

## Project of energy conservation indicators in the southern Mediterranean countries



**Kick-off Workshop, Tunis, January 6-7, 2011**

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## Context

The design, the implementation or the monitoring of any energy conservation policy in a country, at the national or sectoral level, requires relevant indicators which reflect the reality of the energy performances of the socio-economic activities.

In addition, for the developing countries in general and those of southern of Mediterranean sea in particular, the implementation of information systems for energy conservation indicators and those corresponding to the greenhouse gas emissions, is a key condition not only for the development of NAMAs in the framework of the current negotiations on climate change, also for the National Energy Efficiency Action Plans, that are being prepared as part of the Arab Energy Efficiency Directive, accepted by the Electricity Ministers Council of the League of Arab States, last November 2010.

For this reason the Plan Bleu ([www.planbleu.org](http://www.planbleu.org)), in partnership with RCREEE, ([www.rcreee.org](http://www.rcreee.org)), launched this work on 10 MENA region and south Mediterranean countries, namely: Morocco, Algeria, Egypt, Lebanon, Syria, Jordan, Libya, Palestine, Tunisia and Yemen.

The main objective is to develop energy efficiency indicators and to interpret them for the whole region. The indicators will be, as far as possible, similar to those developed in the European Union countries. For this purpose, an Excel database is prepared, discussed among participants and is to be filled out by national experts selected in the various partner countries.

The implementation of this project is based on the contribution of 10 national experts from the private sector, whose primary mission is collecting data and developing indicators in each target country, in close collaboration with the focal points of RCREEE. These focal points are officially appointed by the Member States to represent the energy agencies or statics departments. Regional coordination of the project is ensured by Rafik Missaoui, from Alcor.

The national experts and focal points from the start, will built an Energy Indicators Network, initiated by this project. The purpose of this Network is to facilitate data collection, allow for regional exchange, and promote the dissemination of the data and indicators. The Energy Indicators Network assures continuity and sustainability of ongoing Data collection and evaluation of energy efficiency policies. This is essential for the development of Energy Efficiency in the region, as started by the above mentioned Arab EE Guidelines.

As part of this project, three workshops and one seminar, are planned with national experts and focal points RCREEE as follows:

- A kick-off workshop of the project,
- A first mid-term workshop for country expert's assistance,
- A third mid-term workshop for the validation of data and indicators calculation.

At the end of the project, a final seminar concluding the finalized results of the works, will be organized for the benefit of decision-makers in the region.

This document includes the Minutes of the Kick-Off workshop, held in Tunis on 6 and 7 January 2011.

## **General presentation of the kick-off meeting**

### **Objective and content of the workshop**

The objective of this workshop is to develop, with national experts and RCREEE Focal Points, a common vision for the methodology of the project and prepare jointly the data collection phase in the target countries and their treatment.

Hence, the workshop included the following aspects:

- Theoretical training of the participants on energy balance and energy conservation indicators and their interpretation;
- Presentation of the case study of Tunisia to illustrate the calculation of indicators, with the contribution of the National Energy Conservation Agency (ANME);
- Presentation of Case study of Energy Indicator for Buildings (MED ENEC)
- Selection and validation of the collective selection of indicators to be developed within the project;
- Validation and evaluation of the list for data collection for individual countries;
- Validation of the planning intervention country experts;
- Definition of rules for technical assistance to country expert.

The workshop agenda is attached in annex.

### **Participants:**

- Representative of Plan Bleu : Mr. El Habib El Andaloussi,
- Representative of RCREEE : Mrs. Amel Bida,
- General Manager of ANME : Mrs. Noura Laaroussi Benlazreg,
- Representative of MED-ENEC: Mrs. Florentine Visser
- The 10 country experts,
- The focal points of RCREEE for all countries (except those of Palestine, who was absent for these days)
- The representatives of other invited organisms (OTED, AFD, MEDENER).

The list of participants is presented in annex.

## **Opening and introduction to the workshop**

1. The workshop was opened by Mrs. Noura Laaroussi Benlazreg, General Director of the ANME, who emphasized the importance of energy efficiency indicators in the definition and monitoring of any energy conservation policy. She particularly mentioned the information system on energy conservation and environment in Tunisia, developed in cooperation between the ANME and ADEME and its

contribution in the monitoring and evaluation of the Tunisian policy and programs in this field.

