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Mitigation Enabling Energy Transition in the MEDiterranean region – Phase II

How to monitor energy efficiency and RES policies through a regional Observatory MedObserv'eeer
Agenda

Dr Didier BOSSEBOEUF, Scientific advisor, ADEME, France)

REDEC 2023– meetMED II
6 July 2023
Lebanon

- **Introduction**: The need to implement a Monitoring and Evaluating EE and RE system : Dr Didier Bosseboeuf (Leader of the activity A2.4, Meetmed, ADEME (France)

- **Presentation of the Med-Observer tool** and its current status of implementation in the SouthMed region (Dr Didier Bosseboeuf (MeetMED, ADEME)

- **National report on EE indicators**
- – Lebanon Case study : Dr Adnan Jouni (Director of the Department of Energy and Water, ALMEE)
  - Algerian Case study : Souad Azouz, Mrs. Wadiha Klouche (Chef de projet Statistique (Azzouz), et Responsable Observatoire de la Maitrise de l'Energie, APRUE)

- **Training on RE indicators (**Dr Didier Bosseboeuf, Meetmed, ADEME)

- **Conclusion and recommendations (**Dr Didier Bosseboeuf, (Meetmed, ADEME)

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Mitigation Enabling Energy Transition in the MEDiterranean region – Phase II

How to monitor energy efficiency policies and RES through a regional Observatory MedObserver : A good practice in SMECs

Dr Didier BOSSEBOEUF, Scientific advisor, ADEME, France)

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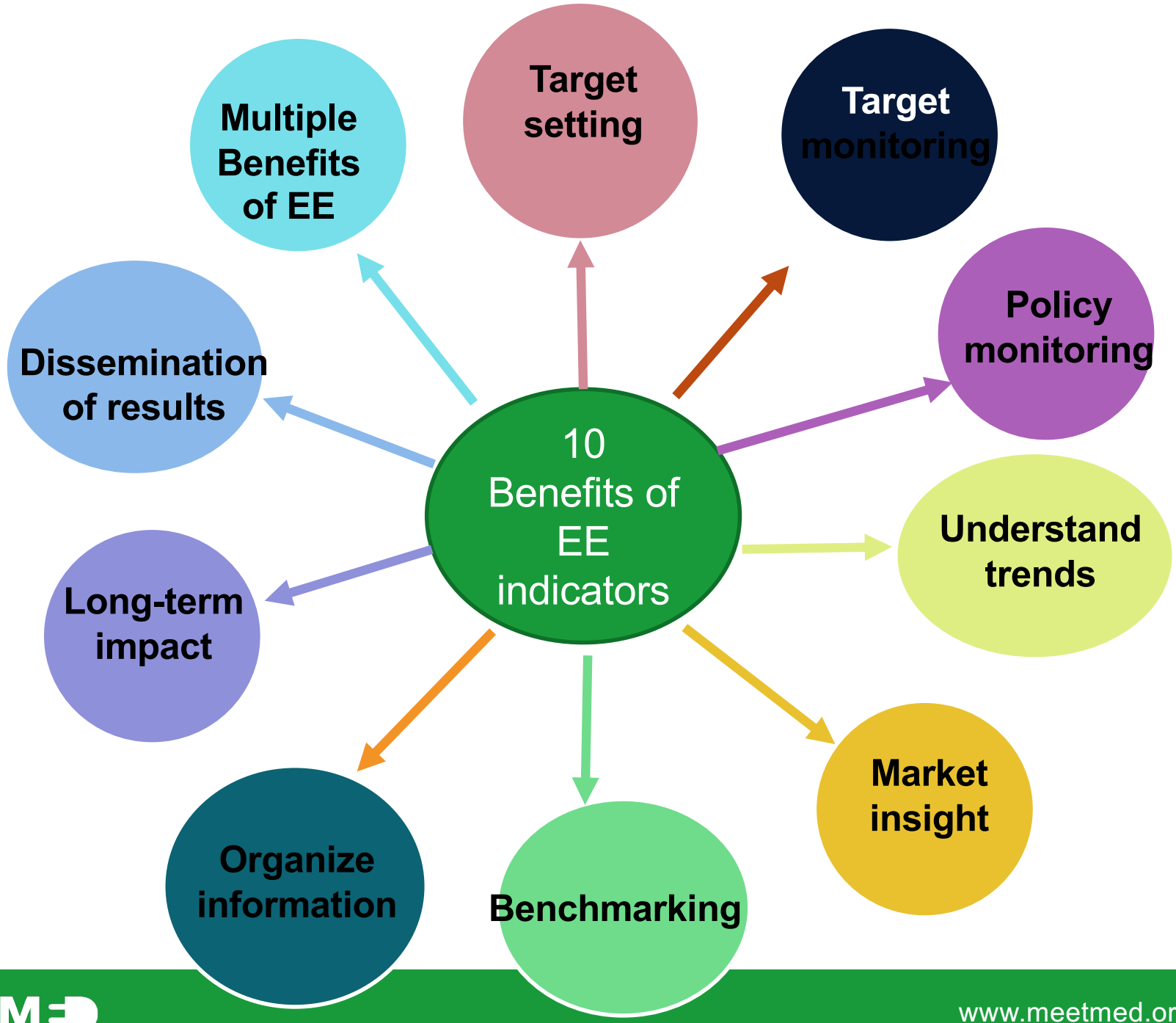
Lebanon


Multiple Benefits of EE
Target setting
Target monitoring
Policy monitoring
Dissemination of results
10 Benefits of EE indicators
Understand trends
Long-term impact
Organize information
Benchmarking
Market insight

Why a monitoring tool ?

- EEI need data on activity and data on energy consumption that usually come multiple sources: it is important to well organise and document all the required data.

- In addition, transparency of methodology it is necessary. We include the calculation of EEI, that are just division for simple indicators but can be more complex for advanced indicators.

- The monitoring tool we proposed is an Excel file, also called "data template", that have been initially developed and further refined in Europe for the ODYSSEE projects.

