



A Cost-Effective Photonics-based Device for Early Prediction, Monitoring and Management of Diabetic Foot Ulcers

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PHOTONICS PUBLIC PRIVATE PARTNERSHIP

This project is an initiative of the Photonics Public Private Partnership. It has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 871908

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## Executive Summary

This document is the 1st version of the Communication Kit which will be updated regularly throughout the project process.

# 1 Introduction

The project communication kit aims to target audiences beyond the project's own community, including the broader public and potential end-users, and focus on expected outcomes and related socio-economic benefits for the EU. This is the 1st version of the deliverable (which is delivered by M3); it will be updated regularly throughout the project process.

## 1.1 Structure

This document is structured as follows:

Section 1: Introduction

Section 2: Narrative Text

Section 3: Press Release

Section 4: Logo

Section 5: Website

Section 6: Social Media

Section 7: Copyright Licenses

Section 8: Conclusions

## 1.2 Applicable Documents

AD1 PHOOTONICS Grant Agreement

## 2 Narrative Text

### **PHOOTONICS - A Cost-Effective Photonics-based Device for Early Prediction, Monitoring and Management of Diabetic Foot Ulcers**

Diabetes is a major public health issue for Europe, with diabetes affecting about 9,1% of the population in Europe. This represents a major economic burden to the healthcare system with annual cost reaching €7-10 € billion to direct yearly costs, across EU. According to the World Health Organization, the global prevalence of diabetes among adults over 18 years of age has risen from 4.7% in 1980 to 8.5% in 2014, when 422 million adults in the world suffered this disease, and forecasts do not indicate a declining trend.

Diabetic Foot Ulcer (DFU) is one of the most common complications of diabetes, caused by neuropathic (nerve) and vascular (blood vessel) problems: annually, up to 4% of those with diabetes develop a foot ulcer and 10-15% of those with diabetes will have at least one-foot ulcer during their lifetime. Moreover, chronic DFUs are the most common indications for hospitalization for diabetic patients, and the direct cause for 50% of all non-traumatic amputations. The cost of care for patients with a foot ulcer is 5.4 times higher after the first ulcer episode, as they require more frequent emergency department visits and longer stays. In this regard, the global market for diabetes diagnostics devices and systems generated a revenue of \$9,040 million in 2014 and it is forecast to reach \$14 billion by 2022.

**PHOOTONICS** aims at developing innovative, reliable and cost-effective (in terms of almost zero operational cost and high return of investment) photonic-driven devices for DFU monitoring and management which can be applied for wide use.

The key strategic objectives are:

1. To develop reliable devices for DFU monitoring: The proposed devices combine passive infrared photodetectors with active illuminators. Specifically, we deliver (i) a passive HSI photo-detector, sensitive at NIR spectrum of 700nm-1000nm with an active tuneable diode illuminator, operating at NIR spectrum, for optimising reliability (in terms of sensitivity, specificity and accuracy) in detecting peripheral oxygen and tissue saturation- SpO<sub>2</sub>/StO<sub>2</sub> and oxyhaemoglobin/deoxyhaemoglobin, at a spatial resolution of approximately 50pixels/cm, (ii) a passive Mid-IR photodetector, sensitive at spectrum 5.7µm-9.3µm with a Quantum Cascade Laser (QCL) optimized to capture additional tissue attributes such as elastin, collagen, lipid, amino amino-acids and carbohydrates necessary information for DFU early prediction and management at a resolution scale approximately of 10pixels/cm. and (iii) a thermal-IR sensing component capable of detecting hyperthermia/hypothermia distributions in ROIs with different levels of resolution for the PRO and In-Home version (full HD and 10 pixels/cm respectively).
2. To develop cost-effective devices for DFU: We (i) employ photonic enabled technologies targeted specifically for capturing key medical indicators for ulcer healing and monitoring, (ii) implement state of the art signal processing and machine learning algorithms to increase the discrimination accuracy (between healthy and non-healthy tissues) while maintaining hardware cost-benefit, (iii) develop a user-friendly interface in order to allow these devices to be operated by non-certified physicians, and even by patients (for the simplified In-Home version), and (iv) minimise operational cost in the monitoring and management of DFU by replacing invasive and costly practices with our non-invasive device and zero-consumables devices.

### 3 Press Release

## PHOOTONICS

### **PHOOTONICS Project launched – Delivering a Cost-Effective Photonics-based Device for Early Prediction, Monitoring and Management of Diabetic Foot Ulcers**

**November 1<sup>st</sup> 2019**

Diabetic Foot Ulcer (DFU) is one of the most common complications of diabetes, caused by neuropathic (nerve) and vascular (blood vessel) problems: annually, up to 4% of those with diabetes develop a foot ulcer and 10-15% of those with diabetes will have at least one-foot ulcer during their lifetime. The cost of care for patients with a foot ulcer is 5.4 times higher after the first ulcer episode, as they require more frequent emergency department visits and longer stays. In this regard, the global market for diabetes diagnostics devices and systems generated a revenue of \$9,040 million in 2014 and it is forecast to reach \$14 billion by 2022.

