COST ACTION CA17107 - European Network to connect research and innovation efforts on advanced Smart Textiles

Virtual Mobility Grant Title:

CONTEXT Participants' Interest in Relevant Open and Forthcoming Calls – Networking Opportunities for Greater Competitiveness

Report on a questionnaire survey

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The author wish to thank all CONTEXT participants who took part in the survey for their important contribution to define their interest in relevant open and forthcoming calls and the problems they face when applying.

This Virtual Mobility Grant (VMG) is a part of the new types of Grants launched by COST which aim at strengthening the existing networks by allowing scientists to foster collaboration in a virtual setting.

The activity covered is preparation of a professional report on a questionnaire survey which results should contribute to deliver the overall objectives of CONTEXT.

INTRODUCTION

The main objective of this VMG is to enable greater competitiveness of CONTEXT participants with reference to current and upcoming calls related to smart textiles by fostering collaboration and boosting the networking. This implied defining the calls of interest; sharing information among participants about available facilities in terms of equipment, people, project ideas; sharing the needs for partners, coming from industry or with expertise in certain topic, technique, methodology or the need of creative ideas.

The questionnaire was designed in a way that information on the interest of the participants regarding certain calls, their potentials and needs were obtained. Also a list of open and forthcoming calls related to smart textiles was included.

This report contains the results of the questionnaire survey.

All CONTEXT participants were included in the survey and they were expected to contribute by sharing information regarding their interest, opportunities and needs.

The outputs of this VMG are closely related to the capacity building objectives of CONTEXT by promoting the development of networking activities in order to attract talent and build more and better research projects, under the scope of Horizon Europe or other funding schemes.

It also contributes to the COST Excellence and Inclusiveness Policy in a way that all CONTEXT participants were given the opportunity to express their interests and needs related to the preparation of excellent research projects, regardless of whether they are coming from ITC countries, or what is their career stage, or gender and this will increase the awareness of all participants about the needs of others and hopefully foster collaboration and networking and stakeholder engagement.

This report is disseminated to all CONTEXT participants.

DESIGN

The questionnaire consists of 16 questions that were designed to provide relevant information on the interest of the participants regarding certain calls, their potentials and needs. Also a list of ten calls (six forthcoming and four open) was included. It was also considered that the active involvement of the participants would not be a time-consuming endeavor.

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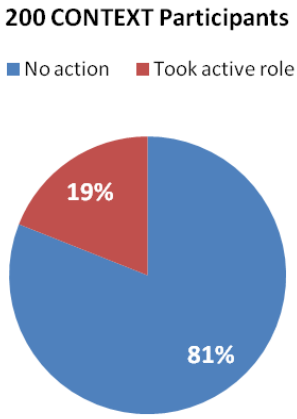
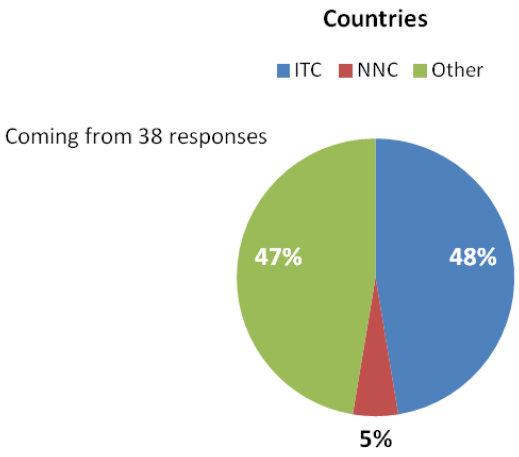
RESULTS

Participation

- The questionnaire was sent to 200 participants; only 38 or **19 % took active part**. This is an indicator that CONTEXT participants are not motivated enough to take active role in the proposed activities. A way should be found to motivate them further.



- From 38 Participant 18 were coming from Inclusiveness Target Countries (ITCs) and 2 from Near Neighbour Countries (NNCs).



- 33 participants were coming from academy and 5 from industry. Regarding career stage 25 were experienced researchers, 10 early stage researchers and 3 employed in industry.

