



Deliverable Report

Grant agreement number: 678875

Project acronym: ambliFibre

Project title: adaptive model-based Control for laser-assisted Fibre-reinforced tape winding

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Deliverable Title:	Website
Work Package:	WP9 - Sustainable impact and innovation management
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Dissemination Level		
PU	Public	✓
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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1 Deliverable outline

1.1 Description of deliverable

In this deliverable, the project website developed, set-up and maintained by FhG-IPT will be described.

Furthermore, this deliverable will describe the preparation of a visual identity carried out by MACH4. By means of the preparation of templates for posters, flyers, brochures, PowerPoint presentations and the creation of and reporting documents the visual identify will be realized. These templates will be part of the deliverable. This deliverable is linked to task 9.2.

1.2 ambliFibre – Project overview

ambliFibre will develop and validate the first intelligent model-based controlled laser-assisted tape winding system for fibre-reinforced thermoplastic (FRP) components. This system will include optical non-contact monitoring and innovative Human-Machine-Interfaces, which are easily manageable for the worker. Based on thermal and optical models embedded into integral process simulation tools combined with novel machine and laser technologies, for the first time a tape winding system will be realised, which is able not only to drastically reduce the occurring waste, but also predict potentially arising failure in order to reduce machine downtimes. Statistical reliability and maintenance models for detection of critical elements and definition of their reliability will also prevent sudden machine breakdowns and allow defining the most cost-efficient maintenance schedule.

Thus ambliFibre will be a major breakthrough for the continuous and discontinuous production of neuralgic tape winded tubular composite components, such as gas tanks for automotive application, pressure vessel housings for the desalination of sea water or composite ultra-deep-water risers which are all affected by rapidly changing product requirements concerning both, material and design.

With respect to changing and challenging environmental influences, quick adaptability, failure-free quality and safe operation over the complete life-cycle are mandatory. The successful application of the ambliFibre results will dramatically accelerate the replacement of metal components in these domains, reducing the carbon footprint thanks to the low weight and long life cycle of FRP components and provide new opportunities for European manufacturers in global, high-value multi-billion € markets

1.3 Work Package 9 - Overview

Planning and coordinating throughout the project lifetime all activities related to impact, innovation management and possible exploitation of results.

- Producing the ambliFibre website, communication tools and materials
- Contacting and mobilising experts from different business and industry sectors (actually or potentially using diode laser-assisted tape-winding for manufacturing their components or products) to participate and contribute to ambliFibre workshops or events and formation of an Stakeholder Group out of the industrial Stakeholders for the ambliFibre technology
- Designing generic business plans
- Proactive Management of IP brought into or generated by the project

1.4 Task related to this report

Task 9.2: Website development and creation of a visual identity

Partners Involved: MACH4, FhG-IPT

A project website will be developed, set-up and maintained (by FhG-IPT) throughout the project. Its aim is to inform visitors about the project activities and be a communication tool for the partnership through the private project intranet. A well-maintained website will be essential to the success of the project, and to the longer-term exploitation of the results, leaving behind a track of the accomplished work. Content will be adapted to different targeted audience readers, industrials, scientists, media, and wide audience. The website will be updated at least every quarter using back-end database and a content management system (CMS) to disseminate the findings of the project. It will be designed so that its content can be easily shared, tweeted, bookmarked and curated on social web and digital territories.

A dedicated project visual identity is a prime communication need so this task will include the creation of templates for dissemination tools, which will be implemented throughout the project.

