an oversupply of allowances on a key market for CER trade, the EU ETS, and an uncertain demand for CERs until 2020. Although the second commitment period of the Kyoto Protocol, which was agreed at the Doha COP, contains emission reduction pledges by 37 Annex I countries (14% of global emissions), it is unclear whether this will stimulate CDM credit demand.

At its 71st meeting, the CDM Executive Board adopted a two-year business plan and management plan. With these vision documents, the Board formulates four objectives:

1. To provide for simplicity and predictability in the operation of the CDM and ensure integrity of CERs.
2. To ensure the CDM makes a growing contribution to the mitigation of climate change and sustainable development of host countries.
3. To further expand the geographic reach of the CDM.
4. To promote the use of, and safeguard the reputation of, the CDM as a mechanism for low carbon development.

The Executive Board strategy is to keep the CDM alive during the next years and to prepare the mechanism for times when the market will be back in balance and to make the CDM compatible with a future climate agreement. It is hoped that the Board will be successful with this strategy. Above, it has already been explained that during the first Kyoto Procotol commitment period the CDM generated considerable climate funding in a dynamic carbon credit market and built up knowledge of GHG accounting. Now, there is a considerable risk that skilled and experienced CDM staff leave their jobs at government agencies, private CDM companies and the CDM EB itself. This could already be seen during the final months of 2012 when designated operational entities saw some of their staff switch to jobs with more post-2012 security.

That would be a shame, because it would take ages to bring the knowledge levels back to current levels when a future climate regime needs the CDM back again at full speed.

In this issue

Uncertain Times for the EU ETS – Can the Market Imbalance be Repaired?

On Thursday 24 January of this year, the EU Emissions Trading Scheme (ETS) experienced a price drop to €2.81 per allowance (ton CO_2 emission reduction), which was a 40% decrease in one day. The direct reason for this development was the decision of the European Parliament's Committee on Industry, Research and Energy (ITRE) not to support the European Commission's proposal to retire 900 million allowances from the ETS during 2013-2015 (400 million in 2013, 300 million in 2014 and 200 million in 2015) and bring these back to the market at the end of current third ETS phase (300 million in 2019 and 600 million in 2020). Through this 'backloading' it is hoped that EU ETS prices will recover in the short term.

ITRE's negative position on the Commission's proposal does not necessarily mean that the Parliament will vote against backloading. In fact, ITRE's position serves as an opinion and does not directly influence the Parliament's decision making process. The lead committee on the backloading proposal is the Committee on the Environment, Public Health and Food Safety (ENVI), which will vote on the proposal on 19 February of this year. Should ENVI support the retiring and backloading of allowances, then the European Parliament will have a plenary vote in March or April of this year. That will not be the end of the process though, as negotiations will then start with the European Council of Ministers. The outcome of those negotiations remains uncertain since some Parties may want to delay the decision for several reasons (e.g., Poland for its coal-intensive energy mix and Germany for its elections in September of this year).

Medium term risk

The implication of the voting process on the backloading proposal for ETS market prices remain thus unclear. The 24 January price drop was generally considered an overshooting (partly caused by stop-loss positions at €5 which triggered automatic sales without generating extra demand) which was corrected on the same day when ETS prices climbed back to levels above €4 per allowances. Observers also expect that the ENVI committee and hence the European Parliament will eventually support the Commission's backloading proposal[1], but the uncertainty about how the Ministers will decide on the proposal creates a medium term risk.

It is clear though that without any structural measures to bring supply and demand back in balance on the ETS, prices will remain low and stay far below the €30 to €40 per allowance level that were expected for the third ETS phase to trigger a large-scale switch from CO_2-intensive to low emission technologies within Europe. For instance, in its "Report from the Commission to the European Parliament and the Council" of November last year,[2] the European Commission explained that during the second phase of the ETS (2008-2012) supply of issued allowances and used credits from JI and CDM projects amounted to 8,720 million whereas installations' cumulative emissions during this period (i.e., demand for emission allowances) amounted to 7,765 million tonnes CO_2-eq. In other words, the second ETS phase had an oversupply of 955 million allowances. Only in 2008, before the global economic crisis began, emissions were higher than allowance supply (24 million tonnes).

As a consequence, price development on the ETS market has shown a downward trend during 2008-2012 with an acceleration from almost €30/allowance around mid-2008 to less than €10/allowance early 2009 and from €17 in May 2011 to € 5/allowance in January 2012 (which was related to the accelerated build-up of JI and CDM credits supply on the ETS market). In between of these accelerations, prices remained stable around €15/allowance from May 2009 until May 2011.

Two billion surplus

In order to scale up the ambition level of the ETS, a number of changes were agreed in 2008 for application in 2013:

- Instead of national emission caps, as during the second phase of the ETS, the third ETS phase will have an EU-wide cap on allowances. This cap is based on verified emissions during 2008-2012 and will be reduced by 1.74% per year.
- The majority of allowances will be distributed

[1] EurActive, *EU Carbon Market in 'freefall' after backloading vote*, 25 January 2013 <http://www.euractiv.com/climate-environment/eu-carbon-market-hit-fresh-low-b-news-517347>
Reuters, *EU carbon market hit fresh low after backloading vote*, 24 January 2013 <http://www.reuters.com/article/2013/01/24/us-eu-ets-idUSBRE90N0EG20130124>
Interfaxenergy.com, *Backloading proposal 'likely' to find support in Parliament*, 31 January 2013 <http://interfaxenergy.com/natural-gas-news-analysis/european/backloading-proposal-likely-to-find-support-in-parliament/>

[2] European Commission, 2012, Report from the Commission to the European Parliament and the Council - the state of the European carbon market in 2012, 14 November 2012, COM(2012) 652 final

across installations through auctioning.
- In cases where allowances are allocated for free, this will be based on performance benchmarks.
- The use of credits from the Kyoto mechanisms is further restricted.
- There will be one single EU-wide registry for allowances and emissions.

