

# NPA GLOW2.0 - Green Energy Technologies for Tourism Growth

## Deliverable D1.3.1 Stakeholder workshops, seminars, webinars

(15.8.2025)

 <p>Embracing the Night I: Basics of natural darkness and light pollution</p> 	 <p>Embracing the Night II: Benefits for Tourism</p> 	 <p>Embracing the Night III: Conserving natural darkness</p> 
 <p>Immersive technology in tourism</p> 	 <p>Introduction to Dark Sky Tourism</p> 	 <p>Service Design for Dark Sky Tourism I: Identify your customer</p> 
 <p>Service Design for Dark Sky Tourism II: Define your idea</p>	 <p>Service Design for Dark Sky Tourism III: Map your customer's experiences</p>	 <p>Service Design for Dark Sky Tourism IV: Create a sellable product</p>

## Introduction

The objective of NPA GLOW2.0 – Green Energy Technologies for Tourism Growth project is to support enterprises and public organisations in developing tourism flow during the dark autumn and winter months, using darkness of nature and Dark Sky as additional elements for diversifying the tourism package, while effectively communicating light pollution and ways to prevent and reduce it.

The goal of GLOW2.0 Activity A1.3, Implementation of the capacity building programme in the different areas based on the needs of the target audience, was to engage project stakeholders and beneficiaries with discussions (workshops, seminars, webinars) e.g. on service design, learning journey model, and storytelling, to develop service offers and tourist package.

The aim of the activity was that upon its completion, target group enterprises and organisations will have received upskilling and reskilling, and will adapt these to their specific needs. In other terms, they would be more competent about thematics of service design, immersive technologies, application of green business models, and the role that light pollution plays in tourism. The other aim of the activity was to gather feedback and refine tested modules to create an Online Capacity Building Training Programme, project Output O1.1, for enterprises and organisations, also those not directly engaged with the project but interested in the Dark Sky tourism economy to get inspired, upskill or reskill themselves on thematics post project period.

The capacity building events (A1.3) acted as venues for gauging target groups interests with the dark sky thematics and attracting target groups for upskilling and reskilling (project activities A2.4, A2.5, A2.6 and A3.3). These (A1.3) and complementary thematic events (activities A2.4, A2.5, A2.6 and A3.3) collectively formed the Capacity Building Training Programme for upskilling and reskilling. These were activities:

- A2.4 Learning Journey Learnings - the learning journey in each region in the adoption of the relevant technology solutions (ref: project deliverable D2.4.1 Learning Journey Learnings);
- A2.5 Engaging with Regional SMEs to developed Immersive Technology Solutions that support the marketing or delivery of their product/service to the Dark Sky's Tourism Economy (ref: project deliverable D2.5.1 Regional Workshops and Events);
- A2.6 Developing and implementing the adoption of Service Design in SMEs as a tool for Innovation and/or marketing (ref: deliverable D2.6.1 Regional Workshops and Events); and
- A3.3 Workshops in the regions involving agencies and enterprises to discuss how dark skies tourism can be stimulated and how the potential roles of the participants (ref: deliverable D3.3.1 Minutes of workshops with list of agreed actions).

This report only summarizes the stakeholder workshops, seminars, webinars undertaken as part of Activity A1.3 Stakeholder and beneficiary engagements with discussions (workshops, seminars, webinars) to develop the service offer and tourist package (e.g., service design, learning journey model, storytelling e.t.c).

## Specification for the Capacity Building Programme

### Activity A1.1 Engaging target audience to verify needs

Northern Periphery and Arctic (NPA) Green Energy Technologies for Tourism Growth (GLOW2.0) project partners worked towards identifying the needs of the target audience during the first project period (12.2022 – 05.2023). This development was part of project Activity A1.1 Engaging target audience to verify needs. The target audience were small and medium-sized (SMEs) tourism product and service providers from four participating countries – Finland, Ireland, Norway and Iceland. This was realised via a survey questionnaire aimed at specifying the needs of target audience for developing offerings within the Dark Nights Tourism Economy, and creation of a formal capacity building and training programme. The key elements included:

- knowledge of dark skies science concepts and technologies and techniques for preserving dark skies.
- technical capacity in integrating dark skies elements in service design, branding and promotion, use of digital communication for promotion and sales.
- technical capacity in using immersive and other digital technologies, including conditions of hire of specialist immersive equipment.
- networking needs for regional impact, including needs for partnerships with tourism agencies and other tourism operators.

