

ACTION PLAN

**ENERGY EFFICIENCY CAP AND TRADE
SYSTEM:**

**DESIGNING AN INSTITUTIONAL FRAMEWORK
FOR NORTHERN AFRICA**

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The ECATS project main goal is to design national energy Efficiency CAp and Trade mechanism, shaped on the institutional, legal and business frameworks of Algeria and Tunisia.

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1.1 Review of legal framework in Europe

A new directive on renewable energy, which should be transposed and implemented in 2010 by many states, has set very ambitious targets for all 27 member countries. It will allow, by 2020, to the European Union the achievement of 20% energy from renewable sources, plus a 10% renewable energy in transport. The directive, which would complement the existing regulatory framework for the promotion of "green" electricity, requires that national action plans would be set the stage for the development of renewable in Europe.

Regarding energy efficiency, two of the main objectives of European Union are to reduce energy consumption and eliminate waste. European Union energy efficiency improvement will be crucial to the competitiveness, to the security's supply, as well as for complying with the obligations as a signatory to the Kyoto Protocol.

The potential for reducing consumption is an important part, especially in energy intensive sectors such as buildings, manufacturing and transport. In late 2006, the Union had established a reduction of its annual consumption of primary energy by 20% by 2020 and, to reach the goal, work is underway to mobilize public opinion, decision-makers and practitioners in market for the establishment of energy efficiency minimum standards. In each country are implementing various measures to promote energy efficiency and energy produced from renewable sources.

In Austria, the government decided that the *Bürger Förderungs* bank should provide assistance to support investment in energy efficiency, such as isolation in the frame of another program funded by the Federal Environment Agency. However, private companies may obtain subsidies for the use of renewable energy and adoption of measures such as improving energy efficiency and the use of waste heat. Even the Federal Fund is managed by a specialized bank on behalf of the Ministry of Agriculture, forestry, environment and water. Another program was launched in 2003 to finance energy efficiency measures by others in public buildings. Then no lack programs for energy savings in residential, for a total of 2 million per year invested, with support by State through an agreement between the federation and Lander in the majority of the houses renovated or built.

In Belgium, one of the means adopted to promote energy efficiency since 2003 has been to encourage the increased use of cogeneration by ensuring a lower tax burden for those who decide to invest in energy efficiency measures and renewable energy in their homes, with assistance from the *Federal Public Service* (FPS) of Belgium.

The *regional government of Wallonia*, by contrast, has created some subsidies for the installation of micro-cogeneration and wood-burning heating plants and boilers turned to business, residential, self-employed and private structures and subsidies for energy efficiency, for energy audits and feasibility studies, pre-investment, and for that part of the private sector wishing to invest in machinery with high efficiency. Both institutions, federal and regional, have also introduced subsidies for local governments to improve the energy efficiency of public buildings are ultimately guaranteed by each of the three regions, the funds for technological innovation programs that relate to the improvement energy efficiency. As for renewable, has adopted a scheme of green certificates to encourage the production.

In Great Britain was introduced since 2001 the framework of White Certificates for energy efficiency in the residential sector. The *Carbon Emissions Reduction Target* (CERT), initiated in 2008 and active until 2011, represent today an obligation of the government on energy suppliers to achieve targets for promoting reductions in greenhouse gas emissions in the residential sector. In addition to the system of white certificates, was also created a scheme for green certificates to encourage energy produced from renewable sources. Also in relation to reducing emissions, the *Carbon Reduction Commitment* (CRC) requires mandatory emission cuts by large commercial organizations and public sector (including supermarkets, hotel chains, government divisions, large buildings of local authorities) of 1.1 MtCper year by 2020. For micro CHP, was established the *Low Carbon Buildings Program* in April 2006, in force until 2010, that goes for the subsidies to ensure about 86 million pounds for the technologies micro-cogeneration. The Carbon Trust, founded in April 2001, is an independent non-profit company, created by the government to promote energy efficiency in non-domestic sector. The three main goals of this important organization are to help the country to achieve the targets for CO₂ reductions in other greenhouse gases, improving the competitiveness of industries in the United Kingdom through resource efficiency and savings and support the development of a industrial sector that capitalize on the commercial value and innovation of technologies with low CO₂.

Denmark has activated the mechanism of energy efficiency certificates or white certificates, and since 2004 has introduced subsidies for the production of electricity by renewable sources. Reflecting the implementation of *Directive 2002/91/EC* on the energy performance of buildings, the National Code for energy efficiency in buildings has changed from 1 January 2006. The new code stipulates that the maximum amount of energy consumed in new buildings must be justified on the basis of a predefined performance efficiency, new buildings will be subject to the standards of

thermal efficiency by approximately 25-30% higher than the existing buildings, standards that will be raised by 25% in 2010, another 25% in 2015, and even a 25% to 2020.

In Finland it was created a system of tariff subsidies for energy produced by plants using renewable sources, together with a grant program for restructuring and improving the energy efficiency of residential buildings.

France adopted the system of white certificates for energy efficiency together with other programs that provide the ability to make loans for energy saving measures, subsidies for energy audits and pre-feasibility studies. For renewable, have been created systems of feed-in tariffs as an incentive for energy produced by plants using renewable sources.

In Germany there is a system for financing cogeneration project, organized through subsidies for public buildings. Then there exists a fund for energy efficiency in small and medium enterprises by the Ministry of economy and technology to remove existing barriers for the dissemination of energy saving measures (such as the high costs that often characterize them). Regarding the energy produced from renewable sources, even in Germany was introduced the mechanism of feed-in tariff.

In Holland, is setting up a fund for renewable energy subsidies that guarantees to investors for projects involving electricity from plants powered by renewable, gas and cogeneration; since 2001 has been in place a framework of green certificates to evaluate and monitor the production and sale of green electricity. An interesting initiative is the environmental tax on flights from the Netherlands: the Government has created a new *environmental tax* from 1 July 2008 which is applied to all airline tickets departing from the country; the charge was reduced from 1 January 2009 for those tickets in which the devices used were more energy efficient. For renewables and energy efficiency, there is another program, called *Energy Investment Deduction*, which allows you to save energy by encouraging investment in energy efficiency and renewable technologies. It also should allow those companies that make the intervention was able to deduct from taxable a certain percentage of taxable investment instruments relating to energy conservation and renewable energy.

Ireland, through the *Low Carbon Homes Program*, has sought to improve energy efficiency in the residential sector, going to provide capital subsidies for those who decide to implement these interventions. For renewable, have been secured grants for homeowners who want to buy a new

heating system powered by renewable, in addition to the usual feed-in tariff for renewable energy.

In Italy the mechanism of *energy efficiency certificate* (or *white certificates*) was introduced by the Ministerial Decree of 24 April 2001, that was replaced by Ministerial Decree of 20 July 2004. The two decrees put energy distributors, with more than 100,000 customers, required to achieve savings targets measured in TOE - (Tons Oil Equivalent); objectives are proportional to the energy distribution, saving measures are certified by the *Authority for Energy Electricity and Gas* (AEEG), issuing 1 energy efficiency certificates for each TOE. The Italian experience is the first in the world to apply this market-based instrument to promote energy efficiency in end uses. Since the introduction in Italy, the structure of mechanism and its implementing regulations have been the subject of thorough study and analysis by the European Commission, International Energy Agency and a growing number of countries, both in Europe and outside Europe (United States, Australia, Japan, Korea).

In Portugal were adopted several programs to implement the Directive on the energy performance of buildings in national legislation, these include the creation of the *national system for energy and quality certification of buildings* (SCE). The SCE has entered in force on 1 July 2007, and its implementation has been divided into three parts (of which the final in 2009). An important aspect of the SCE has been the introduction of energy performance certificate which gives a level of energy performance for residential and non, listing possible interventions for improving it, adding to the savings from 20 to 40% and consequently reducing emissions CO².

Spain, since 2007, has subsidies for energy efficiency in buildings, besides the presence of feed-in tariffs for electricity produced by plants using renewable sources, which was drastically reduced in 2008.

The Swedish system provides rather a specific pattern of green certificates for the promotion of renewable sources by 2003, and other programs for environmental sustainability set by the Swedish environmental protection, which shall provide financial assistance with support for interventions municipalities together with local companies and organizations.

Poland adopted, in implementation of the *Directive 2004/8/EC* on the promotion of cogeneration based on a useful heat demand in the internal energy market, a law on electricity production from cogeneration, going to create a system of so-called *red certificates*. From 1 July 2007 those

energy companies that supply electricity to final customers are required to obtain certificates showing the origin of electricity produced from high efficiency cogeneration. The mechanism will remain in force until the end of 2012 and the failure to obtain certificates is translated into a tax imposed on providers. Poland has not yet activated a system of white certificates, but was activated in October 2005 with transposition of *Directive 2001/77/EC* a mechanism for “green certificates”.

The Slovak Republic has set up a fund for energy efficiency, aiming to implement *Directive 2006/32/EC* on energy end-use and energy services, ensuring integration of the financing of actions for energy savings. Furthermore, to ensure support to the use of renewable sources, the Slovak government adopted laws and regulations providing for recourse to the mechanism of *feed-in tariff*.

Hungary, with regard to renewable was adopted a pattern of green certificates, and for energy efficiency have been created specific programs such as National energy savings passed in 2003 that provide financial assistance for the conservation of Energy in the resort with the goal of reducing consumption and costs of the domestic sector. In 2006, it was approved a development plan to promote energy efficiency and renewable, going to subsidize saving measures such as renovation of buildings, development of heating systems for municipalities and the promotion of cogeneration.

1.2 Comparison analysis of the mainstream efficiency cap and trade mechanisms implemented in Europe

In Europe, the system of white certificates is the most developed between cap-and-trade mechanism. In order to investigate on their transferability to North Africa the table below reports the pattern of experiences from all the three major European Countries that, more than the others, have currently excelled in the field of white certificates. The three examined Country are Italy, Great Britain and France, although the English is not an appropriate system of white certificates because there is no certification.

The table I reports for each Country:

- the program start date;
- the target of the program with the dates of the intermediate steps;
- the parties obligated to certify energy savings produced by the achievement of white certificates;
- the eligible participants and customers;
- the Authorities delegated to the control that the system has been implemented.

For the subsequent development of ECATS project and its definition of Action plan, it will be assessed whether it is possible to transfer to the North African market a fully examined system or whether it is necessary to adopt a different system as result of the lesson learnt from the experiences of the European Countries.

European Country	Italy	Great Britain(*)	France
Start date	January 2005	April 2002	July 2006
Energy saving target	At the end of the first five years of the scheme (2005-2009), annual primary energy savings should be equal to 5,8 millions Tce (lifetime cumulated and not discounted), equivalent to approximately 68 TWh.	The first phase (April 2002-March 2005) involved a target of 62 TWh (fuel standardised). The second phase 2 (April 2005 to March 2008) and entails an overall energy saving target of 130 TWh (lifetime cumulated and 3.5% discounted savings).	54 TWh of final energy for the first three years (2006-2009, cumulated over the lifetime of the actions and 4% discounted).
Obligated parties	Electricity and gas grid distribution companies with more than 100,000 client	Gas and electricity suppliers with more than 15,000 client	Gas, electricity and domestic fuel (not for transport) suppliers
Eligible participants	Only gas and electricity grid companies or ESCos can get certificates	Gas and electricity suppliers only can achieve accredited savings	Any economic actor can undertake energy saving actions and get certificate
Eligible customers	All included transport	Residential only	All (included Transport) excluded EU trading
Measurement and verification system in place	AEEG,(Italian Regulatory Authority for Electricity and Gas), uses three evaluation approaches: <ul style="list-style-type: none"> • Default value (where the energy saving is defined using an ex-ante approach) • Engineering approach (some on-field measurements) • An energy monitoring plan (an ex-post approach) 	OFGEM (the Office of Gas and Electricity Markets) assesses and approves all measures that suppliers take; Defra (the UK Government Department for the Environment, Food and Rural Affairs) developed a <i>Target-setting Model</i> for determining the energy savings attributed to different measures using an ex ante approach	ADEME (French Agency for Environment and Energy Management) and ATEE (Association Technique Energie Environment) are in charge of defining standardised actions and setting related methodologies for calculation of the savings achieved. Actions by eligible parties that are not standard are also permitted. Savings are validated by the French High Council for Energy

Table I –Comparison betweenItaly, Great Britain and France

1.3 Lesson learnt and keys to success stories

BELGIUM

The current Energy Efficiency Obligations have been in place in Belgium since the beginning of 2003 but grew out of the obligations introduced at the Belgian federal level from 1995. The obligation is placed on its electricity distribution network managers. The Belgium Government decided to introduce its own regulations because they were concerned about the limited control by the Belgium Government of the then existing initiatives in energy efficiency and that there was not clear energy saving target associated with these initiatives or indeed limited evaluation of the initiatives that had been carried out.

Objective

The Belgium Obligations are to encourage the efficient use of energy in a liberalised market. It covers all end users of electricity and initially had separate targets set for the low voltage clients (< 1 kV) and for the high voltage clients (> 1kV). From 2008, separate energy saving targets will be defined for residential and non-residential customers. Additionally, distribution network managers in fulfilling the obligations must pay attention to “protected clients”, i.e. low income house holds.

Characteristics of the programme

Under the Flemish obligations, the electricity distributors are required to achieve separate targets for the promotion of energy efficiency improvements in all end use electricity sectors. For the high voltage end users, the target is 1% of the energy used two years previously. For the low voltage end users (including residential), the annual target is 1% of the energy supplied to these users two years previously. For electricity distributors, supplying less than 10% of their total electricity distribution to low voltage end users, they are exempted from the additional targets in this sector and these remain constant at 1%. Distributors can fulfil their obligations by carrying out any combination of energy efficiency measures provided that there is both a direct action (i.e. the distributor financially supports in some form to stimulate investment by the end user) and an indirect action, i.e. drawing attention to the energy efficiency measure and providing the necessary information on saving possibilities to the end user. As an additional requirement, the electricity distributors have to offer all their end users, the dissemination of information brochures provided by the Belgium Government and to offer individual energy efficiency advice to low voltage end users. Broadly speaking, the intervention instruments used in Belgium have been information via brochures and internet, energy audits, rebates for different energy efficiency technologies and

financial help for municipalities to invest in energy efficiency measures. It would appear that such “soft measures” no longer count towards the energy saving target except in the case of “energy scans” of residential properties. With regard to the typical measures supported in the residential sector, the important ones are:

- ✓ Low flow shower heads,
- ✓ Energy efficient lighting (CFLs),
- ✓ Thermal insulation of roofs and windows,
- ✓ Condensing boilers.

For the non-residential sector, measures are more different but cover typical energy efficiency measures including energy audits, retrofitting energy efficient lighting, variable speed drives, roof insulation, more energy efficient boilers, etc. For 2004 and 2005, there was an obligation imposed on grid energy managers to send to the households that they distributed to a coupon which could be changed for either a CFL or energy saving shower head or indeed an energy meter. In 2006 and 2007, every other member of the family would receive a voucher for a free energy saving light bulb. All Flemish distributors have met their targets with the exception of one smaller distributor who failed to meet their HV user’s target.

Monitoring

It would appear from comments by the Social and Economic Council of Flanders that the verification of savings is a “paper” check that ensure that the energy savings claimed are from eligible measures and checking the energy saving calculations. There would appear to be no random audits that the claimed measures are actually in place.

Energy and Carbon Savings

As the target is an annual primary energy target, there is no discounting of savings in the future and in a sense, there is no recognition of the benefits of longer last in energy efficiency investments. In terms of the low energy savings for low customer, Flemish Energy Agency (VEA) estimate that the low target for 2005 was 357 GWh primary energy savings and the target achieved was 489 GWh and that 414GWh out of the 489 are from residential customers.

