**GLOW2.0 – GREEN ENERGY TECHNOLOGIES FOR TOURISM GROWTH**

**Kort beskrivelse**  
The GLOW2.0 project will apply a Green Business Model to pilot and learn how to develop sustainability methodologies in SMEs with a focus on companies and social enterprises serving the Dark Nights Tourism Economy. It thus will enhance sustainable growth and competitiveness of SMEs and job creation, which will involve them in productive investments.

**Beskrivelse**  
The project will support enterprises and public organisations in developing tourism flow during the dark winter months by enabling the application of immersive technologies at an enterprise level and developing common use applications presenting the night sky (developed during the project). These will be integrated into existing tourism strategies and offers on natural and cultural heritage to develop a marketing platform, which will enable the enterprises to reach beyond their existing markets. These will enable enterprises to develop their own green business models. Green businesses can grow economically and reduce the use of resources. The project will integrate techniques for green business with immersive technologies for maximum impact.

A bridging study has involved enterprises, tourism, and local authorities in workshops to determine their priorities and what they can absorb, which has determined the feasibility of the project. There are three main aspects: enhancing the capacity of SMEs, and in delivery, marketing and promotion of a tourism offer including dark skies; technology development of a virtual planetarium, 360-degree photography and star gazing applications, to be shared and adapted across the region; and validation and promotion of Dark Skies tourism as a regional offer across the NPA area, which also serves as means of safeguarding natural assets.

The three aspects are mutually supporting. Enterprises gain technical and business capacity. Regions enhance their overall tourism offer and this is disseminated across the NPA.

**Prosjektbeskrivelse**

**Bakgrunn**  
NPA-region is known by low population density, sparse settlements, long distances and physical barriers between the communities, difficulties for communications and accessibility, and extreme climates. At the same time NPA is the only region of Europe where light pollution is weak. For Dark skies tourism these are all advantages, which provide opportunities so that Dark skies are considered as a resource for Northern Periphery and Artic community.

The Tourism Potential of Dark Sky Assets was a report produced for Fáilte Ireland in 2019. It noted the following challenges, which are shared by Finland, Norway and Iceland:

(a) underdeveloped and highly seasonal tourism,

(b) sparse populations and often poor facilities for visitors,

(c) lack of strategies integrating local provision and that of tourists, and

(d) need for increased skills to integrate dark sky into other regional assets.

Dark Skies is an additional element of the tourism package, diversifying the offer and lengthening the season. For optimum impact it needs to integrate with existing offers, where it can either lead or supplement the brand. The Dark Skies criteria also apply to local service delivery and infrastructure, reducing light pollution and energy consumption and safeguarding the environment and biosphere from the adverse effects of light pollution.

The project responds to the challenges faced by small enterprises, being unable to reach beyond their regions and diversity their service offers. It thus responds the challenge of reducing economic activity and depopulation in the most rural areas of the NPA.

The development of marketing and promotion of Dark Skies tourism is currently only evident as a formal offer in Ireland. However, it has been recognized as a development path in other NPA regions such as Iceland. It is thus opportune to share and transfer expertise in this developing theme.

Links with other aspects of natural and cultural heritage, for example Irish, Norse, Sami and Finnish folklore and history will enable tourism providers to have a full range of services to cope with bad weather conditions and so extend the tourism season. In this way, local culture will be an asset, which enhance the visitor experience.

The project uses a transnational approach learning from the skills/opportunities that are available in each region (among other, laboratory of extended reality in Norway, Dark Sky Observatories in Ireland, regional destination experiences/parks in Iceland, events and festivals across regions.) to co-create models of development, design thinking approaches, and Covid recovery approaches. The outputs are aimed at a training scheme (to include marketing, branding, storytelling etc.) and an immersive technology output (demonstration-type approaches to creating a virtual planetarium), as both a regional and transnational experience. Beneficiaries include SMEs, Parks, astropreneurs and tourism agencies and operators.

This project builds immediately on the findings of the bridging project GLOW (funded by Interreg), which ascertained an enthusiasm among regional actors for an initiative on Dark Skies Tourism. This involved development agencies, regional parks, research bodies and enterprises. Beyond this it builds on the results of three transnational European projects, a NPA project, Digi2market, a HORIZON project, Ruritage, concluding in June 2022, and the COSME project, CAST, which concluded in 2021.

Digi2Market demonstrated the application of immersive technology applications by SMEs in the NPA, showing both the practicality for developing markets beyond their regions, but also the necessary capacity building among enterprises in terms of marketing, particularly with regard to branding and promotion.