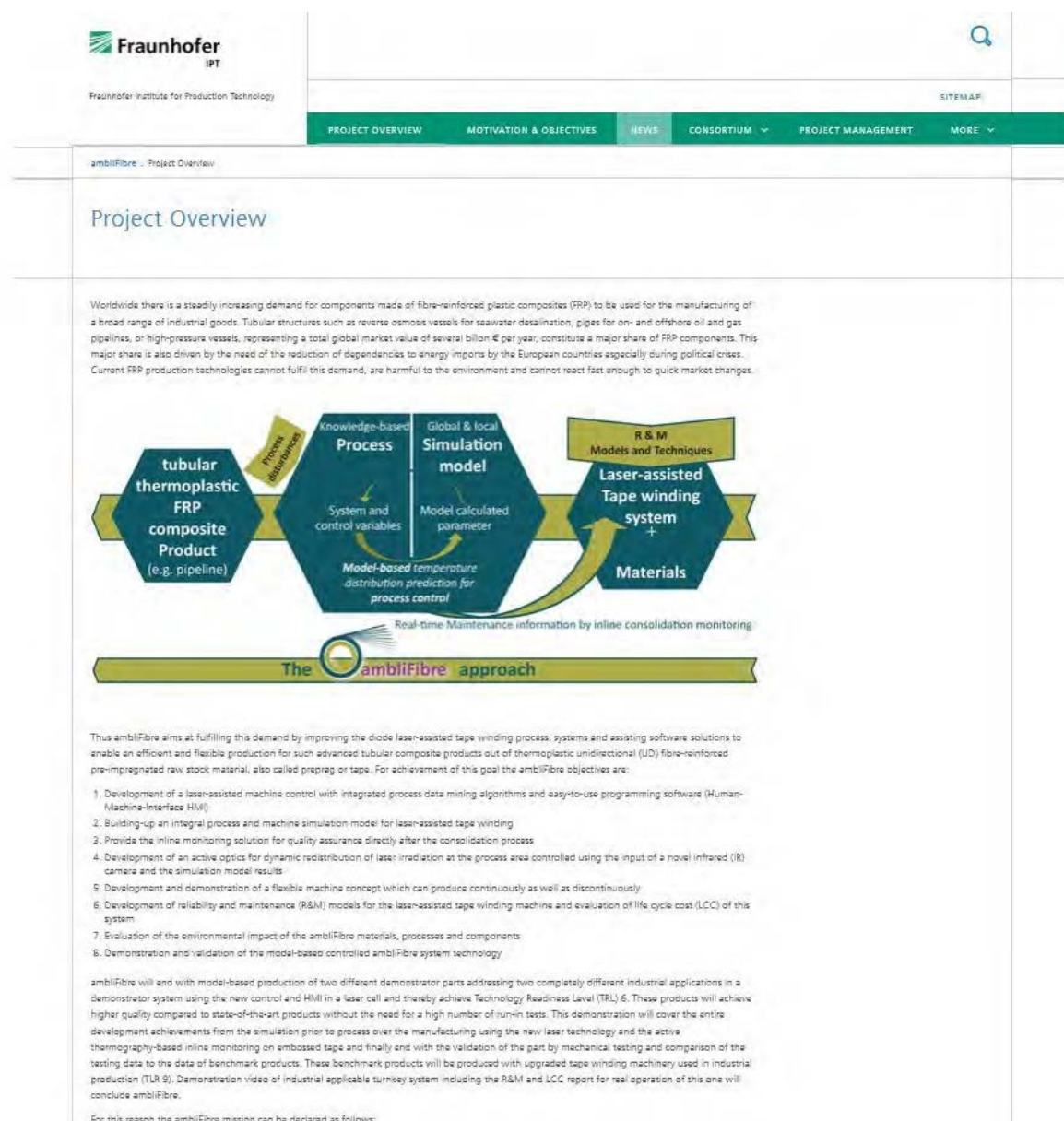
2 Description of actions and work

2.1 ambliFibre Website development

The main project website at <http://www.ambliFibre.eu> went live within the fourth month of the project and is one of the primary interfaces for dissemination.

Initially, the project website provides a basic overview of the project (Figure 1), its motivation and objectives, actual news about the project, details regarding the consortium and the partners (Figure 2), access to the project intranet via a login and password in a “project Management” section, news on upcoming events, trainings, publications and trade fairs, press and media material and finally a contact page (Figure 3).

The outline of the project intranet is covered in more detail in deliverable report D10.2.



