Carbon Constraint in the Mediterranean

Differentiated Impacts and Policies for Carbon Reduction in the Euro-Mediterranean Region

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EXECUTIVE SUMMARY

AN ANALYSIS OF CARBON CONSTRAINT in the Euro-Mediterranean Region distinguishes two groups:

The North Mediterranean Countries (NMCs) and Turkey, all of which have signed the United Nations Framework Convention on Climate Change (Annex I countries); the South and East Mediterranean Countries (SEMCs), which have not signed the Convention, with the effect of an imbalance in the Mediterranean Region concerning obligations to reduce CO_2 emissions.

The objective of this report is to update previous IPEMED studies, analyse the latest developments concerning the Kyoto Protocol and international climate negotiations, and assess green public initiatives and the impacts of carbon constraint in the Region.

SEMCs, despite their apparent lack of concern regarding CO_2 emissions, have progressed significantly in their understanding of climate change mechanisms. These countries are entering a new phase with the inclusion of aviation in the European Union Emission Trading Scheme (EU ETS) and the latest stage of the Kyoto Protocol starting in 2013. Aviation has been the focus of much attention since it joined the EU ETS in 2012, forcing SEMC airlines to comply to new EU rules. However, given that air travel represents only 2% of global CO_2 emissions, it should not be allowed to overshadow challenges in other industrial sectors.

The combination of the economic downturn, the euro crisis in NMCs and the Arab revolutions in SEMCs has jeopardized the willingness to inject more funds into sustainable development, and uncertainties about the new Kyoto Protocol phase raise concerns that will need to be tackled during the forthcoming Party Conventions following the recent Durban Summit.

This report attempts to make recommendations to strengthen regional cooperation, limit negative impacts of carbon constraint, and identify best practices, including China, to succeed in reducing CO_2 emissions in the Region during the new 2013-2020 phase.

INTRODUCTION

AN ANALYSIS OF CARBON CONSTRAINT[2] in the Euro-Mediterranean Region distinguishes two groups: the North Mediterranean countries (NMCs) and Turkey[3], which signed the United Nations Framework Convention on Climate Change (listed in Annex I of the Convention with individual targets for Annex I Parties detailed in the Kyoto Protocol's Annex B), and South and East Mediterranean countries (SEMCs) that are non-Annex I countries.

In the first Ipemed report on carbon constraint in the Mediterranean[4], it was underlined that climate-related, political and economic reasons justified addressing this problem at regional level. It was highlighted that even though SEMCs had benefited very little from the Kyoto Protocol Mechanisms, the European Union's energy goals for 2020 and the extension of the European Union Emission Trading Scheme[5] (EU ETS) to cover new sectors as of 2012 (i.e. aviation sector) would impact SEMCs.

Furthermore, the foresight analysis produced by the *Mediterranean 2030* consortium in *Tomorrow, the Mediterranean*[6] in November 2011, stressed that CO_2 emissions would increase in the Southern Mediterranean countries within the next few decades whatever the scenario:

- **"crisis in the Mediterranean Region scenario" (CR)** leading to bottom-up convergence and the marginalization of Mediterranean countries weakened by the sovereign debt crisis in the North, and uneven political transition in the South;
- **"Mediterranean divergences scenario" (DI)**, with countries' disparate insertion in the world's economy, producing divergences between the economies of the Region;
- **"Mediterranean convergence scenario" (CO)** that promotes complementarities, greater redistribution of wealth and competitiveness in a regionally integrated system that benefits from the four freedoms implemented in the EU.

According to these scenarios, regional energy demand and CO_2 emissions are set to rise from over 10% to more than 40% during the period 2009-2030, with discrepancies between NMCs and SEMCs:

TABLE 1 Progress of energy consumption and CO2 emissions per inhabitant in the Mediterranean up to 2030

		2009	2020			2030		
		Actual	CR	DI	CO	CR	DI	CO
Mediterranean	Energy consumption (toe/inhabitant)	1.8	2.0	2.2	2.1	2.2	2.5	2.4
	CO_2 emissions (tCO_2 /inhabitant)	3.3	3.5	3.9	3.5	3.7	4.5	3.9
NMC	Energy consumption (toe/inhabitant)	2.7	2.9	3.1	3.0	2.8	3.2	3.3
	CO_2 emissions (tCO_2/inhabitant)	3.6	3.5	3.8	3.5	3.0	3.5	2.2
SEMC	Energy consumption (toe/inhabitant)	1.2	1.4	1.6	1.5	1.7	2.1	1.9
	CO_2 emissions (tCO_2/inhabitant)	3.0	3.5	3.9	3.5	4.1	5.0	4.3

OME 2011

2. Carbon constraint is a set of binding regulations stemming from the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, which, in Europe, resulted in the European Union Emission Trading Scheme (EU ETS)
3. Turkey is a special case because it is listed in Annex I but its individual targets are not included in Annex B of the Protocol.
4. Mozas M., (2011) « La contrainte carbone dans la région euro-méditerranéenne », *Palimpsestes* n°6, Ipemed, Paris
5. Directive 2008/101/EC of the European Parliament and the Council of 19 November 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community.
6. *Tomorrow, the Mediterranean. Scenarios and projections for 2030*, coordinated by Cécile Jolly with the Mediterranean 2030 consortium (Carim, Ciheam, Femise, OME, Ipemed), Construire la Méditerranée, November 2011.

The report *Tomorrow, the Mediterranean* also underscored that the imbalance would be significant between the North and South in terms of energy and carbon intensities in 2030 according to the three scenarios. Energy intensity is 2.5 times higher in the South than in the North in the crisis and divergence scenarios, and twice as high in the convergence scenario. Carbon intensity is 5.4 times higher in the South than in the North in the crisis and divergence scenarios, and five times higher in the convergence scenario.

TABLE 2 Energy and carbon intensity in the Mediterranean in 2030

	Energy intensity (toe/US$ 1000 constant price)			Carbon intensity (tCO2/US$ 1000 constant price)		
Scenarios	CR	DI	CO	CR	DI	CO
Mediterranean	0.1	0.1	0.08	0.17	0.17	0.14
NMC	0.07	0.07	0.06	0.08	0.08	0.06
SEMC	0.18	0.17	0.13	0.42	0.41	0.30

OME 2011

The three scenarios present significant challenges for sustainable development in the Region, and especially for SEMCs. The convergence scenario is the preferred option, with a better progression in energy efficiency and significant development of renewable energy sources thanks to new cooperation and technology transfers.

Hence, CO_2 emissions reductions in the Mediterranean remain a critical issue. Initiatives undertaken in favour of carbon constraint need to be supported and intelligently organised so as to maintain the momentum of reduction policies launched in NMCs and encourage SEMCs to take measures.

There are still some uncertainties today regarding the second commitment period of the Kyoto Protocol, starting on January 1st 2013. In addition, carbon credits[7] generated from the Kyoto Protocol's Clean Development Mechanisms (CDM) projects in intermediary revenue countries (such as SEMCs) will no longer be able to be traded on the European carbon market (EU ETS) as of 2013. Therefore, the international and regional impetus that EU ETS has given to emission reduction projects might be stemmed.

Non-annex I countries of the Euro-Mediterranean Region, previously known for their general lack of concern regarding CO_2 emissions, have progressed significantly in their understanding of climate change mechanisms. This is evidenced by conducting direct interviews and analysing national publications and national communications to the United Nations Framework Convention for Climate Change (UNFCCC). SEMCs may not have put CO_2 emissions reduction at the top of their current agendas, following the revolutions in the Arab world and the tensions in Libya and Syria, but they have not closed the door to reducing their CO_2 emissions.

Will the differentiated impact of carbon constraint in Northern Mediterranean countries and South and Eastern Mediterranean countries persist? Will European carbon constraint keep producing effects (positive or negative) in SEMCs? Finally, can SEMCs develop their own tools or mechanisms to reduce their emissions?

This imbalance in commitments to CO_2 emissions reduction is a concern for the Region and must be carefully assessed. This report presents post-Durban challenges aimed at reducing CO_2 emissions. This evolving imbalance in the Region, and the inclusion of airlines in the EU ETS as of January 2012,

7. Carbon credit is the generic term for any tradable certificate or permit representing the right to emit one tonne of carbon dioxide or the mass of another greenhouse gas with a carbon dioxide equivalent, equivalent to one tonne of carbon dioxide.

creates different potential impacts on economic, social and environmental issues and regional trade. The momentum of European carbon constraint may generate extra-territorial effects.

Thus, the potential and visible impacts of carbon constraint in the Region over the short and long term need to be analysed. We can look at the limited impact observed so far in NMCs and the indirect impact in SEMCs with the financing of CDM projects. Different positive and negative impacts have been identified.

Finally, the report reviews green public initiatives undertaken in SEMCs and new mechanisms to harness mitigation beyond 2012. Best practices need to be compared, including those of China, a leading country significantly increasing its trade and market share in the Euro-Mediterranean region.

European carbon constraint versus non-binding CO_2 rules in South and East Mediterranean Countries (SEMCs)

THE UNITED NATIONS framework convention on climate change, which entered into force in March 1994, is an overall framework for intergovernmental efforts to tackle the challenges posed by climate change. The Kyoto Protocol, in force since February 2005, is an international agreement linked to the Convention. Under the principle of "common but differentiated responsibilities", industrialised countries (Annex I Parties) are required to stabilize their greenhouse gas (GHG) emissions. Turkey is the only Annex 1 country from the SEMCs. This commitment was achieved in the European Union with the implementation of an Emissions Trading Scheme in 2005, which will be entering into its third phase in 2013.

Although, non-binding rules apply to SEMCs (i.e. Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Mauritania, Morocco, Syria, Tunisia), these countries are encouraged to continue stepping up action to control their GHG emissions and to adapt to the impacts of climate change. However, the recent inclusion of aviation in the EU ETS has recently shown that progressively common binding rules will apply to European and international economic actors, and in particular to economic stakeholders in SEMCs.

Extension of the Kyoto Protocol and the third phase of the EU ETS

THE UNITED NATIONS Climate Change Conference in Durban, in December 2011, made some progress in implementing the Convention and the Kyoto Protocol, the Bali Action Plan and the Cancun Agreements. The Durban conference had to be extended to reach an agreement.

Three outcomes were particularly significant:

- An extension of the Kyoto Protocol and its flexible mechanisms until 2017 or 2020.
- The creation of a new working group to achieve a new climatic architecture by 2015 involving all countries and effective from 2020. This concerns all SEMCs.
- A Green Climate Fund, an Executive Committee of Technology and an Adaptation Committee, created during the Cancun conference, are now in operation and will concern the Euro-Mediterranean Region.

Parties did not agree on some points:

- Whether the Protocol is extended for five years or eight years i.e. ends 31 December 2017 or 2020.
- What the quantified emission limitation or reduction objectives should be for the second commitment period.

These issues should be resolved by the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol. The group will also consider the implications of carrying over assigned amount units to the second commitment period regarding emission reductions to be achieved by Annex I Parties as a whole for the second commitment period.

Parties are currently negotiating:

- The length of the commitment period.
- CO_2 emissions reduction commitments, to be communicated by mid-2012.
- The possibility of keeping surpluses of Kyoto quotas distributed.
- CDM policy after 31st December, 2012.

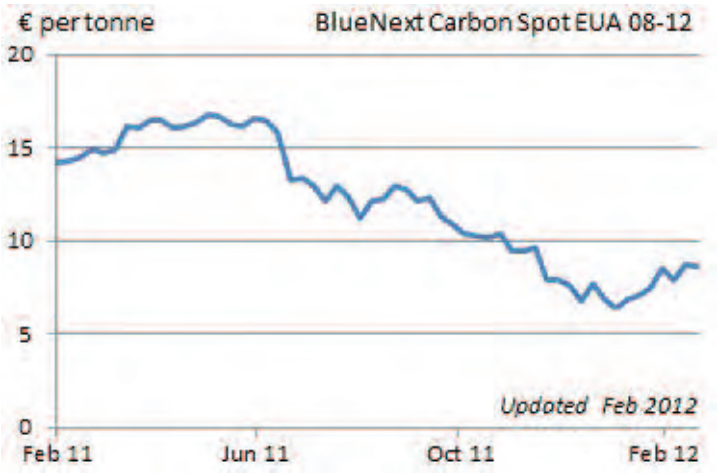
The Clean Development Mechanism (CDM) allows emission-reduction projects in developing countries to earn Certified Emission Reduction (CER) credits[8]. The mechanism is meant to stimulate emission reductions, while giving industrialized countries some flexibility to meet emission reduction targets. In 2012, there has been a rush in CDM project registrations because of the 31st December, 2012 cut-off. The European Emission Trading Scheme decided that carbon credits from projects registered after 31st December 2012 can only come from least developed countries. Mauritania is the only country to be classified as such in the SEMCs. This was presented as a move to rebalance the geographical development of all CDM projects, which were mainly funded in emerging countries such as China and India. The final objective also seems to be to try to curb the surplus of emission reduction project credits.

International climate policy system after 2012 is uncertain because the CDM may be replaced or complemented by new market mechanisms.

CO_2 markets are under scrutiny, with the spot price almost continuously decreasing since June 2011. The current spot price level is an issue: the lack of demand leads to a price level that is lower than expected. The European Commission is particularly concerned about a significant surplus of emission permits over the third phase of EU ETS (2013-2020 period), due to lower CO_2 output. The economic and financial crisis explains this situation. The direct consequence is a lower carbon constraint on economies.

8. A CER is equivalent to one tonne of CO_2. It can be sold and used by developed countries to meet a part of their emission reduction targets under the Kyoto Protocol.

GRAPH 1 CO_2 spot prices



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Carbon constraint for NMCs companies is relative in these circumstances. The current demand of EU quotas does not reflect the future anticipated price of emissions allowances. Although companies are aware of the constant reduction of EU allowances beyond the third phase, they are also expecting a revision of the emission cap after 2020. This uncertainty for the period beyond 2020 does not help to constrain economic actors. In order to uphold a sufficient carbon market price to guide investors in the short term and maintain carbon constraint in the long term, it would be helpful to set up an independent body able to regulate the European carbon market.

In the shorter term, the European Commission has said that the system for allocating emission allowances will significantly change beyond 2012 compared to the two previous trading periods. Emission allowances will be distributed according to fully harmonised and EU-wide rules. The centralised EU-wide cap on emissions will be 1927 Mt and will reduce annually by 1.74% compared with the average annual level of the Phase 2 cap.

Auctioning will prevail for the power sector, which means that the majority of allowances under the EU ETS will no longer be allocated for free. Installations in the industry and heating sectors not exposed to a significant risk of carbon leakage will receive an allowance allocation of 80% of the 2013 benchmark, dropping to 30% in 2020 [in most cases, benchmarks are an average of the most efficient 10% of installations in a (sub) sector in the EU]. Installations that meet the benchmarks will receive the allowances required. Installations that do not meet the benchmark will have a shortage of allowances and face the possibility of either reducing their emissions or purchasing additional allowances to cover their excess emissions.