2. Then, Mr. El Habib El Andaloussi, representative of the Plan Bleu, introduced Plan Bleu and its activities, including those related to energy efficiency. He also presented the project of energy conservation indicators in MENA countries: its objectives, its components, its organization and planning.
3. Mrs. Amel Bida, RCREEE representative, presented the Centre and its activities. She also explained the reasons for the Centre to launch, in cooperation with the Plan Bleu, the project of energy conservation indicators in the MENA region, covering the 10 RCREEE member states.
4. Then a presentation of the participants was held, followed by a presentation of the program and organization of the workshop by Rafik Missaoui.

## Participants training

### The energy balance

The energy balance is the basic element of the calculation of energy conservation indicators, since it represents the main source of energy data. Basic understanding of the concepts related to energy accounting seems are necessary.

			A	B	C	D	E	F	G	H	K
			Coal	Oil	Gas	Nucl.	Hydro	Geotherm.	RE	Electricity	Total
	lines	in Mtoe									
'High' Of energy balance	1	Primary production									
	2	import/export									
	3	Bunkers, storage/unstorage									
	4	Primary energy Consumption									
	5	Fuel input power plants									
	6	Other transformations									
	7	Final energy Cons.									
'Low' Of balance	8	Industries									
	9	Transport									
	10	Other sectors (Residential...)									
	11	Electricity Production (TWh)									

For this reason, basic training on energy balance was provided by Mr. El Habib El Andaloussi to participants.

Based on energy balance sheets of the International Energy Agency (IEA), he first presented the general structure of the balance sheet and the explanation and meaning of each of its components. He then presented the details to familiarize participants with the reading of the main rows and columns of the energy balance, in the various blocks of the balance components as the top of the balance (production / imports-exports / consumption), the transformation part and lower part (made by total final consumption and sectors consumption).

The special cases of nuclear, hydro and geothermal energy have been presented and their integration in the energy balance was explained. Finally, H. EL Andaloussi introduced the concepts of units, including conversions factors used between the physical original units and the energy units. Mr. H. EL Andaloussi insisted on handling energy balance sheet items to insure the coherence of a national energy balance.

## Indicators

After training on energy balance, Rafik Missaoui provided participants with a basic training on key energy and environmental indicators.

He began by presenting the objectives and purposes of calculating these indicators, which lie mainly in:

1) diagnosis of the energy performance of activities at the macro, sectoral and micro level,

2) benchmarking of energy efficiency

3) design, monitoring and evaluation of energy conservation policies and programs,

4) explanation of energy trends,

5) measurement, reporting and verification (MRV) in the framework of greenhouse gas emissions reduction activities.

He then presented the two main categories of indicators of energy efficiency, namely: descriptive indicators and explicative indicators.

Descriptive indicators are essentially:

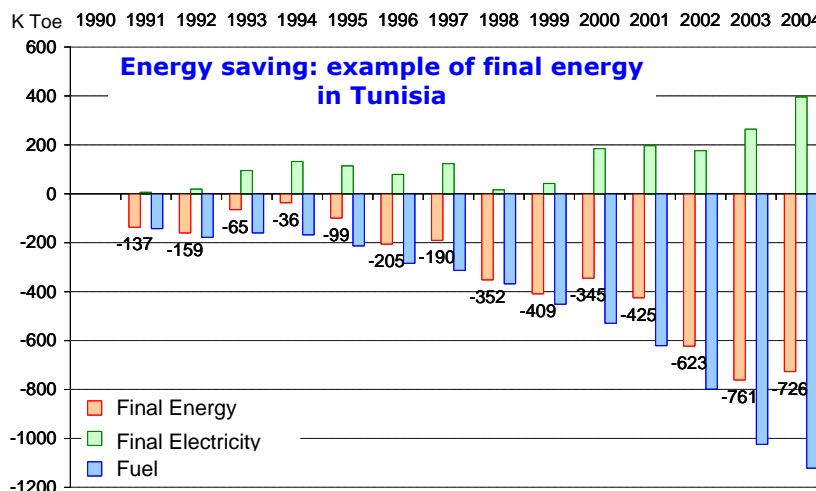
- 1) the primary and final energy intensity at different activity levels (macro and sectoral) and for different types of energy (electricity and fuel),
- 2) unit and specific consumption in different economic branches,
- 3) socio-economic impacts indicators and
- 4) diffusion indicators.

Explicative indicators, such as intensity at constant structure, intensity with climate correction, quantity effect, unit consumption effect, energy efficiency index, are designed to explain the observed trends in energy consumption, by isolating the various effects.

