How to monitor and Evaluate energy efficiency policies through a regional energy observatory?

MedObservEER : A good practices in SMECs

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with the collaboration of Hossam Alherafi - RCREEE

MEETMED WEEK
09 – 11 MAY 2023
MARRAKESH - MOROCCO

Second meetMED Week

May 10th 2023

Marrakech

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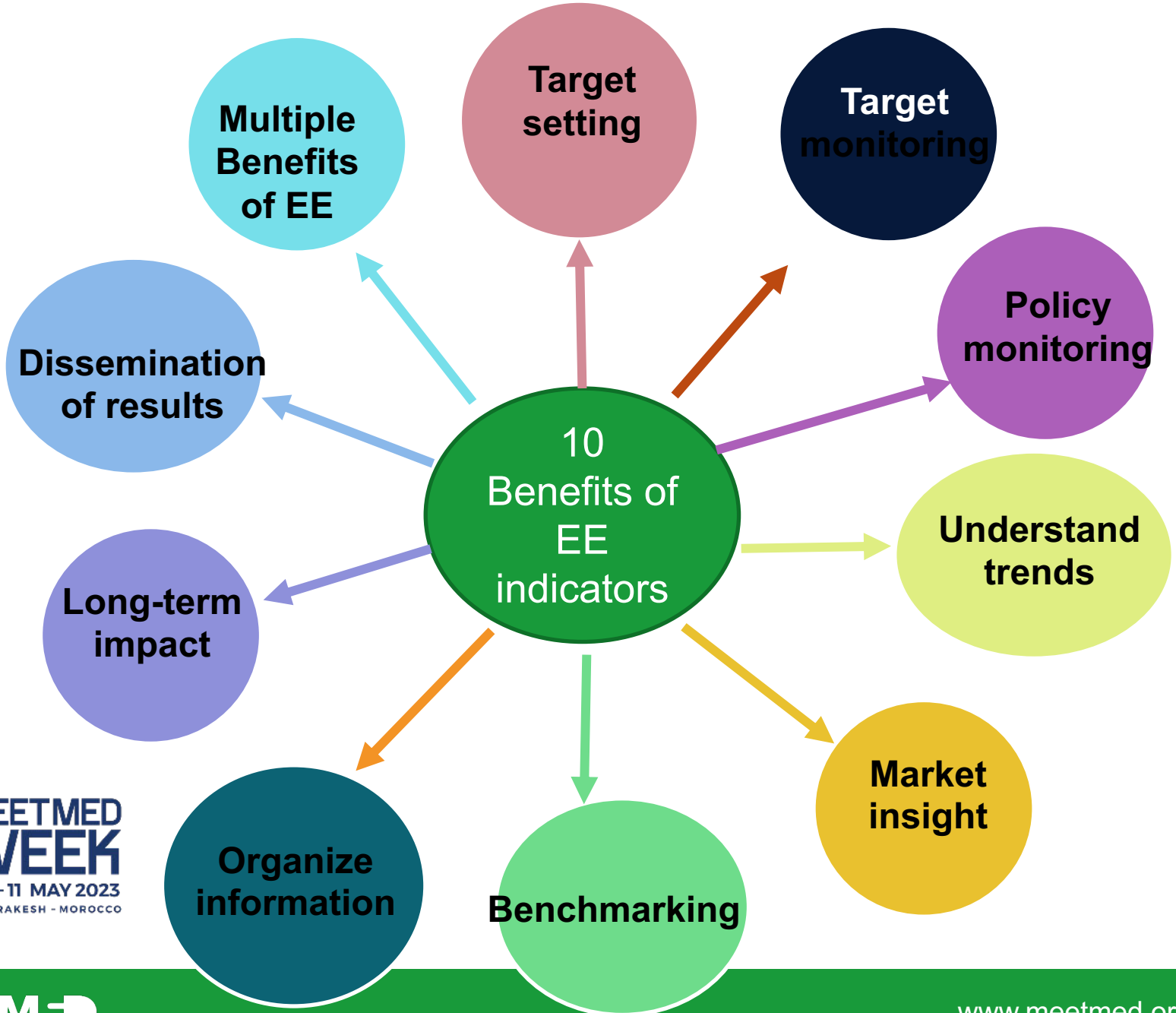

Multiple Benefits of EE
Target setting
Target monitoring
Dissemination of results
Policy monitoring
10 Benefits of EE indicators
Understand trends
Long-term impact
Organize information
Benchmarking
Market insight

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 ...