Fraunhofer IPT
Fraunhofer Institute for Production Technology

ambliFibre - Project Overview

Project Overview

Worldwide there is a steadily increasing demand for components made of fibre-reinforced plastic composites (FRP) to be used for the manufacturing of a broad range of industrial goods. Tubular structures such as reverse osmosis vessels for seawater desalination, pipes for on- and offshore oil and gas pipelines, or high-pressure vessels, representing a total global market value of several billion € per year, constitute a major share of FRP components. This major share is also driven by the need of the reduction of dependencies to energy imports by the European countries especially during political crises. Current FRP production technologies cannot fulfil this demand, are harmful to the environment and cannot react fast enough to quick market changes.

The ambliFibre approach

Real-time Maintenance information by inline consolidation monitoring

This ambliFibre aims at fulfilling this demand by improving the diode laser-assisted tape winding process, systems and assisting software solutions to enable an efficient and flexible production for such advanced tubular composite products out of thermoplastic unidirectional (UD) fibre-reinforced pre-impregnated raw stock material, also called prepreg or tape. For achievement of this goal the ambliFibre objectives are:

1. Development of a laser-assisted machine control with integrated process data mining algorithms and easy-to-use programming software (Human-Machine-Interface HMI)
2. Building-up an integral process and machine simulation model for laser-assisted tape winding
3. Provide the inline monitoring solution for quality assurance directly after the consolidation process
4. Development of an active optics for dynamic redistribution of laser irradiation at the process area controlled using the input of a novel infrared (IR) camera and the simulation model results
5. Development and demonstration of a flexible machine concept which can produce continuously as well as discontinuously
6. Development of reliability and maintenance (R&M) models for the laser-assisted tape winding machine and evaluation of life cycle cost (LCC) of this system
7. Evaluation of the environmental impact of the ambliFibre materials, processes and components
8. Demonstration and validation of the model-based controlled ambliFibre system technology

ambliFibre will and with model-based production of two different demonstrator parts addressing two completely different industrial applications in a demonstrator system using the new control and HMI in a laser cell and thereby achieve Technology Readiness Level (TRL) 6. These products will achieve higher quality compared to state-of-the-art products without the need for a high number of run-in tests. This demonstration will cover the entire development achievements from the simulation prior to process over the manufacturing using the new laser technology and the active thermography-based inline monitoring on embossed tape and finally end with the validation of the part by mechanical testing and comparison of the testing data to the data of benchmark products. These benchmark products will be produced with upgraded tape winding machinery used in industrial production (TLR 9). Demonstration video of industrial applicable turnkey system including the R&M and LCC report for real operation of this one will conclude ambliFibre.

For this reason the ambliFibre mission can be declared as follows:

Figure 1: Screenshot of website homepage

ambliFibre - Consortium

Consortium

The ambliFibre Consortium is made of 12 partners and it is composed by a balanced mix of research institutes (Fraunhofer), university (RWTH Aachen, University of Twente) and industrial partners. 1 of which are from industry and 8 are SMEs. These consortium members represent key elements of the supply chain from 7 EC countries (D, UK, NL, IT, ES, DK, CZ). All the Industrial and in particular the SME partners demonstrate a strong commitment to the project and have their assigned fundamental role within the project work programme (see Figure) as the main objective of the project is to develop technologies that could be readily implemented industrially and which will bring benefits to the entire European industry and society.

The consortium includes complementary knowledge and skills (special purpose machine building, novel laser system technology, process engineering, process & machine simulation, product engineering, environmental science, etc.) that cannot be found in a single EU state. The combined efforts of these partners will ensure that the results meet the requirements of all parties and the exploitation will be maximised across the EU.

Academic and Research Partners

The academic and research part of the ambliFibre consortium is composed of two research institutes being part of Fraunhofer-Gesellschaft, Europe's largest research organization for applied research and three academic institutes belonging to two different Universities. The ambliFibre project involves two departments of the RWTH Aachen University and the Production Technology research group being part of the Faculty of Engineering Technology of University of Twente located in the Netherlands.