With these changes, it was intended to make the scheme more harmonized across the Member States and to tighten the supply of allowance thereby creating upwards pressure on the prices. However, as the European Commission concludes in its note to the Parliament and the Council, these pre-economic crisis measures will not prevent that also during most of the third ETS phase there is likely to be a surplus of allowances. The latter is largely due to surpluses from the second ETS phase that are carried over to the third phase. The European Commission estimates that during 2013-2020 the cumulative surplus of allowances could amount to approximately 2 billion, although it is assumed that from 2014 onwards the annual increase of surpluses will slow down.

Structural revision for longer term goals

One possible solution to reduce the surplus, at least in the short run, is to retire allowances by postponing the auctioning of 900 million allowances during 2013-2015 and bring these back into the system during 2019-2020 ('backloading'). This option has been discussed above and is subject to a current voting procedure in the European Parliament. Although backloading would in the short run strongly reduce the allowance surplus, it would not solve the problem of a structural surplus during the third ETS phase. Therefore, the Commission has identified, in its note to the Parliament and the Council, a number of structural surplus reduction options:

- Increase of the EU GHG emission reduction target to 30% in 2020 as this would need a consequential amendment to the quantity of EU ETS allowances. This could be done by retiring an estimated amount of 1.4 billion allowances from the scheme or a revision of the annual cap reduction.
- Permanently retiring a number of allowances during the third ETS phase. This would imply a reduction in the quantity of allowances available for auctioning. As a consequence, this option would result in a GHG emission reduction within the EU that goes beyond the -20% target in 2020.
- Early revision of the annual linear CO_2 emission reduction factor. As explained above, during 2013-2020 the emission cap for ETS installations will decrease by 1.74% per year. According to the ETS Directive, the reduction factor will be reviewed as from 2020, and this option would imply a revision already during the third phase. The European Commission note explains that such a revision would also bring GHG emission reduction trends in the EU in line with the longer term climate goals, such as the 80-95% emission reduction target in the EU Climate Roadmap for 2050. With a continuation of the current annual reduction schedule of 1.74% during and after the third phase, EU GHG emissions would be 'only' 70% below 1990 emissions in 2020.
- Extension of the ETS to other sectors. According to the Commission, emission reductions in ETS sectors have been stronger than in non-ETS sectors (for instance, 11% vs 4% in 2009). One option to extend the ETS scope to other sectors could be to include energy related CO_2 emission sources in non-ETS sectors within the scheme.
- Limit access to credits from international carbon markets. The Commission estimates that without access to JI and CDM credits, the surplus of allowances during the period 2008-2020 would have been only 25% of the presently expected surplus (see also above). In this option, access to international credits would be limited (or even excluded) whereby temporary demand increases could be softened by the present allowance surplus. More structural price increases could then lead to more flexible access to international credits again (or to non-ETS projects as described in Art. 24a of the ETS Directive).
- Discretionary price management mechanisms. Options for such mechanisms are: a price floor during the auctions and depositing of a certain amount of allowances in a reserve in case of a temporary demand-supply imbalance.

Climate policy patchwork

Each of these options would imply a significant impact on the current ETS legislation and would require support from policy (European Parliament and the Council) and through this from the market itself. In that respect the current voting process in the European Parliament about the backloading proposal could be considered a case study for the feasibility of any of these options.

After the ETS price drop on 24 January, several observers pointed out scenarios in case nothing was done to restore the current ETS demand-supply imbalance. For instance, with a practically inactive ETS, Member States would have to formulate national climate policy measures again for meeting future climate goals which would go against the past trend of harmonising EU climate policy making. As EU Commissioner Hedegaard pointed out: "The alternative is a re-nationalisation of climate tools, meaning a future patchwork of up to 27 different systems and taxes instead of one market creating a level playing field internally in Europe."[3]

[3] EurActive, *EU Carbon Market in 'freefall' after backloading vote*, 25 January 2013. http://www.euractiv.com/climate-environment/eu-carbon-market-hit-fresh-low-b-news-517347

Further Development of Domestic offsetting in Germany[1]

by Carsten Warnecke and Sina Wartmann[2]

Introduction

The number of Joint Implementation (JI) projects in various Western European countries is significant, although the initial focus was to jointly develop emission reduction opportunities in Central and Eastern Europe. Currently, 25 JI projects are registered in Germany with a high share of small scale energy efficiency projects using the "Programme of Activities" approach. Several activities are carried out unilaterally and are thus considered as domestic JI projects.

Domestic JI has developed to an important instrument supplementing national policies with various advantages including its innovation potential, the private sector investments and the activated search for unregulated reduction potentials. Unfortunately, the continuation of this instrument is uncertain. Beside general uncertainty on the future of the JI, the current German JI law states the end of 2012 as end date for JI in Germany.

Against this background, the German Emission Trading Authority (DEHSt) assigned Ecofys to conduct a research project that aims to increase the acceptance of the existing domestic project opportunities by enhancing the integrity of the mechanism. In this respect Ecofys developed criteria and options for the possible design and further development of the JI mechanism or an alternative project-based mechanism for Germany which goes "beyond pure offsetting".

Further developments of the existing domestic JI, as well as possible implications in case of the discontinuation of JI, were considered. This included the implementation of a mechanism under Article 24a of the EU ETS Directive. In particular, the research

- analysed approaches for net emission reductions in project host countries,
- provided a basis for the development of further quality criteria for projects and
- suggested optimisations regarding the level of demand on certificate markets.

This article explains how the research aimed for profound general assessments which provides a basis also for the identification of methodological approaches suitable for future mechanisms. While no agreement on discounting in the CDM has been reached, the UNFCCC level decisions require, e.g., net reductions ('net mitigation effects') to be ensured in the framework for various approaches and for a new market-based mechanism. The further development of domestic offsetting approaches can in this way lead to important insights also for the methodological design of new market-based mechanisms.

Concepts for the realisation of Net-Mitigation-Effects

Project-based mechanisms are typically a "zero-sum-game" for global emission levels. JI projects do neither contribute to achieving national reduction targets under the Kyoto-Protocol because issued Emission Reduction Units (ERU) have to be backed with Assigned Amount Units (AAU). In addition, some host countries are concerned that JI projects harvest cheap mitigation potentials which will be unavailable for the host country later on. A further concern is that project baselines might not consider ambitious emission reduction paths for the country and thus could lead to issuance of more ERUs than adequate.

