UNDA project, on “Up-scaling Energy Efficiency in the residential and tertiary sectors in the Arab Region”

National Seminar on: “Launching of the baseline mapping study on the energy use in the building sector in Jordan”,
5 March 2019 –Amman - Jordan

Ministry of Energy and Mineral Resources
The Hashemite Kingdom of Jordan

Economic And Social Commission For Western Asia

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Proposed UNDA baseline mapping study methodology for energy consumption of buildings in the tertiary sector

Main objectives of the baseline mapping study for buildings in the tertiary sector

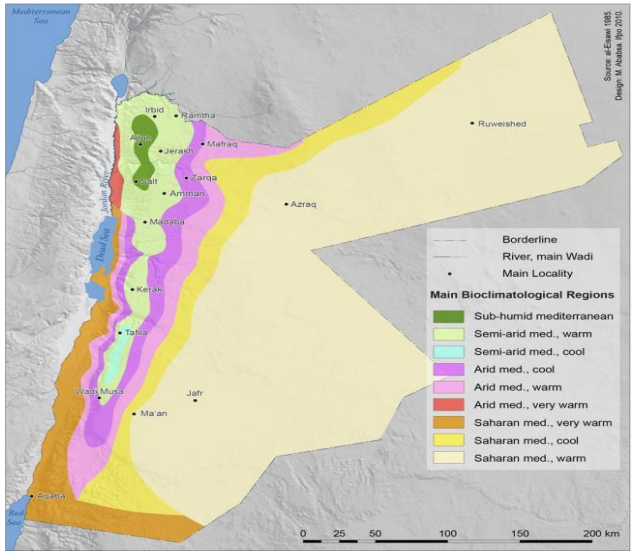
- Estimation of the regional stock of tertiary building
  - ✓ Per category: sport, culture, religion, etc.
  - ✓ Per climate and geographical areas
  - ✓ Per energy performance (where possible)
- Estimation of final Energy consumption
  - ✓ per source of energy
  - ✓ Per usage (heating, cooling, lighting, ECS, etc.)
  - ✓ Per climate zone
- Estimation of equipment rate
  - ✓ Per usage (focus on heating, cooling, ECS)
  - ✓ Per category
  - ✓ Per climate area

Main objectives of the baseline mapping study for buildings in the tertiary sector

- Focus on some specific usages
  - ✓ Evolution of the rate of heated and/or air conditioned buildings and equipped with solar hot water systems
  - ✓ Evolution of energy performance
  - ✓ Evolution of energy consumption linked to usage patterns
- Elaboration of EE indicators
  - ✓ Per total final consumption
  - ✓ Per energy source
  - ✓ Per usage
  - ✓ per category (where possible)
  - ✓ Per climate zone
- Enable the elaboration of future scenarios for the stock of tertiary buildings and estimate their EE potential

Methodology of data gathering and analysis for tertiary buildings

- **Distribution of Building stock per climate zone**



Climate characteristics of Jordan. Atlas of Jordan 2014.

- **More distribution factors**
  - ✓ Governorates
  - ✓ Urban / rural
  - ✓ Shares of total heated areas
  - ✓ Shares of total air conditioned areas
  - ✓ Etc.

Methodology of data gathering and analysis for tertiary buildings

- 4 types of possible sources of information
  - ✓ **Public sources data**
  - ✓ **Surveys**
  - ✓ **Measurement campaigns**
  - ✓ **Modeling**

  Combining sources is often needed for complete and balanced indicator sets

Statistical data of building stock	Data for GIS	Energy consumption
• Ministry of Energy • DoS, chambers of com. • JNBC, MoPWH, MoA	• JNBC • DoS, MoMA, MoT • Google Map…..	• Ministry of Energy • NERC • RSS, JorGBC……
↓	↓	↓
Typology & Quantification Equipments / Buildings	**Climate zone distribution**	**Characterization physical / energy**