For each type of indicators, R. Missaoui presented the definition, the uses, the calculation method and some illustrative examples.

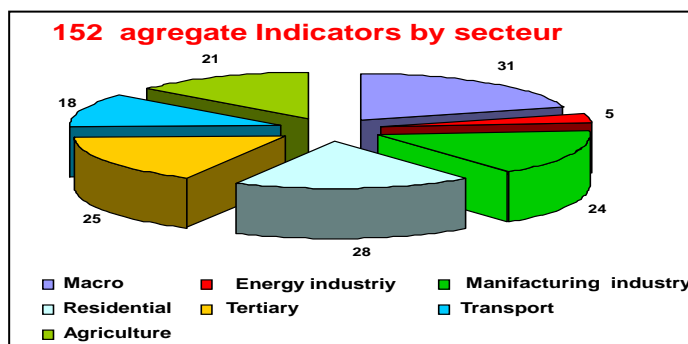
R. Missaoui then presented the main criteria for selecting indicators to guide participants in choosing the indicators to be developed in the framework of the project. These criteria are essentially the coherence, the relevancy to decision-makers at various levels and the data availability.

Finally, key data required to calculate these indicators were presented. These are mainly the socio-economic data, the energy data and the environmental data at the various macro and sectoral levels.



## Illustrations

- To illustrate the calculation of indicators, Ms Leila Bejaoui from ANME presented the case of the information system on Energy Conservation and Environment (SIM2) in Tunisia, developed as part of the Cooperation between ANME and ADEME. This system developed in a flexible and user-oriented way, enables to develop all indicators desired by its user. Thus, in the case of Tunisia, 152 indicators were developed through this system.

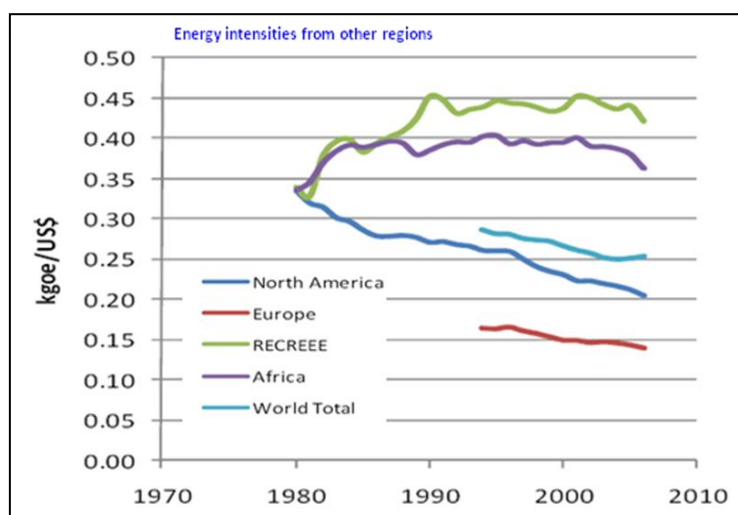


Leila Bejaoui presented particularly the following:

- What is an information system on energy conservation and emissions of CO<sub>2</sub>?
- Why an information system on energy conservation?
- The steps of the process of establishing the information system SIM2 Tunisia;
- A demonstration of the information system SIM2;
- The prospects of development of SIM2.

- Mrs. Amel Bida presented the energy situation in the RCREEE member countries which expect, in the coming years, an annual increase of average primary energy demand of about 5% and a growth in average electricity consumption of 8% per year. This shows the importance and the necessity of a proactive energy conservation policy in these countries.

In response to this situation, she presented the national targets for energy efficiency and renewable energy in the different countries of the region. She then presented the Arab energy efficiency

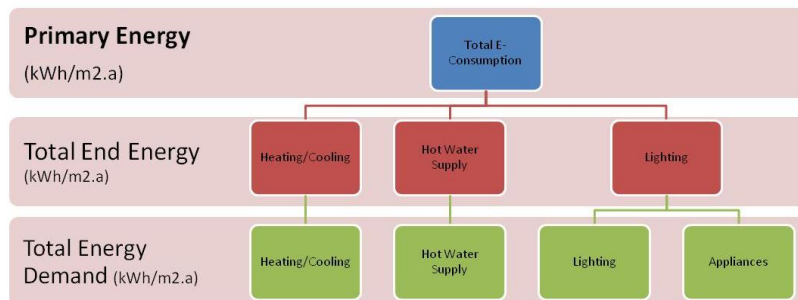


directive initiated by the League of Arab States and supported by the RCREEE. In the framework of this directive the Arab countries committee themselves to establish triennial National Action Plans for Energy Efficiency (NEEAP) with goal of electricity consumption reduction set at the horizon of 10 years, until 2020. The work of RCREEE consists essentially to develop energy efficiency indicators for monitoring and evaluation of the NEEAPs, benchmarking between the countries in the region and decision-making support to national policy makers.