However, although some energy saving values have been published, in general the approved calculation methods are not made public by the Flemish Department of natural Resources and Energy.

Carbon Dioxide savings from the total activity (i.e. LV plus HV customers) were estimated by VEA to be 181 and 185 kt CO₂ per year in 2003 and 2004 respectively.

Financial benefits

In addition to meeting their targets, the actual expenditure was considerably less than that budgeted for the obligation. In 2003, expenditure was €11.8 million against a budget of €24.8 million; in 2004, expenditure was €18.3 million against a budget of €30.2 million; in 2005, the amount budgeted for was reduced to €24.5 million and expenditure was €18.7 million.

	Budget [€ million]	Expenditure [€ million]
2003	24.8	11.8
2004	30.2	18.3
2005	18.7	24.5

Table 2—Financial benefits of current Energy Efficiency Obligations in Belgium

For the residential sector in 2003, the Ministry has reported that the cost effectiveness for the protected clients was 1.7 eurocents/kWh primary for CFLs and 0.25 eurocents/kWh primary for energy saving shower heads. For the rest of the residential customers, the average cost effectiveness was 3.7 eurocents/kWh primary and ranged between 0.5 and 113 eurocents/kWh primary. As the average electricity price for the residential sector in 2004 was 16 eurocents/kWh (equivalent to 6.4 eurocents/kWh primary), then the average cost effectiveness was surprisingly good as this value is based only on one years energy saving. For the non-residential clients, the average cost effectiveness in 2003 was 1.03 eurocents/kWh primary and ranged between 0.25 and 152 eurocents/kWh primary. The latest data for 2005 from VEA indicate that the average cost effectiveness for LV customers is 2.6 eurocents/kWh primary and 1.2 eurocents/kWh primary for HV customers. In terms of carbon dioxide cost effectiveness, the VEA figures for 2004 indicate €12.3/t CO₂ (LV customers) and €6.3/t CO₂ (HV customers).

There appears no estimation of dead weight or free riders, e.g. replacement gas boilers appear to be accredited the energy savings compared to the old boiler rather than compared to the current average of boilers on sale. The amount of the obligation costs charged to end users is fixed in advance by the budgets submitted by the network operators to implement the energy saving activities. It is not clear how the differences between the cost actually incurred (which have been much less than the budget for actions) are taken into account in drawing up distribution tariffs for the following year.

Lessons and replication conditions

Clearly the Flemish Energy Efficiency Obligations have been successful in meeting their targets and in doing so, expending much less than was originally budgeted. However, because of the lack of transparency about many aspects of the

obligation, it is difficult to make detailed evaluation of the life time carbon savings after the effects of free riders/dead weight have been removed.

FRANCE

The French White Certificates have been in place since July 2006 and arose out of the new French energy policy law passed in July 2005. It places an obligation on suppliers of electricity, gas, domestic fuel (but not for transport), LPG, cooling and heat to save energy in the residential and commercial markets. White Certificates were a key part of the French policy to reduce energy intensity by 2% per year until 2015 and then by 2.5% until 2030. It particularly was designed to focus on the more diffuse potentials of energy savings in the residential and tertiary sectors and was intended to provide a new means of financing energy efficiency projects in these sectors.

Objective

The French White Certificates are intended to encourage the efficient use of energy in a liberalised market. Additionally, it hopes to encourage the development of the energy service approach.

Characteristics of the programme

The target is both set and administered by the French Government. Over the period July 2006 to June 2009, there was a national target of 54 TWh life time savings of final energy. The target is shared out between the obliged energy suppliers based on their market shares by energy volume in the residential and tertiary markets and the prices of the energies. The targets do not prescribe how energy suppliers should attain these energy efficiency savings. There are already 70 energy efficiency measures with deemed energy saving values.

The target can be reached either by implementing end user energy saving or by buying energy saving certificates. If the target is not met, there is a penalty of 2 eurocents/kWh life time final energy for each unit of saving missed. The allocation of the target by energy source is 57% electricity, 26% natural gas, 13% domestic oil and 4% others. Because of the structure of the French electricity and gas markets, around 80% of the obligations fall on two suppliers, EDF (30 TWh) and Gaz de France (13 TWh). The other 20% of the obligation falls on around 2,400 energy suppliers. There are exemptions for small suppliers which are below 0.4 TWh except for domestic oil providers where all suppliers are obligated. The energy savings are discounted over the life time of the target at a discount rate of 4%. The minimum size for a White Certificate is 1 GWh – this is equivalent to the average annual electricity consumption of just over 170 French households or the savings that would be obtained by installing around 3,000 CFLs in households (depends on life time of CFL and wattages being

replaced).As with other Energy Efficiency Obligations, the French system permits deemed, or ex ante, savings as well as calculations being done on a one by one basis; the deemed savings appears to be the preferred route.

Evaluation and impacts

It is too early for a full evaluation to have been carried out to date. However, the major player, EDF, has reported that in the first six months of White Certificates operation, the energy savings in the residential sector were obtained through retrofitting 60,000 households with insulation, double glazing, heat pumps, gas condensing boilers, energy management systems, solar water heaters and woodstoves. EDF has also been marketing pilots to address home lighting and electrical appliances and has set up an on line shop to sell energy efficient appliances through the internet.

The design of the projects under the French White Certificates attempts to ensure that any claimed savings are additional to those which would have been attained other wise. In France, tax credits up to 50% of the capital costs have been introduced for householder who have certain energy saving measures installed professionally(e.g. insulation, efficient heating). These are allowed to be claimed in conjunction with White Certificates by an obligated energy supplier. While this will undoubtedly speed up the early introduction of new energy saving technologies, the progress in market penetration of the individual technologies will need to be monitored and reduction and/or elimination of double subsidies reviewed as appropriate.

Lessons and replication conditions

The energy saving actions in France can be performed by either the obliged or non-obliged companies provided they satisfy the additionality criteria. The main actors are anticipated to be energy suppliers and public or collective bodies. The White Certificates are issued by the French Ministry of Economy, Finance and Industry after the completion of the energy efficiency action. It is possible to buy or sell certificates below the penalty price of 2 eurocents/kWh but there is no formal market as such.

It is not obvious that the normal retail outlet to households is being utilised to the maximum effect. In other words, to achieve the desired market transformation in products such as lighting and appliances, then the normal retail outlets for these need to be involved in the delivery of the energy efficient goods. Although it is early days, it does not appear that these routes are utilised to the same extent as they are in the UK for example. As the initial target period is for only three years, it is hoped that there will be early clarification of the details that in principle the French Government will continue with White Certificates in order to give regulatory certainty to the obligated energy suppliers. The following period of obligations could be up to 5 years.

ITALY

Italian White Certificates have been in place in Italy since January 2005. The obligations were placed on 10 electricity distributors and 20 gas distributors in Italy, however in practice the electricity board ENEL s.p.a. has ~90% of the electricity target and the Italgas s.p.a. company has over30% of the gas target. The Italian Government was responsibility for setting the size of the obligation and in the Italian National Plan, it is expected that one third of the expected carbon dioxide savings by 2012 will come from the White Certificate activities.

Objective

The White Certificates have always been driven by the Italian Kyoto commitments and were designed to be coherent with the framework that Italy would be expected to meet under the EU Directive of Energy End Use Efficiency and Energy Services. Another important objective was to encourage the development of an energy services market. The White Certificates cover all energy end users. The obligations also allow the energy distributors to meet their targets by improving the efficiency of their own business. However, at least 50% of the White Certificates must be met via reduction of electricity and gas in their final customers' premises. Although in principle any fuel can be saved, in practice to May 2006, electricity accounted for74.7%, gas for 21.9% and other fuels for only 3.4% of White Certificates issued by AEEG (Authority for Energy Electricity and Gas).

Background

Italy imports over 80% of its energy need. The imported energy sources bill is a big burden on national economy. As a matter of fact, Italy can be set among the more industrialized Countries, but its vulnerability in the energy sector remains very high. Therefore the main goals for the energy policy in Italy are: energy saving, development of national energy sources, diversification of energy sources, and maintenance of competitiveness of Italian exports.

Two Ministerial Decrees for promoting energy conversion efficiency were issued on July 20th, 2004 by the Ministry for the Environment and the Ministry of Productive Activities, and came into force on January 1st, 2005. These Decrees replaced and updated similar Decrees issued on April 24th, 2001 by the then Ministry of Industry, in agreement with the Ministry for the Environment. The general objectives are the promotion of :

- ✓ Energy savings and the use of renewable energy sources in the distribution of natural gas and heat;
- ✓ Improvement of energy efficiency for final use with particular focus on the distribution of electric energy.

Characteristics of the programme

The mechanism introduced by the White Certificates is directed to the energy and gas distribution companies with over 100,000 clients. The contribution is tailored to the overall goals based on the ratio between the energy distributed to final consumers connected to their network and the total energy distributed throughout the national territory. At least 50% of energy savings must be achieved through a corresponding reduction of consumption.

The White Certificates are issued after AEEG had certified:

- the occurrence of energy savings;
- energy savings target expressed in tons of oil equivalent (Toe)⁵;
- one White Certificate equals 1 Toe saving.

A White Certificate is equivalent to the average annual electricity consumption of between 1-2 Italian households or the savings that could be obtained by installing around 70 CFLs in households. The White Certificates can be exchanged by means of bilateral contracts, or in the frame of a specific market ruled by GME. AEEG has also the task to perform sampling inspections to ascertain the actual implementation of the projects and their compliance with the rules now in force.

By marketing the documents, the distributors – which are obliged by law to reach the stated targets - are able to buy them from specialized companies, achieving cost reduction and at the same time assuring the stated efficiency level. The objective of these decrees is to get, in the five –year frame 2005-2009, an energy saving of 0.2 MToe/year at the beginning and of 2.9 MToe/year within 2009.

All actors are involved in the following typologies of actions:

Interventions for the substitution of water heaters running on electric energy with appliances running on other more efficient energy sources (wood pellet, chips, fluff, solar energy, other RES) with focus on district heating systems.

Installation of plants for the use of low enthalpy heat (for example heat from co-generation plants), using also wastes for space heating.

Campaigns for training, informing, promoting and sensitizing end users.

Obliged distributors have four options to comply with their White Certificate obligation:

- ✓ They can develop “in house” energy efficiency projects,
- ✓ They can develop projects either jointly or contact with other third parties such as product manufacturers, retailers, installers, ESCOs, etc.

- ✓ They can buy from the market tradable energy efficiency certificates which attest energy savings achieved by third parties via the implementation of energy efficiency projects; these third parties can include subsidiaries of the obliged distributor or other distribution companies or energy service providers.

Alternatively the companies can pay the sanction for non-compliance with the obligation.

Monitoring

Measurement and verification are crucial to the efficient functioning of a tradable certificates mechanism so that players in the market can have confidence in the certificate. This is achieved by AEEG having a rigorous monitoring and verification system so that the Italian White Certificates can serve as an accounting tool and thus prove the corresponding amount of energy has been saved. This is achieved by AEEG providing specific guidelines on the preparation, measurement and evaluation of individual projects. Subsequently documentation has to be transmitted to the Regulator to allow verification and validation on a project by project basis before the Italian White Certificates are issued. As most of the activity is related to be deemed or scaling of engineering estimates, then this effectively becomes verifying that the energy efficiency measures were installed and are in place. This process is subject to a random audit by the Regulator. The Regulator AEEG makes an allowance in the distribution price formula to cover the costs of the Italian White Certificates. In the first phase, this cost has been assumed to be €100/Toe of primary energy saved. For both the first and second year (2005, 2006) the energy distributors met their targets and AEEG has estimated that the break down of where energy savings were achieved is, for 2005, as shown in Figure 1.

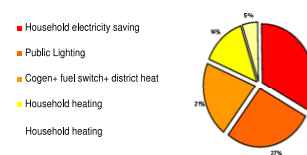


Figure 1 - Breakdown of where the Italian White Certificates were generated in 2005 (source AEEG)

Although industry was only 5% of the energy savings in the first year, it is growing fast and has increased by nearly 50% in the second year. Roughly 90% of the energy savings achieved were done through the deemed energy savings method with the balance being largely engineering estimates and a few large energy saving projects which were monitored.

Public lighting has been the most popular individual measure and while electricity savings in house holds through CFLs

and appliances have been significant, it is noticeable that the most common measure in the UK programmes of improving heating efficiency through insulation and also the installation of more efficient boilers are not so prevalent in Italy. In the industrial and commercial sector, other important energy efficiency measures include motors and drives, inverters, air conditioning in the service sector, schools, hospitals and offices.

Evaluation and impacts

The Italian White Certificate obligation has been in a great success. For the first year (2005), nearly 90% more certificates were issued than required to meet the target. This is in part due to the delays in actually implementing the White Certificate mechanism; energy savings from projects dating back to 2001 are included and these account for 62% of the total White Certificates issued.

In Italy the targets for 2005 were equivalent to 456 GWh/y electricity saving and 675 GWh/y gas savings (both figures in delivered units). The Italian regulator has reported that both figures were easily exceeded. The 2005 annual target corresponds to 0.15% and 0.13% of Italian electricity and gas consumption respectively. It should be born in mind that this is only the first year's savings and that the targets will increase in subsequent years. In the first year, the carbon dioxide savings were 0.76 MT/year. To date, the carbon dioxide savings are 2.3 Mt/year.

The regulator AEEG has not published information on the financial benefits to end use consumers but it is clearly very positive. For example, the amount allowed in the distribution price formula of €100/Toe is at least a factor of six less than the price of electricity and natural gas to residential customers.

Lessons and replication conditions

Public money has been used almost exclusively for supporting district heating capital costs, while individual heating with wood was neglected, regardless to the fact that domestic bioheating is the largest source of renewable energy in Italy, second only to hydropower. This lack of capital incentives on domestic heating plants must be corrected, in consideration of the high technology level (efficiency around 90%) reached by the modern small wood boilers available on the market, now ready to replace the great number of existing old and low efficiency boilers. A second lesson should regard the upstream side of the biomass path (cut, collection and transport): the Italian incentive policy has, up to now, totally neglected this crucial sector (only the existing Decree 124/02 provide some tax deduction for interventions limited to forest maintenance).

Full trading of the certificates is allowed under the Italian White Certificate program. Any accredited party can achieve

savings provided which satisfy the Regulator and showing that they have installed energy efficiency measures appropriate to the savings claimed. The White Certificates are traded on a specific market place, organized and administered by the Electricity Market Operator (GME) according to rules approved by the Regulator, or through bilateral trading (over the counter). GME also operates the "Power Exchange" and the "Green Certificates" market for renewable energy. The market was opened in March 2006.

The five year fixed period has been a problem in that it does not provide long term continuity for Energy Efficiency Obligations. However, the current proposal is that in the period 2009 – 12, targets will be set by the Government by the end of 2007 which will see an increase in activity. Currently under discussion is to have a target of 5 MToe primary energy after three years (compare 2.9 MToe after five years in the current phase) and to extend the obligation to smaller distributors, perhaps those with 50,000 customers. One of the consequences of the three years extension of the obligations is that it is likely that Italy will need to look again at how the life time issues of the individual projects are addressed. For example, insulation measures which can save energy and carbon dioxide for at least 30-40 years are not awarded their full benefits under a scheme which only counts savings from a few years. Other issues to be addressed in the coming period are to re-look at the additional issues in the light of the increasing scale and to look further at the development of the trading to give clearer price information to the Regulator.