The findings were thereafter adapted to the verified needs and refined on a common and on a regional basis. The result was a specification of a capacity building programme, including main items and balance of elements of training, knowledge access and mentoring, with means of delivery. The results are accessible from GLOW2.0 report, **deliverable D1.1.1 Specification for the capacity training programme ([link](#))**, presenting a summary of the survey findings and the main items and balance of elements of training, knowledge access and mentoring, with means of delivery.

## Creation of formal capacity building and training programme

Results of Activity A1.1 Engaging target audience to verify needs, condensed into project deliverable D1.1.1 **Specification for the capacity training programme** ([link](#)), formed basis for creation of formal capacity building and training programme - Activity A1.2 of the project. In the deliverable report, survey respondents showed high interest across all regions to enhance services under the Dark Sky thematic framework, with over 90% stating interest in product-service development, and over 70% stating an interest to learn about and or test technologies that could be used to improve existing or create new service offers.

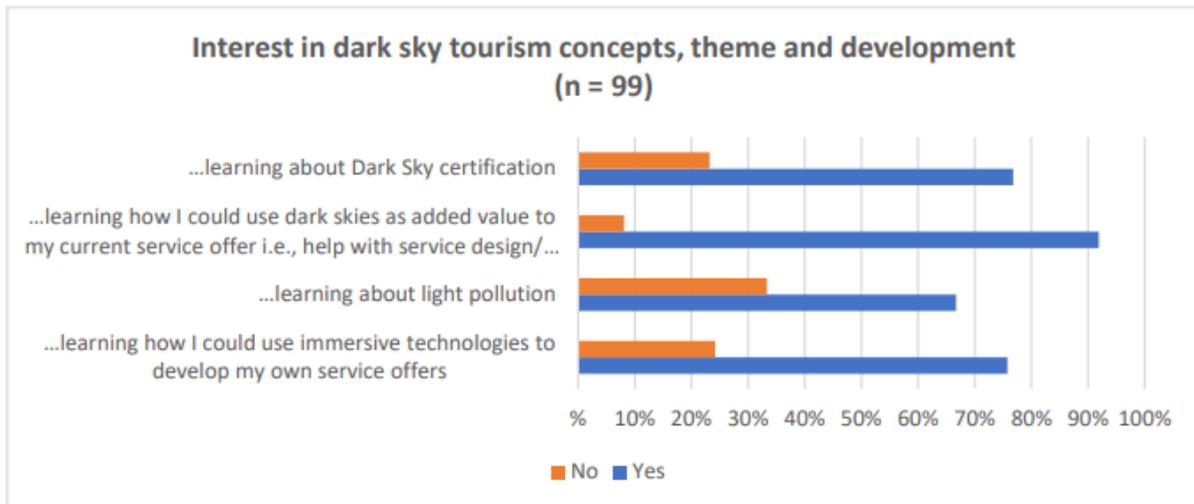


Figure. Survey respondents on interest areas and themes for dark sky development.

GLOW2.0 consortium, all partners in collaboration, worked on project Activity A1.2. Creation of a formal capacity building and training programme (CBP) as a series of modules based on:

- (i) analysed survey results in deliverable D1.1.1 Specification for the capacity training programme ([link](#))
- (ii) project period 1 findings from work package 2 learning journey learnings, benchmarking activities and learnings about immersive technologies possibilities and restricting factors ([link](#))
- (iii) findings of project work package 3 activities D3.1.1. Criteria and good practices identified for development of dark sky strategies.
- (iv) partners' own knowledge of each region's specified needs.

The programme consisted of series of modules on immersive tech, biodiversity, light pollution, tourism logistics etc.



Figure. Capacity Building Programme Routes designed by GLOW2.0 consortium.

The consortium also produced various materials used during implementation of capacity building events (Activity A1.3), and later in the development of the Output O1.1 Online capacity building training programme i.e. the refining of modules (deliverable D1.2.1).

#### I. GLOW2.0 “Noctourism/Dark Sky tourism” video

One of the results of GLOW2.0 survey (D1.1.1), was that even though immersive technologies were considered an asset, over half of respondents (from total 99) had neither used, tested or experienced immersive technologies. GLOW2.0 therefore used the findings from period 1 benchmarking activities ([link](#)), joint survey results ([deliverable D1.1.1](#)), and feedback from Karelia

UAS's immersive technology testing for target groups (2.5.2023) to produce an exemplary video showcasing an example use of immersive technology in promotion or marketing of darkness.



Clips of NPA GLOW2.0 produced video by Lead Partner Karelia UAS ([link to video](#)).

