

# IT4PQ 2<sup>nd</sup> Stakeholder Workshop



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## Status of the Activities of WP4 - Creating Impact

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*Mario Luiso*

IT4PQ 2<sup>nd</sup> Stakeholder Workshop  
9<sup>th</sup> February 2022



Università  
degli Studi  
della Campania  
*Luigi Vanvitelli*

*Dipartimento di Ingegneria*

# Task 4.1 Knowledge Transfer

Activity number	Activity description	Partners (Lead in bold)
A4.1.1 M36	<p>A Stakeholder Committee composed of at least <b>12 members</b> from 12 organisations including CLC and IEC standardisation technical committees, TSO and DSO, IT manufacturers, PQ instrument manufacturers and academics from at least <b>eight different countries</b> will be created. Each project partner will be asked to promote participation in the Stakeholder Committee among his contacts.</p> <p>The aim of the Stakeholder Committee is to <b>clarify the metrological needs to be addressed</b> of the various interested parties and ensure that project progress and outputs are kept aligned with the developing needs.</p> <p>Interaction of the Stakeholder Committee will be achieved via <b>a central website</b> (see below) and <b>ad-hoc meetings</b> will be held at suitable events where the committee are in attendance.</p>	<b>SUN</b> , all partners

# Task 4.1 Knowledge Transfer - Stakeholders

Stakeholder	Contacted BY	Contacted/Contact person	Contacted	Accepted (mail)	contact e-mail
IEC TC38/CENELEC	RSE	Volker Leitloff - CENELEC/IEC TC 38 Chair Stakeholder IT4PQ Chief	yes	yes	<a href="mailto:volker.leitloff@rte-france.com">volker.leitloff@rte-france.com</a>
IEC SC77A WG9:PQ measurement methods	TUD	Michael Schwenke (Siemens), Convenor of IEC SC 77A WG) of the JWG C4.42/CIRE	yes	yes	<a href="mailto:michael.schwenke@siemens.com">michael.schwenke@siemens.com</a>
CIGRE JWG C4.42/Cired: Overview of common methods for assessment of harmonic contribution from customer installation	TUD	Igor Papič (University of Ljubljana), Convenor of the JWG C4.42/CIRE	yes	yes	<a href="mailto:igor.papic@fe.uni-lj.si">igor.papic@fe.uni-lj.si</a>
AMPRION GmbH	TUD	Robert Dommerque	yes	yes	<a href="mailto:robert.dommerque@amprion.net">robert.dommerque@amprion.net</a>
D-A-CH-CZ WG EMC and PQ Responsible for maintenance of the "Technical Rules of assessment of Network disturbances of customers installations connected to LV,MV&HV	TUD	Karl Scheida, Convenor of the D-A-CH-CZ WG EMN&PQ (Oesterreichs Energie)	yes	yes	<a href="mailto:k.scheida@Oesterreichsenergie.at">k.scheida@Oesterreichsenergie.at</a>
ARERA	RSE	Luca Lo Schiavo	yes	yes	<a href="mailto:lloschiavo@arera.it">lloschiavo@arera.it</a>
TESMEC Automation S.r.l.	SUN	Andrea Pedron	yes	yes	<a href="mailto:andrea.pedron@tesmec.com">andrea.pedron@tesmec.com</a>
TND Elettronica S.r.l. (SME)	SUN	Aldo Capone	yes	yes	<a href="mailto:aldo.capone@tndel.com">aldo.capone@tndel.com</a>
METAS	INRIM	Cristian Meister	yes	yes	<a href="mailto:christian.mester@meats.ch">christian.mester@meats.ch</a>
EDF research et Development, LME	LNE	Éric Treuillet/Bernard Paya (contact)	yes	yes	<a href="mailto:bernard.paya@edf.fr">bernard.paya@edf.fr</a>
OMICRON	TUD	Erik Rydler	Yes	Yes	<a href="mailto:erik.sperling@omicronenergy.com">erik.sperling@omicronenergy.com</a>
G&Welectric	UNIBO	Elisa Scala	Yes	yes	<a href="mailto:elisa.scala@gwelec.com">elisa.scala@gwelec.com</a>
KEMA	VSL	Mark Achterkamp	Yes	yes	<a href="mailto:marc.achterkamp@kema.com">marc.achterkamp@kema.com</a>
ZES Zimmer	PTB	Stergios Dimakis	Yes	yes	<a href="mailto:sdimakis@zes.com">sdimakis@zes.com</a>
RITZ	RSE	Roberto Schulze	Yes	yes	<a href="mailto:Roberto.Schulze@ritz-international.com">Roberto.Schulze@ritz-international.com</a>
TECTRA	RSE	Ivo Novakovic	Yes	yes	<a href="mailto:novakovic@tectra.hr">novakovic@tectra.hr</a>

- 16 (12) members
- 7 (8) Countries
  - Italy
  - Germany
  - Switzerland
  - France
  - Netherlands
  - Austria
  - Croatia
  - ...

