Enerdata

Evaluation of Medium/Long term Energy Efficiency Potentials

Case Study 2

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Case study 2

Exercise 1 : Construct a simple techno-economic model to project the diesel demand of cars (FCCA) (in Mtoe) in 2005 and 2010, with 1990 as base year. The model is based on the number of cars (NBCA) and the average unit consumption (UCCA) (model ET1): NBCA is assumed to increase at a constant rate of 4.5 %/year ; UCCA is assumed to remain constant.

Projection of diesel demand of cars in 2005 and 2010 (Mtoe)

2005 2010	

Data : - Diesel consumption of cars in 2000 (FCCA)
- Number of cars in 2000 (NBCA) (see above)

Code	**NBCA**	**FCCA**
Unit	**M**	**Mtoe**
2000	4.400	2.100

Exercise 2 :Adapt the model ET1, assuming that UCCA is no longer constant and changes over time with a linear trend GRUCCA(t), and that NBCA is related to GDP with an elasticity (ELGDP) to GDP.

Projection of diesel demand of cars in 2005 and 2010 (Mtoe)

2005 2010	

Data : - Annual growth rate of unit consumption of cars (GRUCA)
- Elasticity of number of cars to GDP (ELGDP)
- Annual GDP growth rate (GRGDP)

Code	**GRUCCA**	**ELGDP**	**GRGDP**
Unit	**1**	**1**	**1**
2005	-0.01	1.5	0.02
2010	-0.02	1.5	0.03

Exercise 3 : Construct a simple techno-economic model to project the diesel demand of cars (Mtoe) (FCCA) in 2005 and 2010, from three variables (model ET2) : number of cars (in k) (NBCA), the specific consumption of cars in l/100 km (SCCA) and the average distance driven by car every year in km (KMCA). The number of cars is assumed to be related to the GDP with the same elasticity as last exercise ; the specific consumption is assumed to change with a linear trend GRSCCA ; the distance is assumed to be related to the diesel price (PRGS) with an elasticity (ELPRGS).

Projection of diesel demand of cars in 2005 and 2010 (Mtoe)

2005 2010	

Data : - Consumption of cars in 2000 (FCCA)
- Number of cars in 2000 (NBCA)
- Coefficient of conversion of liters in toe (CFDS)
- Average distance driven by cars (KMCA)
- Annual growth rate of specific consumption of cars (GRSCCA)
- Elasticity of number of cars to GDP (ELGDP) (see above)
- Annual variation in diesel price (GRPRGS)
- Elasticity of car annual distance to diesel price (ELPRGS)

	CFDS	**KMCA**	**GRSCCA**	**GRPRGS**	**ELPRGS**
	koe/l	**km**	**1**	**1**	**1**
1990	0.88	8 000			
1995	0.88		-0.01	0.01	-0.1
2000	0.88		-0.02	0	-0.1

Exercice 4 :Calculate the elasticity of the car number to GDP over the period 1990-2000 and use it in the model ET2 instead of the assumed value.

Projection of diesel demand of cars in 2005 and 2010 (Mtoe)

2005 2010	

Data : - Number of cars 1990, 2000
- GDP 1990, 2000

	Number of cars (NBCA)	**GDP**
1990	1.840	144569
2000	4.400	205474

Exercise 5 :The change in the specific consumption of cars over time is defined from an economic potential (POT) and a rate of exploitation of that potential. Adapt the model ET2.

Projection of diesel demand of cars in 2005 and 2010 (Mtoe)

2005 2010	

Data : - Potential of energy conservation for cars (POTCA)
- Rate of exploitation of the potential for cars (TEXCA)

	POTCA	**TEXCA**
Unit	**1**	**1**
2000	0.3	0
2005	0.3	0.3
2010	0.3	0.5