

Kingdom of Morocco

ROYAUME DU MAROC

Office National de l'Electricité et de l'Eau Potable



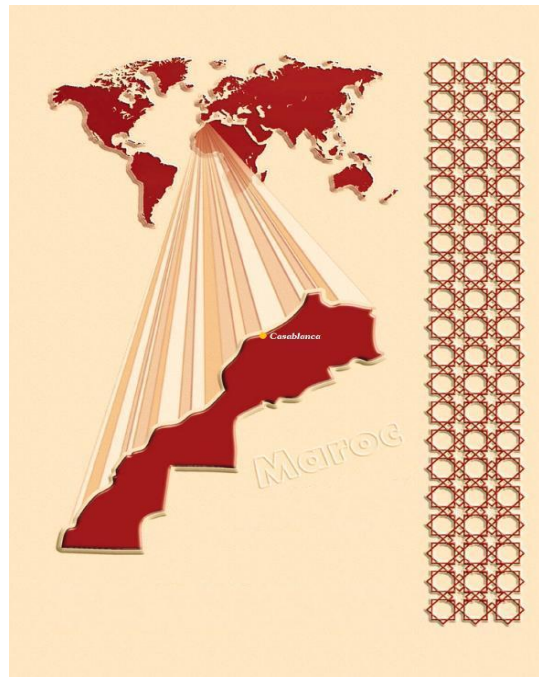
المملكة المغربية

المكتب الوطني للكهرباء و الماء الصالح للشرب

Branche Eau

قطاع الماء

ENERGY IN DRINKING WATER SECTOR ONEE Experience



IFAT- Munich 8th May 2014

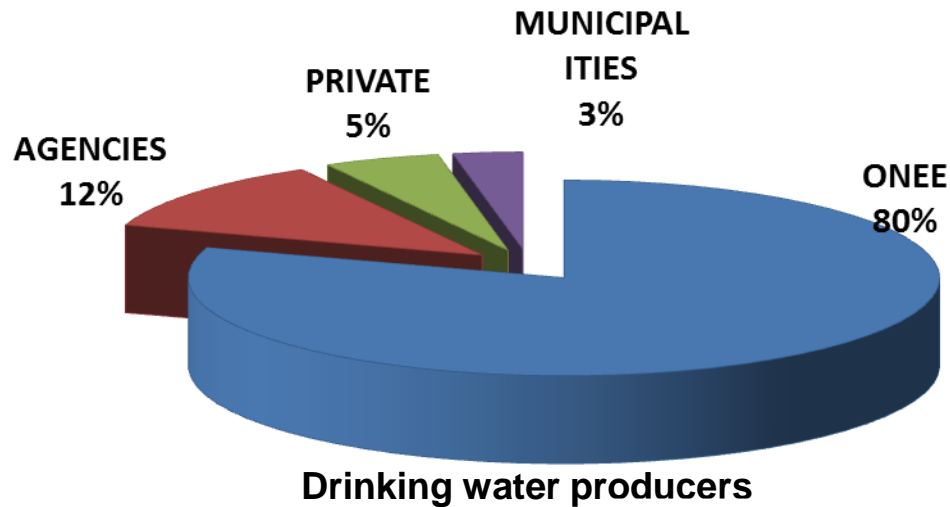
Eng. Abdellatif BIAD

Outline

- ⊕ **Drinking water and sanitation sector - ONEE water branch key figures**
- ⊕ **Energy indicators**
- ⊕ **Achievements and ongoing actions**
- ⊕ **Difficulties and limitations**
- ⊕ **Action plan**