# Task 4.1 Knowledge transfer – Chief Stakeholder

A4.1.2 M36	The consortium will update and consult with the Chief Stakeholder on a regular basis (at least <b>every four months</b> ) to ensure that the planned outcomes are still relevant and that the eventual normative are acceptable, practical and applicable to the wider stakeholder community. This could be done by <b>face or web meeting, as well as by exchange of e-mails and reports.</b>	<b>SUN</b> , all partners
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Date	Event	Person of Chief Stakeholder	Project Partner
02/09/2020	IT4PQ kick-off Meeting	Volker Leitloff	All partners
30/09/2020	IEC TC38 Chairman Advisory Group Meeting	Volker Leitloff & all the WG convenors	Gabriella Crotti
02/12/2020	Web call	Filippo Frugoni	Mario Luiso
09/12/2020	Email	Volker Leitloff	Mario Luiso
10/12/2020	Email	Volker Leitloff	Mario Luiso
08/02/2021	Email	Volker Leitloff	Mario Luiso
25/02/2021	IT4PQ 1st Stakeholder Workshop	Volker Leitloff	All partners
30/03/2021	Web call	Filippo Frugoni	Mario Luiso
09/04/2021	Presentation at IEC TC38 WG49 Meeting	Filippo Frugoni & WG49 Members	Mario Luiso
22/06/2021	Web call	Filippo Frugoni	Mario Luiso
09/02/2022	IT4PQ 2nd Stakeholder Workshop	Volker Leitloff	All partners

• Many meetings of IEC TC38 Chairman Advisory Groups

# Task 4.1 Knowledge transfer – Website

A4.1.3 M10, M36	<p>A project <b>website</b> will be created with a <b>public access</b>. Development of the project website will be via subcontract because the partners do not have the relevant expertise. The website will be regularly updated with information such as project reports, papers published by the partners, project meetings. It will inform interested parties in the IT manufacturers, utilities and PQ instrument manufacturers.</p> <p>A separate <b>restricted access website</b> will be also created to exchange confidential information and internal project reports by project partners. It will also include a section archive of all <b>presentations, reports and papers from the project</b>.</p>	<b>SUN</b> , all partners
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- Public website online : [www.it4pq.eu](http://www.it4pq.eu)
- FTP project repository with restricted access, online
- IT4PQ Logo Done

# Task 4.1 Knowledge transfer – Conference papers

A4.1.4 M36	The partners plan to present at least 12 papers at International Conferences. The following international conferences are possible venues:	SUN, all partners
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#	Citation	Conference
1	G. Crotti et al., "Measurement Methods and Procedures for Assessing Accuracy of Instrument Transformers for Power Quality Measurements," 2020 Conference on Precision Electromagnetic Measurements (CPEM), Denver, CO, USA, 2020, pp. 1-2. doi: 10.1109/CPEM49742.2020.9191698	CPEM 2020
2	Crotti, G., Giordano, D., Letizia, P.S., Delle Femine, A., Luiso, M., "A simplified procedure for the accurate frequency response identification of voltage transformers", (2020) 24th IMEKO TC4 International Symposium and 22nd International Workshop on ADC and DAC Modelling and Testing, 14-16 September 2021, Virtual Conference, pp. 50-54.	IMEKO TC4 2020
3	"Gabriella Crotti, Jan Meyer, Helko Van den Brom, Enrico Mohns, Yeying Chen, Roberto Tinarelli, Mario Luiso, ""ASSESSMENT OF INSTRUMENT TRANSFORMER ACCURACY FOR POWER QUALITY MEASUREMENTS IN DISTRIBUTION GRIDS: RECENT ACTIVITIES AND FIRST RESULTS FROM 19NRM05 IT4PQ PROJECT """, CIRED 2021, 20-23 September 2021, Geneva, Switzerland"	CIRED 2021
4	G. D'Avanzo, M. Faifer, C. Landi, C. Laurano, P. S. Letizia, M. Luiso, R. Ottoboni, S. Toscani, "Improving Harmonic Measurements with Instrument Transformers: A Comparison Among Two Techniques", I2MTC 2021, 17-20 May 2021, Virtual Conference	I2MTC 2021
5	Paolo Castello, Antonio Delle Femine, Daniele Gallo, Mario Luiso, Carlo Muscas, Paolo Attilio Pegoraro, "Measurement of Synchrophasors with Stand Alone Merging Units: a Preliminary Study", I2MTC 2021, 17-20 May 2021, Virtual Conference	I2MTC 2021
6	Gabriella Crotti, Giovanni D'Avanzo, Carmine Landi, Palma S. Letizia, Mario Luiso, Fabio Muñoz, Helko van den Brom, "Instrument Transformers for Power Quality Measurements: a Review of Literature and Standards," 2021 IEEE 11th International Workshop on Applied Measurements for Power Systems (AMPS), Cagliari, Italy, 2021, pp. 1-6, doi: 10.1109/AMPS50177.2021.9586028	AMPS 2021
7	A. Mingotti, F. Costa, L. Peretto and R. Tinarelli, "External Magnetic Fields Effect on Harmonics Measurements with Rogowski coils," 2021 IEEE 11th International Workshop on Applied Measurements for Power Systems (AMPS), Cagliari, Italy, 2021, pp. 1-6.	AMPS 2021
8	R. Stiegler, J. Meyer: "Impact of external influences on the frequency dependent transfer ratio of resin cast MV voltage instrument transformers" 20th International Conference on Harmonics and Quality of Power – ICHQP 2022.	ICHQP 2022
9	D. Giordano, Stray Parameter Evaluation of Voltage Transformers for PQ Measurement in MV Applications	ICHQP 2022
10	Y. Chen, Reference system for current sensor calibrations at power frequency and for wideband frequencies	ICHQP 2022
11	G. Crotti, G. D'Avanzo, P.S. Letizia, M. Luiso, "Towards the Evaluation of Instrument Transformers' Accuracy in Harmonic and Interharmonic Measurement", I2MTC 2022	I2MTC 2022