The **main objective** set forth by PHOOTONICS is to **develop innovative, reliable and cost-effective** (in terms of almost zero operational cost and high return of investment) **photonics-driven devices for Diabetic Foot Ulcers (DFU) monitoring and management which can be applied for wide use.**

PHOOTONICS kicked off in November 2019 and is expected to be completed in April 2023.

Email: [info@phootonics.eu](mailto:info@phootonics.eu)

Website: <https://www.phootonics.eu/>

Twitter: <https://twitter.com/phootonicsp>

Facebook: <https://www.facebook.com/phootonics/>



This project is an initiative of the Photonics Public Private Partnership [www.photonics21.org](http://www.photonics21.org) and has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no 871908.

## 4 Visual Identity

### 4.1 Logo

The project logo has been established and is already being used for all communication and dissemination activities.

There are two main variations of the Project logo:



*Figure 1: Project Logo (1<sup>st</sup> variation)*



*Figure 2: Project Logo (2<sup>nd</sup> variation)*

### 4.2 Typography & Color guide

The main font used for all deliverables is Times New Roman (free).

The Logo uses Open Sans font (free).

The Project primary colors are directly derived from the PHOOTONICS logo. Ideally, these shall be used in all communication and dissemination tools and products (leaflets, brochures, templates etc.).

Dark Blue #006699 (RGB 0, 102, 153) 

Light Blue #99ccff (RGB 153, 204, 255) 

Red #cc0033 (RGB 204, 0, 51) 

White #ffffff (RGB 255, 255, 255)

Black #000000 (RGB 0, 0, 0)

### 4.3 Acknowledgments

Beneficiaries of the EU's Horizon 2020 research and innovation programme have the obligation to

explicitly acknowledge that their action has received EU funding. This must be done, if possible and unless the Commission/Agency requests otherwise, in all communication, dissemination and IPR activities as well as on all equipment, infrastructure and major results funded by the grant.

The EU emblem and reference to EU funding must be displayed in a way that is easily visible for the public and with sufficient prominence (taking also into account the nature of the activity or object). Examples: for equipment and major results a sticker or poster, for an infrastructure a plaque or billboard.

Moreover, this project is funded by one of the calls under the Photonics Public Private Partnership (PPP). All communication activities related to the project will acknowledge the context of the Photonics PPP, for example by stating that the project is an initiative of the Photonics Public Private Partnership.

Specifically, for workshops, press releases, presentations etc, the EU emblem and Photonics21 logo will be displayed prominently together with the text "Photonics Public Private Partnership" (see below). The link [www.photonics21.org](http://www.photonics21.org) will also be included.

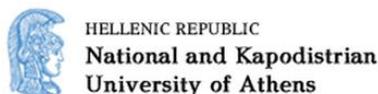


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Project communications such as project press releases, workshops announcements, websites, brochures will respect the principle of fair visibility for all partners. If the logo of any individual beneficiary is included, then the logos of all beneficiaries will be included.

#### 4.4 Partners Logos

Partners logos are currently used in the main and basic communication material (website, brochure) and may be used in additional material as well as in single presentations. High-resolution versions of the logo are available to partners in the Cloud Document Management System.



## 5 Website

The website for the PHOOTONICS project is publicly available at <https://phootonics.eu/> and is maintained by EXUS. The website has been available from the third month of the project (January 2020).

The primary ambition of the PHOOTONICS website is:

- a. To establish an online presence and to disseminate the generated information and material to the public;
- b. To raise awareness on PHOOTONICS and provide information to all stakeholders about the progress of the project.

The technical details, the structure, and the main functions of the website are described in the following sections, along with short descriptions of each web page.

### 5.1 Website layout

The PHOOTONICS website is build using a contemporary layout on the ‘homepage’ with simple page layouts throughout the site. Overall the layout comprises the following sections:

- a. The **Main Navigation panel**, offering quick access throughout the site pages;
- b. The main **Content Area**, occupying the main area of each page;
- c. The **Footer**, containing information regarding funding, as well as contact details.

### 5.2 Menus and submenus

This subsection presents the menu and submenu entries that comprise the Main Navigation Panel.

#### 5.2.1 Home

The public first page of the website provides the project logo, along with a summary of the PHOOTONICS concept. Direct links to other website pages, such as “News”, and “Publications” are provided for easy access.