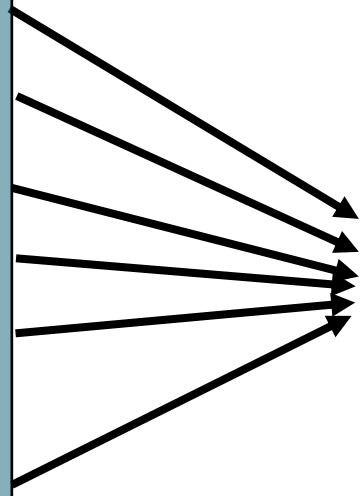
Measure
Building code

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

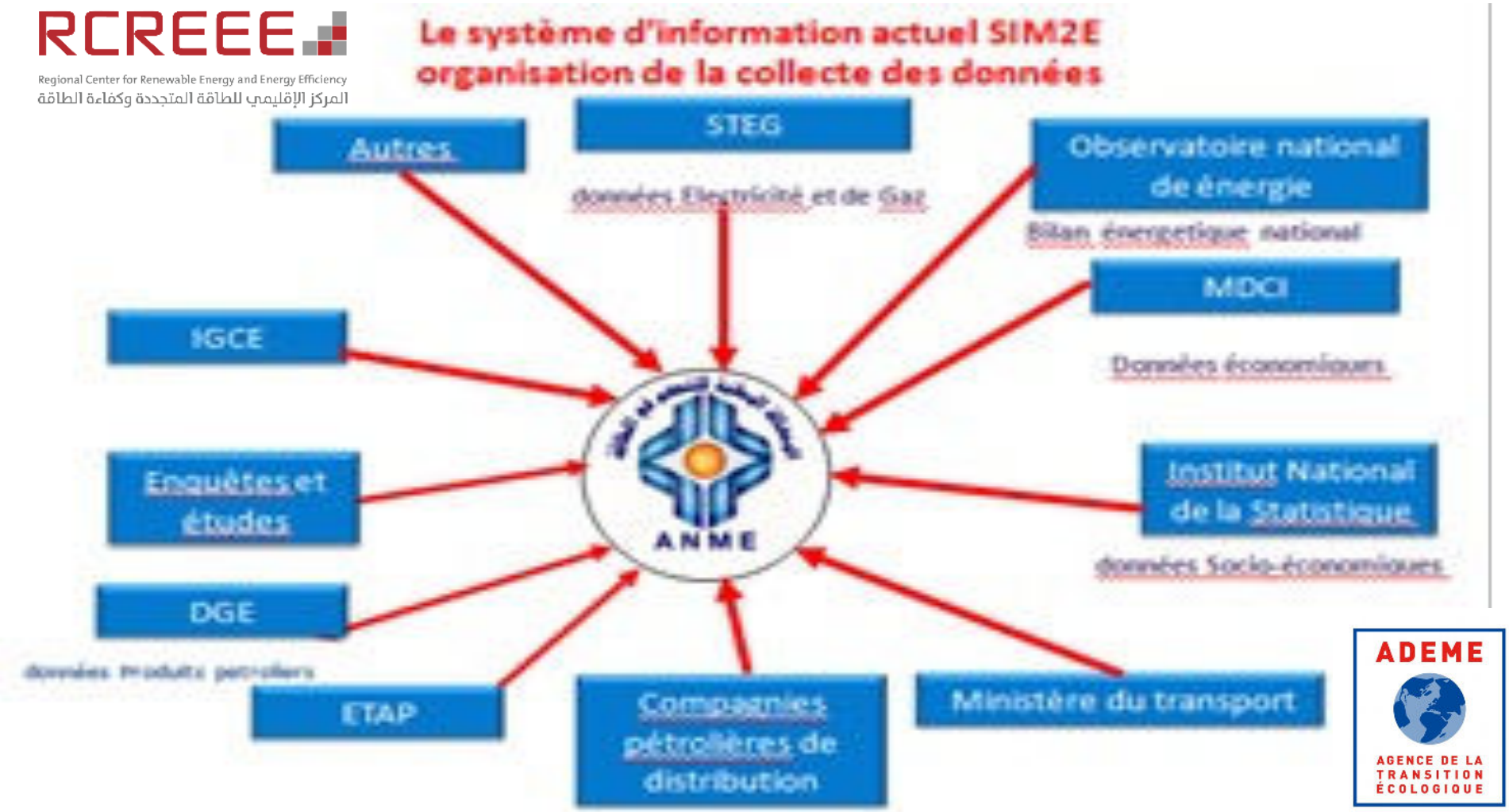


Test value
l/100km (km/l)
gCO_2 per km

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

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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

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	Preparation	Preparation	Template design
Training data collections New comers			Training all
Training all			Data collection 1er update
Data collection 1er update	Workshop	Workshop	Data collection second update
Data collection second update			On job assitance
On job assitance			Quality check 1er update
Quality check 1er update	Minutes rapport	Minutes rapport	Quality check 2ème update
Quality check 2ème update			Reporting
National Reporting			Dissemination by NT
Regional reporting			
National seminar			

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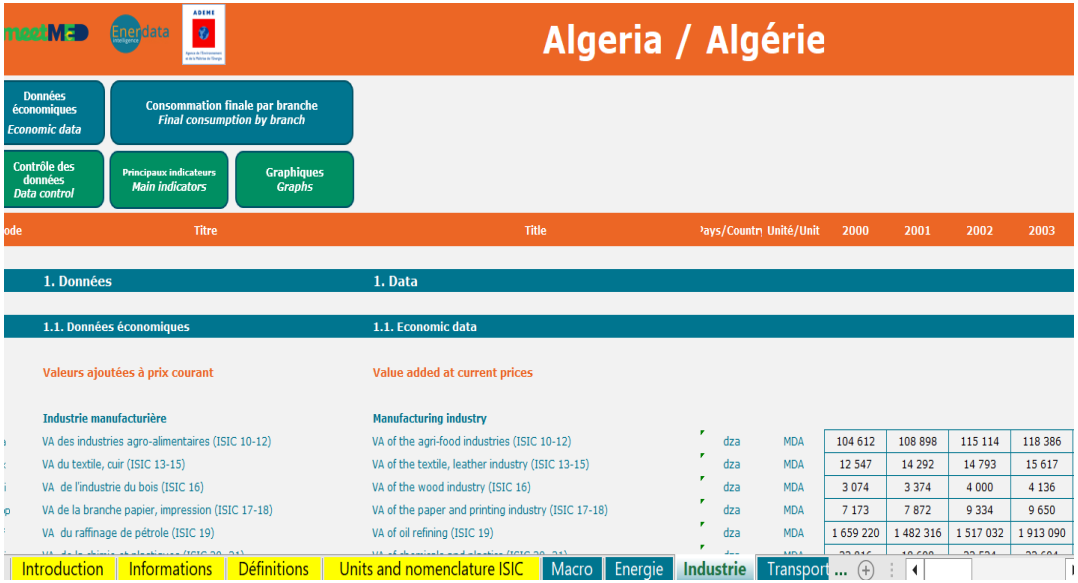
Trainings, data collection, reporting, disseminations



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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¶