- 7 published, 4 in press
- 11 out of 12
- Plans
- AMPS 2022
  - 1 SUN-VSL
  - 1-2 UNIBO...
- CPEM 2022
  - Joint paper
- IT4PQ Zenodo Repository

# Task 4.1 Knowledge transfer – Journal papers

A4.1.5 M36	<p>The partners will submit at least <b>5 papers</b> in total to peer-reviewed journals during the project. Content and partners of three of them are indicated in the planned activities, one for each technical WP.</p> <p>Target journals include but are not limited to IEEE Transactions on Instrumentation and Measurements, IEEE Transactions on Power Delivery, Elsevier Measurements, ACTA IMEKO, MDPI Sensors. The authors of the peer reviewed papers will clearly acknowledge the financial support provided through the EMPIR as required by EURAMET.</p> <p>The expectations are that at least 3 out the 5 open access publications will be the result of a collaborative effort from partners from different countries.</p>	SUN, all partners
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#	Citation	Journal
1	Crotti, G.; D'Avanzo, G.; Giordano, D.; Letizia, P.S.; Luiso, M. <b>Extended SINDICOMP: Characterizing MV Voltage Transformers with Sine Waves</b> . Energies 2021, 14, 1715. <a href="https://doi.org/10.3390/en14061715">https://doi.org/10.3390/en14061715</a>	MDPI Energies
2	G. Crotti, D. Giordano, G. D'Avanzo, P.S. Letizia, M. Luiso, "A New Industry-Oriented Technique for the Wideband Characterization of Voltage Transformers", Measurement, Volume 182, 2021, 109674, ISSN 0263-2241, doi: 10.1016/j.measurement.2021.109674	Elsevier Measurement
3	G. Crotti, G. D'Avanzo, P. S. Letizia, M. Luiso, "Measuring Harmonics With Inductive Voltage Transformers in Presence of Subharmonics," in <i>IEEE Transactions on Instrumentation and Measurement</i> , vol. 70, pp. 1-13, 2021, Art no. 9005013. doi: 10.1109/TIM.2021.3111995	IEEE Transactions on Instrumentation and Measurement
4	G. D'Avanzo, M. Faifer, C. Landi, C. Laurano, P. S. Letizia, M. Luiso, R. Ottoboni, S. Toscani, "Theory and Experimental Validation of Two Techniques for Compensating VT Nonlinearities", in <i>IEEE Transactions on Instrumentation and Measurement</i> , in press	IEEE Transactions on Instrumentation and Measurement
5	A. Mingotti, F. Costa, L. Peretto, and R. Tinarelli, "Effect of Proximity, Burden, and Position on the Power Quality Accuracy Performance of Rogowski Coils," <i>Sensors</i> , vol. 22, no. 1, p. 397, Jan. 2022, doi: 10.3390/s22010397.	MDPI Sensors

- 4 published, 1 in press
- 5 out of 5
- WP1, WP2, WP3 paper
- Maybe CPEM special issue
- Joint paper for WP1



## Task 4.1 Knowledge transfer – Trade Journal papers

A4.1.6 M36	The partners will submit at least 3 papers to international or national trade Journals (e.g. IEEE Power & Energy Magazines, The Electrical Energy).	SUN, all partners
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- I&M magazine
- Italian Trade Journal



