

# **RREGULATED TARIFFS FOR SHPP-S IN ALBANIA**

*Progress and Perspective*

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# Introduction

- ✓ Legal Framework of Albania guarantees **purchasing of electricity generated by SHPP by KESH. Sh.a (Wholesale Public Supplier).**
- ✓ Electricity generated by SHPP-s , **may be sold even in the Free Market.**
- ✓ Sale Contract to Wholesale Public Supplier is a **Long Term Contract** (according to CMD nr.87, dated on 16.01.2008) .
- ✓ Since that is a regulated relationship, **Sale and Purchase Price is regulated too.**
- ✓ This price has been and it is foreseen to be **an incentive price** for SHPP-s.
- \* Law nr. 9072, dated on 22.5.2003 'ON POWER SECTOR', amended needs **coherence** and CMD nr.27, dated on 19.01.2007 and CMD nr.87, dt. 16.01.2008 should be amended to be **harmonized** to the other parts of Legislation.

**As a rule, HPP-s with installed capacity up to 10 MW , are considered SHPP-s  
In Albania this limit is 15 MW.**

*In our country the first SHPP has been constructed in 1936, in Vithkuq, Korça. It is still in operation with installed capacity of 780 kW .*

# Actual and Perspective Importance of SHPP-s

- Government Assessment :
  - ❑ Albanian Strategy of Energy considers exploitation of SHPP-s as strategic priority .
  - ❑ Measurements Plan considers promotion of domestic capital for rehabilitation of SHPP a key factor for realization of Albanian Strategy of Energy 2007 – 2010
    - *Indicators used for quantitative assessment* . Installed Capacity of SHPP-s

Name	Installed Capacity ( 2009)		Installed Capacity , if all Concession are Contracts are realised	
	MW	% to the total	MW	% to the total
Power Plants except SHPP-s	1,548	98,3	2,244	85,8
SHPP	27	1,7	371	14,2
<b>Total</b>	<b>1,575</b>	<b>100</b>	<b>2,615</b>	<b>100</b>

Total Concessionaire Contracts signed (all are for SHPP-s to be commissioned after 2009)



Year	Nr. Of Concession Contracts	Nr. of SHPP-s	Foreseen Capacity (kW)
2007	3	3	17,800
2008	26	38	167,898
2009	56	176	840,884
<b>TOTAL</b>	<b>85</b>	<b>217</b>	<b>1,026,582</b>

N. 0	NAME	NUMBER of SHPP-s		INSTALLED CAPACITY (KW)		
		No. According groups	Progressive	Of Group	Progressive	% progressive /total
1	deri ne 5 MW	78	78	96,530	96,530	9.3
2	5 MW deri 10 MW	50	128	132,899	229,429	22.1
3	10 MW deri 15 MW	33	161	114,403	343,832	33.1
4	15MW deri 50 MW	54	215	249,692	593,524	57.1
5	mbi 50 MW	9	224	446,600	1,040,124	100.0
	<b>TOTALI</b>	<b>224</b>		<b>1,040,124</b>		

# Why an Incentive Regulated Tariff ?

(for purchasing electricity of SHPP-s by Wholesale Public Supplier)

- ✚ Increases security and sustainability of electricity supply;
- ✚ It is a clean energy;
- ✚ Improves substantially the quality of service of electricity supply in the country, especially in mountainous zones;
- ✚ Increases the efficiency of the system , contributing in technical losses decrease;
- ✚ Uses domestic resources;
- ✚ Decreases the import;
- ✚ Employment and development in rural zones;