3. Mrs. Florentine Visser, representative of the EU funded MED-ENEC project, showed the importance of energy saving potential in the building sector in the MENA region. And demonstrated this potential through the main Energy Indicators for Buildings from pilot projects built under the MED-ENEC I. And addressed the issue of data availability for reliable indicators calculation in the MENA Building sector, needed for accurate Policy Evaluation.



Indeed, these consumption data can either be approximated by modeling the thermal behavior of building types or monitoring ex post the actual consumption of these buildings, which remains difficult.



## Discussions

Following the various presentations, many questions for explanations and clarifications were made by participants, particularly regarding the concepts of energy balance and indicators.

Discussions also focused on the difficulties of data access for the calculation of the presented indicators.

## Selection of indicators to be developed under the project

### Methodology

1. The objective is to choose, collectively, a selection of energy and environmental indicators that will be calculated, as part of this project, in the target countries. These indicators should be selected on the basis of objective criteria, including relevancy to the country and data availability.
2. To make it easier for participants, a complete list of indicators and data needed to calculate each indicator was presented and distributed to participants (file provided on the CD distributed at the workshop). The latter should indicate for each indicator a score of 1 to 5 according to the difficulty of access to data necessary for calculating this indicator, and their availability. The list of indicators is presented in the appendix.
3. The scoring of indicators for each country is made by a pair consisting of the national expert and the designated focal point for the concerned country. This approach can better reflect the real difficulties and the availability of data necessary to calculate these indicators.
4. The indicators with the average score of all countries greater than or equal to 3 are selected. The results of scoring of each country were then presented in plenary for discussion and approval by the entire group of participants.

## Results of the selection process

The selecting indicators process has led to the selection of 62 indicators as follows:

Sector	Number of Indicators
Macro level	9
Energy transformation	10
Transport	12
Industry	8
Tertiary	7
Residential	11
Agriculture et fishing	5
<b>Total</b>	<b>62</b>

The list of the selected indicators is presented in annex.

## Organization of the following steps of the project

1. The national experts will begin collecting data from the list provided at the kick-off workshop, in close collaboration with the focal points of RCREEE. The role of the latter is to facilitate access to data for experts as well as to validate the data before their final adoption by the project. An Excel file of data organization and indicators calculation will be sent by Alcor by mid-February 2011.
2. The next workshop will be held in early April in a country to be determined later (a priori in Cairo, Egypt). Consultants should send Excel files filled by the end of March 2011.
3. A technical assistance through a hotline is made available to country experts for their questions and queries. The contacts of this hotline include:
  - Rafik Missaoui:
    - Mail: [r.missaoui@alcor.com.tn](mailto:r.missaoui@alcor.com.tn)
    - Phone: +216 71 234 854
    - Skype: rafik.missaoui
  - Adel Mourtada
    - Mail: [ecotech@inco.com.lb](mailto:ecotech@inco.com.lb)
    - Phone: +961 3607590
    - Skype: adel.mourtada
  - Hassen Ben Hassine:
    - Mail: [hasenhasine@yahoo.fr](mailto:hasenhasine@yahoo.fr)
    - Phone: +216 22877702
4. The exchange of mails must always include the following persons:
  - El Habib El Andaloussi: [ehelandaloussi@planbleu.org](mailto:ehelandaloussi@planbleu.org)
  - Amel Bida: [amel.bida@gtz.de](mailto:amel.bida@gtz.de)
  - Rafik Missaoui: [r.missaoui@alcor.com.tn](mailto:r.missaoui@alcor.com.tn)
  - Adel Mourtada: [ecotech@inco.com.lb](mailto:ecotech@inco.com.lb)
  - Hassen Ben Hassine: [hasenhasine@yahoo.fr](mailto:hasenhasine@yahoo.fr)

