

# Measurement Methods and Test Procedures for Assessing Accuracy of Instrument Transformers *for Power Quality*

## Overview

**Gabriella Crotti – Project coordinator**

**19NRM05 IT4PQ 2<sup>nd</sup> Stakeholder Workshop**  
**February 9<sup>th</sup>, 2022**

- **The project framework**
- **Overview of IT4PQ aim and objectives**
- **Implementation**
- **Timeline and scheduled activities**

# The project framework: EMPIR



The European Metrology Programme for Innovation and Research is a joint European Research Programme in the field of Metrology, undertaken by 22 countries - Member States and Associated Countries to Horizon 2020

- **Call Normative:** research to develop metrological methods and techniques required for standardization, regulation and conformity assessment

The project is supported by the European Metrology Network for Smart Electricity Grids (EMN SEG)

# Project focus

Electrical energy grid increased complexity

Accurate monitoring of PQ grids

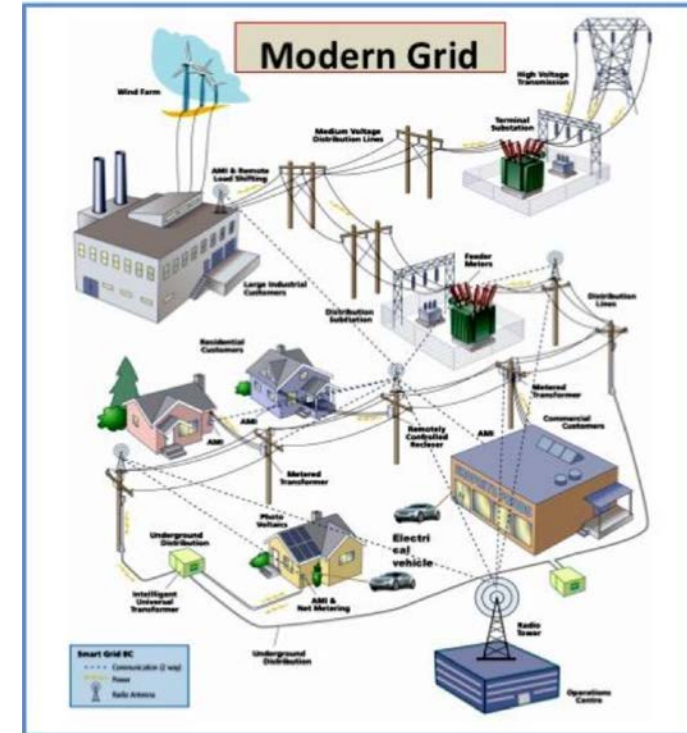
Reliable and accurate instrumentation

Qualified ITs and measuring systems for PQ monitoring

↓  
**IT *for* PQ**  
↑

**Needs for research on ITs for PQ from IEC TC 38.**

- understanding and quantification of ITs behavior
- traceability of PQ measurements
- tests procedures to qualify ITs for PQ under actual conditions



# Project aim

Metrological framework for the **traceable calibration and test of Instrument Transformers (ITs) for Power Quality (PQ)** measurements in electricity distribution grids

- Focus on MV grids, disturbances up to 9 kHz

**Contributions to be proposed to Standardisation (IEC TC 38/WG47, ..)**

## OBJ. 1 - WP1

Accuracy and uncertainty  
limits of ITs  
(selection of parameters to be  
measured, definition of  
evaluation indexes with  
validated limit values and  
uncertainties)

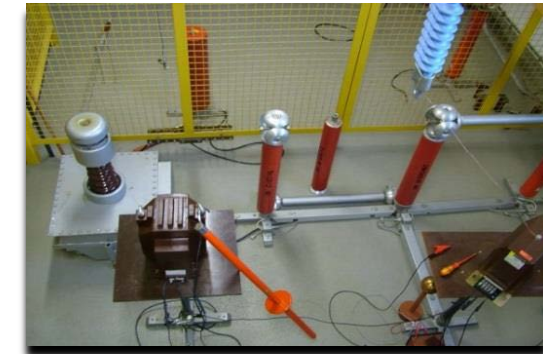
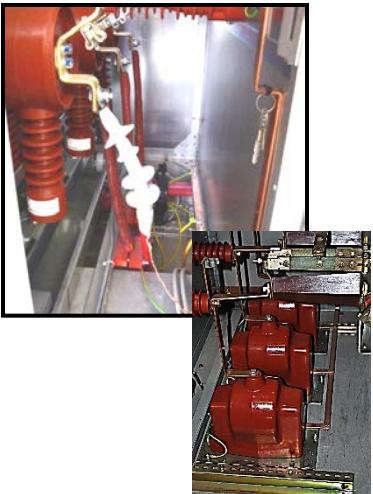
## OBJ. 2&3 - WP2