- [Fraunhofer Institute for Production Technology IPT](#)
- [Fraunhofer Institute for Laser Technology ILT](#)
- [Chair for Technology of Optical Systems TOS](#)
- [Teaching and Research Field for Design and Development of Microsystems](#)
- [University of Twente, Production Technology, Faculty of Engineering Technology](#)

Industrial Partners

Amongst SMEs developing automation solutions, thermal measurement devices and providing services for an environmental friendly and economically efficient development the industrial part of the ambliFibre partnership contains high-tech organisations active in areas including: Oil & gas industry, special purpose composite machine building, laser industry and Tier 1 supplier for heavy vehicle industry.

- [GE Oil & Gas UK Ltd.](#)
- [HEM Technik AG](#)
- [Ivan Lasertechnik GmbH](#)
- [Life Cycle Engineering Srl](#)
- [MachLab](#)
- [Mecvision s.r.l.](#)
- [New Infrared Technologies, Ltd.](#)
- [Purtech Ltd.](#)
- [Video Systems Srl](#)

Share



PRINT

Figure 2: Screenshots on consortium section

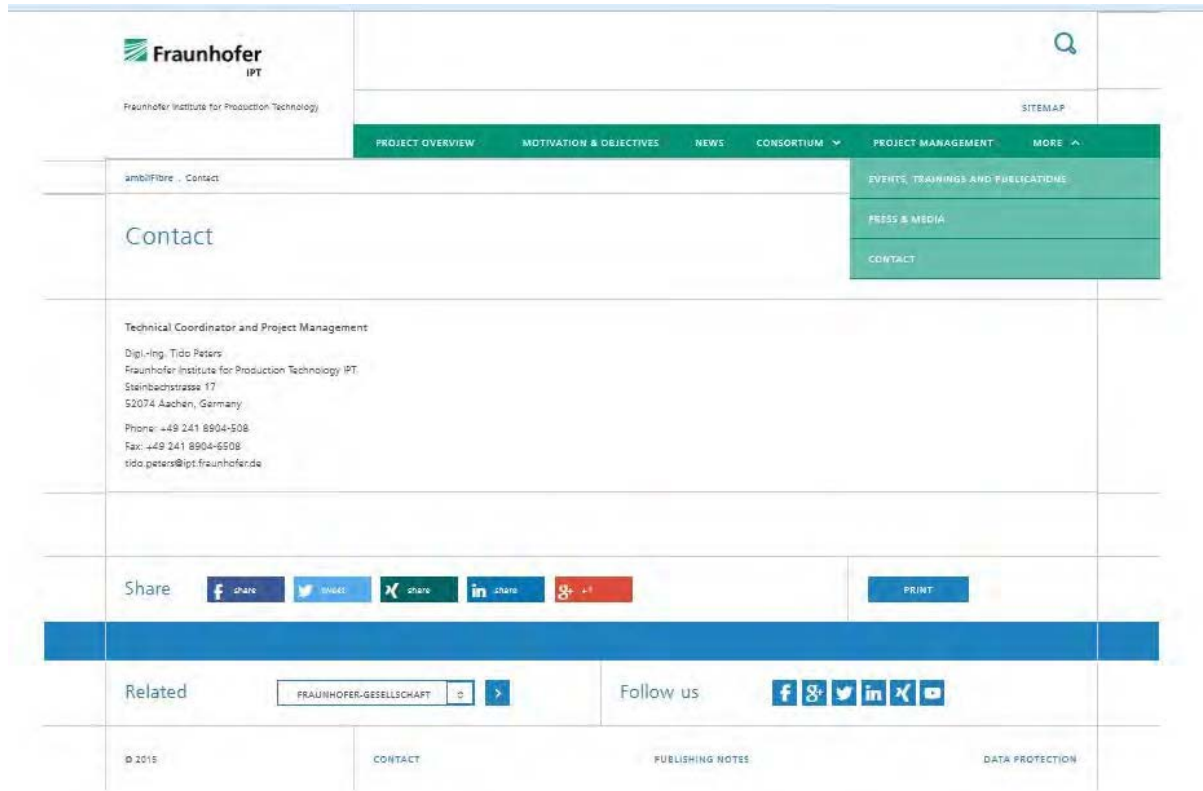


Figure 3: Screenshot on contact page

2.1.1 Future concepts for the website

The plan is to develop the website further during the following project months. In addition to the information already available the website will provide general information about the intermediate results on the separate work packages. Dissemination activities and regular news will be updated.