Addressing the above concerns, the study introduced the term "Net-Mitigation-Effect" (NME) which is defined as the amount of achieved emission reductions by mitigation activities which are not issued as offsets to project developers. Instead NMEs contribute to achieving reduction targets by host countries, thus also allowing countries to adopt more stringent targets. Today only a few mechanisms and approaches exist which actually generate net emission reductions. In recent years, no agreement was reached for the application of discounts in the CDM which was debated for various objectives. However, the recent mechanism developments indicate that contributions to net emission reductions in host countries will become mandatory in new mechanisms such as in

[1] This article is based on the research project "Project-based mechanisms for climate protection in Europe: Net-mitigation-effects and further development of the Joint Implementation (JI) Mechanism" (FKZ 3711 41 501) funded by the German Emissions Trading Authority (DEHSt). The opinions expressed in this article, however, are the authors' and do not reflect, necessarily, the views of the German Emission Trading Authority. The full report will be published soon.

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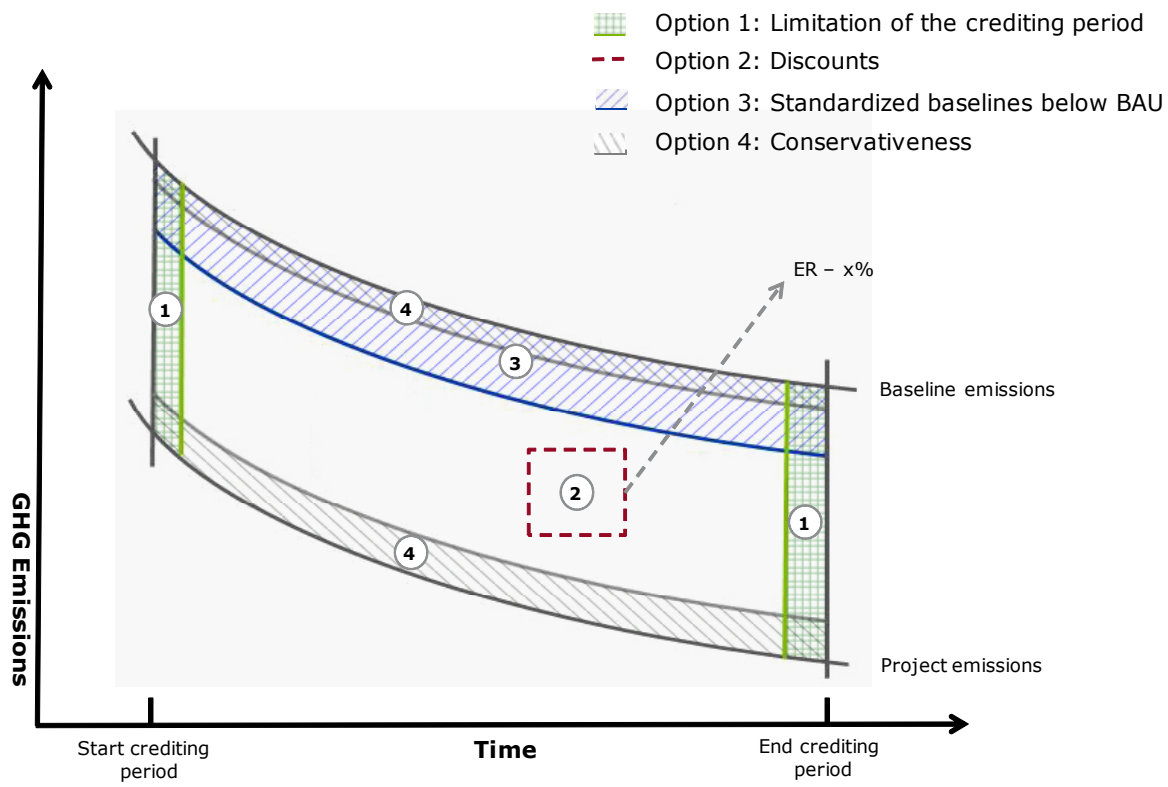

Figure 1. Effects on the offset generation through approaches for achieving Net-Mitigation-Effects

the framework for various approaches, a new market-based mechanism and even in a reformed JI.

The research followed an open outcome process and analysed a broader selection of potential NME approaches. The most relevant approaches were assessed against different scenarios for domestic offsetting in Germany. Based on thorough evaluation of experiences with existing examples, the study developed criteria to assess the strengths and limitations of different approaches.

The following four Net-Mitigation-Effect approaches were analysed whose effects on the offset generation of a reduction project are shown in Figure 1:

1. Limitation of the crediting period: crediting periods which are shorter than the period in which projects are operational and have a baseline lead to NMEs.
2. Discounts: the application of discounts means a certain percentage of certified reductions of project activities are not rewarded with carbon credits.
3. Benchmarks / standardised baselines: standardisation facilitates setting baselines or benchmarks with emission levels below the business-as-usual (BAU) emissions. The difference between actual and benchmark baseline emissions represents the NME.
4. Conservativeness: conservative methodological approaches ensure that reductions are underestimated rather than overestimated. If the safety deductions exceed the scientifically justified level, this "over-conservative" approach provides an NME.

Analysis results show that in the context of domestic JI the application of discounts on the supply side and the application of standardised baselines below BAU are most promising. An NME generated by discounts is most accurately and efficiently quantifiable while the study identified problematic interactions for other options which are initially designed to serve specific purposes different from the NME generation. Furthermore, consideration of individual niche project capabilities is required to preserve the mechanism's attractiveness. Project-by-project determination of NME contributions seems thus desired but impractical. In addressing this, the study suggested an approach for efficient standardised implementation which is based on the current investment analysis.

Further quality criteria for project-based mechanisms

Where projects benefit from a domestic project-based mechanism, they should ensure that no negative side effects occur. If they lead to co-benefits, they even go "beyond pure offsetting". These objectives can be achieved with application of additional quality criteria for projects. The study analysed requirements for criteria in Germany including their potential implementation. Results show that negative lists of

project categories should be complemented by an individual catalogue of criteria.