- Similar templates have been developed in other regions (Latin America or North Africa) as well as at national level for national energy efficiency agencies (e.g. Brazil, Mexico, India, Thailand, Algeria, Greece, Turkey). In that case they are customised according to the data availability in each country and the important EEI issues.

P&M and EE indicators :
From the most simple case ...

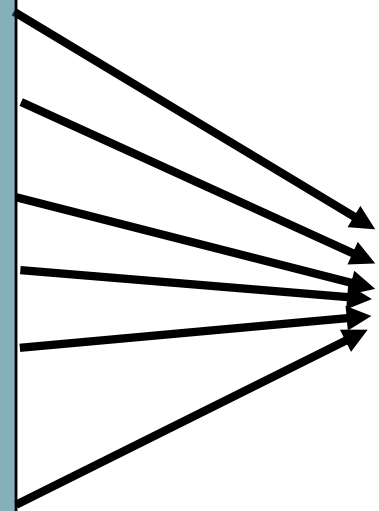
Measure
Building code

Target
New buildings

EE indicator
Goe/M2 of new building

To a more complex situation …
Policy-mix for new cars and related EE indicators

- Support to R&D
- EU Standard on CO2 emissions
- Voluntary agreement
- Labelling
- Technology procurement
- Incentives for clean vehicles
- Taxation
- Car scrapage scheme

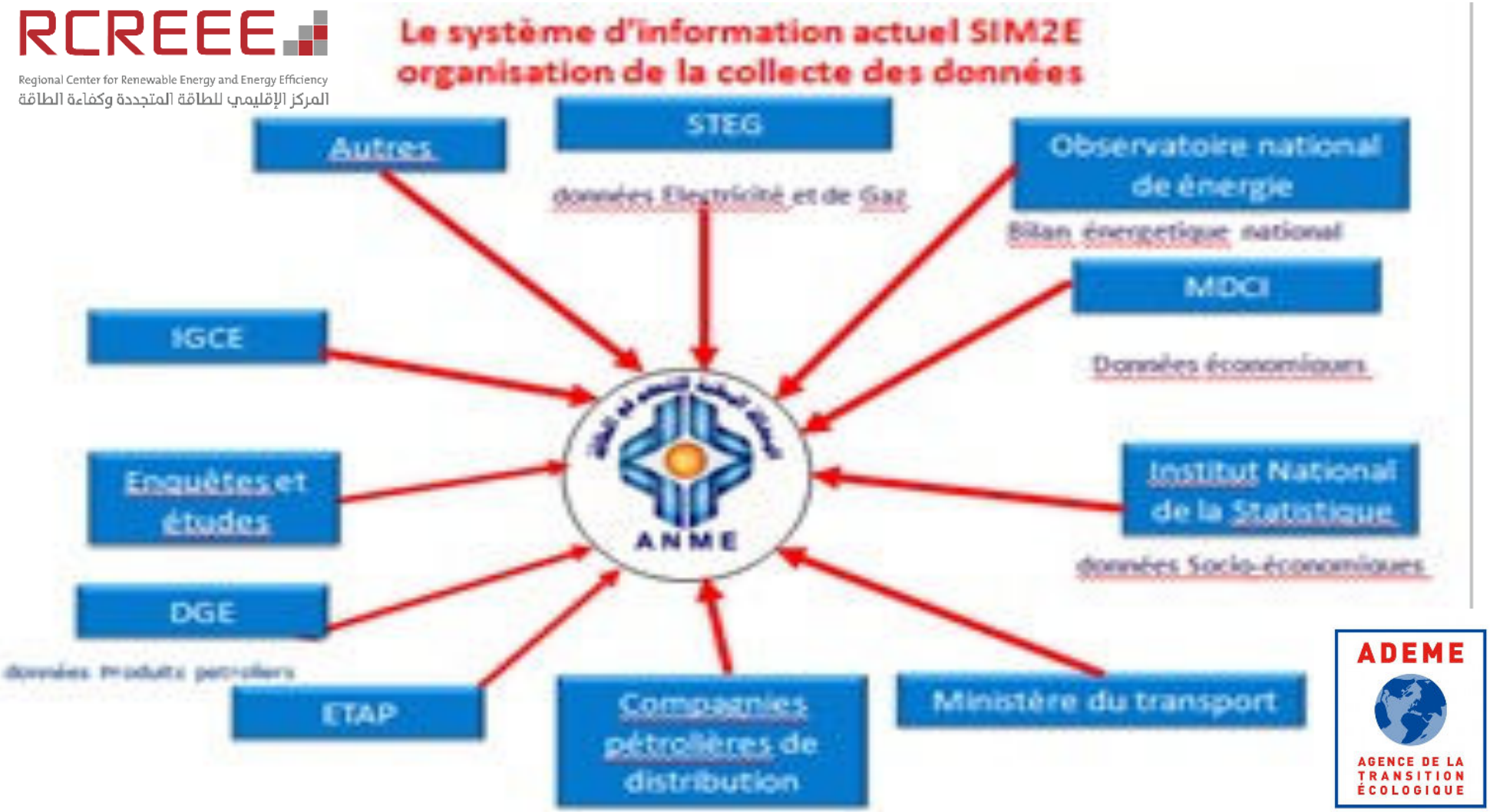


Test value
l/100km (km/l)
gCO_2 per km

EE Policies and Indicators ;
The case of new vehicles in France

To organise a sustainable framework for data providers for monitoring energy efficiency: Tunisia

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



ADEME
AGENCE DE LA TRANSITION ÉCOLOGIQUE

Monitoring energy efficiency in SMECs: Main features of the meetmed'observer initiative

- **Coordination :** ADEME with a co-charing of RCREEE
- **Participating countries**:
- **Duration**: 30 Months

- **Technical coordination**: ADEME, RCREEE, Enerdata: Propose methodology, perform trainings and on job assistance, manage the data base and data mapper,

- **National task force :** composed with data providers (ie National statistics office, energies utilities, technical associations, universities etc.) and key stakeholders (Ministries et.). Experts participate to the meetings and trainings, perform the data collection and disseminate the results of the task 2.4, including in other meetMED WPs.