GREAT BRITAIN

Energy Efficiency Obligations have been in place in the UK since 1994, initially on the electricity industry but since 2000 on both the electricity and gas suppliers. During this time, the electricity companies moved from fourteen regional monopolies (and gas from one national monopoly) to a fuller liberalised market with six major energy suppliers. Since 2002, the Government has been responsible for setting the size of the obligation which is now called the Energy Efficiency Commitment (EEC) and from 2008 will be called the Carbon Emissions Reduction Target (CERT). EEC, along with Building Regulation, forms the main energy policy planks for tackling house hold carbon dioxide emissions as part of the UK 2006 programme for tackling Climate Change.

Objective

EEC has always been viewed primarily as an environmental policy to tackle carbon dioxide emissions. The residential sector is responsible for around 27% of total UK carbon dioxide emissions on an end used basis. EEC is intended to stimulate greater investment in energy efficiency measures in the house hold sector than would otherwise have occurred

and at the same time to support progress towards wider economic and social objectives.

Characteristics of the programme

Under EEC, electricity and gas suppliers are required to achieve targets for the promotion of energy efficiency improvements in the residential sector. The targets do not prescribe how suppliers should attain these improvements and suppliers can fulfil their obligations by carrying out any combination of approved measures including installing insulation or supplying and promoting low energy light bulbs, high efficiency appliances or boilers. The only constraint on the suppliers' activities is that they must achieve at least half their energy savings in low income house holds (those households on income related benefits and tax credits). As the UK energy market is fully liberalised, the EEC obligation only applies to those energy suppliers with more than 50,000 customers to ensure that EEC does not act as an entry barrier to new suppliers. As energy supply price restraints were removed in 2002 for electricity and gas in the residential sector, there is no longer an allowance to cover the costs of this activity. In other words, it has become a "cost of business" like environmental considerations or health and safety, etc. The Government makes a (conservative estimate) of the likely costs of EEC to customers when it is setting a target. For example between 2002-5, the EEC cost was around £3.20 per household per fuel per year. This was about 20% less than Defra had expected, allowing for inflation. The current phase was estimated by Defra to be around £9 per fuel per house hold per year but is expected to once again be at least 20% lower. In EEC1, all energy suppliers met their target and the indication is that this will also be the case for EEC2 (2005-8).

In terms of energy efficiency measures used by the energy suppliers, there has been a tremendous growth in annual installations as shown in Figures 2-3. In terms of number of measures, CFLs and appliances dominate, but in terms of energy saving insulation, particularly of empty cavity walls, is the most important activity. In the current phase (EEC2), insulation accounts for ~85% of the energy savings achieved to December 2006.

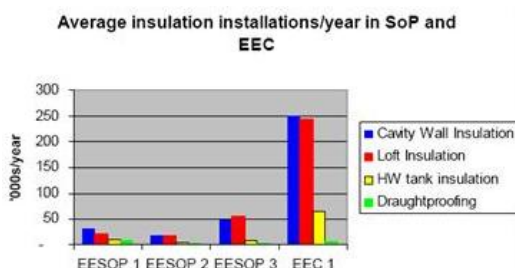


Figure2 - The average annual installations of various insulation measures over the period 1994-2005 associated with UK energy efficiency obligations

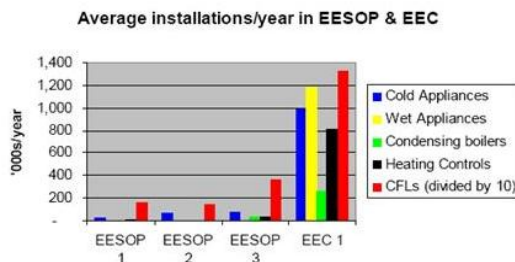


Figure 3 - The average annual installations of various energy efficiency measures over the period 1994-2005 associated with UK energy efficiency obligations. (N.B. in EEC1 annual CFLs are actually 13 million etc.)

Monitoring

This important function is carried out by the Energy Regulator, Ofgem. they are responsible for providing guidance on the preparation, measurement and evaluation of individual projects to the energy suppliers. It is by monitoring and verifying the suppliers' activity on an individual project by project basis that Ofgem satisfies itself that the energy supplier has met their overall target. As the UK system has focussed only on small users and now just householders, then the deemed, or ex ante, energy saving values have been the sole method used by energy suppliers to deliver their targets. This has meant that Ofgem's role has effectively become verifying that the energy efficiency measures are on the list which have deemed savings and that subsequently these measures were installed and are in place. The process is subject to random audits by the Regulator and its agents to ensure these conditions are met.

Evaluation and impacts

Unfortunately, the EEC target is measured in fuel standardised units which although correctly carbon weighted between the differing fuels, are meaningless in terms of relating to electricity and fossil fuel savings. Unravelling these fuel standardised units, the EEC1 savings represented some 27 TWh of electricity and 53 TWh of fossil fuel. Without discounting, these savings would be around 40 TWh life time for electricity and around 100 TWh life time for fossil fuels – insulation measures in the UK, which have the longest lives, usually save fossil fuels and hence discounting affects the lifetime saving values more heavily. From 2008, the target will be expressed in lifetime carbon savings which are not discounted with time. The carbon savings from EEC1 are estimated at over 10 million tons carbon lifetime or 0.5 million tons of carbon per annum in the middle of the Kyoto period 2010 (1.3% of household emissions).

Financial benefit

The UK Government has evaluated that during EEC1, the net resource benefit for saving each ton of carbon is around £300, i.e. the net present value of the on going energy

savings set against the costs of all the parties involved is such that the UK benefits by £300 for every ton of carbon saved. Defra estimated that the net present value of the measures necessary to meet the EEC1 target after including all party costs and benefits was £3 billion over the lifetime of the measures discounted at 3.5%. This is to be compared with a total cost to all players of £0.6 billion. An alternative way of looking at this is that the cost to the nation of saving a delivered unit of electricity or gas is 1.3p/kWh and 0.5 p/kWh respectively; both figures are significantly less than the consumer prices of those fuels in 2004 of 6.7p/kWh and 1.7 p/kWh respectively in 2004. The market transformation effects have been most marked for energy efficient appliances. Figure 4 shows the situation for the most important of the cold appliances which accounted for 76% of the appliance energy savings accredited to energy suppliers under EEC1. The market transformed markedly in the three years period of EEC1. As the evaluation discusses, there are many factors contributing to the growth in sales of A-rated cold appliances as shown in Figure 4. However, without the financial incentives available from the energy suppliers, it is doubtful whether the transformation could have taken off as quickly as it did

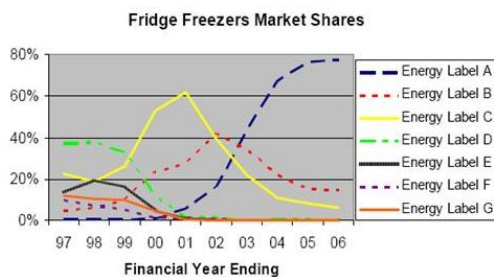


Figure 4 - Development of the fridge freezer market by energy rating from 1996 to end of September 2005 (source EST using GFK data)

As the scale of the energy efficiency measures has increased, then the costs of the energy efficiency measures have fallen in real terms. This is shown in Figure 5 where all measures, apart from cavity wall insulation (a mature technology), have fallen considerably.

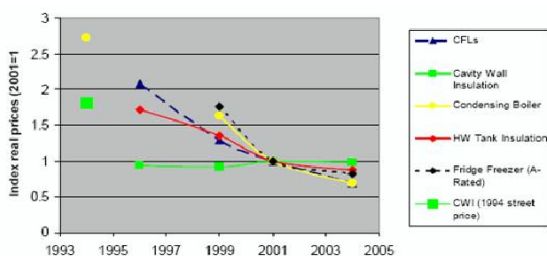


Figure 5 - The real prices of energy efficiency measures over the period of UK energy efficiency obligations.

Lessons and replication conditions

Trading is permissible under EEC only between obligated parties, i.e. energy suppliers. Nevertheless the way that EEC operates, there are many similarities between trading and EEC's operation. Energy suppliers have the ability since 2002 to trade between different obligation periods and this has been utilised by the carry forward of excess energy savings between the various phases of the obligation. This has the great advantage of ensuring a smooth transition for the energy efficiency industry between different phases and thus avoids the "stop start" nature of activity which was witnessed in the earlier, more rigid transitions. In general, the energy suppliers largely subcontract most of the activity to either retailers, professional installers, managing agents, etc. In principle this should ensure competitive pricing and simulates some of the benefits of trading. In practice, as Figure 6 shows, there was a marked difference in the way that energy suppliers met their targets through the various energy efficiency measures.

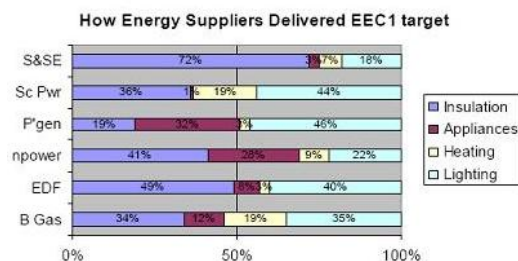


Figure 6 - How the energy suppliers 14 delivered their targets broken down by end use sector.

Variation is to be expected as there will be different positioning within the market on issues such as the importance of branding (especially with appliance sales), home services and maintenance, geographical location of (historical) customer base etc. Additionally, some companies may have been more effective at securing lower prices than others in certain energy efficiency areas.

A major criticism of EEC has been that it is not conducive to the introduction of new energy saving technologies. In fact, there has been considerable innovation in the way that energy suppliers promote energy efficiency measures to households (e.g. involving charities and/or local community based approaches, working with local authorities, appliance retailers and combined offers of insulation when replacing with a condensing boiler). Energy services were experimented but they were not so successful. On the technical innovation side, only in CFL design and performance over the past 10 years was there considerable change. This has also changed attitudes such that lighting manufacturers now believe "energy efficiency is key to product development". As mentioned earlier, the uplift factors for innovation did encourage a limited number of

products and it was particularly marked for transforming the market for appliances.

The UK Government has already committed to an EEC running from 2008-11 and signalled that post 2011 some form of supplier obligation is likely to remain in place at an expanded level compared to today. For 2008-11, the objective is to double the carbon savings from EEC and the energy saving target will be replaced by a life time carbon saving target. The intention is to encourage the development and promotion of house hold and community scale renewable energy sources which currently are not supported by the much larger renewable obligations placed on energy suppliers; these tends to support the large scale, commercial development activities. The UK Government has started consulting on how trading or White Certificates might be introduced post 2011 in a coherent framework to that in place for other end us.

2.1 Picture of energy market in Algeria and Tunisia

ALGERIA

2.1.1 Algeria macroeconomic overview

Hydrocarbons dominate the Algerian economy, providing 60 percent of government revenue, 30 percent of Gross Domestic Product (GDP) and 95 percent of exports. The 45percent of government expenditure in the non-hydrocarbon sector is paid for by oil and gas revenues. Oil and gas exports pay for nearly 80% of imports of goods and service, and other net payments by the non-hydrocarbon sector. In the 1990s, the country went through a civil war in which some 100,000people were killed. Although the security situation appeared to be improving, last year there was a resurgence of violence. The windfall revenues of the 1970s were largely wasted on large-scale, state-controlled heavy industry projects which were not well-integrated into the small domestic private sector or the international economy. Although they attracted very strong state protection, these eventually proved too inefficient to maintain and the country built up a huge external debt. This time there is a much greater awareness of the dangers but corruption remains a problem amongst the ruling elites. Regarding hydrocarbons policy, there is an ambivalent attitude over whether greater oil and gas producing capacity is required given the current very high levels of revenues. With \$110 billion of foreign reserves already in the bank and prices were expected (in early 2008)to remain high for the foreseeable future, key decision makers were generally of the opinion that Algeria does not necessarily need a massive expansion of production.

In terms of oil, the government's attitude is rather uncertain. With such high existing oil revenues, there is concern that

more will simply generate a serious attack of "resource curse". This combined with growing sentiments of "resource nationalism" means that Algeria's attitude towards International Oil Company (IOC) involvement is becoming rather ambivalent. Recently there have been distinctly hostile signals to the IOCs and in 2007, it was announced that plans to increase oil-producing capacity to 2 million b/d by 2010 had been scrapped. However, the official position is that the government is "entirely committed" to sustaining oil predicting levels and Sonatrach has announced plans to spend \$48 billion on the upstream and pipelines over the next five years. Certainly the government appears to want to encourage greater exploration, especially for gas. Thus recently the much delayed 7th licensing round has been launched to offer 10 – 15 blocks in gas prone areas for licensing. There is some concern as to whether the reserves are large enough to support the numerous gas export projects that are under consideration. Thus in 2007 Algeria was exporting some 63 billion cubic metres per year (bcm) with official plans to increase this to 85 bcm over the "next few years" and, to this end, a number of gas pipelines and LNG plants are under consideration. The official line is that there is plenty of gas but there is no doubt that the domestic gas consumption is growing rapidly. In particular, there are plans for 13 new desalination plants to come on stream between 2005 and 2009 with a total capacity of 2.2 million cubic metres per day which will seriously strain Algeria's power supply system. In fact the completion date for these plants was recently extended to 2011.

2.1.2 Energy market overview

Algeria is an important exporter of oil and natural gas and is a member of the Organization of the Petroleum Exporting Countries (OPEC). In 2008, Algeria produced 2.18 million bbl/d of crude oil. Algeria was the fourth largest crude oil producer in Africa after Nigeria (1.94), Angola (1.89), and Libya (1.71) and the largest total oil liquids producer on the continent. As a member of OPEC, Algeria's crude oil production can be constrained by the group's crude production allocations, but Algeria also produced 450,000 bbl/d of condensate and 357,000 bbl/d of natural gas liquids, which are exempt from OPEC quotas, bringing total oil liquids production for the year up to a total of 2.23million bbl/d. Domestic oil consumption accounted for about 13 percent of total production. Algeria was the sixth largest natural gas producer in the world in 2007 after Russia, the United States, Canada, Iran, and Norway. Algeria produced 3.03 trillion cubic feet of natural gas in 2007, of which 70 percent was exported and 30 percent was consumed domestically.

According to Oil and Gas Journal (OGJ), Algeria contained an estimated 12.2 billion barrels of proven oil reserves as of January 2009, the third largest in Africa (behind Libya and Nigeria).Algeria's largest proven reserves are located in the

eastern half of the country. Algeria's Saharan Blend oil, 45% API and 0.1 percent sulphur content, is among the highest quality in the world. European countries rely on Algerian oil to help meet increasingly stringent European Union regulations on sulphur content of gasoline and diesel fuel.

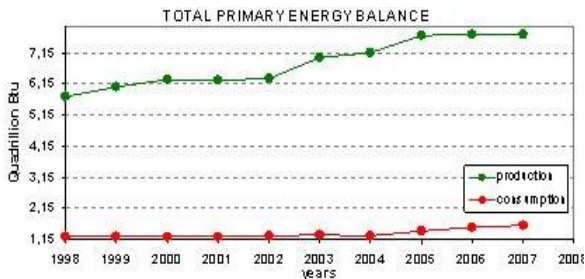


Figure 7 Algeria Total primary energy balance from 1998 to 2007 (data source Energy Information Administration – EIA)

Figure 7 reports Algeria total primary energy balance in the period 1998 ÷ 2007; total primary energy includes oil, natural gas, and coal. The balances of these individual components are respectively reported in Figures 8-10.

