United Nations Environment Programme

Mediterranean Action Plan

Mediterranean Commission on Sustainable Development

Mediterranean and National Strategies for Sustainable Development
Priority Field of Action 2: Energy and Climate Change, Energy Efficiency and Renewable Energy

National Studies Specifications
WORKING DOCUMENT

Support Centre:

PNUE

plan bleu

In partnership with:

MEDENER

medrep mediterranean renewable energy programme

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FEMISE

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CONTENT

I. Background Information

Context

1.1 The Report entitled "A Sustainable Future for the Mediterranean"

At the end of 2000, the Plan Bleu published a regional Report on the Mediterranean's environment and sustainable development (a Sustainable Future for the Mediterranean) which includes a chapter on Energy, written with the input of many Mediterranean energy experts. This report pointed out the potential consequences of current trends until 2025 (base line scenario), and highlights alternative scenarios which would improve the sustainability of energy development in this region. This scenario stresses on rational use of energy (RUE), and renewable energy (RE). It affords major advantages would include:

- Geopolitical: less dependency on energy: maintaining the export capacities of the producing countries for future generations,
- Socio-economical: creation of numerous jobs within the post-oil's innovative sector, slower increases in energy costs,
- Environmental: 860 million tons of avoided CO_2 emissions, 156 less 500 MW energy plants constructed, mainly on the Mediterranean coastal areas, preparing the region for more radical changes necessary in the future.

Refer to the summary of the Energy Chapter in the Report's first annexe.

1.2 The Mediterranean Strategy for Sustainable Development

The MSSD, which was announced at the Johannesburg Summit, was further elaborated in 2005 within the context of the MCSD, and then in November 2005 it was adopted by the Contracting Parties to the Barcelona Convention (involving the Mediterranean basin countries, and the EC), and by Barcelona's Euro-Mediterranean Summit.

The MSSD is a "framework strategy" designed to help the countries develop their own national and sectoral strategies for sustainable development (SNDD). It can also help keep them up to date, as each country is naturally responsible for setting its own specific objectives. The MSSD also encourages stronger regional cooperation on targeted sustainable development objectives. Lastly, it necessitates follow-up on progress, and regular sharing of experiences by the regions. 34 pre-defined priority indicators have been established to facilitate this mandatory follow-up. Additional indicators can be proposed and formalised for particular fields of activity (for example Energy).

The Strategy's second priority area for action, entitled **"Ensuring sustainable management of energy and mitigating and adapting to the effects of climate change"**. The MSSD's energy objectives are as follows;

- **Promote rational use of energy (RUE) and enhance the potential of renewable energy (RE)**.

  The countries have been specifically asked to define RUE and RE objectives, both globally, and for each sector of activity, and also to make progress the institutional and regulatory frameworks and make investments more attractive to make possible the change of the dimension/scale of the sustainable energy policies implementation. This requires the mobilisation and the awareness-raising of the whole stakeholders businesses/enterprises, local authorities, consumers and regional and international cooperation. One of the

objectives for the regions would be to reduce the energy intensity by between 1 and 2 per cent per annum and to make the total demand for renewable energy increase to 7 percent by 2015 (excluding biomass).

- **To control, stabilise or reduce greenhouse gas emission as appropriate**
- **Mainstream measure for adaptation to climate changes within the major objectives of national development plans**
- **Increase access to electricity in rural areas where necessary**

1.3 The MCSD's energy and climate change activities; objectives, organisations and schedule.

Energy and climate changes have been defined as priority areas for the MCSD for 2006 and 2007. The aim is to contribute to the implementation of MSSD by making a preliminary summary of progress made and implementation methods used regarding RUE and RE, mobilisation of the flexibility mechanisms of the Kyoto Protocol, by helping the countries to produce national analyses which can be used to define their strategies, by organising regional sharing of experiences, and by elaborating proposals to be discussed at the MCSD and country level.

The first national workshop on energy and sustainable development will be organised under the framework of the MCSD in Spring 2007. The participants will include international, regional and national experts, as well as representatives of donor institutions, the NGOs, local authorities and the private sector.

This workshop will be facilitated by the Plan Bleu, which is one of the leading MCSD support centres, and will be lead in conjunction with the following partners:

- OME (Observatoire méditerranéen de l'énergie),
- MEDENER, Mediterranean network of efficiency energy agencies (with the participation of ANME and ADEME),
- Type II initiative on renewable energy in the Mediterranean MEDREP(Mediterranean Renewable Energy Programme),
- l'UMET (Université méditerranéenne d'été),
- l'Institut de la Méditerranée/FEMISE (network of Mediterranean economic research institute) and Clean Production MAP/RAC centre in Barcelona,

It will be co-financed by the MAP, the Italian Ministry of Environment's (IMET) programme, the ADEME (French agency for energy efficiency), and by the Principality of Monaco.

The schedule of action was agreed upon after input from all the parties concerned. The items included cover regional analyses, National Studies in volunteer countries based on the current specifications, data collection by using questionnaires in the neighbouring countries, a regional workshop to be held in March 2007, a Debate to take place within the MCSD, and the production of a regional Study for the end of 2007.

Objectives and use of National Studies

They have two principle objectives:

1. To provide information on the country's situation and observed evolution, progress made or foreseen in terms of energy efficiency and renewable energy, tools implemented and examples of good practice. To contribute to the Mediterranean reflection, to the sharing of experiences, and to enrich the respective experiences of the countries.

2. To raise awareness of the needs to get involved/engaged/committed in ambitious RUE and RE development objectives, to implement specific tools and to take into consideration the relevant benefits that would arise. If needed offering assistance to countries in developing the energy section of their national sustainable development strategies and selecting monitoring indicators and enabling their energy policies to evolve positively.

Implementation and Schedule

The National Study will be carried out by a national expert mandated by Plan Bleu and the National Agency in charge of Energy Management or an equivalent agency, both of which will guide him/her during his/her mission. A first mission by Plan Bleu could be organised in volunteer countries before the end of 2006. It would allow to meet and brief the selected expert in charge of preparing the Study.