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MED'ObservEER : Monitoring energy efficiency policies
Countries Expectations and impact per country

- Each country will develop and manage a **national monitoring system for evaluating energy efficiency policy impacts** and energy saving calculations in particular for the building sector and electrical appliances.

- They will benefit of **international comparison** based on harmonized set of energy efficiency indicators and exchange of information on good practices of data collection and energy efficiency trends analysis.

- They will have also **exchange on information of practices on energy modelling practices and NEEAP** development and implementation.

The Med'ObervEER initiative : Objectives

- To implement a national energy efficiency monitoring system;
- **To develop a common Regional Energy Observatory Database on EE indicators** in particular on buildings and appliances;
- To monitor the **NEEAPs** and **national strategies' implementation** providing inputs on reports, strategic recommendations for the implementation of WP3 and WP4.
- To exchange on good practices **on energy demand and energy efficiency modelling and prospective** to provide inputs for the process of defining energy scenarios for the region, that could be endorsed by UfM REEE platforms

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The Med'ObervEER initiative : Objectives

To fulfill these objectives, 4 technical complementary working groups have been launched to perform the specific activities of this activity

TWG1 : Energy efficiency indicators implementation
TWG2 : Energy demand modelling and prospective tools
TWG3 : NEEAPs and national strategies implementation
TWG4 : Specific Energy Efficiency indicators in buildings and appliances

Activity 1 EEIs Data collection	Activity 2 Modelling	Activity 3 NEEAP	Activity 4 Housing and electrical appliances
Template design			Template design
Training data collections New comers	Preparation	Preparation	Training all
Training all			Data collection 1er update
Data collection 1er update			Data collection second update
Data collection second update	Workshop	Workshop	On job assitance
On job assitance			Quality check 1er update
Quality check 1er update			Quality check 2ème update
Quality check 2ème update	Minutes rapport	Minutes rapport	Reporting
National Reporting			Dissemination by NT
Regional reporting			
National seminar			

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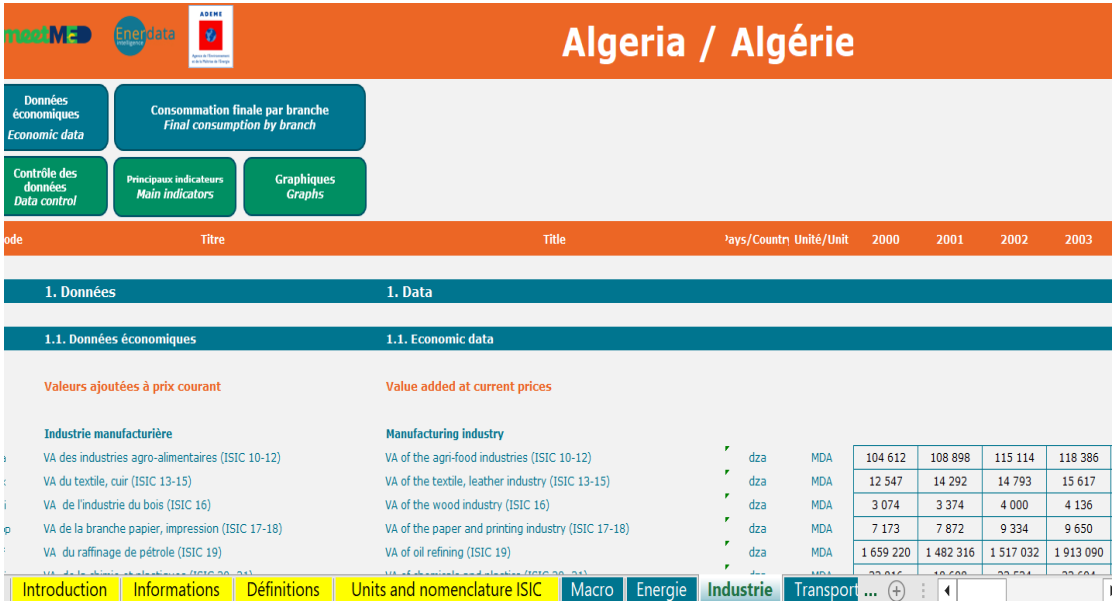
Trainings, data collection, reporting, disseminations



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ALMEE

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Association·Libanaise·pour·la·Maitrise·de·l'Energie·et·de·l'Environnement¶

Tendances·de·l'efficacité·énergétique·au·Liban¶

¶

Rapport·préparé·dans·le·cadre·de·la·mise·à·jour·des·indicateurs·d'efficacité·énergétique·pour·les·pays·méditerranéens¶

MEETMED·II¶

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Mitigation Enabling Energy Transition in the MEDiterranean region – Phase II

How to monitor energy efficiency and RES policies through a regional Observatory
MedObserv'eeer : EEIs What are they?

Dr Didier BOSSEBOEUF, Scientific advisor, ADEME, France)

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Lebanon

The different Energy Efficiency indicators

Type	Level
1. Energy intensity	Final, by sector and industry
2. Adjusted energy intensity	Final and industry
3. Specific energy consumption	By industry and use
4. Specific energy consumption benchmark	Steel, cement, paper, etc.
5. Energy efficiency indices (ODEX, MEDEX)	Final and by sector
6. Energy savings	Final, by sector or industry
7. Dissemination indicators	By sector
8. Intensity CO_2	By sector and industry
9. Specific CO_2	By industry and use