For general sustainability criteria of projects in Germany, a proposal was developed based on the German Sustainability Strategy. For specific biomass sustainability criteria, the use of suitable existing standards is recommended. Implementation and compliance control should aim for cost-efficient approaches which can, for example, be achieved by applying ex-ante assessments where possible and requiring ex-post MRV only where necessary. In case continuous MRV is unavoidable, pragmatic approaches preferably based on existing standards should be applied. Quality requirements should furthermore only address issues that are not already addressed by national or EU legislation and should lead to adjustments of legislation whenever possible. A domestic project-based mechanism can, however, contribute to the identification of gaps and by showing novel approaches that go beyond minimum requirements.

Demand side optimisation

Success of project-based mechanisms requires that sufficient demand exists for the generated carbon credits. The current JI-based domestic project approach generates ERUs for which the demand and respective prices decreased to insufficient low levels. The study therefore developed and discussed proposals to optimise the demand situation for a domestic offsetting mechanism and to incentivise future activities based on this instrument. While new demand resulting from generally increased ambition levels is not specific to reduction units generated by a domestic mechanism, alternative opportunities might allow using the additional quality of domestic approaches that go beyond pure offsetting.

Preference can be given to domestic offsets if they are distinguished from international reduction units, e.g., with the introduction of quota or limitations. In this case, the use of international offsets is further limited to a level below the currently existing restrictions and the volumes between the new and the original restrictions could be filled with domestic offsets only. Enabling the voluntary market also offers additional demand opportunities and might provide good conditions to highlight and use the additional values of a domestic standard with high quality. This option requires the cancelation of AAUs for the amount of verified emission reductions (VERs) issued but seems possible. A government purchase programme, in which the government hosting the mitigation projects sets up an own framework in which project proposals are validated, approved and verified, provides also interesting opportunities and might even be cost-effective.

Conclusion from the study

The study concluded that additional contributions from domestic offset projects are desirable but that this can affect the feasibility of projects. Implementation should therefore follow cost-effectiveness principles to avoid increasing transaction costs. Demand strategies should additionally be developed to facilitate the marketing of contributions which are "beyond pure offsetting". With balanced requirements aiming for a high integrity and new markets the instrument of domestic offsetting can also in the future contribute to innovative mitigation approaches supplementing existing policies and measures.

Green gas plant. Photo courtesy of Energy Valley

Technology Needs Assessment (TNA) for Climate Change Mitigation and Adaptation for Montenegro*

by Marina Markovic and Wytze van der Gaast**

From May 2011 through October 2012, the Technology Needs Assessment (TNA) Montenegro project was implemented by the Ministry of Sustainable Development and Tourism (Division for Support to the National Council for Sustainable Development). The project was supported by the Netherlands Ministry of Infrastructure and Environment through the Government-to-Government (G2G) programme. Project execution was done jointly by NL Agency and the Ministry of Sustainable Development and Tourism in Montenegro, in collaboration with Marina Markovic (TNA coordinator) and Wytze van der Gaast (JIN).

The goal of the TNA project was to strengthen the capacity of the Government of Montenegro and other relevant stakeholders to define low emission and climate resilient development strategies by prioritising technologies that will ensure:

- Highest benefits in terms of short, medium and long term economic, social and environmental improvements;
- Contribution to GHG emissions reduction in the context of national, EU and UNFCCC policies; and
- Contribution to increased resilience to climate change in priority sectors.

The TNA Montenegro project was supported by a consultative process with various stakeholders, such as representatives of ministries competent for climate change and related issues (energy, transport, water resources management, forestry, etc.), relevant agencies and institutions (such as Environmental Protection Agency, Forest Administration, Hydro-meteorological and Public Health Institutes, etc.), local self-governments and the business sector (energy, industry, forestry, tourist organisations), as well as experts from university, non-governmental and international organisations. Overall, more than 50 individuals from these institutions and organisations participated in different project activities.

As described in JIQ (April 2012, p.3-7), identification of development priorities in Montenegro in the context of climate change and of priority sub-sectors for mitigation and adaptation were the initial steps in the TNA process (August-November 2011). The next step referred to identification of appropriate technologies and measures for mitigation and adaptation within these sub-sectors (December 2011 – March 2012). For that, a long list of possible technologies was created within different categories (technologies available in the short or medium to long term and applicable on a small or large scale). Subsequently, stakeholders were familiarised with these technologies within the Montenegrin context which formed the basis for selecting priority technologies. This prioritisation was done by assessing technologies' contribution to economic, social and environmental development and climate change mitigation and adaptation, thereby assuming deployment and diffusion of technologies at full technical potential in the country (see Table 1 for details about prioritised technologies for mitigation and their assumed potential emission reduction and estimated costs).

The final stage of the TNA Montenegro process (April-October 2012) contained the formulation of a national low emission and climate resilient strategy and action plan for strategy implementation. For that, the following steps were conducted. First, the desired scale of technology implementation in Montenegro was further detailed (differing from earlier assumed technical potential) by identifying specific objectives per sector for each priority technology. Second, (system) barriers were identified which currently slow down or prevent development, deployment and diffusion of new technologies and approaches within Montenegro. Third, measures were identified to solve these barriers and create an enabling environment for deployment and diffusion of priority technological options at the desired levels. These steps are explained in further detail below.

* This article is based on the report "**Technology Needs Assessment for Climate Change Mitigation and Adaptation for Montenegro - National Strategy and Action Plan Final**" <http://www.mrt.gov.me/en/library/strategije >

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Table 1. Priority technologies for climate change mitigation with estimated emission reduction potential, assessment of benefits, deployment objectives and costs.