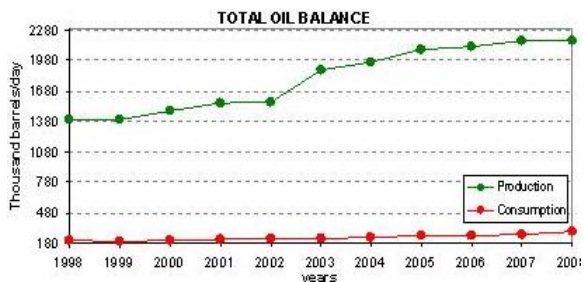


Figure 8 Algeria Total oil balance from 1998 to 2008 (datasource Energy Information Administration - EIA)

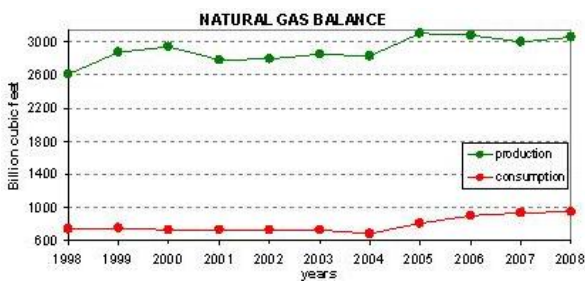


Figure 9 Algeria Natural gas from 1998 to 2008 (datasource Energy Information Administration - EIA)

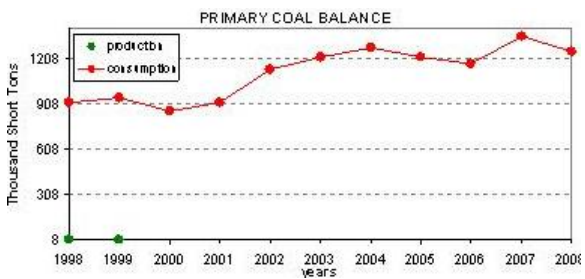


Figure 10 Algeria Primary coal from 1998 to 2008 (datasource Energy Information Administration - EIA)

At the end in Figure 11 is reported the renewable electricity balance (1998 ÷ 2007), as it is possible to note the renewable electricity production is identical to the consumption.

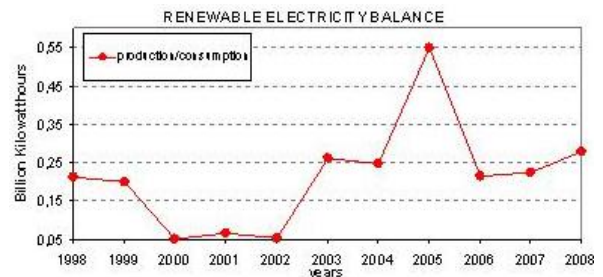


Figure 11 Algeria Renewable electricity balance from 1998 to 2008 (datasource Energy Information Administration- EIA)

2.1.3 Algeria energy actors

MEM (Ministry of Energy and Mines)

APRUE (National Agency for the Promotion and Rationalisation of Energy Use)

It is a public agency for the industrial and commercial sectors created by presidential decree in 1985, under the control of the Ministry of Energy and Mines . Its primary mission is the implementation of the national policy of energy conservation, and this through the promotion of energy efficiency. The Agency's mission are :

- The coordination and facilitation of the national policy of energy conservation;
- The implementation and monitoring of the National Program of Energy Management (PNME);
- Awareness and dissemination of information on energy efficiency towards different targets (general public, professionals, school ...);
- The assembly program and sector-based projects in partnership with relevant sectors (Industry, Construction, Transport, ...).

GREG (Commission de Régulation de l'Electricité et du Gaz)

It was created by Law 02-01 of 05 February 2002 relating to electricity and gas distribution by pipeline. It is an independent body with legal personality and financial autonomy.

The CREG's role is to ensure transparent and competitive functioning of the electricity market and the national gas market, in the interests of consumers and the operators. It's main tasks are: the implementation and monitoring of public

service, advise the government regarding the organization and functioning of markets and said monitoring and control of compliance with laws and regulations.

The main powers and functions of the regulatory commission are:

- authorizations and concession;
- demand forecasting and scheduling investments;
- remuneration of operators and tariffs;
- access to networks / markets;
- quality and regulatory and technical inspection and environmental;
- consumer protection.

2.1.4 Current energy policies

The elaboration of energy efficiency standards and requirements for appliances is a part of the National Energy Efficiency Programme (Programme National de Maîtrise de l'Énergie - PNME) of the Ministry of Energy and Mines. The Energy Efficiency Law (Loi relative à la Maîtrise de l'Énergie no. 99-09) of July 1999 defines the reference frame for the orientation and management of energy demand and declares energy efficiency to be an activity of public usefulness. Concerning energy efficiency standards and labelling, the Law requires the mandatory labelling of every new or used appliance to be sold on the national territory. The Draft Executive Decree, which determines the general rules concerning the energy efficiency of appliances operating on electricity, gas and petroleum products (Projet de Décret Exécutif fixant les règles générales relatives à l'efficacité énergétique des appareils fonctionnant à l'électricité, aux gaz et aux produits pétroliers), defines issues like the labelling of appliances and the information of users, the control of energy efficiency and the rules for imported appliances, both new and used. In particular, the draft executive decree requires that the label has to be of a comparative type and ought to classify the appliances according to categories (as is the case for the Australian, European and Korean labels for example). The draft executive decree also stipulates that the energy performance requirements of the appliances will have to be set by Government orders.

Between September 2001 and December 2002, the APRUE conducted a study and performed related awareness building activities on the "Regulation of Electric Household Appliances". These activities were carried out in the framework of a co-operation project with the European Union, with the participation of public and private partners and with the support of European experts. The principal tasks realised in the framework of the project were:

1. review of policies, legislation and regulations related to energy efficiency programmes;
2. orientation of APRUE staff and project partners regarding the international and European state-of-the-art for equipment energy efficiency policy with a mind to the strategic options in Algeria;
3. an assessment of the market for refrigerators and freezers in Algeria, based on a statistical analysis of the market;
4. formulation of proposals for equipment energy test procedures;
5. specification of an energy efficiency test laboratory and of a system for energy efficiency conformity evaluation;
6. estimation of the investment and operational cost of such a laboratory;
7. consideration of the most appropriate type of energy efficiency label and orientation of project partners regarding potential consumer research to guide the label design process;
8. orientation of project partners regarding a national energy efficiency standardisation and labelling plan for refrigerator and freezers and for other electric household appliances and assistance in the formulation of a work plan for future activities.

2.1.5 The legal and institutional framework

Law N° 02-01 of 5th February 2002 relating to electricity and gas distribution by pipeline lays down principles for opening the electricity and gas distribution markets. It describes the conditions, then methods and time scales of implementation. This law cancels a state monopoly previously held by the original operator, Sonelgaz, regarding generation of electricity, and transport and marketing of gas by pipeline. It introduces competition in electricity generation, in marketing of electricity and gas by conduit; it makes concessions a standard management technique in distribution to the public; finally, it enshrines the doctrine that third parties may have free access to the networks. This law aims at various goals :

- developing the field in the context of the country's energy policy;
- setting down transparent and attractive regulations;
- reducing costs while improving service delivery, using steps that incite/encourage an efficient and disciplined market that practices competition;
- improved safeguards for the public in hygiene, security, and environmental protection.

To implement these, the law provides for the following steps:

- competition in electricity generation, and in marketing energy;
- access by other parties to the network and free consumer choice of an energy provider;
- providing concessions for distributing electricity and gas, as well as equalising rates for non-eligible customers;
- changing the historic operator, *Sonelgaz*, into a holding of limited liability bodies, and acting through its subsidiaries to produce electricity and transport and market electricity and gas;
- founding the Commission for Electricity and Gas Regulation (CREG).

Since the promulgation of the law N° 02-01 of 5th February 2002, the lawful device was reinforced year by year by the adoption of new texts of application.

Thus during the 2008 fiscal year, the works undertaken by CREG within the framework of the "committee of the texts" allowed to lead to the publication of the texts enumerated hereafter :

- **Executive decree n° 08-114 of 9th April, 2008** laying down the modalities of allotment and withdrawal of concession of electricity and gas distribution and the schedule of condition relative to the dealer's rights and obligations.
- **Executive decree n° 08-394 of 14th December, 2008** laying down the tools and the methodology for the elaboration of the indicative programme of the supply of the national gas market.
- **Ministerial order of the 21st February, 2008**, laying down the technical rules of the connection to the electricity and gas transport network and the rules of the electrical and gas system management.

It should be noticed that the draft of the executive decree relative to tools and methodology for the establishment of the indicative programme on the requirement of means for electricity generation was examined and adopted by the government council on July 15th, 2008 and issued on the official news paper of the January 25th, 2009.

The existence of this lawful base will allow to the commission to get another part of its attributions and to gradually achieve the tasks referred to in articles 8, 36, 74 and 78 of the law on planning, the statement of concessions and quality of service.

As regards planning, it will authorize a transparent and standardized access to information and will define the

different parts involved in the process of making the indicative programmes in requirement of means of electricity generation and supply of the national market with gas.

As regards the concession, it allowed the distribution of electricity and gas to take a significant contribution share in the commission activity during the year 2008. The regulations contained in the executive decree n° 08-114 of April 9th, 2008 have allowed the launching of the process of implementation of the concession mode, the statement to the CREG of the concessions of distributions of electricity and gas and the launching, within the second phase, the process of the five-year commitments to improving performance.

Other drafts of texts worked out during the same period are pending deliberation at "The committee of the texts"; it is about:

- Draft of executive decree relative to the economic rules for the rights of connection to the networks and other actions necessary to satisfy the demands on supplying the customers.
- Draft of executive decree laying down the technical rules of design, exploitation and maintenance of the distribution networks.
- Draft of executive decree relative to the operation of the electricity and gas fund.
- Draft of interministerial order "Energy-Habitat", relative to the building permit.

TUNISIA

2.1.6 Tunisia issues

Tunisia has been a pioneer among developing countries in terms of energy management policy, having formulated and implemented a policy for rational use of energy and promotion of renewables as early as 1985. The energy intensity stopped increasing in the 1990s and has since then declined to the lowest level in the Middle East and North Africa region. However, the intensity remains high compared to some other Mediterranean countries such as Greece and Portugal. Moreover, energy-expenditures (energy-consumption valued at international energy prices) accounted for 12% of Gross Domestic Product (GDP) in 2006, which is a high level compared to industrialized countries (they amount to 4% of GDP in Japan and 7% in Greece).

The 11th Development Plan (2007-2011) sets the broad directions of energy policy, including gradual reduction in energy subsidies, and calls for a scaling-up of investment in energy efficiency and renewable energy. Given the urgency to intensify energy conservation efforts, the Government has formulated a 4 year Energy Conservation Program (4ECP) for the period 2008-2011, which was adopted by the

Council of Ministers on January 15, 2008 and presented to the public in a National Conference on Energy Management (NCEM) on February 12, 2008. The objective is to reduce the energy intensity of the Tunisian economy by 3% p.a. over the period and to increase the contribution of renewables to 4% of primary energy demand.

The 4ECP proposes to strengthen further the institutional and legal framework which is already well established. Tunisia has had an energy efficiency agency since 1985, Agence Nationale pour la Maitrise de l'Energie (ANME). Its missions include implementation of the energy management policy, supporting research, development and demonstration activities, communication, information and training, as well as managing the process of allocating the investment subsidies. An energy efficiency fund (FNME) was created in 2005 to provide investment subsidies for energy efficiency and renewable projects and is managed by ANME. A legal framework was established for the operation of Energy Service Companies (ESCOs) in 2004, and ESCOs have since then flourished, with seven now in operation in Tunisia.

The 4ECP calls for regulation to encourage cogeneration and self-generation from renewables, by giving third party access to the Société Tunisienne de l'Electricité et du Gaz (STEG) transmission network and setting the rules for buy-back of excess production by STEG. To that purpose, a new law was enacted on 9 February 2009; the law also broadens the audit requirements for industrial facilities, set norms and standards for existing and new buildings and makes mandatory the formulation of urban transport plans. A decree issued on the same day stipulates the new rules and procedures for eligibility to the FNME investment subsidy.

2.1.7 Tunisia Energy market overview

Until the second half of the 1980s, Tunisia was characterized by an energy surplus, and the energy sector was a major driving force of economic development, contributing to 13% of GDP and 16% of exports. Since the late 1980s, the energy surplus decreased and in 1994 for the first time Tunisia recorded a deficit in its energy balance. Following the extension of the gas pipeline between Algeria and Italy and the start-up of operations in the Miskar gas mine in 1996, surplus was restored, but as of 2001, deficits appeared again as a result of increasing demand and stagnating supply (i.e. Figure 12). The energy sector now makes up only 5% of GDP and 7% of exports. In 2006, the import dependency was 11%. Tunisia's primary energy demand is nearly entirely based on oil and gas. Natural gas was first introduced in 1983 and has been capturing a rapidly increasing share of primary energy demand - nearly 50% last year. The production of electricity is nearly entirely based on natural gas.

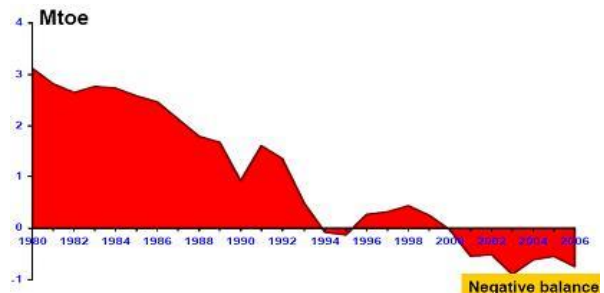
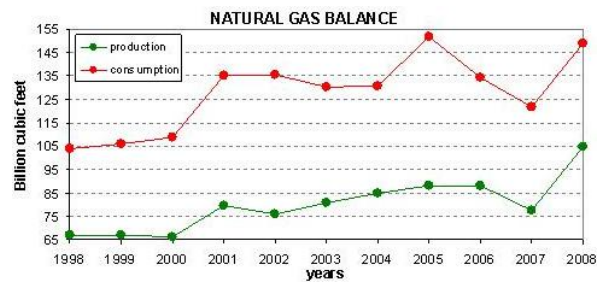


Figure 12 Tunisia Natural gas balance from 1998 to 2008 (data source Energy Information Administration - EIA)

As it is possible to see from the 13, 14, also the other components of total primary energy (oil and electricity) have a deficit on their balance (in the same period 1998 ÷ 2008); the balance of total primary energy (in the period 1998 ÷ 2007), instead, is reported in Figure 15.

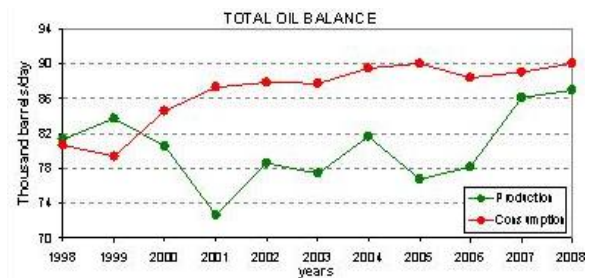


Figure 13 Tunisia Total oil balance from 1998 to 2008 (datasource Energy Information Administration - EIA)

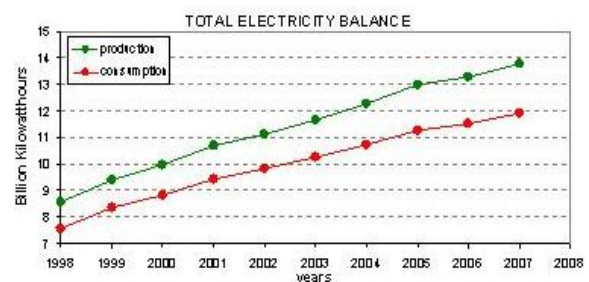


Figure 14 Tunisia Total electricity balance from 1998 to 2007 (datasource Energy Information Administration - EIA)

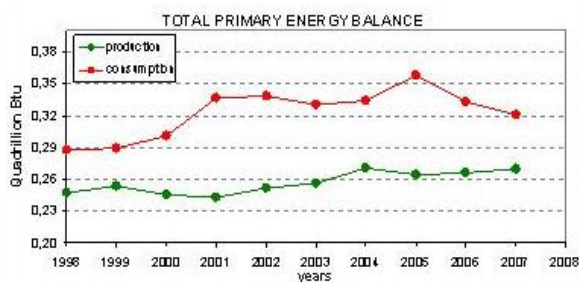


Figure 15 Tunisia Total primary energy balance from 1998 to 2007
(datasource Energy Information Administration - EIA)

At the end in Figure 16 is reported the renewable electricity balance (1998 ÷ 2007), as it is possible to note the renewable electricity production is identical to the consumption.