Figure 3. View of the "Home" page - upper part

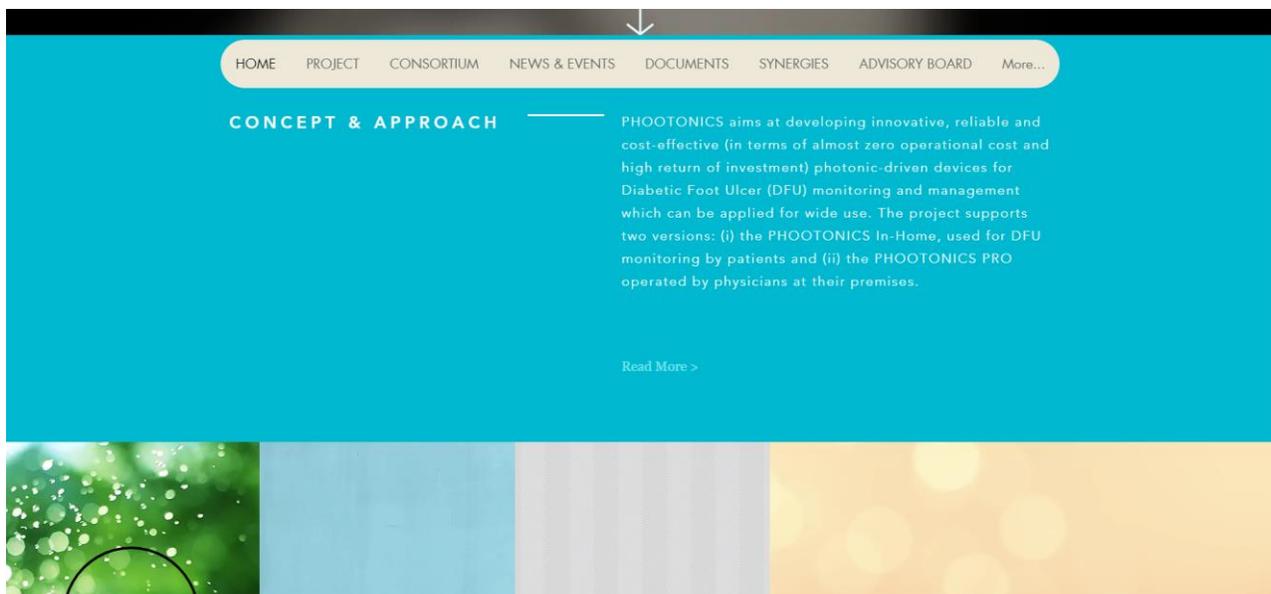


Figure 4. View of the "Home" page - middle part

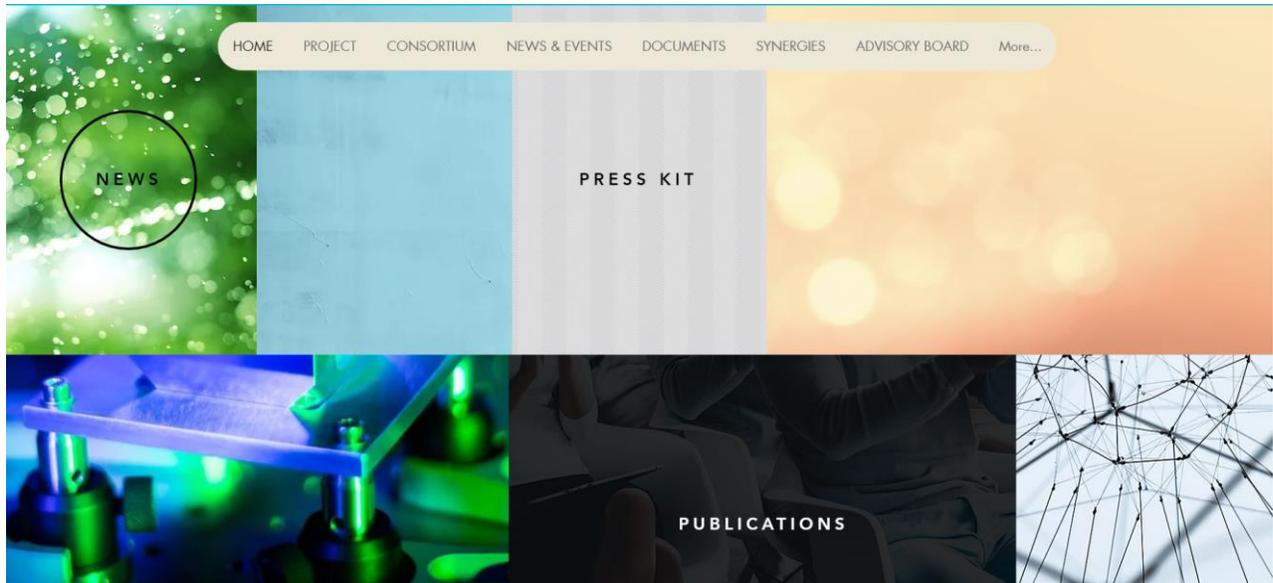


Figure 5. View of the webpage - middle part 2

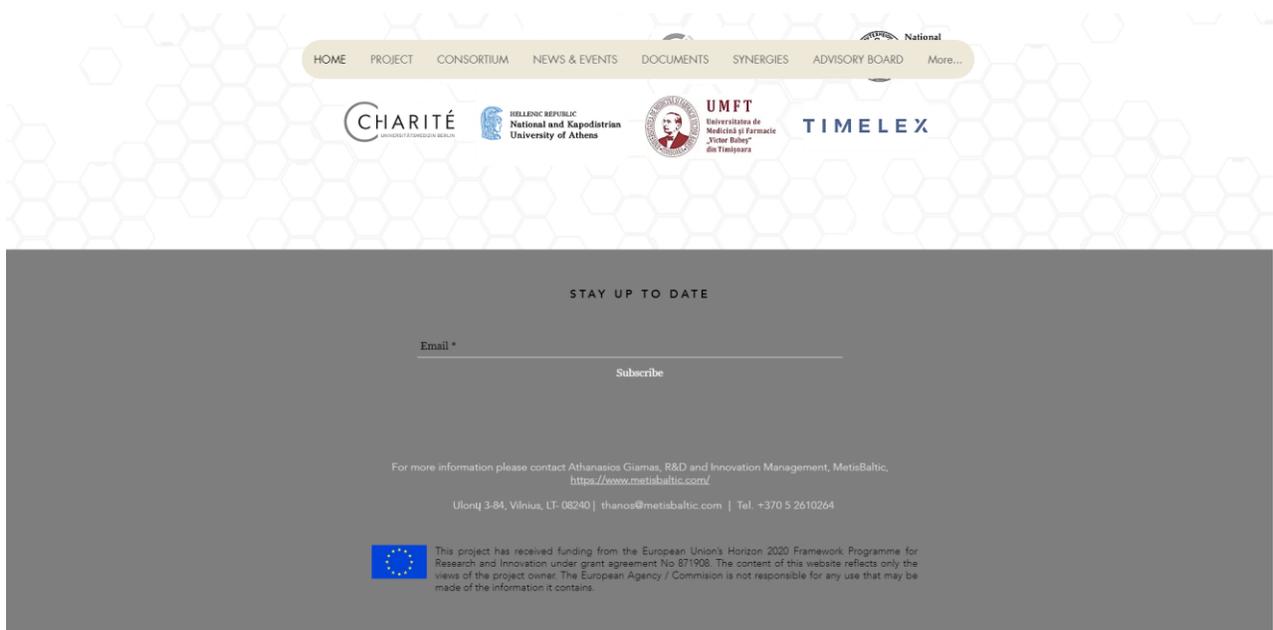


Figure 6. View of the "Home" page - lower part

## 5.2.2 Project

This section of the PHOOTONICS website provides information related to the project. In this page the visitor will be able to find information about the PHOOTONICS project, the motivation behind it, a more elaborate description of the Concept, and the project objectives.