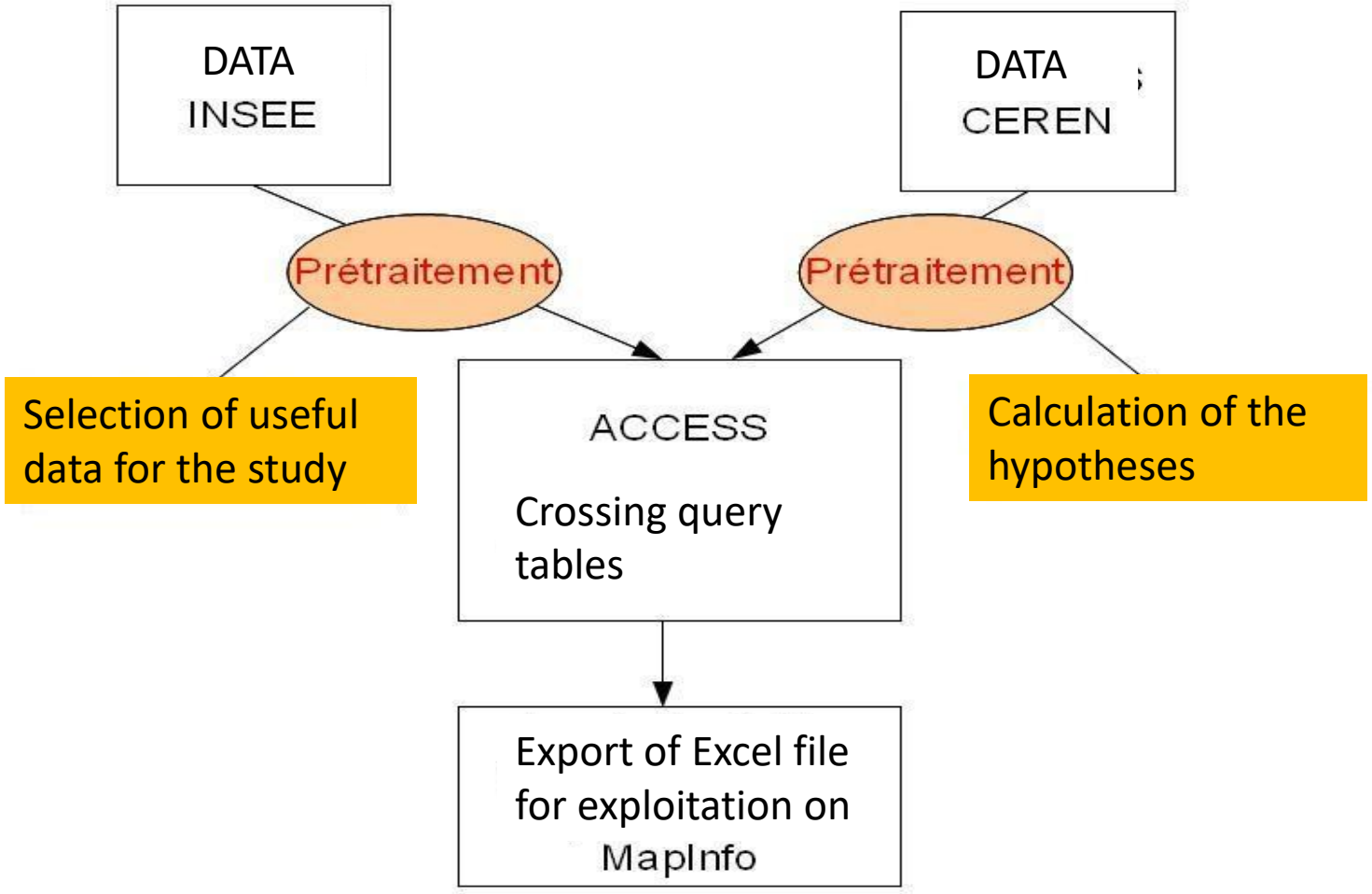
Methodology of data gathering and analysis for tertiary buildings

- **Available data sources from public services**

	National level	Regional level
Available data	▪ Final energy consumption ▪ Final energy consumption per usage	▪ Final energy consumption in tertiary buildings per energy source ▪ Final energy consumption per usage
Sources	✓ STEG surveys ✓ Ministries concerned ✓ Energy audits	✓ Data gathering from gas and electricity distributors
strengths	Reliable sources	Surveys
weaknesses	✓ Little data on characteristics of the buildings and equipment	✓ Small number of indicators ✓ No aggregation possible on supra levels
Timeliness	Access to data processed by the Ministries concerned and electricity utilities but no access to raw database	

Methodology of data gathering and analysis for tertiary buildings

- Example of approach used in France



Energy Consumption and their respective ratios for tertiary buildings per category

Category	Area covered m^2	Electricity		Thermal energy	Specific ratios			
					Electricity		Thermal energy	
		Final MWh/year	Primary toe/year	toe/year	kWh/m^2. p/year	kWh/visitor p/year	koe/m^2 p/year	Koe/visitor p/year
Sport								
Culture								
Religions								
Others								

Methodology of data gathering and analysis for tertiary buildings

- **Highlight on the methodological aspects taken into account**
  - ✓ The right approach is needed from all actors for all to endorse the results.
  - ✓ The appraisal of information gathered through available sources (Ministry of Energy, DoS, Chamber of Commerces, Electricity utilities, NERC, RSS, JorGBC, etc.) and identifying the additional data needed
  - ✓ The methods to estimate the additional data needed (combination of top-down and bottom-up approaches)
    - ➢ Bottom-up : the use of micro data (energy consumption of a representative sample of shopping malls per category per climate zone) to reduce uncertainty
    - ➢ Top-down : Macro data (Country or region) using distribution factors (administrations, climate zones, categories., etc.)
  - ✓ Comparison of modeling results with metered data (gas/electricity consumption for a representative sample of shopping malls)
  - ✓ Data consistency checks with regional and national level statistics.

Main questions and points for discussion

- What are the important energy usages to focus on ? (heating, cooling, lighting, others?)
- How can we estimate the penetration rate of high-performance equipment and its evolution ?
- How can we estimate the high thermal quality buildings rate and its evolution?
- What are the alternative sources of information to turn to for complementary data? (Other than Ministry of Energy, DoS, Chamber of Commerce, Electricity utilities, NERC, RSS, JorGBC, etc.).
- How to strengthen efforts of existing data producers : Ministry of Energy, DoS, Chamber of Commerce, Electricity utilities, NERC, RSS, JorGBC, etc.?
- How to establish an energy monitoring tool for the commercial building sector, in order to measure the impact of energy management in the country?
- Other points for discussion….

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THANK YOU FOR YOUR ATTENTION

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