Enerdata

Evaluation of Medium/Long term Energy Efficiency Potentials

Case Study 1

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Exercise 1 :Set up the sectoral energy consumption account of the household sector showing the breakdown of the energy consumption by end-use and type of energy. The total energy consumption for heating and hot water is 30 Mtoe. The share of oil, gas and electricity are respectively 30%, 37% and 10%. 41% of households use lpg for cooking, 28% use gas and 31% use electricity; and their respective unit consumption are 0,1 toe/hh, 0.15 toe/hh and 0.11. About 70 % of households are electrified. The specific consumption of kerosene of non electrified household is 120 liters/year (1 liter of kerosene = 0.8 koe). The specific consumption of electricity for lighting is 400 kWh/year. The specific consumption of TV and refrigerators is respectively 100 kWh and 500 kWh/year. 90% of the electrified households own a TV and 95% a refrigerator.

	LPG	Oil	Gas	Electricity	Wood	Total
Heating and hot water						
cooking						
Lighting						
Refrigerators						
TV						
Others						

	Unit	2000	2020	2000/2020
Population	M	60	63	
Population/household	1	2.5	2.1	
Electrification rate	%	70	95	
GDP				2.5%/year

Exercise 2 : Forecast the evolution of the electricity consumption in 2010 in the same country, assuming,
   - firstly, that the electricity consumption per electrified household is stable
   - secondly, that the electricity consumption per electrified household increase with a
    0.5 elasticity to the income (GDP per household).

Exercise 3 :Forecast the electricity demand in 2020 by summing up the demand for the different electricity uses : lighting, TV, refrigeration and other uses. The urbanisation rate is 65%. The electrification rate is 75% for urban households and 60% for rural households. The average consumption of a refrigerator is 500 kWh/year for urban households and 300 kWh for rural households. The average consumption of a TV is about 100 kWh/year both for rural and urban households. The specific consumption of electricity for lighting is 400 kWh/year both for rural and urban.

Urban households consumption and equipment rate in 2000

Urban	Consumption (TWh)	Equipment rate (%)
Total, of which :	35	
Lighting		
TV		70
Refrigerators		70

Rural households consumption and equipment rate in 2000

	Consumption (TWh)	Equipment rate (%)
Total, of which :	13.6	
Lighting		
TV		50
Réfrigérators		60

Exercise 4 : In this exercise only urban is considered. Forecast the electricity demand in 2020 in according to 3 cases:

Assumption 1 : the equipment rate for refrigerators and TV increase like the GDP/hh and that the electrification rate is 99% in 2020. We suppose that the unit electricity consumption is stable for "other appliances".

Assumption 2 : What are the results if the equipment rate of TV increase 2 times quicker than the GDP/hh?

Assumption 3 : the specific consumption decrease by 20% for refrigerators and 20% for TV over the 2000-2020 period and 40% of lamps are low consumption lamps in 2020 (80% of energy saving for a low consumption lamp compared to a standard lamp)