# Evolution of Regulated Tariffs of SHPP-s

<b>Existing SHPP-s (constructed up to 2007)</b>									
Nr.	Company	Tariff; lekë/kWh							
		2004	2005	2006	2007	2008	2009	2010	2011 →
<i>Installed Capacity :</i>		<i>Up to 5 MW</i>			<i>Up to 10 MW</i>				<i>Up to 15 MW</i>
1	ESSEGEI SMOKTHINA	3.75	5.4	5.6	6.2	6.5	6.5	7.4	
2	EMIKEL	4.3	4.3	4.52					
3	WONDER - POWER	4.4	5.85	5.85					
4	SPAHIU - GJANC	4.6	5.9	6.28					
5	AMAL	4.15	4.15	4.15					
6	PROJEKSION	4	4	0					
7	SAROLLI	4.6	4.6	4.6					
8	HCA	3.77	4.79	5.2					
9	JUANA	4.55	5.35	5.43					
10	WTS energji	4.55	4.55	4.6					
11	MARJAKAJ	3.78	3.78	4.2					
12	DARDANIA	0	0	0					
13	FAVINA 1	0	5.3	5					
14	MAKS ELECTRIC	4.95	4.95	5.1					

<b>New SHPP-s (to be constructed after 2007)</b>									
Nr.	Company	Tariff lekë/kWh							
		2004	2005	2006	2007	2008	2009	2010	2011 →
<i>Installed Capacity</i>		<i>Up to 5 MW</i>			<i>Up to 10 MW</i>			<i>Up to 15 MW</i>	
1	xy				6.5	9.37	9.37	6	
2	etj.								

# Accepted Incentive mechanism

Incentive methods used up to now: Feed-in tariff on :

- Average price of electricity sold to Tariff Customer (for existing SHPP) ;
- Average Price of import of electricity provided by KESH sh.a in previous year (for new SHPP-s).

What is accepted to be used in the future:

- Supporting Mechanism: feed-in tariff
- Fixed Feed-in tariff (in general, without ongoing regulation)
- There will not be anymore any division of existing and new SHPP-s
- Postpone of the threshold of installed capacity from 10 MW to 15 MW
- Feed-in tariff Scheme will be offered for 15 years
- Some incentive methods will differ the price according to installed capacity r:
  - SHPP-s up to 2,000 kW, (up to 2 MW.)
  - SHPP-s from 2,001 up to 5,000 kW, (up to 5 MW).
  - SHPP-s from 5,001 up to 15,000 kW, (up to 15 MW).



## **TERVOLI SHPP**

Installed Capacity: 10,000 kW

Company: Ble-Klo-Ar shpk

Location: Holta river, Gramsh

Commissioning Year: 2010

ERE Conference "Albanian Energy Sector,  
Challenges and Regulation" Tirana, 7

October 2010

# Analyzed Methods for the Future:

- **Feed-in tariff on:**
  - 1. Import prices or on Market Prices .**
  - 2. Retail electricity price**
  - 3. Maximum Regulated Price .**
  - 4. Levelised Discount Cost for unit of electricity generation.**



## Method 1:

### Feed-in tariff on: import prices or market prices.

- *It is the actual method of calculation of the price of new SHPP-s, given to concession*

- *Formula:*

$$P_U = P_{I(t-1)} * 1.1 * R_{EX}$$

- *Theoretical Justification : In actual conditions of domestic generation , import price is considered like the cost of the best opportunity , if this energy is not generated by SHPP-s.*
- *In fact the energy from import and the energy generated by SHPP-s is not offered from the same conditions.*
- *If there would be a different situation of the open market and international and regional interconnection capacities would be different, the import price will be a good reference alternative.*

### Advantages:

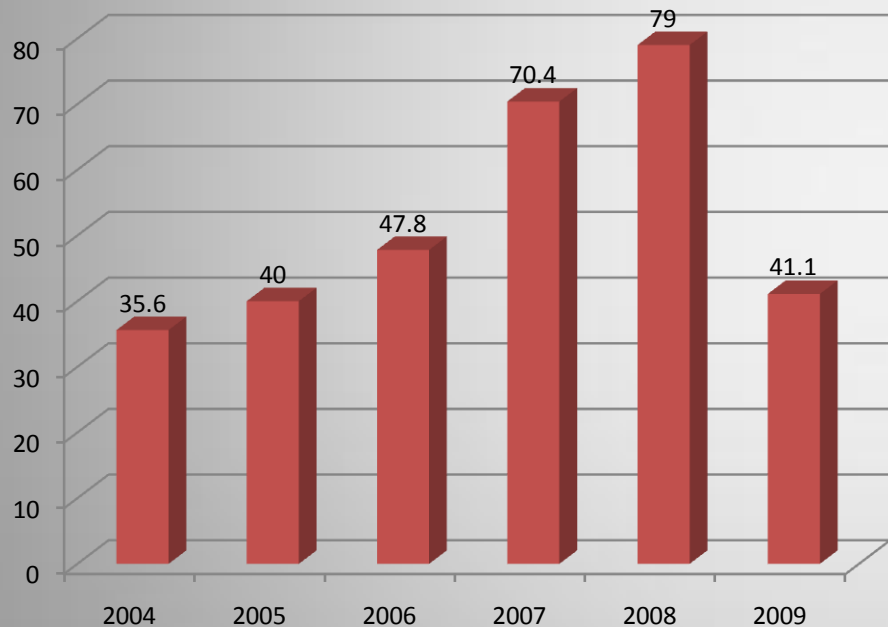
- a. It is based on market prices.