The Final Study should be submitted to Plan Bleu from November 2006 and by January 2007 at the latest.

The expert will be designated by the Plan Bleu together with the MEDENER, MEDREP, OME and ADEME subject to approval by the country. He or she will be invited to the regional workshop in 2007.

The country is encouraged to form a Pilot Programme group comprised of qualified experts from the local administrative bodies, (environment, energy, industry, construction), local authorities and other interested organisations (business organisations, users' groups, NGOs) in order to manage, enrich and facilitate the production of the National Analysis Study.

Once the MCSD meeting and regional workshops have taken place in 2007, a second mission by the Plan Bleu could be organised between June and December 2007 where a broader debate on the results of the National Study and its related activities would be planned, and where necessary, make decisions about the desired follow-up actions.

II. Contents of the National Study.

The final versions of the National Studies should be in the **form of brief syntheses** (20 – 30 pages plus annexes) so as to be easily readable by the decision-makers.

The National Study should cover the following items in order to meet its defined objectives:

- To quantify and analyse the basic data and the **indicators** (please note that hereafter the basic data are in italics, and the MSSD indicators highlighted in grey – the latter have a detailed methodological sheet in Annexe 3) – particularly those stipulated in the Mediterranean Strategy and in the National Strategies. The objective is to explain the situation, evolution, the concerned country's energy forecasts, and progress made in terms of RUE and RE – both globally and sector by sector.
- To present the **RUE and RE strategies and policies** currently under way. The goal is to highlight the agreed objectives and the strategies adopted to attain them, the methods put in place, the main difficulties encountered, the necessary investments, and the cost of the RUE and RE policies.
- To present the effects and **benefits** gained from the current development of RUE and RE on an economic, social and environmental level, paying particular attention to the region's socio-economic and environmental issues - growth, unemployment, poverty, immigration, investments, integration into globalisation, GHG emissions, coastal area focus, urbanisation etc.
- To devise at least two to five **case studies** dealing with good practices to be communicated on a Mediterranean scale: an example of local progress within an urban zone or rural area, and/or an example of sectoral progress made, or even significant effects on the country's development resulting from URE and RE.
- Produce a **prospective** analysis of possible risks linked with the observed and forecasted trends; highlight potential solutions which could be proposed in the scope of RE and RUE strengthening policies; suggest more voluntary objectives the country could adopt, the main obstacles to overcome, tools and investments to be implemented, and the economic, social and environmental benefits which would result from this.

Analyses will be based upon available statistics, case studies, results of other studies, prospective information, evaluation of policies already in place, existing planning documents, and expert opinions.

The following frame and its proposed contents are only a guideline. The editor should in fact exercise a certain amount of freedom when taking into account the country specifics and the existing documentation. The aim is to produce a study which is interesting and useful for debate and decision-making purposes.

Data and indicators

The **basic statistical data** used in the Study should be those most recently available from within the national sources, and if possible should be comparable with information taken from the international data bases (IEA, OECD, WB).

The priority indicators and the complementary indicators from the MSSD (in grey boxes in this document and in bold for priority indicators - please see their definitions and descriptions in Annexe 3) will be calculated and used with key priority to produce the National Study. If all the necessary figures are not available, only certain components of the indicators will be provided, or similar indicators where the definitions within use (?) are already specified.

Any additional indicators used within the Study should be clearly defined.

The trends (?) analyses should cover the time period between 1980 and 2005 (or even up until the beginning of 2006 in some cases) and, should the prospective be available from the country's official Energy Planning and Policy-making documents until 2015/2025, this should be used. If this is not the case, the author can refer to shorter or longer periods, from either a retrospective or prospective standpoint, depending on data available.

NB: we suggest that the National Study should include information on all the additional indicators available on a national level.

1. PART I – The country's energy situation: indicators and basic data

=> **Objective**: to present the national energy context in general, to analyse the basic energy data using the MSSD indicators to point out the main evolutions which have taken place since 1970-1980 and those possible (until 2015/2025) according to existing planning documents.

Ideal length: 5 to 8 pages

1.1 Share of the Energy Sector and Institutional Specificities

The sector's economic weight

To show the relative importance of the energy issue in the country, the following indicators and their evolution since 1970-1980, as well as their prospectives, will be analysed:

- *Energy share in the GDP (%)*
- *Energy shares in export and import (absolute value and percentage of the total) per type of energy (oil, gas, coal, electricity, other)*
- *Number of jobs in the energy sector (absolute value, percentage of the total)*
- *Relative importance of the energy sector within the State budget*
- *Fiscal revenue linked to energy taxation (percentage of the total fiscal revenue)*
- *Share of total investment in the country, and of total industrial investment*
- *Infrastructures: number of refineries, of power stations, length of the electricity network…*

Where necessary, the country's energy data will be situated in terms of recent international contexts (for example the evolution of oil prices).

National energy resources and potential saving

Fossil energy resources: latest assessments, relative importance on a worldwide level

Potential renewable energies: wind, solar, hydroelectric, biomass. Some countries have a not inconsiderable potential here either on a worldwide, Mediterranean or European level. Information available on this topic will be included.

Estimate of the *potential energy saving* (total and per sector) possible by using the energy rationally will be provided. Also, if available, the degree of not billed energy could be explained (e.g.: pilferage from the electricity distribution network).

Institutional specificities and energy policies

A brief outline will be made of the following:

- the main institutional specificities regarding energy, administrative organisation, production and distribution, market structure, the decision-making process for energy choices, users' associations.
- the recent evolutions in energy policies. The integration of environmental issues in the energy policies will be explained with reference to ER and the RUE

1.2 Energy Supply, Demand and Production: evolution and structure

Electricity Access

One of the MSSD's key objectives is that the percentage of the population without access to electricity should be halved by 2015 (basing the calculation on the figures from 1990).