European Union countries, and NMCs in particular, have taken the lead in the reducing CO_2 emissions because figures have been evolving a negative way. The *Observatoire méditerranéen de l'énergie* mentions that CO_2 emissions from fuel combustion increased by 30% in the Mediterranean Region to over 2 billion tonnes of CO_2 from 1990 to 2009, with the Mediterranean Region representing 7% of global CO_2 emissions. Some questions must be answered regarding the second commitment period under the Kyoto Protocol in order to ascertain whether it will work: How will international climate policy develop? What will be countries' potential commitments and attitudes towards crediting?

SEMCs' non-commitment to carbon reduction

SIMILARLY TO OTHER DEVELOPING countries, SEMCs take the position that global warming is the responsibility of Northern countries, which generated the industrial revolution in the 19th century and must now provide funds and support to fix the problem.

The Group of 77 (seventy-seven developing countries, signatories of the Joint Declaration of the Seventy-Seven Countries in 1964) and China lead calls for developing countries to have greater access to climate-friendly technologies and increased support for capacity building. SEMCs agree that efforts need to be scaled up to promote an integrated approach to climate change response measures and sustainable development planning.

The United Nations can play an important role by promoting an intellectual property rights regime that facilitates the transfer of climate-friendly technologies. As an example, in Durban, on 8th December 2011, the Lebanese delegation stated "*We need to be reassured that there is commitment to a second commitment period to a legally binding regime in the near future in addition of enhanced mechanism for the implementation of the convention. We need to be reassured that adequate and sustainable long term finance will be delivered and that the implementation of all agreements continues without any commitment gap.*"

SEMCs' non-commitment to carbon reduction is a key factor to further imbalance in the Region, as shown in the scenarios concerning CO_2 emissions. Previous IPEMED studies have shown that some imbalances in the Region result from different demography, agriculture and economic growth structures. SEMCs could see carbon reduction as a new constraint that is not a priority and is expensive.

The first and second national communications to the United Nations Framework Convention on Climate Change show, however, that SEMCs have progressed significantly in assessing their greenhouse gas emissions. The statement made at the Durban summit by H.E. Mr Cherif Rahmani, Minister of Territorial Planning and Environment in Algeria, was positive in saying that Algeria will definitely contribute to the preservation of the planet's atmosphere.

Some measures have already been taken in SEMCs, such as developing energy efficiency and renewable energy, but the key issues are commitment, funding and technical support. A lack of commitment from SEMCs will create further imbalance, as shown in the three Mediterranean CO_2 emissions scenarios for 2030, and will impact the Region, especially if the carbon price increases (**TABLE 1**).

Potential for a new Clean Development Mechanism (CDM) project is high in SEMCs given the natural availability of renewable energy and energy efficiency. In September 2011, 52 CDM projects were registered in twelve Mediterranean countries, with estimated emission savings of about 80 millions tonnes. Registered CDM projects in the Mediterranean Region represented about 1.5% of all projects in the world at year end 2011, according to UNEP Riso CDM/JI pipeline analysis and database[9]. This potential for energy savings is significant in energy-intensive industries (heavy industries, energy sector). However, the Arab revolutions and riots increase political risks, and regulatory uncertainties post-2012 create a difficult environment for new CDM implementation.

9. www.cdmpipeline.org

This report confirms that a leading group of three countries is more proactive in implementing best practices and innovative projects. These countries are Egypt, Morocco and Tunisia. These three SEMCs have had a Designated National Authority (DNA) for several years, built expertise with local consultants, and developed pipeline projects with the help of international parties. The other countries, and especially Algeria, Israel, Jordan, Lebanon, Libya, Mauritania and Syria, provided less information in their first and second national communications and have been slower in implementing CDM projects. Palestine, which is not yet a UN member state, cannot directly participate in the CDM, and Turkey is an Annex 1 country.

The traditional model of public action obliging economic actors to adopt measures so as to contribute to meeting a quantified target of domestic emissions reduction has shown its limits. SEMCs must get more involved in the fight against climate change, depending on their respective responsibilities and capabilities. SEMCs must act for their own transformation towards more sustainable production methods that will lead to low-carbon economies.

Nationally Appropriate Mitigation Actions (NAMAs) are a set of policies and actions that SEMCs can undertake as part of a commitment to reduce greenhouse gas emissions. Different countries may take different nationally appropriate actions based on equity and in accordance with common but differentiated responsibilities and respective capabilities. NAMAs were first used in the Bali Action Plan as part of the Bali Road Map agreed at the United Nations Climate Change Conference in Bali in 2007. They are part of the Copenhagen Agreements issued following Conference of the Parties (COP) 15 in December 2009.

The Cancun Agreements confirmed NAMAs, including those supported through climate finance. The three leading SEMCs are also pioneers in setting up NAMAs pilots. NAMAs are more suited to the implementation of policies and programmes driven by national governments. The CDM is, on the contrary, implemented at project level by firms involved in carbon markets, and requires demonstration of emissions reductions. NAMAs may vary significantly depending on the nature of the activity and the financing approach, and will not necessarily result in credits.

NAMAs may encourage developed countries to provide financial assistance to developing countries to reduce emissions and can be defined as an incentive strategy designed to reward emerging countries with national and international funding for trying to voluntarily reduce CO_2 emissions. Although the potential for NAMAs implementation is high in SEMCs, SEMCs are still not able to reach this ambitious mitigation goal by themselves because of a lack of capacity and willingness. Capability depends on the available financial, technological, infrastructural and human resources, whereas willingness depends on political and institutional factors.

For instance, effective mitigation of climate change in the transport sector will require substantial capacity building. This could be facilitated by earmarking funds to programmes and projects for capacity-building activities. Transport must find its place in NAMAs as opposed to CDM (where transport represents only 0.2% of emission reductions achieved).

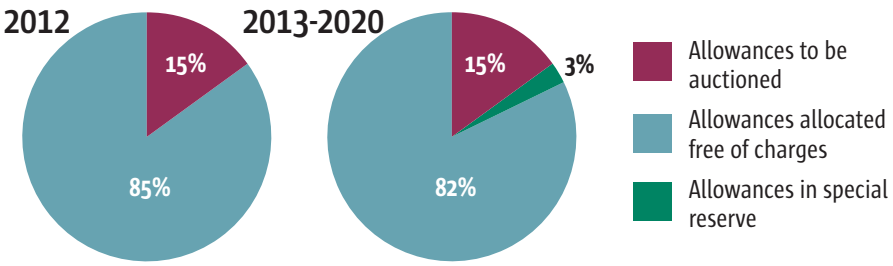
The emergence of common binding rules: the case of aviation

AS OF 1st JANUARY 2012, the European Union Emissions Trading Scheme (EU ETS) makes it compulsory for airlines to pay charges that reflect the CO_2 emissions generated from commercial flights starting or ending within the EU. All flights connecting EU to an SEMC are therefore concerned. This constitutes the first application of common binding rules to reduce CO_2 emissions on both shores of the Mediterranean. Carbon credits are being allocated to cover these emissions for the most part but, where additional emissions are produced, carbon credits have to be purchased.

Since 2005, the EU ETS has been progressively extended to cover a higher number of installations and additional countries (Iceland, Norway, Liechtenstein, Romania and Bulgaria), and the European Commission is now adding some 5,000 airlines to utilities and manufacturing, most of which operate in the Euro-Mediterranean Region.

With a goal of reducing emissions by 3% in 2012 compared to average annual historical emissions (2004-2006), then by 5% per year from 2013 to 2020, the aviation sector will receive 214.7 Mt of CO_2 quotas in 2012 and 210.3 Mt per year from 2013. This allowance will mostly be free, 15% of allowances are auctioned and 3% set aside for new entrants[10].

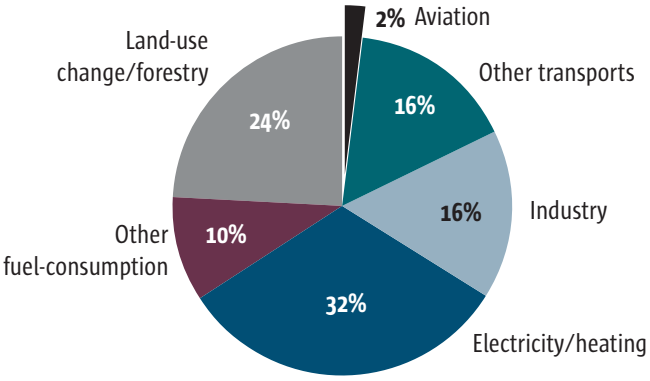
GRAPH 2 Allocation of allowances for aviation in EU ETS



European Commission

Contrary to common belief, aviation only accounts for about 2% of the world's CO_2 emissions (air cargo varies from 0.3% to 0.6%). However, the constant increase in air traffic and CO_2 emissions (+2% pa) has led the European Commission to include international aviation (connected to EU member states) in the EU ETS.

GRAPH 3 Global CO_2 emissions per sector



Figures derived from World Resources Institute and International Energy Agency data.

10. Source: CDCClimat, Tendance Carbone, January 2012.

In its 2010-2011 Corporate Social Responsibility and Sustainability Report, Air France-KLM explained that the company anticipated the trend by reducing its fuel consumption and CO_2 emissions by 14% in 10 years (2000-2010), reaching 3.7 l/passenger/km i.e. 93 g CO_2/passenger/km. Further progress can be achieved[11].

GRAPH 4 Air France-KLM-Group fuel consumption and CO_2 emissions

Air France – KLM CSR report 2010/2011

EU ETS impacts

In the current context of European economic recession, low carbon prices, and discussions on the potential intervention of the European Commission on the supply of allowances, this extension of EU ETS' scope must be carefully analysed.

The EU ETS baseline was published by the European Commission in 2011. It represents an average of the annual aviation emissions for 2004, 2005 and 2006, which is approximately 221 millions tonnes of CO_2. The benchmark is used to allocate the free-of-charge allowances to operators, by dividing the total cap by the sum of tonne-km data provided by operators in 2010. It is set at 0.6797 allowances / 1000 tonne-km (2012) and 0.6422 allowances/ 1000 tonne-km (2013-2020).

The impact on the airline market should be progressive according to their coverage needs. The cost of an aeroplane ticket could increase significantly, impacting traffic and therefore tourism in the Euro-Mediterranean Region. Some airlines could become less competitive and disappear. For most airlines operating from/to Europe, the estimated cost could range from 40 to 60 billion euro between 2012 and 2020[12].

According to the CEO of Royal Air Maroc, Driss Benhima, in 2010, Royal Air Maroc's CO_2 emissions reached 804,903 tonnes, i.e. 255,525 tonnes of Jet A1 consumed in the countries covered by the ETS[13]. The estimate of 2012 quotas based on Royal Air Maroc's provisional programme is 679,114 tonnes, of which 523,539 tonnes are free quotas. The cost of the 155,575 tonnes without allowances is estimated at MAD 16,102,012 (equivalent to € 1,400,175) to cover the CO_2 emissions of the 2012 calendar year (with a carbon credit estimated at € 9 by Royal Air Maroc, where € 1 is MAD 11.50). This figure is expected to evolve eventually following an update of the forecast programme of flights with values of carbon credit and currency in the market (it might cost the airline € 9 million a year for the next eight years).

11. In October 2011, an experimental Air France KLM shuttle flight Paris Orly / Toulouse used 50% of biofuel and reported a 50% drop in CO_2 emissions compared to traditional shuttle flights, reaching 54 g CO_2/passenger/km.

12. Source: Air France.

13. Conversation with the Chairman of Royal Air Maroc.

International positions

The International Air Transport Association (IATA) and the Aviation Global Deal Group quickly took a stance against the EU ETS and called for CO_2 emissions from international aviation to be included in a broader international framework coordinated by the International Civil Aviation Organization (ICAO). ICAO's position states that the inclusion of international civil aviation in the EU ETS goes against the principle of state sovereignty mentioned in ICAO's creation in the Chicago Convention. Furthermore, the EU unilateral decision will lead to unsustainable growth of international aviation, since it does not consider the different social and economic circumstances of developing nations. ICAO called on the EU to improve its collaboration with the whole international community in order to find a common solution to reduce CO_2 emissions from aviation. EU is very committed to dealing with global environmental issues related to aviation.

At the end of 2011, the European Court of Justice released an initial opinion on the case brought by the US Air Transport Association, which challenged the legality of the EU ETS on aviation. The Court stated that the scheme was legal and compatible with international law. For the Court, the EU ETS and its application to the airline industry is compatible with various international laws, including the Chicago Convention, and does not infringe the sovereign rights of non-EU countries.

Countries such as the USA and China continue to express their disagreement with this European Directive, following ICAO's position. The China Air Transport Association, representing four Chinese airlines, stated in January 2012 that China would not co-operate with the European Union on the ETS and that Chinese airlines would not impose surcharges on customers relating to the emissions tax[14]. A joint declaration was made by 23 airline representatives, none of them from SEMCs airlines, in Moscow in February 2012, claiming that EU ETS would lead to serious market distortions and unfair competition.

Air France-KLM's position is to welcome this cap and trade mechanism, which it considers to be more effective than a single taxation, provided that it does not distort competition. Air France-KLM believes that the most efficient solution is to include global air transport involving all airlines because it would avoid diverting traffic to non-European hubs i.e. carbon leakage. In the meantime, Air France also called on the United Nations to include international aviation in a specific global agreement under the auspices of the ICAO.

The inclusion of aviation is a test to see whether non-EU countries, and especially SEMCs, will follow this policy. Nearly two-thirds of airlines impacted by the EU ETS are non-European companies. SEMCs could be tempted to follow the ICAO's position and challenge the European system on two issues: that it is a unilateral and extraterritorial decision, breaking the founding principle of the UNFCCC "common but differentiated responsibilities".

SEMCs' position

The voice of SEMCs' airlines is expressed through the Arab Air Carriers Organisation (AACO) that gathers most of the airlines of the Region (Air Algérie, Air Cairo, Egypt Air, Jordan Aviation, Libyan Airlines, Palestinian Airlines, Royal Air Maroc, Syrian Arab Airlines, Transmediterranean Airways, Nouvelair and Tunisair). Recent AACO statements have shown SEMC airlines' posi-

14. Reuters, "China will not cooperate with EU on ETS", 4th January 2012.

tion to be in line with ICAO and IATA's stance[15] (absence of agreement between EU and other states, infringement of the principles of sovereignty, operating at global level with ICAO).

