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*Project Title:*

**Autonomous self powered miniaturized intelligent sensor for environmental sensing and asset tracking in smart IoT environments**



## **AMANDA**

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### List of definitions & abbreviations

<b>Abbreviation</b>	<b>Definition</b>
ASSC	Autonomous Smart Sensing Card
ESS	Electronic Smart Systems
IoT	Internet of Things
KPI's	Key Performance Indicators
PV	Photo Voltaic

## Executive Summary

The aim of communication and dissemination in AMANDA was to help achieve the overall vision and goals of the project. Various areas of the project had socio-economic impact while communication and dissemination played an important role in supporting and maximising this impact.

This Deliverable, **D7.9 - Dissemination and Communication Plan v3**, presents the strategy on the way that communication, in terms of promoting the action and its results, and dissemination, in terms of sharing the results, helped achieve the project's goals throughout its lifetime. This involved activities at a project- as well as at a partner-level. It is a central guideline document for the AMANDA Consortium in communicating and disseminating AMANDA to external stakeholders as well as for sharing and coordinating activities internally.

In this third and final version of the Deliverable, an analysis of the project objectives and impact is given, as well as of the dissemination and communications activities that took place during the project is carried out against those planned. Activities beyond the lifetime of the project are also described.

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## 1 Introduction

This Deliverable is part of **WP7 - Exploitation and Dissemination** and specifically **Task T7.1 - Dissemination & Exploitation Planning & Review**. It follows an iterative approach with four versions delivered throughout the lifetime of the project:

- A preliminary dissemination and communication plan (M3)
- **D7.3 - Dissemination and Communication Plan v1** on M12
- **D7.6 - Dissemination and Communication Plan v2** on M18
- **D7.9 - Dissemination and Communication Plan v3**, this final update on M45

Since the project is in its final month, planning activities are now limited to delivering the last few KPIs, as presented in the DoA and also described here. Post-project activities are also discussed, in Section 4. The core of this report, however, concentrates on an analysis of WP7's activities throughout the lifetime of the AMANDA project, comparing achievements vs targets, pointing out deviations from the plan and reflecting on lessons learned.

The aim of communication and dissemination activities in AMANDA was to help achieve the overall goals of the project and maximise the project's impact through a strategic approach. The task was to promote (communication) and share (dissemination) the AMANDA results effectively to a wide range of stakeholders who have an interest in, are concerned about or are affected by applications within AMANDA's key target markets.

The distinction between the terms communication and dissemination was presented in the AMANDA Grant Agreement where the obligations are listed. The dissemination obligations concerned the obligation to publicly disclose the results from the project. The communication obligations were extended to promoting not only the results but also the project as a whole to a wider audience, thereby going beyond the project's own community. A third important goal related to the exploitation of the results of which the dissemination strategy is a prerequisite for the exploitation plans developed during and after the project.

This report is supplemented by the following documents, also part of WP7:

- **Deliverable D7.10 - Exploitation Report v3** (authored by IMEC) is part of **Task T7.3 - Exploitation Strategy & IPR Management**. The Deliverable details the exploitation efforts of the project. It discusses the impact of background IP potential, identifies potentially exploitable IP, undertakes commercialisation support activities and evaluates licensing options
- **Deliverable D7.11 - Dissemination and Coordination with Relevant Activities Report v3** (authored by PENTA), as part of **Task T7.2 - Dissemination & Communication Activities and Material**. It discusses the dissemination activities of the project to a wide group of stakeholders, including the academic community, ESS groups, industrial stakeholders and policy makers



## 2 Analysis of the project's strategy

The AMANDA project is expected to have a significant impact in the domain of ESS in Europe, due to its technological and scientific advances. In combination with the project's dissemination efforts, the outcomes of AMANDA, in terms of the hardware architecture, but also the miniaturization, the low-energy consumption, and the State-of-the-Art algorithms, were expected to have an impact both on the scientific and the industrial scenes. This Section reflects on project visions, objectives and impact as well as communication objectives set by the AMANDA Consortium at start of the project, comparing targets with delivered outcomes. Technical achievements are only described here at a high level, whilst additional details can be found in **Deliverable D8.4 - AMANDA Final Report**.

### 2.1 Project vision and objectives

The aim of the AMANDA project was to develop a unique Autonomous Smart Sensing Card (ASSC), a self-powered, miniaturised, thin, embedded system with the dimensions of a credit card that is able to monitor air quality, temperature, humidity, image, long range tracing. The system can easily be deployed in smart indoor (e.g. smart buildings) or outdoor (e.g. smart cities) environments, on-the body (wearables) or on operating machineries (Industrial IoT). AMANDA have used the Consortium partners' expertise in the area of manufacturing infrastructures and know-how, micro- and nano-technology, new composites, architectures and firmware/software to develop innovative technologies whilst also aiming to use existing off-the-shelf technologies when available and suitable.

AMANDA's vision was to overcome the current technological challenges and achieve the development of a user-friendly wearable platform. Eight different objectives were identified, with their outcomes listed in Table 1 below, with more information available in **Deliverable D8.4 - AMANDA Final Report**.

Objective	Achievement	Indicator	Achieved
<b>1: To design and develop a maintenance-free, miniaturised and adaptable ASSC for multi-purpose environmental sensing and asset tracking in smart living and working applications; indoor, outdoor and wearable versions of the ASSC are anticipated</b>	Multiple versions of the ASSC	3 versions of the ASSC: indoor, outdoor, wearable	☑
	Built-in intelligence	Data fusion and inference capabilities	☑
	ASSC maintenance free lifetime	≥ 10 years	☑
<b>2: To apply high aspect ratio architectures and miniaturization-oriented design in terms of the overall size reduction to achieve up to</b>	ASSC size	Credit card size up to 3mm overall thickness	☑
	Miniaturised sensors, antenna and energy harvester	Few cm <sup>2</sup> each	☑
	PMIC PCB footprint	Less than 1cm <sup>2</sup>	☑

<b>3mm thickness depending on sensors employed</b>			
<b>3: To ensure maintenance-free (energy autonomy) functionalities exploring energy harvesting and storage concepts for powering microsensors nodes</b>	PV harvester and battery sizes and geometries	2-3 different sizes and/or geometries	2 different sizes for the PV energy harvester
	Coverage of the energy needs of the ASSC (for all versions) on a long-term basis	100% coverage	<input checked="" type="checkbox"/>
	PMIC converter	Delivery of a new fully integrated converter for the power management integrated circuits	<input checked="" type="checkbox"/>
	Vmin cold-start and minimum Input power	Vmin cold-start: 300mV; Minimum Input power: 2µW at project end	<input checked="" type="checkbox"/>
<b>4: To apply multi-layer optimisation strategies for ultra-low power processing/ management</b>	Charging/ discharging algorithms for smart power management	Charging/ discharging algorithms for smart power management	<input checked="" type="checkbox"/>
	Smart energy strategies and algorithms for minimizing energy consumption, based on different energy modes: deep sleep, idle, operating modes at sub-system and ASSC level	Smart energy strategies and algorithms for minimizing energy consumption, based on different energy modes: deep sleep, idle, operating modes at sub-system and ASSC level	<input checked="" type="checkbox"/>
<b>5: To develop and integrate advanced miniaturised multi-sensing technology that will contribute significantly to the realization of next generation autonomous analytical instruments for distributed environmental sensing, asset and people tracking and monitoring</b>	Development / optimisation partners' sensors	Development / optimisation of at least 4 sensors	3 sensors have been fully developed and optimised as part of the project; temperature and capacitive sensor from Microdul and image sensor from EPEAS. A CO <sub>2</sub> sensor was partially developed and validated from IMEC
	Incorporation of off-the-shelf or close to commercialisation sensors	In total incorporation of > 5-6 off-the-shelf or close to commercialisation sensors	<input checked="" type="checkbox"/>