This section should present the progress achieved and targeted up to 2015 in comparison to 1990, and should also compare access to and consumption of electricity in both urban and rural areas.

The following indicator should be used to attain this:

ENE_C10: Share of households (or population) with no access to electrification

The main means of support to electricity access projects and investments should be stipulated here.

Evolution and structure of the energy demand

This should feature:

The evolution of the total demand in commercial primary energy since 1970-1980 in terms of TOE (ton oil equivalent), its growth rates (current and evolving) and a forecast of the demand in 2015-2025 resulting from demographic and economic evolution, the country's energy strategies and those of its large energy firms.

- The evolution of the primary energy demand's structure, per type of source, by distinguishing between fossil energies (total and by type: oil, gas, coal), nuclear energy, biomass, hydroelectricity, and RE types (renewable energy: solar, wind, geothermal energies…).
- The relative importance, where possible, of the *non commercial energy demand* (evaluation of the energy provided by mobilised non commercial biomass: fuelwood etc.).
- The evolution since 1970-1980 of *the demand for electricity* (in terawatts-hour – TW/h - and as a percentage of the total of energy consumed) and of its growth rates (current, evolving).
- The *final relative consumption percentage per sector*, as it evolved over 1970-2000-2005:
  - of *the residential* and *tertiary sectors*
  - of *industry*
  - of *transportation*
  - *if* the demand forecast for any specific activity is particularly high, this will be highlighted (for example in the case of high energy demand required for water desalination)

Evolution and structure of production

The following should be illustrated:

- the evolution of the structure of primary energy production per source (in TOE and %), since 1970-1980,
- the evolution of the structure of electricity production per source (in TW/h and %) since 1970-1980,
- the country's current and forecast situations up until 2015-2025 for the two previous cases (energy and electricity production)
- the Production structure figures will differentiate the fossil energies (total and per source: oil, gas, coal), from the nuclear, hydroelectric, biomasse and RE (renewable energy: solar, wind, geothermal energies…) .

1.3 Impacts and risks of the observed and forecast evolutions

Energy dependence and Energy bill, reduction in export capacities

- As regards the producers exporting countries, the consequences in terms of balanced supply and export capacity should be included.

- For the importing countries the potential consequences in terms of energy dependency and energy bills, as well as the impact on both the business and domestic sectors (crowding-out effect) will be analysed (evolution from 1970-1980 to 2005 and forecast until 2015-2025). The following indicators will be used:

ENE_CO1: External Energy Dependency: the share of imported energy in national consumption and the number of supplier countries

Greenhouse gas effect

The energy sector has major impacts on the greenhouse effect. Evolution since 1970-1980 should be described here and, using the following indicators, the current and forecast situation (total in T CO_2 and per capita, growth rate) and prospectives to 2015-2025 (using current trends):

ENE_PO3: Greenhouse gas effect emission ; CO_2 emitted from energy production and use.

The national binding objectives relative to the Kyoto Protocol and/or to the country's official position on current discussions and future negotiations (post 2012) should be covered.

Other impacts on the Environment

The survey will try to summarise the energy infrastructure's main impacts on the Mediterranean coastal areas (evolution since 1970-1980, current situation, forecasts until 2015-2025) by basing their calculations on this indicator's figures:

ENE_C04: Number of energy infrastructures on coastal areas
ENE_C13: Ozone picks frequency

Where possible, other impacts on the environment and additional indicators used in the country should be explained.

1.4 Financing and investment needs

This section will contain a brief summary of the financing needs of both the investments currently underway, and those planned until 2015/2020 with regard to RUE, RE, electricity and hydrocarbons sectors.

Investments expected for large infrastructures will be mentioned as well as potential opportunities for investors.

This section should also contain a brief review of the main sources of financing either currently in use or potentially foreseen for future (public, private, foreign direct investment (FDI), ODA)

2. PART II - Rational Energy Use (RUE) - Renewable Energies (RE): policies, tools, progress, resulting effects, case studies

=> **Objective**: to analyse the evolution of the in-country RUE and RE since 1980, the policies, the tools, their existing methods of development, difficulties encountered, efficient leverage and the resulting effects in terms of the country's development (economic, social and environmental).

Suggested length: 10 to 15 pages

The RUE is one the major objectives of both the MSSD and the UN's Millennium Development Goals. The MSSD suggests that the entire region should aim to reduce its energy intensity by 1 to 2% per year from now until 2015.

The MSSD's Energy Chapter's second most important priority focus is on RE development. It suggests that a targeted 7% of the total energy demand should be satisfied by renewable energies (not including CWR) by 2015.

The National Study should concentrate on the following:

- Tertiary, domestic and industry sectors, and on the energy sector itself (production, transmission and distribution). Specific transportation matters will not be analysed in detail here, as transportation plays an important role within the MSSD and will therefore be studied at greater length at a later date,
- Renewable energies (other than large hydro power plants). Biomass use will be mentioned and quantified as much as possible depending on available figures.

Definitions:

The aim of RUE is to optimise Energy Systems by a vast range of actions.

They consist in:

- Improving the energy chain's output: energy production, transformation, transmission, distribution and use. These objectives include actions such as: improving management of the energy infrastructure, insulating housing, reducing unit consumption of electrical devices or bulbs, and fighting useless consumption (bio-climatic buildings are a good example of a combination of those actions).
- Rethinking energy supply systems from a more global perspective, in order to reduce energy consumption without altering the quality of energy service provided to the user: co-generation, decentralised energy production, evening out of the electricity consumption peaks and re-balancing the daily and seasonal load curves, which would allow the country to avoid or defer investing in additional infrastructures necessary to maintain the quality and security of the electricity service provided.
- Intervening well in advance regarding the determining factors of energy demand, even to the point of questioning various plans of moving or re-localising residential areas for example by rethinking in advance the locations necessary to house urban services which could lead to superfluous travelling.