The CEO of Royal Air Maroc, Driss Benhima, explained the position of the Moroccan national airline:

"Royal Air Maroc disagrees with EU ETS. It questions the compliance of EU ETS with ICAO rules, as many flights covered by the EU Directive are held outside of its airspace. However, being aware of the firmness of the European Commission regarding the implementation of Directive 2008/101/EC and given the importance of the European market, Royal Air Maroc complies to the decisions of the EU while lobbying with international institutions"[16].

The CEO also pointed out that the EU Directive states in the paragraph 17 of its preamble:

"If a third country adopts measures that have an environmental effect at least equivalent to that of this Directive in reducing the climate impact of flights to EU, the Commission should consider the options available to ensure optimal interaction between EU and third country. Systems of emission trading in third countries are beginning to provide optimal interaction with EU for the inclusion of aviation. Bilateral agreements between EU ETS and other trading systems are necessary to create a common system. Equivalent measures designed to prevent the existence of dual regulation could be a step towards a global agreement".

Driss Benhima explained that Royal Air Maroc has three options: to comply until international legislation comes into force. ICAO issued a resolution in October 2011 which aims at establishing *"a harmonized agreement on a global scale to reduce emissions of CO_2"*; to adopt similar measures to the EU legislation; to establish, within bilateral agreements or with Brussels, a fee *per passenger*, based on the extra cost of EU ETS to EU airlines. This tax revenue would "exclusively" fund projects to reduce greenhouse gas emissions in Morocco, thus meeting the Clean Development Mechanism (CDM) established by the United Nations.

The second and third options would require setting up a working group of specialized departments in each area. From a macroeconomic perspective and in line with international competitiveness, the last option would give Morocco an opportunity to develop its legislative framework, create new jobs and generate financial revenues. It would also open up an avenue for Morocco to implement the commitments of the Kyoto Protocol.

The position of Tunisair appears similar. Tunisair's Director of Environment and Fuel, Souhaiel Dallel, said that the Tunisian airline applies a "comply [with EU ETS] and contest" policy[17]. Tunisair submits to the EU policy by setting up an emission plan as required by the European Directive. The airline complies with the new rules but follows the position of AACO expressed at the Doha meeting in April 2012. The new Tunisian government has not ruled on that very technical issue.

Basically, Royal Air Maroc and Tunisair take very similar positions. It is likely that the other SEMCs airlines will follow the position of the AACO and stick together. The position adopted by Royal Air Maroc and Tunisair appears more conciliating and less aggressive than that of American, Chinese and Indian airlines.

15. AACO, Press Release, 3rd April 2012.

16. Source: interview with the Chairman of Royal Air Maroc.

17. Source: interview with Tunisair's Director of Environment and Fuel.

The European Commission should take more account of SEMCs' partial willingness. SEMCs airlines make an effort to comply with new EU rules. Further negotiations must be carried out between the European Union and SEMCs airlines. Some priority bilateral and regional positive measures must be found in order to show the ICAO that the Mediterranean Region can take a lead in these complex issues.

Potential and visible effects of carbon constraint in Euro-Mediterranean countries: a non-exhaustive list of environmental, social and economic impacts

ANALYSING THE IMPACTS of carbon constraint in the Mediterranean Region is different from analysing the impacts of global warming in the same area. Climate change policies are intended to improve an existing situation. Observers are concerned about possible side effects and unexpected consequences of NMCs' initiatives in the Mediterranean Region.

This Region has significant imbalances already analysed by IPEMED and is subject to strong uncertainties regarding its future. The current profound crisis in the European Union brings into question its construction and the economic governance of the Euro zone; Balkan countries promised with integration are affected by the Greek crisis; the Arab uprisings are drawing countries into a long phase of transition; tensions in Israel and Syria are a major geopolitic issue. Regional integration is in jeopardy, and NMCs must be careful not to add negative impacts in the process of entering a new Kyoto Protocol phase.

All impacts are analysed from different perspectives for the sake of accuracy. First of all, a geographical perspective ranks impacts for NMCs and SEMCs, with a detailed analysis of CDM projects per country. Secondly, the impacts are assessed as positive or negative.

First visible effects of carbon constraint on both shores of the Mediterranean

THE EU ETS and the Kyoto Protocol have had limited effects on the economic situation in Northern Mediterranean countries. Similarly, their impact, as expressed in SEMCs through CDM projects, has been fairly disappointing.

Continued limited impacts in Northern Mediterranean Countries

CO_2 EMISSIONS vary significantly from one economic sector to one another. For all Annex I countries, emissions from all sectors decreased from 1990 to 2009[18], and especially in industrial processes. A net greenhouse gas (GHG) removal is noted in 2009 for agriculture and Land Use Land-Use Change and Forestry (LULUCF).

18. UNFCCC, GHG inventory data from parties, Durban, nov. 2011.

TABLE 3 GHG emissions/removals – Annex 1 countries

1000 of Tg CO_2 eq	1990	%	2009	% change
Energy	15.33	87%	13.98	-8.80%
Industrial processes	1.45	8%	1.03	-28.90%
Waste	0.54	3%	0.48	-10.20%
Agriculture & LULUCF	0.33	2%	-0.95	-388.00%
Total	**17.65**	**100%**	**14.54**	–

UNFCCC

Commitments made by European countries further to the Kyoto Protocol clearly contribute to reducing greenhouse gas emissions. The last two decades have seen a constant decrease in EU27 emissions, which are 15.4% lower than 1990 levels[19].

During its first phase (2005-2007), the EU ETS covered some 12,000 installations, representing about 40% of EU CO_2 emissions. Some analyses have demonstrated that EU ETS had no impact on the competitiveness of cement, steel, aluminium and oil refining sectors in EU countries during this first phase[20].

The second phase (2008-2012) expanded the scope significantly. The over-allocation of permits and the reduced output of energy-intensive sectors, as the result of recession, led to a permit price of under € 10 per tonne in 2011 and 2012, as shown in **TABLE 2**. The market was oversupplied with permits and the constraint was therefore limited in the European Union and in NMCs in particular.

During this second phase, a massive value added tax (VAT) fraud took place within the EU ETS, creating a reputation risk on carbon trading. In 2009 and 2010, suspicious CO_2 trading activities were noted and several market platforms recorded a significant increase in the volume of trade in European Unit Allowances. This led to a loss of approximately 5 billion euro in VAT for tax authorities. Taxation rules on these transactions had to be changed. The courts reacted quickly and five executives were condemned to a maximum of 5 years in jail and heavy fines[21].

The limited impact so far on NMCs economies is taken into consideration in order to change gear for the next phase and the future.

Phase 3 (2013-2020) will be subject to a more stringent emissions cap, covering new sectors and new gases. Auctioning is set to become the basic method of allocating allowances from 2013 onwards, as we have seen.

In order to pursue efforts in NMCs for the next period after 2020, prospective work has been done to produce a vision and long-term objectives up to 2050.

The report by the "committee 2020-2050: trajectories to a low carbon economy" chaired by Christian de Perthuis[22], explains that the European context is currently marked by discussions on achieving the EU's reduction objective of at least 80% of GHG emissions between 1990 and 2050. This objective is not broken down by Member State and consequently by NMC.

France, the main focus of de Perthuis' report, has a low level of industrial and energy-related emissions, due to its nuclear power plants. The biggest reductions sought by the European Union are in industrial processes and energy. The French target of "Factor 4" would bring the country to an emission level of less than two tonnes of CO_2 per capita in 2050, in line with European Union objectives. This national target should not be affected by international

20. D. Ellerman, FJ. Convery, C. Perthuis, "Le prix du carbone", 2010

21. *Le Monde*, 11th January 2012, "5 ans ferme pour une fraude à la TVA sur le marché du carbone".

22. De Perthuis C., Buba J., Million A., Scapecchi P., Teissier O. (2012) « Rapport Trajectoires 2020 - 2050 vers une économie sobre en carbone », report of committee Trajectoires 2020-2050 chaired by Christian de Perthuis, Centre d'Analyse stratégique, La Documentation française, Rapports et documents, n°46.

climate negotiations, but depends on future economic growth. France's Grenelle Environment Round Table, resulting in the Grenelle 1 and Grenelle 2 laws, was an important step for national public policies on carbon constraints. The country must continue to implement government action to achieve its ambitious climate targets at a time when public finance is under pressure.

Since 1990, French GHG emissions have not been totally bound to economic growth, even though recession has led to less CO_2 emissions than expected. France's Kyoto Protocol commitments will be maintained, with the strong likelihood that the current 2020 Climate and Energy Package target will be achieved. In order to reach "factor 4", de Perthuis' report mentions that France must act on both demand and supply of CO_2 credits, mobilize funds, and create the conditions for social acceptance. This is true for France and probably for NMCs.

To act on both demand and supply of CO_2 credits means that non-emitting primary sources of energy cover medium- to long-term needs. De Perthuis adds that particular attention must be paid to "diffuse" sectors, where multiple emission sources make it more difficult to establish the appropriate incentives: transportation, buildings and agriculture.

Initiating rapid investment and mobilizing funds requires innovation efforts to achieve the proposed carbon emissions reduction targets by 2050. It is also important that additional investment does not destabilize public finances, whose consolidation will remain the priority in coming years.

Innovation is key to economic growth, employment and competitiveness in NMCs. When the EU ETS was launched in 2005, it was thought that imposing a price on CO_2 emissions would encourage public and private organizations to develop new technologies to further reduce CO_2 emissions. In its working paper series, the Climate Economics Chair of University Paris Dauphine[23] analysed patent data for five subsequent years to determine whether the EU ETS has induced low-carbon technological change. Surprisingly, the findings suggest that the EU ETS has had a very limited impact on innovation and low-carbon technological change. This is further evidence that EU ETS had limited impacts in NMCs during the first two phases, from 2005 to end 2012.

To create the conditions for social acceptance of these changes means that a low carbon economy must demonstrate its beneficial effects on business activity and employment.

There is no consensus within NMCs on how to achieve long-term objectives on CO_2 emissions reduction, and international climate discussions must continue. Each country has its own specific agenda. Raising the current 20% European target would require strengthening the system of economic incentives by expanding the pricing of energy-related CO_2 to areas not covered by the EU quota system. Signals sent by authorities should be credible and predictable in order to avoid negative impacts, and carbon revenues should promote growth and employment.

At EU level, a 2030 EU target reduction must be quickly adopted, in line with the 2050 objective. De Perthuis' report states that this target figure should be in the range of 40% to 45% at EU level as estimated by the European roadmap, and should be specifically broken down between Member States. National objectives should be monitored in NMCs.

23. Calel R., Dechezleprêtre A., (2012) "Environmental Policy and Directed Technological Change: Evidence from the European carbon market", Climate Economics Chair of University Paris Dauphine, working paper series.

Near end of the CDM projects' momentum in SEMCs

IN NOVEMBER 2006, the United Nations Secretary-General launched the Nairobi Framework to support the Kyoto Protocol's Clean Development Mechanism (CDM) in under-represented regions, including SEMCs. Since then, SEMCs' interest and involvement in the CDM has grown, and with it the number of projects in SEMCs, creating a momentum. Yet SEMCs account for 1.5% of almost 2000 CDM projects registered to date in 58 countries.

First of all, as explained previously, the cut-off date of 31st December 2012 has a negative impact on the selection of priority CDM projects and Programmes of Activity (PoA). Time becomes a key factor and can exclude good projects that are long to mature. SEMCs have established criteria in accordance with the terms of reference.

These criteria include project maturity with CDM status: identified, Project Design Document, submitted for registration, registered; quality of the project implementer; scale of the project; mitigation potential and additional criteria.

The combination of these criteria improves the chance of registration of the projects identified before the end of 2012. The process of identifying priority projects is based on the screening of the Project Design Document approved by the Designated National Authority (DNA) within the national CDM portfolio.

UNEP mentions that industrial development and high levels of urbanization contribute towards the present situation in SEMCs[24]. Impacts vary, as SEMCs are not all the same, and a careful analysis must be carried out per country, with the priority CDM projects to be registered before end 2012.

The Durban conference in December 2011 agreed that CDM is a long-term mechanism that should continue from one period to the next. It should not be tied to specific commitment periods. The issue is the level of demand. If demand is not sufficient, the CDM's future is uncertain after the end of this commitment period, i.e. after 2012.

The momentum of CDM projects in SEMCs is questionable after 2012, since there will be no opportunity for NMCs to trade CER credits coming from these countries. It will be an important issue to be discussed at the next Conference of Parties.

De Perthuis' report states that the mechanism project should target LDC. In SEMCs, Mauritania is the only LDC, and could therefore receive more attention in this context. The extension of these mechanisms, if harmonized within NMCs, would also facilitate the achievement of reduction targets in sectors not covered by the European quota system.

If carbon credits for CDM projects registered in SEMCs after 2012 are no longer allowed in the EU ETS as of 1st January 2013, they may meet the demand of other national or regional carbon markets. The USA is considering introducing a federal mandatory cap and trade scheme by 2015. Australia and New Zealand are discussing how the two countries' trading schemes could be linked. Some Anglo Saxon business leaders are even questioning whether CDM should remain within UNFCCC in order to solve its governance problems. They add that CDM must leave the UNFCCC to improve credibility.

24. UNEP Africa Environment Outlook 2 - 2006.

Analysis of CDM projects per SEMC

Algeria

In Algeria, the energy sector is crucial. Nearly 75% of greenhouse gas emissions come from this sector. The hydrocarbon industry is the driving force of the national economy and represents a major share of economic activity. Sector emissions are associated with the production, processing and transportation of hydrocarbons (Oil and Liquefied Natural Gas – OLNG), a significant portion of which is exported. Power generation, and energy consumption for domestic industry, the residential and institutional sectors and transportation, are another source of CO_2 emissions. Agriculture, land use and forestry occupy second position and account for 11% of total GHG emissions.

CDM projects in Algeria have been progressing very slowly. It seems that the priority was not placed on this mechanism due to a lack of understanding of the requirements of the CDM, limited national capacity to direct the CDM process and an absence of technical assistance which prevented the development of a CDM market in Algeria. However, two projects on the same industrial site are likely be registered before end 2012: the N2O reduction project at Fertial's nitric acid for plants n° 1, and n° 2 in Annaba.

Egypt

Egypt's open market economy has attracted energy-intensive industries such as the cement and fertilizer industries, which are highly dependent on the consumption of energy. Cairo, Egypt's capital and the largest city in the Euro-Mediterranean Region with 15 million inhabitants, has poor air quality. The average inhabitant ingests more than 20 times the level of accepted air pollution. Cairo's smog, known to Egyptians as the Black Cloud, is detrimental to health.

Egypt has discovered significant reserves of gas. LNG is exported to many countries, and the Arab Gas Pipeline, a 1,200 km natural gas pipeline, exports this Egyptian gas to Jordan, Syria and Lebanon. The Egypt National Cleaner Production Centre works in partnership with Morocco CMPP and the Lebanese Cleaner Production Centre to implement best practices.

