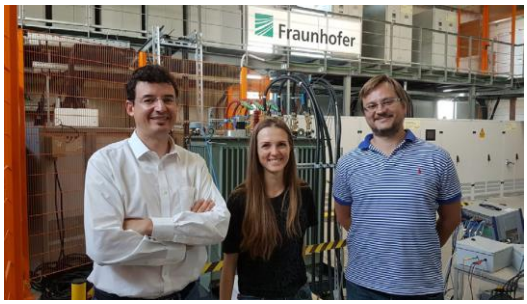
TRANSNATIONAL ACCESS
USER PROJECT FACT SHEET

USER PROJECT	
Acronym	**INTREPID**
Title	**INtelligent Transformer for Renewable Energy Prosumers Integration and Deployment**
ERIGrid Reference	
TA Call No.	**1**

HOST RESEARCH INFRASTRUCTURE			
Name	**SysTec of Fraunhofer IWES**		
Country	**GERMANY**		
Start date	**19-06-2017**	**Nº of Access days**	**15**
End date	**07-07-2017**	**Nº of Stay days**	**15**

USER GROUP	
Name (Leader)	**PABLO CIRUJANO**
Organization (Leader)	**ORMAZABAL COTRADIS**
Country (Leader)	**SPAIN**
Name	**GONZALO PÉREZ DE NANCLARES**
Organization	**ORMAZABAL COTRADIS**
Country	**SPAIN**
Name	**ALBERTO SÁNCHEZ**
Organization	**ORMAZABAL COTRADIS**
Country	**SPAIN**
Name	**JUAN SASTRE**
Organization	**ORMAZABAL COTRADIS**
Country	**SPAIN**

1. USER PROJECT SUMMARY (objectives, set-up, methodology, approach, motivation)

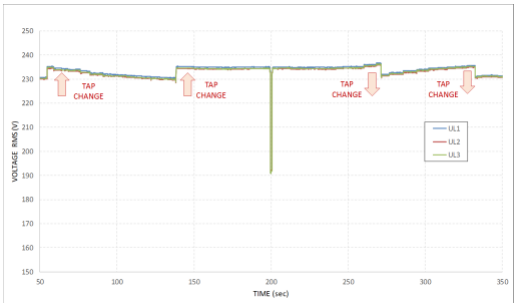


The objective was to test the behavior of a new compact smart distribution transformer with an OLTC that promotes the integration of DG and electric vehicles by regulating the voltage automatically - to cope with the voltage fluctuations generated by DG (now) and the EV (in the future) in the LV side of the electric network.

The test centre for smart grids and electromobility SysTec of Fraunhofer IWES provides the infrastructure to realistically develop and test grid components and equipment in view of new system functions, such as controllable transformers for dynamic voltage support. In this case the test facility is connected to the MV network between the equipment under test and the network connection point of the grid operator. It produces voltage dips on the MV side of the equipment under test by means of a mobile test container (LVRT test facility).

In addition to the existing test procedures which are in accordance with current standards and application requirements, the investigations might serve to further develop the grid connection rules.

2. MAIN ACHIEVEMENTS (results, conclusions, lessons learned)



The new smart transformer has been assessed under different voltage dip conditions, according to grid code specifications, proving that the control box was not disconnected after the tested dips. Different control algorithms (normal, advanced) have been checked under a set of different operation conditions (normal, quick, blocked). In addition, reverse power flow conditions, in the case that distributed DG excess the LV loads, has been tested along with remote sensors devices. Finally, the relation between voltage and power consumption has been assessed promoting the full range operation of the OLTC.

The necessity to improve the coordination of the smart transformer with the inverters has been detected for further research.

3. PLANNED DISSEMINATION OF RESULTS (journals, conferences, others)

Technical papers presented in conferences such as the ones organized by CIRED or CIGRE.

The proposed research might help to develop a grid code for DG connected in the LV, and for their associated equipment - such as the smart distribution transformers with OLTC.