

# Microproduction with Photovoltaic and Wind Systems

## Analysis of Economical Profitability and of Impacts in the Electric System

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### 1. Brief introduction

In this work an analysis of economical profitability is done for the promoters of the microproduction of electric energy in Portugal, through photovoltaic systems, wind and mixed. There is also done an analysis of impact of the microproduction in the electric system, the impact at economical level and the impact in the global production of electric energy for consumption. These studies take as a base the current legislation that brought a new spirit to this activity, relatively to the tax of adhesion of the microproduction and its influence in the taxes of reference to apply to the microproducers.

### Key-Words

Microproduction, Photovoltaic Systems, Wind Systems, Remuneration, Impacts.

### 2. Introduction

Portugal has been showing how the energetic politics have an important role particularly in the adoption of renewable energy sources to produce electric energy. With the entry into force of the current legislation (*Decreto-Lei n°363/2007, 2 de Novembro*) the microproduction became a more appellative activity, particularly in terms of remuneration of the energy sold to the net for the microproducer. This document predicts two remunerative regimes for the producers / consumers, the general regime and the subsidized regime which is applicable to units of microproduction with power of connection up to 3,68 kW that use renewable sources.

### 3. Analysis of Cases Studies

For the realization of this study it was created scenery of adhesion to the microproduction, with the purpose of determining the tariffs' behavior and its influence in the effectuated investments. The adhesion scenery is characterized by the adhesion predicted in the *Decreto-Lei n° 363/2007*, which was consisting of 10 MW of installed power in 2008 and, in the following years, the limit would be added annually in 20 %.

#### A. Analysis of Economical Profitability

It is based on these tariffs and using economic indicators, particularly the Internal Tax of Profitability

(TIR) what the economical analyses prepared for a period of 15 years, so much for photovoltaic and wind systems.

#### B. Impacts of the Microproduction

This study has a base timeline of 10 years. For its preparation the previous scenery was used and was created a scenery of installations which intends to be as realistic as possible, where it is considered 80 % of photovoltaic installations and 20 % of wind installations.

### 4. Conclusions

It is visible in the effectuated analyses, that the microproducing systems for the scenery of reference of the current legislation reveal a small attraction despite the higher investment comparing with Spain. Actually microproducing systems are a type of investment that promotes a reasonable profitability, mainly in the wind systems case. An essential fact to have a good profitability is the local conditions to produce energy (solar radiation and average wind speed). Relatively to the economical impacts of the microproduction, it is concluded that in 10 years time it will be higher, mainly for the scenery where the adhesion is gentler, as less energy is bought to the microproducers and at higher prices comparatively with the scenery of reference. In what it concerns to the impact in the global production this one it is not very much higher than the Electric National System, only around 0,7 % of the total of production, however, its expected a bigger growth rate taking into account that these are related with the Low Tension net.

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