	Sensors' energy load	Keep energy loads of each sensor no more than 10's uW	<input checked="" type="checkbox"/>
	Development of sensor/data fusion and automated inference algorithms to serve the applications scenarios	Development of sensor/data fusion and automated inference algorithms to serve the applications scenarios	<input checked="" type="checkbox"/>
<b>6: To enrich wireless connectivity capabilities in support of cyber-secure mesh communication as well as ultra-low power localisation and tracking</b>	Alternative mesh communication strategies	4 alternative mesh communication strategies with the related supporting procedures for low power communication (1 horizontal plus 1 for each distinct application scenario)	The mesh functionality is possible with the current card hardware and firmware. However, it adds a new layer of complexity and will require additional energy if the card acts as repeater
	Ultra-low power multi-protocol wireless stacks combination and implementation	Ultra-low power multi-protocol wireless stacks combination and implementation	<input checked="" type="checkbox"/>
	Ultra-low power protocol for the localisation/ tracking of the AMANDA ASSC	Ultra-low power protocol for the localisation/ tracking of the AMANDA ASSC	<input checked="" type="checkbox"/>
	Secured-by-design improvements in the ASSC	At least 3 secured-by-design improvements in the ASSC	<input checked="" type="checkbox"/>
	Alternative and/or complementary options for enhanced cybersecurity	At least 4 alternative and/or complementary options for enhanced cybersecurity	<input checked="" type="checkbox"/>
<b>7: To incorporate build-in ASSC processing capabilities for sensor/data fusion and low power edge intelligence in support of IoT-related services</b>	Development and optimisation of data fusion algorithms	Development and optimisation of at least 4 data fusion algorithms	<input checked="" type="checkbox"/>
	Development and optimisation of edge intelligence algorithms for enhanced decision autonomy	Development and optimisation of at least 4 edge intelligence algorithms	<input checked="" type="checkbox"/>
<b>8: To validate the proposed ASSC in laboratory conditions under variable application scenarios</b>	Application scenarios to be validated	Application scenarios to be validated: at least 6	Initially, 19 use case scenarios have been designed. After receiving feedback by the Reviewers of the

			Project, the use case scenarios have been narrowed down to 6 and finally to 3, also given in the present Deliverable. The validation of the AMANDA ASSC for the 3 final use case scenarios is presented in <b>Deliverable D6.3 - Characterisation/test reports of integrated AMANDA platform in lab environment</b>
	Demonstrate capability to meet 100% of the target values for at least 80% of the relevant indicators (as defined in obj.1-7)	Demonstrate capability to meet 100% of the target values for at least 80% of the relevant indicators (as defined in obj.1-7)	☑

Table 1 Objectives achievement indicators

## 2.2 Project impact

AMANDA had the ambitious technical aim to optimise current limitations for the autonomy of sensing systems in terms of energy, decision making and maintenance-free lifetime extension using miniaturized components. The ultimate goal of the project was to develop and successfully validate a cost-attractive next generation ASSC. The project aimed to reach an addressable global electronic smart systems market worth at \$25.96bn in 2017 and forecasted to reach \$72.39bn by the end of 2023, with a CAGR of 18.64% in the forecasted period (2018 - 2023) [1]. In this context, the project consortium acknowledged the necessity to undertake the proposed research and deliver the envisaged technological assets that will help boosting the competitiveness of its industrial partners, while strengthening the scientific and technological excellence of the research/ academic ones.

### 2.2.1 Market impact

Eight areas of impact were identified at the beginning of the project; all areas are analysed in this Section.

#### Impact 1: European technology leadership in Electronic Smart Systems (ESS) performances (functionalities, size, reliability, manufacturability, cost...)

The core technology and IP of the AMANDA consortium formed the basis for the design and development of the innovative ASSC. The AMANDA card integrates the partner-developed components listed in the table below. These were further developed and optimised during the lifetime of the project and all reach their targeted TRL levels:

Exploitable assets	Starting TRL	Final TRL target	Final TRL achieved
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PV energy harvester	2-3	4-5	6
PMIC	3-4	6-7	7
Miniaturized solid-state battery	2-3	4-5	4
Long range communication and processing	2-3	4-5	5
Low-power processing	2-3	4-5	5
Battery-less WPAN system	2-3	4-5	5
Positioning infrastructure Amanda tags in infrastructure	3-4	5-6	5
Energy consumption simulation tool	1	5-6	5
Capacitive sensor	2-3	5	7
Temperature sensor	2-3	5	7
CO <sub>2</sub> sensor	2-3	4-5	4
Imaging sensor	3	4-5	4
AMANDA ASSC card	N.A.	4-5	4-5

Table 2 TRL levels targeted and achieved for each component of the ASSC

On top of the enrichment of the components' functionality, the developed ASSC exhibits enhanced levels of cybersecurity with the work performed as part of **Task T4.2 - Cybersecurity by design implementation** and the development of methods on:

- Intrusion detection and prevention
- Data encryption
- Identity and access management
- Prevention of hardware tampering

Moreover, the architecture of the card includes the provision for three different application-related versions of the card that are utilised in different use case scenarios:

- Indoor version
- Outdoor version
- Wearable version

In terms of cost-attractiveness, the ASSC device in its current form will cost approximately €440, in volumes of 1000+ and up to €930 for a single, prototype device. When replacing the ILIKA battery with an off-the-shelf solution, the price goes down to approximately between €150 and €450, depending on quantity ordered. An off-the-shelf CO<sub>2</sub> sensor can be added via an add-on board which will cost €50, in volumes of 1000+ and up to €150, for a prototype.

Intellectual protection was ring-fenced by the filing of 4 patents by IMEC, Ilika and Lightricity, further described in **Deliverable D7.10\_Exploitation\_report\_v3**.

Table 3 below analyses the Success Indicators and Target Values set in the DoA to contribute to the European technological leadership in ESS performance.

Success Indicator	Target Value	Outcome	Achieved
<b>Number of patent applications</b>	At least 4	4 filed patents described (IMEC, Lightricity x 2, Ilika)	<input checked="" type="checkbox"/>
<b>Number of peer-reviewed publications</b>	At least 6 (2 on energy autonomy, 1 in edge intelligence, 1	6 conference publications described in <b>Deliverable D7.11</b>	<input checked="" type="checkbox"/>

at international journals	related production cost and miniaturization, 1 in cybersecurity, 1 concerning sensor-related functionalities at application-oriented lab validation)	<b>Dissemination and Coordination with Relevant Activities Reports v3</b>	
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Table 3 Impact 1 achievement indicators

**Impact 2: Improving ESS manufacturing capabilities in Europe**

During the project elaboration and as part of the technology prototyping and commercialisation process, a draft manufacturing plans was elaborated which is further detailed in **Deliverable D7.10 - Exploitation Report v3**. This plan included a determination of the Bill of Materials at various volume levels as well manufacturing cost estimates provided by assembly houses. Estimated cost of the ASSC is discussed in Impact 1. In addition, the Consortium received 4 letters of intents: 2 for PCB manufacturing, 1 for PCB assembly and 1 for both; all manufacturers are located in Europe. At this stage, we expect that all assembly steps may be carried out using automated assembly equipment. The following Table analyses the Success Indicators and Target Values set in the DoA to contribute to Impact 2.