Renewable energy

The possibilities for renewable energies are inexhaustible. They can be provided by the sun, the wind, heat from the earth, waterfalls, and tides, or by crop-growing or waste recycling. They generate little or no waste or pollution. Renewable energy is considered as a "flow" energy, whereas the types of energy produced from limited resources of fossil fuels such as oil, coal, gas, and uranium fall into the "stock" energy category.

We can distinguish between renewable combustibles and waste materials (CWR), and non-renewable combustibles energy.

CWR: solid biomass, gas/liquid from biomass, both municipal and industrial

Non-renewable combustible: geothermic, solar, wind, hydraulic, wave and tide produced energy

The National Study will concentrate on non renewable fuels, other than large hydraulic types

2.1 RUE and RE Policies

This paragraph is divided into the two following subsections

2.1.1. Rational energy use (RUE) policies

2.1.2. Renewable energy (RE) development policies

For each subsection, the survey will analyse the main RUE and RE policy decisions of the past 10 years (including their dates):

  - specific national strategies,
  - general national objectives set for RUE and RE by sector and, for RE, by type of energy (solar, wind…),
  - how these issues have been integrated into the national sustainable development strategies, government planning and so on,
  - the determining factors of decision-making: economic factors, civil society actions, international agreements…

- main policies decisions by sector: RUE and RE integration into industrial and or tertiary/housing sectoral strategies
- main given orientations and determining taken decisions
- institutional measures taken to define and monitor ER and RUE policies better: cross-sectoral ministry meetings and committees on RUE and RE, State Administration plans, creation of departments or agencies dedicated to RUE, RE, and CDM, energy auditing structures, national reports etc…

2.2 Instruments and measures to be taken in favour of RUE and RE

This paragraph is divided into the two following subsections

2.2.1 Tools and measures in favour of rational energy use (RUE)

2.2.2 Tools and measures in favour of renewable energy (RE)

For each subsection the survey will highlight the main instruments and tools used at the national level to implement their RUE and RE policies:

- incentive methods: subsidies, fiscal measures, energy pricing, legislation,
- quotas, carbon and energy audits,
- evolution of research and training programmes (builders, engineers, administrators,…), public research and development (R&D) investments
- awareness-raising campaigns, information campaigns, consumption display legislation creation of specific vocational training sessions and means of motivating users' associations, professionals
- investments: if specific measures have been set up to maintain investments in RE and RUE, they will be stipulated: State budget allocations, creation of a CDM project portfolio, formal mention in the documents of action plans concluded with international donor institutions (in particular the EU), measures aiming at attracting the FDI in the RUE/RE sector…
- initiative at the local level: measures taken at the national level to encourage local authority actions in RUE and ER; the number of cities and/or the percentage of regions where

effective actions are implemented will be mentioned; practical actions taken by towns/municipalities, users' groups, local authorities or local communities will be explained

This section will be based on the following indicators (with details of their recent evolution):

ENE_C08: Expenditures in RE and RUE: RE and RUE programmes share in energy investments and R&D expenses

ENE_C05: Final consumer energy price per fuel and per sector

ENE_C11: Share of fuel and electricity expenditures in household budgets

ENE_C06: Existing incentive measures and policies for RE and RUE development at national level

ENE_C07: Cities/regions/provinces with an existing energy audit and/or a carbon audit and/or with objectives in terms of RE and RUE

ENE_P04: total sum of investments made within the Kyoto Protocol's Flexibility Mechanism

2.3 Energy Efficiency Evolution - decoupling

The energy intensity indicator best allows progress in energy efficiency to be measured. This indicator's evolution since 1970-1980 should be described. If possible, energy intensity progress should be quantified for the main sectors of use: industry, households, services sector (tertiary/ /residential); plus if possible transportation. It will allow to observe if a decoupling between economic activities and energy consumption is noticeable. The efficiency of energy production, conversion and transportation must also be closely monitored.

This section will include:

- the calculation of the following indicators from 1970-1980 to date:

Indicators for analysis:

ENE_P01: Total energy intensity and by sector

ENE_C03: Efficiency of Energy conversion and distribution

NB: we recommend that all indicators available either on a national level or where limited to certain geographical zones (cities, regions…) be included

- The analysis of the evolution of each indicator with regards to national policy and objectives; the progress obtained, the possible gap between objectives voiced, and results obtained on a national level,
- The analysis of the impact of policy on progress achieved: are the policies and actions implemented in the country the main factor explaining progress observed? are there others (e.g.: recent trends in fossil fuel prices)?
- Main obstacles identified and difficulties encountered: difficulties encountered in setting up certain tools, the possible inefficiency of some tools or some measures taken; obstacles (economic, technological, cultural, administrative, legal obstacles, policies…) which need to be overcome to speed up transitions
- The most efficient leverage used: the measures or tools giving the best results

2.4 Renewable Energy evolution

This section will include:

- the calculation of the following indicators from 1970-1980 to date:

Indicators:

ENE_P02: Renewable energy share in the total energy

ENE_C02: RE capacity installed per inhabitant: wind, photovoltaic and thermal solar

NB: we recommend that all indicators available either on a national level or where limited to certain geographical zones (cities, regions…) be included

- The analysis of the evolution of each indicator in regards to the national policy and objectives; the progress obtained, the possible gap between objectives voiced, and results obtained on a national level,
- The analysis of the impact of policy on progress achieved: Are the policies and actions implemented in the country the main factor explaining progress observed? Are there others (e.g.: recent trends in fossil fuel prices)?
-
- Main obstacles identified and difficulties encountered : difficulties encountered in setting up certain tools, the possible inefficiency of some tools or some measures taken; obstacles (economic, technological, cultural, administrative, legal obstacles, policies…) which need to be overcome to speed up transitions
- The most efficient leverage used: the measures or tools giving the best results

2.5 Existing or expected effects and benefits of RE and RUE

The benefits and follow-on effects of RE and RUE development on a national scale, whether currently observed or expected in the future should be highlighted here.