DRINKING WATER AND SANITATION SECTOR



Production

Volume of produced water

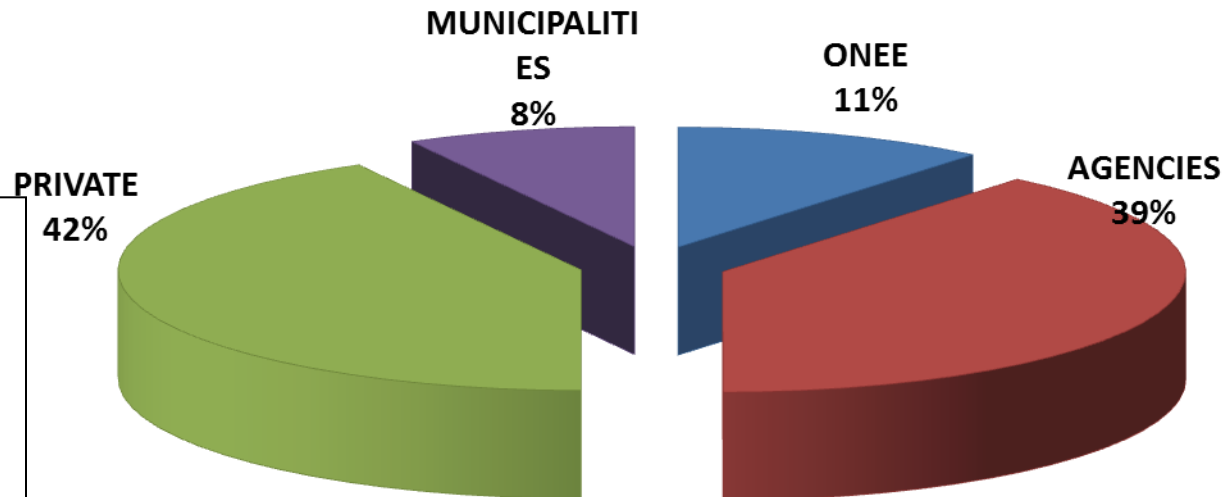
- 1 Billion m³ per year

Access Rate to Potable Water

- Urban Area : 100 %
- Rural Area : 91 %

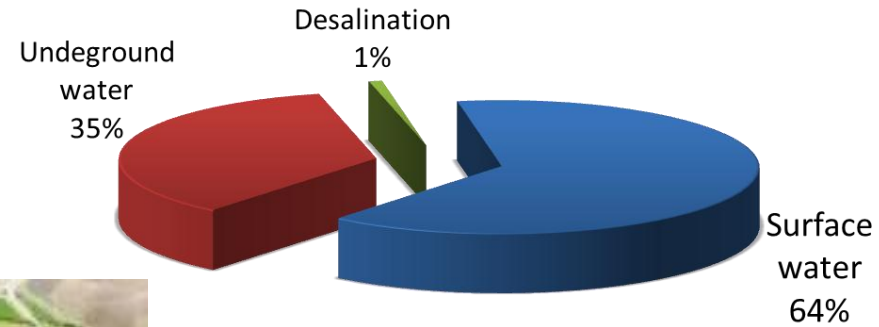
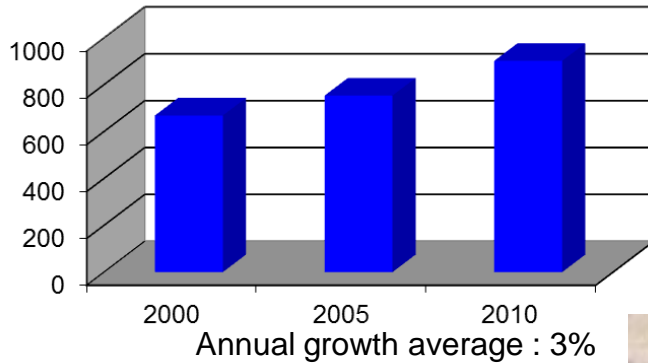
Sanitation

- Urban areas
 - Connection Rate: 70 %
 - Purification : 11 %
- Rural areas: Autonomous sanitation