Success Indicator	Target Value	Outcome	Achieved
<b>Elaboration of draft manufacturing plans for all core elements of the ASSC</b>	1 draft manufacturing plan	Manufacturing plan described in <b>Deliverable D7.10 - Exploitation Report v3</b>	☑
<b>Automated assembly possible</b>	For > 95% of the tasks	All components were designed with the aim to be assembled on PCB in automated manner (e.g. pick & place)	☑
<b>Letters of intent from European manufacturing facilities expressing their capability for mass-scale production of the ASSC</b>	At least 2	2 for PCB manufacturing, 1 for PCB assembly and 1 for both	☑

Table 4 Impact 2 achievement indicators

**Impact 3: Increasing ESS market penetration in emerging digital economy sectors**

The AMANDA card was initially designed to meet the requirements of various sectors, including smart cities, smart homes and smart workplace. During the project's lifetime, additional COVID-19-related use cases were added. In order to keep the Consortium focused, and based on the feedback of the EC, the project's Reviewers and the experts of AMANDA's External Advisory Board, the number of uses were reduced. Initially, 19 use case scenarios had been designed. Subsequently, the use case scenarios have been narrowed down to 6 and finally to 3. The final list of use cases and scenarios of the project is given in Table 5 below and detailed in **Deliverable D6.4 - Report on Evaluation Results, Lessons Learned and Improvements**. The

validation of the AMANDA ASSC for the 3 final use case scenarios is presented in **Deliverable D6.3 - Characterisation/test reports of integrated AMANDA platform in lab environment.**

Use case	Label	Use case scenario
UC1 - Environment monitoring and reporting	FS01	Work environment and thermal comfort monitoring
UC2 - Asset tracking and occupancy monitoring	FS02	Parking lot occupancy monitoring
UC3 - Mitigating the effects of the pandemic	FS03	Crowd counting for social distancing

Table 5 AMANDA use cases

Variants of the card were designed to meet use cases happening indoor, outdoor or as a wearable:

- **Indoor.** It can be installed in interior places and areas. It includes, on top of the core system components, light, audio and magnetic sensors, a pressure, ambient temperature, humidity and gas sensor as well as imaging, temperature, CO<sub>2</sub> and capacitance sensors
- **Outdoor.** It can be installed at outdoor locations, like the surrounding area of a house or a building, or on various outdoor assets, such as a car or other vehicles. Due to the increased luminosity (outdoor), the energy harvester can be smaller than the one used for indoor applications. Since the ASSC can be exposed to external hazards such as rain, dust and others, it is necessary to have an IP rating for the platform. This version includes light, audio and magnetic sensors, a pressure, ambient temperature, humidity and gas sensor as well as imaging, temperature, CO<sub>2</sub> and capacitance sensors and an accelerometer
- **Wearable.** An on-the-move solution for the end user. It provides various information with regards to the highly diverse environment of the user, like the environmental temperature and the surrounding noise level. It will also require an IP rating for environmental hazards. It includes audio, imaging, temperature, CO<sub>2</sub> and capacitance sensors as well as an accelerometer

Table 6 analyses the Success Indicators and Target Values set in the DoA to contribute to Impact 3.

Success Indicator	Target Value	Outcome	Achieved
<b>AMANDA ASSC meeting requirements of each of the target application areas</b>	Application scenarios to be validated: at least 6	Initially, 19 use case scenarios have been designed. After receiving feedback by the Reviewers of the Project, the use case scenarios have been narrowed down to 6 and finally to 3, also given in the present Deliverable. The validation of the AMANDA ASSC for	☑

		the 3 final use case scenarios is presented in <b>Deliverable D6.3 - Characterisation/test reports of integrated AMANDA platform in lab environment</b>	
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Table 6 Impact 3 achievement indicators

#### **Impact 4: Creating new opportunities for digitisation in traditional sectors and improving user acceptance of IoT and energy harvesting technologies**

The successful deployment of IoT is linked to the ability to collect relevant data and transfer that information to the appropriate systems for further processing. AMANDA's ASSC aimed to open a window of opportunity for new innovative applications and services in traditional sectors not yet embracing digitisation of data. Validation of the ASSC's applicability and acceptance to users followed the following activities:

- Design of the card based on an early Voice of the Customer research
- Setting up of lab trials simulating real life scenarios
- Validation of the ASSC using simulation trials once the card was developed

As described in Impact 3, and in order to focus the partners' attention and efforts, the numbers of simulated services was lower to 6 (2 in the area of environment monitoring and reporting, 2 in the area of assets tracking and occupancy monitoring and 2 in the area of mitigating the effects of the current pandemic). These are further described in **Deliverable D6.4 - AMANDA Report on Evaluation Results, Lessons Learned and Improvements**. Table 7 - analyses the Success Indicators and Target Values set in the DoA to contribute to Impact 4.

Success Indicator	Target Value	Outcome	Achieved
<b>Number of new services/ applications becoming possible thanks to AMANDA's ASSC</b>	At least 20 (5 per sector: building management, transport, environmental monitoring, occupational health and safety)	6	<b>In order to focus the consortium's attention, and a response to project monitoring officers' advice, a smaller but better-targeted number of services and applications was selected</b>

Table 7 Impact 4 achievement indicators

#### **Impact 5: Attract a substantial number of new users, from industry (in particular SMEs and mid-caps) and academia, to advanced technologies**

Despite restrictions placed on the AMANDA Consortium by the effects of the COVID-19 pandemic, dissemination and communication activity carried on strongly during the project, albeit largely in virtual form. A total of 60 events took place, in the form of conferences, interviews and trade shows:

- 21 took place in-person
- 2 were cancelled
- 37 took place online



These activities, in addition to all other marketing channels, including website, social media, newsletters and other activities, represented the “awareness” stage of AMANDA’s communication strategy and accessed more than 10,000 of potential users. These include website views, LinkedIn and Twitter views, trade fairs, conferences and others, simply interested in learning about the technologies developed in AMANDA. From these first sections of stakeholders, more than 100 of them accepted to show “engagement”, i.e. voluntary action to respond to the consortium’s request to connect further. This phase was principally carried out via webinars, attended by more than 100 different stakeholders. Finally, a subset of these stakeholders took “action” and voluntarily engaged further with AMANDA, typically by way of online calls and teleconferences. Table 8 analyses the Success Indicators and Target Values set in the DoA to contribute to Impact 5.