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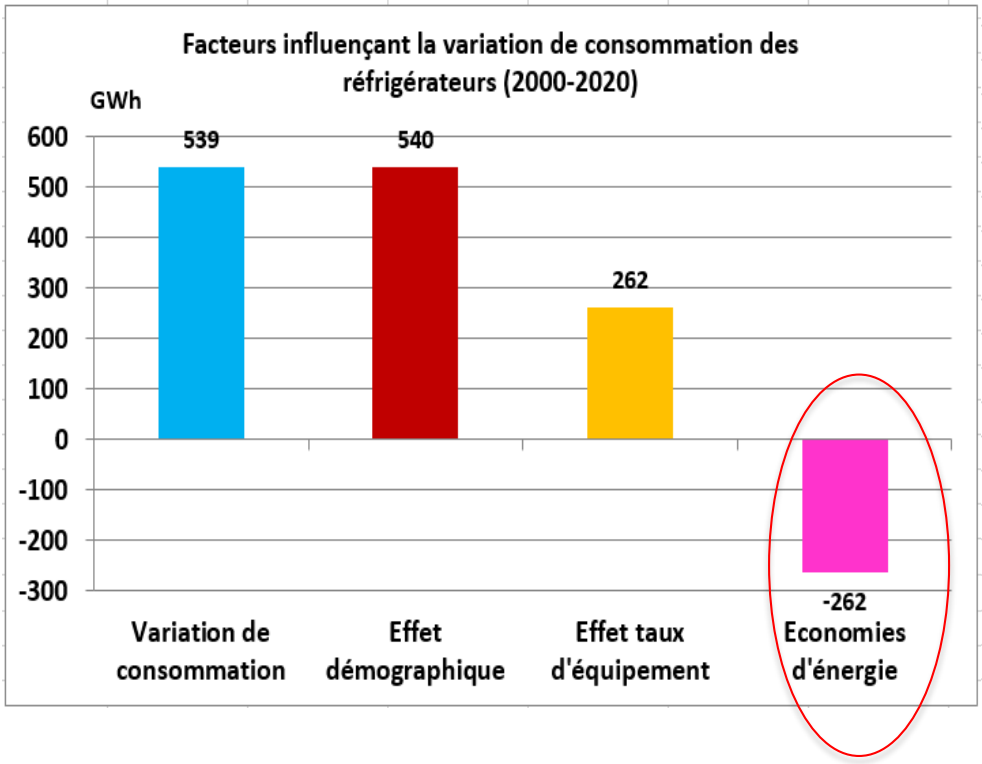
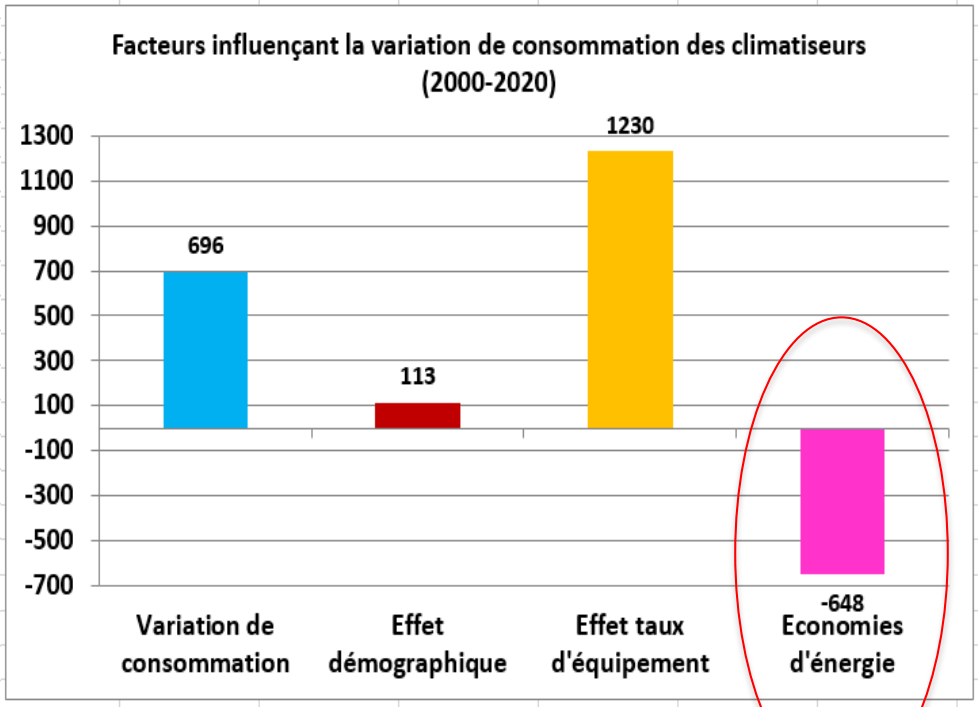
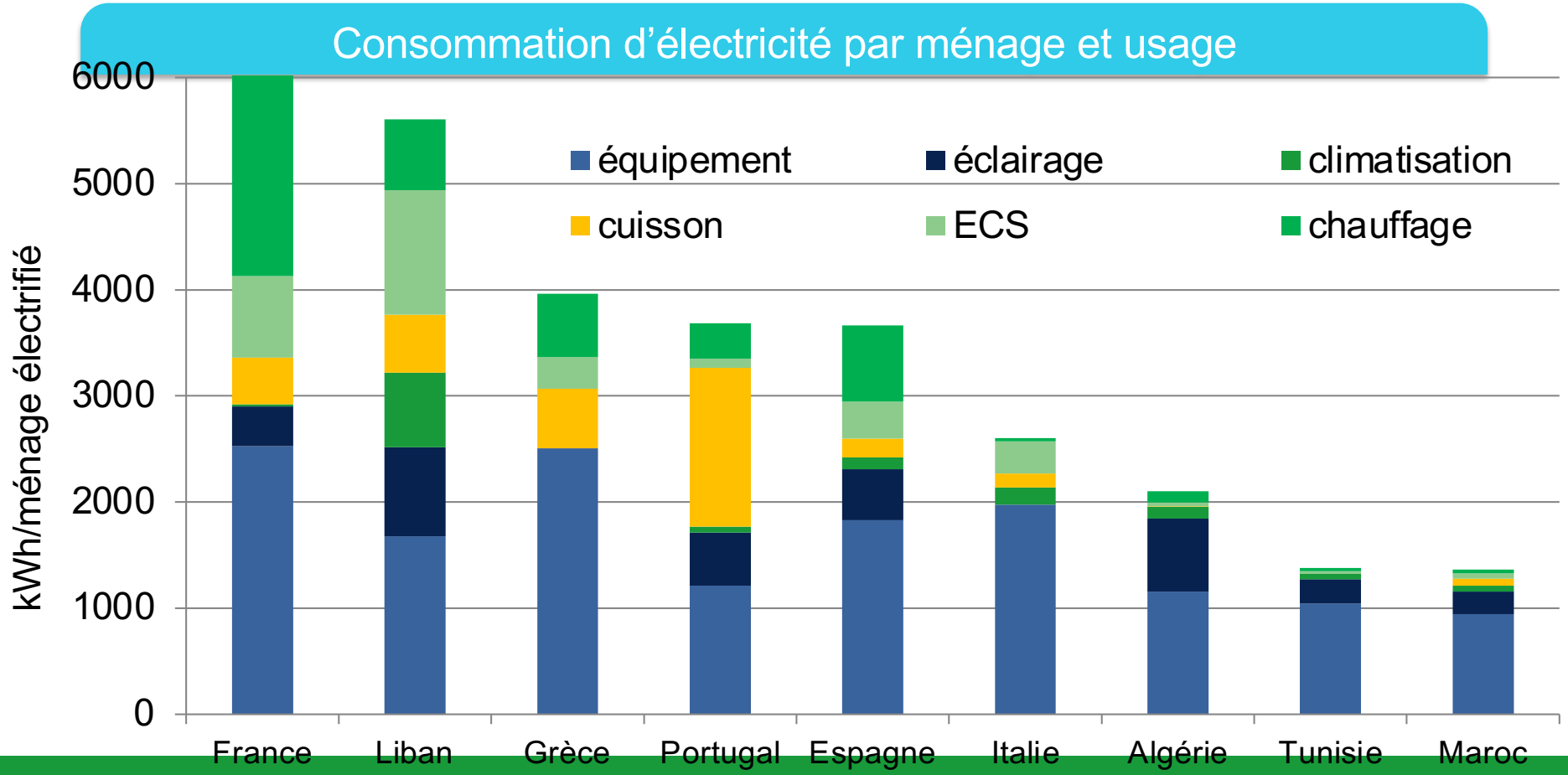
Advanced indicators
The case of Lebanon for refrigerators and ACs (2000-20)