Egypt has positive activity in the CDM market with tangible results. The establishment of the CDM Awareness and Promotion Unit in 2009 strengthened CDM promotion and awareness activities in Egypt. It has contributed to identifying and promoting new potential CDM projects. The national project portfolio currently comprises 77 CDM projects at different stages. At present, there are 10 registered CDM projects in Egypt and 13 under validation in different sectors.

Among these, 4 CDM priority projects have been identified in Egypt, to be registered before end 2012. These projects are:

- Abu Zabal Landfill Gas Recovery and Flaring/Destruction Project.
- Waste Heat Recovery projects for gas turbine generators.
- Shifting from Traditional Open-Pit Method to Mechanized processes for Charcoal production.
- Scrapping and Replacement programme of Twostroke Motorcycles.

It seems that there is no formal willingness to implement NAMAs due to an unclear vision of Measurable, Reportable and Verifiable actions. However, Egypt has started some internal action regarding the development of NAMAs, such as:

- A committee of concerned sectors (energy, agriculture, oil and gas, transportation, and housing) has been established.
- Focal points from each sector have been identified.
- International co-operation on NAMA capacity building has been initiated with UNDP.

Israel

The second national communication to UNFCC is not as detailed as for previous countries. It only gives GHG inventories from 2000 to 2007 with no text. It shows that energy accounts for 96% of GHG emissions (energy industries, manufacturing industries, transport).

Jordan

Jordan is a small country with limited natural resources. The country is exploring ways to expand its limited water supply and to use its existing water resources more efficiently, including regional cooperation with Israel. The country depends on external sources for the majority of its energy requirements. Rapid privatization of previously state-controlled industries and liberalization of the economy is spurring unprecedented growth in Amman and Aqaba. Jordan has six special economic zones that attract significant investment. Despite this high mitigation potential, Jordan has not fully benefited from the CDM. Up to now, only two projects have been registered: the Fuel Switching Project at the Aqaba Thermal Power Station, and the Reduction of Methane Emissions from Ruseifeh Landfill.

CDM development in Jordan requires more responsiveness, efficiency and transparency. Jordan must carry out appropriate reforms of its legal, tax and institutional framework, particularly regarding the bidding procedures of CER sale and CDM revenue tax in order to make CDM more attractive for project holders. The CDM projects portfolio includes eight more projects submitted for registration or identified, such as, Amman East 400 MW Combined Cycle Power Plant, wind farms at Fujeij and Wadi Araba, and Al Kaider landfill CH_4 collection for power generation.

Lebanon

Many years of war have devastated the country, which now has to import 85% of basic necessities, has a highly developed underground economy, and must bear the burden of debt and a considerable budget deficit. The Lebanese Cleaner Production Center is the third Resource Efficient and Cleaner Production (RECP) in the Region.

Lebanon became eligible for the CDM relatively late, since it ratified the Kyoto Protocol in 2006.

Lebanon mitigation assessment must be updated, as it does not estimate emission reduction potential resulting from industrial processes and forestry measures. Measures related to the agriculture and energy sectors are also only partially estimated.

Despite this high mitigation potential, Lebanon has benefited little from CDM. To date, it has not registered one single project.

Among the CDM portfolios, 4 projects were identified as priorities to be registered before 2012. These 4 projects are:

- 60 MW Wind farm in Hermel Region;
- Hydro-Power facilities in Qadicha, Safa and other sites;
- Fuel switching to Refuse Derived Fuel (RDF) at SEBLIN Cement Plant;
- Waste to Energy generation at SICOMO paper plant.

Libya

Libya has the highest per capita share of CO_2 emissions compared to its neighbours. In Libya, the main sources of air pollution are related to the use of petroleum derivatives such as fuel in many industrial, artisan and transport fields. Oil refineries are the main sources of atmospheric pollution due to their harmful gas emissions, mainly hydrocarbons, carbons, nitrogen oxides and sulphur from burning fuel in oilfields and refineries. Most of these plants were not subjected to environmental evaluation prior to their establishment, and they have adverse effects on the surrounding residential and maritime areas. The plants do not have the necessary pollution control, monitoring and measurement systems, nor the necessary equipment and devices for limiting or decreasing the volume and concentration of the pollutants. The recent war destroyed some industrial facilities.

Libya has ratified the UNFCCC, signed the Kyoto Protocol, and created a DNA in 2010. There is a crucial lack of data and information on climate change in general and on mitigation in particular. However, the mitigation potential in the energy sector is certainly very high.

Only two projects were identified in the CDM portfolio of Libya: one project, at validation stage, is related to cement blending; and the other is related to a 60 MW wind energy farm. Considering the current political situation in the country, these two projects will not succeed in meeting the deadline.

Mauritania

Mauritania is not on the Mediterranean Sea but is part of the 5 + 5 initiative together with Algeria, Tunisia, Libya, Morocco, France, Italy, Spain, Portugal and Malta. The country is a least developed country with one of the lowest GDF rates in Africa, despite the presence of natural resources such as iron ore. GHG emissions come from agriculture and forestry (84.7%), energy (14.5%), waste (0.6%), and industry (0.1%). There is a strong need for education on CDM projects.

Morocco

The high cost of energy imports is a major problem. Morocco has no reserves of oil and gas, but phosphates and their derivatives account for almost one fourth of Moroccan exports. Morocco has virtually limitless phosphate reserves and its state-owned company *Office Cherifien des Phosphates* (OCP) is the world's largest exporter of phosphates in the world. While the phosphates industry is a major contributor to GDP and employs tens of thousands of people, it is also a source of serious environmental concerns, with high levels of CO_2 emissions.

In 2000, The Kingdom launched CMPP, the National Reference Centre for Cleaner Production, a member of the United Nations Industrial Development Organisation (UNIDO), UNEP and contacts were established for this research.

As examples of best-known projects, two CDM projects were registered at an early stage in Morocco, one of the most active countries in the Region in the fields of climate change mitigation and adaptation. The first of these is the wind farm in Tetouan, which provides 50% of the electrical needs of the Lafarge cement plant, officially registered as a Clean Development Mechanism (CDM) by the CDM Executive Committee in Bonn in 2005. The second concerns the *Office Cherifien des Phosphates* (OCP). OCP has deployed a Heat Recovery System that captures heat from its smokestacks. Phosphoric acid production involves chemical reactions. OCP facilities capture the heat relea-

sed during this process through an engineered recovery system and use it to generate power for consumption by its plants. The heat capture system allows OCP's plants to use less coal-fired energy. OCP earns "carbon credits" they can sell on a secondary market through CDM.

Morocco must seize the opportunities offered by the CDM and enhance its capacities in the public and private sectors. Morocco should prepare itself for the new mechanisms currently under discussion, although these are still at a concept stage. This should include NAMA identification by carrying out sectoral screening based on objective criteria, NAMA formulation including cost and funding assessments (unilateral, supported, crediting), and NAMA development and implementation. The idea is to build capacities around pilot NAMAs to be developed within the project, such as the current energy efficiency and renewable energy programs of Morocco. A draft paper *Project Market readiness* identifies three key areas for Morocco: power generation, cement, and phosphate production.

Currently, there are eight Moroccan CDM projects registered by the CDM Executive Board and twelve projects under validation according to the Point Carbon database (end 2011). According to the Moroccan Climate Change unit's website, a further five projects have been approved by the Designated National Authority (DNA) at the level of Project Design Document, while thirteen projects are at the stage of Project Idea Note approved by the DNA, and around 27 projects are at conception stage. This suggests a total of 65 projects.

Palestine

Palestine is not yet a member state of the UN and thus cannot participate directly in the CDM.

Syria

Syria is a middle-income country, with an economy based on agriculture, oil, industry, and tourism. However, Syria's economy is currently facing serious political problems resulting from declining rates of oil production, a rising non-oil deficit, wide-scale corruption and high rates of unemployment linked to a high population growth rate. 2 CDM priority projects are:

- Qatineh 50 MW wind energy project
- Portland Pozzolana "Blended Cement" at Lafarge Cement Syria

Tunisia

In Tunisia, energy generation and the transport sector are among the major contributors to air pollution. The transport sector is another specific contributor to CO_2 and lead emissions. CO_2 emissions account for 92% of the total GHG emissions, while methane emissions account for 7%, and nitrogen oxide for 1%. GHG emissions of CO_2 from the transport sector rose constantly, with an annual increase rate of 9%.

The current CDM portfolio of Tunisia comprises sixteen projects with advanced CDM status in the CDM project pipeline in Tunisia: three projects are registered, three projects are under validation and 10 projects are in Project Design Document stage. The low number of registered CDM projects in Tunisia is due to the fact that funding is lacking and public organisations are the main project-executing agencies. The private sector is not involved and information is insufficient, but we consider Tunisia as one of the three leading countries of the Region concerning CDM project implementation.

CDM priority projects are:

- Partial substitution of fossil fuels with biomass at *Les Ciments Artificiels Tunisiens*, Tunis.
- Tunis light rail transit project.
- Biomass Power Generation Project.
- Distribution of 1 million Compact Fluorescent Light to the Société Tunisienne de l'Electricité et du Gaz (STEG) consumers with 1 to 2 kVA capacity.
- Tunisian co-generation development programme.
- Integrated fuel switching Project at Industrial Facilities in Gafsa Region
- Flared gas in *Sidi El Itayem* oil field
- 190 MW wind farm project in Bizerte

Turkey

Turkey cannot participate in the CDM mechanisms, because it is an Annex 1 country.

When the United Nations Convention on Climate Change (UNFCCC) was adopted in 1994, Turkey, as a member of the OECD, was included among the countries of the Convention's Annexes I and II. At COP 7 in Marrakech, 2001 Turkey's name was deleted from Annex II of the Convention.

As a result, Turkey remained an Annex I Party of the UNFCCC, in a different position to other Annex I countries. Turkey was not party to the UNFCCC when the Kyoto Protocol was adopted. Therefore, Turkey's name was not included in Annex B of the Protocol, which lists the individual targets for Annex I Parties.

However, Turkey has recently ratified the Kyoto Protocol. The country is not subject to a quantified emission limitation or reduction commitment within the first commitment period of the Protocol. Despite Turkey's accession to the Kyoto Protocol, its name was not directly added to Annex B, subject to the decision 26/CP.7. Turkey cannot participate in the mechanisms CDM/JI/IET, as only non-Annex I Parties can host CDM, and only Annex B Parties can undertake JI and International Emission Trading (IET). Participation in the Voluntary Carbon Markets (VCMs) seems to be the only realistic possibility for Turkey in the period 2008-2012 for smoother integration into the post-Kyoto period.

Turkey's first national communication on climate change was submitted in January 2007. GHG emissions per sector in Turkey in 2009 show that the energy sector accounts for 75%, followed by waste (9%), industrial processes (9%) and agriculture (6%).

Among the three flexibility mechanisms set forth in the Kyoto Protocol, we have focused so far on EU ETS and CDM. The Joint Implementation (JI) is the third mechanism to help countries with binding greenhouse gas emissions targets meet their obligations. Joint Implementation is defined in Article 6 of the Protocol. Under this Article, "*any Annex I country can invest in emission reduction projects* (referred to as *Joint Implementation Projects*) *in any other Annex I country as an alternative to reducing emissions domestically*". Countries can lower the costs of complying with their Kyoto targets by investing in greenhouse gas reductions in an Annex I country where reductions are cheaper, and then applying the credit for those reductions towards their commitment goal. Most Joint Implementation projects take place in Eastern Europe and this mechanism does not directly impact SEMCs.

Potential positive and negative impacts

IN THE NORTH, THE ECONOMIC CRISIS led to less production and lower CO_2 emissions. The demand on quotas is therefore lower than expected, leading to the low tonne/CO_2 price shown in **TABLE 2** and a surplus in carbon credit. In these circumstances, the competitiveness of the EU industry is less affected by carbon constraint. If the system for allocating emission allowances changes after 2012, auctioning versus free allocation may lead to new impacts.

WTO and UNEP launched a report in June 2009 explaining for the first time the connections between trade and climate change. The report examines the intersections between trade and climate change from four perspectives:

- The science of climate change;
- Economics;
- Multilateral efforts to tackle climate change;
- National climate change policies and their effect on trade.

The WTO and UNEP are partners in the pursuit of sustainable development and this report is the outcome of their collaborative research. While it is written on a global basis, some aspects can be used to analyse the situation in the Euro-Mediterranean Region and help identify impacts.

Positive impacts

A READING OF SEMCS' second national communications definitely points to increased awareness of sustainability. Carbon constraints can have positive impacts on production, trade and consumption. They can be defined as moving in a direction of progress. Positive impacts must be considered as effects that reduce global CO_2 emissions, develop sustainable production and consumption patterns on both shores of the Mediterranean, and do not hamper regional economic growth.

Energy

In recent decades, fossil fuels of petroleum products and natural gas have represented the main sources of primary energy in SEMC. On the production side, since the early 1960s, large amounts of crude oil and natural gas reserves have been discovered in countries such as Algeria, Libya and Egypt. These 3 countries are the main oil and gas exporters of the Region. Other countries, such as Morocco and Tunisia, do not have such reserves and have to import energy.

Access to energy and power generation are key issues for development. Everyone agrees that emissions of pollutants and greenhouse gases from fossil fuel-based electricity generation account for a significant portion of SEMC greenhouse gas emissions. Hydraulic facilities have been built in many countries, for instance the Assouan Dam, in Egypt. Accelerating the completion of electric interconnections within SEMCs, with plans for interconnections with the European grid in the future, is a major challenge.

On the consumption side, the trend is clearly towards more energy demand due to population growth and industrialization, to be used for transportation, buildings and industries. Transportation is a major factor to ease mobility in large cities but also toward rural areas. The number of cars and motorcycles is due to increase and this is a threat to the reduction of CO_2 emissions.

The long-term trend is clearly towards:

- More renewable energy: solar, wind, hydro, biomass, marine energy, with 20 GW of additional capacity just for solar energy in 2020 (Mediterranean Solar Plan).
- More energy efficiency in buildings, transport and industry.

Those are positive impacts if new investments are managed and operated properly.

Some significant progress can be mentioned in NMCs and SEMCs. The Mediterranean Solar Plan, as an example, was endorsed in 2008 and is expected to develop new capacity of 20 GW in order to satisfy energy demand in SEMCs. The principal issues are its high cost and the need to strengthen the Mediterranean power grid. No allowances will be allocated free of charge for electricity production in NMCs after 2012, with only limited and temporary options to derogate from this rule.