### Disadvantages:

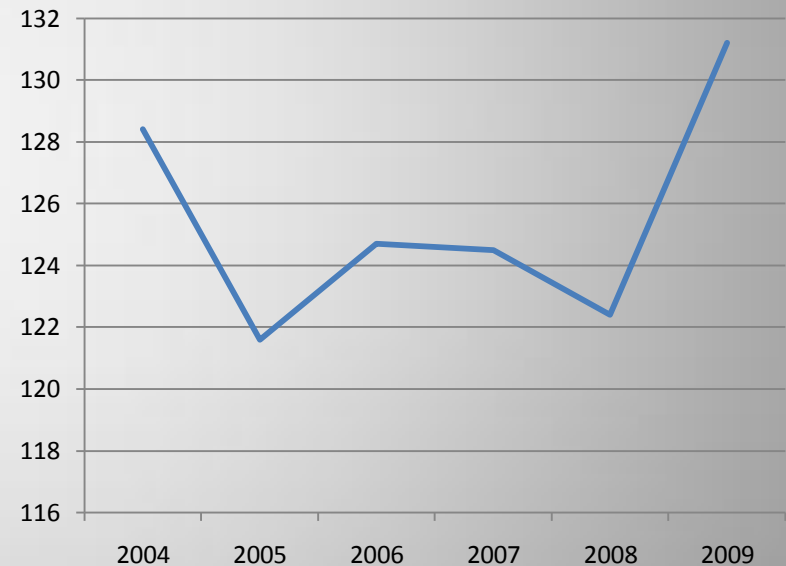
- a. There is a risk for instability of prices for investors.
- b. Benefit from technical losses reduction in Distribution and Transmitting Sector goes only for generators.
- c. It is used for one year only, and so it requires calculations year by year.
- d. Can't be measured the stimulation effect.

# Graphic Illustrations of instability of investor prices, as a result of instability of market prices (Price risk):

## Average Import Price EUR/MWh in Years



## Exchange rate Lek/Euro provided by KESH sh.a for 2004-2009 ALL/EUR real



## Method 2:

### Feed-in tariff on: Retail Electricity Price and Z-Factor

#### Case A – Without transmitting cost reduction

- *This method is proposed by METE in the framework of designing the Draft “For Renewable Energy ” and it considers , through “Z” factor different types of renewables, potentials of their using and also respecting EU Directive for Renewable Energy. According to this Project it is foreseen that “Z” factor to be defined by ERE.*

- *Formula:*

$$P_U = P_R * (1 - Ld\%) * Z$$

- *Theoretical Justification : This method doesn't have to much theoretical base. Retail electricity Price of Tariff Customers is taken as a reference.*

#### Advantages:

- a. Make possible the difference based on the type of energy used.
- b. Price sustainability of relatively accepted in time.