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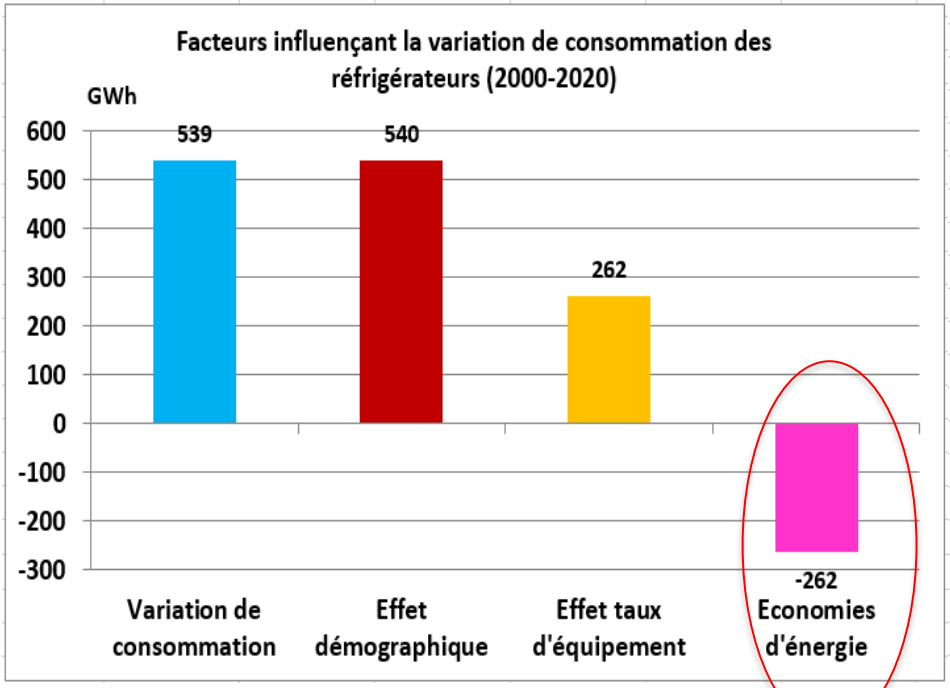
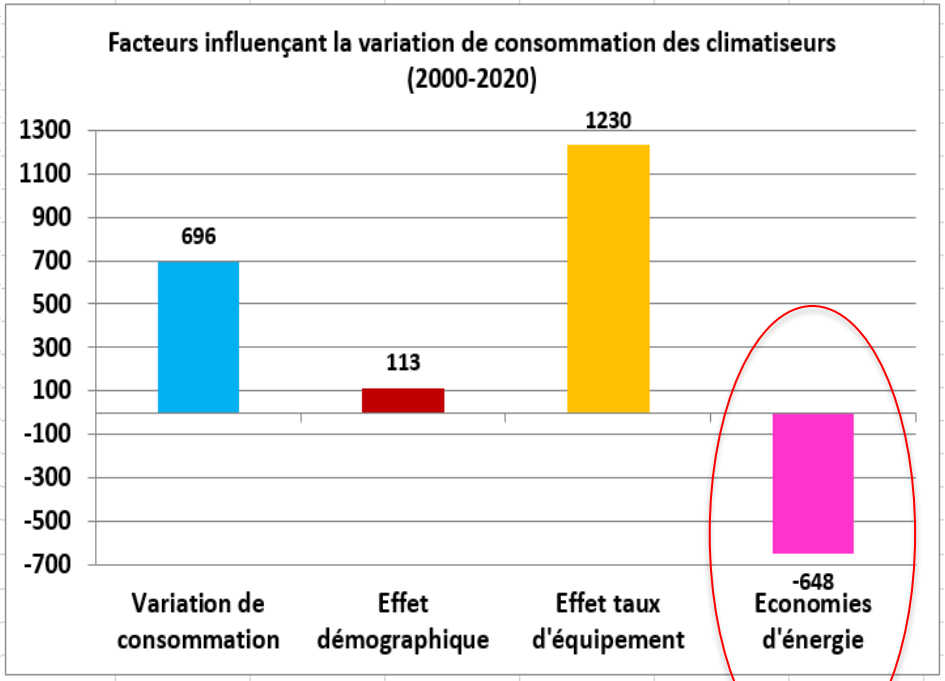
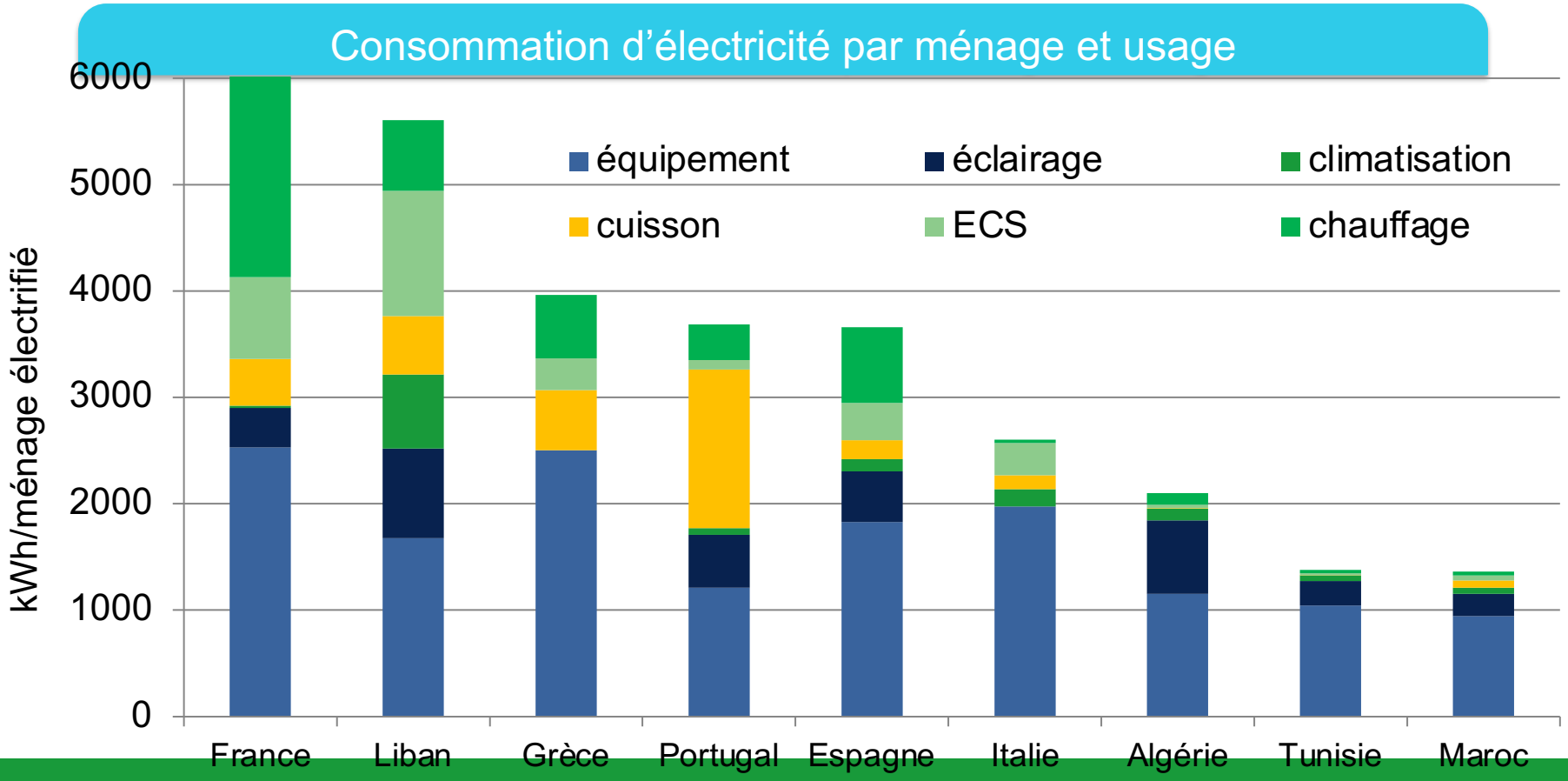
Advanced indicators
The case of Lebanon for refrigerators and ACs (2000-20)





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

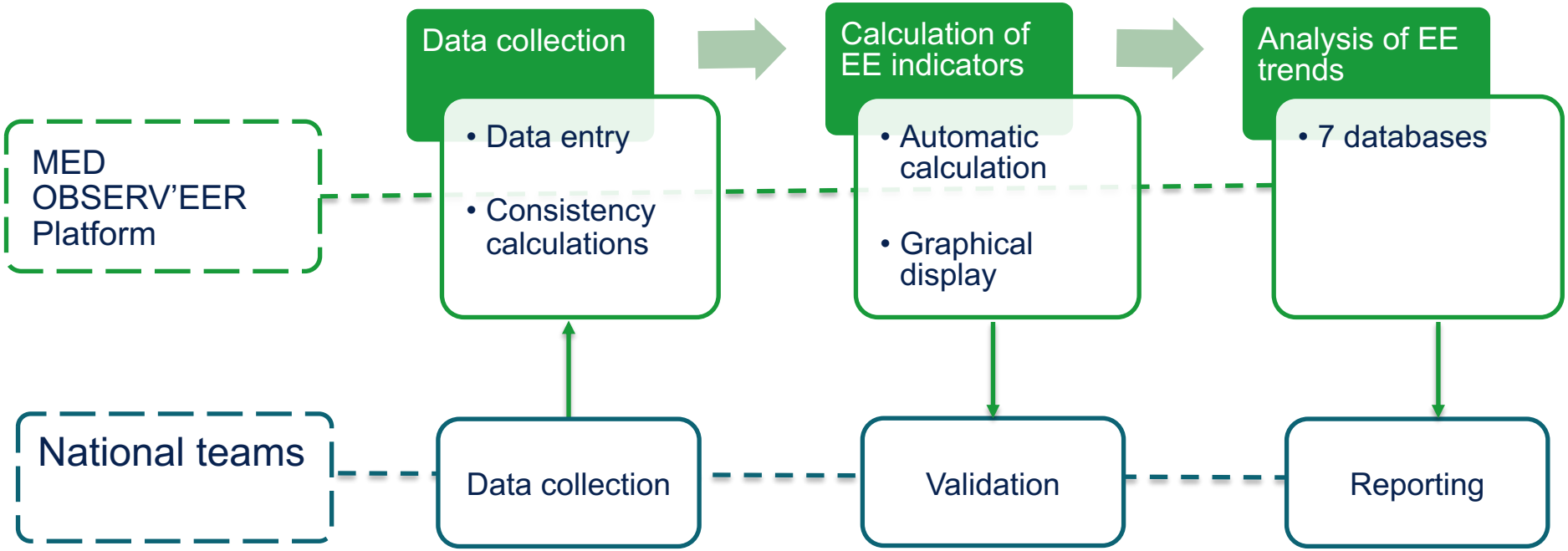
Database goal : to produce harmonised energy efficiency indicators (~100) in SMECs to monitor EE policies