Benchmarking the energy performances

Poids dominant des équipements électroménagers et éclairage en Tunisie, Algérie, Maroc et Italie (80-90% de la consommation d'électricité);
Climatisation surtout importante au Liban (> 10%); environ 5% dans autres pays;
Tunisie et Maroc : ~ 1000 kWh; 2000 kWh en **Algérie, ~3000 kWh pour pays UE**



Grèce: climatisation & éclairage inclus dans équipement
Italie: éclairage inclus dans équipement

Monitoring policies with EEI: why so many indicators are needed?

For a given sector or end-use several indicators can be considered, for different reasons:

- Energy efficiency has different meaning and frontiers (economic versus technical efficiency).

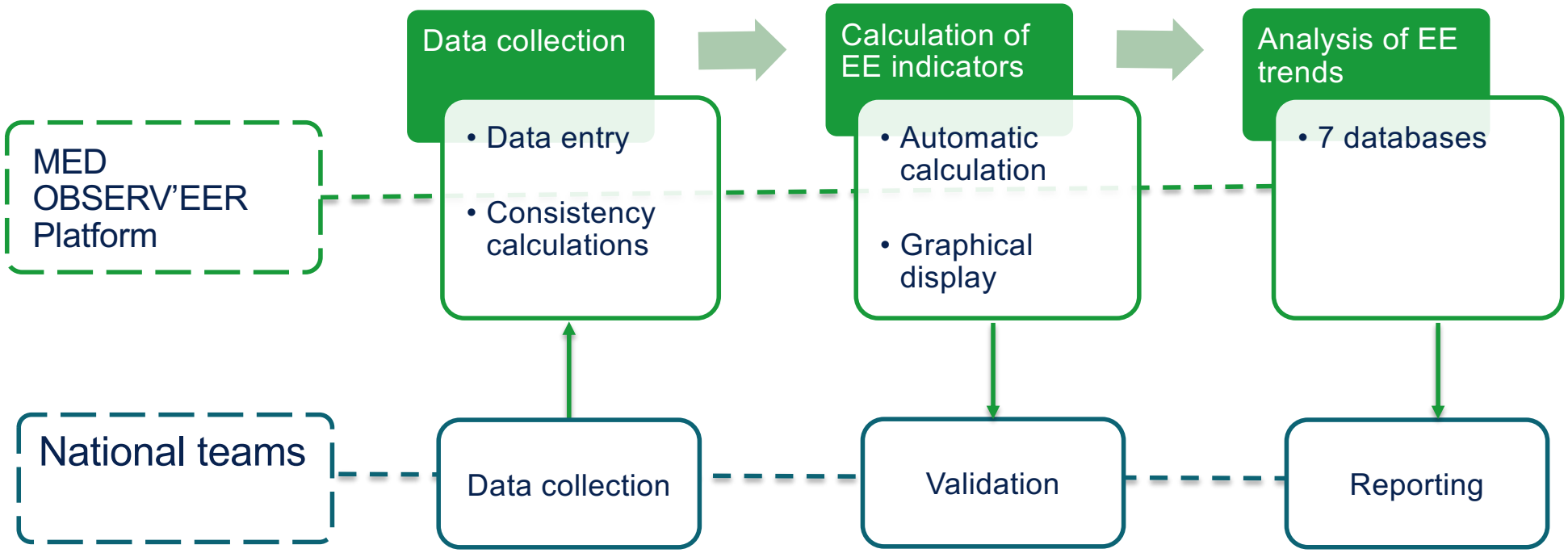
- EE P&Ms are designed and implemented at the level of end-use and equipment (e.g. labels or standards on lighting, cooling), or branch (e.g. voluntary agreements, audits). Therefore, the monitoring of each P&M requires detailed indicators (e.g. kWh/m^2 for new buildings with building codes; kWh/year per refrigerators for labels/standards; gCO_2 or toe per km for Bonus-malus).

- Interpretation of indicators is more powerful when combined; for instance, comparing trend in energy use per household and per m^2 will show the impact of the change in dwelling size.

- Alternative indicators are often necessary to cope with possible data gaps.