1. if new sectors of development activities arise - for example energy audits, various new electric device industries, or bioclimatic building, within the RUE sector, or, as far as RE is concerned, thermal solar, photo-voltaic, solar or wind activities, the National Analysis Study should try to show their importance in terms of:
   - job creation,
   - international trade (avoiding import costs),
   - technology transfer,
   - R & D,
   - investment,
   - business competitiveness,
   - reduction of poverty,
   - limitation of rural exodus,
   - environmental benefit (t of CO2 saved,…).
   - …
2. the survey will also include any existing cost/benefit or cost/advantage analyses which allowed decision-making in favour of RE and RUE; or even economic analyses comparing different options - for example, production increases or energy saving.

Indicators to be used here:

- ENE_C12: Job creation through the development of renewable energies and rational use of energy
- ENE_C08: Expenditures in RE and RUE: RE and RUE programmes share in energy investments and R&D expenses

NB: we suggest that all other indicators available on a national or geographical level geographical (cities, regions…) should be listed in this section

3. PART III - Examples of good practice, case studies

Objective: select and document case studies / examples of good practices relating to RUE and RE. They should allow showing how concrete actions have been implemented and which results arouse.

They should be useful for the whole actors who wish to commit in RUE and RE field (investors, policy decision-makers, citizens, enterprises…)

Documenting case studies with examples of good practices is a key factor in national studies

3.1 Content of good practice and case studies

The expert will develop two to five RUE and RE case studies. In the final version of the national study, examples of good practice could be inserted as boxes in the previous section of the document (e.g.: if a case study refers to the use of RE for desalination, it will be included in the paragraph corresponding to the renewable energy evolution).

Objective and contents of case studies:

Case studies will provide concrete demonstration of progress achieved, necessary costs, net profits obtained (cost/benefit analyses), tools put in place, and difficulties and obstacles encountered during RE and RUE development. Case studies should illustrate the particularly striking aspects of energy demand management and renewable energy within the country concerned. They should be presented from a story-telling perspective, and illustrated by numbers and diagrams wherever possible. The introduction of the survey could relate to a particular type of energy or action, involved actors (for example a city, a private company…), a territory or a particular issue (for example job creation). They should try to establish a link between the case in question and the region's important socio-economic issues (unemployment, migration, world trade integration, direct investment, saturation of activities in coastal areas…) .One of the case studies could be about the development of a particularly dynamic action plan in the country (for example the development of wind energy in Morocco). Another case study could cover the implementation of a concrete RUE or RE project. The case studies could also analyse the implication of local in-country involved actors, for example actions from city levels. The case studies can illustrate national evolutions involving both success or failure, as the essential result is the ability to learn lessons from them.

3.2 Examples

The following could be examples of potential case studies:

- a town which carried out an energy audit or a carbon audit and then committed itself to reach specified objectives; details on reasons, means and tools used and results obtained,
- a public administration entity which put an RUE and/or RE plan in place,
- an important industrial RUE innovation, for example creation of bioclimatic construction materials,
- a tourism-related achievement exemplary in terms of energy,
- the accomplishment of an urban project,
- an industrial business which, after inclusion of RUE in its internal policies was able to prove the total profits derived,
- RE rural electrification, showing the benefits attained (reduction in the rural exodus rate, economies made regarding infrastructures.…),
- a RE CDP (clean development Mechanism of the Protocol of Kyoto project): in this case, it is advisable to describe the project's progress from the identification phase up until its implementation, explaining the important intermediate steps and key factors for success

(support received, relationships with investors, financial engineering, estimated of emission reduction certificates…)

- a successful investment in electricity generation: it is advisable to provide with information on the cost per Kwh generated, type of contract drawn up and any informationthat might prove useful for potential investors,
- development of a solar power station or a wind network,
- use of the RE for sea water desalination,
- impact of the existence of a well-informed consumers/users' association as an intermediary between the suppliers and citizens aiming at providing citizens with updated information and the best available choice and the respect of this choice
- experiences and initiatives impacts aiming at displaying electric devices energy consumption and their use costs

4. PART IV – Proposals for more sustainable energy development

Objective: Pointing out the feasibility of relevant changes within the country, to propose new, more ambitious URE and RE objectives, their appropriate policies and strategies, and the most adequate tools and financing. These propositions will provide a first set of possible actions for a more sustainable energy development scenario. Its relevant costs and economic, social and environmental advantages will be mentioned.

Suggested length: 5 to 10 pages

4.1 Summary of under exploited RE and RUE

RUE policies can lead to considerable economic benefits. Experts are of the opinion that by using today's existing technology, current energy demand could be reduced by 20 – 25%. The results of RUE policies can have major consequences in the Southern and Eastern countries of the Mediterranean, as there is strong demographic growth in these regions (96 million additional inhabitants over a 25 year period). Moreover, evolution within the construction and consumption pattern will have major impact on these countries' futures.

Besides, RE can also make potentially rapid progress, particularly within solar and wind areas. Plan Bleu's alternative scenario envisages that 14% of the total primary energy demand be covered by RE by 2025, compared to a mere 4% to date. As for the MSDD, it aims to reach a target of 7% by 2015.

Finally, climate changes also represent high stakes for the region.

4.2 Proposal for a sustainable energy development

In this section, the expert will elaborate **upon proposals** which will help strengthen the country's sustainable development policies within this field.