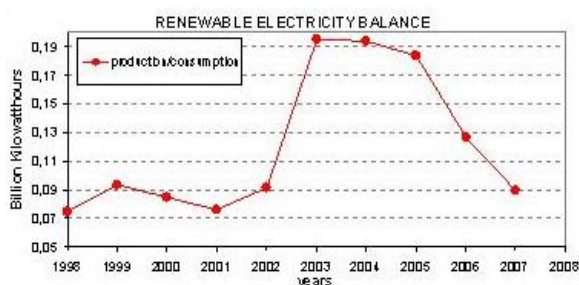


Figure 16 Tunisia Total primary energy balance from 1998 to 2007
(data source Energy Information Administration - EIA)

2.1.8 Tunisian Current energy policies

1985-Tunisia reinforced its institutions with the creation of the *Agence Nationale de Maîtrise de l'Énergie* (ANME). ANME is a public agency under the control of the Ministry for Industry and Energy and is responsible for implementing the Government's energy management policy, through the promotion of energy efficiency, of renewables and the switch to natural gas. Its mandate includes:

- Implement energy conservation programmes: ANME manages the energy audit program in industry and is the recipient of the audits, is the organization that manages the process of authorization for large energy consuming industrial installations, delivers certificates to energy using equipments so that they can benefit from existing incentives, etc.;
- Manage the process of award of investment subsidies and other financial incentives;
- Propose new laws, regulations and incentives for energy efficiency and renewable;
- Support research, development and demonstration activities;
- Manage the awareness raising, communication, information and training programs;
- Conduct strategic and forward studies, as well as any studies relating to its mandate, including as regards

climate change and carbon finance (in particular it manages the Clean Development Mechanism – CDM - Tunisia program).

1993 - Law 930120 of December 27,1993 regarding financial incentives.

1994 -Decree 94-537 of March 10,1994 that sets the criteria for financial incentives for energy efficiency and renewable projects.

2004-Law 2004-72 has strongly reinforced the regulatory framework governing energy savings, It consolidated promotional texts, clarified the energy savings concept, increased the responsibilities of the ANME and increased financial support to Rational Use of Energy (RUE) initiatives.

2005 - Law 2005-82, that update the types of financial incentives and the criteria for their attribution. In particular a decree on September, 15 2005 sets the rules for the operations of Energy Service Companies (ESCOs) in Tunisia.

2005 - Decree n°2005-2234 has further enlarged the scope by increasing the subsidies for energy savings initiatives from 5 % to 20 %, and by adding a 20 % subsidy for the purchase of solar water heaters.

2005 – *Fonds National de Maîtrise de l'Énergie*(National Energy Savings Fund - FNME); through these fonds Tunisia has implemented a financing mechanism to subsidize with in particularly the introduction of a:

- 20 % subsidy for all Rational Use of Energy (RUE) investments undertaken by corporations;
- 50 % of energy audit costs;
- 20 % of all solar energy investments;
- 50 % of investments in Renewable Energy (RE) and Rational Use of Energy (RUE) demonstration initiatives.

Furthermore, gas prices will be supported to promote more general use of gas in all sectors and throughout the country. The support to natural gas has a direct impact on electricity prices since electricity in Tunisia is essentially supplied by gas-powered plants.

2008 - Given the urgency to intensify energy conservation efforts, the Government has formulated a 4 year Energy Conservation Program (4ECP) for the period 2008- 2011, which was adopted by the Council of Ministers on January 15, 2008 and presented to the public in a National Conference on Energy Management (NCEM) on February 12, 2008. The objective is to reduce the energy intensity of the Tunisian economy by 3% p.a. over the period and to increase the contribution of renewables to 4% of primary energy demand. The main measures under the 4ECP are:

- Promotion of cogeneration and self-generation in industry using renewables (essentially wind);

- Increasing subsidies available for energy audits in industry, in order to extend the promotion of energy efficiency in industry, and necessity to obtain an authorization to set up large new industrial installations;
- Improvement in the thermal insulation of buildings;
- Development of norms and standards for appliances, and gradual removal of equipment not meeting standards;
- Generalization of the use of Compact Fluorescent Lamps (CFLs);
- Financial incentives for solar water heaters;
- A series of measures to improve energy efficiency in transport
- Increasing the use of natural gas in the residential and commercial sectors
- Expansion of the resources and coverage of the Energy Efficiency Fund (FNME), with in particular the introduction of a 20% subsidy for cogeneration investment (with a maximum of 500 000 TD per project)
- Creation of an energy regulator, which will in particular oversee the implementation and compliance of the energy management program.

2009 - Law 2009-7 of February 9 2009, modifying Law 2004-72, that lowers the threshold for mandatory energy audits in industry, sets norms and standards for buildings, make urban transport plans mandatory and sets rules for access to network and buy back of excess power from cogeneration units and self-generation from renewables.

2009 - Decree 2009-362 of February 9 2009, modifying decree 2005-2234, that stipulates the levels of FNME investment subsidies for each type of investment, as well as the applicable ceilings.

2.2 Design of institutional framework with regard to energy services and energy efficiency cap and trade

Issues

The careful examination of the energy and development policies of the energy market for both Algeria and Tunisia, have helped ECATS staff to make first steps of institutional assumptions which can lead to the development of cap and trade in energy efficiency.

Although the analysis and study of the contexts of individual countries concerned have carried out well-marked differences both in terms of size of energy markets and in terms of approaches and initiatives on renewable energy and energy efficiency measures, it was considered advisable to establish a common institutional model implementation.

Subsequently, the identification of the Action Plan aimed to the introduction of mechanisms of Cap and Trade, will proceed to consider separately the case of Algeria and Tunisia.

The refinement of the proposed institutional framework, which is summarized in the flow chart in Figure 17 may be possible as a result of the moments of confrontation in the development of the research project will be organized locally for the involvement of institutional stakeholders and industries.

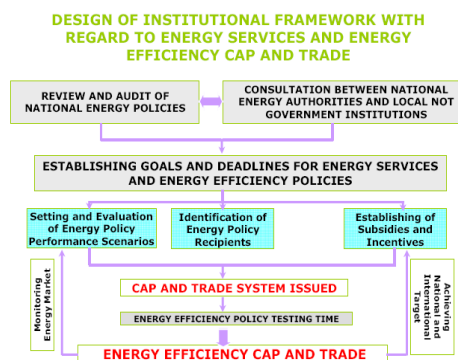


Figure 17 Design of ECATS institutional framework

Review and audit of national energy policies

Among the preliminary activities to be provided in the process of implementing the cap and trade in energy efficiency, it is critical to verify the energy policy in place. This will allow one hand to highlight the achievements against objectives and secondly to identify the strengths and weaknesses, both in relation to the current scenario and to the scenarios forecasting at local and supranational levels.

This preliminary step is considered essential in order to avoid conceptual errors and policy and to give greater efficiency to the next institutional steps.

Consultation between national energy authorities and local not government institutions

This moment is predicted at the beginning of the implementation process to ensure maximum involvement of all stakeholders of the system. This in order, firstly, to ensure that these objectives be achieved through the activation of the system of Cap and Trade and, after, avoid overlapping and / or the partial ineffectiveness of the actions in the field.

This step is considered critical for all purposes, as necessary to identify those procedures and terms of operation of the

technical board to ensure agility and incisiveness of the decisions taken.

Establishing goals and deadlines for energy services and energy efficiency policies

This task, although seemingly obvious and exquisite technical nature, should not be neglected because it depends largely on the extent and strength of action to implement the system of Cap and Trade. The goals should be set depending by prevalent criteria of national energy policy and guidance from the over world economy. Really, they should integrate with the projections of research in technologies and renewable energy sources and the peculiarities of the context of national production.

For definitions of deadlines, it shall conduct a careful examination of the recipients of policy measures for energy efficiency and major national energy actors. Furthermore, it may be helpful to use the timing of cap and trade system to increase the attractiveness of the national energy market with regard to international investors.

Setting and Evaluation of Energy Policy Performance Scenarios

This phase of the implementation process of the system of Energy Efficiency Cap and Trade is closely related to the goals in each country under study will be deemed achievable and in any case related to the timeframes set. For this reason it is essential to consider various scenarios for the integration of energy efficiency policies to those in place today. This should also cover simulation and estimation of multiple hypotheses profitability of energy saving measures and system activation of Cap and Trade.

Identification of energy policy recipient

This phase is of vital importance, since the activation of a real system of Cap and Trade can only occur if they are well identified recipients of the mechanism.

In other words, the performance of a system of Energy Efficiency Cap and Trade can be measured only from the involvement and contribution provided by each stakeholder of the country energy market.

Therefore, when it is designing a system of Cap and Trade in energy efficiency, at first it must be necessary to identify the categories and types of recipient which should pay or impose such strategies developed.

Establishing of subsidies and incentives

The introduction of a Cap and Trade energy efficiency system, in any of the possible forms of energy market regulation, must be complemented by strategies for provision of subsidies and / or incentives for market players.

In other words, it should be provided different type of economic / financial effort to the recipients of Cap and Trade system measures. Many previous experiences over the world have showed that subsidies and incentives policy are determinant for achieving energy saving target set. It should also distinguish between the recipients of subsidies (eg. energy producers) and those incentives (eg. energy users), and for each context in relation to the characteristics of the energy market. Finally, it will be necessary to proceed through detailed financial analysis to estimate the magnitude of incentives and subsidies to ensure its consistency with the overall results expected from the introduction of Cap and Trade energy efficiency system

3.1 Set of recommendations

3.1.1 Cap and trade mechanism and emissions abatement policies: definition and design of an institutional framework

Emission abatement policies are on the agenda on all levels. As public awareness about climate change seems to be rising at the same time the commitment and pressure for effective political action is mounting.

In carbon-intensive societies, where transportation industry, heating and other basic functions to a large extent is based on the consumption of fossil fuels, the economical and political costs associated with effective political action may be very steep.

Cap and trade (C&T) is a mechanism used to control pollution providing economic incentives. In other words, a C&T mechanism aims to reduce carbon dioxide and other greenhouse gas emissions in a cost-effective manner.

Under this scheme a company has a limit on the amount of greenhouse gas that it can emit. In fact, the firm must have an "emissions permit" for every ton of carbon dioxide it releases into the atmosphere. These permits set a limit, or cap, on the amount of greenhouse gas pollution that the company is allowed to emit.

Usually a governmental authority sets the limit or cap. Companies or other groups are issued emission permits and are required to hold an equivalent number of allowances (or credits) which represent the right to emit a specific amount. The total amount of allowances and credits cannot exceed the cap, limiting total emissions to that level.

Companies that need to increase their emission allowance must buy credits from those who pollute less. The transfer

of allowances is referred to as a trade. In a market-based approach, C&T consent to company that are more efficient than others to sell their extra permits to companies that are not able to make reductions. This creates a system that guarantees a set level of overall reductions, while rewarding the most efficient companies and ensuring that the cap can be met at the lowest possible cost to the economy.

Concerning the design of emissions reduction mechanism different framework have been developed and three different point of view can be take into account in order to clarify the concept, the so called: price, quantity and safety valve approach.

For instance, an emission cap and permit trading system is a quantity instrument because it fixes the overall emission level (quantity) and allows the price to vary. Uncertainty in future supply and demand conditions coupled with a fixed number of pollution credits creates an uncertainty in the future price of pollution credits and the industry must accordingly bear the cost of adapting to these volatile market conditions. However, under volatile market conditions, the ability of the controlling agency to alter the caps will translate into an ability to pick "winners and losers" and thus presents an opportunity for corruption.

In contrast, an emission tax is a price instrument because it fixes the price while the emission level is allowed to vary according to economic activities. A (major) drawback of an emission tax is that the environmental outcome (e.g. a limit on the amount of emissions) is not guaranteed. On one hand, a tax will remove capital from the industry, suppressing possibly useful economic activity, but conversely, the polluter will not need to hedge as much against future uncertainty since the amount of tax will track with profits. An advantage is that, given a uniform tax rate and a volatile market, the taxing entity will not be in a position to pick "winners and losers" and the opportunity for corruption will be less.

Assuming no corruption and assuming that the controlling agency and the industry are equally efficient at adapting to volatile market conditions, the best choice depends on the sensitivity of the costs of emission reduction, compared to the sensitivity of the benefits (i.e., climate damages avoided by a reduction) when the level of emission control is varied.

Because there is high uncertainty in the compliance costs of firms, some argue that the optimum choice is the price mechanism. However, the burden of uncertainty cannot be eliminated and in this case it is shifted to the taxing agency itself.

The third option, known as a safety valve, is a hybrid of the price and quantity instruments. The system is essentially an emission cap and permit trading system but the maximum (or minimum) permit price is capped. Emitters have the choice of either obtaining permits in the marketplace or

purchasing them from the government at a specified trigger price (which could be adjusted over time). The system is sometimes recommended as a way of overcoming the fundamental disadvantages of both systems by giving governments the flexibility to adjust the system as new information comes to light. It can be shown that by setting the trigger price high enough, or the number of permits low enough, the safety valve can be used to mimic either a pure quantity or pure price mechanism.

Furthermore CO₂emissions abatement can be seen, also, as a problem of social coordination. The complexity and costliness of this coordination problem puts high demands on the coordinating mechanism and the institutions set up to implement it.

In the light of this, the different types of coordination mechanisms, or modes of governance, that characterize emission trading system must be analyzed.

To simplify, the problem of climate policy is basically to coordinate the actions of an high number of actors – corporations, households, public agencies – so as to achieve abatement while simultaneously minimizing costs and managing the broad array of political concerns. The potential adversity between these considerations adds to the complexity, as do the fact that the sources of these emissions are highly dispersed throughout society.

A generalized approach to the management of such problems is to address them as problems of social coordination or governance.

The generic modes of governance are mainly two: hierarchy and market.

Hierarchy is characterized by centrality and vertical power distribution. Decisions are made in the centre, communicated in the form of rules and directives, and implemented through a vertical chain of command. Formalized procedures and specialized organizational structures are hallmarks of this form of co-ordination.

The market is a mode of governance characterized by decentralization and self-regulation. The price is the mechanism of self-regulation and the sole means of communication between the (autonomous) actors. Prices will be set so as to balance supply and demand, and suppliers and demanders will adjust their behavior accordingly. In the ideal type market, no single supplier or demander is able to affect prices.

The increasing complexity and fragmentation of modern-day societies, marked by complex patterns of interdependence and widespread diffusion of power and resources, decreases the coordinating capacity of the public sector. A growing body of literature points rather to empirical evidence indicating that policy is developed and implemented through broad processes in society, blurring the boundaries between

state and society. This mode of governance refers to network governance.

Network governance has been defined as “self-organizing, inter-organizational networks characterized by interdependence, resource exchange, rules of the game and significant autonomy” (Rhodes, 1997). Key characteristics of network governance include informality, self-regulation, non-hierarchical relationships between the participants and a blurring of the distinction between different spheres of society, notably that between the public and the private sector.

“Informality” is a strategy to counter the cumbersome and time-consuming tendencies of coordination through formal institutions.

“Self-regulation” denotes the need for flexible coordination determined by the actors involved, and the absence of a centrist organizing authority. Because network governance is a form of voluntary cooperation between operationally autonomous but mutually interdependent actors, the relationship between the participants is basically non-hierarchical.