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## Annexes

## Workshop program

  		<b>Project of energy conservation indicators in Southern Mediterranean Countries</b> Kick-off Workshop, Tunis, January 6-7, 2011	 <small>Regional Center for Renewable Energy and Energy Efficiency</small>
<b>Day 1</b>			
9:00	Welcome and registration		
9:30	Opening		
9:30-9:40	Welcome speech of the General Director of ANME		Mrs Nora Laroussi Benlazreg
9:40-9:50	Presentation of Plan Bleu		El Habib El Andaloussi
9:50-10:00	Presentation of RCREEE		Amel Bida
10:00-10:20	Presentation of country experts		
10:20-10:40	Presentation of project on EE indicators		El Habib El Andaloussi
10:40-11:00	Presentation of programme and workshop organization		Raffik Missaoui
<b>11:00-11:15 Coffee Break</b>			
11:15-11:30	Why EE indicators for RCREEE Member States		Amel Bida
11:30-12:30	Training on energy balances: elaboration, unit conversion and coherence		El Habib El Andaloussi
12:30-13:15	Basic training on energy indicators		Raffik Missaoui
<b>13:15-14:30 Lunch Break</b>			
14:30-15:30	Basic training on energy indicators		Raffik Missaoui
15:30-16:00	SIM2E information system, Tunisia		Leila El Bejaoui (ANME)
16:00-16:030	Presentation of Tunisian indicators (1)		Leila El Bejaoui (ANME)
<b>16h30-16h45 Coffee Break</b>			
16:45-17:15	MED ENEC Case study for Building Indicators		Florentine Visser
17:15-17:45	Discussions and closing		
<b>Day 2 Hosted by R. Missaoui and H. El Andaloussi</b>			
9:00-9:30	Presentation of Tunisian indicators (2)		Leila El Bejaoui (ANME)
9:30-10:15	Sectoral working groups for indicators definition		
10:15-10:45	Collective validation of the choice of indicators to be developed		
10:45-11:15	Definition and discussion on data to be collected		
<b>11:15-11:30 Coffee Break</b>			
11:30-12:15	Presentation of indicators' calculation tool		
12:15-13:00	Definition and discussion on data to be collected		
<b>13:00-14:30 Lunch Break</b>			
14:30-15:00	Definition of expert tasks and planning establishment		
15:00-15:30	Definition of the structure and content of country reports		
15:30-16:00	Definition of modalities of technical assistance to country experts		
<b>16:00-16:15 Coffee Break</b>			
16:15-17:00	Discussions and workshop closing		
	Establishment of the planning of works and of next workshops (date and venue).		

## List of selected indicators

### Macro level

	Indicator	Unit	Data
IPE	Intensity of Primary Energy	toe/ LC	Reference year
			Primary energy consumption
			GDP at constant price
IFE	Intensity of Final Energy	toe/ LC	Reference year
			Final Energy consumption
			GDP at constant price
RFEPE	Ratio of final energy consumption to primary energy	%	Primary energy consumption
			Final Energy consumption
EBR	Ratio of National Energy Bill to GDP	%	Primary energy consumption per energy
			Average international energy price of each energy
			GDP at current price
ESR	Ratio of public subsidies for energy to GDP	%	Final energy consumption per energy
			Average international energy price of each energy
			Average internal energy price of each energy
			GDP at current price
AEF	Average emission factor	teCO2/toe	Primary energy consumption for each energy
			Average emission factor of each energy
			Primary energy consumption
ICO2	Intensity of CO2	teCO2 / LC	Reference year
			Primary energy consumption per energy
			Average emission factor of each energy
			GDP at constant price
AECH	Average Primary Energy Consumption per habitant	Toe/h	Primary energy consumption
			Population
AELCH	Average Primary Electricity Consumption per habitant	kWh/h	Electricity consumption
			Population

## Energy transformation sector

	Indicator	Unit	Data
URIC	Utilization rate of the installed power generation capacity	%	Total produced electricity
			Total installed generation capacity
AETS	Apparent Efficiency of Energy Transformation Sector	%	Transformation Sector Energy Input
			Transformation Sector Energy Output
PGEFF	Power generation efficiency - fossil fuel	%	Thermal power plants Produced Electricity
			Thermal Power plants Input
SCFFP	Specific Consumption of fossil fuel power plants	toe/GWh	Thermal plants Produced Electricity
			Thermal Power plants Input
PGF	Power generation efficiency	%	Total Produced Electricity
			Total Power plants Input
SCPG	Specific Consumption of Power Generation	toe/GWh	Total Produced Electricity
			Total Power plants Input
TDEE	Transmission and Distribution Electricity Efficiency	%	Total Electricity Output of the Transmission and Distribution System
			Total Electricity Input to the Transmission and Distribution System
ESEF	Electricity Sector Emission Factor	teCO2/GWh	Total GHG Emission of the Electricity Sector
			Total Electricity Output of the Electricity Sector
PGEF	Power Generation Emission Factor	teCO2/Gwh	Total Produced Electricity
			Total GHG Emission of the Power Generation System
SREC	Share of installed RE electricity capacity	%	Installed RE electricity capacity
			Total Installed generation capacity