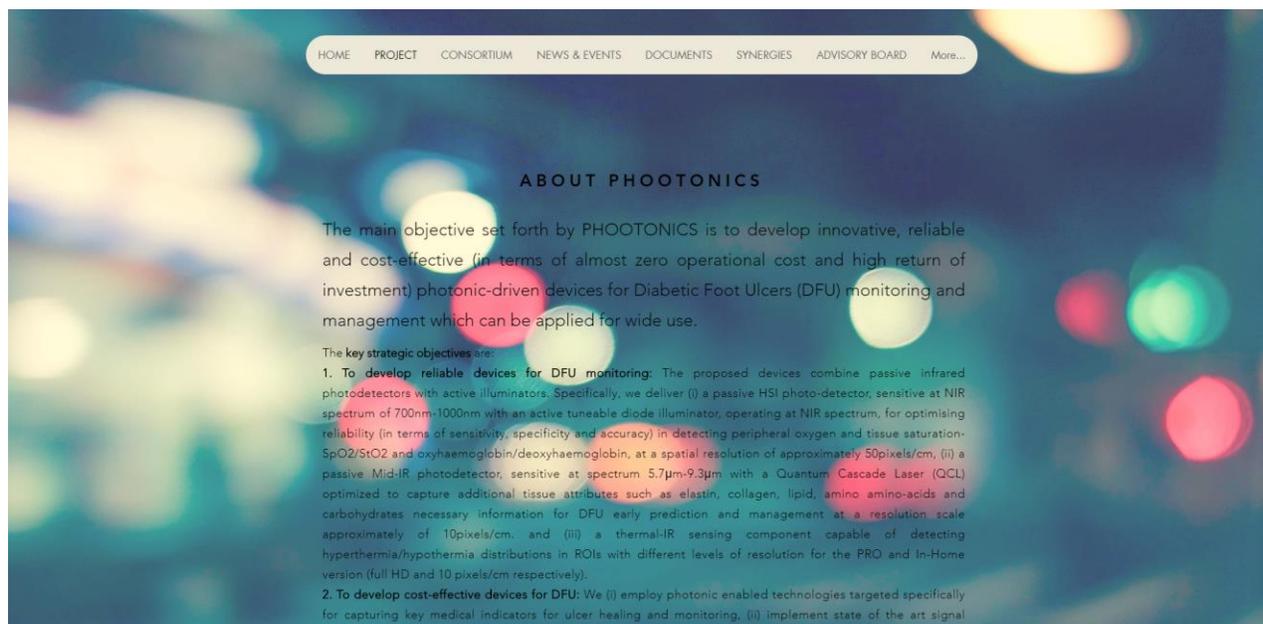


Figure 7. View of the "Project" page - upper part

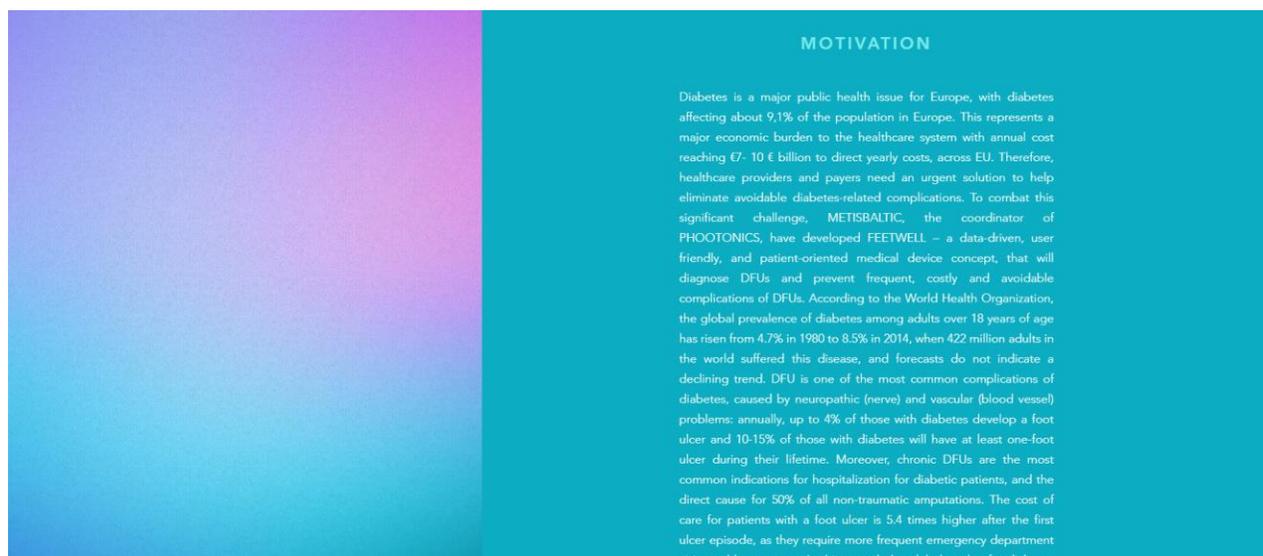


Figure 8. View of the "Project" page - middle part

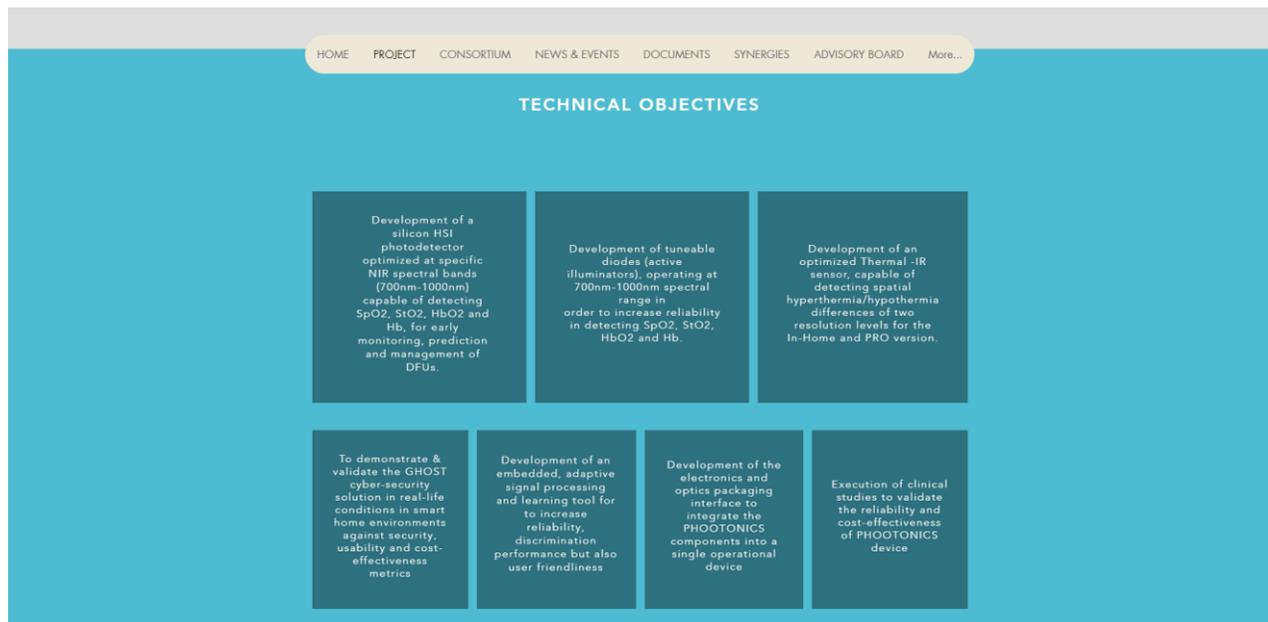


Figure 9. View of the "Project" page - middle part 2

#### 5.2.2.1 About PHOOTONICS

This subsection of the website is about the main objective of the PHOOTONICS website. The two major strategic objectives are also presented, providing a high-level view of the project to the visitor.