Success Indicator	Target Value	Outcome	Achieved
<b>Stakeholders expressing interest for the commercialisation of the AMANDA’s ASSC</b>	At least 50	Stakeholders identified and disseminated to > 100, External engagements: 7	☑
<b>Participation in events</b>	At least 8 conferences/ exhibitions/ trade fairs, 5 other related events organized; Interconnection with 5 relevant DIH	60+ events attended with active participation (oral presentation, poster, booth)	☑

Table 8 Impact 5 achievement indicators

### **Impact 6: Increased industrial investments and open innovation marketplace for ESS technologies**

In terms of open innovation, The Open Research Data Pilot (ORDP) initiative of the European Commission aims to provide open access to scientific data generated throughout the lifetime of Horizon 2020 projects and promotes their reusability.

The AMANDA Data Management Plan (DMP) was covered by three different Deliverables:

- **D8.3 - Data management plan & ethics v1**
- **D8.5 - Data management plan & ethics v2**
- **D8.6 - Data management plan & ethics v3**
- **D8.7 - Data management plan & ethics v4**

In the first stages of the project, a dataset template was sent to the Consortium to use for any corresponding produced datasets. The template included information on the owner of the component, the Partner responsible for the data collection, analysis and storage, the dissemination level of the data, the standards and formats of the metadata, the data access policy, as well as of the data storage medium. Throughout the lifetime of the project, 22 different datasets and scientific publications have been shared by the AMANDA Consortium, detailed in **Deliverable D8.4 - AMANDA Final Report**.

In addition, and in order to contribute to further innovation, both from academia and industry, information from the AMANDA project was included in the Greek [PRAXI Network](#), which disseminates from technical programs online. From this cooperation, contacts were made with the following companies:

- Swatch
- INNDATA

- Graftmasters
- DVC-COe

Table 9 analyses the Success Indicators and Target Values set in the DoA to contribute to Impact 6.

Achievement	Indicator	Achieved
AMANDA increased open innovation	<ul style="list-style-type: none"> <li>• AMANDA results shared on Horizon and PRAXIS platform</li> <li>• Webinars attended by 78 people</li> </ul>	☑
AMANDA increased industrial investments	Initial interest from Swatch, INNDATA, Graftmasters and DVC-COe	☑

Table 9 Impact 6 achievement indicators

### **Impact 7: Increased cooperation and synergy across electronic technology areas, promoting joint, multi-disciplinary initiatives including general health and medicine**

For this impact, no Success Indicators and Target Values were specifically set in the DoA. Nevertheless, evidence can be found of increased cooperation and synergy across several markets. The AMANDA consortium itself is evidence of multi-disciplinary cooperation. The AMANDA ASSC was designed from European experts in the area of sensors, energy harvesting, communications, energy storage, power management, PCB design and software, bringing their expertise together to develop a state-of-the-art prototype. Whilst each partner entered the project with their own key target markets, complimentary areas of interest enabled an effective collaboration. Moreover, some of the components and architectures designed within AMANDA will be considered for commercialisation in connected markets (not served by AMANDA): as an example, both Microdul and Ilika will be commercializing the components developed during the AMANDA project in the area of implanted medical devices.

### **Impact 8: Stimulating the involvement of industry in longer term research and innovation activities**

For this impact, no Success Indicators and Target Values were specifically set in the DoA. Nevertheless, the AMANDA project has clearly stimulated involvement of its industrial and academic partners for longer-term collaborative research. The Consortium will remain active post-project, in activities detailed in Section 4.

#### **2.2.2 Business models**

The exploitation strategy for the AMANDA card is described in details in **Deliverable D7.10 - Exploitation Report v3**. In brief, the strategy to responding to customer demand is to form a common exploitation group (CEG) from members of the partners within the AMANDA Consortium. The exploitation form can then be a combination of the following:

- **Licensing:** The most common methods for exploitation will come to a licence agreement. That can be in several different forms whereby the Customer:
  - Purchase a set number of ASSC devices “off-the-shelf” from the CEG for a set price per part
  - Licences the complete IP platform, including the BOM, PCB design, manufacturing know-how, after which the Customer can design and manufacture ASSC (derived) products all by themselves

- **Design Services:** In case the ASSC does not completely match the set requirements (e.g. functional, maturity or price) the CEG can offer a design service to customize the ASSC platform to match the specific needs of the customer
- **Joint Venture / Partnership:** If the market situations for the ASSC card technology is favourable enough, then the CEG can consider creating a joint venture or another form of intimate cooperation between the Partners for further exploitation of the complete solution

### 2.2.3 Value proposition

The unique selling point of the ASSC, compared to other market solutions are its unique combination of:

- **Small size:** Easy to install anywhere or to carry around
- **Energy autonomy:** Fully battery operated, easy to install due to lack of wires
- **Low maintenance cost :** No battery replacement during its lifetime,
- **Multi-sensing:** Allowing the platform to fit the need of different applications
- **On-board sensor fusion capability:** Enables on-board sensor fusion
- **Wireless connectivity:** Connects the device and its data to the “world” for easy integration into larger systems

### 2.2.4 Market reach

The tactics for the AMANDA Consortium to respond to customer demand post-project are described in detail in **Deliverable D7.10 - Exploitation Report v3**.

First, the Consortium can engage with potential customers reactively, i.e. upon request of information from a prospect, a CEG is formed, which determines the prospects’ technical and non-technical requirements, evaluates the alignment of the prospects’ needs with the features of the AMANDA card; if an alignment exists, discussions take place with regards to finalising the commercial aspects of a potential deal, which involves connecting the prospects with a manufacturer of the card.

Second, the Consortium will remain active post-project and will engage actively with keeping communications channels open (see Section 4).

### 2.2.5 Stakeholders

Both dissemination and communication activities of the AMANDA project targeted people who might be interested in the project: these were added to a stakeholder list including 203 names in the categories shown in Table 10. **Error! Reference source not found.** The percentage of stakeholders in each section led to the following conclusions:

- Industry decision-makers and facilitators were successfully reached, likely as a result of connections already available from the partners or the type of marketing channels used
- Low percentage for researchers is misleading: for example CERTH made their own stakeholder list available to AMANDA, 1000+ strong, but remained anonymous for the AMANDA partners, hence not taken into account in the calculations here
- End users were reached reasonably, particularly via PENTA and their own customer list (48 out of 203 contacts)
- EU citizens: in hindsight, this target was not likely to be easily reached, due to the essentially business-related environment that AMANDA partners are functioning in. The Technical and Manufacturing Readiness Levels (TRL, MRL) reached during the project were such that EU Citizens were not likely to be reached

Categories	% stakeholders reached
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Industry Decision-Makers	46
Research Community	2
End users	19
Facilitators	33
EU citizens	0

Table 10 Description of stakeholders

### 2.3 SWOT Analysis

A competitive analysis was refined throughout the project, while more than 19 close competitors were identified. Conclusions from this study included:

- Pros:
  - No other platform included the array of sensors provided by ASSC
  - The form factor, in particular the thickness, of ASSC was more attractive than other competitive solutions
  - The power autonomy of ASSC was unique
- Cons:
  - The price of competitive solutions (although not always available from our research) appeared significantly lower than that of the ASSC. A cost-analysis is available in **Deliverable D7.10 - Exploitation Report v3** which points out the strong volume dependency of the ASSC’s cost

An earlier SWOT analysis for the AMANDA ASSC is reproduced in Table 11 **Error! Reference source not found..** An end-of-project review of the 4 sections concludes:

- Strengths:
  - The expertise of partners in their respective areas was demonstrated and the goals of the AMANDA project were essentially achieved
  - Some of the technologies developed during the project remain innovative and state-of-the-art
  - Excellent communication within the consortium
- Weaknesses:
  - Variable TRL within the partners technologies, at start of project and continued throughout, led to some partners delivering to expectations whilst some did not
  - Low MRL of some technologies, including at end of project, led to uncertainty in the anticipation of volume manufacturing and a poorly understood pricing of some components, and of the card in general
- Opportunities:
  - Consortium turned the COVID-19 pandemic into an opportunity by aligning the ASSC’s usage to new medical-related use cases
  - The Voice of the Customer activities identified that multiple sectors could make use of an autonomous, wireless platform such as ASSC. The fact that the Consortium decided to concentrate on a few of them to optimise effort should not ignore the fact that other opportunities were also present
- Threats:
  - The concept of a sensor platform in the form factor of a credit card is easily reproducible

<b>Strengths</b>	<b>Weaknesses</b>
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<ul style="list-style-type: none"> <li>✓ Experience in low-power and energy harvesting is available</li> <li>✓ Combination of innovative sensors (sensor fusion), self-power features form factor not considered or achieved previously at such integration and functionality levels gives a clear position advantage for the consortium</li> <li>✓ Previous positive interactions between most of the members from the consortium</li> <li>✓ World-class efficiency and performance of the 1st generations of components (sensors, Energy harvesting, power management and storage) brought into the project</li> <li>✓ Good tools for analysis of energy requirements</li> <li>✓ Good contacts with the low-power semiconductor and sensor industry</li> <li>✓ Use of energy harvesting is especially important for IoT devices</li> <li>✓ Personnel highly qualified in this area of activities with great complementarity of the technical skills</li> <li>✓ Stable economic and financial situation of the partners. Resources already in place for a prompt and efficient project start</li> <li>✓ Deep knowledge of the market strategies for the individual components</li> <li>✓ Good initial understanding of the potential exploitation routes for the integrated ASSC</li> <li>✓ Expertise in procedures and methods for protecting intellectual propriety</li> <li>✓ The consortium is the owner of specific innovative technologies</li> <li>✓ Positive results from past and ongoing research activities and projects as well as success stories</li> </ul>	<ul style="list-style-type: none"> <li>▪ Cost of technology is currently higher than competitors which limits it to small sizes</li> <li>▪ The minimal operation voltage is defined by ADUCM355 (used for CO<sub>2</sub> sensor) and it is 2.8V. It is bit higher than other components in the architecture (2.2V)</li> <li>▪ Novel sensor technologies. Thus, production processes need to be developed for future commercial production of the novel sensors</li> <li>▪ The coverage of European countries with LPWAN is not (yet) consistent</li> <li>▪ Very limited space on the smartcard for future extensions</li> <li>▪ Lack of standardization across EU countries regarding low-power wireless connectivity makes it more difficult to explain to end-users and deploy in the field (no single wireless protocol solution)</li> <li>▪ Complexity of the ASSC integration will require multiple iterations that will be challenging to solve within the project timeline</li> <li>▪ Sensor/data fusion needs to be clarified with further end-user input during the first phase of the project</li> <li>▪ Lack of the awareness among stakeholders and difficulties to understand similar solutions</li> <li>▪ Slow diffusion of knowledge among potential stakeholders due functional disaggregation of the actors in the chain</li> </ul>
<p><b>Opportunities</b></p>	<p><b>Threats</b></p>
<ul style="list-style-type: none"> <li>❖ Power consumption of IoT sensors and sizes is reducing year after year (compatibility with energy harvesting increasing)</li> <li>❖ Society is positive towards the use of alternative and renewable energy sources (no batteries, less waste)</li> <li>❖ Small is beautiful. A smart card format is attractive (easy to carry and install)</li> </ul>	<ul style="list-style-type: none"> <li>○ Emerging technologies such as Perovskites, DSSCs, organic PV if stability issues are solved</li> <li>○ Some mobile phone manufacturers have been interested in adding environment sensors</li> <li>○ System integrators or other competitors looking into similar concepts for miniaturisation</li> </ul>

<ul style="list-style-type: none"> <li>❖ Long range communications add a degree of independence to the system</li> <li>❖ Sensor fusion will open-up new application opportunities for AMANDA</li> <li>❖ Air quality sensing in smart sensing is growing due to importance of monitoring and controlling pollution levels</li> <li>❖ The modularity aspect of the ASSC will offer platform flexibility and further reach.</li> <li>❖ Business to Business initial market could transition to Business-to-Consumer market upon identification of suitable application(s)</li> </ul>	<ul style="list-style-type: none"> <li>○ Changes in the regulations landscape (for example privacy laws) could make the deployment of IoT sensing and tracking devices more difficult than anticipated</li> <li>○ Obstacles to fast entry into the market such as lack of knowledge and the time needed to overcome technical and technological barriers</li> </ul>
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Table 11 SWOT analysis for the AMANDA ASSC

### 3 Analysis of the communication and dissemination plan

#### 3.1 Communication and dissemination objectives

The objective of the communication activities in AMANDA was to promote the project and its results for maximum impact, demonstrating how EU-funding contributes to tackling societal challenges. This was achieved by providing targeted information to multiple audiences, including the media and the public in a strategic and effective manner and by engaging its stakeholders in a two-way exchange.

The objective of dissemination in AMANDA was to make results and knowledge easily available to the public and stakeholder groups who have an interest in AMANDA's key applications, enabling stakeholders to use the results in their own work:

- Building automation
- Smart cities
- Wearables
- Industrial IoT
- Health and condition monitoring
- Educational IoT

This was achieved by enabling open access to scientific publications, sharing open data and offering development tools. Table 12 to Table 15 illustrate how communication and dissemination supported the achievement of the overall goals in AMANDA.

Project objective	Communication and dissemination objective	Outcomes
To encourage public authorities, businesses and researchers to make the most of Smart Living technologies	<ul style="list-style-type: none"> <li>• To ensure that the stakeholders have access to information about the project, pilots and the results within their interest area.</li> <li>• To ensure that especially the users of the Smart Living technologies i.e. the relevant actors have the opportunity to contact and meet with the pilots</li> <li>• To provide demonstrations of the solution to personal/city challenges</li> <li>• To ensure that scientific publications and results are easily available for the research community and documented in internal assessments of impact</li> </ul>	Results from AMANDA project were disseminated in various forms and via varied physical and digital channels to stakeholders within academia, industry, general public, other Horizon programs. See KPI section for details
To provide best practice deployment	<ul style="list-style-type: none"> <li>• To provide evidence of best practise based on the identified KPI</li> <li>• To ensure that the general public and the press are continuously made aware of the AMANDA vision, results and innovations</li> <li>• To ensure that the advisory and ethical boards in AMANDA have access to relevant information</li> </ul>	Webinars and training sessions demonstrated best practice and illustrated benefits of ASSC <ul style="list-style-type: none"> <li>• AMANDA promoted via digital press (article) and video interview (see KPI section for details)</li> <li>• Open access repository created</li> </ul>

To develop attractive business models	To make the value propositions and business prospects available to the relevant stakeholders	PowerPoint presentation created and used to describe value proposition and path to industrialisation
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Table 12 Goals and outcomes: To foster the take-up of Smart Living technologies