Once the expert has taken these elements into account – current and past country experience, the potentials of RUE energy and RE development considering in-country needs and constraints - analysis of the following points should be included:

- **objectives** which could realistically be set up for 2015-2025 if the country were to adopt or update its national RUE and RE energy sustainable development strategy. Details on the main sectors for which specific targets would be defined, in terms of energy savings should be included. Regarding RE, specific target by type of RE (wind, solar…) should be included
- the **main tools** which would need to be implemented to overcome identified obstacles, in order to attain the proposed objectives, with particular regard to the MSDD's suggested tools: pricing policies, taxation, awareness-raising, training, users' empowerment, green certificates, white certificates, legislation (regulation???)
- the **economic and financial costs** of setting up the tools and means for RUE and RE development (including necessary investments) and how to finance them (private and public investments, CDM, international cooperation…)
- the **benefits** which would ensue from adhering to this alternative type of sustainable development scenario, from these standpoints: geopolitical, socio-economic (job creation, avoided expenditures, users' involvement), environmental (reduction in tons of CO2 emitted, construction avoided on the Mediterranean coastlines) – compared to the outcome of continuing with the current trends
- a proposal of a limited number of **indicators** (maximum 10) to monitor progress and results obtained by implementing a national strategy.

5. Annexes to be attached to the Study

- statistical tables (data series)
- list of the main references used
- brief explanation of the difficulties encountered whilst gathering the information necessary to produce the Study. Where necessary, proposals to improve short and long term monitoring systems, and means of justifying more in-depth analyses from both a National and Mediterranean standpoint.

III. Annexes

1. Annexe 1 - Plan Bleu Scenarios

1.1. Baseline scenario

Climate change is one of the basic data for the prospective analysis of the 21st century. The Mediterranean will be particularly affected. A study concludes that a global warming of 1°C by 2025 would result in the intensification of extreme climatic events in the Mediterranean. Energy consumption and increasing transport activities are the main sectors responsible for green house gas (GHG) emissions. The OECD concluded that half the GHG emissions are related to energy activities.

Over the past thirty years, the demand for primary commercial energy has more than doubled in the Mediterranean Basin (1970 to 2000). In 2000, fossil fuels (oil, coal and gas) were the prevalent form of energy in the Mediterranean - over 75% consumption in the North and 96% in the South and East -, followed by nuclear and hydraulic electricity. More recently, for the past few decades (years?), the very strong progression of natural gas over oil has been observed. Renewable energies, excluding biomass, account for 3% of the commercial energy demand of Mediterranean countries. In many countries, cost and tax structures do not encourage energy savings or the development of renewable energies.

Between 2000 and 2025, total demand for primary commercial energy could rise by 65% throughout the Mediterranean region. By 2025, as a result of changing demographics and lifestyles, the growth rate of energy demand in southern Mediterranean countries could represent four times the levels in developed countries. Fossil fuels would still cover 87% of the energy consumed (oil 40%), and renewable energies would remain marginal.

These changes bring with them risks and challenges as well as geopolitical, socio-economic and environmental impacts:

- A peak in energy dependence: in the producing Mediterranean countries, export capacities may be reduced due to the increase in domestic demand; other Mediterranean countries may be confronted with growing energy deficits and unbalance. This situation may result in increased hydrocarbon imports, from 290 Mtep in 2000 to 530 Mtep by 2025.
- A rise in supply costs: in a context of higher and more volatile hydrocarbon prices, the massive growth in energy imports could weigh heavily on the cost of the energy bill for countries and households and have serious social implications.
- Environmental Impact:s in 1990, the region's total CO_2 emissions related to energy-based activities accounted for 7% of the total global emissions (approximately 70% emitted on the North rim) and could reach 9% by 2025.

1.2 Alternative scenario

The alternative scenario recommends more rational use of energy (reducing network losses, improving housing insulation, household appliances, efficient industrial technologies, transport, etc.) combined with more intensive use of the Mediterranean potential in renewable energies (solar, wind).

The technologies currently available seem to indicate that renewable energies (geo-thermal, solar, wind, hydraulic) could represent 14% of the primary energy balance by 2025 instead of the 4% of the baseline scenario.

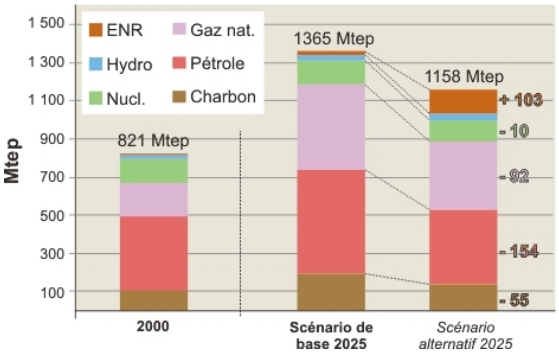
It is estimated that more rational use of energy, using currently available technologies, could bring savings of approximately 20% to 25% in total energy demand (depending on the countries and quantities of waste) by 2025. Creation of users' associations would accelerate this trend by empowering citizens.

The housing and service sectors represent the most significant areas of energy savings, particularly on the southern rim, where there is extensive demographic and urban growth.

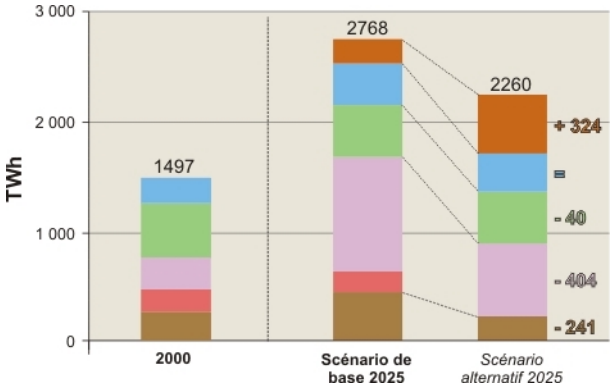
The advantages of such a scenario:

- Total energy savings of 208 Mtep/yr in 2025, i.e., nearly half of the growth in demand forecast between 2000 and 2025.
- Limiting oil demands in 2025 to the 2000 level.
- Savings equal to half the current demand for natural gas.
- Reducing the average dependence index[1] from 34% to 18% in the Mediterranean Basin between 2000 and 2025.
- Reducing all environmental risks and impacts due to energy production, use, and transport, particularly as regards gaseous emissions (–25%), and CO_2 in particular, and thereby participating to the objectives of the Kyoto Protocol.
- Creating jobs in innovative sectors.
- Ensuring the sustainability of resources in producing countries to benefit future generations.