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	

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

code series

Series titles

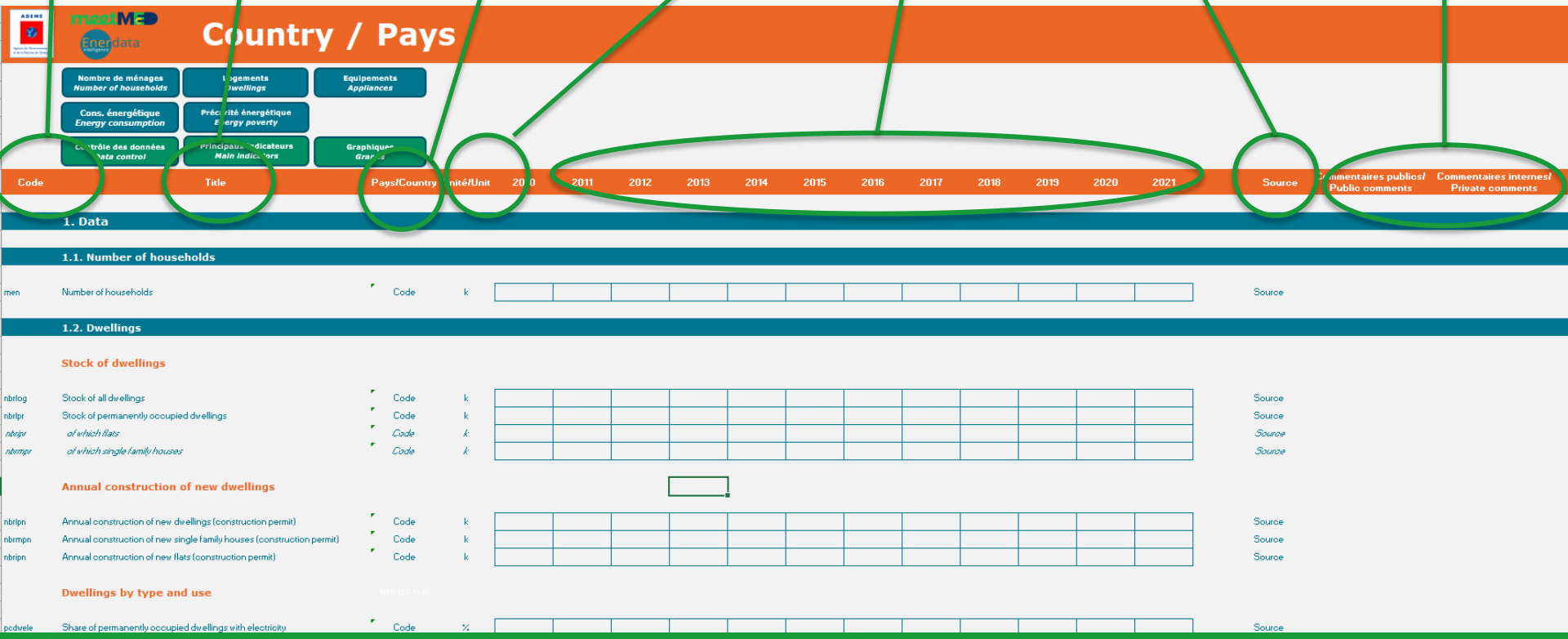
country code

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 Libaneon

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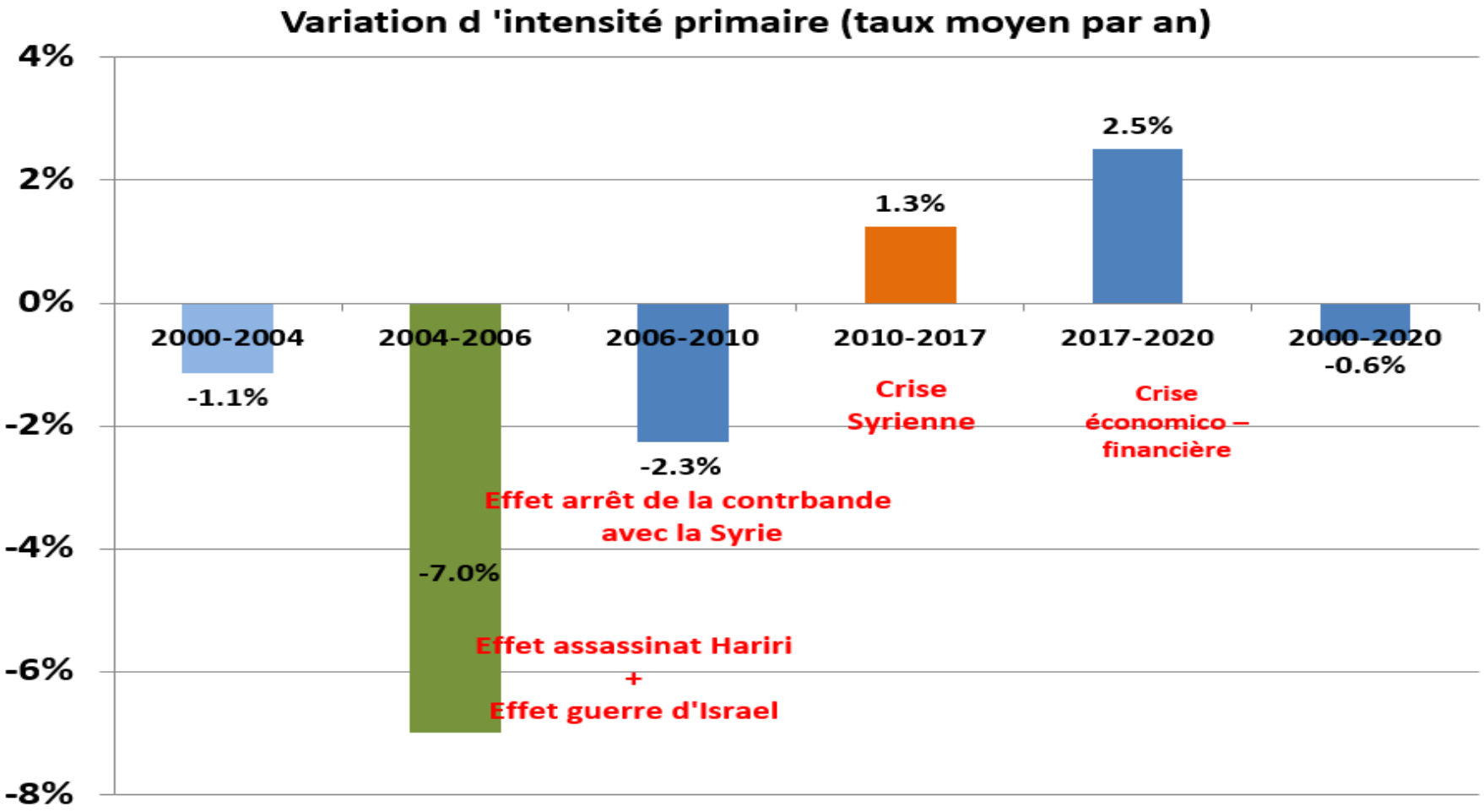
Analysing the trend of an EE indicators
The case of Lebanon (1990-2021)



How to monitor and Evaluate energy efficiency policies through a regional energy observatory?