Sub-sector/ prioritised technology	Potential for mitigation in Mt (for 25 y)	Result of TNAssess - benefits	Objective (aspirational level of deployment)	Estimated total costs over 25 years in € (for set objectives)
Sub-sector: Energy supply				
Small HPP	11.05	309	420 GWh annually (92 MW installed capacity); 10 - 15% of total supply	228,969,600
Solar photovoltaic panels	0.4	241	50 MW	191,226,750
Solar thermal plants (STP)	0.96	Not done	50 MW	244,182,100
Plasma gasification	2.83	Not done	70 MW	1,199,519,300
Sub-sector: Energy consumption				
Solar systems	0.18	273	80% of all households (individual buildings); widespread use in collective housing and in service sector	384,196,613
Insulation of buildings	0.03	222	90% of the total housing stock	1,288,568,925
Efficient air-conditioning	0.02	Not done	All commercial buildings, 50% of housing units	280,156,814
Automated control of energy consumption in buildings	0.28	Not done	All public institutions and large commercial buildings, app 50% of large housing objects (collective housing)	258,596,250
Sub-sector: Transport				
Public transport improvements	Not done	Not done	System enhancement and doubling the number of passengers by 2025	Not estimated
Liquefied petroleum gas	0.027	Not done	30% of the entire vehicle fleet	49,500,000
Bike lanes	Not done	Not done	Development of cycling infrastructure in urban centres and expansion/ linkages to national and regional networks	Not estimated
Electric vehicles	0.027	207	3% (or 9,000 vehicles) of the total number of private vehicles at the end of 25 years	393,300,000
Plug-in hybrids	0.009	168	1,7% (or 5,000 vehicles) of the total number of private vehicles at the end of 25 years	180,000,000
Intelligent transport system	0.134	Not done	The system covers main transport centres	21,000,000
Sub-sector: Aluminium production				
Increasing the efficiency and operating temperature in electrolysers	3.525	Not done	All electrolysers over the course of 25 years	2,167,200
Alumina point-feeding and better process control	3.525	Not done	All electrolysers over the course of 25 years	5,569,200
Inert anodes	3.525	Not done	All electrolysers over the course of 25 years	20,066,250

* TNAssess is a multi criteria software tool in MS Excel that was used for prioritising climate technologies

Desired scales of deployment and diffusion of prioritised technologies

The determination of the desired scale of development and transfer of prioritised technologies within the country was based on official documents and stakeholder consultation. For instance, in the energy supply sub-sector the desired scale for solar photovoltaic panels and solar thermal power plants[1] was determined at 100 MW of installed capacity in Montenegro during a period of 25 years (assumed timeframe in the TNA project). Together with small-scale hydropower plants (using the target in the updated Energy Development Strategy for Montenegro), installed solar-based installed capacity could, within the next 25 years, reach 200 MW (cost: €26 million/year[2]). Such a capacity is close to the current capacity of the thermal power plant Pljevlja and slightly less than a quarter of the country's currently installed power capacity. Should this desired scale for small-scale hydro and solar technologies be achieved, then GHG emissions could be reduced by more than 15 Mt (compare: in 2009 Montenegro's GHG emissions were less than 5 Mt).

Together with application of priority technologies for energy efficiency (insulation of buildings, use of efficient air conditioners, automated energy management in buildings), such development in the energy sector would have significant benefits for Montenegro (e.g., reduced energy imports, harmonisation with EU climate policies, market development for renewable and energy efficiency technologies, reduced pollution, and improved living comfort). However, for the strategy, the TNA consultation also concluded that these benefits are difficult to achieve with the development of the second block of TPP Pljevlja (a plan that is currently receiving renewed attention and is being promoted by the updated Energy Development Strategy).

Likewise, mobilisation of necessary financial resources for incentives for low emission energy technologies

[1] These technologies are now at the very beginning of entering the market in Montenegro. According to the results of 2011 population census, for example, only 109 out of the total number of 247,000 housing units have had the equipment for solar energy utilisation. The Montesol project which is being implemented since last year provides favourable conditions for instalment of solar collectors; so far, around 100 households have used this support. There is also a programme of support for instalment of solar equipment at remote mountain summer cottages (where the state finances 70% of the total cost of installation).

[2] Capital and operational costs, not taking into account expected lower prices of solar technologies over the time.

can hardly be achieved if support (through direct or indirect subsidies) for energy and emission intensive industries such as aluminium production is continued.

Similar considerations were formulated for the TNA strategy for road transport and for aluminium production. More details about these can be found in the final report (see footnote *).

The TNA strategy for priority adaptation sub-sectors is complementary with relevant sectoral policies and goals and is mainly based on technologies and measures that will: a) contribute to a rational use of water, land and forest resources and to preservation of their quality; b) strengthen the public health sector to provide adequate responses in the climate change context; c) provide adequate support with adaptation to agricultural producers; and d) strengthen structures for integrated management in the coastal area.

TNA strategy and action plan implementation

A final step in the formulation of the TNA strategy for Montenegro was to identify barriers to the acceleration of development and transfer of prioritised technological options and select measures to solve these. For an action plan for strategy implementation,[3] these acceleration measures were characterised in terms of responsibilities for their implementation, time frame, costs, and monitoring and reporting requirements. The measures were first identified at the level of a technology for implementation at desired scale and then aggregated across technologies at the sectoral and the national level.

Measures identified by the stakeholders as relevant for multiple sub-sectors and the ones that should be paid special attention are:

- Fiscal (lowering of VAT and customs rates) and financial (subsidies, favourable loans) incentives;
- Awareness raising and educational campaigns;
- Trainings to transfer and disseminate necessary specialists knowledge and skills;
- Discouraging unsustainable behaviours (by adopting and implementing appropriate instruments, regulations and standards);
- Improved cooperation and coordination among competent institutions, as well as with other stakeholders (private sector, scientific and research community, civil society);
- Enhancing databases and information systems; and
- Conducting studies, analyses and research for better understanding of implications of climate change for economy, society and the environment.

Adoption of national climate policy and systematic integration of climate change concerns into sectoral policies are very important for the implementation of the TNA strategy and action plan. Even though these processes are beyond the scope of the project, the TNA represents a significant contribution to both formulation of climate policy and integration into sectoral policies because it offers concrete analyses and parameters which can be used by decision makers to evaluate different alternatives and opt for appropriate solutions. The EU integration process will represent an important impetus for the implementation of the TNA strategy and action plan since TNA results are based on the same premises as the European climate change mitigation and adaptation policies.