Feasible energy savings with the alternative scenario, 2025



Primary commercial energy demand -MED



Electricity demand - MED

Source: Plan Bleu & OME ; Med 2000

Primary energy supply sources per country, baseline and alternative scenarios, 2000–2025

Baseline scenario	**Primary commercial energy total demand[1]**		**Share of renewable energy in % of the total energy balance sheets (TPES)**			
	(Mtoe)		**A**	**B**	**A**	**B**
	2000	**2025**	**2000**	**2000**	**2025**	**2025**
Spain	121	157	6.0	2.5	7.0	4.2
France	246	317	6.8	2.4	7.6	4.1
Italy	169	214	5.3	4.0	6.0	5.0
Greece	27	50	5.3	1.6	7.0	5.1
Malta	1	3	0.0	0.0	0.9	0.9
Cyprus	2	5	2.0	1.5	1.5	1.3
Slovenia	6	8	12.0	5.0	10.2	4.6
Croatia	7	15	11.3	6.5	7.7	5.3
Bosnia-Herzegovina	4	4	14.2	10.0	15.8	11.8
Serbia-Montenegro	13	28	9.4	7.6	7.8	7.0
Albania	2	4	29.3	25.7	19.8	18.3
Turkey	71	251	12.5	4.1	6.4	3.9
Syria	18	39	4.6	4.4	2.6	2.4
Lebanon	5	12	3.4	0.9	2.3	1.2
Israel	20	37	3.4	2.9	2.3	2.1
Palestinian Territories	1	3	25.6	9.8	12.1	5.3
Egypt	45	83	5.4	2.7	4.4	2.8
Libya	16	29	0.9	0.0	0.6	0.1
Tunisia	7	16	15.8	0.1	9.3	2.2
Algeria	29	69	0.3	0.0	0.5	0.4
Morocco	10	20	5.0	0.7	6.4	4.3
NMC	**599**	**806**	**6.4**	**3.1**	**7.1**	**4.6**
SEMC	**222**	**560**	**7.0**	**2.6**	**4.6**	**2.8**
TOTAL	**821**	**1365**	**6.6**	**3.0**	**6.1**	**3.9**

[1] Index of dependence = [(demand-production)/demand]

Primary energy supply sources per country, baseline and alternative scenarios, 2000–2025

Alternative scenario						
NMC	**599**	**724**	**6.4**	**3.1**	**19.1**	**16.4**
SEMC	**222**	**433**	**7.0**	**2.6**	**10.2**	**7.9**
TOTAL	**821**	**1157**	**6.6**	**3.0**	**15.8**	**13.2**

[sc]*Source*: OME from the International Energy Agency from 1971 to 2000, energy balances of the OECD and non-OECD countries, 2001.

[nt]*Notes*:

[1] total demand of energy, excluding CWR

A: Share of total renewables in TPES (%);(Hydro+REn+CWR)/TPES

B: Share of renewables excluding combustible renewables and waste in TPES (%); (Hydro+REn)/TPES

CWR: Combustible Renewables and Waste: Solid bio-mass, gas/liquid from biomass, Municipal and Industrial waste

TPES: Total Primary Energy Supply (methodology IEA); TPES = Total+CWR

[tx]For availability and comparability reasons, the tables only concern primary commercial energy balance sheets; they exclude non-commercial primary energy, in particular the biomass; they therefore have a tendency to under-estimate the shares of renewable energy in the energy balance sheet. For example, France would have had only 2.4 per cent of renewable energies (REns+HYDRO) in the primary commercial energy balance sheet in 2000 whereas with the biomass, this share should be nearly 6.8 per cent of the total primary energy balance sheet (columns A and B). Likewise, by including the biomass in the renewable energies, Turkey would have already had over 12 per cent of its total primary energy demand in the form of renewable energies in 2000, whereas they were in fact under 5 per cent of its primary commercial energy balance sheet.

To convert electricity production and trade into primary energy, the coefficient of 0.086 toe/MWh was used, in accordance with the method recommended by the IEA. Trend scenarios built by the countries on the basis of different assumptions may lead to other projections. For example, according to Syria's projections the share of renewable energy in TPES in 2025 would be of 3 per cent (figure from the Ministry of Local Administration and Environment).

Energy intensity, per country, trends and scenarios to 2025 (in toe/US$ constant 95)

Countries	1971	1980	1992	2000	Baseline scenario 2025	AAGR (%) 1980–2000	AAGR (%) 1992–2000	AAGR (%) 2000–2025
Spain	0.143	0.168	0.165	0.172	0.107	0.13	0.51	–1.88
France	0.177	0.165	0.148	0.140	0.102	–0.80	–0.66	–1.27
Italy	0.196	0.170	0.149	0.140	0.106	–0.96	–0.74	–1.12
Greece	0.129	0.155	0.195	0.194	0.174	1.14	–0.03	–0.45
Malta	0.426	0.237	0.273	0.204	0.272	–0.74	–3.53	1.16
Cyprus	—	0.241	0.226	0.222	0.171	–0.42	–0.25	–1.05
Slovenia	—	—	—	0.263	0.110	—	—	–3.44
Croatia	—	—	—	0.329	0.196	—	—	–2.04
Bosnia-Herzegovina	—	—	—	0.689	0.238	—	—	–4.17
Serbia-Montenegro	—	—	—	1.020	0.795	—	—	–0.99
Albania	—	—	—	0.513	0.393	—	—	–1.06
Turkey	0.213	0.297	0.307	0.345	0.390	0.75	1.49	0.49
Syria	1.013	0.818	1.115	1.346	0.791	2.52	2.39	–2.10
Lebanon	—	—	0.308	0.394	0.287	—	3.12	–1.26
Israel	0.221	0.192	0.184	0.190	0.168	–0.05	0.36	–0.49
Palestinian Territories	—	—	—	0.277	0.292	—	—	0.21
Egypt	0.440	0.508	0.631	0.576	0.363	0.63	–1.15	–1.83
Libya	—	—	0.302	0.477	0.319	—	5.87	–1.60
Tunisia	0.240	0.294	0.294	0.282	0.210	–0.22	–0.53	–1.16
Algeria	0.232	0.391	0.640	0.594	0.569	2.12	–0.93	–0.17
Morocco	0.177	0.212	0.235	0.251	0.205	0.85	0.80	–0.80
NMC	0.176	0.167	0.153	0.154	0.113	-0.39	0.08	-1.25
SEMC	0.255	0.323	0.371	0.393	0.354	0.99	0.72	-0.42
TOTAL	0.182	0.180	0.178	0.184	0.156	0.13	0.42	-0.66
					Alternative scenario			
NMC	0.176	0.167	0.153	0.154	0.101	-0.39	0.08	-1.66
SEMC	0.255	0.323	0.371	0.393	0.273	0.99	0.72	-1.44
TOTAL	0.182	0.180	0.178	0.184	0.133	0.13	0.42	-1.31