The website will provide access to the future dissemination material available for the general public and material used by the partners for events etc..

2.1.2 Linked-in group

To help to fully exploit the results of the project an ambliFibre Industrial Stakeholder Group will be formed during the 1st year of the project (see Task 9.3). A “Linked-in” group is planned to be set up to encourage regular communication between this group and the ambliFibre consortium. This will allow both groups to raise and discuss topics directly related to the project. Newsletters and a Newsfeed from the project will enhance the communication between the consortium and the wider scientific/industrial community.

2.2 Creation of a visual project identity

The partnership used an ambliFibre Corporate Design (CD) which comprises the ambliFibre logo (Figure 4) and a specified set of colours for all kinds of the ambliFibre communication activities (e.g. dissemination and internal reporting). This CD allows all people in the public space as well as the partners to directly associate ambliFibre material which they see with the project, the partners and its objectives and outcome. Thus a broader range of potential customers and potential industrial interest groups for joining the ambliFibre Stakeholder group can be addressed.



Figure 4: ambliFibre Logo

Using this CD for the internal project communication will strengthen the team spirit of the consortium.

2.2.1 *Preparation of dissemination templates*

Within ambliFibre visual identity templates for posters and flyers have been proposed to promote the project and communicate methodologies and objectives.

In Figure 5 and Figure 6 the template for a tri-fold brochure is proposed. A4 standard format has been chosen to print the flyers that are then folded in 3 parts. On the front page are reported the logo, the title of the project and a picture showing the technology the project is focused on. On the back page partners forming the consortium are listed together with their logos, while in the inner folded page relevant contacts are proposed.

Once opened in the internal part of the brochure it is possible to see a description of the project together with technical objectives and expected results.

Another piece of the visual identity of the project is created through the design of posters.



Contacts

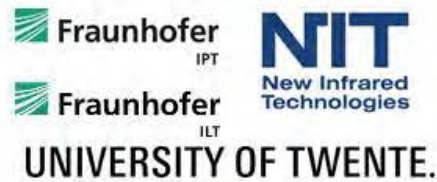
Project coordinator:
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Foerderung der Angewandten
Forschung e.V. – Institute for
Production Technologies

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Project website:
www.ambliFibre.eu

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The Consortium



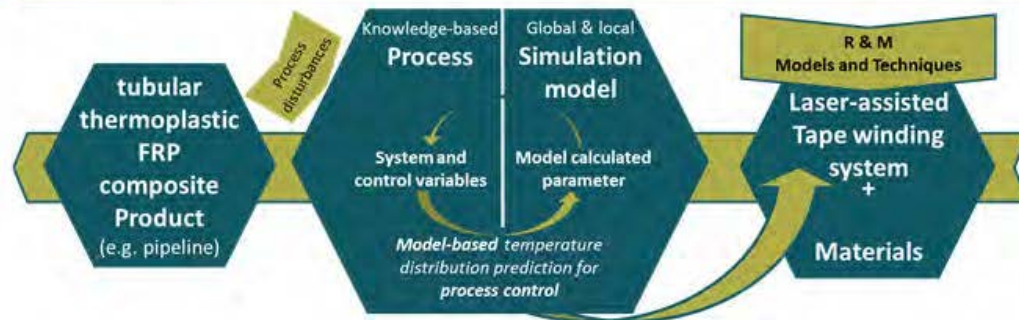
GE Oil & Gas



**adaptive model-based
control for laser assisted
Fibre reinforced tape
winding**



Figure 5: ambliFibre brochure – external side



ambliFibre aims at fulfilling the demand for tubular components made of fibre-reinforced plastic composites (FRP) by improving the diode laser-assisted tape winding process, systems and assisting software solutions to enable an efficient and flexible production for such advanced tubular composite products out of thermoplastic unidirectional (UD) fibre-reinforced pre-impregnated raw stock material.



ambliFibre expected results:

- Increase of the process speed
- Reduction of maintenance costs and machine downtimes
- Reduction of changeover times
- Reduction of waste material and pre-trials
- Reduction of personnel training