Project objective	Communication and dissemination objective	Outcomes
To offer plug-in solution to existing Smart Living IoT device	<ul style="list-style-type: none"> <li>To ensure that the relevant stakeholders know of the possibilities of integrating the AMANDA ASSC and have access to the technology</li> <li>To provide demonstrations of scalability and integration</li> </ul>	ASSC usage illustrated in context of use cases and scenarios, for example in videos created by AMANDA
To contribute to standardisation work	To ensure that the AMANDA contributions are made available from the demonstrations	Features and benefits of ASSC linked to the contributions from each partners
To influence other Smart Living / IoT related areas	To make the AMANDA concept and results known to other IoT areas and through collaboration with other large-scale projects, support actions and initiatives	Digital Innovation Hubs and other Horizon programs were contacted

Table 13 Goal and Outcomes: To enable open ecosystems at a large scale

Project objective	Communication and dissemination objective	Outcomes
To engage citizens in co-creation	<ul style="list-style-type: none"> <li>To enable access to information, city and personal data and dialogue about city and personal challenges</li> <li>To provide demonstrations of solutions on how to involve the citizens</li> </ul>	ASSC demonstrated to general public in contexts relevant to their working and personal life
To improve trust, safety and quality of life	<ul style="list-style-type: none"> <li>To ensure that information about the AMANDA approach to social innovation is available to city, business and personal administrations including health agencies in light of the COVID-19 pandemic</li> <li>To make the evaluation results from the pilot demonstrations known to stakeholders</li> </ul>	Various channels used to communicate benefits of ASSC to people's lives
To stimulate tourism	<ul style="list-style-type: none"> <li>To ensure that information about the business impact coming from the pilots is available to the tourism and cultural industries</li> </ul>	Communications took place in some of the partners own countries using the own language (as well as globally and in English)

Table 14 Goal and outcomes: To gain user acceptance of the Smart Living solution



Project objective	Communication and dissemination objective	Outcomes
To create sustainability of the pilots	To ensure that the strategies and promotion actions are informed about internally in the organisations and to its external audiences	Good dissemination of AMANDA activities and post-project plans within each partners organisations
To prepare for exploitation	<ul style="list-style-type: none"> <li>To make support material available for partners to use</li> <li>To make the AMANDA concept and results known to strategic networks of partners</li> </ul>	Marketing material prepared throughout the whole project will be available post-project via website, email and social media

Table 15 Goal and outcomes: To create sustainable solutions

### 3.2 Communication and dissemination tactics

The goal of communication and dissemination activities in AMANDA was to help achieve the overall vision and goals of the project for maximum impact. This was performed by a threefold approach; making results and knowledge available (dissemination); promoting results and the project in general (communication) and engage stakeholders (collaboration, demonstration and user engagement). Key objectives include ensuring easy access to information and results for all stakeholders, engaging with stakeholders and providing demonstrations and developer tools. A three-phase approach was:

- “Phase 1 - Preliminary Project Promotion phase” aims at:
  - Agreeing upon the communication strategy and future activities
  - Creating initial awareness in the markets related with the Project’s objectives and scope
- “Phase 2 - “Project Commercialisation phase” aims at:
  - Create more “targeted awareness” regarding AMANDA technologies with key players and potential users
  - Inform the target market about the technological benefits of AMANDA
- “Phase 3 - Business Strategy phase” aims at:
  - Maximizing target market and industry awareness regarding the AMANDA device
  - Thus contributing to ensure the project sustainability and full exploitation

The process followed is illustrated in Figure 1 **Error! Reference source not found.**. The AMANDA consortium followed the plan strictly and showed agility in responding to the demands of new technologies useful to mitigate the impact of current and future epidemics (such as COVID-19) by introducing topics such as medical sensors, medical technologies and health in its messaging. Success of this plan is evaluated in Table 16, which shows that all planned activities were achieved.

Planned Activity	Outcome	Achieved
<b>Year 1</b>		
Create awareness of the project	<ul style="list-style-type: none"> <li>• Website and social media accounts created</li> <li>• Press release</li> </ul>	☑

Disseminate the concept in strategic networks of the partners	<ul style="list-style-type: none"> <li>PowerPoint pack created, delivered to partners for inclusion in their own communication activities</li> </ul>	<input checked="" type="checkbox"/>
Prepare powerful public image	<ul style="list-style-type: none"> <li>Logo created</li> <li>First leaflet</li> </ul>	<input checked="" type="checkbox"/>
Engage the public at large	<ul style="list-style-type: none"> <li>Website and social media accounts created</li> </ul>	<input checked="" type="checkbox"/>
Liaison with business stakeholder	<ul style="list-style-type: none"> <li>Completed through partners own networks only</li> </ul>	<input checked="" type="checkbox"/>
<b>Year 2</b>		
Continue to build awareness of the AMANDA results	<ul style="list-style-type: none"> <li>Application note written</li> <li>3 newsletters</li> <li>1 leaflet</li> <li>6 videos</li> <li>2 webinars</li> </ul>	<input checked="" type="checkbox"/>
Engage public stakeholders further	<ul style="list-style-type: none"> <li>2 interviews on Greek National TV</li> </ul>	<input checked="" type="checkbox"/>
Fully engage in IOT groups and horizontal activities	<ul style="list-style-type: none"> <li>Connections to Digital hubs, Horizon and PRAXI platform</li> </ul>	<input checked="" type="checkbox"/>
Verify opportunities to present AMANDA applications at public events	<ul style="list-style-type: none"> <li>Appearance at 19 conferences</li> </ul>	<input checked="" type="checkbox"/>
Obtain press coverage	<ul style="list-style-type: none"> <li>Interview of the current progress of the AMANDA project in the Athenian / Macedonian News Agency</li> </ul>	<input checked="" type="checkbox"/>
<b>Year 3</b>		
Prepare to integrate AMANDA in other IOT environments	<ul style="list-style-type: none"> <li>Addition of pandemic-related scenarios during COVID-19</li> </ul>	<input checked="" type="checkbox"/>
Enhance press coverage	<ul style="list-style-type: none"> <li>1 article in New Electronics</li> </ul>	<input checked="" type="checkbox"/>
Promote uptake of business models	<ul style="list-style-type: none"> <li>Letter of Intent received</li> </ul>	<input checked="" type="checkbox"/>
Prepare for exploitation of all AMANDA knowledge components	<ul style="list-style-type: none"> <li>Exploitation plan created</li> </ul>	<input checked="" type="checkbox"/>
Elicit public engagement through TV and newspapers	<ul style="list-style-type: none"> <li>1 article in New Electronics</li> </ul>	<input checked="" type="checkbox"/>