#### 5.2.2.2 Motivation

This subsection presents the motivation that led the consortium to the realization of the PHOOTONICS project.

#### 5.2.2.3 Concept & Approach

Here we present the PHOOTONICS concept, including the description of the two devices that will be developed within the project, and the approach that we will follow in order to fulfill our objectives.

#### 5.2.2.4 Objectives

The technical objectives of the PHOOTONICS project are provided in this subsection, allowing the visitor to understand the technical aspect of the project.

### 5.2.3 Consortium

The “Consortium” page provides information about the “Consortium as a whole” before presenting all consortium partners, along with their logos and links to their webpages.

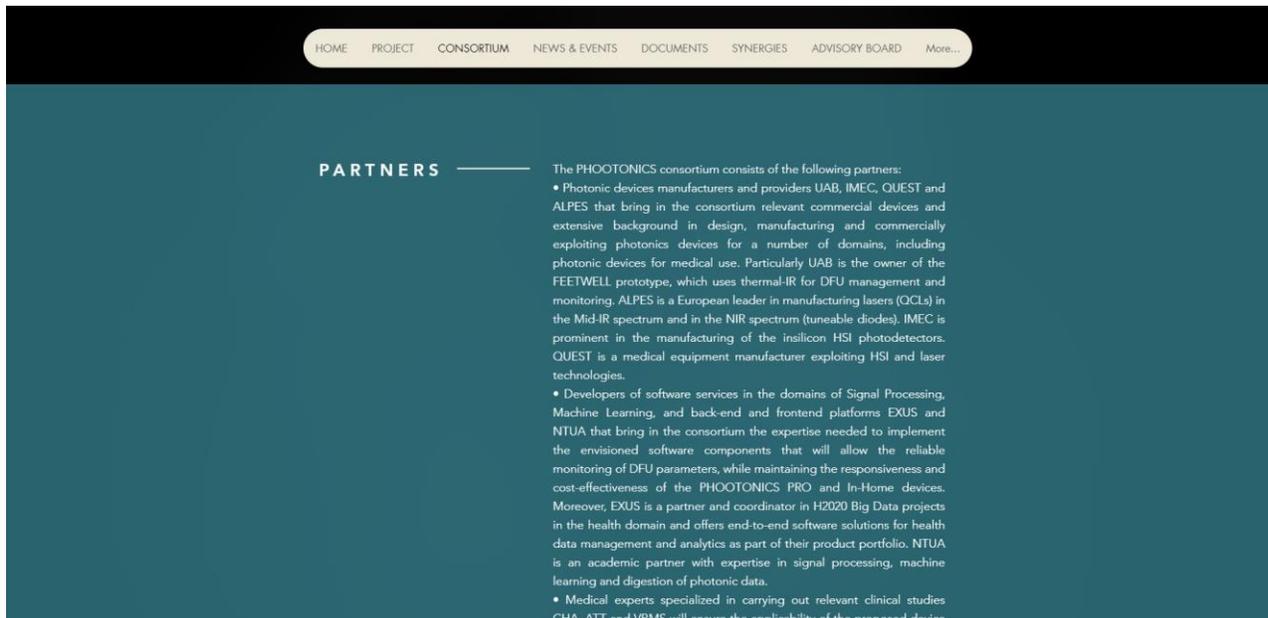


Figure 10. View of the “Consortium” page - upper part

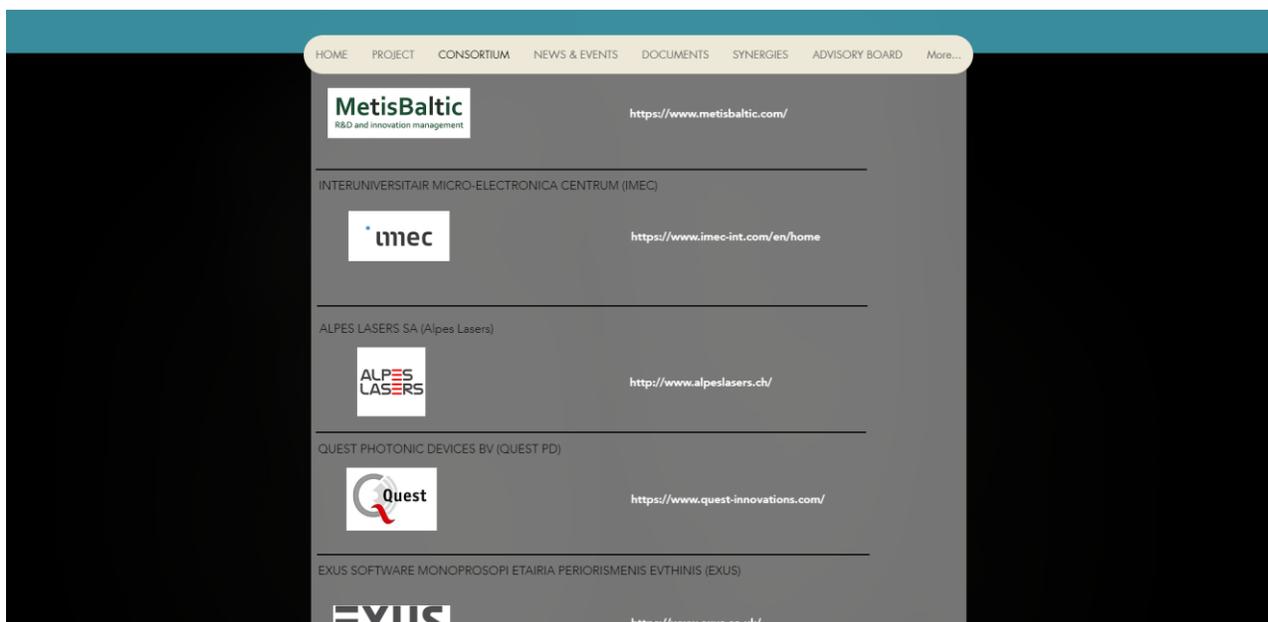


Figure 11. View of the “Consortium” page - lower part

### 5.2.4 News & Events

This is the page where all communication material will be presented. This includes information about news and events, and the newsletters and press kits that will be produced. A calendar at the bottom of the

page will present the dates when events related to the PHOOTONICS project (e.g. workshops, exhibitions, etc.) will take place. This page consists of the following subsections:

- News & Events
- Newsletters
- Press Kit
- Calendar

#### 5.2.5 Documents

The “Documents” page in the PHOOTONICS website will have a twofold scope. It will include all publications created by the project partners and funded by the PHOOTONICS project. Secondly, a visitor will be able to find all deliverables submitted by the project to the European Commission. For deliverables with a Restricted Dissemination level, only the executive summary will be provided. The “Documents” page will comprise the following two subsections:

- Publications
- Deliverables

#### 5.2.6 Synergies

This page will present information related to synergies of the PHOOTONICS project with other projects and initiatives. Information about the scope of each synergy will also be included, providing visitors with insight over the liaison activities of the project.

#### 5.2.7 Advisory Board

This page presents the members of the Advisory Board. News related to the Advisory Board meetings will be communicated through this page.

#### 5.2.8 Contact

This page provides a form via which anyone can contact the project. A map showing the location of MetisBaltic, the Project Coordinator, is also included.

#### 5.2.9 Link to the Document Management System

This is a direct link to the Document Management System, i.e. the internal platform employed by the consortium partners for their communication and exchange of project-related files.

## 6 Social Media

The consortium's goal is to make extensive use of the capabilities offered by social networks to communicate its achievements and reach a wide audience. For this purpose, a number of social media accounts have been already generated. Corresponding links have been placed on the Project Website, as well as on select partners websites.

### 6.1 Twitter

Project Page URL: <https://twitter.com/PhootonicsP>



**Phootonics Project - Horizon 2020**  
@PhootonicsP

A Cost-Effective Photonics-based Device for Early Prediction, Monitoring and Management of Diabetic Foot Ulcers