The video gives an idea of immersive technology use in tourism for target groups for example:

- (i) as a product on its own, offering thematic dark sky experiences to visitors
- (ii) as a plan B service offer where the promised/ marketed phenomenon are not visible due to bad weather
- (iii) for use in joint marketing e.g. trade fairs by collaborating businesses or destination marketing organisations to showcase their varied dark sky elements as part of tourism offerings, or the overall regional or national destination offers (night sky phenomenon like northern lights, stories, etc) which cannot be easily marketed/ understood by tour agents/ visitors (e.g. international) without the visual effect.

The aim of the video for capacity building purposes, was to give insights, support /enhance understanding about possibilities of technologies uses for adding value to own offers /regions, offering concrete example about ways to develop immersive offers.

## II. GLOW2.0 “Light pollution” animation video



Clips of NPA GLOW2.0 produced light pollution animation video by Lead Partner Karelia UAS ([link to video](#)).

The video was used during capacity building events to demonstrate in practical terms, the impacts and effects of light pollution on humans, biodiversity, and tourism, and to engage target groups

on the benefits of dark sky protection. The video offers ways a tourism business, other actors and residents can act to enhance the protection, limitation, or reversing of light pollution impacts and effects.

## Implementation of capacity building and training programme

The aim of implementing the capacity building and training programme was to engage with regional stakeholder and beneficiaries from the participating Northern Periphery and Arctic regions of Finland, Ireland, Iceland, and Norway with discussions, via workshops, seminars, webinars, to develop the service offer and tourist packages that could support the marketing or delivery of their product/service to the Dark Sky's tourism economy.

The formal capacity building and training programme routes therefore aimed to engage stakeholders and beneficiaries with discussions (workshops, seminars, webinars) to develop service offers and tourist package (e.g., service design, learning journey model, storytelling e.t.c). The goal was that by the end of the activity:

- (i) enterprises and organisations engaged by GLOW2.0 would adapt the capacity building training programme to their specific needs.
- (ii) GLOW2.0 project consortium will have feedback for curtailing an online capacity building training programme (Output O1.1) for target groups for continued use in developing own staff competences and activities.
- (iii) the GLOW2.0 curtailed online capacity building training modules under Output O1.1 would be available for target groups for further upskilling, reskilling for sustainable regional development, including those not directly engaged by the project.

To achieve this, GLOW2.0 project consortium organised capacity building workshops and events for enterprises and organisations on immersive technology development needs and Service Design processes. These took place in own regions, and via jointly organised events. Synergies with other similar projects were also encouraged and utilised to broaden networking and for advancing the horizontal principles in line with GLOW2.0 project.