Table 16 Outcome of planning activities

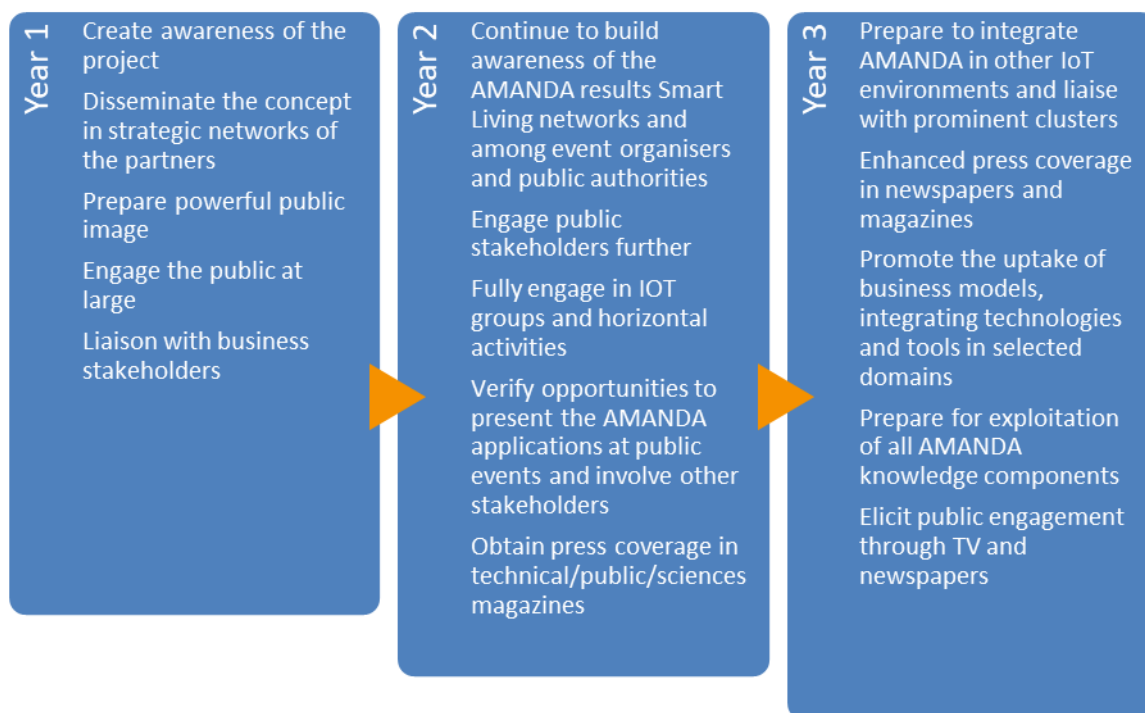


Figure 1 Stages of activities

### 3.3 Communication and dissemination activities

Dissemination activities were carried out both:

- Collectively by all partners of sub-groups of the whole consortium
- Individually by each partner

The key collective activities included:

- Development and maintenance of the project website
- Production of project documentation and printing costs
- Organisation of presentation / feedback sessions
- Networking with relevant Digital Innovation Hubs (DIH) and other innovation support structures in the target areas of IoT (ESS CSA)

In addition to collaborative activities, each partner took charge of planning and executing activities related to their own ecosystem, as shown in Table 17.

Partner	Individual Dissemination Plan
CERTH	CERTH based its dissemination strategy on a multi-scale approach with the central axis being academia, research and industry by publishing results in widely read well-known scientific journals, making presentations at International Conferences, Workshops, Webinars and Exhibitions and seminars for specific audiences
IMEC	IMEC: published results on the IMEC website and at conferences; contributed to workshops; submitted scientific and popular journal papers; invited interested industrial partners to IMEC Technology Forums (ITF) or IMEC-NL partner events
ZHAW	ZHAW disseminated information within the flow of teaching activities, helping to enhance courses and providing appropriate examples at different levels. ZHAW attended conferences, contributed in specialised journals and popular science journals and ASSC in open door promotion activities

Lightricity	Lightricity engaged with the wider scientific and industrial community through presentations, workshops and active involvement nationally (e.g. through Energy Harvesting Special Interest Group) and internationally (trade shows and industry events)
EPEAS	EPEAS disseminated the developed technology by patenting results and by integrating them to its R&D roadmap ultimately leading to the commercialisation of new products with lower power consumption and optimised integration
Microdul	Microdul marketed the standard products using the sales force in Europe and Asia. The standard products were listed on the web-site and datasheets were made available. Demonstrators were made for the standard products and presented to potential customers at trade shows. Where appropriate, the products were presented in talks
Ilika	Ilika attended IoT and solid-state battery events and published any significant developments, after they have been protected by patent
PENTA	PENTA's plan was to implement knowledge gathered in this project to other applications of its portfolio. The plan was also to raise awareness among end users on the importance of AMANDA card and its benefits in environmental sensing and in people's quality of life in general

Table 17 Partners individual dissemination planned activities

### 3.4 Adjustments due to the COVID-19 pandemic

It is without a doubt that the COVID-19 pandemic significantly affected all project activities but in particular, dissemination and communication of the project's progress and results. Nevertheless, the research and dissemination activities related to the project continued as much as possible in remote mode. More specifically, during the months from January 2020 until mid-2021, almost all face-to-face activities and events were cancelled. Thus, the Consortium was forced to create new communication mechanisms, namely through online meeting platforms. Further details on these activities are available in **Deliverable D7.11 - Dissemination and Coordination with Relevant Activities Report v3**.

### 3.5 Dissemination and communications KPI's

An assessment of the dissemination and communication activities against those planned is shown in Table 18. All activities have been completed in accordance to plan, with some, e.g. External Events Attended, over-delivering on original targets (54 achieved, 20 planned). Deviations from the plan include:

- Articles and proceedings (2 per year): 6 achieved over 45 months
- Training sessions (3): were delayed until late in the program in order to use unconstrained ASSC in the session. None have taken place at time of writing this report, whilst 3 are in planning.

Communication & Dissemination Supports and Channels	KPIs	Status	Evaluation
Leaflet	2 project versions + 2 technology specific (results)	2 project versions and technology specific leaflets were created and available on the project website	
Application note	1 version	1 Application Note (technical brochure)	

		available on the project website	
Poster	1 initial version + update	3 project posters were prepared and available on the project website and each partner's premises	
Reference PPT presentation	1 initial version + update	15 project PPT presentations available on the project website	
Project newsletter	6 (2 per year)	6 newsletters were prepared, published on the project website and sent via MailChimp to identified and updated stakeholder list	
Articles and proceedings	2 publications per year (on average)	6 conference publications	
Project Deliverables	See the list of Deliverables	Public deliverables available on the project website	
Open access repository	1 deposit per year	1 deposit per year	
Project video / demo	1 initial version + update	12 videos are available on the AMANDA official YouTube channel	
Project website	1 website, monthly updated	54 news published on the project website	
Related websites	5+	5+	
LinkedIn	At least 1 monthly update	60 posts	
Twitter	At least 1 weekly update	66 tweets	
Presentation & feedback sessions (incl. webinars)	3	3 webinars were performed, recording available on the AMANDA official YouTube channel	
Training sessions	3	Not yet completed at time of writing this report but planned	
External events	20+	54 external events attended	

Table 18 Assessment of dissemination activities and KPIs against the initial roadmap; colour key: green (completed), red (not completed)

Dissemination and communication activities followed a range of channels and AMANDA's extended marketing toolkit. The full extent of these activities is not included in this report, but can be found in **Deliverable D7.11 - Dissemination and Coordination with Relevant Activities Report v3**. Some of the most notable results include:

- Logo: was modified during the project to incorporate message "The world in your hands"