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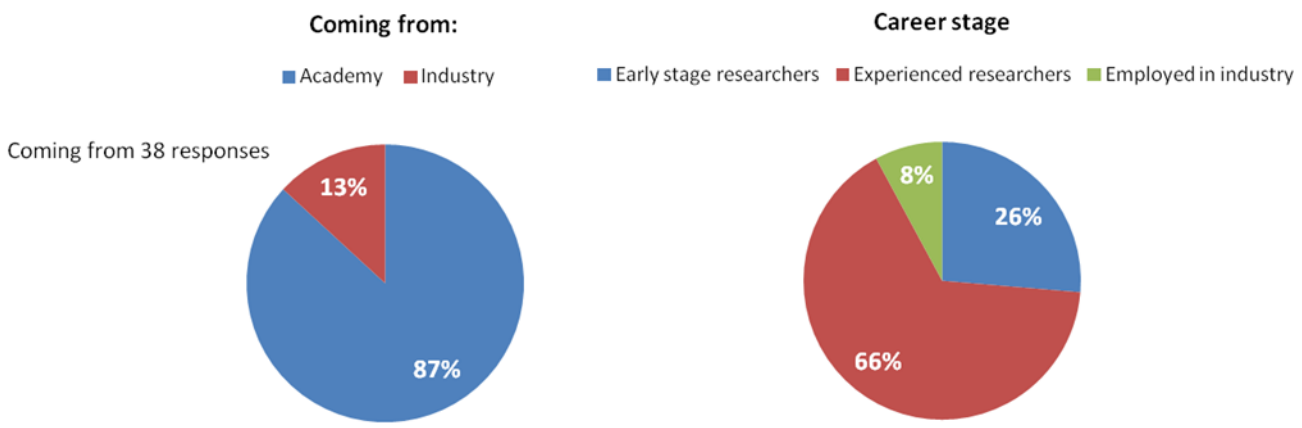
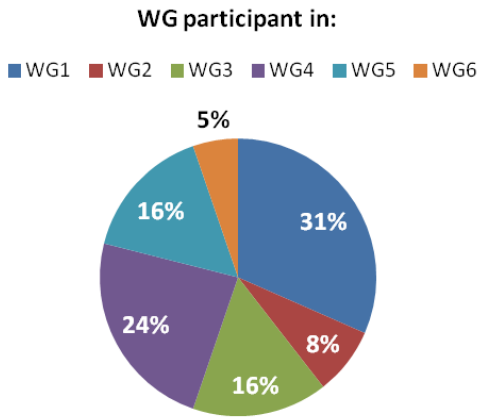


- Distributed by participation in working groups, 12 are participating in WG1 - Healthcare & medicine; 3 in WG2 - Automotive & aeronautics; 6 in WG3 - Personal protective equipment; 9 in WG4 - Building & living; 6 in WG5 - Sports & wearables; and 2 in WG6 – Dissemination.



Calls

- Open and forthcoming calls related to smart textiles were searched online, 4 open and 6 forthcoming calls were found to be relevant and were presented in the introduction part of the questionnaire.

List of Forthcoming calls:

1. **2D materials-based devices and systems for biomedical applications (RIA)**
   TOPIC ID: HORIZON-CL4-2022-DIGITAL-EMERGING-02-19
   Planned opening date: 16 June 2022
   Deadline date: 16 November 2022

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2. **Smarter buildings for better energy performance**
   TOPIC ID: HORIZON-CL5-2022-D4-01-03
   Planned opening date: 28 April 2022
   Deadline date: 06 September 2022

3. **Designs, materials and solutions to improve resilience, preparedness & responsiveness of the built environment for climate adaptation (Built4People)**
   TOPIC ID: HORIZON-CL5-2022-D4-02-01
   Planned opening date: 06 September 2022
   Deadline date: 24 January 2023

4. **Membranes for gas separations - membrane distillation (IA)**
   TOPIC ID: HORIZON-CL4-2022-RESILIENCE-01-14
   Planned opening date: 12 October 2021
   Deadline date: 24 January 2023

5. **Functional multi-material components and structures (RIA)**
   TOPIC ID: HORIZON-CL4-2022-RESILIENCE-01-12
   Planned opening date: 12 October 2021
   Deadline date: 30 March 2022

6. **Advanced lightweight materials for energy efficient structures (RIA)**
   TOPIC ID: HORIZON-CL4-2022-RESILIENCE-01-11
   Planned opening date: 12 October 2021
   Deadline date: 30 March 2022

List of Open calls:

7. **Materials and structures for enhanced protection in hostile environments**
   TOPIC ID: EDF-2021-MATCOMP-R-PHE
   Planned opening date: 09 September 2021
   Deadline date: 09 December 2021

8. **New materials and technologies for additive manufactured defence applications**
   TOPIC ID: EDF-2021-DIS-RDIS-AMD
   Planned opening date: 09 September 2021
   Deadline date: 09 December 2021

9. **Functional electronics for green and circular economy (RIA)**
   TOPIC ID: HORIZON-CL4-2021-DIGITAL-EMERGING-01-31

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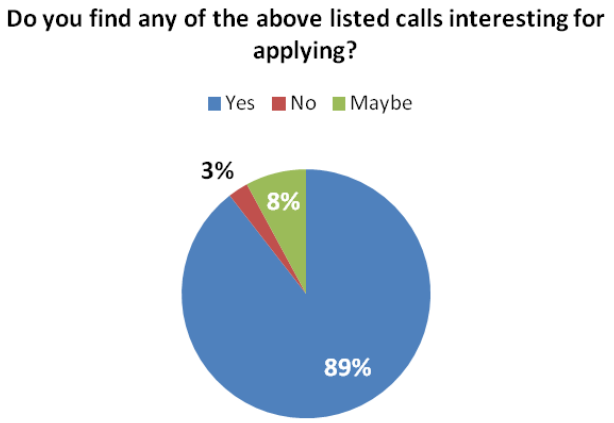
Planned opening date: 22 June 2021
Deadline date: 21 October 2021*

10. Increasing the circularity in textiles, plastics and/or electronics value chains
TOPIC ID: HORIZON-CL6-2021-CIRCBIO-01-04
Planned opening date: 22 June 2021
Deadline date: 06 October 2021*

- 34 participants find the suggested calls interesting for applying, 3 replied with "maybe" and 1 did not find the calls interesting.



- Among the suggested calls, the greatest interest for applying of **23 %** is shown for the call No. 10:

Increasing the circularity in textiles, plastics and/or electronics value chains
TOPIC ID: HORIZON-CL6-2021-CIRCBIO-01-04
Planned opening date: 22 June 2021
Deadline date: 06 October 2021*

Followed by call No. 5 with **20 %** shown interest:

Functional multi-material components and structures (RIA)
TOPIC ID: HORIZON-CL4-2022-RESILIENCE-01-12
Planned opening date: 12 October 2021
Deadline date: 30 March 2022

And then follow call No.1 and No.3 with **11 %** shown interest:

* These calls were still open when the questionnaire was sent to the participants.

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2D materials-based devices and systems for biomedical applications (RIA)
TOPIC ID: HORIZON-CL4-2022-DIGITAL-EMERGING-02-19
Planned opening date: 16 June 2022
Deadline date: 16 November 2022

Designs, materials and solutions to improve resilience, preparedness & responsiveness of the built environment for climate adaptation (Built4People)
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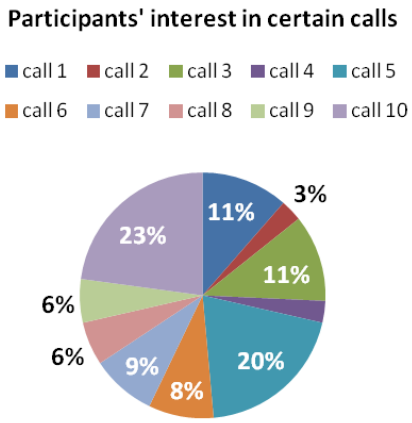

- 21.6 % stated that they are willing to share their information on open or forthcoming calls related to smart textiles, but only one additional call was suggested **NATO The Science for Peace and Security (SPS) Programme (https://www.nato.int/cps/en/natolive/78209.htm).** This Programme may publish calls in two formats:
    - Open Calls that encourage applications addressing any of the SPS Key Priorities.
    - Special Calls that invite applications addressing specific priorities and themes of particular relevance at the time of publication.

  There are currently no open calls under this Programme but usually are published annually.