The meetobserver database : general principle

Database goal : to produce harmonised energy efficiency indicators (~100) in SMECs to monitor EE policies
Based on previous MeetMED I → Improved and workable template
Coverage : all end-use sectors + Power
Data collection : 50% activity data 50% energy data from 2000 to 202X (2 updates)
Based on official data provided by NTs with centralized consistency check



Households data requirement in the meedmed'observer Database

Data

- Number of households;
- Annual construction;
- Caracteristics of dwellings: number by fuel and end-use; floor area;
- Electrical appliances*: stock, sales; specific consumption;
- Efficient equipment (lighting, solar water heaters, refrigerators, heat pumps, air conditioners): number, sales (inc. by energy label);
- Energy consumption of households by end-use (space heating, water heating, cooking, electrical appliances, lighting, air conditioning)

*Electrical appliances :
- Refrigerators
- Washing machines
- TVs
- Microwaves
- Electric water heating
- Air conditioners
- Fans

Indicators

- Energy/electricity intensity;
- Energy/electricity consumption per dwelling (actual and climate corrected);
- Energy consumption per dwelling by end-use :
  - Space heating,
  - Space cooling,
  - Water heating
  - Cooking
  - Electrical appliances
  - Lighting;
- Equipment rate and heat production of SWH;
- Efficient equipment: lighting (LED and CFL), heat pumps, electrical appliances*

Note: for electrical appliances, we ask for sales by energy label (A or better, B) for refrigerators, washing machines and air conditioners.

New indicators for electrical appliances in the household sector

Freezers	Dishwashers	Electric hot and cold-water dispenser	A/C
Number of dwellings with freezers	Number of dwellings with dishwashers	Number of dwellings with electric hot and cold-water dispenser	
% of dwellings with freezers	% of dwellings with dishwashers	% of dwellings with electric hot and cold-water dispenser	
% of households with at least one freezers	% of households with at least one dishwashers	% of households with at least one electric hot and cold-water dispenser	
Annual sales of freezers	Annual sales of dishwashers	Annual sales of electric hot and cold-water dispenser	
% of new freezer in label class A (or most efficient label) % of new freezer in label class B (or most efficient label)			% of new AC in label class C (or second most efficient label)
Specific consumption of freezers	Specific consumption of dishwashers	Specific consumption of electric hot and cold-water dispenser	
Specific consumption of new freezers	Specific consumption of new dishwashers	Specific consumption of new electric hot and cold-water dispenser	

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MedObserv'eeer : The template

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Lebanon

Presentation of the sectoral tabs : architecture of the data entry area

code series

Series titles

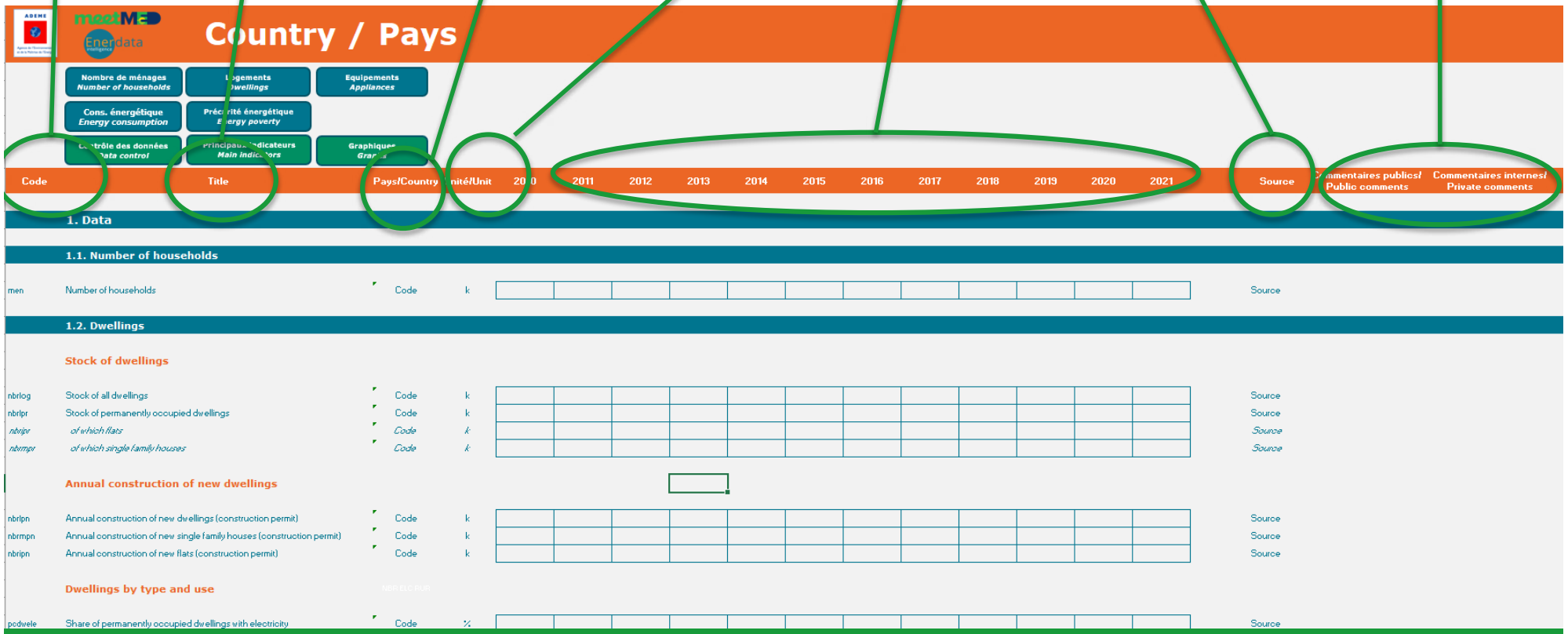
country code

Units (pre-defined)

Data (1990-2017)

Source (acronym or abbreviation)

comments (web link, note on the series, calculation methods/ estimate....)