DRINKING WATER PRODUCTION OF ONEE

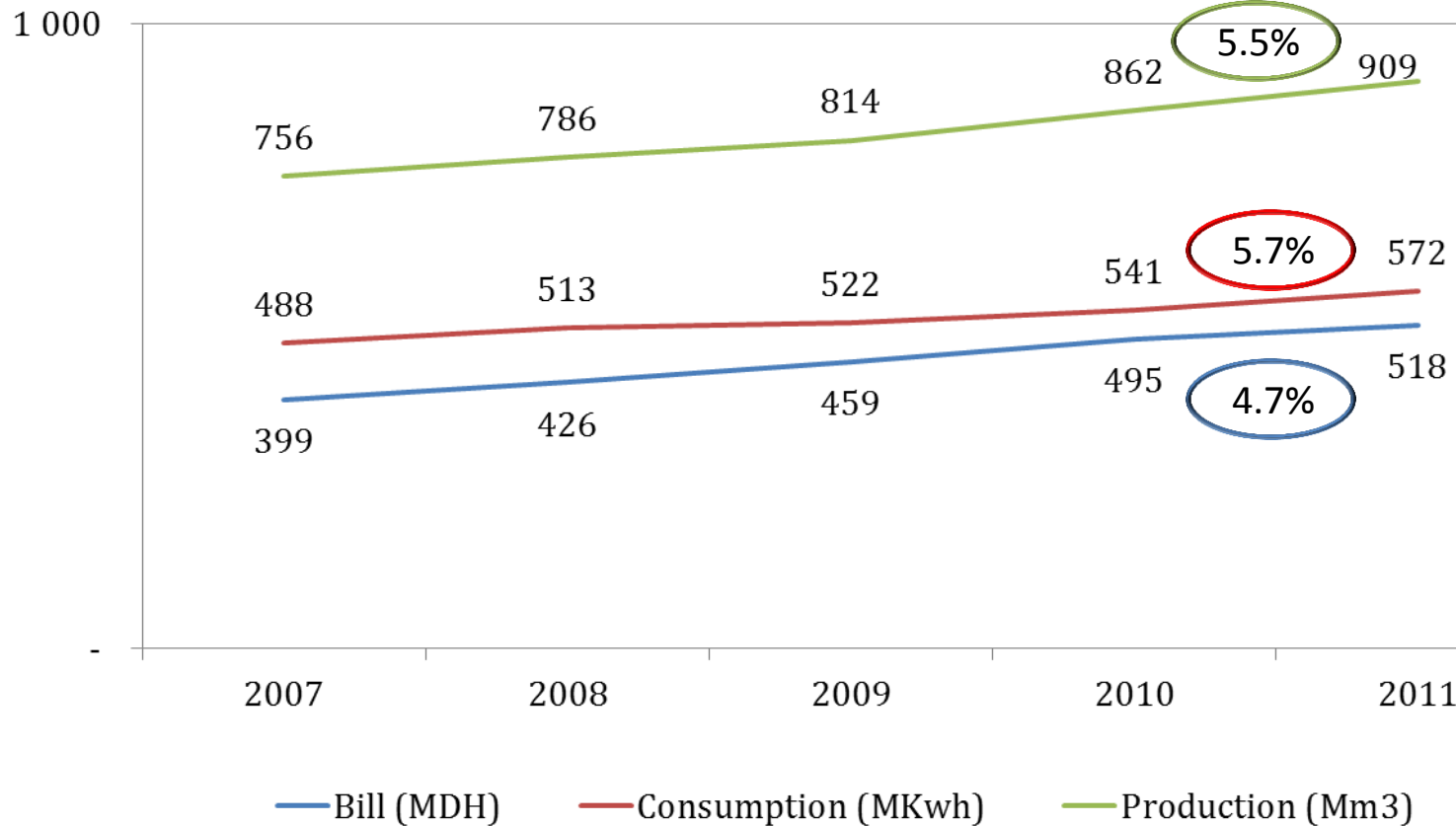
Production Evolution
millions of m3



Number of catchments : 1230
Number of treatment plants : 75
Number of pumping stations : 1820