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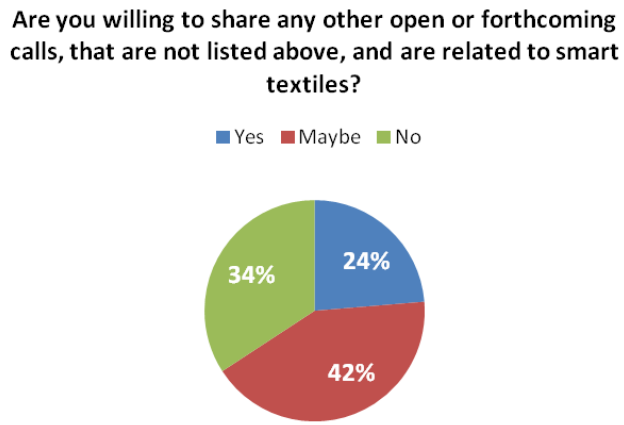

Participants' expertise

PARTICIPANT	EXPERTISE
AEI TÈXTILS, Barcelona, Spain	An organization that is strongly close to the industry.Participation in R&D projects mainly in dissemination activities and organization of activities to involve the industry.
Bursa Technical University, Bursa, Turkey	Energy generation and storage with 2D materials for polymers and textiles.
Çanakkale Onsekiz Mart University, Çanakkale, Turkey	Multifunctional composite/nanocomposites and their process.
CITEVE, Vila Nova de Famalicão, Portugal	Computational design and digital prototyping.
Cluster des Textiles Techniques Marocains, Casablanca, Morocco	Technical textile.
Ege University, Izmir, Turkey	Textile engineering, design and management. Yarn spinning-weaving-smart textiles.
EMPA, Switzerland	Polymers.
Environment Park S.p.A. - Plasma Nano-Tech sector	Provides surface treatments based on plasma technologies for eco-efficient solutions designed to make more environmentally sustainable and more competitive industrial production in terms of market. A pulsed-arc atmospheric pressure plasma jet system for surface treatments (activation, functionalization and

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	polymerization). Process supply gases – nitrogen, oxygen, argon and compressed air. Skills and expertise: • Surface modification of long and continuous fibers based on aramid, glass, carbon, basalt by grafting and polymerization by using an industrial plasma jet (Plasmatreat technology) and subsequent coextrusion with thermoplastic polymers. The remarkable effectiveness of the process, in particular with regard to continuous fibers, is due to the integration of a cylindric tubular reactor studied and patented by Environment Park (number 0001426769) that allows to extend the secondary plasma region (chemically the most effective) by orienting the ionized gas flow in order to generate a vortex affecting the yarns uniformly, thus creating the ideal conditions for permanent high-density surface functionalization. The process promotes the improvement of fibre-matrix interfacial adhesion and wettability. In this way it's possible to realize a range of composite fibers that allow to offer customized solutions for complex applications both combining different fibers and using different thermoplastic matrices. • Plasma treatment of different reinforced fabrics (multi-axial, crochet) to enhance the interaction between fibers and monomer to provide an efficient polymerization in moulds. • Regeneration of carbon fibres from composites' production scraps (pre and post curing) and from end-of-life structures (mainly form ELV): surface functionalization of recycled carbon fibers with the aim to promote adhesive forces and wettability of reinforcing fibers and matrix and to increase the mechanical properties of composites. • Improvement of the surface properties of composite materials composed by recycled polymers (for example polypropylene) as matrix and biobased waste as wood pulp, hemp and coffee as reinforcement • Surface treatments of biobased waste as powders of wood pulp and coffee or hemp fibers to enhance the aggregation and an efficient mixing with recycled thermoplastic polymers (for example polypropylene) in order to develop eco composites with a good mechanical resilience.
Erciyes University, Kayseri, Turkey	Smart textiles, textile engineering and industrial design engineering.
Giresun University, Giresun, Turkey	Product Design, performance-based and LCA-based design. Mechanical, optical, thermal testing of textiles and foils.
InnoRenew CoE, Isola, Slovenia	Renewable materials and sustainable building research.
ISAMS/University of Sfax, Sfax, Tunisia	Materials and textile structures. Medical textile.