Technical objectives:

- Development of process data mining algorithms integrated in machine control and **easy-to-use programming software**
- Building-up an **integral process and machine simulation model** for laser-assisted tape winding
- Provide the **inline monitoring solution** for quality assurance
- Development of an active optics for **dynamic redistribution of laser irradiation** based on a novel infrared camera and the simulation model results
- Demonstration of a **flexible machine concept** which can produce continuously and discontinuously
- Development of **R&M models** for the laser-assisted tape winding machine and **evaluation of life cycle cost**
- **Evaluation of the environmental impact** of the ambliFibre materials, processes and components
- **Demonstration and validation** of the **model-based controlled** ambliFibre system technology

Figure 6: ambliFibre brochure – internal side

A1 standard format has been chosen. Two possible concepts are shown in Figure 7 and in Figure 8. The content in terms of objectives and approaches is the same for the 2 options and remind the brochure to guarantee a coherent visual identity. For the same reason the same pictures have been selected to illustrate both the leaflets and the posters.

The main difference between the 2 version of the poster is in the way the consortium is represented: logos are grouped in the bottom of the page, as it is conventionally done for these kind of posters in the first version, while in the second version it has been chosen to highlight the role of the partners through an easily readable image.

adaptive model-based control for laser assisted Fibre reinforced tape winding

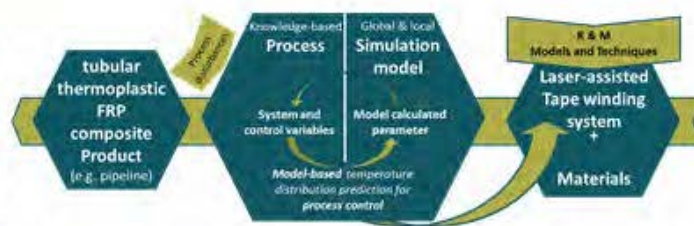
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Figure 7: ambliFibre poster 1

adaptive model-based control for laser assisted Fibre reinforced tape winding

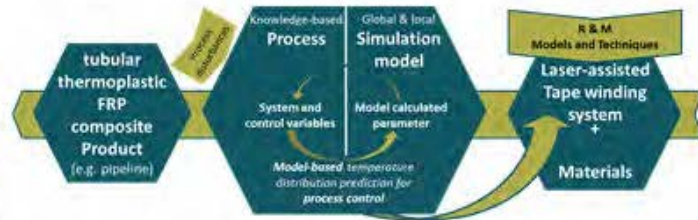
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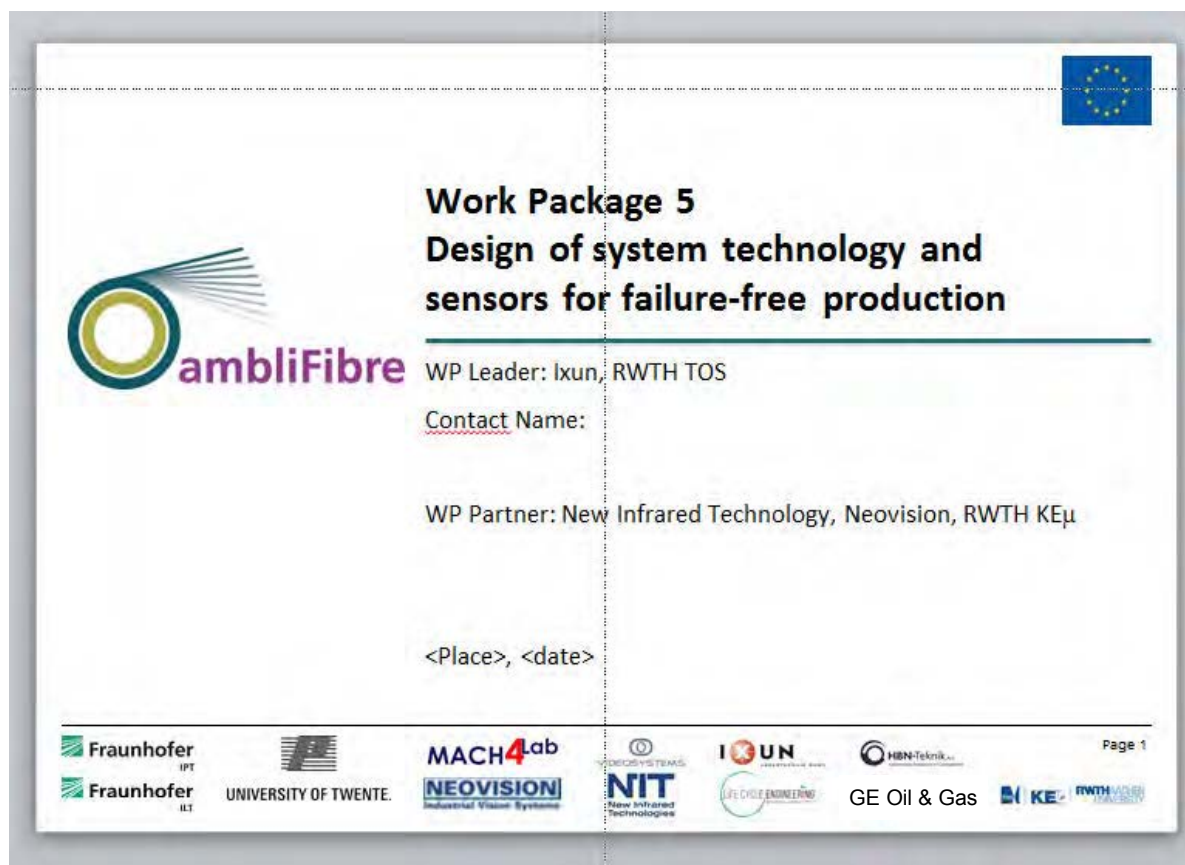