Implementation of TNA results and recommendations will have synergetic effects for a range of national policies and programmes, such as, for example, the recently adopted objective of 33% share of renewable sources in total energy consumption and energy efficiency programmes. A very important role for the TNA implementation is also played by transfer of internationally available knowledge through networking and cooperation at all levels, including local levels (cooperation of municipalities with corresponding partners in other countries) and the level of scientific and research centres. It is also necessary to mobilise local knowledge as an important resource and to apply it in a way that serves the function of acceleration of technology deployment.

As for financing of the deployment and diffusion of priority TNA technologies, a strong and unambiguous state support is needed, both through provision of financial incentives and participation in project funding, as well as through adequate policy making and implementation. Local self-governments are also in a position and need to contribute, within the limits of their competencies. Mobilisation of financial resources of the private sector is exceptionally important, and can be done, among other ways, through public-private partnerships and through creation of favourable conditions for investments. International climate funds and bilateral assistance represent yet another channel for raising part of the necessary funds for deployment of TNA technologies. International financing institutions (especially EBRD) are also important.

Conclusions and recommendations

The TNA process has contributed to awareness raising on climate change in Montenegro and has demonstrated importance of participation of different stakeholders for generation of additional knowledge

[3] The action plan has been compiled from the following groups of measures (for various sub-sectors/technologies): 1) networking; 2) policies and instruments for their implementation; 3) organisational and behavioural change; 4) market, system support and financial services; 5) training, education and development of skills; and 6) international cooperation and intellectual property rights

Box 1. Pilot/ demonstration projects identified in the TNA for strategy and action plan implementation

- **Organisation of workshops and preparation of manuals** for making and installing solar collectors (while integrating guidelines for protection of space and the environment)
- **Mojkovac as a pilot municipality for achievement of climate and development goals by using RES and EE technologies**: preparation and implementation of several small scale projects (small hydropower plant on gravitational water supply system, efficient public lighting, solar and other RES technologies for supplying electricity to remote households not connected to grid, and similar) that would have a demonstration character and are recognised in the local Green Agenda; researching possibilities for construction of solar thermal power plant at the location of restored mining tailings
- **Feasibility study for development of bike lanes in Podgorica** with proposal of the most feasible solutions (pilot lanes) in accordance with existing spatial plans
- **Pilot project for using electric vehicles/ buses in public transport** with mobile charging stations with solar panels
- **Preparation of pollination map**, including survey of the existing conditions (measurements and organisation of data), strengthening of cooperation among expert services (health, meteorological, forestry, spatial planning) and creation of preconditions for prevention and treatment of pollen related illnesses
- **Analysis and assessment of vulnerability of agricultural producers** for extreme weather conditions and climate change in general
- **Preparation of study on coastal area wetlands** (significance for reduction of vulnerability to climate change in coastal area, links with Natura 2000, degree to which they are endangered and necessary protection measures)
- **Research on vulnerability of different types of forests** to climate change.

and information and for the quality of overall results. TNA results encapsulated in the strategy and action plan can be used to support preparation of documents such as the Second National Communication, National Sustainable Development Strategy (the review of which is forthcoming), NAMAs and NAP.

The TNA has informed decision makers on advantages and disadvantages of different approaches and on implications of climate change for future development. At the same time, a portfolio of priority technologies is recommended to relevant institutions, together with the action plan for acceleration of their deployment. It is up to the government to make choices regarding the manner and dynamics of implementation of TNA recommendations based on available administrative, technical and financial capacities. TNA also defines a set of actions and measures where stakeholders other than administration have the key role in their implementation.

The majority of technologies prioritised in the TNA process are short term technologies, which means that they are well known commercial technologies present at markets. Systematic effort for creation of enabling environment is necessary if deployment of these technologies is to be accelerated. At the same time, importance of research and development has been emphasised to support deployment of short term-available technologies in Montenegro (pertaining to further research of potential, collection of data and vulnerability assessments, the need to adjust to local conditions and similar) and especially for medium to long term technologies.

The TNA strategy and action plan complement several of the current programmes and projects in the areas of climate, energy and other policies and a growing number of initiatives to direct the country's development towards low emission technologies and green economy. At the same time, TNA Montenegro indicates that attainment of development, climate and EU integration goals is possible if the current practice of favouring emissions and energy intensive projects and solutions is modified and support redirected towards new technologies that contribute to achievement of sustainable development goals and generating higher total benefits.

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APRAISE - Analysis of Differences between Environmental Policy Expectations and Realisations

An important challenge when designing an environmental policy is to formulate expectations of what the effect of a policy will be and to minimise the deviation between these expectations and the eventual outcomes. This challenge is addressed by the EU-funded research project APRAISE (Assessment of Policy Interrelationships and Impacts on Sustainability in Europe), which is carried out by a European consortium under the EU Seventh Framework Programme, during 2011-2014 (see http://apraise.org for an overview of the consortium members).

As explained before in JIQ (July 2012), the APRAISE project has developed a methodology (APRAISE 3-E method) to assess for a range of environmental policy case studies the differences between expected and observed effects and to explain these differences. For that, the project first identifies the policy instruments used for the policies formulated for each case study. Departing from the knowledge of / assumptions about the efficacy of these instruments (based on theory, experience with the instruments in other but comparable circumstances, etc.), expected impacts of the policy can be formulated.

These expectations can then be compared with the observed effects of the policy so that conclusions can be drawn about whether and how the effectiveness of a policy deviates from the expectations based on the efficacy knowledge of policy instruments. In APRAISE, these conclusions are specified in terms of:

- Have policy instruments applied in the policy area of the case study worked in the expected direction?
- Has the strength of the policy instruments towards achieving a target been as strong as expected?
- Has the end result of the policy instruments been in accordance with the expected results?