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Istanbul technical University, Textile Technologies and Design Faculty, Istanbul, Turkey	Innovative textile materials, clothing comfort, e-textiles.
Joanneum Research, Graz, Austria	Chemosensor development for textiles.
Karadeniz Technical University, Ortahisar/Trabzon, Turkey	Recycled textile materials, cotton, yarn technology.
Karlsruhe Institute of Technology, Karlsruhe, Germany	Physical Chemistry.
Military Technical Institute, Belgrade, Serbia	Materials science.
NAITEC - Fundación I+D Automación y mecatrónica, Navarra, Spain	Printed electronics and composites.
Politecnico di Milano, Milan, Italy	Textile yarn spinning and weaving. Textiles for composites, coated textile for sensing purposes (piezoresistive textiles), plant fibers textiles. Fog harvesting textile architecture. Smart textile for building retrofit. Membranes and technical textiles for architecture, life cycle assessment, eco-efficiency, circularity of materials.
Polytechnic University of Tirana, Tirana, Albania	Phytochemistry.
Research Center for Environment and Materials, MASA, Skopje, North Macedonia	Electrospinning, scaffolds for tissue engineering.
Ruđer Bošković Institute, Zagreb, Croatia	Material synthesis, gas sensing, metal oxides, 2D materials, sensors and OTFEs.
Sabanci University, Istanbul, Turkey	Recycling, functional textile materials.
TYH Textile, Izmir, Turkey	Apparel, garment.
Tyndall National Institute, Cork, Ireland	Electronics, RF, data science, materials.
Universidade de Aveiro, Aveiro, Portugal	Textile antenna design.
Universitat Politècnica de Catalunya, Barcelona, Spain	Composite materials.

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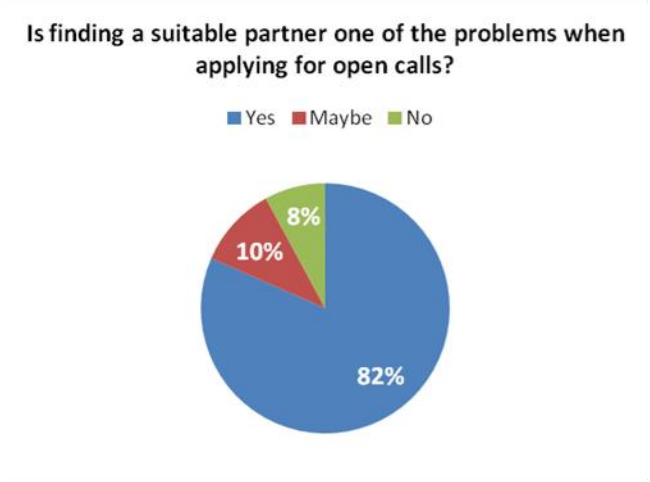
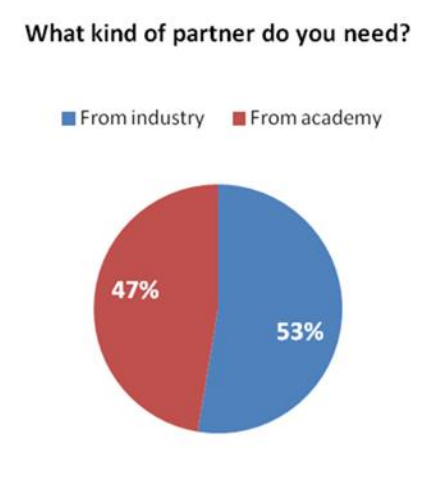
University College Dublin, Dublin, Ireland	Wearable sensing & actuation in health and sports applications. Interested in providing application domain expertise and functional/field testing input to proposals. Not experts in smart textiles, but very strong on application and evaluation of technology in the real world or laboratory setting.
University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia	Nanofinishing of textiles.
University of West Attica (Uniwa), Egaleo, Greece	Triboelectricity, spinning, spinning quality control, cotton quality control. Circular economy.

Partners

- 82 % of the participants declared that finding a suitable partner is one of the problems when applying for open calls. 53 % need a partner coming from industry and 47 % a partner from academy. When asked at what career stage they need a partner; 42 % answered that they need a partner employed in industry, 45 % – experienced researcher and 13 % – early stage researcher.