Figure 8: ambliFibre poster 2


2.2.2 Preparation of presentation and reporting templates

Since the first project month internal project templates have been developed and used for the following communication activities:

- Kick-off presentations
- Presentations for project related Meetings (Figure 9)
- Quarterly report templates
- Deliverable reporting templates.



The image shows a template for a presentation slide. It features the ambliFibre logo on the left and the title "Work Package 5 Design of system technology and sensors for failure-free production" in the center. Below the title, there are fields for "WP Leader: Ixun, RWTH TOS", "Contact Name:", and "WP Partner: New Infrared Technology, Neovision, RWTH KEμ". A placeholder "<Place>, <date>" is located below the partner information. The slide includes a European Union flag in the top right corner and a footer with logos for Fraunhofer IPT, Fraunhofer ILT, UNIVERSITY OF TWENTE, MACH4lab, NEOVISION, NIT, IOUN, HBN-Technik, GE Oil & Gas, KE, and RWTH AACHEN UNIVERSITY. The page number "Page 1" is also present in the footer.

 **Work Package 5**
Design of system technology and sensors for failure-free production

WP Leader: Ixun, RWTH TOS

Contact Name:

WP Partner: New Infrared Technology, Neovision, RWTH KEμ

<Place>, <date>

Fraunhofer IPT, Fraunhofer ILT, UNIVERSITY OF TWENTE, MACH4lab, NEOVISION, NIT, IOUN, HBN-Technik, GE Oil & Gas, KE, RWTH AACHEN UNIVERSITY, Page 1