Industrial processes

According to the Intergovernmental Panel on Climate Change document "Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories"[25], the main sources of GHG emissions from industrial processes include the cement industry, limestone and dolomite production, iron, steel and aluminium industries, nitric acid production, fertilizer production, etc. The implementation of new climate policies in the Euro-Mediterranean Region primarily impacts energy-intensive industries.

The impacts on industrial processes could include:

- Energy efficiency improvement in industrial processes.
- Improved information about GHG emission reduction opportunities.
- Fewer financial barriers on some GHG emissions reduction investment programs compared to other investment alternatives.
- Improved data exchange between sectors (Centre Marocain de Production Propre).
- Improved knowledge, awareness of rationalizing energy usage and technology levels.

Industry is subject to the most re-location in NMCs. Carbon leakage, energy and labour costs are key factors to take into consideration. In France, the Union des Industries Chimiques (UIC) estimated in June 2008 that purchasing their full allowances in 2020 could cost the 96 French industrial chemistry sites subject to ETS EU 1.1 billion euro per year.

In 2009, European Union member countries agreed that 164 industrial sectors will be exposed to a significant risk of carbon leakage in NMCs. They will receive free allowances based on ambitious benchmarks, but for non-exposed industry sectors, such allocations will be phased out. These rules imply that at least half of the total number of allowances are expected to be auctioned beyond 2013.

The example of Northern countries and new green policies can positively impact SEMCs leaders and governments. These positive impacts include higher construction standards for low-emitting factories, such as the Renault's plant in Tangier (**BOX 1**), and residential buildings. Another advantage is a positive mentality of responsibility for anticipating and implementing new norms, measurements and verifications. Key low carbon technologies can become more important, such as renewable energy and fuel cell technology.

25. Intergovernmental Panel on Climate Change (IPCC 1996).

This positive impact could lead to sustainable production, which is the creation of goods and services that use non-polluting processes and systems, save energy and natural resources, and are economically viable, safe, and creatively rewarding for workers.

If production becomes sustainable, the environment, employees, communities, and organizations should benefit. These conditions can lead, always in the long term, and often in the short term, to more economically viable and productive enterprises.

BOX 1 Car industry – positive impacts lead to top-standard plant in Tangier

Renault's new plant in Tangier was inaugurated in February 2012 to some controversy in France, despite the car manufacturer's assurance that the plant emits zero carbon and zero industrial liquid discharges.
Production began with two new entry models: the Dacia Lodgy and a small van/passenger car. Renault's Tangier plant now produces 170,000 vehicles per year on one production line. Capacity is to be increased to 400,000 vehicles per year.
Renault says that the plant's environmental impact is reduced to the lowest levels ever reached by a bodywork-assembly plant, thanks to a partnership with the Kingdom of Morocco and Veolia Environnement:
• CO_2 emissions are cut by 98%, the equivalent of about 135,000 tonnes of CO_2 per year by optimizing energy consumption and using renewable energies. The few remaining tonnes of CO_2 are offset either by buying carbon credits or by generating renewable energy on site.
• Industrial wastewater is not discharged into the natural ecosystem and the quantity of water consumed by manufacturing processes is cut by 70%.

The European Union awarded Renault a Sustainable Energy Production Award in 2011 based on four achievements:
• Energy efficiency improvement: Renault cut the site's consumption and has revised its painting processes, especially in the baking phases. Substantial energy savings have been made by combining innovative technologies and best practices for the recovery of energy in the paint-shop, which accounts for 70% of the plant's thermal energy consumption. The thermal energy requirements of the Tangier plant are cut by 35%, compared with a plant with an equivalent production capacity.
• No CO_2 thermal energy generation: Renault identified a zero- CO_2 thermal energy generation system. Biomass boilers produce high-pressure, hot water for the paint process ovens, for other manufacturing processes and for the ventilation of the air in the buildings on the site. Part of the fuel for the biomass boilers is made up of locally sourced olive stones. Renault says that the rest of the fuel comes from eucalyptus wood imported from Southern Europe, and, 4 years hence, short-rotation eucalyptus from Morocco.
• Use of renewable energy sources: The Moroccan Office National de l'Énergie (ONE) plans to develop renewable energy so that the site can be powered entirely by wind and hydraulic electricity.
• No industrial liquid discharges: The Tangier plant does not discharge any industrial liquids and has reduced its water consumption for manufacturing processes by 70% compared to a plant with equivalent output capacity.

With significant improvements in energy efficiency and production processes, the impacts of carbon constraint obviously diminish, although CO_2 emissions are not the main factor for relocating such a plant to Morocco.

Renault SA

Agriculture, fair trade and consumption

Even though the relationship between agriculture, fair trade, consumption and carbon constraint is not totally apparent at this stage in the Mediterranean Region, this link should not be neglected in the search for the right policies to generate positive impacts.

Global and regional trade could be better organised to reduce the carbon footprint. Tanger Med harbour is an example of a well-designed infrastructure, organised as a hub with a motorway and high-speed train to reduce the burden of passenger and freight transportation.

The WTO/UNEP report says that opening up trade and combating climate change can be mutually beneficial in achieving a low carbon economy. Contrary to some claims, trade and trade liberalization can have a positive impact on greenhouse gas emissions. Accelerating the transfer of clean technology and adapting these technologies to local circumstances have positive effects. Rising incomes due to the opening-up of trade can also change dynamics, with wealthier societies tending to demand higher environmental standards. More open trade together with actions to combat climate change can catalyse global innovation, including new products and processes that can stimulate new clean-tech businesses.

Fair trade is also a market-based approach that aims to help producers in SEMCs make better margins while promoting sustainability. Positive impacts include paying higher prices to exporters from the southern Mediterranean, as well as improved social and environmental standards. Fair trade focuses in particular on exports from SEMCs to NMCs, mostly handicrafts and commodities, and agriculture is especially concerned.

Carbon constraint should lead to a more sustainable agriculture in the Mediterranean Region. Some principles could be promoted such as:

- Conservation and preservation: "What is taken out of the environment is put back in, so land and resources are available to future generations". As an example, CDC Climat founded a "Club – Carbon Forest", promoting the French forest and wood-product sector's role in the fight against climate change. The aim of this Club is to put in place the appropriate practical conditions to enable the entire forest and wood product sector to benefit from new revenue sources created by using the carbon markets.
- Biodiversity: Farms cultivate and breed different types of plants and animals, which are rotated around the fields to enrich the soil and help prevent disease and pest outbreaks. Chemical pesticides are used minimally and only when necessary.
- Bioenergy, in which crops play a crucial role in the global energy mix in NMCs and SEMCs.

Pressure from northern consumers for product origin certification can have a positive impact on creating sustainable value chains and fair trade. This positive impact on consumption leads to sustainable consumption in the whole Region, where all stakeholders are involved, i.e. governments, businesses, consumers and civil society.

This sustainable consumption is defined by the United Nations as the use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle

so as not to jeopardize the needs of future generations. It also includes the awareness that goods must not be spoiled.

This sustainable consumption offers new market opportunities and increased efficiency that can result in continuous economic and environmental improvements.

Waste

It is not currently possible to claim that carbon constraint leads to better waste management in the Mediterranean Region. However, waste management is a main concern for SEMCs. In a country such as Morocco, waste accounts for 6.23% of GHG emissions in the 2010 reference scenario and is expected to increase to 10.24% by 2030[26].

Waste can be either solid waste or wastewater. Solid waste can be divided into municipal waste, industrial waste, agricultural waste, waste from cleaning waterways, and healthcare waste. Household waste constitutes the majority of total municipal waste, with the remainder generated by commercial establishments, service institutions, streets and gardens, hotels and other entertainment sector entities. Waste collection efficiency needs to improve in small provincial towns and large cities.

Industrial wastewater is one of the environmental concerns relating to the industrial sector, as it contains dissolved industrial organic and inorganic waste, solids and metals, all of which have negative and hazardous impacts and directly affect human health. Industrial wastewater treatment plants exist in industrial areas of SEMCs in order to comply with the various new relevant laws. Two multinational French companies that are world leaders in waster management and water distribution, Véolia Environnement and GDF SUEZ, play a significant role in the Region. As an example, Veolia Propreté Maroc, with 7 branches all over Morocco, collected 460,000 tonnes of waste per year in 2008 and reached 2,000,000 inhabitants[27].

Relevant carbon constraint policies in the Mediterranean Region should lead to: better waste management, with an obligation to decrease the overall waste level and more waste used for energy to generate power and heat.

Negative impacts

HOWEVER, SOME IMPACTS could have unfavourable and detrimental effect on the Mediterranean Region, and especially on its economic growth, stability and environmental aspects.

Risk of carbon leakage

Carbon leakage occurs when CO_2 emissions increase in one country as a result of emission reduction in another country with a strict climate policy. Carbon leakage is a negative impact that the European Commission tries to mitigate. On the production side, when an NMC's emissions policy raises local production costs, then SEMCs with no carbon constraints have a competitive advantage. If demand for these goods remains the same, production may move to an SEMC with lower standards and global emissions will not be reduced.

There is no consensus over the magnitude of long-term leakage effects in the Mediterranean Region. This is a challenge for climate change policies in the Region. The price of carbon is a key factor to take into account.

26. Second national communication to UNFCCC-Morocco.

27. Institutional brochure, Veolia Environnement.

According to EU legislation, a sector is exposed to a significant risk of carbon leakage if:

- The extent to which the sum of direct and indirect additional costs induced by the implementation of this directive would lead to a substantial increase in production costs, calculated as a proportion of the Gross Value Added, is at least 5%.
- The Non-EU Trade intensity defined as the ratio between total value of exports to non-EU countries and the value of imports from non-EU countries and the total market size for the Community (annual turnover plus total imports) is above 10%.

According to the Directive, production from sectors exposed to a significant risk of carbon leakage will receive relatively more free allowances than other sectors. Free allowances will, in principle, be allocated based on product-specific benchmarks for each relevant product. The starting point for the benchmarks is the average of the 10% most efficient installations, in terms of greenhouse gases, in a sector and they shall take into account the most efficient techniques, substitutes and alternative production processes.

Only the most efficient installations have a chance of receiving free allowances. Free allowances will be product-based, not sector-based. All products of the same kind should get equal treatment in terms of carbon leakage. All relevant products will be classified as exposed to carbon leakage or not, based on a list of sectors. Therefore, an installation producing goods exposed to a significant risk of carbon leakage may receive favourable carbon leakage treatment for one product but not for all of them.

Due to low carbon prices and the fall in emissions, energy-intensive sectors that were in the ETS before 2013 are likely to end up with a considerable number of unused freely allocated allowances at the end of the second period of the ETS in 2012. These allowances can be carried over into phase three (2013-2020) and will put energy-intensive sectors in a comparatively better position in the face of international competition.

Risks for trade

On the supply side, when the emissions policy in NMCs adds a premium to certain imported goods, then demand and price may fall in NMCs. SEMCs that do not place a premium on those items may take up the demand and use the same supply, negating any benefit.

NMCs may limit imports from SEMCs because products are high carbon products. This could alter trade. When a product is of first necessity, other elements such as price, quality and availability might mitigate this risk.

This raises issues about the EU's trade policy. The impact of increased costs of imported goods for EU manufacturers, due to carbon constraint, needs to be considered. Such a measure could lead to NMC imports being delivered by the "cleanest" third country producers, while keeping "dirtier" production for their own domestic use.

The inclusion of imports into the ETS would need to be very carefully designed to ensure that it is fully compatible with WTO requirements. A system that defines in detail the carbon content of each individual category of goods is difficult to put in place. The system could at best only be envisaged for a limited number of standardised commodities, such as steel or cement in

the Region. For each category of goods, an average EU carbon content would have to be defined. This could become an administrative burden and agreement on such an average might be difficult to reach in the Region.

Border adjustment mechanisms could be put in place on the EU borders in order to cover high carbon imports.

Windfall profit

If a company receives permits allocated for free and tries to pass through pollution costs to consumers, this company will be reimbursed for costs it has never incurred, with the additional profit occurring unexpectedly as a consequence of the implementation of the Emissions Trading Scheme. It is not due to any effort on the part of the beneficiary company and could be seen as a new opportunity for companies. The negative impacts are the price increase for consumers, artificial operating income for corporations, and unfair competition.

Free allocation versus auctioning in NMCs

A shift from free allocation to auctioning after 2012 could impact the profitability of some industry sectors in NMCs, such as electricity generation. During the first and second phases of the EU ETS, electricity generation benefited from free and over-allocations of European Union Allowances. The benefits of free allocations are due to come to an end. The Commission's Auctioning Regulation ensures that participation in auctions will be cost-efficient.

The argument that auctions could lead to further increases in power prices must be challenged. In competitive wholesale markets, auctioning has no impact on power prices because the opportunity costs of free allowances are passed on to the power prices. In the long term, different mechanisms must be considered. Removing the free allocation for new installations is equivalent to removing an investment subsidy. This could delay some investments, which could lead to higher power prices.

Green initiatives in the Mediterranean Region

THE UNITED NATIONS Framework Convention on Climate Change explains that countries must submit national reports on the implementation of the Convention to the Conference of the Parties (COP). The required contents of national communications (initial and second communications) and the timetable for their submission are different for Annex I Parties and non-Annex I Parties. This is in accordance with the principle of "common but differentiated responsibilities". The analysis of these national communications highlights efforts to assess greenhouse gas emissions, mitigations and new policies, and other incentive mechanisms for reducing emissions in SEMCs. Among these innovative initiatives, the example of China is mentioned to see whether it could influence SEMCs.

National communications and environmentally friendly public policies

THE CORE ELEMENTS of the national communications for both Annex I Parties and non-Annex I Parties are information on emissions and removal of greenhouse gases (GHGs) and details of the activities a country has undertaken to implement the Convention (mitigation actions). National communications usually contain information on national circumstances, vulnerability assessment, financial resources and transfer of technology, education, training and public awareness. The date of submission for each communication is in the annex of this report.

Mitigation

THE OBJECTIVE OF REGULATORY policy is to ensure that the regulatory lever works effectively because regulations and regulatory frameworks are in the public interest. For mechanisms to be successful in reducing CO_2 emissions, SEMCs need regulatory reforms, such as introducing feed-in tariffs for renewable energy and facilitating public private partnerships. The goal of regulatory reform is to improve national economies and adapt them to change. Good regulation and structural reforms must go hand-in-hand with sound fiscal and macroeconomic policies. SEMC governments must consider the effectiveness of reforms to ensure that their regulatory structures and processes are relevant, robust and transparent.