Good practices in energy demand and efficiency modelling in SMECs

Dr Didier Bosseboeuf, ADEME, France
With the collboration of Dr Bruno Lapillonne (Enerdata)

Second meetMED Week

Marrakech , May 10th 2023

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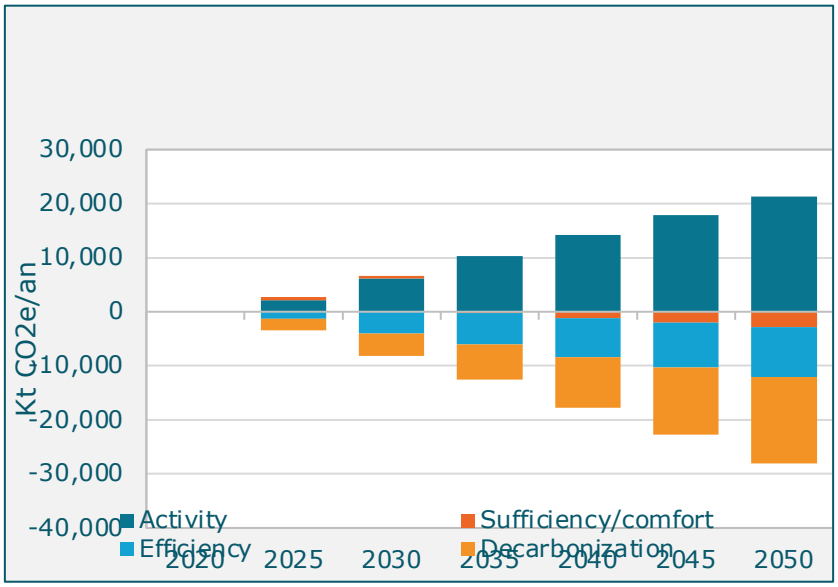
Workshop on Energy efficiency LT Modelling

Objectives : Exchanges of information, good practices, experiences on energy demand and energy efficiency forecasting

- Session 1: Overview of models
- Session 2: How to organize the data collection and models inputs?
- Session 3: Combination with energy supply and macro sectorial models



Interest for ANME :

- new energy uses over the long term
- the disaggregation of sectoral energy consumption
- integration of energy sufficiency and behavior changes in simulating the final energy consumption

Energy demand modelling and prospective tools
1st workshop : Topics around technics of modelling

Objectives: Exchanges of information, good practices, experiences on energy demand and energy efficiency forecasting

1. Which type of models are used for demand projection (econometric, bottom-up, hybrid) ?

- For which purpose these models are used ?
- Do you link this model to a supply or macro sectorial model ?
- Which entities is doing the job and who pays for it ?
- Is it a collaborative process ?
- Do you participate to regional planning or forecasting ?

TD or BU models : strengths and weaknesses

	Strengths	Weaknesses
Econometric models	**Easy to implement** because of limited number of data required Very well equipped to assess **price related issues, including taxation**.	Price elasticities are often impossible to quantify if prices were stable in the past or because price effects are combined with energy efficiency policies. They are very limited to assess the impact of: – Policy measures (regulations, incentives,…) that will strongly affect energy performance, mainly for new buildings, new equipment – Changes in technologies and lifestyles (sufficiency policies),as too aggregate .
Bottom-up models	They are very well adapted to simulate the impact of alternative **energy efficiency policies,** which is a requirement to assess the long-term energy efficiency potential and CO2 abatement options **(NDC and LEDS purposes)**.	They are quite demanding in data, which however maybe collected for other purposes. Simple version may be weak to capture the influence of price changes (including taxes) on energy demand.

MedPro/EnerMed models: Flexible structure

Modelling options

- By branch
- By end-use
- By vehicle (cars, bus…)
- By zone

Flexible disaggregation level

Flexible endogenization of parameters

- Number of vehicles
- Production of energy intensive industries
- Building stock
- …

Inputs

Socio-economic variables

- GDP, population, value added, energy prices, productivity …

Technological

- Fuel efficiencies, mileage, new equipment performance…

Total Energy Demand

Transport | Industry | Residential | Tertiary | Agriculture

Transport	Industry	Residential	Tertiary	Agriculture
Passenger, freight By mode By type of vehicles	EIP (steel, cement …); branches (chemicals, food, …)	Cooking, hot water, heating, AC Lighting, electrical appliances	Branches (offices, hospitals …) End-use (thermal, electricity) Public lighting	Tractors, water pumping …

Outputs

Socio-economics

Demand by energy

- Industrial output
- Vehicles stocks, traffic
- Dwellings, equipment…

Specific consumption

- EIP
- Vehicles type
- End-use
- Appliances…

Indicators

- Energy intensity
- Energy expenses
- CO_2 emissions

EIP: Energy intensive products

The current practice on energy demand modelling at APRUE (Algeria)

- **APRUE**, a central element of the national energy management system, is led **by its missions** to:
- Perform periodically prospective studies on final energy demand in order to evaluate the long-term **energy saving potential** as well as **greenhouse gas emissions** avoided,
- Draw up a **corrective strategy** for the mode of consumption as part of sustainable development.

- The structure of APRUE responsible for carrying out these missions is: **The Energy Management Observatory (EMO)**

- The latest prospective study was spread **out to 2035**, applying the guidelines of **the government program** on energy management.

It includes all sectors of activity (**Building, Industry, Tertiary, Transport & Agriculture**) at a detailed level of disaggregation (**by use and by product**).

The current practice on modelling in Algeria

APRUE has participated in several other sector planning works, in particular:

- **The National Project on Sustainable Energy Development and the Introduction of Nuclear Power, in 2008:**

Phase I: Energy Demand (MAED Model)
Phase II: The Power Supply (Message Model)

- **The Prospective study on the national demand for final energy on the horizon of 2030** (from the Ministry of Energy and Mines, with the assistance of the World Bank), **in 2012.**

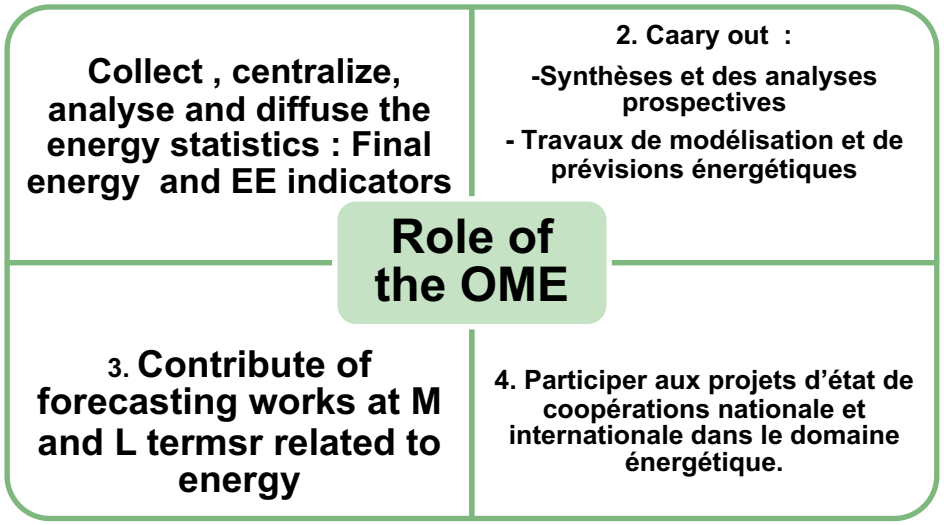
The experience made it possible to refine the first exercise carried out by APRUE in 2005 **(prospective energy study on the horizon of 2020 with the Medpro model)**.