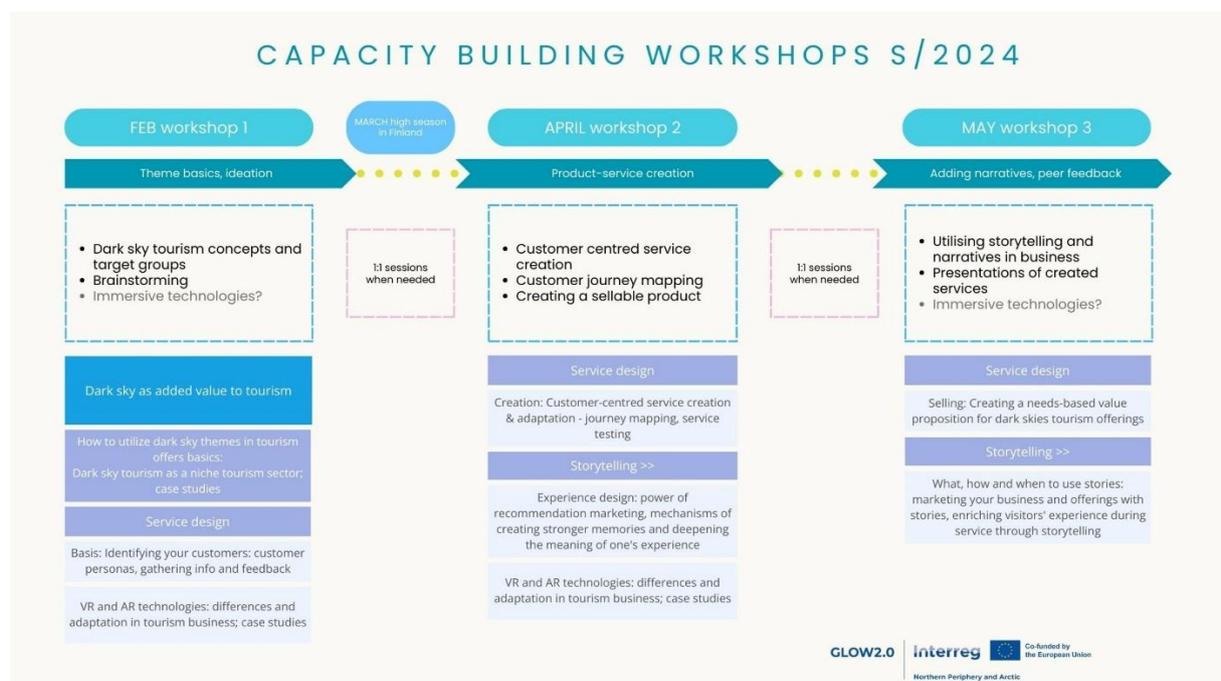


Figure. Series of workshops plan for Eastern Finland presented by Lead Partner during project meeting.

## I. Regional events

Regional capacity building trainings covered a wide spectrum of topics, ranging from light pollution, tourism trends and challenges, business capacity in dark sky tourism, to technological innovations and their implications. The common framework was created by the GLOW2.0 consortium in cooperation with associated partners, and contents curtailed in own regions according to (i) level of SMEs competences with themes, and (ii) the main interests of SMEs and organisations in the regions and (iii) available resources for implementing the programme.

The regional workshops and events were also important venues for mapping needs and collecting feedback from tourism enterprises and organisations interested in immersive technology solutions/ possibilities that support marketing or delivery of products/services to the Dark Sky's Tourism Economy. Results of engagements helped partners gain an understanding of future needs, and which of those could be integrated as part of the Output O1.1 Online capacity building training programme self-study modules to be made available post project for SMEs upskilling and reskilling to develop own activities. The events ran from start of period 2 (1.12.2023) to end of period 5 of the project (May 2025).

### Finland

- 14.3.2023 SMEs engagement workshop with content and surveys attended by 22 participants. During the event, target groups stated interest for testing and learning possibilities for technologies and dark sky integration in business models.
- 27.10.2023 regional event "Tähtelä Dark Evening" organised in Finnish Lapland by PLAKY partner in collaboration with associated partner Sodankylä Geophysical Observatory. 15 participants joined the event.



Agenda and presentation during the Tähtelä Dark Evening event in Lapland, Finland.

- GLOW organised DarkSky film session in Joensuu 24.1.2024 focusing on ways Dark Sky issues can be advanced via research, awareness and practical actions e.g. via will/ mindset change and case study pilots. The event combined lecture and info session, and film viewing about why, how and ways Dark Sky issues can be advanced via research, awareness and practical actions e.g. via will/ mindset change and case study pilots.
- Karelia joined 14.2.2024, a regional workshop that was organised by creative industries project (PK Taideverkkarit by Arts Promotion Centre Finland). During this workshop, GLOW2.0 project and aims were presented to the participants. Karelia representative also

contributed to the workshop sessions, most importantly on ideas for regional tourism development in cooperation with creative industries (art, music, etc).

- February 2024 regional event “Tunturi-Lapin WYNE-project” workshop, where GLOW2.0 themes were discussed as part of the workshop. The focus was on potential new services and products, new networks models, and challenges that need solving to enable development.



Presentations and workshop results from mapping session during workshop in Lapland, Finland.

- Karelia met Dark Sky International representative on 20.8.2024 during which the project was presented. Discussions on concrete guidance for nighttime lighting, templates to guide regions in curbing light pollution, DSI certification process, and need for effective communication materials were discussed. GLOW materials and links were thereafter to them for distribution/use as needed.
- GLOW representative also joined the DSI “Under One Sky Conference” on 8.-9.11.2024, sharing project materials also during relevant sessions.

## Ireland

- Udaras attended a Service Design Training Program given by organisation CREW, with hope to work with them in period 4 and design a workshop for SMEs.
- 15.3.2024 regional workshop titled 'Stars and Strategies for a Sustainable Tourism Business' held in Leenane, Co. Galway, during Astronomy Week. The event featured information sessions and workshops covering topics on stargazing as a business, the mysteries of the night sky and how they can be leveraged to attract tourists year-round. Storytelling was also a focal point – with discussions on how tales of celestial wonders can be utilised to enchant visitors and create a memorable experience.



Agenda and participants at the Stars and Strategies for a Sustainable Tourism Business workshop in Ireland.