With this analysis of the deviation between expected and observed functioning and effects of environmental policy instruments, the APRAISE consortium aims at explaining the deviation and which mechanisms have caused this. To this end, the APRAISE 3-E method:

1 Defines a case study as a system with policy instruments and stakeholders (e.g., plastics recycling in an EU Member State),
2 Generates expectations about the result of a policy (e.g., 55% of plastic packaging material will be recycled within 10 years) and describes the efficacy of the policy instruments used for that (e.g. taxes, public campaigns, voluntary agreements),
3 Describes actual results, either intermediate or final results, and observes deviations from expectations in terms of direction, strength and outcome of policy instruments used,
4 Explains these deviations by analysing: whether the political and economic context has been different from what was expected before policy implementation, whether policy (instrument) implementation has been different from what one might expect based on efficacy knowledge, and whether there have been positive or negative interactions with other policy areas and instruments (either environmental or socio-economic) which has affected the effectiveness of the policy instruments concerned,
5 Engages with stakeholders from the case study fields to discuss these observations, and
6 Feeds the lessons learned into general knowledge of efficacy of environmental policy instruments for improved application also in other contexts.

The detailed methodology can be downloaded from the APRAISE website: http://apraise.org/sites/default/files/apraise_d2.2_0.pdf. It will be applied for case studies in different member states in the areas of renewable energy (wind, bioenergy, hydro), energy efficiency (buildings, energy production), resource efficiency (recycling of waste, water).

http://apraise.org

Diekmann, J., 2013. EU Emissions Trading: The Need for Cap Adjustment in Response to External Shocks and Unexpected Developments?, Environmental research of the German Federal Ministry of the Environment, Nature Conservation and Nuclear Safety, Project-no. (FKZ) 3711 41 504 <http://www.uba.de/uba-info-medien/4399.html>

This paper discusses the advantages and disadvantages of the various adaptation options from an economic perspective. Firstly, the criteria for identifying a need for potentially legitimate adaptation are investigated. Furthermore, the issue of appropriate timely intervention points prior to or within the trading period are discussed by posing the following questions: in what periods and scenarios are adjustments to the cap worthwhile from an economic perspective?; to what extent could minimum prices or price ranges make sense?; what role could a strategic reserve play?. By addressing these issues, the paper discusses as to how the emissions trading scheme could be further developed and strengthened by greater flexibility.

Ecorys, Climate Focus, ECN and Wuppertal Institute, 2012. Design Options for Sectoral Carbon Market Mechanisms, Clima.B.3/SER/2011/0029 <http://ec.europa.eu/clima/policies/ets/linking/docs/study_20120831_en.pdf>

This report includes an assessment of different elements and features for the design of the New Market Mechanism (NMM) under the UNFCCC. Based on this assessment, three coherent packages of design elements have been compiled as proposals for the (potential) design of the NMM. These three design proposals have been analysed in five case studies, in which the emission reduction potential of the NMM has been assessed for several policy scenarios in certain country/section combinations. Next to the assessment of the emission reduction potential of the NMM, the project team has conducted interviews with carbon market observers and sector representatives to verify the feasibility of and to receive feedback on the design proposals.

Ellison, D., H. Petersson, M. Lundblad and P-E Wikberg, 2012. The Incentive Gap: LULUCF and the Kyoto Mechanism before and after Durban, Global Change Biology Bioenergy (2012) <http://onlinelibrary.wiley.com/doi/10.1111/gcbb.12034/pdf>

This paper argues tha t LULUCF under the UNFCCC, Kyoto Protocol (KP), European Union (EU) and national level emission reduction schemes considers only a fraction of its potential and fails to adequately mobilize the LULUCF sector for the successful stabilization of atmospheric GHG concentrations. It argues that modifications at COP17 in Durban have partially addressed this, but leave room for improvement. The presence of an Incentive Gap continues to justify reform of the LULUCF carbon accounting framework; some 75% or more of potential forestry-based carbon sequestration is not effectively incentivized or mobilized for climate change mitigation and adaptation. This paper expand earlier analysis by the authors of the Incentive Gap to incorporate the changes agreed in Durban and encompass both a wider set of countries and a larger set of omitted carbon pools.

High-level panel on the CDM Policy Dialogue, 2013. Several reports available at: http://www.cdmpolicydialogue.org/research

The high-level panel on the CDM policy dialogue based its deliberations and recommendations on a combination of stakeholder meetings and a research programme that collected data and input on specific issues identified as priorities for the panel. The research programme outlines the questions that the panel focused on, and also reflects the structure of the research areas. A range of project reports are available on the website in the areas of: impact, governance, future context, financial and accounting issues, CDM strengths and weaknesses, sustainable development impacts, role of CDM in future credit trading, linking CDM with new and emerging carbon markets, REDD+ in CDM and development of global carbon markets.

Kachi, A., D. Taenzler, W. Sterk, 2012. Prospect for CDM in Post 2012 Carbon Markets, Discussion Paper, German Emissions Trading Authority (DEHSt) at the Federal Environment Agency < www.dehst.de>

This report provides an analysis of Australian, Californian, South Korean and Japanese offset policies. The paper examines the future role of the CDM as an instrument of carbon finance and explores the differences between the CDM and new emerging offset approaches. The report draws conclusions regarding the possible markets for CERs in the post 2012 period and discusses the question if and how a reformed CDM can build a bridge between emerging and existing emissions trading systems.

Schneider, L., D. Broekhoff, J. Fuessler, M. Lazarus, A. Michaelowa and R. Spalding-Fecher, 2012. Standardized Baselines for the CDM – Are We on the Right Track? Policy paper, November 20, 2012 <http://www.sei-international.org/mediamanager/documents/Publications/Climate/Policy-paper-2012-Standardized-baselines-CDM.pdf>

Drawing on the lessons learned from standardization in CDM methodologies and other schemes, this paper recommends avoiding the use of one single methodological approach for different sectors, project types and locations, and exploring more practical, robust and data-driven approaches that are developed for specific project types. The development of such approaches should be based on actual projects and reflect the particular circumstances of the sector, project type and location. The authors further recommend that standardized baselines should be mandatory once approved, but to carefully select for which purposes, sectors, project types and baseline emission sources standardized baselines are used. They also recommend review, road-testing and impact assessments of proposed approaches prior to approval, in order to ensure the overall quality, practicability, effectiveness and robustness.