- **Prospective study on energy transition scenarios in Algeria on the horizon of 2050**, **in 2020**, with Enerdata's EnerNEO tool: On the demand side, EnerNEO makes it possible to provide consumption projections with a level of detail close to MAED and MedPro models.

The Energy management observatory (Algeria)

- **The Energy Management Observatory (EMO):** is a management center for information collected from various external sources and consolidated in the form of a statistical database (BDD) allowing to know the energy situation at the national scale.

- **Main mission:** it is Focus on Algeria's final energy consumption as well as energy efficiency indicators**: A review of Algeria's final energy consumption is published annually.**



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The energy demand and efficiency modelling (Tunisia) Background

EnerMed is technico-economic, bottom-up demand simulation model where energy demand is simulated based on technical and socioeconomic determinants at a disaggregated level (by usage, by branch…). This model has been used by ANME:

•First, for the energy planning through the simulation of the final energy demand based on a detailed representation of energy consumption by sector, by use and by energy form.

•Then the model gets improved to be used for the simulation of GHG emissions for NDC and LEDS purposes.

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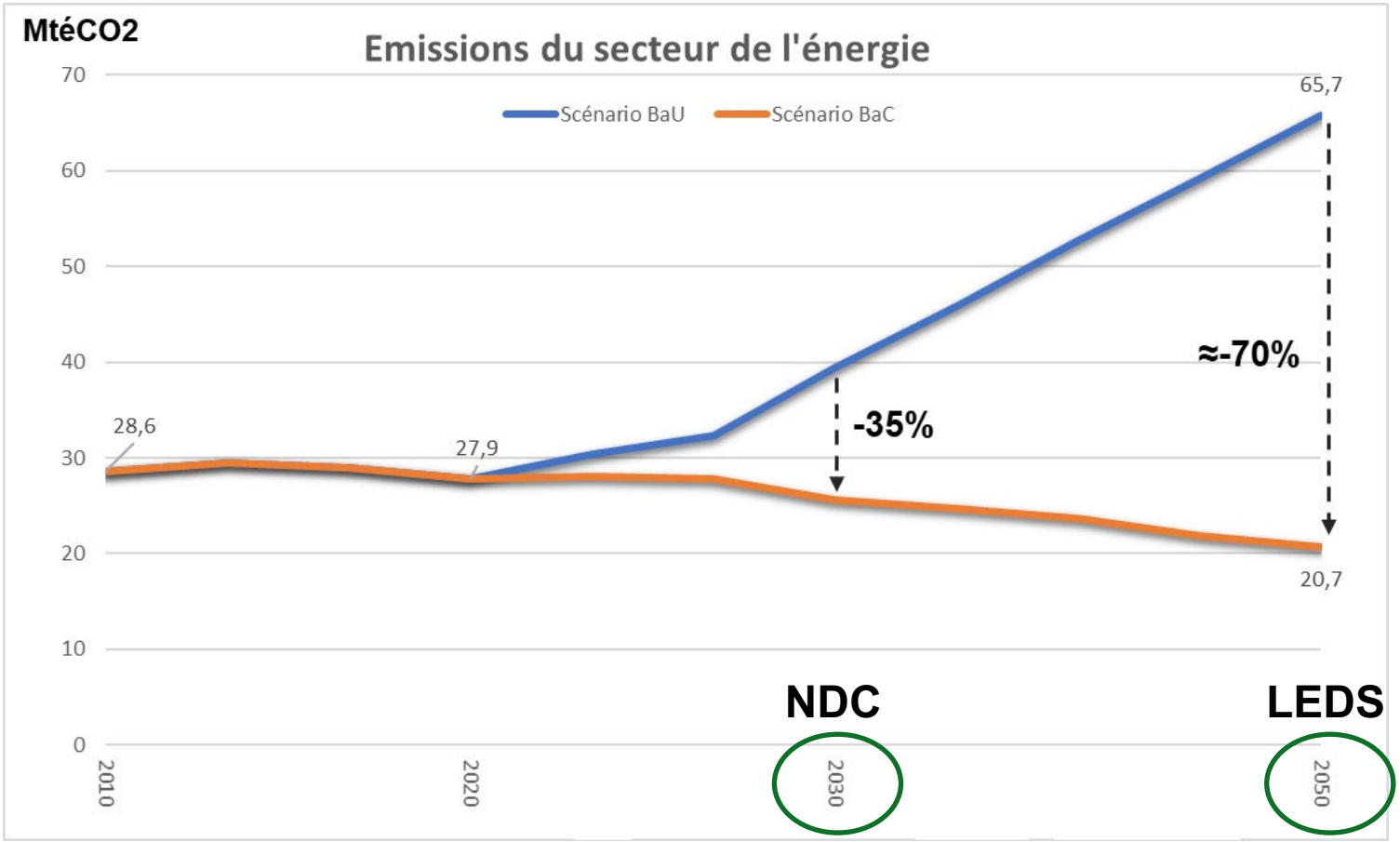
CO2 Emissions from the energy sector (Tunisia)



Energy demand and efficiency modelling
Next steps for Tunisia

- Development of a new scenario for the energy sector : NeT Zero Emission Scenario
- Update of the current version of EnerMed to include new energy uses, innovative technologies, new energy vectors (hydrogen), energy sobriety…
- Coupling EnerMed with a general equilibrium model to assess the economic and social impacts of a net zero CO2 scenario

The need to evaluate the macro-economic impact of an energy efficiency scenario
The ThreeME model

- **M**ultisectoral **M**acroeconomic **M**odel for the **E**valuation of **E**nergy and **E**nvironmental policies

- A series of Computable General Equilibrium (CGE) models designed to consistently assess the interactions between

  Economy, Energy et Environment

  - Medium to long term
  - At different geographical scales (regions, countries)

- Assessment of the macro-economic impacts of energy, climate and public policies

- Addresses issues such as: Energy security, Energy and low carbon transitio cost of climate policies (domestic and/or external), articulation between domestic policies (price instruments, energy efficiency measures, sectoral measures) and international agreements...