- 11.9.2024 Astrophotography workshop organised by GLOW2.0 associated partner Mayo Dark Sky Park. feedback on what tourists and the public find engaging in photography, understanding customers values, and how to consider those values in tourism offerings.



11.9.2024 astrophotography workshop organised by GLOW2.0 associated partner Mayo Dark Sky Park.

Iceland

- SSNV organised a regional awareness event in Skagaströnd (25.01.2024) for stakeholder SMEs and municipality attended by approx. 30 persons.

Norway

- 30.10.-01.11.2023 Norsk Opplevelseskonferanse event where UiT partner presented the GLOW2.0 virtual planetarium with an initial showcase to target groups. Interested stakeholders were registered for seminar event that later took place in 7.2.2024 in Narvik.



Demonstration of Virtual Planetarium by GLOW2.0 at Norsk Opplevelseskonferanse event Norway.

- Virtual Planetarium was demonstrated and tested using the development workstation along with the Meta Quest 3 headset by approx. 70 persons (public, UiT students and employees) at Mørketidsmagi “The Magic of Polar Night” event arranged by UiT Campus Narvik together with Narvik municipality, and Narvikfjellet. The event took place at the UiT campus on Friday 8 November 2024 and was devoted to beginning of the polar night in Narvik region and preparing for the upcoming alpine ski world championships (will be held in Narvik in 2029).



Testing at Mørketidsmagi.

## II. Joint events across and beyond the NPA region

### Learning Journeys & joint seminars

All partners in collaboration also arranged, in addition to other regional events, capacity building events in form of learning journeys, covering the various themes in GLOW2.0. One key focus of learning journeys was to map technological solutions and their potential and feasibilities of the various solutions for marketing or delivering products or services related to Dark Sky Tourism.

The learning journeys took place between period 2 (Jan 2023) and period 5 (May 2025) of the project. Four seminars were organised as part of learning journeys: in Ireland, September 2023, in Norway, February 2024, in Iceland, October 2024, and in Finland, March 2025.



SMEs engagement networking, information & testing sessions during seminar/LJ in Belmullet, Mayo, Ireland.



Seminar session and stakeholder testing the virtual planetarium during seminar and LJ event in Narvik, Norway.



Figure. Seminar session with partners and stakeholders during Learning Journey Iceland.



Figure. Development from project and testing product by local company during Learning Journey Finland.

The events offered stakeholders a forum to discuss, learn from one another and network for tourism. At the same time, partners were able to gather feedback for refining and creation of Output O1.1 Online capacity building training programme. Feedback from engagements helped partners gain an understanding of future needs, most importantly regarding technological solutions and green business model as part of service design, that could be integrated as part of the Output self-study modules to be made available post project for SMEs upskilling and reskilling to develop own activities, including means of delivery.

## Joint international webinars

Partners additionally implemented joint webinars for SMEs and organisations interested in dark sky themes development. The joint workshops and events brought local businesses, communities, infrastructure providers, and policy makers together in a forum where they were able to discuss/learn ways to improve tourism while protecting the environment from excessive and misdirected artificial lighting at night (ALAN). The events were used as forums to gauge interest in themes and content, and gather feedback for streamlining the final output, Output O1.1 Online capacity building training programme. Participation levels, comments and feedback showed how important the themes were for target groups/ regions.

Partners implemented in collaboration a joint webinar (30.4.2024). It aimed at communicating project themes, their importance, and showcasing examples of green business models in tourism using Darkness as added value, including immersive technologies potential. The event attracted 147 registrations and 106 connections (as some participants joined as a group) on webinar day. Participation covered six out of the seven member states of the Northern Periphery and Arctic (NPA) area.

February 2025 webinar organised by GLOW2.0 (Northern periphery and Arctic project) in cooperation with Light in the Dark project (Baltic Sea project), also attracted almost 400 participants (365) from at least 11 countries (Finland, Estonia, Latvia, Åland Islands, Sweden, Germany, Lithuania, Norway, Poland, Denmark and Ireland), with event recording “Low Season Travel Harnessing the Magic of Darkness and Dark Skies” in YouTube viewed over 300 times.

The capacity building events (A1.3) were important venues for building capacity and attracting target groups for upskilling and reskilling. The regional workshops and events (A2.4, A2.5, A2.6 and A3.3) were important venues for upskilling and reskilling, while the Learning Journeys gauged uptake and networking. All events were also venues for gathering feedback which helped streamline the Output O1.1 Online capacity building training programme, including best ways to provide this for target groups post project period.