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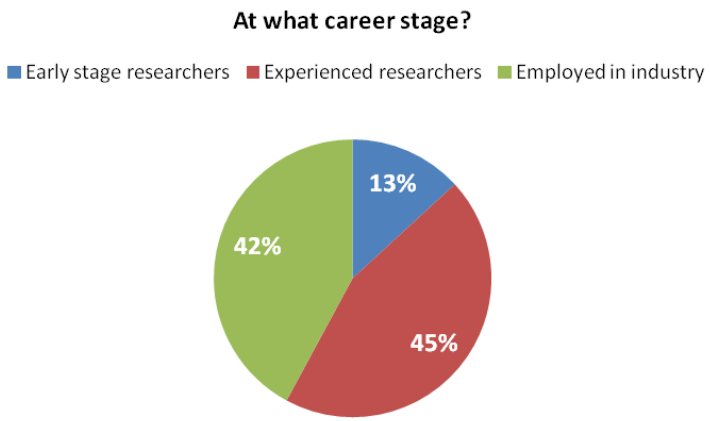

- Partners with the following expertise are needed

EXPERTISE NEEDED
Advanced manufacturing of smart textiles and meshes.
Apparel, garment.
Characterization of polymers and 2D materials.
Chemical characterization on materials behaviors.
Coating.
Composite materials in construction.
Developer of recycling technologies for composites.
Development of functional materials, transferring electronic-electromechanic technologies.
Innovative materials.
Integration of electronics into functional textile / bringing the prototypes into mass-manufacturable products.
Materials synthesis, device fabrication, 2D materials, sensors.
Medical textile production.
Partner for implementation of new technologies to obtain sensor textiles.
Proposal coordination.
Recycled textile materials, smart garments.
Recycling, dissemination, LCA.

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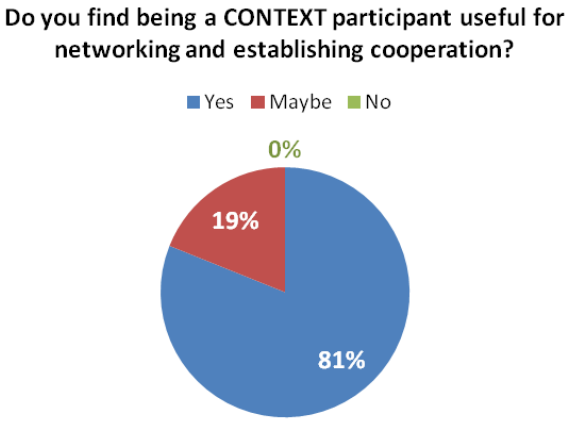
Smart textile development.
Smart yarns, knitting and weaving technology, recycling of fabrics, recycling of electrical devices.
Software and electronics.
Textile chemistry, biological analyst.
Textile production.
Yarn Spinning/ 3D Weaving.

About CONTEXT

- 81 % of the participants find being a CONTEXT participant useful for networking and establishing cooperation.



- What could be improved?

WHAT COULD BE IMPROVED?
Providing assistance in preparing applications.
More frequent meetings (e. g. monthly) – online if not in person.
Joint publications.
Active engagement of all participants (e. g. proposals of new activities, sharing experiences, etc.).
Creating small and agile teams for envisioning new proposals for the open calls.
More communications, interactions, and concrete collaboration intra WG and between members of different WGs.

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To increase a bit the period length for completing the STSMs. As it is now, it is a bit difficult to plan perfectly the stay because by the time you get the grant and the time you need to complete the STSM there is a very short period.
More significant participation of textile industry.
Stronger emphasis on building consortia for national and international funding, more emphasis on KPIs (i.e., number of publications resulting from the action, proposals written from the cooperation, books/book chapters, etc.)
Engaging with Policy Makers.
Create a database with competences and expertise of each participant.
Everything is fine. No idea.

CONCLUSION

This report contains the results of the questionnaire survey on the interest of the participants regarding certain calls, their potentials and needs. It is evident that only a small number of CONTEXT members took an active part, only 19 %. This is an indicator that CONTEXT participants are not motivated enough to take active role in the proposed activities. A way should be found to motivate them further. The participation of CONTEXT members coming from ITC countries and other COST member countries is almost equal, 48 % and 47 %, respectively. The number of participants coming from the academy is significantly higher – 87 %, as well as the number of experienced researchers – 66 %. Most of the participants find the suggested calls interesting for applying – 89 %. 82 % of the participants declared that finding a suitable partner is one of the problems when applying for open calls. 53 % need a partner coming from industry and 47 % a partner from academy, preferably experienced researchers. The results of this questionnaire showed that there are calls for which more participants are interested in applying, and the lists made for the expertise of the members and the partner with which expertise they need show that suitable partners can be found within the CONTEXT members. 81 % of the participants find being a CONTEXT member useful for networking and establishing cooperation and interesting suggestion have been given on what could be improved in order to foster collaboration and boost the networking.

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