The subsequent figure 18 highlight the relationship between the different form of emission reduction mechanism previously analyzed and the different potential mode of governance such as market, network and hierarchy.

Emissions reduction mechanism	Quantity			
	Safety valve			
	Price			
		Market	Network	Hierarchy
		Mode of governance		

Figure 18 Relationship between different emissions reduction mechanism and mode of governance

The matrix shows the existing correlation between the abatement policies and the governance of the process.

Actually, there is a strong relation between market mode of governance and quantity approach in reducing emission. Instead, price approach to emission reduction it seems more consistent to hierarchical form of governance. Network governance seems to be more consistent to safety valve approach.

Starting from the previous remarks in the next paragraph the mainstream and the critical aspects of introducing a cap and trade mechanism will be analyzed.

3.1.2. Mainstream and critical aspects of introducing emission trading program

Nature of the pollutant plays a very important role when policy-makers decide which framework should be used to control pollution.

CO2 acts globally, thus its impact on the environment is generally similar wherever in the globe it is released. So the location of the originator of the emissions does not really matter from an environmental standpoint.

The policy framework should be different for regional pollutants (e.g. SO2 and NOX, and also mercury) because the impact exerted by these pollutants may not be the same in all locations. The same amount of a regional pollutant can exert a very high impact in some locations and a low impact in other locations, so it does actually matter where the pollutant is released.

In a cap and trade program, sources are allocated a fixed number of allowances. Each allowance represents an authorization to emit a specific quantity of a pollutant. The number of allowances is capped in order to reduce emissions to the desired level, and sources are required to meet stringent, comprehensive emission monitoring requirements. At the end of the compliance period, emission sources must hold sufficient allowances to cover their emissions during the period. Sources that do not have a sufficient number of allowances to cover emissions must purchase allowances from sources that have excess allowances from reducing emissions.

Cap and trade programs have been applied to large electric power and industrial emissions sources. Examples of cap and trade programs include: the Acid Rain SO2 Program; the Ozone Transport Commission NOx Budget Trading Program and the NOx SIP call; as well as proposed legislation and regulations for additional emission reductions in the power sector.

Actually, different form of trading exist in addition to C&T mechanism for example: project-based program and rate-based program.

In a project-based program, also referred to as a credit or offset program, sources earn credit for projects that reduce emissions more than is required by a pre-existing conventional regulation or other benchmark. These credits can then be traded to other facilities where they can be used for compliance with a conventional regulatory requirement. The decision to generate these credits is usually voluntary; however, credits must be certified through some sort of administrative process.

Credit programs impart flexibility to existing programs but do not require reductions.

In rate-based or averaging programs, the regulatory authority sets a constant or declining emission rate performance standard (e.g. tons of emissions per megawatt hour). Emission sources with average emission rates below

the performance standard earn credits that they can sell to other emission sources. Sources with emission rates above the standard must obtain credits to cover the excess. Rate-based programs can lower emissions, but emissions can subsequently grow if activity grows.

These programs are most easily applied in a specific sector where facilities have similar emissions characteristics (such as refineries, mobile sources and power plants).

For all types of emissions trading, the basic concept is similar. Trading provides companies with the incentive to develop cost effective emission reduction strategies. Companies may elect to control emissions more than required and sell surplus allowances or credits to other facilities that may face more expensive options to reduce emissions. All three types of trading can include provisions to allow companies to save extra allowances or credits for use in future years (banking).

Each of the three forms of emission trading is appropriate in certain situations.

When achieving and maintaining an absolute emission goal is important, a cap and trade program provides more certainty about total emissions from a defined set of sources. Administrative and transaction costs for cap and trade programs often are lower than for project-based trading.

Project-based trading is burdened by higher uncertainty and risk and the need for extensive regulating authority involvement due to the need to assess individual projects.

Offset trading programs have historically evolved from introducing limited flexibility in traditional command-and-control programs. Because offset programs usually do not require net emission reductions, they are not effective as stand-alone programs. However, a well designed program may complement a command-and-control program that establishes emission or concentration limits. It also may complement a cap and trade program in sectors for which accurate emission measurement of regulated sources or activities may not be developed as well.

	Potential to Limit Total Emissions	Cost Minimization	Administrative & Transaction Costs
Cap and Trade	High	Yes	Low
Project-based Trading	Low to Medium	Yes	High
Rate-based Trading	Medium	Yes	Low to Medium

Source: "Tools of the Trade: A Guide to Designing and Operating a Cap and Trade Program for Pollution Control," June 2003 EPA 430-B-03-002

TABLE3-Comparison between different form of trading program

Rate-based trading can be an effective way to promote efficiency if circumstances do not require an absolute cap on emissions. The administrative and transaction costs for rate-based trading programs are likely to be similar to those for cap and trade.

All three types of emission trading programs are meant to work in conjunction with existing regulations.

In synthesis, in figure 19 have been underlined the relationship between the different trading type (i.e. C&T, project-based and rate-based) and the diverse potential mode of governance.

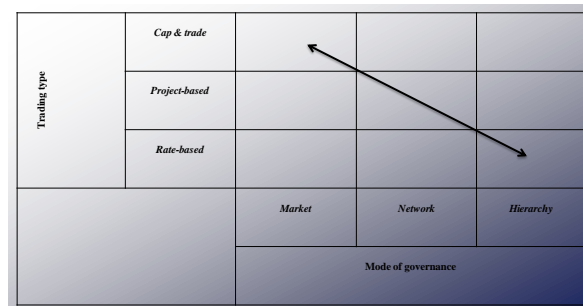


Figure 19 Relationship between different trading program and-mode of governance

Specifically, the matrix shows the existing correlation between the trading type and the mode of governance.

It seems to be a strong relation between market mode of governance and C&T mechanism. Rate-based, instead, it seems more consistent to hierarchical form of governance. Network governance seems to be more consistent to project-based approach.

3.1.3 Remarks concerning the development of a cap and trade program in Algeria and Tunisia

In order to implement a cap and trade program, policymakers need to analyze various design problems. Key decisions include the definition of a legal authority, the determination of which sources to include in the program, the definition of the level of the emission reduction and the timing when reductions will be required.

In addition to that it is important to determine requirements for measuring and reporting emissions, methods of distributing allowances, rules governing allowance use, compliance and enforcement provisions and in conclusion mechanism of integration with other existing policies.

According to EPA (Environmental Protection Agency - USA) in implementing a cap and trade program some principles can guide policymakers.

In particular these principles are:

- (1) simplicity;
- (2) accountability,
- (3) transparency;
- (4) predictability and consistency.

Simplicity is an important goal when designing an effective cap and trade program, if the rules are not overly complex operations function better. It is important that the rules are simple and easily understood by all participants. Generally, the principle of simplicity can be applied to all the different steps of a cap and trade program design.

Concerning accountability the program must create a framework that will hold participants accountable for their emissions and ensure compliance with the program's requirements. In this sense, accountability means accurate measurement and verification of emissions and rigorous and consistent enforcement of penalties for noncompliance.

Transparency refers to the disclosure of relevant decisions about the program. Transparency can stimulate public and private acceptance and confidence in the plan. Information transparency provides a higher level of analysis to verify enforcement and encourage compliance.

Predictability and consistency in the design of the program rules can produce the right circumstances to encourage innovation and lower costs. This encouragement depends upon predictable and consistent regulations – also if in a dynamic point of view - that affect the economic value of emission reductions.

Legal Authority and emission inventory

As introduced earlier, to establish a legal authority is a cornerstone for each cap and trade implementation program.

Normally, the regulating authority must have power to limit the total quantity of pollution from the relevant sectors by establishing a cap on emissions, to define implementation dates, to outline sources covered, to distribute tradable allowances, etc.

Policymakers should explicitly state which regulating authority is responsible for developing and enforcing trading procedures for conducting allowance transfers, emission monitoring and reporting. Further, cap and trade programs must include provisions that authorize the regulating authority to reconcile the emissions of each source with the number of allowances they hold to determine compliance and to establish and enforce penalties for non-compliance.

Legislation to provide legal authority can range from a few broad sentences to many detailed pages. The legislation may provide only general language authorizing the use of emission trading or it may explicitly state the rules and guidelines for a cap and trade program.

According to the previous remarks an important step in the development process for a cap and trade program is the creation of an adequate source-level emission inventory.

The emission inventory is a useful tool for instance in analyzing and making decisions about program applicability and allowance allocations.

For cap and trade programs that require emission sources to hold allowances, sources can be inventoried at five different levels of detail:

- (5) the company level;
- (6) the plant level;
- (7) the point/stack level;
- (8) the process/segment level;
- (9) the unit level.

3.1.4 Program Design Elements

Applicability

In introducing a cap and trade approach policymakers must determine which emission sources to include in the program. All sources, sectors and emissions would be included for full coverage and maximum environmental effectiveness and economic efficiency but because of measurement capabilities and costs, political issues and other considerations it is useful limit participation to a subset of emission sources.

Sources that participate in a cap and trade program must have the ability to account for their emissions accurately and consistently. Alternatively, a regulating authority may involve independent parties to measure and report emissions. It is important to avoid overly complex applicability criteria. The regulating authority should give careful consideration to the economic competitiveness of businesses and the effect on markets that could result from including or excluding certain industries from a trading system.

Closely related to the preceding questions is the matter of where there is an obligation to hold allowances: direct emitters, potential emitters, hybrid.

Setting the Level of the Cap

Setting the level of the emission cap is one of the most important decisions for policymakers and the regulating authority. In theory, the most economically efficient level for the emission cap is where marginal abatement costs are equal to marginal benefits from the reduced emissions.

However, this level is often difficult to determine due to uncertain information. More generally, the cap should be set at a level that is expected to address the environmental and health problems of concern at an acceptable cost.

In practice, policymakers will determine the cap by considering a combination of science, economics, and political feasibility. One approach that policymakers sometimes use to determine the aggregate emission cap is

finding the “knee in the cost curve” (EPA, 2003). Policymakers may also want to ensure that costs are within an acceptable range. To estimate costs and benefits, policymakers may use economic modeling to depict optimal control decisions.

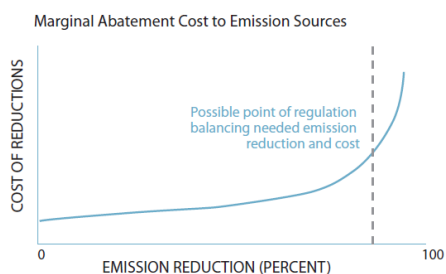


Figure 20 Curve of marginal abatement cost to emission sources

Policymakers may establish a cap that declines over time to ultimately achieve the environmental goal. For predictability, it is important that policymakers or the regulating authority define the decline in allowances in advance to provide sources sufficient time to adjust to new cap levels.

The level of the cap will also depend on applicability decisions about which sources and sectors to include in the program. In the case where policymakers establish a national emission goal and develop a cap and trade program in conjunction with other regulatory tools, they must determine what portion of the goal should come from sources in the cap and trade program (the cap) and what portion from other sectors and sources. Ideally, a cap and trade program should include as many sectors as possible to maximize the cost savings from trading between sources with different marginal abatement costs.

Length of Compliance Period

The length of the compliance period should be linked to the environmental problem and reflect operational considerations. If the environmental problem is continuous and long-term the compliance periods should be continuous, covering all months of the year. If the problem is seasonal the compliance period may be seasonal.

The decision of whether to assess compliance quarterly, annually, or less frequently should also take into account the administrative burden imposed. A short compliance period puts a larger administrative burden on both the regulating authority and emission sources but allows for swifter action to correct a case of noncompliance. A longer compliance period allows more flexibility for the sources to achieve compliance and reduces the administrative burden for the regulating authority. By lengthening the period between compliance assessments, however, cases of noncompliance can persist for longer periods of time, possibly increasing the difficulty of correcting those problems. Most cap and trade programs determine compliance on an annual basis.

Emissions measurement

One of the most important features of a cap and trade program is that sources measure total mass emissions (as opposed to emission rate or concentration) as accurately and consistently as possible. Because the emission measurements are the “gold standard” underlying the traded allowances, it is important that a ton of emissions at one source is equal to a ton of emissions at any other source. This creates a level playing field for participants in the program and a strong foundation upon which a market can operate.

The emissions monitoring priorities for a cap and trade program differ from other types of environmental regulations. In considering potential emission measurement regimes for a cap and trade program, the following monitoring objectives may be useful as a guide.

The regulating authority should create clear and consistent protocols for sources to determine emissions. This means employment of standard procedures and the use of sound engineering practices. For a cap and trade program, accurate measurement is more important than consistency over time. Policymakers should consider enhancements to measurement methods or using different methods if better approaches are available and practical. The monitoring program can also be designed to include performance standards that reward sources that achieve better accuracy than required. For example, for less accurate approaches, sources should use more conservative estimation methods that are not biased toward underestimating emissions. Ultimately, it is most important to avoid systematic underestimation of emissions.

Allowance Distribution

The distribution of allowances may be one of the most difficult issues for policymakers when developing a cap and trade program. Cap and trade programs create a valuable asset for those who own or control the authorizations to emit. If emission sources receive allowances through a no-cost allocation, they capture the gains from these valuable assets. Under an auction, the government captures the value of these assets in the form of increased revenues. Some analysts have argued that the revenues from allowance auctions can have economy-wide efficiency or equity benefits if they are distributed in certain ways.

The first major step in the allowance distribution process is to decide whether the allowances will be allocated at no cost to the emission sources (usually based on some form of operating data), sold by the regulating authority through an auction or a direct sale, or distributed by some combination of these systems. To date, existing cap and trade programs have allocated allowances at no cost to sources.

Policymakers or the regulating authority must create rules governing the use and trading of allowances.

Accounting for allowances works like a banking system. Each affected emission source should have an allowance account for holding their allowances. Transfers of allowances between these accounts should be made as simple as possible, with few limits or restrictions to impede the market. There are, however, two possible categories of restrictions on allowance trades that may be considered — temporal and spatial.

Each source that is responsible for compliance should have an allowance account. These accounts are the official records for allowance allocations, holdings, and transfers and can be used to track compliance. Initial allocations (or initial winning bids in an auction) provide the beginning balance for the allowance accounts.

Policymakers might also consider whether the program will allow other interested parties to have allowance accounts and hold allowances. These non-source accounts provide the vehicle through which organizations, such as brokers or environmental groups, can hold and trade allowances. Brokers, investors, and other market makers may play a crucial role in facilitating allowance trades.

Allowances can be serialized to facilitate tracking the allowance from creation to use for compliance. There are a number of benefits to identifying allowances by serial number. Although tracking serial numbers increases the administrative burden to both regulators and industry, it provides additional transparency and protection against accounting discrepancies. The use of serial numbers could also facilitate record keeping so allowance holders can track the different costs incurred in acquiring allowances. This may be necessary for tax purposes. Finally, the inclusion of serial numbers in the allowance tracking system provides the opportunity to analyze trading patterns and the movement of allowances over time. This may be useful for assessing the impacts of the trading program.

Compliance Determination

The compliance determination process for a cap and trade program should be simple and straightforward. Prior to implementation, the rules should clearly specify the deadlines for reporting and for holding sufficient allowances to cover emissions.

At the end of the compliance period, the emission sources should be given enough time to verify emission data for the period and to submit them for compliance. This verification period should not be so short as to cause the emission sources to submit data that has not been properly quality assured, but not so long as to unreasonably delay compliance assessment. It should also allow enough time for the regulating authority, once it receives the data, to finish

conducting the compliance determination well before the end of the subsequent compliance period, when the process will begin again. At the end of each compliance period and during the time when sources are assuring the quality of their emission data, the rules should provide for a short grace period (e.g., 60 days) so that sources can make final allowance trades. This will allow sources to assure that their account has allowances equal to or greater than their emissions. The regulating authority should specify an allowance transfer deadline in advance.