Traceable reference systems  
and test procedures for IT  
calibration  
(from National Metrology  
Institute to test and  
manufacturer laboratories)



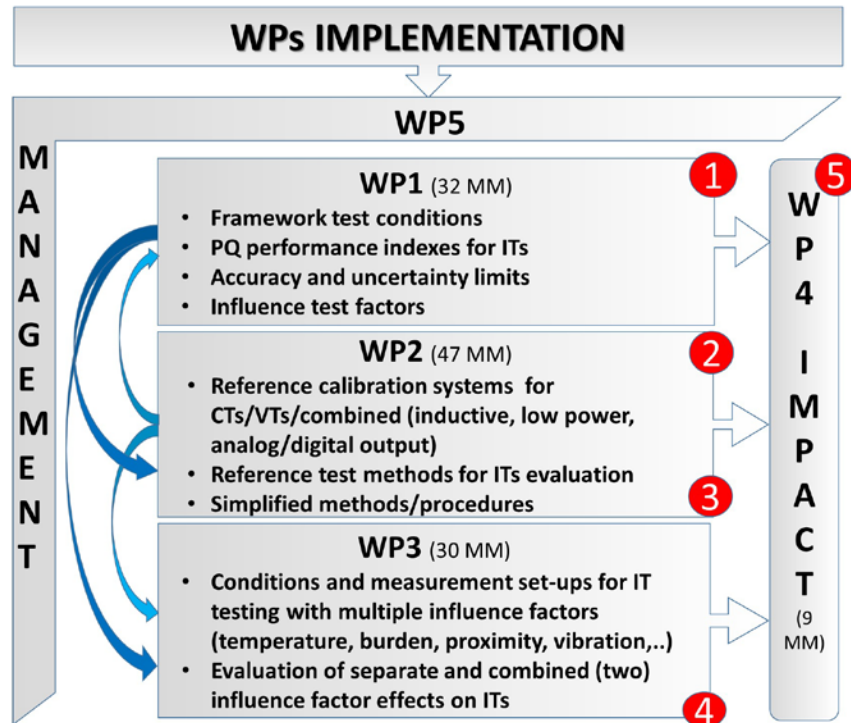
## OBJ. 4 - WP3

Effects of combined  
environmental and circuital  
influence quantities  
on the IT performances in  
PQ measurement





# Implementation



## CONSORTIUM

- **6 NMIs**  
(specific competences in HV, HI sensor and measuring instrument calibrations, IT modelling)
- **3 Universities**  
(Signal processing, on-site measurements and lab testing, IEC/IEEE JWG 55 project leadership)
- **1 Research centre**  
(IT development, IEC TC 38 WG47 Convenor, CENELEC TC 38 Secretariat)

**Chief stakeholder**

**IEC TC 38/CENELEC TC 38 Instrument transformers**

## Tools for creating impact

Chief Stakeholder  
Stakeholder  
Committee

Links with  
Standardisation  
Organisations

Calibration set-ups,  
Test procedures,  
Guidelines,..

Papers/  
Presentations  
(Scientific/Trade  
Journals, Conf. ,..