- Website: number of unique visitors peaked in 2020, from ~5.000 in 2019; ~10,000 in 2020; ~8.000 in 2021. Full 2022 data not yet available (January to July: ~3.300 visitors). We can explain this variation by the “new normal” habits from users who received more information from online sources during COVID-19
- LinkedIn account: achieved 86 connections, 90 followers, 60 posts, and 18.242 post views
- Twitter account: achieved 48 followers, 17.584 Impressions, 66 tweets, and 4.780 profile visits
- YouTube account: twelve videos are available on the AMANDA project's official YouTube channel. The highest number of video views was recorded in June 2020, when six videos were published showing possible AMANDA card applications, and at the end of September 2020, when two interviews were published with Dr Charis Kouzinopoulos on AMANDA and the COVID-19 mitigation scenarios
- Newsletters: 6 were produced and circulated to our stakeholders via MailChimp with average 28% opening rate and 7% click rate

#### 4 Dissemination actions beyond the project's lifetime

The obligation of H2020 beneficiaries is to continue to disseminate project results up to four years after the end of the project, as stipulated in articles 28 and 29 of the Model Grant Agreement. AMANDA partners will continue keeping on with the dissemination of project results even beyond the project lifetime to assure better sustainability and usability of the project results. For this reason, each partner will individually undertake dissemination activities according to their possibilities, resources and profile. The project website will also be active and available for the specified period after the end of the project. Furthermore, partners provide open access to scientific publications and the research data funded by the Framework Programme and will ensure that scientific publications based on the result of the project published after the project ends will also be open access.

This Section highlights the main future dissemination and communication activities that the partners plan to undertake in the period after the end of the project:

Dissemination and communication activities	Partner	Remarks
Maintenance of the AMANDA project website ( <a href="https://amanda-project.eu/">https://amanda-project.eu/</a> )	PENTA	PENTA will maintain the AMANDA website. All partners will provide PENTA with the relevant content to be added to the website (additional news posts in case of external events or key project results)
Availability of downloadable documents	PENTA	All dissemination materials (leaflets, posters, application note, ppt presentations), newsletters, public deliverables, and scientific publications will be available for download at the AMANDA project website
Maintenance of the AMANDA social media channels ( <a href="#">LinkedIn</a> , <a href="#">Twitter</a> , <a href="#">YouTube</a> )	PENTA	PENTA will maintain the AMANDA social media channels. All partners will provide PENTA with the relevant content to be added on
Publication of news, articles and relevant information about AMANDA on the official websites of project partners.	All partners	All partners will endeavour to publish basic information and a brief description of the AMANDA project and periodically, as necessary, publish news and results related to the project
Presentation of AMANDA to partners, clients, collaborators, potential customers, etc.	All partners	Project results will be presented at various events relevant to AMANDA. Furthermore, project results will be reported in meetings where potential stakeholders show interest in a solution where AMANDA could be applicable. Partners have promotional material such as leaflets, posters, application note, videos and presentations at their disposal
Dissemination at the external events (exhibition, fair trades, conferences, workshops, webinars, etc.)	All partners	All partners prepare an annual plan of events where they will perform

		and present their products, solutions or papers. If some of the mentioned events are relevant, they will use the opportunity to present the AMANDA project and cases of using the Autonomous Smart Sensing Card (ASSC). Partners have promotional material such as leaflets, posters, application note, videos and presentations at their disposal
Dissemination in education and distribution of knowledge to students and academic teachers	ZHAW	The results of the AMANDA project will be used and disseminated scientifically in various ways. The lectures will be enriched with the content of the project. The results can also be the basis for student works (e.g. master's or graduate thesis), as well as a platform for further scientific work
Scientific dissemination to the research community	CERTH, ZHAW, IMEC	Further publication of the AMANDA results in conferences, expert and scientific journals is probable
Cooperation with other EC funded projects and initiatives	All partners	Cooperation with similar projects, Digital Innovation Hubs and initiatives will continue in the post-project period. PENTA will maintain contacts, and upon receipt of new requests for collaboration with projects and initiatives considered suitable and of interest for the project, partners will forward them to PENTA

Table 19 Dissemination activities beyond the project's lifetime

Targeted and well-thought-out outreach activities and measures are necessary to boost the impact of the AMANDA project during and after its end. In addition, the Consortium published seven (7) Key Exploitable Results (KERs) on the Horizon Results Platform, the entry point for policy-makers, investors, entrepreneurs, researchers and experts where to discover the wealth of EU-funded research results and get in contact with their creators. Published results related to the project are searchable by an acronym or by typing the keyword: AMANDA. These are the primary and prioritised results selected by the project partners, with a high potential value to be “exploited”.

Result title	Result contributors	Link to the Horizon Results Platform
Ultra-Low Power Capacitive Sensor for AMANDA - Autonomous	Microdul	<a href="https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/38458;keyword=AMANDA">https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/38458;keyword=AMANDA</a>



Smart Sensing Card		
Ultra-Low Power Temperature Sensor for AMANDA - Autonomous Smart Sensing Card	Microdul	<a href="https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/38490;keyword=AMANDA">https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/38490;keyword=AMANDA</a>
Data Fusion Engine for AMANDA – Autonomous Smart Sensing Card	CERTH	<a href="https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/45629;keyword=AMANDA">https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/45629;keyword=AMANDA</a>
Edge Intelligence for AMANDA – Autonomous Smart Sensing Card	CERTH	<a href="https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/45632;keyword=AMANDA">https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/45632;keyword=AMANDA</a>
Cybersecurity for AMANDA – Autonomous Smart Sensing Card	CERTH	<a href="https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/45642;keyword=AMANDA">https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/45642;keyword=AMANDA</a>
AMANDA – Autonomous Smart Sensing Card	All partners	<a href="https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/45651;keyword=AMANDA">https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/45651;keyword=AMANDA</a>

Table 20 Key exploitable results published on the Horizon Results Platform

## 5 Conclusions

This document presents the Dissemination and Communication Plan Report of the AMANDA project. The report analysed the strategy that guided the corresponding targets, messages and best-suited tools that used with during the overall project period.

In order to achieve AMADA's aim to successfully developed and commercialise an innovative sensing solution, dissemination and communication activities included building a project identity, embracing digital communications such as website, webinar and social media, creating and distributing pushed collaterals, collaborating with related on-going initiatives and participating in events to present the project's progress.

In **Deliverable D7.3 - Dissemination and Communication Plan**, a first version of this document planned strategies and tactics for the whole project. In **Deliverable D7.6 - Dissemination and Communication Plan v2**, strategies were updated (particularly in the light on the COVID-19 pandemic) and tactics reviewed. This document was finalised in M45, as **Deliverable D7.9 - Dissemination and Communication Plan v3**, where an analysis of actions taken against planned was carried out, as well as a description of activities taking place beyond the lifetime of the project. Key takeaway messages from this report include:

- Technical targets and objectives were met successfully met with all assets reaching planned TRL levels at end of project
- A manufacturing plan for both the ASSC and its components was created, including letters of interest received from manufacturers
- The usage of the ASSC was validated against use cases, including COVID-19 related scenarios created during the project
- Stakeholders showing interest in the ASSC were reached and engaged with the consortium to learn about the technical and commercial benefits of the card
- AMANDA results were disseminated across European networks, enabling open innovation with the academic and industrial sectors
- A business model was created to enable future commercialisation of the card
- All dissemination objectives were met and all communication activities and deliverables took place on target