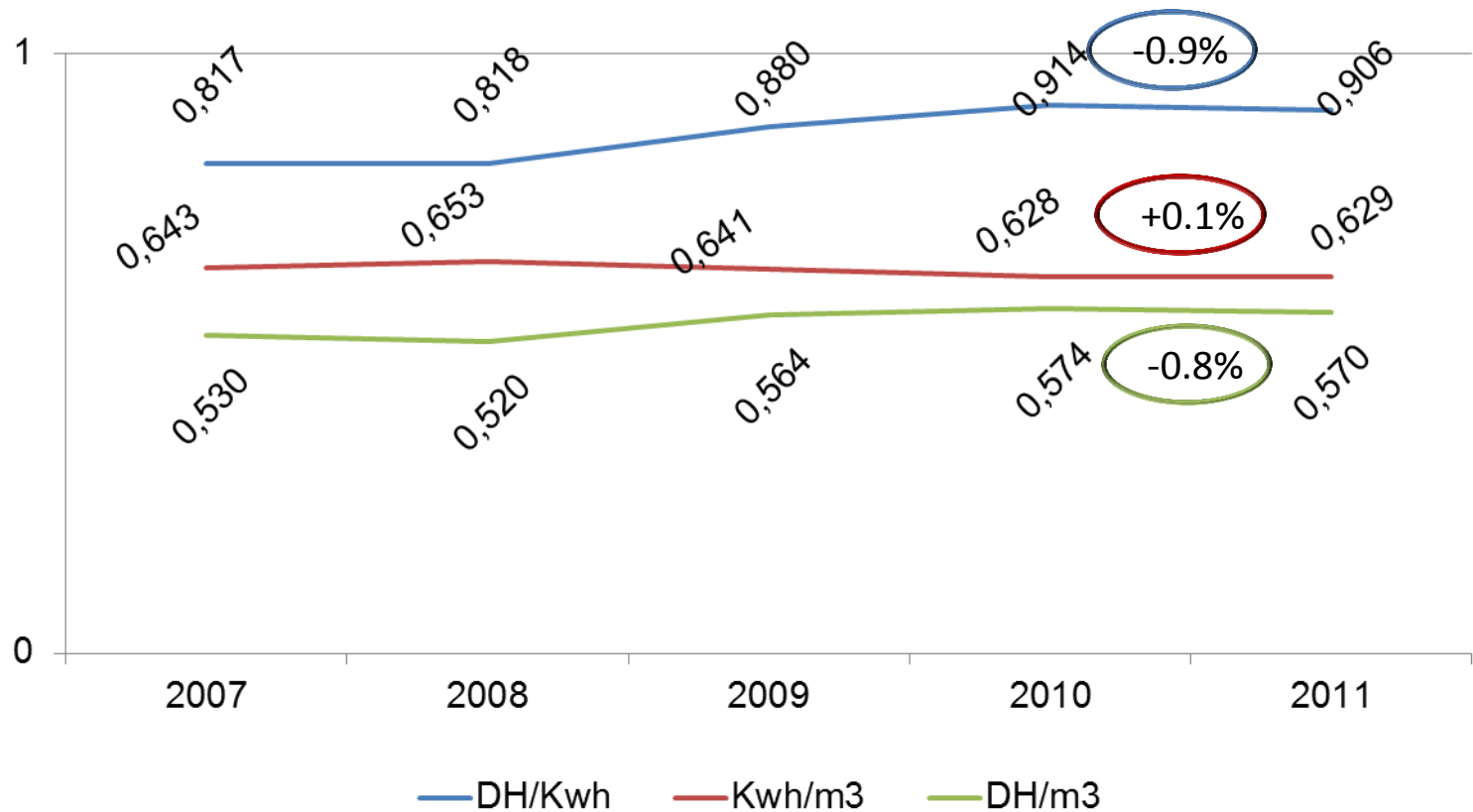


Energy consumption, billing and water production



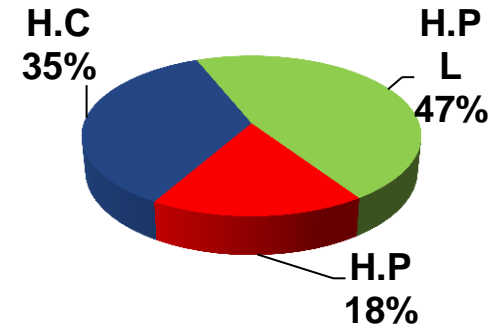
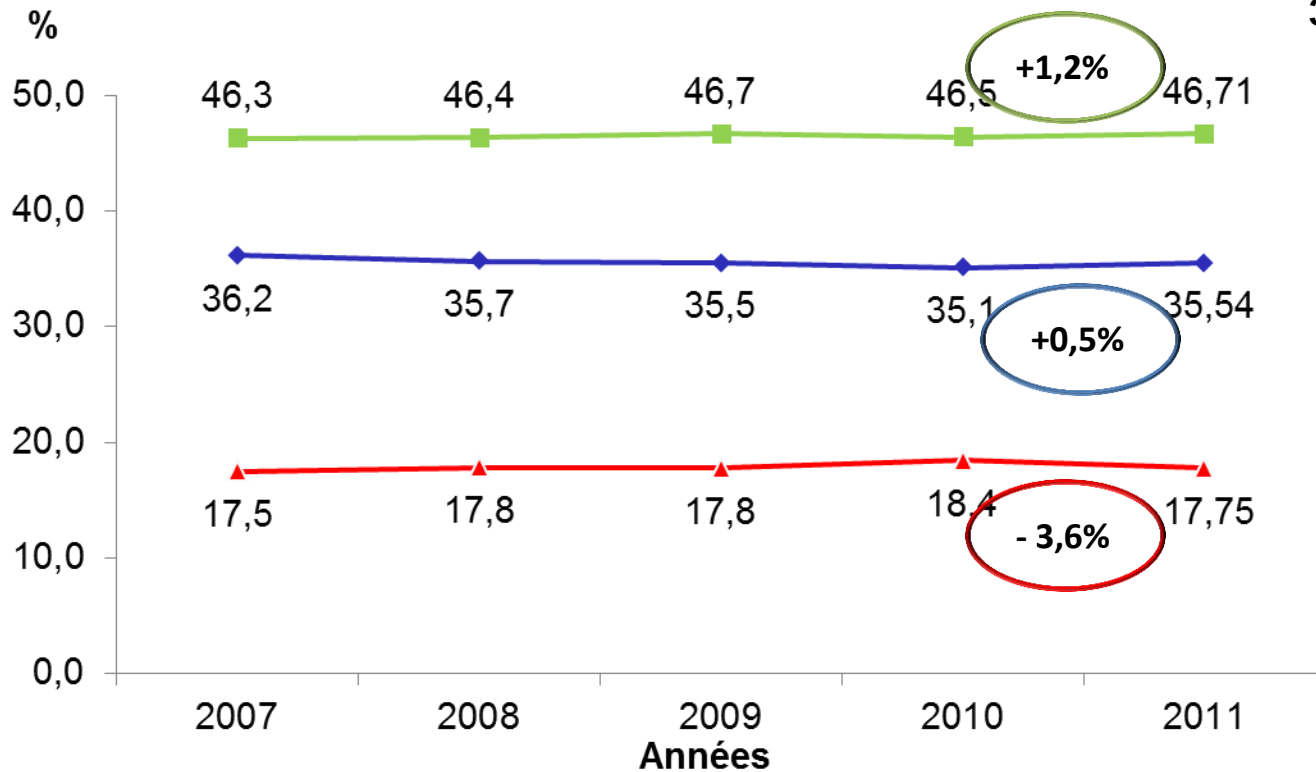
The main reason of bill and energy increase is the increase of water production .