#### Disadvantages:

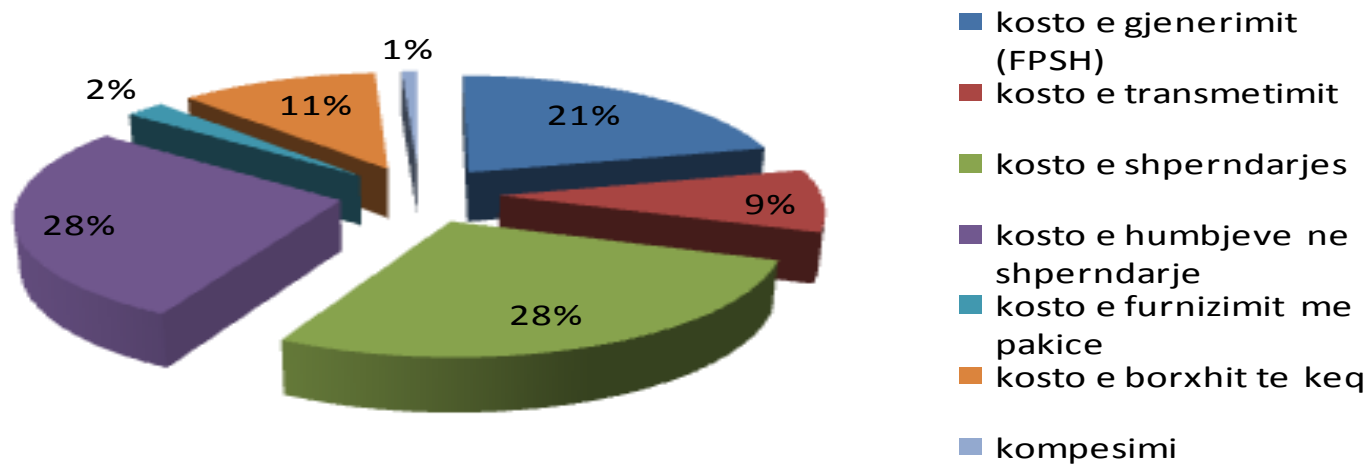
- a. Including of costs economically unjustified (look the following page).
- b. Benefit from technical losses reduction goes only for customers.
- c. It is used only for one year (or other short deadlines, as much as regulated period is) and it requires recalculation year by year.
- d. Stimulation effect can't be measured.

# Graphic illustration of including unjustified costs in retail electricity price

## Economically unjustified costs:

1. Distribution Losses cost 28%
2. Bad debt cost 11 %

Struktura e cmimit te shitjes me pakice te energjise elektrike per vitin 2010



## Case B – with reduction of transmitting cost

- *This method corrects method proposed by METE, considering price reduction with transmitting cost. SHPP-s are connected straight to the Distribution System, so there is no reason that transmitting tariff to be added to their tariff.*
- *Formula:* 
$$P_U = [(P_R - P_T)(1 - Ld\%)] * Z$$
- *Theoretical Justification : The same of the Case A.*

### Advantages :

- a. Make possible the differentiation based on the type of used energy resource.
- b. Corrects reasonably the case A in the favour of tariff customers.**
- c. Price sustainability relatively accepted in time.

### Disadvantages:

- a. Including of economically unjustified costs.
- b. Benefit from reduction of technical losses goes only for customers.
- c. It is used only for one year (or other short deadlines, as much as the regulated period is) and it requires calculations year by year.
- d. Stimulation effect can't be measured.

## Method 3:

### Feed-in tariff on: maximum regulated price.

- *This method considers the fact that not all electricity generated by SHPP-s and injected to the Distribution System , goes for End Use Customers . It is reduced by technical losses.*
- *Also , in time there will be investments for increasing energy efficiency.*
- *Formula:*

$$P_U = [P_R * (1 - Kgr)] * \alpha$$

- *Theoretical justification : The same to Method 2*
- *'α' Factor is going to be lower , about 0,85 in 2016-2020, and then it will be assessed .*

SHPP-s Groups	Factor 'Kgr'	Factor 'α'	
		Vlera	For period
0 – 2 MW	0,12	0,900	2011 – 2015
2 – 5 MW	0,15	0,900	2011 – 2015
5 – 15 MW	0,18	0,900	2011 – 2015

### Advantages:

- Corrects the retail electricity price with reasonable and relatively detailed factors .**
- Price sustainability, relatively accepted in time

### Disadvantages :

- Including economically unjustified costs.
- Benefit from reduction of technical losses and increasing of energy efficiency goes only for customers.
- Admissions have been realised without related studies.**
- It is used only for one year (or other short deadlines, as much as the regulated period is).
- Stimulation effect can't be measured.