## Transport sector

### All transport sector

	Indicator	Unit	Data
FEIT	Final Energy Intensity	toe/ LC	Final Energy Consumption of Transport Sector
			GDP at constant price
STEHE	Share of household expenditure for transport	%	Household Expenditures for Transport
			Total Household Expenditures
ICO2	Intensity of CO2	teCO2/toe	Energy consumption of the sector by energy
			Emission factor for each energy
			GDP at constant price
AEFTS	Average emission factor of transport sector	teCO2/toe	Energy consumption of the sector by energy
			Emission factor for each energy
			Final Energy Consumption of Transport Sector

### Road transport

	Indicator	Unit	Data
UCC	Average Unit Consumption of Cars	teo/car/year	Total Number of private Cars
			Total Fuel Consumption for private Cars
UCC G	Average Unit Consumption of gasoline Cars	teo/car/year	Total Number of private gasoline Cars
			Total Fuel Consumption for private gasoline Cars
MR	Motorization rate	persons / Vehicle	Total Number of private Cars
			Population

### Transport ferroviaire

	Indicator	Unit	Data
SCRW	Specific consumption for Rail ways	toe/ p.km	Total Number of passengers
			Total Energy consumption of trains
			Total number of kms operated

### Air and maritime transport

	Indicator	Unit	Data
SCAT	Specific consumption for air transport	koe/ p.km	Total Number of passengers
			Total Energy consumption of the sector
			Total number of kms operated
SCMT	Specific consumption for maritime transport	koe/ t.km	Total Number of tones
			Total Energy consumption of the sector
			Total number of kms operated
SEAT	Specific emission for air transport	teCO2/p.km	Energy consumption of the sector by energy
			Emission factor for each energy
			Final Energy Consumption of the Sector
			Total Number of passengers
SEMT	Specific emission for maritime transport	teCO2/t.km	Total number of kms operated
			Energy consumption of the sector by energy
			Emission factor for each energy
			Final Energy Consumption of the Sector
			Total Number of passengers
			Total number of kms operated

## Industry sector

	Indicator	Unit	Data
IIFE	Intensity of Industry Sector	toe/ LC	Reference year
			Final energy consumption of Industry Sector (ktoe)
			Aded value at constant price
SEC	Specific Branch Energy Consumption Cement Phosphate Steel Paper .....	toe/t clinker toe/t toe/t toe/t toe/t	Energy consumption (ktoe)
			Production (t)
IEBR	Ratio of Industry sector Energy Bill to Added Value	%	Final energy consumption per energy of IS
			Average international energy price of each energy
			Aded value at constant price
IESR	Ratio of public subsidies to added value	%	Final energy consumption per energy of IS
			Average international energy price of each energy
			Average internal energy price of each energy
			Aded value at constant price
IESRGB	Ratio of public subsidies for energy to Government Budget	%	Final energy consumption per energy of IS
			Average international energy price of each energy
			Average internal energy price of each energy
			Government budget at current price
IELSR	Ratio of public subsidies for electricity to GDP	%	Subsidies to electricity consumed in Industrial sector
			Aded value at constant price
IAEF	Average emission factor	teCO2/toe	Final energy consumption of IS
			Average emission factor of each energy
			Final energy consumption
IICO2	Intensity of CO2	teCO2/ LC	Reference year
			Final energy consumption per energy of IS
			Average emission factor of each energy
			Aded value at constant price

## Tertiary sector

	Indicator	Unit	Data
TIPE	Intensity of Tertiary Sector	toe/ LC	Reference year
			Final energy consumption of Tertiary Sector (ktoe)
			GDP at constant price
HECNG	Energy Consumption per night guest	koe/Nigh Guest	Final energy consumption of Hotel Sector (ktoe)
			Total number night guest
TESRGB	Ratio of public subsidies for energy to Government Budget	%	Final energy consumption per energy of TS
			Average international energy price of each energy
			Average internal energy price of each energy
			Government budget at current price
TELSR	Ratio of public subsidies for electricity to GDP	%	Subsidies to electricity consumed in Tertiary sector
			GDP at current price
TAEF	Average emission factor	teCO <sub>2</sub> /toe	Final energy consumption of TS
			Average emission factor of each energy
			Final energy consumption
TICO <sub>2</sub>	Intensity of CO <sub>2</sub>	teCO <sub>2</sub> / LC	Reference year
			Final energy consumption per energy of TS
			Average emission factor of each energy
			GDP at constant price
TDRSHR	Diffusion Rate of Solar Water Heaters in tertiaire sector	m <sup>2</sup> /1000 hab	Total area of Solar Water Heaters in TS
			Number of habitants