It may be advisable to freeze allowance transfers into or out of accounts after the transfer deadline until the regulating authority completes the compliance determination and deducts allowances for compliance.

Enforcement

According to this proposal as a legal authority could be functional to identify an institution like the Tunisian “National Agency for Energy Conservation (ANME)” or similar for the other countries of the region. The ANME is a non administrative public entity belonging under the authority of the Ministry of Industry, Energy and Small and Medium Enterprises. The mission of ANME consists in implementing the State policy in the field of energy conservation and this based on rational energy use, the promotion of renewable energies, as well as energy substitution.

In order to support the competitiveness of the economy of the area and to reduce its vulnerability to world energy market shocks and reduce the budgetary burden of energy subsidies, critical issues at a time of financial and economic crisis, by seeking a reduction of the energy intensity of the regional economy electricity and gas industry have been identified as target sources.

Through a mechanism of continuous emissions measurement at plant level in the recognized industry according to international standards the program will try to get gradually a 20% reduction of CO₂ emissions in a period fixed according to international standards.

The authority in order to distribute allowance according to the general approach of a cap and trade mechanism will use an auction mechanism for stimulating economy-wide efficiency and equity benefits.

Compliance determination will allow sources to assure that their account has allowances equal to or greater than their emissions. The regulating authority should specify an allowance transfer deadline in advance. A system of financial penalties will sustain the process of achievement of the general goal.

Finally, with regard to integration different forms of emission trading, the regulating authority must decides to establish

specific program for distinct sectors. If desired, allowances from a cap and trade program could, in theory, be fully interchangeable with offsets from project-based mechanisms or credits from a rate-based program. In the case of Tunisia particular attention will assume project such as clean development mechanism.

Focusing on Algeria and Tunisia context, more appropriate considerations are needed.

In fact, some “market skeptic” assert that developing countries are not prepared for cap and trade implementation. Often to support this thesis they cite three primary concerns:

Integration with other policies

There are a number of ways in which policymakers can integrate cap and trade programs with other approaches for environmental policy.

For example, command-and-control approaches can be compatible with cap and trade, but policymakers should identify the relationships between the different policies and ensure there are no contradictions or duplications. With command-and-control, the regulating authority specifies sector-wide technology and/or performance standards that each of the affected sources must meet, whereas cap and trade provides sources with the flexibility to choose the technologies that minimize their costs.

Depending on the type of pollutant that is being regulated by cap and trade, integration with command-and-control approaches can aid in the prevention of hotspots that may result from the use of allowances. For example, additional reductions through a cap and trade program could be layered on top of existing requirements.

Finally, with regard to integrating alternative forms of emission trading, if the regulating authority decides to establish more than one type of emission trading program, each should affect distinct sectors. If desired, allowances from a cap and trade program could, in theory, be fully interchangeable with offsets from project-based mechanisms or credits from a rate-based program. However, the regulating authority must ensure that project-based mechanisms do not undermine the environmental integrity of the cap. Stringent oversight, verification, and conservative crediting methodologies need to be established to account for uncertainties and to avoid the creation of “anyway” tons, paper credits, leakage, or double counting.

The design framework as a general approach

In the figure below a scheme regarding an adaptation of the general approach recommended by EPA for cap & trade design framework.

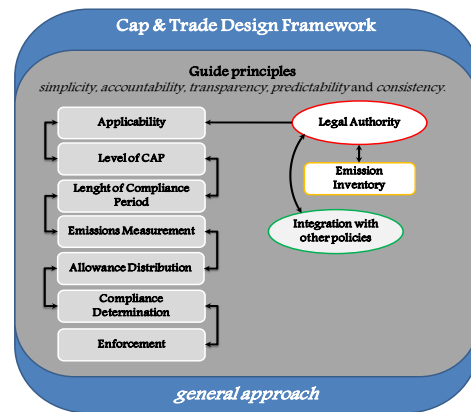


Figure 21 Cap & trade design framework (general approach)

Cap and trade design framework: a proposal for Northern Africa

In the light of the previous remarks in this paragraph one introduces a possible scheme of application of a cap and trade program in North Africa.

The Figure 22 shows the principal choices concerning the implementation of a cap and trade system in the analyzed context regarding:

- legal Authority and emission inventory;
- program design elements (applicability, level of the cap, length of compliance period, emissions measurement, allowance distribution, compliance determination, enforcement);
- integration with other policies.

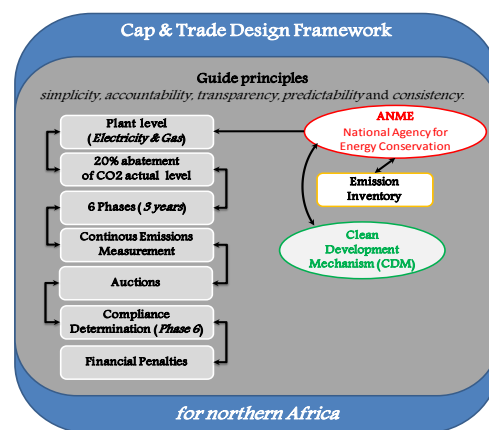


Figure 22 Cap & trade design framework for northern Africa

According to this proposal as a legal authority could be functional to identify an institution like the Tunisian “National Agency for Energy Conservation (ANME)” or similar for the other countries of the region. The ANME is a non administrative public entity belonging under the authority of the Ministry of Industry, Energy and Small and Medium Enterprises. The mission of ANME consists in

implementing the State policy in the field of energy conservation and this based on rational energy use, the promotion of renewable energies, as well as energy substitution.

In order to support the competitiveness of the economy of the area and to reduce its vulnerability to world energy market shocks and reduce the budgetary burden of energy subsidies, critical issues at a time of financial and economic crisis, by seeking a reduction of the energy intensity of the regional economy electricity and gas industry have been identified as target sources.

Through a mechanism of continuous emissions measurement at plant level in the recognized industry according to international standards the program will try to get gradually a 20% reduction of CO₂ emissions in a period fixed according to international standards.

The authority in order to distribute allowance according to the general approach of a cap and trade mechanism will use an auction mechanism for stimulating economy-wide efficiency and equity benefits.

Compliance determination will allow sources to assure that their account has allowances equal to or greater than their emissions. The regulating authority should specify an allowance transfer deadline in advance. A system of financial penalties will sustain the process of achievement of the general goal.

Finally, with regard to integration different forms of emission trading, the regulating authority must decide to establish specific program for distinct sectors. If desired, allowances from a cap and trade program could, in theory, be fully interchangeable with offsets from project-based mechanisms or credits from a rate-based program. In the case of Tunisia particular attention will assume project such as clean development mechanism.

Focusing on Algeria and Tunisia context, more appropriate considerations are needed.

In fact, some "market skeptic" assert that developing countries are not prepared for cap and trade implementation. Often to support this thesis they cite three primary concerns:

- accurate emission measurement is too difficult and too expensive;
- developing countries lack the expertise to implement and enforce cap and trade programs;
- developing countries lack fully developed markets.

Accurate measurement and consistent, credible enforcement are the foundation of an effective cap and trade program.

Emission measurement is critical because it ensures the environmental integrity of the emission cap. Ultimately, the number of allowances an emission source must surrender to the regulator for compliance is determined by measured emissions.

Moreover, since compliance costs are linked directly to total emissions, sources have an incentive to underestimate their own emissions. Accurate emission measurement is therefore the backbone of a cap and trade program and ensuring that emission measurement is accurate is the fundamental government role in these programs.

Much of the skepticism about developing countries' ability to measure emissions focuses on the expense and technical challenges of using continuous emission monitors (CEMs) to measure emissions. Although CEMs may be the most accurate measurement method in many circumstances and may be necessary if a source utilizes post-combustion controls, different pollutants may permit alternative measurement methods.

Emissions that are based on fuel composition can often be estimated using engineering calculations. In addition, to reduce opportunities for false reporting and improve verifiability, the regulator can collect supplemental information (e.g., fuel purchases, product output) and use this information to verify fuel consumption and compare emission intensity over time to look for unexpected values.

Whatever measurement approach is used, policymakers, program participants, and other interested stakeholders must perceive the approach as fair and accurate (Drayton, 1978). Developing a complete, accurate accounting of total mass emissions provides additional benefits beyond the enforcement of cap and trade programs. An emission inventory can help regulators determine the effectiveness of an environmental policy, improve air quality modeling efforts, and set more appropriate emission targets for applicable sources.

Further the environmental departments in developing countries are often understaffed, underfinanced and lack public support. As a result, many environmental policies in developing countries have failed. Regardless of the type of policy chosen, these constraints will affect a policy's effectiveness. Given these constraints and history of limited success, some analysts argue that institutions are insufficient for all but the most simple command-and-control programs. However, many of the requirements for cap and trade programs are the same as those required for command and control. Each type of program requires regulators to promulgate rules, allocate the emission reduction burden to sources, determine the requirements to place on sources, and enforce compliance.

More specifically, an emission trading program, like any other environmental program, requires certain capabilities of

the governing institution and the regulated community in order to achieve environmental success.

Although many elements are similar, it is useful to examine how expertise and institutions differ for cap and trade and conventional programs. Cap and trade programs focus most staff resources on measurement, reporting and auditing of source specific mass emission data. The key to a cap and trade program is that emission measurements be as accurate and complete as possible and measurement methodologies be as consistent as possible.

Some market skeptics argue that a technology requirement is the appropriate first step towards regulation for developing countries. Putting aside the cost of requiring standardized technology on all facilities, there are several problems with this argument. First, ensuring that control technology is properly installed is not a simple task for government officials. Power plants and industrial facilities often have significantly different configurations, and ensuring proper installation requires substantial engineering expertise. In addition, ensuring that control technology is turned on and is operating properly requires some form of periodic monitoring.

Second, the standard way that governments around the world enforce technology requirements is through a detailed permitting process. In most cases, sources submit detailed permit applications describing plant configurations, the proposed technology and its specifications, expected emissions and levels of operation, proposed expenditures, and other information. Government officials review this information for each facility and issue a detailed, legally enforceable permit.

Thus, for some types of sources, implementing cap and trade programs can be simpler than command and control. Focusing on measurement and tracking of emission data rather than on detailed, facility specific technology or compliance plans is arguably a more straightforward role for government officials because it removes them from facility specific decisions and focuses them on measuring results.

Measurement expertise may be applicable to a wider variety of facilities than the detailed, facility specific knowledge required to review permits. Similarly, fine tuning measurement techniques to different plants usually requires less adjustment and variation than adapting control technologies to different plant configurations.

Moreover, as noted above, conventional regulatory approaches still need some form of emission measurement, particularly if there are post combustion controls.

Finally, another administrative advantage of cap and trade is that it provides little discretion for the regulator when determining whether a source is in compliance.

In addition, critics of market-based approaches argue that operations managers at emission sources do not have sufficient understanding of how markets work and that developing countries do not have developed market institutions. It is true that for the trading part of a cap and trade program to work, a country must have some of the same institutions and incentives in place that are required for other types of markets. These include a developed system of private contracts and property rights, a private sector that makes business decisions based on the desire to lower costs and raise profits, and a government culture that will allow private businesses to make decisions with a minimum of intervention. The regulated community must have confidence that allowances, if not explicitly provided as a property right, will function similarly to property rights and not be confiscated by the government without warning or reason.

Focusing on the adequacy of a country's market institutions as the primary criterion for whether cap and trade is appropriate assumes the primary goal of a cap and trade program is trading. From an environmental perspective, it is the cap and its associated institutions (measurement, enforcement, data systems, etc.) that represent the most important components of cap and trade programs. Thus, even in developing countries where laws, institutions, and practices associated with market economies are not fully developed it may still be valuable to experiment with cap and trade. These countries may experience a transitional phase for cap and trade where there is initially very little trading. Even in the absence of trading, the flexibility for sources to develop compliance strategies that account for their circumstances and the limit on total emissions provided by cap and trade can form the foundation of a credible, more efficient environmental program.

However, even with high transaction costs and other market constraints, cap and trade can be more environmentally and cost effective than command and control. In some developing countries, the government may provide some market services to reduce transaction costs.

In the long run, cap and trade may also address a chronic problem in developing countries – access to capital. Many environmental programs in developing countries fail because industries do not have access to capital or equipment necessary to reduce emissions. Without access, industries cannot reduce emissions and the government must decide whether to allow the source to operate in non-compliance, provide the source with financial grants or loans, or shut down the source. With emission trading, industries can use revenues from allowance sales as collateral to finance technologies or process changes. It may, however, require experience before financial institutions are comfortable

granting loans for environmental projects on the basis of allowance revenues.

Market skeptics considerations seem to emphasize a particular criticism in the process of introduction of a trading mechanism such as C&T in a development country, but at the same contrasting consideration suggest that it is not impossible to implement it.

In other words, an ad hoc approach - encompassing advantage and disadvantages existing in these countries related to the specific theme in analysis – should be developed in order to introduce a C&T system.

3.2 Simulation of possible scenario for the implementation of adapt mechanism

Energy efficiency is an important part of the environmental and climate change policies and permits to reach the aims of improved security of energy supply, energetic and economic efficiency and to increase competitiveness together with job creation and better consumers welfare.

Moreover, energy efficiency is also one of the quickest, most realistic and cost-efficient way to cut greenhouse gases emissions in atmosphere.

In these years, the use of market mechanisms to reach precise environmental objectives is really growing, with the most important example to use of emissions trading schemes to control greenhouse gases emissions (e.g. Emission Trading – ET; Clean Development Mechanism – CDM; Joint Implementation – JI).

Trading mechanisms for energy efficiency, as for example the White Certificates Schemes, are now in place in many countries with very interesting results (see different experiences in Europe).

For this reasons, ECATS project, within the development of a Cap and Trade system inconsidered contexts (Tunisia and Algeria), has supported the possible technical implementation of tradable White Certificates schemes covering energy savings and energy efficiency to design an institutional framework.

In order to promote the introduction of White Certificates schemes in these Countries, recommendations in this Plan Action are made considering the peculiarities of the contexts and the possible interactions of white certificates with other existing and designed tradable certificates and with other policy tools for sustainable energy.

The ECATS project implied a critical assessment of the experiences in the energy sector in Tunisia and Algeria and explored the practical implementation of a White

Certificates schemes by developing measurement and verification methodologies and individualizing possible stakeholders.

The ECATS project is supported by Renewable Energy & Energy Efficiency Partnership (REEEP). The kick-off meeting was in September 2009 and the project finished in October 2010.

3.2.1 Energy Sector in Tunisia and Algeria

In order to investigate the possible implementation of White Certificates schemes, it's undoubtedly important to focus the main characteristics of energy sectors in examined contexts.

In Tunisia, the consumption of primary energy is assessed at about 8.5 Mtoe, covered prevalently by oil products and natural gas with values near to 90%.

Biomass is essentially used to cook bread and food in rural areas, while renewable energies are still relatively developed and need of significant investments.

Since the end of the 1960s, Tunisia has benefited from relatively secure energy balance surplus, but the 1980s saw the advent of the era of energy dependency, so in 1994 for the first time, Tunisia recorded a deficit in its energy balance.

In Figure 23 is reported the Energetic Balance for the last years (2006/2009).