## Anticipated impact of activity A1.3 on engaged target groups

The immediate impact on enterprises and organisations involved in the design, for both scoping and testing of modules as part of upskilling and reskilling, was that they got:

- ✓ Better understanding about the role light pollution plays and importance of protecting the night and night sky not only for the environment, but also for business viability and wellbeing of tourism destination and its residents.
  - Improved knowledge on darkness values for heritage preservation and tourism.
  - New knowledge how darkness benefits tourism destinations and communities.
- ✓ Improved and new knowledge on crafting memorable experiences and storytelling as integral components of own tourism offerings
  - New knowledge how to identify potential customers, define own idea, map customer experiences and create saleable products using service design methods.
- ✓ Opportunity to envision how visual content (immersive technologies) and immersive experiences can offer new opportunities, create value and/ or improve their current offers/ their region's offers:
  - Improved knowledge about technologies potentials for enhancing/ adding value to/ increasing visibility of own enterprise tourism offers, also via storytelling;
  - New knowledge how technologies could be used as plan B in service design of enterprises when considering Light Pollution (ALAN) and climate change impacts (weather unpredictability) and effects (limiting outdoor activity guarantee leading e.g to cancellation of events or dissatisfaction about purchased visitor services);
  - Knowledge uptake how technologies visual content can be used to offer impactful marketing/ selling product at trade fairs where themes relating to darkness phenomenon may be difficult to comprehend/ express to agents (e.g. international);
  - Knowledge how immersive technology could be used to save time/ costs, among other, in joint marketing of regional enterprises or destination offering.
  - Knowledge about competence, resources and time needed in developing immersive technologies
  - Knowledge about what immersive technologies are best adaptable to own needs. I.e. information about issues to consider before deciding to invest in technologies and related content developments.
- ✓ Enhanced learning about the role of networking for tourism:
  - got to network with other regions target groups.
  - got to learn from other regions how tourism networking is carried out and tourism offerings as results of regional and international networking.
  - guidance from offered materials guiding about ways to network for regional impact (resources: [link](#)).

## Conclusion

The goal of GLOW2.0 Activity A1.3, Implementation of the capacity building programme in the different areas based on the needs of the target audience, was to engage project stakeholders and beneficiaries with discussions (workshops, seminars, webinars) e.g. on service design, learning journey model, and storytelling, to develop service offers and tourist package.

The aim of the activity was that upon its completion, upskilling and reskill target group enterprises and organisations on thematics of service design, immersive technologies, application of green business models, and role that light pollution and its tourism connection would be enhanced, i.e:

- enterprises and organisations engaged by GLOW2.0 would adapt the capacity building training programme to their specific needs.
- GLOW2.0 project consortium will have feedback for curtailing an online capacity building training programme (Output O1.1) for target groups for continued use in developing own staff competences and activities.
- the GLOW2.0 curtailed online capacity building training modules under Output O1.1 would be available for target groups for further upskilling, reskilling for sustainable regional development, including those not directly engaged by the project.

The capacity building events and workshops were a success as many engaged target groups internalised learning with many adapting themes into current offering or creating totally new dark sky offerings as a result of engagements with the project. The events provided valuable insights, particularly for the development of output O1.1 online capacity building training programme for enterprises and organisations continued use in developing own competences about added value from darkness and dark skies.

Relevant organisations e.g. Destination management Organisations, Business Support Organisations, Sectoral Agencies and Infrastructure Providers in various participating regions were also consulted and engaged with capacity building and attracting of enterprises and organisations for upskilling and reskilling. They also joined events to upskill and reskill themselves.

The interest and responsiveness of target groups to the capacity building and training themes made it easier to streamline the mapped common and future needs into series of online self-study modules, combined to form output O1.1 Online capacity building and training module (GLOW2.0 Capacity Building Study Modules, [link](#)). The hope is that these will further assist the SMEs and organisations with upskilling and reskilling of target groups, also those not directly engaged by the project, long after end of project, thereby guiding actions towards sustainable and responsible ones, creating with it positive impact both for tourism, tourism destinations and communities.

Green business models i.e. considering impacts & effects of light pollution and importance of protecting the night and dark sky heritage, can offer economic benefits to enterprises (benefits from darkness, dark skies and nightscapes), while preserving resources and wellbeing of humans and the environment (health and wellbeing values from darkness).

## FURTHER INFORMATION

GLOW2.0 - Green Energy Technologies for Tourism Project has been funded by Interreg Northern Periphery and Arctic Programme.

Link to project website: [NPA GLOW](#)

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