## Residential sector

	Indicator	Unit	Data
RIPE	Intensity of Residential Sector	toe/ LC	Reference year
			Final energy consumption of Residential Sector (ktoe)
			GDP at constant price
UECD	Unit Energy Consumption per Dwelling	koe/Dw	Final energy consumption of Residential Sector (ktoe)
			Number of Dwellings
SECD	Specific Energy Consumption	koe/m2	Final energy consumption of Residential Sector (ktoe)
			Total area of Dwellings
UEICD	Unit Electricity Consumption per Dwelling	kWh/Dw	Total electricity consumption of Residential Sector (kWh)
			Number of Dwellings
SEICD	Specific Electricity Consumption	kWh/m2	Total electricity consumption of Residential Sector (kWh)
			Total area of Dwellings
RESRGB	Ratio of public subsidies for energy to Government Budget	%	Final energy consumption per energy of RS
			Average international energy price of each energy
			Average internal energy price of each energy
			Government budget at current price
RAEF	Average emission factor	teCO2/toe	Final energy consumption of RS
			Average emission factor of each energy
			Final energy consumption
RICO2	Intensity of CO2	teCO2/ LC	Reference year
			Final energy consumption per energy of RS
			Average emission factor of each energy
			GDP at constant price
RDRSHR	Diffusion Rate of Solar Water Heaters in Residential sector	m2/1000 hab	Total area of Solar Water Heaters
			Number of habitants
ERACR	Equipement Rate of Air conditioning in Residential sector	Unit/Dw	Total number of air conditioning units
			Number of Dwellings
ERFR	Equipment Rate of refrigerator in Residential sector	Unit/Dw	Total number of refrigerator units
			Number of Dwellings

## Agriculture and fishing sector

	Indicator	Unit	Data
FEIA	Final Energy Intensity	toe/ LC	Final Energy Consumption of Agriculture
			AV of agriculture at constant price
FEIF	Final Energy Intensity	toe/ LC	Final Energy Consumption of fishing
			AV of fishing at constant price
SCF	Specific consumption of fishing	toe/ tone	Energy consumption for fishing
			Total physical production of fishing
CA	Total cultivated area	km <sup>2</sup>	Total cultivated area
	Dry cultivated area	km <sup>2</sup>	Dry cultivated area
	Irrigated cultivated area	km <sup>2</sup>	Irrigated cultivated area
NEW	Number of equipped wells with Moto pumps		Number of equipped wells with Moto pumps
	Number of equipped wells with electro pumps		Number of equipped wells with electro pumps



**Atelier de démarrage « Projet des indicateurs de maîtrise de l'énergie dans les pays de la rive sud de la Méditerranée »**

**Kick-off Workshop on "Project of energy conservation indicators in the countries of southern shore of the Mediterranean"**

المرکز الإقليمي للطاقة المتجددة وكفاءة الطاقة  
**RCREEE**  
 Regional Center for Renewable Energy and Energy Efficiency

Tunis (TU), 6 & 7/01/2011

### Liste des participants / List of participants

<b>Doria ABBAS MOHAMED</b> Head of Industrial Statistics Central Agency for Public Mobilization and Statistics EGYPT	E-mail	Doria_a@capmas.gov.eg
<b>Ali Mohamed AL-ASHWAL</b> YEMEN	E-mail	amashwal48@gmail.com
<b>Abdul-Motaleb AL-NUGRUSH</b> Head of Statistical and Information Division Ministry of Energy and Mineral Resources JORDAN	E-mail	abdoh_nugrush@yahoo.co.uk
<b>Abd Elrafik BELAL</b> Chargé d'études technique Agence Nationale pour la Promotion et la Rationalisation de l'Utilisation de l'Energie (APRUE) ALGERIE	E-mail	rafik_belal@yahoo.fr
<b>Mohamed BERDAI</b> Directeur coopération internationale CDER (Centre de Développement des Energies Renouvelables) MAROC	E-mail	m.berdai@cder.org.ma
<b>Amel BIDA</b> Senior Expert RCREEE EGYPT	E-mail	amebida@yahoo.fr