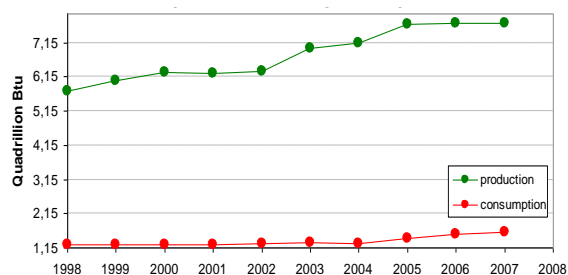


Figure 23- Tunisia Energetic Balance 2006/2009 (MToe)

Although a Party to the Kyoto Protocol, Tunisia has no commitment to reduce greenhouse gases emissions. On the other hand, over the last ten years, the national choices in energy (rational use of energy, development of natural gas consumption) and development (emphasis placed on low-energy intensive industries and a service-focused economy) have led to the decoupling of air pollutant emissions and to get energetic efficiency aims.

So, for these reasons, Tunisia represents a interesting context for the implementation of energy efficiency policies as White certificate mechanism.

About Algeria, we can see that hydrocarbons govern its economy, making available about 60 percent of government

revenue, 30 percent of Gross Domestic Product (GDP) and 95 percent of exports.

For these reasons, Algeria is an important exporter of oil and natural gas and is a member of the Organization of the Petroleum Exporting Countries (OPEC).

Algeria was the fourth largest crude oil producer in Africa after Nigeria, Angola and Libya and the largest total oil liquids producer on the continent.

Domestic oil consumption accounted only for about 13 percent of total production. In 2007 Algeria was the sixth largest natural gas producer in the world after Russia, the United States, Canada, Iran, and Norway. In the same year, Algeria produced about 3.03 trillion cubic feet of natural gas, of which 70 percent was exported and 30 percent was consumed domestically. In Figure 24 is reported the Algeria Total Primary Energy Balance for the period 1998/2008.

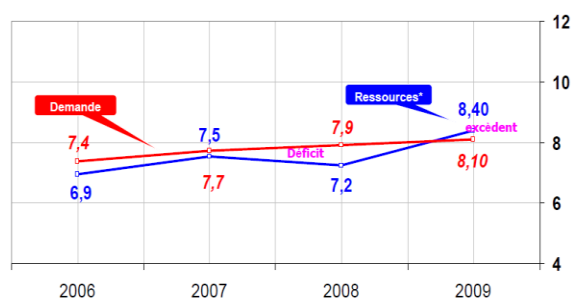


Figure 24- Algeria Total Primary Energy Balance 1998/2008

According to Oil and Gas Journal (OGJ), Algeria contained an estimated 12.2 billion barrels of proven oil reserves as of January 2009, the third largest in Africa (behind Libya and Nigeria). For these reasons, Algeria in a different way by Tunisia, could be a context less more difficult for the implementation of energy efficiency policies as White certificate mechanism.

The basics of a White Certificates mechanism

A White Certificates mechanism is a hybrid instrument making on the one hand utilization of energy saving obligations, and on the other hand allowing flexibility to get the goals providing for some trading provisions.

As a hybrid instrument it utilizes several procedures of action: coercion on the one hand and freedom of strategy choice on the other hand.

White Certificates mechanism are relatively new instruments in the energy policy framework. They represent an illustration of the steady movement towards implementation of market-based instruments and the gradual progress from supply-side towards demand-side policy measures.

The certificate systems are not a policy tool in itself, but represent a mechanism to reach the targets specified in the more possible cost-efficient way.

A White Certificate is a specific amount of energy saving that has been realized or will be realized in a specific time. Certificates can be produced from investments in energy savings projects beyond business as usual.

The market actors receive certificates for savings realized, which can be utilized for own target compliance or eventually can be sold to obliged actors.

Market actors (usually energy suppliers or distributors) are forced to achieve a determinate quantity of energy saving.

Target compliance imposes submission of a definite amount of certificates that show the amount of obligatory energy savings to be achieved, so White Certificates are used for compliance.

In order to design a White Certificates scheme for considered contexts, policymakers can draw lessons from the experiences and design characteristics of existing schemes in the EU and other countries.

These experiences were analyzed carefully in other ECATS documents.

It's patent that the eventual choice and mode of implementation of such systems in these context is responsibility only of the Governmental Public Boards of these Countries; aim of this Plan Action is only suggest the steps to implement it, drawing attention to eventual criticalities.

As a starting point, a White Certificates scheme in its design phase consists of the following fundamentals upon which decisions are taken:

- Targets definition;
- Obligated parties;
- Counting rules;
- Eligible projects;
- Costs;
- Governance definition;
- Trading rules;
- Penalty;
- Correlations to other policy instruments.

The problems that need to be answered from policymakers during this phase are reported in Table 4.

Targets definition	What should be White Certificates scheme targets? What is the specific timeframe?
Obligated parties	Which market actors should assume the obligation? Producers? Distributors (e.g. in Italy, distributors over a threshold)? Energy/fuel suppliers? Consumers? Are there other eligible actors? Does the scheme improve competition or does it lead to market concentration?
Counting rules	Which projects are eligible for certification? All end-use sectors? Sales or end use counts for target? Are there verification modes?
Eligible projects	Are all or specific technologies allowed? Does the scheme support innovation or advantages existing technology diffusion?
Costs	White Certificates costs? Transaction costs? Administrative costs? Do costs reflect energy efficiency costs?
Governance definition	Which subject is responsible for which procedures? Which subject undertakes the costs? Are there possible conflicts between procedures?
Trading rules	Is trading prerequisite for the scheme? How can the scheme enhance trading?
Penalty	What is the optimal level of penalty? Is the penalty relevant to sales or not covered target?
Correlations to other policy instruments	Complementarities and overlaps with other instruments?

Table 4- Issues in White Certificates scheme design

For these reasons, the design of any White Certificate scheme is not a trouble-free mission. The choices, made on a large number of design elements, will strongly condition the outcome of the system.

So, White Certificates schemes can be really complex in terms of definition, implementation and operation.

Instead, the possible key benefits of a such system are:

- Introduction of tradability should aim at least-cost realization of targets;
- The system could unlock energy saving potentials and actors that are currently not unlocked by other energetic policy tools;
- Can stimulate the market for ESCOs;
- Penalties guarantee achievement of the fixed target;
- Employment opportunities, pollution reduction, reduced external fuel dependency for Countries, technical innovation, etc.;
- Saving public money (compared to others systems of subsidies).

3.2.2 A possible White Certificates scheme involving Tunisia and Algeria

For the considered contexts it's possible to preview a model that is a mix between a Market Based Approach and hierarchic "Command and Control" policies.

When defining the White Certificate system the following steps have to be considered carefully:

1. Designate an independent organization that is responsible for issuing of White Certificates;
2. Present a clear definition of the White Certificate in terms of resource eligibility, size, rules, validity, the obligated parties and the energy using sectors covered, etc;
3. Organize a registration system where each White Certificate and each trade is attentively registered;
4. Organize independent monitoring and verification systems;
5. Formulate clear rules on compliance and in case of a mandatory system set automatic non-compliance penalties.

The main tasks of Public Board and Regulator in the definition of WCS are reported in Table 5.

Model of Governance
Public Board (e.g. Governmental):
<input type="checkbox"/> Set energy saving national targets;
<input type="checkbox"/> Establish obligation-bound actors;
<input type="checkbox"/> Allocation of the global targets on obligation-bound actors;
<input type="checkbox"/> Establish eligible energy saving projects;
<input type="checkbox"/> Set measurement and verification rules;
<input type="checkbox"/> Assign enforcement mechanism: general criteria for setting the penalty.
Regulator:
<input type="checkbox"/> Technical rules for projects design, development and evaluation;
<input type="checkbox"/> Technical rules for the issuing of White Certificates scheme (e.g. how many types, unit, lifetime, etc);
<input type="checkbox"/> Technical rules for the functioning of the WCS market;
<input type="checkbox"/> Definition of sanctions for non compliance;
<input type="checkbox"/> Criteria and rules for cost-recovery;
<input type="checkbox"/> Monitoring of results and proposals to the Government: publishes an Annual Report on the results delivered by the system with proposals to improve its effectiveness.

Table5- Main tasks of Public board and of Regulator of WCS

As previously said, the White Certificates hold the attributes of a definite amount of energy saving. But what are exactly these attributes? Different market participants and other stakeholders often have very different opinions to this.

For White Certificates the narrowest significance is that a certificate only registers energy savings from projects that result in additional energy savings beyond usual developments.

A wider definition also includes the resulting greenhouse gas reductions from the obtained energy savings, the resulting increase in security of supply, and many other attributes of energy savings.

Issues to be decided upon in the issuing of certificates take account of:

- What types of projects, in what sectors are eligible to receive White Certificates?

- What is the size of the White Certificates (i.e. for how much energy saved will a certificate be issued)?
- What information should be registered on the certificate (e.g. location of the project, owner, etc.)?

In order to ensure a reliable system and avoiding many sellings and countings in the market, each White Certificate should be uniquely identifiable.

It should contain standardized informations such as a exclusive certificate number, name of the certificate issuer, identification of the project and project owner, and time of issuing.

If the certificates are tradable, each trade should be informed to the party that has issued the certificate.

Each transfer of ownership of the certificate should be recorded in a registration system. This registration system should register all trade as well as final redemption of certificates.

When the certificate owner chooses to use the certificate to accomplish an obligation or in a different way to utilize it to advertise its environmental performances, he needs to redeem the certificate.

In order to redeem the certificate, the issuing body will transfer the certificate to a redemption account, therewith securing that the certificate can no longer be transferred or traded in the market.

One of the more important elements in certificates system is the formation of demand for certificates.

Clearly, when all is left to voluntary demand, the quantity of trade in the market, the overall size of the market as well as the prices of certificates will all be much lower than in a market where actors are obliged to pay for definite amounts of certificates.

Most certificate markets are driven by a mandatory target setting. For a most favorable target design, the next requirements should be keep in consideration:

- Targets should be set beyond business as usual, where business as usual should be formulated including achievements of existing framework of policies and measures.
- In the target setting it should be patent how achievements are accounted for.
- Targets should be place for a longer-term horizon. This is mainly significant for investors in energy saving or renewable energy projects. A minimum of 10 to 15 years is normally necessary for

renewables investors or investors in larger energy saving projects to collect a breakeven return.

Stakeholders can play different parts in White Certificates systems. Every kind of actor can perform numerous activities.

For instance, an energy distributor develops and finances its own energy efficiency project and uses the savings obtained to fulfill its own target.

The various positions are defined below.

- Generator: development and implementation of energy saving projects;
- Investor: funding of projects; in return for direct financial return, decrease of energy costs or part of the certificates generated;
- Market facilitator: a body that supports trading in certificates;
- Bundler: a actor that combines reductions from individual smaller projects into a portfolio to either meet certificate thresholds or create a portfolio for clients. This role could be taken up by ESCOs;
- Trader: a party that purchases certificates and sells them to its clients, either through a brokering service or an exchange.
- Verifier: a party that develops the verification of certificates based on standard or analytic modes;
- Standards developer: a party that carries out project selection criteria and/or monitoring and verification standards to use for screening projects and certificates;
- Service provider: a party that provides access to information, instruments and services without being active in creating, verifying, trading or using certificates.

Different experiences with market-based instruments give an important prompt on the importance of penalty systems, monitoring and enforcement in White Certificates schemes.

In many systems analyzed in the past, the lack of monitoring and enforcement resulted in inefficient or insufficient achievement of energy saving policy objectives.

Setting the level of non-compliance penalties should be done carefully as the height of the penalties definitely influences market expectations of potential investors and may significantly affect market prices.

Theoretically penalties set a ceiling for certificate prices because economic rationality says that obligated parties

would pay the penalty when the market prices exceed this penalty price.

Trade on the market does not always occur against a price close to the penalty price. If markets are short – i.e. there is insufficient supply of certificates to cover demand – market prices are usually quite close to the penalty price.

On the other hand, if markets are long – i.e. there is sufficient supply of certificates on the market – trades may occur at prices well below the penalty price.

Finally, the main elements to be included in the design of certificate markets that affect tradability of certificates are:

- Specification of the compliance period. Often obligations for white certificate systems are set on an annual basis, while obligations in the Emissions Trading System (ETS) are set on a multi-annual basis. Specification of the compliance period needs to balance issues such as environmental integrity, environmental effectiveness. Shorter compliance periods in general will increase transaction costs, possibly enhance market prices, amplify market liquidity and increase price transparency.
- Lifetime of the certificates. When the certificates have a too short lifetime, market prices may be significantly distorted.
- Size of certificates. Each certificate system should specify a standard unit and amount that one certificate represents. Determining the size of the certificate will affect operation, prices and tradability of certificates.

A possible general mode of action of White Certificates scheme for considered contexts is reported in Figure 25.

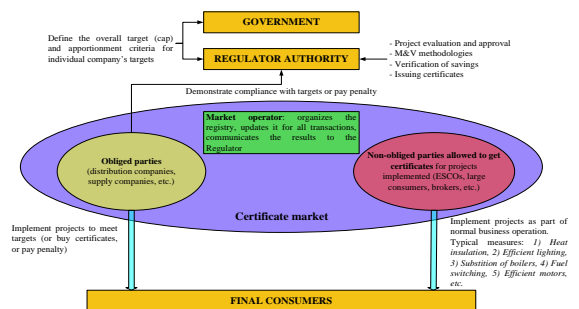


Figure 25- General mode of action of White Certificates scheme

4 Simulation of possible setting for implementation of adapt mechanism

Final considerations

For instance, in the case of Tunisia in which a large number of initiatives concerning environmental sustainability have been developed in the past, such as CDM (Clean

Development Mechanism) projects, it could be more appropriate to suggest a better setting of the functioning of the market system in order to support a full implementation of a cap and trade mechanism.

In contrast, in the case of Algeria with the aim of introducing a trading mechanism could be more consistent to sustain an implementation strategy that first of all pay an accurate attention to stakeholders’ participation to the decision-making process.

In these years, the use of market mechanisms to reach precise environmental objectives is really growing, with the most important example to use of emissions trading schemes to control greenhouse gases emissions (e.g. Emission Trading – ET; Clean Development Mechanism – CDM; Joint Implementation – JI). So, trading mechanisms for energy efficiency are now in place in many countries with very interesting results.

For this reasons, ECATS project has supported the possible technical implementation of a Cap &Trade mechanism covering energy savings and energy efficiency to design an institutional framework in Tunisia and Algeria, considering the peculiarities of these contexts.

The ECATS project implied a critical assessment of the experiences in the energy sector in Tunisia and Algeria and explored the practical implementation of a Cap &Trade scheme by individualizing possible stakeholders.

In the light of the previous remarks, referring to the implementation of a cap and trade model, it seems that for Algeria and Tunisia it could be more appropriate such an approach that just gradually introduce the mechanism in that countries.

In effect, analysis conducted until now suggest to build up a specific approach that consider two main point:

- the usefulness of the definition of a specific approach for each country;
- the opportunity of the definition of different pathway in implementing trading mechanism for emission reduction in each specific country.

The next Figure 26 shows the actual positioning of the two countries and their potential pathways of development.

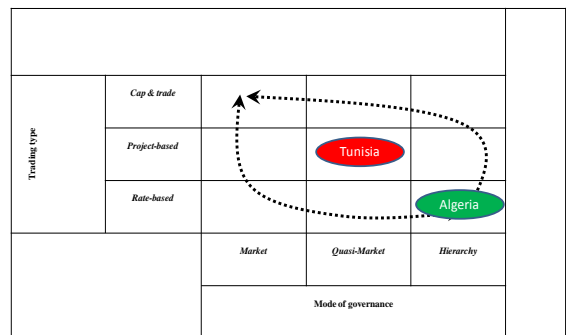


Figure 26-Positioning and pathways of C&T mechanism in Algeria and Tunisia

As depicted in the matrix the introduction of a complete C&T mechanism in these two countries it seems to be more sustainable thanks to a progressive process of implementation. In other words a step by step approach is needed in order to obtain the goal (C&T mechanism development).