An assessment of individual regulatory systems in SEMCs is necessary, and some elements are included in the national communications to UNFCCC. Since the process of regulation improvement is never finished and carbon issues are new topics, reforms are necessary and some questions need to be asked:

- How strongly do political leaders and senior officials express support for regulatory reform in favour reducing CO_2 emissions in SEMCs? How is this support translated in practice into reform. How have stakeholders reacted to these actions and to the reforms in concrete terms?
- What are the accountability mechanisms that assure the effective implementation of regulatory reforms? Are policies, laws, regulations, practices, procedures and decision making transparent, consistent, comprehensible and accessible to domestic as well as foreign parties?
- Do the regulatory authorities have adequate human and technical resources to fulfil their responsibilities in a timely manner? Are there training and capacity building programmes for rule makers and regulators to ensure that they are aware of high-quality considerations?

When Morocco wants to build its first 500 MW concentrated solar plant in Ouarzazate, thanks to an international tender to select the best technology and the best Engineering, Procurement Construction contractor, the regulatory and fiscal challenges are immense.

Some SEMCs have published policy papers recognising the need for environment-related taxes to complement existing regulatory policies. They have introduced electricity generation levies, motor vehicle emissions taxes, levies on incandescent light bulbs, tax incentive measures to support renewable energy investments such as depreciation allowances, income tax exemption for revenues from the sale of Certified Emission Reduction units resulting from CDM projects, and energy efficiency savings tax allowances.

In addition to regulatory and fiscal reforms, local authorities can boost initiatives to implement Agenda 21, a comprehensive programme of action covering every area in which humans impact on the environment.

As an example, new policies must be adopted concerning the production of power from renewable energy sources. NMCs rely on feed-in tariffs, with an obligation to purchase green power by local utility, based on long-term contracts. This mechanism has not been fully satisfactory in France and Spain and it is questionable whether it should be copied in SEMCs. An alternative mechanism to boost green power generation would be the implementation of Green Certificates. These are tradable certificates proving that certain power is generated using renewable energy sources. One certificate represents a generation of 1 MWh of electricity and this mechanism is used in some countries, such as Belgium, Sweden and the USA. Further cooperation is needed between NMCs and SEMCs to pinpoint the most efficient policies and capitalize on the experience of partner countries.

Green public policies are in place in the Mediterranean Region for mitigating risks and adapting to them, as part of a comprehensive strategy expressed in national communications submitted to UNFCCC. If we summarize the action plan of SEMCs for the 4 key sectors previously identified, we can see several practices (**BOX 2**) of different natures. Some practices are available now, whereas others are under development. The effectiveness of these practices must be measured and the cost of implementation is not always calculated.

We see some convergence in SEMCs concerning mitigation programmes, even though some countries have significant natural resources compared to neighbour countries. These countries are potentially richer and could invest the proceeds of natural resource exports in these mitigation practices, but events have shown that nothing is simple.

BOX 2 Current and future mitigation action in SEMCs

	Mitigation practices now available	Under development
Agriculture	• Improved crop and grazing land management to increase soil carbon storage. • Restoration of cultivated peaty soils and degraded lands. • Improved rice cultivation techniques and livestock and manure management to reduce CH_4 emissions. • Improved nitrogen fertilizer application techniques to reduce N_2O emissions. • Dedicated energy crops to replace fossil fuel use. • Afforestation, reforestation, forest managment, reduced deforestation. • Harvested wood product management. • Use of forestry products for bioenergy to replace fossil fuel use.	• Improvements of crop yields. • Tree species improvement to increase biomass productivity & CO_2 sequestration. • Improved remote sensing technologies for analysis of vegetation/ soil carbon. • Sequestration potential and mapping land-use change.

Energy	• Supply and distribution efficiency. • Fuel-switching from coal to gas. • Renewable heat and power sources (hydro, solar, wind, geo, bioenergy). • Combined heat and power. • More fuel-efficient, hybrid, cleaner diesel vehicles,biofuels. • Shifts from road transport to rail and public transport systems, non-motorized transport, land use and transport planning. • Efficient lighting and day-lighting, more efficient electrical appliances and heating and cooling devices. • Improved cooking stoves, insulation. • Alternative refrigeration fluids. • Recovery & recycle of fluorinated gases.	• Carbon capture and storage (CCS) for gas, biomass and coal-fired electricity generating facilities. • Adapted nuclear power. • Marine energy in the Mediterranean Sea. • Advanced solar photovoltaic and concentrated solar power. • Last-generation biofuels. • Higher efficiency aircraft. • Advanced electric and hybrid vehicles with more powerful and reliable batteries. • Smart meters for feedback and control.
Industry	• More efficient end-use electrical equipment, heat and power recovery. Material recycling and substitution. • Control of non-CO_2 gas emissions. • Process-specific technologies.	• Advanced energy efficiency. • CCS for cement, ammonia, and iron manufacture. • Inert electrodes for aluminium manufacture.
Waste	• Landfill methane recovery, waste incineration with energy recovery. Composting of organic waste. • Controlled waste-water treatment. Recycling and waste minimization.	• Biocovers and biofilters to optimize CH_4 oxidation.

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The mitigation measures are described in national plans and country study documents. Implementation of these national plans needs financial and technical support from international donors. The objective of national plans is to create a national greenhouse gas mitigation portfolio to support the process of sustainable development. They stress the need for technology transfer between the North and South of the Region, donor funding, capacity building and financing from the Clean Development Mechanism (CDM), a project-based approach, to New Market Mechanisms (NMM).

The recommendation is to keep on promoting energy efficiency and the use of renewable energy resources, not just to contribute to the reduction of greenhouse gases but also to be consistent with the long-term development goals of the regional economy.

Various policies and measures are being developed related to internalizing renewable energies, energy efficiency and reducing GHG emissions, as advocated in the UNFCCC.

Accelerated developments are underway for introducing renewable energy, fuel switching in industry and transport, domestic and industrial efficiency programmes, energy-efficient buildings, and agriculture and plantation schemes to enable the creation of an economic structure that prioritizes energy efficiency. This reflects SEMCs' basic policy direction and measures for greenhouse gas reductions to contribute to global efforts to mitigate climate change, despite no legal requirement to do so.

Research and knowledge centres

TWO LARGE INTERGOVERNMENTAL organizations have contributed to the creation of research centres that help to develop cleaner production processes in some Southern Mediterranean countries.

UNIDO, a specialized agency of the United Nations that promotes industrial development for poverty reduction and sustainability, is developing a partnership with Arab economies to support sustainable industrial development. The scope of the Arab Programme is larger than the SEMCs, since Arab states in the Gulf Region are included. UNIDO is increasing its cooperation with SEMCs and creating a favourable environment for these countries, and offers technical assistance services with the objective of increasing industrial capacity. UNIDO traditionally works with the public sector but is extending its cooperation with private organizations.

UNEP, another United Nations agency, sponsors the Regional Activity Centre for Cleaner Production[28]. This centre for international cooperation with Mediterranean countries on development and innovation focuses on sustainable consumption and production models. It was established in 1996 in Barcelona with an agreement including the Spanish Ministry of Environment and the Government of Catalonia.

Along with these two international institutions, National Clean Production Centres (NCPCs) have been set up in some SEMCs (Morocco, Algeria, Tunisia and Lebanon).

The Centre Marocain de Production Propre (CMPP), hosted by the General Confederation of Moroccan Enterprises (CGEM) and backed by the Department of the Environment, receives financial support from the Swiss government.

It has become the National Centre of Excellence for the promotion of the Resource Efficient and Cleaner Production (RECP) and the transfer of Environmentally Sound Technologies (EST). Resource Efficient and Cleaner Production (RECP) is defined as the continuous application of an integrated preventive environmental strategy to processes, products and services to increase efficiency and reduce risks to humans and the environment.

CMPP's contributions concern technical and human resources issues and particularly: production efficiency through improved productive use of natural resources and environmental conservation through minimizing the impact on nature.

As a NCPC hosted by the private sector and backed by both the Ministry of Industry and the Department of the Environment, the CMPP is a kind of Public-Private Partnership. It assists national industries and partner companies of all sizes.

As part of its role, CMPP strengthens knowledge on sustainable technology options, defines an operational approach and participates in UNIDO-UNEP joint programmes. The CMPP programme helps increase the competitiveness of Moroccan industries. Its success in achieving its goals is regularly assessed.

Technical and financial support is also urgently needed to establish research programmes with teams from universities and research institutes from NMCs and SEMCs. The Regional Activity Centre for Cleaner Produc-

28. www.cprac.org/en

tion in Barcelona has further partner organisations in Egypt, Lebanon and Algeria (Centre National des Technologies de Productions Plus Propres).

We recommend seeking additional funding in the Mediterranean Region to support the CMPP and to ensure that its role will grow in the future. We also recommend developing priority research in industrial sectors and increasing transversal cooperation between the Regional Activity Centre for Cleaner Production and all local centres for cleaner production.

TABLE 4 Priority research fields in SEMCs

Energy	Upgrading of low-efficiency fossil fuel-fired industrial boilers. Combining heat and power co-generation. Recovering residual and waste heat and pressure. Finding adapted fuel substitutes and biomass energy technologies. Improving energy efficient transport systems and technologies. Assessing potential of CO_2 separation, capture and storage in geological formations. Using heat pumps and condensing gas furnaces. Interconnecting power grids.
Industry processes	Improving production processes. Accelerating technology transfers. Improving basic requirements for health, with migration of populations towards cities and coastal zones for employment reasons.
Waste	Irrigating with treated wastewater and/or low quality water. Developing low-cost technologies for wastewater treatment, water quality improvement. Recycling agricultural wastes and re-use. Improving water use efficiency and water demand management.

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Academic institutions must also develop cooperation programmes within the Mediterranean Region. In an interesting experiment, Paris Dauphine University established a campus in Tunis to teach Bachelors and Masters courses in Economics and Business Administration. This shows that training and research can be linked on subjects other than sciences and engineering.

Other incentive mechanisms for reducing emissions in the Mediterranean Region

INNOVATIVE MECHANISMS must be found to further reduce CO_2 emissions in the Mediterranean Region. Regulation and fiscal policies are two key levers of state power to help reduce CO_2 emissions and this set of policies is referred to as Nationally Appropriate Mitigation Action (NAMA). Financial support and investment funds are crucial for these mechanisms to work effectively, and involvement from international organisations, such as the World Bank, and United Nations agencies, gives credibility to these initiatives.

NAMA and New Market Mechanisms

THE STATUS OF THE CLIMATE negotiations and the recent outcomes of the Durban Conference leave some stakeholders puzzled about the future legal framework of the overall agreement succeeding the Kyoto Protocol. Several international initiatives explore the potential and feasibility of the New carbon Market Mechanisms but uncertainties remain high.

SEMCs are no exception when it comes to the various initiatives and recent studies whose objectives are to assess the potential of GHG mitigation,

develop NAMAs and test Measurement Reporting Verification (MRV) systems. However, the issue of how to implement these new market mechanisms remains to be defined and deserves more attention.

Indeed, a set of institutional, regulatory and technical framework conditions is required for an SEMC to progressively develop market-based instruments in order to mobilize the public and private funds needed for GHG mitigation and to ensure low carbon development. Development agencies, experts, and representatives of public and private partners are assessing challenges and opportunities related to the establishment of NAMAs and have classified them into 3 categories:

- Unilateral efforts of the developing country alone (unilateral),
- Actions supported and funded by developed countries (supported),
- Mitigation actions eligible for carbon credits (credited).

TABLE 5 NAMA opportunity in SEMC identified by Regional Centre for Renewable Energy and Energy Efficiency (RCREE)

	NAMA opportunity	Type of NAMA
Algeria	Solar energy (CSP) Building energy efficiency.	Supported NAMA: financial contributions (loans, grants and/or payment guarantees) to back feed-in tariff payments; provision of technical assistance.
Egypt	Renewable energy (RE).	Unilateral NAMA: in the medium-long term, the RE fund is designed to be self-financing through avoided domestic consumption of natural gas (for export as LNG at a higher value). Supported NAMA: financial contributions (loans, grants and/or payment guarantees) to back feed-in tariff payments; provision of technical assistance. Credited NAMA: the achievement of part of the 20% target (higher cost technologies) could be credited under a sectoral crediting mechanism.
Jordan	Wind energy. Solar energy. Energy efficiency for Water Pumping. Mitigation programme for Amman City.	Supported NAMA with crediting possibility to be explored.
Lebanon	Grid emissions intensity reduction. Public transport development.	Supported NAMA.
Libya	Building energy efficiency.	Supported NAMA.
Morocco	Renewable energy. Solar water heater (SWH). Building energy efficiency. Energy efficiency in industry.	Unilateral NAMA: provision of subsidies for SWH systems; introduction of building code, possibly the insulation programme. Supported NAMA: provision of concessional loans to help finance SWH roll-out, technical assistance to Agence national pour le Développement de l'Energie Renouvelable et l'Efficacité Energétique (ADEREE) to develop MRV framework, an energy labelling scheme, and the building code; training and accreditation of insulation and SWH installers. Credited NAMA: most likely suited to acceleration of Compact Fluorescent Light (CFL) programme, given low domestic energy costs (suggests that CFLs could be additional in a crediting programme).
Syria	Solar Water Heating Systems. Building energy efficiency.	Supported NAMA.
Tunisia	Self generation in industry. Building sector roofing insulation.	Unilateral NAMA: emissions reductions achieved. Supported NAMA: technical assistance to Agence Nationale pour la Maîtrise de l'Energie (ANME) for establishment of MRV system, training operators.

RCREE

Unilateral NAMAs in **TABLE 5** are associated with actions that SEMCs would take voluntarily and unilaterally, without support from NMCs or developing countries.

Supported NAMAs in **TABLE 5** would require support from NMCs or developed countries.

Credited NAMAs in **TABLE 5** are associated with actions that NMCs or developing countries are willing to take order to obtain carbon credit as an outcome of implementing such actions.

NAMAs are defined broadly to include all actions that reduce emissions, ranging from financial incentive schemes and new market mechanisms to regulations.

According to the Directorate-General for Climate Action (DG Climate action), the European Commission is trying to establish new market mechanisms within the UNFCCC. In Durban, in December 2011, in the decision 2 of COP17, it was specified at para.83 that the Conference of the Parties "*... Defines a new market-based mechanism, operating under the guidance and authority of the Conference of the Parties, to enhance the cost-effectiveness of, and to promote, mitigation actions, bearing in mind different circumstances of developed and developing countries, which is guided by decision 1/CP.16, paragraph 80, and which, subject to conditions to be elaborated, may assist developed countries to meet part of their mitigation targets or commitments under the Convention.*"

Hence procedures must be set up for these new market mechanisms. They are being studied, but little progress had been made at the meetings of May 2012 in Bonn. The Commission would like these procedures to be determined in Doha in December 2012. For the European Commission[29], New Market Mechanisms are equivalent to sectoral mechanisms. In fact, the Commission does not much use the word "sector" but rather "broad segment of the economy" which describes the emission-intensive sectors (cement, aluminium). Many projects on energy efficiency have been developed through CDM and PoA. Initiatives at sector scale, through NMM, would generate much more impacts.