Scotney, R., L. Gilchrist, G. Phillips and S. Haefeli-Hestvik, 2102. CDM in Crisis – What is at Stake? A Project Developer's perspective on the past, present and future of the Clean Development Mechanism (CDM), a paper produced on behalf of the Project Developer Forum by Climate Bridge <http://www.pd-forum.net/page.php?m=1>

This paper discusses the results achieved by the CDM thus far in terms of: GHG mitigation, leveraging investments, establishment of institutions, generating knowledge of GHG accounting aspects, measures to ensure that projects represent real emission reductions. It also discusses the potential threats of an imbalanced international carbon credit market leading to reduced demand and potential bankruptcy of project owners with hardly any new projects being developed, even not in least developed countries.

Tuerk, A., M. Mehling, S. Klinsky, X. Wang, 2013. Emerging Carbon Markets: Experiences, Trends, and Challenges, Working paper, Climate Strategies, authors represent respectively Joanneum Research (Austria), Ecologic Institute (US), University of Cambridge (UK), IDDRI (France) <http://www.climatestrategies.org>

This report provides an overview of existing and emerging GHG trading schemes, including those in Europe (EU ETS), North America (the WCI and RGGI), Australia, New Zealand, Japan (regional), China (regional) and South Korea. It discusses lessons learned across the systems and gives an outlook on the development of the future carbon market. The report illustrates that considerable diversity exists across cap-and-trade systems. Although unintentional, a potential benefit of this diversity is that it provides opportunities to compare different approaches and to facilitate transboundary learning. Individually, and in comparison, schemes may offer lessons that can be applied in the development or improvement of others. This report focuses on three large categories of lessons related to: the role of the political and economic process and context for establishing emissions trading systems; system design; and system implementation and oversight.

UNFCCC, 2012. Benefits of the Clean Development Mechanism 2012 <http://cdm.unfccc.int/about/dev_ben/ABC_2012.pdf>

Now that the first commitment period of the Kyoto Protocol (2008–2012) has ended, this report poses the question: Did the CDM fulfil its initial design objectives and were there any other benefits? With this report, the UNFCCC secretariat has analysed aspects of CDM project activities and reported on the levels and types of benefits the CDM has provided. Expanding on the study in 2011, this report analyses approximately 4,000 registered CDM projects (excluding programmes of activities) according to four topics: sustainable development, technology transfer, finance and regional distribution.

Warnecke, C. and S. Wartmann, 2012. Project-based mechanisms for climate protection in Europe: Net-mitigation-effects and further development of the Joint Implementation (JI) Mechanism, Ecofys, FKZ 3711 41 501, contact: c.warnecke@ecofys.com

This report developed criteria and options for the possible design and further development of the JI mechanism or an alternative project-based mechanism for Germany which goes "beyond pure offsetting". The background for the study is that currently, 25 JI projects are registered in Germany with a high share of small scale energy efficiency projects using the "Programme of Activities" approach. As a result, this form of domestic JI has developed to an important instrument supplementing national policies in Germany with advantages such as the innovation potential, the private sector investments and the activated search for unregulated reduction potentials. Now that, according to the German JI law, the German JI programme has ended, this study project was carried out to explore whether and how there could be a continuation of JI in Germany.

The **Joint Implementation Quarterly** is an independent magazine with background information about the Kyoto mechanisms, emissions trading, and other climate policy issues. *JIQ* is of special interest to policy makers, representatives from business, science and NGOs, and staff of international organisations involved in climate policy negotiations and operationalisation of climate policy instruments.

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Abbreviations

AAU	Assigned Amount Unit
ADP	Ad Hoc Working Group on the Durban Platform for Enhanced Action
Annex A	Kyoto Protocol Annex with GHGs and sector/source categories
Annex B	Annex to the Kyoto Protocol listing the quantified emission limitation or reduction commitment per Party
Annex I Parties	Industrialised countries listed in Annex I to the UNFCCC; countries not included in Annex I are called Non-Annex I Parties
Annex II Parties	OECD countries (listed in Annex II to the UNFCCC)
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction (Article 12 Kyoto Protocol)
COP	Conference of the Parties to the UNFCCC
COP-MOP	COP serving as Meeting of the Kyoto Protocol Parties
DOE	Designated Operational Entity
DNA	Designated National Authority
ERU	Emission Reduction Unit (Article 6 Kyoto Protocol)
EU ETS	European Union Emissions Trading Scheme
EUA	European Union Allowance (under the EU ETS)
GHG	Greenhouse Gas
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
LCDS / LEDS	Low carbon (or emission) development strategy
LULUCF	Land Use, Land-Use Change and Forestry
NAMA	Nationally Appropriate Mitigation Actions
NAP	National Adaptation Programmes
PDD	Project Design Document
REDD	Reducing emissions from deforestation and forest degradation in developing countries, including conservation, sustainable management of forests and enhancement of forest carbon sinks
SBSTA	Subsidiary Body for Scientific and Technological Advice
SBI	Subsidiary Body for Implementation
TNA	Technology Needs Assessment
UNFCCC	UN Framework Convention on Climate Change

JIQ Meeting Planner

15-16 February 2013, Chennai, India
The 14th meeting of the BASIC Group - Brazil, South Africa, India and China
Contact: Ministry of Environment and Forests, India www:http://moef.nic.in/

27 February - 1 March 2013, Pattaya, Thailand
Learning and Leading on LEDS Workshop, Organised by the LEDS Global Partnership
Contact: caroline.uriarte@nrel.gov <ttp://en.openei.org/wiki/Learning_and_Leading_on_LEDS_Workshop>

12-15 March 2013, Berlin, Germany
Green Climate Fund (GCF) Board meeting
Contact: Interim Secretariat of the Green Climate Fund, tel.: +49-228-815-1371, e-mail: isecretariat@gcfund.net <http://gcfund.net/meetings.html3>

18-20 March 2013, Hamburg, Germany
European Climate Change Adaptation Conference - Integrating Climate into Action
Contact: Ms Gerlinde Loebkens, TuTech Innovation GmbH, Hamburg, tel. +49 40 76629-6551, fax: +49 40 76629-6559, email: loebkens@tutech.de

14 June 2013, Bonn, Germany
SBI 38, SBSTA 38, ADP2
Contact: http://unfccc.int