## Method 4:

### Feed-in tariff on: Levelised Discounted Costs for unit of electricity generation

- *This method evaluates costs and the future production of a project and discount them considering time value of money.*
- *Electricity price is defined as a ratio of Levelised Discount Cost for unit of electricity generation with sum of discount energy generation for whole life of SHPP.*
- *In average unit cost are included :cost of original investment of SHPP, cost of maintainace, amortization and staff cost.*
- *Formula:*

$$LDC = \frac{\sum_{i=0}^{30} \frac{C_i}{(1+r_i)^i}}{\sum_{i=0}^{30} \frac{E_i}{(1+r_i)^i}}$$

- Cost of capital is based on :
  - a. Return of equity with a rate equal to 16.5%
  - b. Interest rate of the loan after tax of profit equal to 12%
  - c. Ratio/gear of loan-equity with 60% with 40%

The quality of conclusions of this method depends on the quality of data used and quality of forecast.

- Analysing is based on the data of 90 concessionare contracts provided by Albanian Government during 2009 for the construction of SHPP-s with installed capacity up to 15 MW .
- It is made a correction of the data of the contracts .

According to installed capacities, SHPP-s are grouped:

SHPP up to 2,000 kW, (deri 2 MW.)

SHPP from 2,001 up to 5,000 kW, (up to 5 MW).

SHPP from 5,001 up to 15,000 kW, (up to 15 MW).

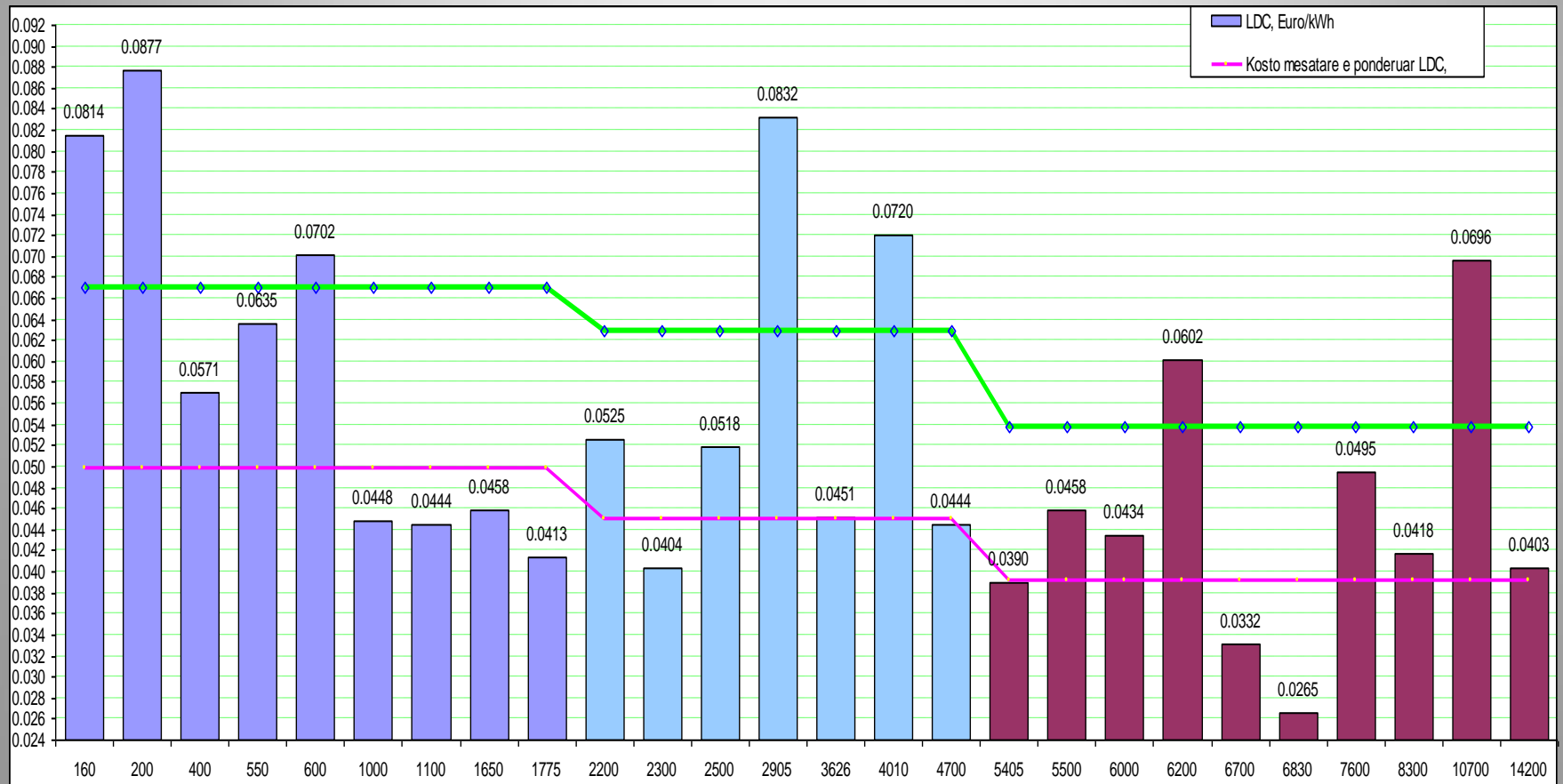
## Method 4:

### Feed-in tariff on: Levelised Discount Cost for unit of electricity generation

- SHPP-s, according to installed capacity, are grouped in three categories. In the table is given a monster for each group.

Recalculations are made, accepting return of equity with a rate equal to 20%; Pay Back Period 7 years (as much as Pay Back of the Loan)

Group	SHPP-s (monster)	Capacity(kW)	
		from	Up to
0 - 2,000 kW	9	160	1,775
2,000 - 5,000 kW	7	2,200	4,700
5,000 - 15,000 kW	10	5,405	14,200





#### Method 4: Feed-in tariff on: Levelised Discount Cost for unit of electricity generation

##### Advantages:

- a. It allows the assessment of real costs for construction and operation of the object.
- b. The incentive rate through Feed in Tariff is expressed in explicit way and it is assessable.
- c. Price sustainability in time.

##### Disadvantages:

- a. There are used a lot of assumptions.
- b. The quality of the data used for some indicators is a little doubtful , if we are based only on Concessionaire Contract and the data is not processed.
- c. It requires forecasting of the costs for long term period , effecting the accuracy of the results.

#### Comparison of the results of analysed alternatives

- Comparison of prices can't be in absolute value.
- Results of the methods are compared through indicators of Pay Back Period. There is no any significant difference between methods .
- May be measured **where** Feed in Tariff-s have impact on incentive , according to groups of SHPP-s and **how much** is this benefit, using costs data, defined by long term average cost method.
- The incentive may be measured in relative and absolute value (how much does this incentive will cost to economy/budget.)

# Conclusions

- ❑ Regulated tariffs of electricity generated by SHPP-s will be remain stimulating for this type of resource.
- ❑ Stimulation will be provided through Feed in Tariff Mechanism.
- ❑ Feed-in tariff is defined using methods generally accepted and used.
- ❑ Criteria for admission of the method: the best harmonization of the interests of the customers and generators.
- ❑ According to this criteria, Levelised Discounted Cost Method (LDC) is more suitable.
- ❑ Since Import prices are market prices, method based on import prices , also is an alternative.
- ❑ The measure of the incentive, according to LDC Method , may be measured in absolute and relative values.
- ❑ From pre calculations , according to LDC method, the prices result:

Groups of SHPP-s	PRICE Lek/kWh
SHPP-s with installed capacity up to 2,000 kW,	9.058
SHPP-s with installed capacity 2,001 – 5,000 kW,	8.505
HEC-e me kapacitet të instaluar 5,001 – 15,000 kW.	7.290

- ❑ After Pay Back Period of the loan (7 years), incentive price may be reduced (1-2%/year)

**The full study carried out by ERE for this goal will be published on ERE website to be object of comments of public or interested groups, before Board of Commissioners take a decision on it.**

**Thank YOU!**