## Task 4.1 Knowledge transfer – Standardization Committees

A4.1.7 M36	Information on on-going activities and results of the project will be disseminated to a range of standards bodies and committees, asking for their feedback (see details in the table in Section B2.c).  The representatives on the corresponding committee or WG from the partners will jointly ask the chairperson to include a point in the agenda to briefly present the outputs of the project related to the WG activities and ask for comments. Where appropriate a written report will be submitted for consideration by the committee or WG.	SUN, all partners
	As regards the Chief stakeholder organisation (IEC TC 38), presentations of the project activity and outcomes will be regularly included in the meeting Agenda of IEC TC 38 and of the relevant WGs (WG47, JWG55, WG37). Moreover, overall presentations at IEC 38 Plenary meetings and detailed presentations at the linked IEC Workshops will be given.	

- Cigrè
- Other IEC TC
- EURAMET T-EM

Date	Event	Person of Chief Stakeholder	Project Partner
30/09/2020	IEC TC38 Chairman Advisory Group Meeting	Volker Leitloff & all the WG convenors	Gabriella Crotti
09/04/2021	Presentation at IEC TC38 WG49 Meeting	Filippo Frugoni & WG49 Members	Mario Luiso
21/06/2021	Presentation at IEC TC38 WG47 Meeting	Volker Leitloff & WG49 Members	Mario Luiso
28/07/2021	Presentation at IEC TC38 WG47 Meeting	Paolo Mazza & WG49 Members	Mario Luiso
17/09/2021	Presentation at IEC/TC38 "2021 WORKSHOP"	Volker Leitloff, Filippo Frugoni and many other TC38 Members	Mario Luiso
17/09/2021	Presentation at IEC/TC38 "2021 WORKSHOP"	Volker Leitloff, Filippo Frugoni and many other TC38 Members	Gabriella Crotti

# Task 4.2 Training – Workshops for Stakeholders

A4.2.1 M3, M18, M36	<p><b>Three workshops for stakeholders</b> will be organised and held during the project. They could be <b>partially or fully via web-conference</b>. The target audience will be standardisation bodies, utilities, manufacturers of ITs and PQ instrumentation, NMIs, and Test and Measurement vendors.</p> <p><b>Within three months from the start of the project a first workshop (0.5 day duration)</b> will be organised for the stakeholder community to inform them about details of the project plan and to receive suggestions about the PQ phenomena more relevant in their experience (A1.1.7), the target accuracy of ITs for PQ measurements (A1.3.1 and A1.3.2), any concerns about reference setups (A2.1.1 and A2.1.2) and industrial setups (A2.2.1), suggestions about the type of ITs to test (A2.3.1), the influence factors to include in the analysis (A1.1.11 and A3.1.1) and to hear their requirements for content and format of the final project outputs (i.e. inputs to standardisation). Relevant suggestion provided will be taken into account in the development of the related activities.</p> <p><b>A mid-term workshop (0.5-day duration)</b> will be held to present interim learning and have further feedback from the user community; an invited representative from the standardisation community will provide an overview of the standardisation needs and foreseen evolution.</p> <p><b>A final stakeholder workshop (0.5 to 1 day's duration)</b> will be organised and held in the final 2 months of the project. The workshop will present the results achieved by the project and will allow extensive discussion of the results with all participating stakeholders.</p>	SUN, all partners
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- First Stakeholder workshop on 25th February 2021
  - 5 presentations from partners
  - 3 presentations from IEC TC 38
  - 5 presentations from Stakeholders
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- M27 Meeting
  - M27 at AMPS 22 27 September

# Task 4.2 Training – Course for PhD students

A4.2.2 M26	A training course for PhD students on PQ measurement issues relevant to ITs will be organised by SUN with the support of INRIM and all partners and held in the framework of a Summer School.	SUN, all partners
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- A course on ITs and PQ measurements inside the PhD course of Industrial and Information Engineering of University of Campania “Luigi Vanvitelli”
- A course on ITs and PQ measurements inside the PhD course of Metrology of Politecnico di Torino and INRIM

## Task 4.3 Uptake and exploitation

A4.3.1 M1, M9, M18, M27, M36	An exploitation plan including consideration of future IP and testing services will be created at the beginning of the project and reviewed and updated at least at each project meeting. This plan will be part of the regular impact reporting	<b>SUN</b> , all partners
A4.3.2 M36	A plan will be also developed and regularly updated on tools and actions for encouraging and facilitating possible early uptake and use of the project outcomes in terms of implementation of project output into standard documents, experimentation in calibration and tests labs of methods and procedure developed, set up of prototypes of suitable test equipment by test instrument manufacturers .	<b>SUN</b> , all partners

- We are preparing a draft

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