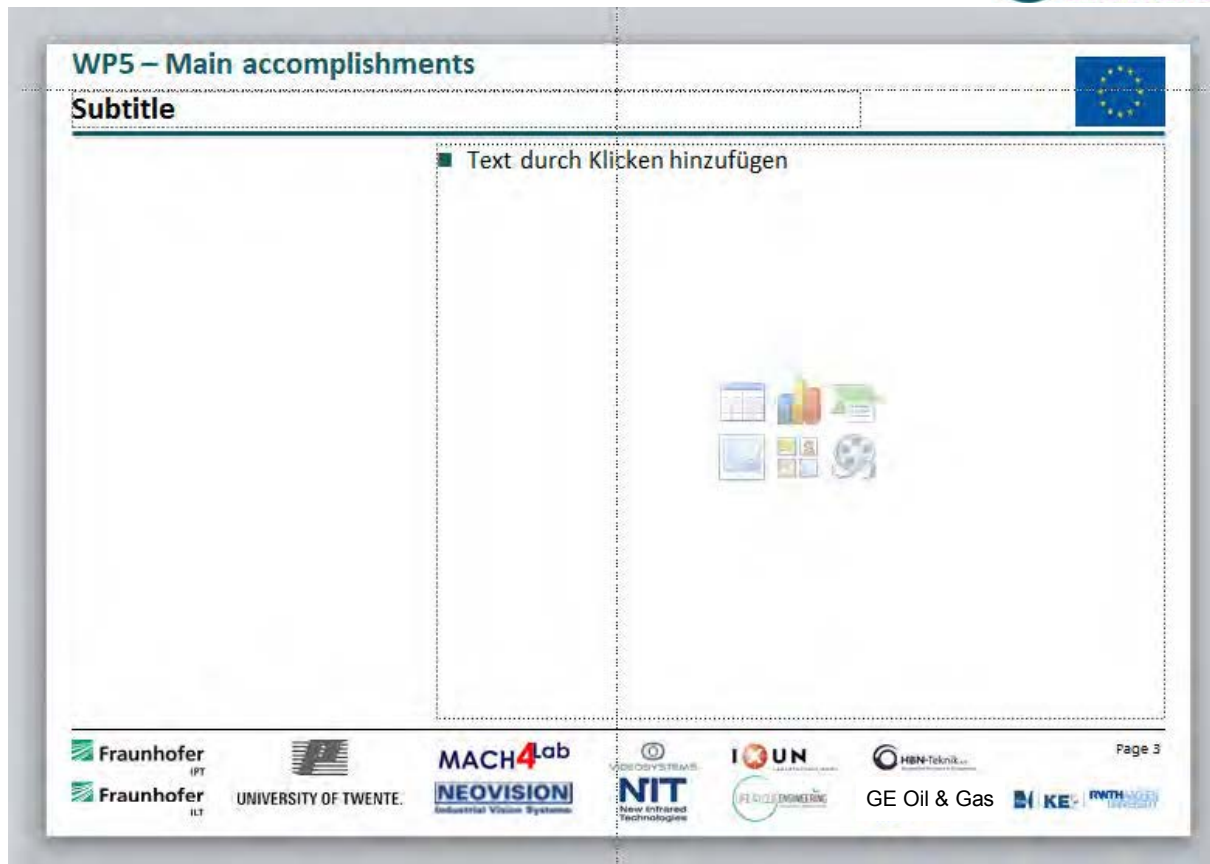


Figure 9: Exemplary screenshots of meeting presentation template

These templates are supplied to each partner and can be downloaded at any time from the ambliFibre Project Intranet (see Deliverable 10.2).

In near future also templates for the periodic reporting towards the EC will be set up.

3 Conclusion of Deliverable Output

Deliverable 9.3 reported the work carried out by FhG-IPT and MACH4 to set-up the project website and to define the visual identity.

The first version of the ambliFibre website is proposed, including specific pages for project outlines, consortium and contacts. Actions to be implemented for a future development of the website are proposed as well.

The visual identity of the project is created through the design of ambliFibre logo, templates for flyers, posters and PowerPoint presentations for communication and dissemination of the project towards the public.

3.1 Review against Task 9.2 statement

The work carried out in Task 9.2 and reported in this deliverable comply with the statements of the Description of Work: the website has been developed and set-up. Plans for maintenance to keep it updated are proposed.

Templates for dissemination tools have been designed to create the project visual identity.

3.2 Review against WP9 objectives

With the work reported in deliverable 9.3 one of the objectives of WP9, namely the “production of ambliFibre website, communication tools and materials” is reached.

The realisation of website and dissemination tools, carried out at the very beginning of the project allow to start the effective communication and dissemination of objectives, methodologies and results, activities that will be undertaken for the whole duration of the project.