[sc]*Sources*: World Bank, *World Development Indicators*, 2002; OME, Plan Bleu, 2002.

Annex 2 – Mediterranean Strategy for Sustainable Development

Chapter 2: Ensuring sustainable management of energy and mitigating of and adapting to the effects of climate change

The energy consumption of Mediterranean countries, which are highly dependent on fossil fuels, has more than doubled over the past 30 years. Many Mediterranean countries have established pricing and tax structures that are not conducive to energy saving. Moreover, there is insufficient encouragement for renewable sources of energy. Should this trend continue, the Mediterranean's contribution to total global greenhouse gas emissions could rise from 7% to 9%. In addition, the region's energy dependence could greatly increase. This situation is all the more regrettable in that the Mediterranean is an eco-region that is particularly vulnerable to climate change, has a significant potential for renewable energy from natural sources (sun, wind, etc.) and could derive substantial savings from the rational use of energy. Policies which follow these orientations would encourage technological progress, create employment opportunities and increase productivity. Decisive implementation of the Untied Nations Framework Convention on Climate Change and of its Kyoto Protocol by the countries that have or will have ratified it would also provide short and long-term local and global benefits, in particular by strengthening the regional cooperation and funding sustainable development projects in Mediterranean developing countries.

Objectives

- Promote the rational use of energy.
- Enhance the potential of renewable energy.
- Control, stabilise or reduce, as appropriate, emissions of greenhouse gases.
- Mainstream measures for adaptation to climate change in national development plans.
- Increase access to electricity in rural areas, where necessary.

Orientations and actions

Promote energy-saving policies and renewable and cleaner energies

1. Establish overall and sectoral objectives for the promotion of rational energy use and the development of renewable energies in national and local strategies for sustainable development. A desirable target for reducing the intensity of energy consumption per unit of gross domestic product by 2015 could be in the range of 1-2% per year. A desirable target for renewable energy would be to meet 7% of the total demand for energy by such means by 2015, excluding renewable combustibles and waste (CWR).

2. Encourage economic actors, local authorities and consumers to adopt sustainable energy-saving habits through pricing, targeted subsidies, tax incentives and public awareness-raising campaigns, supported by NGOs. Encourage economic mechanisms, such as Tradable Renewable Energy Certificates (TRECs), and regulations designed to promote renewable energies.

Strengthen regional cooperation and support the implementation of the Framework Convention on Climate Change and its Kyoto Protocol

3. Invite Mediterranean countries to cooperate in the implementation of the United Nations Framework Convention on Climate Change and flexibility mechanisms of its Kyoto Protocol, to prepare for the post-2012 phase and make progress towards regional investment designed to reduce greenhouse gas emissions.

4. Develop synergies with the Mediterranean Renewable Energy Programme (MED REP), the Rome *Mediterranean Energy Platform* (REMEP) and the Euro Mediterranean Energy Policy.

Adapt to climate change

5. Mainstream the concept of adaptation to climate change in national policies. Develop plans to anticipate risks and adapt the most exposed Mediterranean areas, especially islands, deltas and arid agricultural zones, to climate change.

Access to electricity

6. Support projects and investments for access to electricity. A desirable target by 2015 (compared with 1990) would be to halve the proportion of the population in developing countries who do not have access to electricity.

Annexe 3 – Indicators methodological sheets

Priority indicators

4 indicators among priority indicators are related to energy/climate change and included in the MSDD:

ENE_P01 Energy intensity (total and by sector)
ENE_P02 Share of renewable energies in energy balance
ENE_P03 Greenhouse gas emissions
ENE_P04 Amount financed in the framework of the Kyoto Protocol flexibility mechanisms by the annex 1 countries to the benefit of other Mediterranean countries

Methodological sheets corresponding to those 4 priority indicators are provided in a separated document.

Complementary indicators

13 indicators are selected:

ENE_C01 External Energy Dependency
ENE_C02 RE capacity installed per inhabitant
ENE_C03 Efficiency of electricity conversion and distribution
ENE_C04 Number of energy infrastructures in coastal areas
ENE_C05 Final consumer energy price per fuel and per sector
ENE_C06 Existing incentive measures and policies for RE and RUE development at national level
ENE_C07 Cities/regions/provinces with an existing energy audit and/or a carbon audit and/or with objectives in terms of RE and RUE
ENE_C08 Expenditures in RE and RUE: RE and RUE programmes share in energy investments and R&D expenses
ENE_C09 Official development assistance share in the energy field devoted to RE and RUE
ENE_C10 Share of the population with no access to electrification
ENE_C11 Share of fuel and electricity expenditures in household budgets
ENE_C12 Job creation through the development of renewable energies and rational use of energy
ENE_C13 Frequency of ozone pick

Methodological sheets corresponding to those 4 priority indicators are provided in a separated document.