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MED'ObserEEER EE indicators methodology
It is workable for SMEC's (Marocco)

meetMED

Enerdata intelligence

Morocco / Ma

Resident
Resident

Nombre de ménages *Number of households* | Logements *Dwellings* | Equ ipe

Cons. énergétique *Energy consumption* | Précarité énergétique *Energy poverty*

Contrôle des données *Data control* | Principaux indicateurs *Main indicators* | Gra phi

Titre	Title	s/Couité/U	2000	2001	2002	2003	2004	2005	2006
Consommation énergétique du résidentiel	**Residential energy consumption**								
Consommation de pétrole du résidentiel	Consumption of oil products of residential	mar ktep	782	821	861	902	950	1 440	1 545
Consommation de fioul domestique du résidentiel	*Consumption of heating oil of residential*	*mar ktep*	*9*	*10*	*11*	*12*	*13*	*14*	*14*
Consommation de GPL du résidentiel	*Consumption of LPG of residential*	*mar ktep*	*728*	*769*	*812*	*858*	*906*	*948*	*1 023*
Consommation de gaz naturel du résidentiel	Consumption of natural gas of residential	mar ktep	0	0	0	0	0	0	0
Consommation de charbon du résidentiel	Consumption of coal of residential	mar ktep	0	0	0	0	0	0	0
Consommation d'électricité du résidentiel	Consumption of electricity of residential	mar ktep	320	350	380	420	466	504	547
Consommation d'énergie solaire du résidentiel	Consumption of solar energy of residential	mar ktep						0	0
Consommation de biomasse du résidentiel	Consumption of biomass of residential	mar ktep						1 432	1 272
Consommation totale du résidentiel	**Total consumption of residential**	**mar ktep**	**1 102**	**1 171**	**1 241**	**1 322**	**1 416**	**3 375**	**3 363**
Contrôle	*Control*		100%	100%	100%	100%	100%	100%	100%

Med'ObserVEER indicators methodology
It is workable: case of Algeria

	A	B	C	D	E	F	G	H
162		Consommation spécifique des appareils électrodomestique	Specific consumption of electrical appliances					
163								
164	cselerfg	Consommation spécifique des réfrigérateurs	Specific consumption of refrigerators	dza	kWh/an	456	445	435
165	cselecgl	Consommation spécifique des congélateurs	Specific consumption of freezers	dza	kWh/an	550	543	535
166	cselelvl	Consommation spécifique des machines à laver	Specific consumption of washing machines	dza	kWh/an	686	683	680
167	cselelvv	Consommation spécifique des lave-vaisselles	Specific consumption of dishwashers	dza	kWh/an	300	303	306
168	cseletvs	Consommation spécifique des TV	Specific consumption of TV sets	dza	kWh/an	292	291	289
169	cselelvv	Consommation spécifique des distributeurs électriques d'eau chaude et froi	Specific consumption of hot and cold-water dispensers	dza	kWh/an	nd	nd	nd
170	cselefrm	Consommation spécifique des four à micro-ondes	Specific consumption of microwave ovens	dza	kWh/an	10	10	10
171	cselecli	Consommation spécifique des climatisations	Specific consumption of air conditionners	dza	kWh/an	1 500	1 475	1 450
172	cselefan	Consommation spécifique des ventilateurs	Specific consumption of fans	dza	kWh/an	18	18	18
173								
174		Consommation spécifique des nouveaux appareils électrod	Specific consumption of new electrical appliances					
175								
176	cselerfgth	Consommation spécifique des nouveaux réfrigérateurs	Specific consumption of new refrigerators	dza	kWh/an	410	397	384
177	cselecglth	Consommation spécifique des nouveaux congélateurs	Specific consumption of new freezers	dza	kWh/an	495	484	472
178	cselelvlth	Consommation spécifique des nouvelles machines à laver	Specific consumption of new washing machines	dza	kWh/an	618	608	599

Introduction | Informations | Définitions | Units and nomenclature ISIC | Macro | Energie | Industrie | Transport | Résidentiel | Services | A ...

It is workable and recently updated case of Lebanon

Lebanon / Liban

Données économiques *Economic data* | Consommation finale par branche *Final consumption by branch* | Contrôle des données *Data control* | Principaux indicateurs *Main indicators* | Graphiques *Graphs*

Titre	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Intensité primaire										
Intensité primaire	0,1178	0,1265	0,1227	0,1237	0,1360	0,1351	0,1430	0,140	0,152	0,155
Intensité primaire avec corrections climatiques	0,119	0,127	0,123	0,126	0,136	0,136	0,143	0,144	0,152	0,156
Contribution du secteur électrique à l'intensité primaire	0,0460	0,0381	0,0381	0,0472	0,0441	0,0466	0,0517	0,054	0,055	0,038
Intensité finale										
Intensité finale	0,084	0,081	0,081	0,084	0,091	0,091	0,093	0,095	0,104	0,128
Intensité finale avec corrections climatiques	0,084	0,082	0,082	0,086	0,091	0,092	0,093	0,099	0,104	0,129
Intensité électrique	240	234	242	247	260	267	279	287	320	419
Ratio intensité finale/primaire	71,0	64,4	66,2	67,7	66,8	67,5	65,3	67,9	68,4	82,5
Intensité finale à structure constante de 2000	0,088	0,085	0,085	0,087	0,093	0,097	0,096	0,102	0,112	0,137
Intensité énergétique par secteur										
Intensité énergétique des transports	0,0393	0,0397	0,0383	0,0394	0,0418	0,0451	0,0455	0,046	0,050	0,061
Intensité énergétique de l'agriculture	0,1643	0,1581	0,1483	0,1454	0,1416	0,2064	0,1401	0,192	0,216	0,108
Intensité énergétique de l'industrie	0,0762	0,0703	0,0743	0,0788	0,0905	0,0936	0,1036	0,094	0,121	0,226
Intensité énergétique du tertiaire	0,0099	0,0093	0,0094	0,0100	0,0116	0,0100	0,0103	0,010	0,011	0,015
Intensité énergétique du résidentiel	0,0234	0,0219	0,0228	0,0224	0,0247	0,0215	0,0227	0,026	0,027	0,031
Intensité énergétique du résidentiel (corrigée du climat)	0,0242	0,0224	0,0235	0,0248	0,0246	0,0219	0,0229	0,0299	0,0270	0,0318