Coupling an energy demand and supply model (Enerneo) and a macro-sectorial model (ThreeME) : Case of Tunisia

- Within this context, UNDP has funded the development of a Tunisian version of ThreeME.
- Were (mainly) involved:
  - UNDP
  - ANME (Tunisian Energy Management Agency)
  - ALCOR (research and consulting Tunisian firm specialized in sustainable development)
  - ENERDATA
  - OFCE, NEO

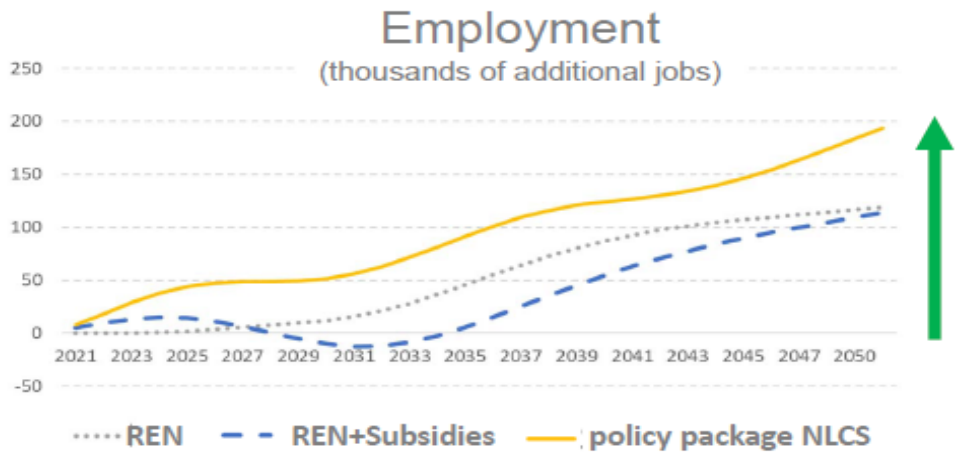
- The first cooperation phase with ENERDATA, ALCORE and ANME led to
  - the development of a bottum-up model (EnerMed)
  - a rich (but) pure energy analysis (without the macroeconomic feedback)

- The data, scenarios and outputs have been embedded within a macroeconomic, sectoral framework...the ThreeME model...co-developed with the local stakeholders.

➔ Analyze the macro-economic consequences as well as the financing needs required for the implementation of energy policies and measures.

Employment rate according to the scenarios

- Although the effects in the different scenarios do not sum up exactly, we observe a virtual accumulation of the positive effects which prevail



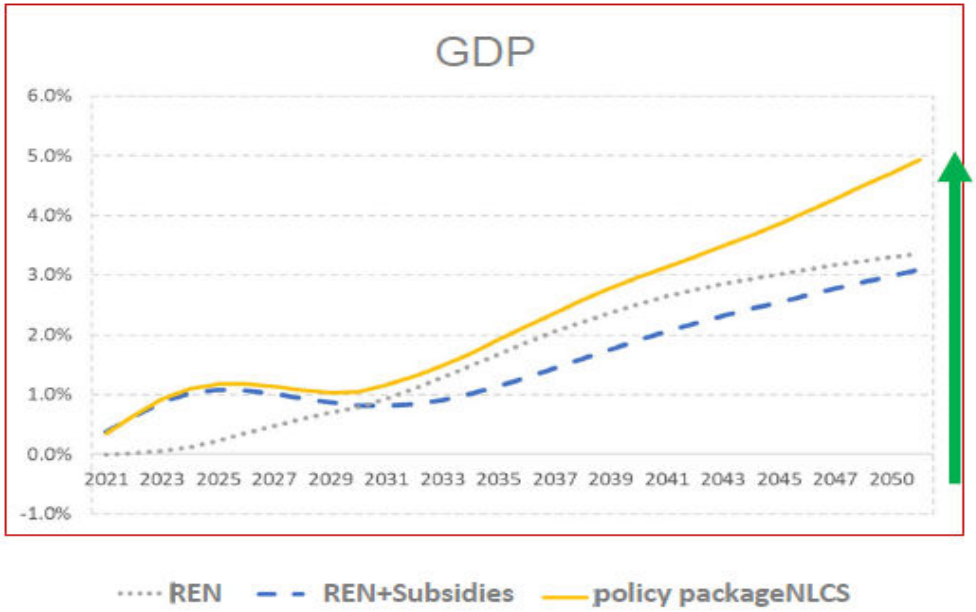
- In the REN scenario, there is a continued growth in additional jobs. This increase affects the entire economy.
  Increase of 12 thousand jobs in 2030 and 118 in 2050

- In the REN + subsidies scenario, the situation is worse than in the REN scenario.
  - Increase during the period of removal (2021-2025)
    +14 thousand jobs in 2025 linked to recycling
  - Deterioration of employment once these transfers stop
    -12 thousands jobs 2031
  - Catch up and significant increase to reach the REN level
    +114 thousand jobs in 2050

- In the NLCS scenario, net job creation over the entire period
  +51 thousand jobs in 2030 and 194 thousand jobs in 2050

GDP increases with penetration of renewables

- The 3 scenarios observe a clear improvement throughout the period reaching + 5% of GDP in 2050 compared to the reference scenario



- In the short term, the two scenarios with a price instrument are significantly better than the REN scenario alone.
  - 1% from 2025 for the two REN + subsidies and NLCS scenarios.
  - While the GDP variations peak at 0.23% in the REN scenario.
- From 2030, the REN+ subsidies scenario shows a worse situation than the other two scenarios
  - Economic agents are less rich in terms of purchasing power and investment compared to
    - the scenario where the subsidy is maintained
    - as well as the scenario where there is a CT over all the period (generating income recycled in a virtuous way in the economy)

Conclusions drawn from ThreeME (Tunisia)

- The fight against climate change, in particular, the implementation of a NLCS in Tunisia could lead to a double dividend:
  - Significant reduction in GHG emissions and
  - Improvement of the macroeconomic situation.
- There is an increase in investment and job creation in low-carbon industries, greater than the destruction of jobs in the fossil fuel sectors and a decrease in the trade balance deficit.
- The NLCS induces a gain equivalent to the income of two years of additional growth over the period,
  - i.e. 5 percentage points of GDP, with employment increasing by 5% in 2050.
  - In other words, over the period 2021-2050, this corresponds to an increase average growth rate of 0.2 percentage point.
- In order to obtain such favorable economic results, recycling carbon tax revenues into the economy is key as it helps to offset the recessionary effects associated with rising energy prices.
  For greater efficiency, this recycling must be given priority
  - to the most vulnerable agents,
  - to support low-carbon investments and
  - to employment-intensive sectors.

Energy demand modelling and prospective tools
1st workshop : some take aways

- SMECs have practice in energy modelling including in the energy efficiency agencies
- All the modelling steps are covered (sectorial demand, supply, sometimes Macro-impact)
- Few practices in combining energy with other resources (Water, land, waste, etc.)
- Very long term scenarios do exist particularly to cover the decarbonization issue (2050)
- Who are the stakeholders ?

Technico-economic models should be prefered for assessing LT energy efficiency scenario

- Technico-economic models should be preferred as they can well reflect the effect energy efficiency policy options, especially for new and existing buildings, new equipment, solar water heater, electric vehicles….
- They are the favorite tools used by most administrations and energy companies.

- Hybrid approach may be considered combining econometric approaches and bottom-up models to simulate technology details on demand and account for price effects.

- Techno-economic models are data demanding but the data needed have multiple uses :to ease this updating of energy demand forecast it is important to link the models with energy consumption and energy efficiency, such as the data bases developed in the MeetMED2 projects or ODYSSEE in European countries.

- Beyond the data issues, well designing the energy efficiency scenario is also a key question to be discussed in the next workshop.