Europe [phootonics.eu](https://phootonics.eu) Joined January 2020

0 Following 0 Followers

Not followed by anyone you're following

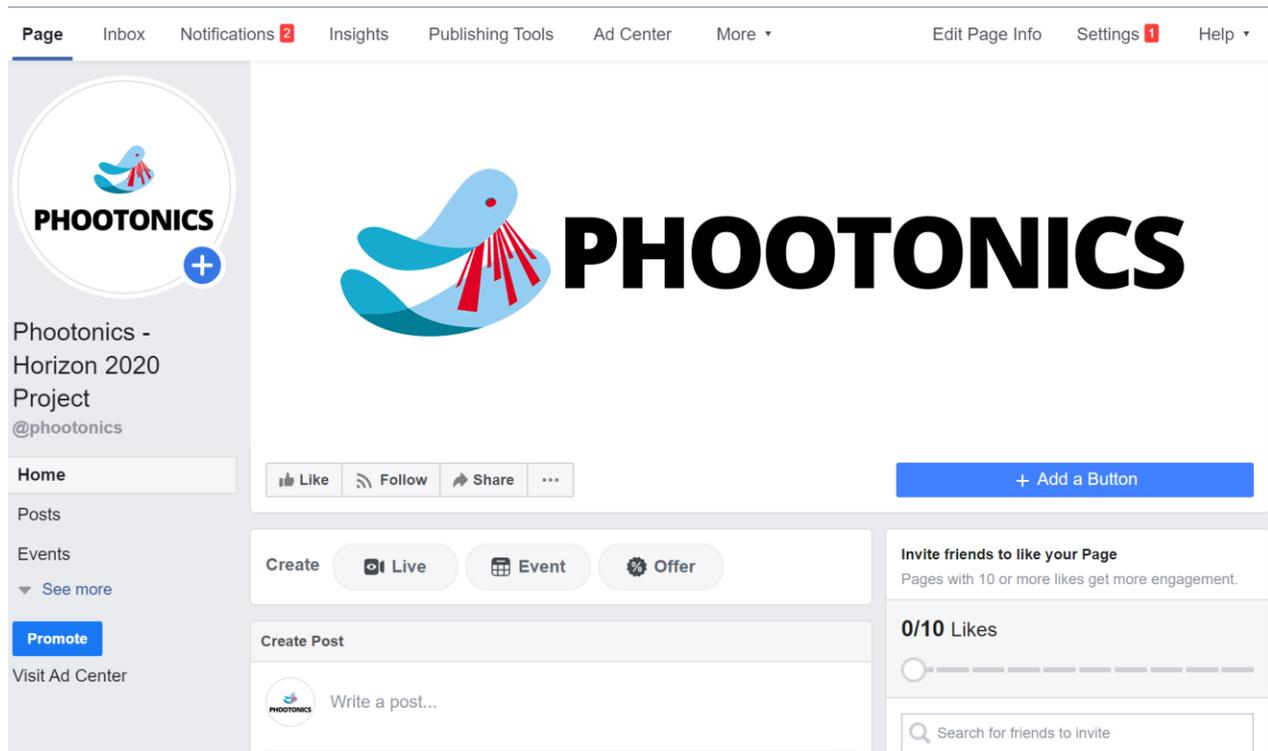
**Phootonics Project - Horizon 2020** @PhootonicsP · Jan 23

The PHOOTONICS Project is an initiative of the #Photonics Public Private Partnership [photonics21.org](https://photonics21.org) @Photonics21 @PhotonicsEU

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## 6.2 Facebook

Project Page URL: <https://www.facebook.com/phootonics/>



Page | Inbox | Notifications **2** | Insights | Publishing Tools | Ad Center | More ▾ | Edit Page Info | Settings **1** | Help ▾

**PHOOTONICS**  
Horizon 2020 Project  
@phootonics

Like | Follow | Share | ... | + Add a Button

Create | Live | Event | Offer

Create Post  
Write a post...

Invite friends to like your Page  
Pages with 10 or more likes get more engagement.

0/10 Likes

Search for friends to invite

## 6.3 LinkedIn

Project Page URL: <https://www.linkedin.com/company/phootonics/>

## 7 Copyright Licenses

The **European Commission** (the Commission) and the **European Technology Platform Photonics21** (Photonics21) may use, for its communication and publicising activities, information relating to the action, documents notably summaries for publication and public deliverables as well as any other material, such as pictures or audio-visual material received from any beneficiary (including in electronic form).

This does not change the confidentiality obligations in Article 36 and the security obligations in Article 37 of the Project Grant Agreement (Grant Agreement number: 871908), all of which still apply.

If the Commission's and/or Photonics21's use of these materials, documents or information would risk compromising legitimate interests, the beneficiary concerned may request the Commission and/or Photonics21 not to use it (see Article 52 of the Grant Agreement). The right to use a beneficiary's materials, documents and information includes:

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- (b) distribution to the public (in particular, publication as hard copies and in electronic or digital format, publication on the internet, as a downloadable or non-downloadable file, broadcasting by any channel, public display or presentation, communicating through press information services, or inclusion in widely accessible databases or indexes);
- (c) editing or redrafting for communication and publicising activities (including shortening, summarising, inserting other elements (such as meta-data, legends, other graphic, visual, audio or text elements), extracting parts (e.g. audio or video files), dividing into parts, use in a compilation);
- (d) translation;
- (e) giving access in response to individual requests under Regulation No 1049/2001/27, without the right to reproduce or exploit;
- (f) storage in paper, electronic or other form;
- (g) archiving, in line with applicable document-management rules, and
- (h) the right to authorise third parties to act on its behalf or sub-license the modes of use set out in Points (b), (c), (d) and (f) to third parties if needed for the communication and publicising activities of the Commission and/or Photonics21.

If the right of use is subject to rights of a third party (including personnel of the beneficiary), the beneficiary must ensure that it complies with its obligations under the Grant Agreement (in particular, by obtaining the necessary approval from the third parties concerned).

Where applicable (and if provided by the beneficiaries):

- the Commission will insert the following information: “© – [year] – [name of the copyright owner]. All rights reserved. Licensed to the European Union (EU) under conditions.”
- Photonics21 will insert the following information: “© – [year] – [name of the copyright owner]. All rights reserved. Licensed to Photonics21 under conditions.”

## 8 Conclusions

This document is the 1st version of the Communication Kit, which includes the first editions of the communication material. It will be updated regularly throughout the project process to include updated and new material regarding the communication activities of the PHOOTONICS Project.