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The Metmeed Energy efficiency indicators methodology
It is workable for SMEC's

		% Complétude 2000 - 2020						
Pays	Version	Macro	Energie	Industrie	Transport	Résidentiel [RCREEE]	Tertiaire	Agriculture
Maroc	v1	80%	10%	0%	0%	5%	0%	0%
	v2	85%	50%	60%	50%	5%	30%	40%
	V3	85%	65%	60%	50%	5%	30%	40%
Algérie	v1	95%	95%	90%	85%	100%	90%	99%
	v2	100%	100%	100%	100%	100%	100%	100%
Tunisie	v1	60%	60%	50%	25%	50%	10%	30%
	v2	60%	60%	55%	25%	50%	10%	30%
Liban	v1	100%	100%	100%	100%	60%	100%	100%
	v2	100%	100%	100%	100%	60%	100%	100%

Bien ou très bien renseigné
Plutôt bien renseigné
Moyennement renseigné
Non renseigné ou problème

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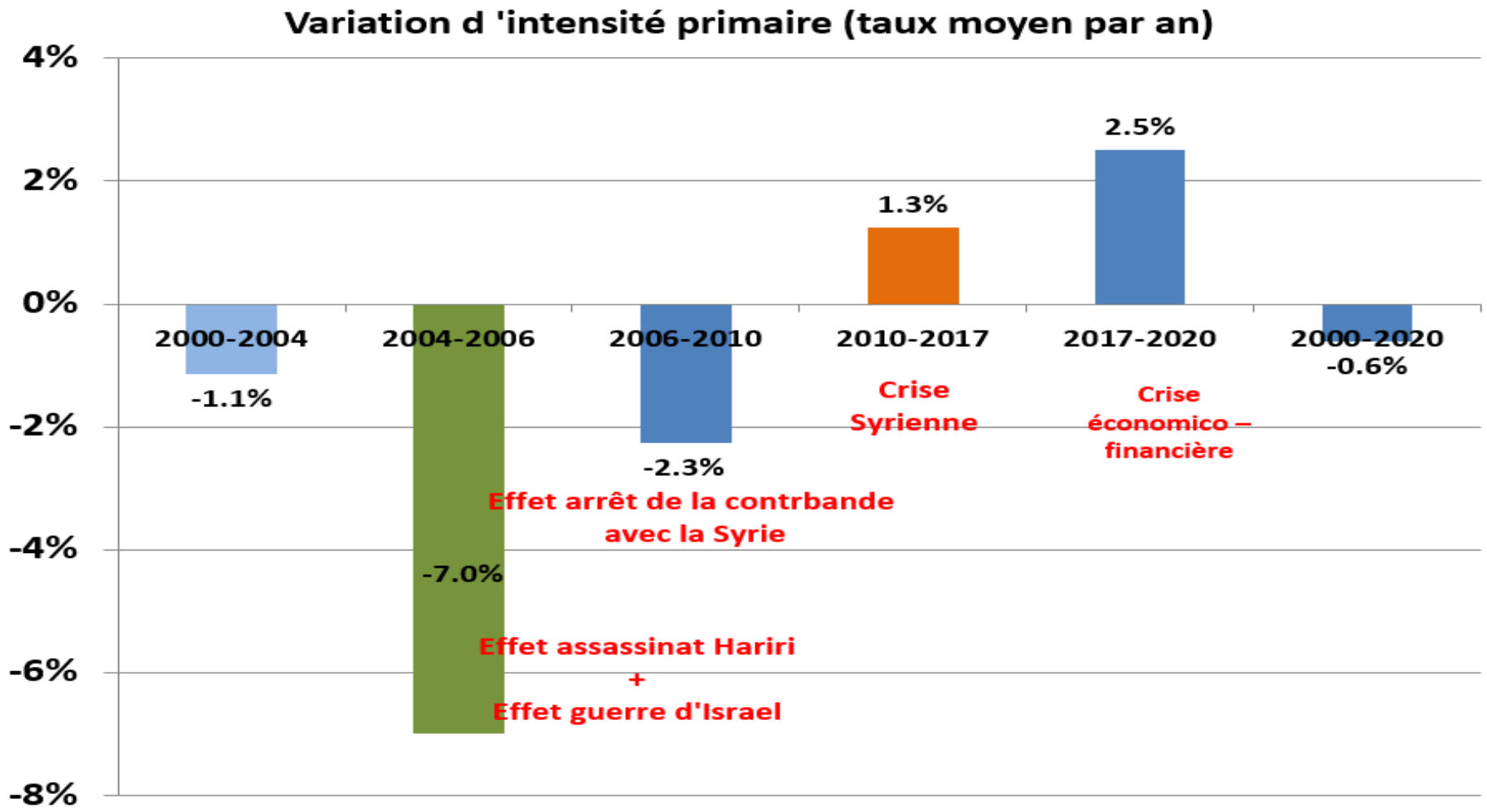
Analysing the trend of an EE indicators
The case of Lebanon (1990-2021)



Monitoring energy efficiency : key messages

- Meetmed2 project recognises **the Multi-Benefits of a monitoring energy efficiency system** beyond the evaluation of energy efficiency policy impact.

- Provision on the launching of a monitoring system should be **included in the energy efficiency law** (target tracking)

- **Monitoring system should be designed at detailed level to properly monitor** EE policies implemented at end-use or efficient technologies.

- SMECs should fund **adequate end-use surveys on a regular basis**

- Meetmed2 project recognizes the value to set-up energy efficiency performances indicators which allow **cross countries comparisons**.

- Already SMECS have demonstrated the feasability and the usefulness of implementing and updating energy efficiency monitoring system. This system can be easaly enlarged to CO2 indicators and can also incorporate renewables and acces to energy (**Monitoring of the OSD7**).

Contact us!

Mitigation Enabling Energy Transition in the MEDiterranean region

Together We Switch to Clean Energy - Phase II

For any inquires or comments, please don't hesitate to contact us

- Work Package leader : @enea.it
- A 2.4 Leader : didier.bosseboeuf@ademe.fr