Ratios analysis



- Increase of water production in adductor complex with high ratio Kwh/m³.
- Starting of the new desalination plant in Laayoune city.
- Starting of the new pumping station of Agadir city.

Schedule of pumping hours



◆ Low price period ■ Medium price period ▲ High price period

Achievements and ongoing actions

- Establishment of pumps efficiency measurement procedure,
- Definition for each Regional department, a core group of contracts to ensure and facilitate the monitoring of performance indicators for major facilities (Pareto law) : 20% of energy providing contract represents 80% billing accounts.
- Assistance of regional department and follow-up of their action plan :
 - optimize energy consumption
 - Analyze operating reports and energy costs,

Achievements and ongoing actions

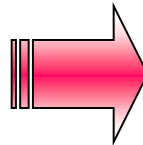
Table for the follow-up of energy contrats

N° contract	P installed KVA	energy consumed	Scheduling of hours of pumping(%)	penalties DH	Bill DH	production (m3)	ratios (DH/KWH,KWH/m3 et DH/m3)
....							
....							
....							

Table to be completed for:

X the period of the year 'n'

X the period of the year 'n-1'



Unlike the contract parameters for the two periods

Achievements and ongoing actions

- Establish of energy audit studies guidelines :
 - Phase N°1 : Diagnosis of the existing situation
 - Phase N°2 : Measurement of equipment performance and adaptation solution
 - Phase N°3 : Action Plan establishment,
 - Phase N° 4: Preparation of tender documents
- Energy audit studies for 5 big and complex systems are ongoing,
- Implementing an ambitious PIP :
 - improvement of hydraulic performances,
 - increasing storage capacity to reduce pumping during peak hours
 - Equipment of certain adductors by remote control systems
 - acquisition of new pumping units



Difficulties and limitations



- Partial fulfillment of the program of pumps efficiency measurement.
- Scheduling of pumping hours influenced by:
 - ❑ Resource saturation
 - ❑ Inadequate capacity of water storage.
 - ❑ Difficulty of harmonization in the management of storage pools with certain agencies and concessionaires.
- Change of the operating point of pumping systems due to operating conditions (change of groundwater levels, etc.).
- Transmission delay of operating reports related to energy.



Action plan



Design and construction level

- ⌘ Choice of optimal solution taking into account the LCC,
- ⌘ Setting a minimum performance requirement for pumping units,
- ⌘ Consideration of energy consumption as a criterion for choosing the right bidder for the stations of high energy consumption (treatment plant, sewage ...).
- ⌘ Establishment of a procedure which regulates the acceptance tests of pumps,
- ⌘ Generalization of new technology : use of new instruments and tools for monitoring and measuring the real-time energy (energy analyzers and remote, variable speed pumps,



O&M level:

- Rigorous monitoring and improvement of power factor ($\cos \phi$)
- Optimize the schedule of pumping periods when the capacity of the system (pump and storage) and the resource permit it.
- Generalization of the energy audit studies.
- Priority allocations of resources to low ratio kWh/m³.
- Achieving annual campaigns of measuring performance of pumping units to identify and replace low-performing groups.
- Involvement and awareness of O&M personnel for compliance with guidelines (scheduling of hours of pumping, tracking the performance of GEP, etc).
- Achieve the maintenance program
- Reinforce the ongoing PIP.

Training and capacity building

**THANK YOU FOR YOUR
ATTENTION**



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