

## PROPOSAL OF A MSC THESIS IN RENEWABLE ENERGIES (MSc RENE)

### 1 Company name / Innovation project /Research Center name

Catalonia Institute for Energy Research (IREC)

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### 2 Coordinator of the proposal (name and email)

José Luis Domínguez-García ([jldominguez@irec.cat](mailto:jldominguez@irec.cat))

### 3 Title of the MSc thesis proposal

Analysis of Harmonics in wind power plants

(reference: 2015-11-IREC-WIND-HaWPP)

### 4 Executive summary of the work to be done in the MSc thesis

The new wind power plants rely on power electronics which do not provide an ideal sinusoidal waves forms. Because of this and the strict requirements of power quality demanded by the Transmission System and wind power plant operator, determine the harmonic content of wind power plants based on Full Rated Converter Wind Turbines is of relevance.

The main objective is to understand and analyse the harmonic content taking place in wind power plants when installing FRC-WTs. Standards and grid codes review regarding harmonic distortion must be performed. Also, some simplified modelling of wind turbines for harmonic content analysis and simulation for verification is expected.

### 5 Required background of the candidate (degrees), if any

*Preference will be given to the following degrees Electrical Engineer, Electronic Engineer, Mathematics, but not limited to these.*

### 6 Skills recommended for the candidate (computer, lab experience, etc.), if any

Knowledge of power converters, power systems, power quality, wind power, modelling and computer

## **7 Location**

IREC  
Jardins de les Dones de Negre 1, 2a pl.  
08930 Sant Adrià de Besòs, Barcelona (Spain)

## **8 Equipment to be used by the thesis student**

*Computer*

## **9 Period**

*From January 2016 to July 2016*