Training  
events/  
actions

## Short-term /wider impact

Standards/  
Report for  
PQ&ITs

New  
extended  
CMC

ITs qualified for  
PQM and relevant  
test facilities

Reduction of  
PQ issues

Increased  
reliability  
grids

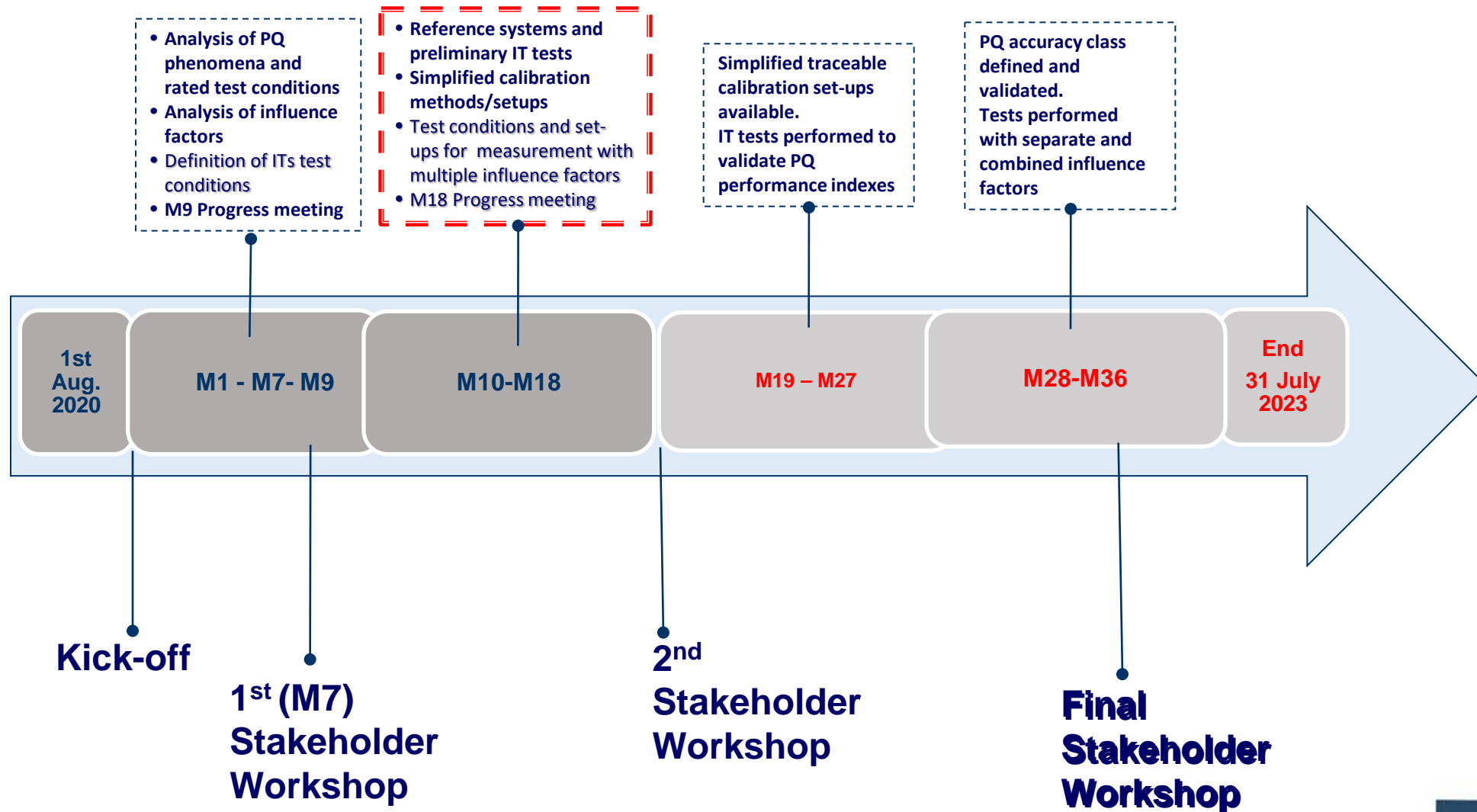
Certainty in  
legal issues



# Project timeline



**IT4PQ**  
Instrument  
Transformers  
for Power  
Quality



# The Workshop



**IT4PQ**  
Instrument  
Transformers  
for Power  
Quality

Update on the  
IT4PQ project  
activity and outputs

Recent  
development in  
relevant IEC TC on  
ITs, PQ, MI

Alignment of project  
activities with actual  
needs, identification  
of further necessities,  
shared knowledge

Experience from  
on-site PQ  
measurement  
campaign

Knowledge and practical  
experience from  
stakeholders



# ***Thank you!***

***This project 19NRM05 IT4PQ has received funding from the EMPIR programme co-financed by the Participating States and from the European Union's Horizon 2020 research and innovation programme***