In the "EU ETS"[30] Directive, bilateral agreements are possible to supply credit, although they are not specified. These bilateral agreements between Europe and developing countries could provide references, give examples for advancing international negotiations, and serve as pilot projects. These bilateral agreements may be negotiated directly with states by the Commission, but a mandate from the European Council is needed.

However, a representative of the EU Commission, DG Climate action, notes that the biggest problem in creating these new mechanisms is that: "we must create a demand !" The European Commission is facing opposition from some member states to raise the requirements of CO_2 emission reduction from 20% to 30% by 2020, especially given the current economic crisis.

Sectoral Credit Mechanisms

Sectoral Credit Mechanism means that a baseline or emissions benchmark is set for an entire economic sector. This new mechanism is being discussed in the UNFCCC process. It allows a national government to possibly earn credits for going beyond the emissions reductions required to meet its benchmark. Sectoral Mechanisms are driven by three considerations:

- Sector-based mechanisms are seen as a way of progressively increasing the involvement of developing countries in global mitigation initiatives. This provides incentives for developed countries to take on greater mitigation commitments by enhancing the cost-effectiveness of mitigation efforts.
- Developing abatement opportunities more suited to supporting policies than CDM at sectoral level.

29. Source: interviews with the European Commission Directorate General for Climate Action.

30. Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

- The potential for overcoming some shortcomings of the CDM (i.e. projects do not result in net global emission reductions).

Sectoral Mechanisms will impose no binding obligations. If the sector's emissions exceed the target, no sanctions would apply. The target could in theory be based on emissions intensity (e.g. tonnes CO_2-e/MWh) or absolute emissions. It would be entirely up to the national government to decide on how to encourage emissions reductions within the sector. It could, for example, offer to pass through any credits earned, or offer other incentives such as tax breaks or subsidies. However, all of these measures would entail some degree of risk that overall sectoral performance would be inadequate to beat the target. That is, unless the government obliges individual entities to comply with regulations.

Sectoral trading

Sectoral trading is a cap and trade approach. A target for sectoral emissions is agreed as a mandatory cap. The developing country needs to implement further actions to reduce CO_2 emissions. If the country manages to reduce its emission below the target, it will obtain a surplus of trading units (Assigned Amount Units) that can be sold on the market.

The framework for employing NAMAs and sectoral crediting for carbon finance is still emerging in SEMCs. Progress is being made in a number of areas, in particular in defining the MRV arrangements that would apply to different types of NAMA and in establishing the framework for proposing and supporting NAMAs.

We recommend that renewable energy and energy efficiency form the central pillar of future climate mitigation strategies involving NAMAs in the Mediterranean Region.

World Bank's Partnership for Market Readiness

The World Bank's Partnership for Market Readiness (PMR) was launched in Cancun in December 2010, SEMCs have expressed an interest in participating in the PMR (Jordan, Morocco, Turkey). Countries will have to contribute at least $5 million up-front to participate in the Partnership Committee. This platform can bring together NMCs and SEMCs to share experience on innovative market-based instruments. It provides financial and technical support to help a country implement, for instance, market-based instruments.

TABLE 6 Activities proposed by the World Bank for SEMCs

Participant	Country context	PMR support
Jordan	Develop renewable energy and energy efficiency as part of national priority.	• Explore market instruments, such as scale-up crediting for NAMAs in sectors including energy and/or waste management. • Support capacity building for data collection, establishment of baselines and MRV system.
Morocco	Implement climate change mitigation policy as part of national plan against global warming.	• Establish MRV framework. • Identify and develop crediting NAMAs in relevant sector.
Turkey	Turkish environmental law recognizes use of carbon market for climate action.	• Implement robust, installation level MRV system. • Pilot market instrument, create carbon exchange.

PMR brochure – World Bank

Carbon funds and Reducing Emissions from Deforestation Degradation (REDD+)

Green Fund

The setting up of a Green Fund was discussed in Durban. The Green Fund's mission would be to channel financial resources from developed countries to emerging markets to finance mitigation, adaptation and capacity building. This relates to renewable energy projects, energy efficiency, and Reducing Emissions from Deforestation Degradation (REDD). The fund would promote the use of public-private partnerships but uncertainties remain concerning its operation.

There are discussions about whether US$ 100 billion a year is a realistic target given the current economic turmoil, and no agreement has been reached. It is therefore too early to analyse its possible actions and impacts in the Euro-Mediterranean Region.

African Carbon Fund

The African Carbon Fund was launched during the African Carbon forum in April 2012 by CDC Climat, Proparco and the Banque Ouest Africaine de Développement.

The African Carbon Fund aims at supporting high-quality environmental and social projects in sub-Saharan Africa through the best use of carbon finance. Thanks to the combined expertise of its sponsors and manager, the African Carbon Fund is well positioned to tailor carbon finance solutions to project developers' needs. The African Carbon Fund promotes high-quality emission reduction projects in Africa that will generate substantial development and environmental co-benefits. The fund is committed to making a contribution towards economic development in Africa. SEMCs are not directly concerned, even Mauritania at this stage, but this fund is a good benchmark for SEMCs.

Mediterranean Carbon Fund

Since 2011, a joint investment facility, CDC Climat / Proparco, allows investment in carbon asset projects in SEMCs. Given European climate regulation and in order to continue its activities beyond 2012 and become the Mediterranean Carbon Fund, this facility has developed a contractual framework called *Program of activities* (PoA). Up to 2020, this PoA will provide all renewable energy projects in the Region with UNFCCC registration, as soon as it is validated. Validation is schedued for the last half of 2012.

However, several projects in the Region are already being studied and under acquisition. For example, at the end of 2011, a contract to purchase GHG emission reductions generated by wind farms in Bizerte, northern Tunisia, was signed with STEG, the Tunisian utility. The wind farm, with a capacity of 190 MW, is expected to generate more than 2 million tonnes of CO_2 emission reductions, as carbon credits by 2019.

Fonds Capital Carbone Maroc

Fonds Capital Carbone Maroc was founded in 2008 by Caisse de Dépôt et de Gestion Marocaine, European Investment Bank and CDC. Fonds Capital Carbone Maroc invested in a ONE wind project, signed with Orbeo in 2010 for a capacity of 240 MW, and the investment period is now over. Like the other carbon funds, it faces carbon market challenges in Africa. Morocco has committed itself to CO_2 emission reduction projects, but investors find that risks are high and carbon credit price is too low.

Private Carbon funds

Private carbon funds with institutional investors have been launched to mobilize private capital to finance greenhouse gas emission reduction projects within the framework of the Kyoto Protocol's Clean Development Mechanism (CDM). They provide European industry with additional flexibility to meet its emission reduction targets. They have structured and directly purchased Certified Emission Reductions (CERs), worth several million tonnes of CO_2 equivalent, coming from several projects developed in many countries. These primary market transactions allow project developers to finance up to 25% of a project's cost, thereby substantially improving its profitability and making it commercially viable. Each project must comply with the "additionality criteria", defined by the United Nations, which demonstrate that the project requires carbon finance in order to be developed, thereby ensuring that it makes a contribution to the environment.

These funds contribute to the local development of SEMCs where some of their projects are based. Their portfolios have generated millions of euro of investments in developing countries. These funds allow for new infrastructure investments in sectors such as wind energy, hydro energy, biomass, energy efficiency and waste management. They also allow existing installations to be upgraded while transferring technology and creating local employment.

What are the benefits of all these carbon funds for SEMCs? Carbon funds were active before 2012 and made some projects possible by injecting funds. Post-2012 uncertainties in the context of the recent Durban summit on climate change have slowed down the pace of investment. Furthermore, very low carbon credit demand post 2012 has also significantly decreased investment.

We recommend maintaining a close cooperation with carbon funds in order to assess the global investment they represent in SEMCs and to analyse the effects of investment reduction in the Region after 2012.

REDD+

Loss of forests could contribute to global GHG emissions by as much as 30% each year. This is equivalent to CO_2 emissions from the global transportation sector.

The UN-REDD Programme is the United Nations Collaborative initiative on Reducing Emissions from Deforestation and forest Degradation (REDD) in developing countries. The Programme was launched in September 2008 to assist developing countries prepare and implement national REDD+ strategies, and builds on the convening power and expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and the UNEP. The Programme currently supports 42 partner countries, none of which is in the Mediterranean Region so far.

The REDD mechanism provides financial value for the carbon stored in forests, and gives incentives for developing countries to reduce emissions from forested lands and invest in low-carbon projects to sustainable development. "REDD+" goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. Financial flows for greenhouse gas emission reductions from REDD+ could reach up to US$30 billion a year. Although forestry land only covers 14% of Mediterranean non-desert territory in the South and 5% in the East of the Region, implementation of this mechanism

could help conserve biodiversity and ensure sustainable management of Mediterranean forests. However, the mechanism has been developed by and for tropical countries and is not well adapted to Mediterranean forests. In order to help countries better understand the potential benefits of implementing REDD+ in Mediterranean forests, and to help them adapt the mechanism, the Fonds Français pour l'Environnement Mondial is funding a project targeting Turkey, Lebanon, Algeria, Tunisia, Morocco, and Syria[31]. Implemented by the FAO Silva Mediterranea Secretary and Plan Bleu, this project aims at developing a cost-efficient tool that could, amongst other things, optimize forest carbon stocks and be used in the Mediterranean Region.

Can China provide an example for SEMCs[32]?

EUROPEAN COUNTRIES have been leading the fight against global warming. The imbalance in the Mediterranean Region could lead to some simplistic conclusions about NMCs bringing expertise to SEMCs to reduce CO_2 emissions i.e. a one-way transfer of knowledge.

In a global world, third-party contributions should be analysed as they could bring good examples and practices for SEMCs. NMCs are challenged by an economic recession, the euro zone crisis and de-industrialisation, and cannot claim to have all the right solutions. The NMCs model is not as attractive as it is used to be, and SEMCs are also looking West and East, to the Gulf and Asia. The United States of America has always been an attraction for SEMCs, especially for the younger generation seeking higher education. Asia is undoubtedly a growing business partner for SEMCs.

The Kyoto Protocol was opened for signature in December 1997. China signed the pact on May 1998 and submitted its initial national communication on climate change in 2004. China is not listed in Annex I and has changed gear over the last decade to become a leading global nation. The country's high growth rate creates a constant need for energy, and China has overtaken the United States to become the world's largest contributor to CO_2 emissions.

In the appendices, the Chinese challenges are presented in terms of CO_2 emissions. One of the problems China faces in closing down its inefficient power plants is the loss of jobs and the negative impact on GDP. As a result, a market-based approach has gained popularity. Although an emissions trading system does not necessarily preclude the use of carbon taxes, the two climate change policy instruments are commonly seen as competing to reduce greenhouse gases. China is considering the two options and this could be of major interest for SEMCs.

Carbon tax

A draft new taxation system has been submitted by the Fiscal Science Research Centre of the Ministry of Finance for review. The plan would impose a tax on emissions of greenhouse gases. The tax is likely to be charged at a rate of 10 Yuan ($1.59) for each ton of carbon dioxide. That rate is expected to increase gradually over time. The main targets will be large users of coal, crude oil and natural gas. Tax cuts will be given to companies that take steps to reduce their emissions.

The taxes will start being collected by the end of the 12th Five-Year Plan (2011-15). The carbon tax will bring many benefits, such as raising companies'

31. Source: ONFI, Plan Bleu.

32. Source: VALMERE.

environmental costs and forcing them to improve their production technology. Firstly though, a tracking system will have to be established to carry out the plan because pollutants and carbon emission will need to be measured in all parts of the value chain. The National Bureau of Statistics has said that indexes measuring emissions of greenhouse gases and power consumption will be published periodically as a test. But there are still disputes over the ratio of the proposed tax. Environmental protection authorities are calling for 20 Yuan ($3) to be charged for each ton of carbon dioxide emitted. The main principle has been adopted by a large consensus. The tax should be a means of cutting emissions rather than a source of fiscal revenue.

Moreover, China extended a regional resource tax on domestic coking coal to the whole country from 1st November 2011. Central government imposed a tax of between 8-20 Yuan per tonne on coking coal and an unchanged tax of 0.3-5 Yuan per tonne on other types of coal, according to a revised draft regulation issued by the State Council, or China's cabinet, on 10th October 2011.

Carbon exchange centres

China is due to implement Carbon exchange centres by 2015. The proposal was included in the 12th FYP stating that the country "will gradually establish a carbon emissions trading market". Five cities (Beijing, Tianjin, Shanghai, Chongqing and Shenzhen) and two provinces (Guangdong and Hubei) have been chosen to test controls on carbon dioxide emissions, probably starting in 2013, to go nationwide in 2015. These regions have submitted detailed plans that cover emissions caps, quota allocations, third-party verifiers of emissions cuts, enforcement of trading emissions consumption quotas and excess emissions penalties. To make this possible, China has to strengthen data collection, Measurement, Reporting and Verification of domestic emissions. China will most likely develop its own registration process and put in place a domestic regulator. Some concerns remain regarding the relationship between this domestic regulator and the United Nations Executive Board.

Carbon fund

The Chinese government has initiated a venture capital investment programme in newly emerging technologies, such as renewable energy and environmental protection, and has established 20 venture capital investment funds.

CDM

China is the source of 51% of globally issued CERs. The China CDM Fund, the government body that invests the money earned from the sale of CERs generated in China, had almost US$ 1.2 billion to invest in clean technology projects in China in 2012.

How could the Chinese experience influence SEMCs? Morocco has secured seed cash under the World Bank's Partnership for Market Readiness (PMR) to help launch pilot carbon markets[33]. China is also taking advantage of the programme, and has proposed using the PMR funding for domestic emissions trading schemes. China is particularly in advance with its ETS schemes and Morocco is about to take the SEMCs lead in developing CO_2 markets.

We recommend carefully following these initiatives and promoting them throughout the Mediterranean Region to share experience and knowledge.

33. Reuters, "Morocco secures cash to develop CO2 markets" (April 2012).

CONCLUSION

PHASE III OF THE EU ETS builds upon the previous two phases and has been significantly revised to – hopefully – make a greater contribution to reducing CO_2 emissions, especially in NMCs. A more ambitious EU-wide cap on emissions using auctioning as the preferred means of allocation and new market mechanisms, should result in greater emission reductions. SEMCs must be part of this dynamic by continuing to make progress and possibly committing themselves, sooner or later, to some limitations.

In finalizing the terms of the second period of the Kyoto Protocol, clarifying the post-2012 financial commitments will be high on the agenda of the next annual conference of COP 18 of the Convention United Nations Framework on Climate Change, in Doha.