Energy demand modelling and prospective tools
2nd workshop : Topics around results

2. Presentation of the results on the most recent prospective energy efficiency scenario study, including :

- What type of energy efficiency scenario ?
- What are the main findings in terms of energy efficiency potential and fuel mix in the different end-use sectors?
- Is there a link with energy efficiency policies and measures ?
- Who are the stakeholders ?

How to monitor and Evaluate energy efficiency policies through a regional energy observatory?

Good practices in NEEAP implementation in SMECs

Hossam Alherafi - RCREEE

Second meetMED Week

Marrakech , May 10th 2023

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

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Workshop on NEEAPs : Objective

The workshop aims to:

- Maximize benefits of knowledge from the international experience on NEEAP monitoring and evaluation tools and mechanism, Also
- Present NEEAP status for the SMECs countries as well as highlighting the challenges and opportunities of NEEAP monitoring and evaluation.

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meetMED
Mitigation Enabling Energy Transition in the MEDiterranean region
Together We Switch to Clean Energy

MED ENER

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المركز الإقليمي للطاقة المتجددة وكفاءة الطاقة

Moroccan experience on Energy Efficiency monitoring and evaluation methods

Amine AHMARRAS
Head of Training within AMEE
Moroccan Agency for Energy Efficiency
15th of December 2022

Workshop on Best Practices on NEEAP Monitoring and Evaluation Tools & Mechanisms in Jordan

15/12/2022

Journey of Designing the 3rd National Energy Efficiency Action Plan

By Eng.Ola Alsarhan

الجمعيّة العلميّة الملكيّة
Royal Scientific Society

Ministry of Energy and Mineral Resources

JREEEF
Jordan Renewable Energy & Energy Efficiency Fund
صندوق تشجيع الطاقة المتجددة وترشيد الطاقة
MINISTRY OF ENERGY AND MINERAL RESOURCES

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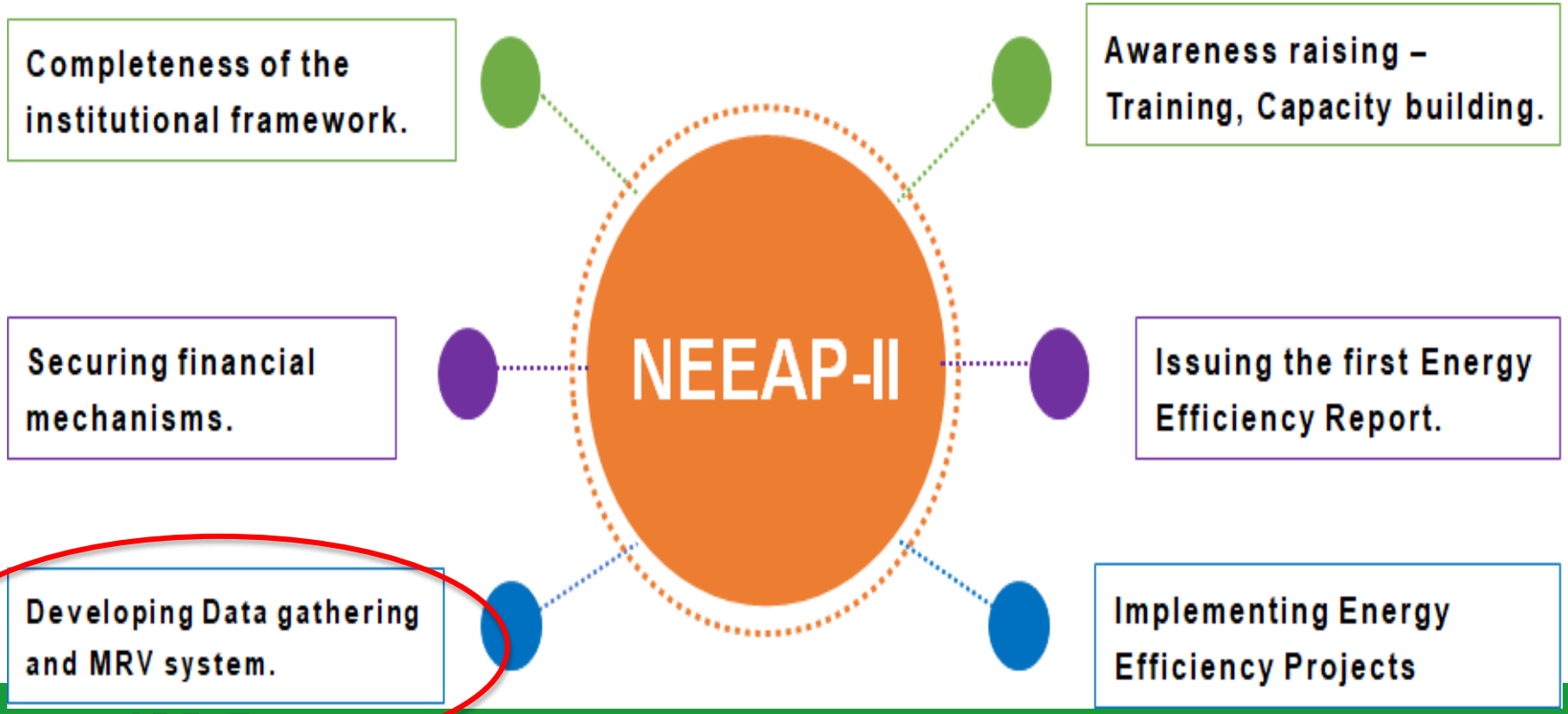
Jordan NEAAP : Stakeholders Engagement

- The approach in building the 3rd National energy efficiency plan was to use both bottom up and top down approaches in designing and planning the measures.

The 2nd National Energy Efficiency Plan for Egypt

- The NEEAP-II (2018/2019 - 2021/2022) was approved in complying with the objective of Egypt SDS 2030“ and “ISES 2035”. It adopted an institutional setup for energy efficiency based on central planning and decentralized implementation by Activating and enabling EE units in the various economic sectors.



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NEEAPs workshop in SMEC's : First set of take aways

Session 1: International Experience on Energy Efficiency Monitoring and Evaluation Methods.

The EU experience in Best Practices on NEEAP Design, Monitoring and Evaluation. Dr. Paolo Bertoldi, European Commission DG JRC

Session 2 : National Experience on Energy Efficiency Action Plans Development, Monitoring and Evaluation.

This session included official representatives from five countries, "Algeria, Egypt, Jordan, Palestine, Morocco" where they presented the experiences of their countries about Energy Efficiency Action Plans Development, Monitoring and Evaluation.

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NEEAPs workshop in SMEC's : First set of take aways

- NEEAP is a powerful instrument to implement well designed policies and measures to improve energy efficiency and helps in reaching EE targets.
- NEEAP allows integrated policy packages with many coherent measures covering all sectors.
- NEEAP is mainly a planning instrument complemented by monitoring instruments.
- There are 5 evaluation criteria for NEEAP: 1. compliance with reporting obligations, 2. target definition, coherency and monitoring, 3. policies and measures, 4. governance and institutional capacity, and 5. general issues.
- The monitoring and evaluation of NEAAPs aiming to learn from previous experiences and build on the unachieved measures adopted in previous action plans in each country.
- To include the new technologies in the Future energy efficiency action plan i.e, Hydrogen, E-mobility, waste to energy and water desalination.

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**).

MEETMED WEEK
09 – 11 MAY 2023
MARRAKESH - MOROCCO

Contact us!

meetMED
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

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