<b>Ghassen DIB</b> Electrical Engineer The Lebanese Center for Energy Conservation (LCEC) LEBANON	E-mail	ghassan.dib@gmail.com gdeeb@cyberia.net.lb
<b>EI Habib EL ANDALOUSSI</b> Chargé de mission Energie PLAN BLEU France	E-mail	ehelandaloussi@planbleu.org
<b>Leila EL BEJAOU</b> National Agency for Energy Conservation TUNISIE	E-mail	
<b>Mohamed Salah ELSOBKI</b> Professor Electric Power Systems, Director Energy Research Center (ERC) Faculty of Engineering, Cairo University EGYPT	E-mail	sobki54@hotmail.com
<b>Fatiha GHERBI</b> Chargée d'études statistiques Agence Nationale pour la Promotion et la Rationalisation de l'Utilisation de l'Energie (APRUE) ALGERIE	E-mail	fgherbi@aprue.org
<b>Mohammed HMAMOUCI</b> Consultant Senior SIAHH Consultant MAROC	E-mail	moh00hmamouchi@yahoo.fr
<b>Mohamad Kassem KORDAB</b> SYRIA	E-mail	mkordab@yahoo.com
<b>Aicha LAABDAOUI</b> Head of Energy Efficiency Service Ministry of Energy, Mines, Water and Environment MAROC	E-mail	a.laabdaoui@mem.gov.ma

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<b>Noura LAROUSI</b> Directrice Générale ANME TUNISIE	E-mail	dganme@anme.nat.tn
<b>Rafik MISSAOUI</b> Directeur Général ALCOR TUNISIE	E-mail	r.missaoui@alcor.com.tn
<b>Adel MOURTADA</b> ALMEE (Association Libanaise pour la Maîtrise de l'Energie et Environnement) LEBANON	E-mail	ecotech@inco.com.lb
<b>Mélanie MOUSSOURS</b> Chargée de projets Environnement AFD-TUNIS TUNISIE	E-mail	moussoursm@afd.fr
<b>Abdul kadir OBEID BASALAH</b> Engineer Ministry of Electricity and Energy. Dept. of Renewable Energy YEMEN	E-mail	malshaabi@gmail.com
<b>Nejib OSMAN</b> Directeur des Etudes ANME TUNISIE	E-mail	osman.nejib@anme.nat.tn
<b>Walid SHAHIN</b> Acting President NERC (National Energy Research Center) JORDAN	E-mail	w.shahin@nerc.gov.jo
<b>Mohamed.D. SIDON</b> Renewable Energy Authority of Lybia LIBYA	E-mail	m_sidoon@hotmail.com
<b>Nouri SOUSSI</b> Directeur de l'OTED ANPE TUNISIE	E-mail	oted@anpe.nat.tn
<b>Jolanar TANBAKI</b> Engineer Public Establishment for Electrical Generation and Transfer SYRIA	E-mail	jolanar62@hotmail.com or jolanar26@hotmail.com

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<b>Florentine VISSER</b> MED-ENEC Key Expert GTZ International Services EGYPT	E-mail	<a href="mailto:florentine.visser@gtz.de">florentine.visser@gtz.de</a>
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<b>Julliette LENGLOIS</b>  AFD-TUNIS TUNISIE	E-mail	<a href="mailto:lengloisj@afd.fr">lengloisj@afd.fr</a>
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<b>Widad BEN NACEUR</b>  AFD-TUNIS TUNISIE	E-mail	<a href="mailto:bennaceurw@afd.fr">bennaceurw@afd.fr</a>
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<b>Hassen BENHASSINE</b> Ingénieur ALCOR TUNISIE	E-mail	<a href="mailto:hasenhasine@yahoo.fr">hasenhasine@yahoo.fr</a>
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***Absents excusés***

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<b>Mohanad AQEL</b> National expert Palestinian Energy Authority (PEA) PALESTINE	E-mail	<a href="mailto:mohanadaqel@yahoo.com">mohanadaqel@yahoo.com</a>
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<b>Mohamed Ali EKHALAT</b> Manager of Planning and Studies Dept REAOL (Renewable Energy Authority of Libya) LIBYA	E-mail	<a href="mailto:libyacigre@gmail.com">libyacigre@gmail.com</a>
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