The new negotiating group to steer the Durban platform's contribution will be implemented during 2012. France and the EU must determine a strategy for defining the Durban platform programme to reach an agreement by 2015. Strengthening collective ambitions is a goal, and opposition between NMCs and SEMCs, on the new airline rules for instance, must be avoided. Finalizing the terms of the second commitment period under the Kyoto Protocol should lead to formal adoption at the COP 18. An agreement should be found on the duration of the second commitment period, setting reduction targets and the postponement of surplus quota emissions from the first period.

SEMCs have progressed significantly in assessing the challenges of global warming and put in place new regulatory frameworks, fiscal policies; they have identified projects to be financed by existing or new market mechanisms. One could criticize the CDM structure because it is restricted to a relatively small number of projects in SEMCs and has not moved NMCs on to a low carbon development path. The incentive of CDM has been too weak to foster the necessary transformation in SEMCs' economies, without which carbon intensities in these countries will continue to increase.

The impacts of carbon constraint in the Mediterranean Region must be analysed by a continuous process. The rules evolve first in NMCs, because of the different phases of the Kyoto Protocol, adjustments such as new industrial sectors being included in the commitments, and because the impacts are not always immediate. It takes time for stakeholders in NMCs and SEMCs to understand the new market mechanisms and their effects and to react positively or negatively. Carbon leakage is probably the best-documented negative impact for the Region. It needs to be very carefully monitored in 164 industrial identified sectors. Since each of these sectors is specific, they may react differently to the same rule. Measurement, Reporting and Verification could apply to assessing carbon constraint impacts.

Last, but not least, best practices for new market mechanisms must be followed carefully around the world and in China in particular. NMCs and SEMCs must take advantage of good solutions being found elsewhere. China is catching up rapidly, to become a world leader and a major business partner for the Mediterranean Region. China's position is key in climate negotiations because it is the biggest producer of greenhouse gases and the largest of the developing economies in the negotiation process. China made non-binding

pledges to reduce emissions in Cancun, and may be willing to accept legally binding commitments after 2020. In order to encourage and accompany SEMCs to take ambitious measures on short-term notice, greater incentives to develop new tools and mechanisms must come from European countries.

ANNEX 1
First national and second national communication to UNFCCC

NATIONAL COMMUNICATIONS to the United Nations Framework Convention on Climate Change give relevant information about geography, governance, demography, national economy, green house gas emissions, public policies, adaptation, mitigation and measures per country. Non annex I countries have reported their second national communication in 2010 or 2011.

Algeria (Non-Annex I)	Algeria's initial national communication under the United Nations Framework Convention on Climate Change. April 2001
	Algeria's second national communication under the United Nations Framework Convention on Climate Change. November 2010
Egypt (Non-Annex I)	Egypt's initial national communication under the United Nations Framework Convention on Climate Change. July 1999
	Egypt's second national communication under the United Nations Framework Convention on Climate Change. June 2010
Israel (Non-Annex I)	Israel's initial national communication under the United Nations Framework Convention on Climate Change. November 2000
	Israel's second national communication under the United Nations Framework Convention on Climate Change. December 2010
Jordan (Non-Annex I)	Jordan's initial national communication under the United Nations Framework Convention on Climate Change. March 6, 1997
	Jordan's second national communication under the United Nations Framework Convention on Climate Change. December 8, 2009
Lebanon (Non-Annex I)	Lebanon's initial national communication under the United Nations Framework Convention on Climate Change. November 2, 1999
	Lebanon's second national communication under the United Nations Framework Convention on Climate Change. March 2011
Libya (Non-Annex I)	No communication so far to UNFCCC
Mauritania (Non-Annex I)	Mauritania's initial national communication under the United Nations Framework Convention on Climate Change. July 30, 2002.
	Mauritania's second national communication under the United Nations Framework Convention on Climate Change. December 6, 2008.
Morocco (Non-Annex I)	Morocco's initial national communication under the United Nations Framework Convention on Climate Change. November 2001
	Morocco's second national communication under the United Nations Framework Convention on Climate Change. November 2010
Palestine	Palestine is not yet a member state of the UN
Syrian Arab Republic (Non-Annex I)	Syrian Arab Republic's initial national communication under the United Nations Framework Convention on Climate Change. December 2000
Tunisia (Non-Annex I)	Tunisia's initial national communication under the United Nations Framework Convention on Climate Change. October,27 2001 Tunisia's second national communication is expected.

ANNEX 2 The Chinese example

THE EXAMPLE OF CHINA is given to broaden the scope of this report and to see whether SEMCs can find good practices and mechanisms outside the Mediterranean Region to reduce CO_2 emissions.

A fast growing and planned economy, compared to SEMC

CHINA IS IN THE LIST of non Annex I parties to the Convention like most SEMCs. It submitted its initial communication to UNFCCC on December 10, 2004, in a similar format as SEMCs, but not its second national communication. As the largest greenhouse gas emitter in the world, China has a leading role in climate negotiations. Furthermore, since 2004, the country has evolved incredibly and its continuous economic growth has positioned it as a major trade partner of NMC and SEMCs. China emitted 8.33 billion tons of carbon dioxide in 2010, a quarter of total global emissions, according to a report by the UK energy company BP PLC.

The State Council released a white paper, outlining China's policies and actions for addressing climate change. China's per-capita GDP in 2010 was only a little more than USD 4 600. By the United Nation standard for poverty, China still has a poverty-stricken population of over 100 Millions.

The Chinese government has included addressing climate change into its mid-and long term planning for economic and social development as a major issue. In 2006, China set forth the goal of reducing its per unit GDP energy consumption in 2010 by 20 percent from that of 2005. In 2009 China put forward the goal of action to reduce the per-unit GDP greenhouse gas emission in 2020 by 40-45 percent as compared to that of 2005.

To accomplish the above goal, China adopted a range of major policy measures during the 11th Five Year Plan (FYP 2006-2010) period. It was the first to put the green agenda on the table. Despite implementation difficulties, most of these goals were achieved by 2010. For example, 70 GW of inefficient power plants have been closed down (Solar Mediterranean Plan's objective: 20 GW of new capacity).

The Outline of the 12th Five Year Plan for National Economic and Social Development (2011-2015), established the policy orientation of promoting green and low-carbon development and set out the objectives and tasks of addressing climate change for the next five years.

Main purposes on 12th Five Year Plan (2011-2015):

GDP by 2015	**8,5 trillions US$**	
Carbon emission Intensity Reduction	17,00%	Reduction of CO2 emission per Unit GDP as compared to 2010
Energy intensity Reduction	16,00%	Reduction of energy consumption per unit GDP as compared to 2010
Consumption of non fossil energy	11,40%	Proportion of consumption of non fossil energy would increase

The 11th Five Year Plan obtained positive results. The country's energy consumption per unit of GDP dropped 19.1% from that of 2005 accumulatively, which is equivalent to a reduction of 1.46 billion tons of carbon dioxide emissions. During this period, China's national economy expanded at an average annual rate of 11.2%, while its energy consumption grew only 6.6% annually on average.

Mitigation and adaptation with a stronger industrial basis than SEMC

Optimization Industrial Structure

CHINA HAS FORMULATED and released plans for reforming and upgrading 10 major traditional industries, including car, iron and steel industries. For this high energy consuming industries, China has raised the market entry threshold, promoted corporate merger, imposed export duties on coal and restrained the export of high emission and high resource consuming products.

Efforts have been made to accelerate the pace of elimination of backward production capacity. The proportion of thermal power generation units with a generation capacity above 300 MW increased from 47% in 2005 to 71% in 2010.

Elimination of backward production capacity on the period 2005-2010 in selected key sector:

Type of production capacity	Production capacity
Steel	72 million tons
Iron	120 million tons
Cement	370 million tons
Coke	107 million tons
Paper	11,3 million tons
Glass	45 million tons

The proportion of large iron production blast furnaces with a capacity above 1000 Cubic meter each increased from 48% to 61%.

Energy consumption in major industries was reduced. From 2005 to 2010, coal consumption in thermal power supply dropped 10% from 370 to 333g/Kwh. Comprehensive energy consumption per ton of steel decreased 12.8% from 694 kg to 605 kg of standard coal.

Energy

750 billion US$ will be invested (5 trillion Yuan) in new energy sector by 2020. 300-450 billion $ (2-3 trillion Yuan) will be invested in renewable energy sector by 2020, included 220 billion $ (1.5 trillion Yuan) for wind energy and 30 billion $ (200 billion Yuan) for solar energy industries. 680 billion $ will be invested (4.5 trillion Yuan) in energy saving by 2015.

15 billion $ will be invested (100 billion Yuan) in alternative energy vehicles industry by 2020. China government aims to sell 1 million units of new energy vehicles by 2015. 600 billion $ (4 trillion Yuan) will be invest in 'smart grids' by 2020. 445-600 billion $ (3-4 trillion Yuan) will be invested in high speed rail by 2015.

China has promoted energy conservation, sets energy conservation measures and evaluations stem by 31 provincial governments and 1000 keys enterprises. Its also improved the implementation rate of mandatory energy conservation standards of new buildings. During the 11th Five-Year Plan period, the accumulated total energy efficient floor space constructed was 4.857 billions sq m, with energy-saving capacity of 46 millions tons of standard coal.

China has also promoted energy saving technology and products. China has released a total of 115 state key energy-efficient technology promotion catalogues and seven energy-efficient technologies in Iron & Steel, building materials, chemical industries. Its has appropriate subsidies to support the production of and the promote of some 360 million high-efficiency illumination

products, 30 million high efficiency air conditioners and one million energy-saving motor vehicles, which have realized an annual energy saving capacity of 20 billion Kwh.

China is connecting increasing green generated power to the grid. Natural gas production increased from 49.3 billion cubic meter in 2005 to 94.8 billion cubic meter in 2010, an average annual growth rate of 14%.

China has enhanced the development of hydro-power, nuclear energy and others low-carbon energy sources through policy guidance and fund input. By the end of 2010, China's hydro-power installed capacity has reached 213 million KW, doubling the figure for 2005. Installed nuclear capacity has reached 10,82 million KW, with another 30 million KW under construction.

With an improvement of the pricing policy for on-grid wind power, China supported the development of wind industry. China's installed wind power capacity grew from 1,26 million KW (GW) in 2005 to 41,07 million KW in 2010 (2) and has now the largest on shore wind energy capacity in the world. China has launched 'Golden Sun Demonstration Project' to promote the franchise bidding for large-scale photovoltaic power station. Installed photovoltaic power capacity increased to less than 100 MW in 2005 to 600 MW at the end of 2010 (3). The number of solar water heater in use reached 168 million sq m. China became the largest manufacturer of solar panels in the world.

China has also improved the pricing policy for power generated by agricultural and forestry biomass energy to reached 5 000 MW in term of Installed Biomass power capacity.

Controlling Non-energy related Greenhouse Gas emission

THE GOVERNMENT HAS enhanced control over greenhouse emission in industrial and agricultural production, waste disposal and others fields. Statistics showed that by the end of 2010, China's nitrous oxide emission in industrial production generally remained at the level of 2005, and the growth of methane emission was basically brought under control.

China carries out ecological protection projects such as the key shelterbelt construction project in North-west, North-east of China and along the Mekong river. It has also carried out a pilot of afforestation project with an aim to expand carbon sinks, enhanced sustainable forest management and increased the forest stock volume. Currently, China's man made forest reserve has reached 62 million ha. Its national forest coverage has reached 195 million ha with the forest coverage rate rising from 18.2% in 2005 to 20.3% in 2010. China's total carbon storage in forest vegetation has reached 7.811 billion tons.

The plan set out the objectives and tasks for addressing climate change during the next five years: Carbon Dioxide emissions per unit of GDP will be reduced by 17% and energy consumption (EC) per unit of GDP by 16% as compared with 2010. The capacity of carbon sinks will be increased to control greenhouse gas emissions. The acreage of new forest will increase by 12,5 million hectares. Coal remains the primary source of energy in China, the world's largest consumer of coal, with more than 70% of the country energy consumption depending on it.

To reach its objectives, China will implement an ambitious action plan and regulatory reforms at a magnitude that will strike SEMCs.

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ACRONYMS

AACO ♦ Arab Air Carriers Organisation

CCBS ♦ Climate, Community & Biodiversity Standards

CCS ♦ Carbon capture and storage

CDM ♦ Clean Development Mechanism

CER ♦ Certified Emission Reduction

CDC ♦ Caisse des Dépôts et Compensations

CFL ♦ Compact Fluorescent Light

CMPP ♦ Centre Marocain de Production Propre

COP ♦ Conference of the Parties

CSP ♦ Concentrated Solar Power

DNA ♦ Designated National Authority

DOE ♦ Designated Operational Entity

EE ♦ Energy Efficiency

EPA ♦ Environmental Protection Agency

ERU ♦ Emission Reduction Unit

EUA ♦ European Union Allowances

EU ETS ♦ European Union Emission Trading Scheme

GDP ♦ Gross Domestic Product

GHG ♦ Greenhouse Gases

ICAO ♦ International Civil Aviation Organisation

IEA ♦ International Energy Agency

IETA ♦ International Emissions Trading Association

IPCC ♦ Intergovernmental Panel on Climate Change,

IRENA ♦ International Renewable Energy Agency

JI ♦ Joint Implementation

LDC ♦ Least Developed Country

LNG ♦ Liquefied Natural Gas

LULUCF ♦ Land Use, Land-Use Change and Forestry

MGGRA ♦ Midwestern GHG Reduction Accord

MRV ♦ Measurement, Reporting and Verification

NAMA ♦ Nationally Appropriate Mitigation Action

NCPC ♦ National Clean Production Centre

NMCs ♦ North Mediterranean Countries

NMM ♦ New Market Mechanisms

OCP ♦ Office Cherifien des Phosphates

ONE ♦ Office National de l'Energie

PoA ♦ Programme of Activity

PMR ♦ Partnership for Market Readiness

RCREE ♦ Regional Centre for Renewable Energy and Energy Efficiency

RE ♦ Renewable Energy

REDD/REDD+ ♦ Reducing Emissions from Deforestation and Degradation

RGGI ♦ Regional Greenhouse Gas Initiative

SEMCs ♦ South and East Mediterranean Countries

SME ♦ Small and Medium Enterprises

STEG ♦ Société Tunisienne de l'Electricité et du Gaz

UNEP ♦ United Nation Environment Program

UNDP ♦ United Nation Development Program

UNFCCC ♦ United Nations Framework Convention on Climate Change

UNIDO ♦ United Nations Industrial Developement Organization

VAT ♦ Value Added Tax

VCM ♦ Voluntary Carbon Market

VER ♦ Voluntary Emissions Reduction

WBCSD ♦ The World Business Council for Sustainable Development

WCI ♦ Western Climate Initiative

WTO ♦ World Trade Organization

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