CAST was a project aimed at supporting innovative enterprises in sustainable tourism. It developed and applied techniques for assessing sustainability in all aspects, and for mentoring and training enterprises, including gaining external finance. This expertise will flow through the partnership to enterprises.

Ruritage is developing local economies on the basis of cultural and natural heritage. It has operated with replicators and role models throughout Europe including Ireland and Norway. It has both models of development and tools to be applied, such as Landscape connect and myCult and the Ruritania game, which can be used in conjunction to enhance or develop local economic strategies. These can be used together to involve local agencies in updating their strategies to take account of not just Dark Sky opportunities, but other natural and cultural assets that would form part of a comprehensive tourism offer. This complements the service offer to enterprises.

Overall it also builds on the increasing knowledge of dark sky benefits (International Dark-Sky Association [IDA]) to reducing pollution and resource use, and the protection of ecosystems and of human health.

**Effektmål**  
The project focuses on the economic benefits to enterprises and regions in NPA to achieve its goals; enhancing sustainable growth and competitiveness of SMEs and job creation in SMEs including by productive investment.

The expected effects are:

1. Introducing Dark Skies tourism as an NPA common strategy. This is done as a keystone branding exercise, which will also incorporate a diversified tourism offer. It will also introduce the International Dark-Sky Association (IDA) Fixture Seal of Approval, which provides objective, third- party certification for luminaires that minimize glare, reduce light trespass, that don''t pollute the night sky. Other elements include energy-saving features such as timers, motion sensors, and dimmers. These have environmental and community benefits.

2. The diversified tourism offer will integrate dark skies tourism with other aspects: folklore, glacier tourism, cross country skiing, to produce a rounded offer, which is at least weather resistant and so enabling more persuasive promotion. Technological advances will assist in rounding the offer.

3. Supporting tourism with both chosen and bespoke technological developments: virtual planetarium and star gazing apps. The common applications will be verified in the early part of the project, e.g. an Augmented Reality of the Moon that can be viewed from different perspectives in Ireland/Finland /Iceland and degree of interactivity and Development of a Metaverse (VR) platform that participants (tourists) can visit virtually at the same time to experience an event. The virtual planetarium will be developed during the project to meet the specifications of participants and ensure the widest technological adoption.

4. Use of green business model and practices as integral to the business development, thus reducing environmental impact and improving business performance. This will be available to all participating enterprises and will be coordinated with technological advances, so that enterprises will enhance, there business, technical and environmental skill sets.

5. Involvement of regional agencies and local governments. These bodies are essential for two main reasons; they are responsible for local economic strategies and so promote tourism and related employment; and they are also providers of infrastructure, such as lighting, and also influential in transport provision.

The project will move immersive technologies a step forward with a range of virtual and augmented reality experiences of the skies and determine the feasibility and potential transfer of their applications across NPA region.

**Resultatmål**  
The main project results are:

1. RCR104\_1.3 Solution taken up or up-scaled by organisations.

Demonstration of the benefits of the implementation of dark skies initiatives. This focuses in the immediate impact on enterprises extending their service range and their marketing approach. This involves a combination of deliverables, which include:

a) virtual planetarium and how it can be utilized throughout NPA, with complementary training package,

b) identified star gazing apps for use by enterprises and tourists,

c) capacity building and training modules to be delivered online to enterprises, which forms a permanent output as training materials for the institutions and SME involved,

d) requirements for dark skies certification, which will involve reduction of light pollution, energy saving applications and appropriate changes to transport and mobility; it also involves specification of the route to certification and integration with other Dark Skies members,

e) promotion messages including video, which will disseminate the benefits throughout NPA.

2. RCR04\_1.3 SMEs introducing marketing or organizational innovation.

50 enterprises, indicatively 10 per region, will improve their service delivery and widen their marketing approach through involvement in the project.

This will happen in several ways. They will develop and become competent in Immersive technology, which will both expand their service delivery in the dark skies domain and enable them to widen their market, through improved promotion, demonstrating services to be delivered.

They will gain capacity through training modules covering business, technical and scientific topics.

They will also improve their networking with other enterprises and with regional authorities and agencies. This should result in better use of local facilities and a more comprehensive tourism offer in the regions, of mutual benefit to the enterprises and to the communities in the regions. The innovations will encompass marketing, organisation and technical aspects.

**Måleindikatorer**  
Main deliverables:

1. Capacity building training programme, including main items and balance of elements of training, knowledge access and mentoring, composed as series of modules (immersive tech, biodiversity, light pollution, tourism, logistics, green business model, selling etc.). A permanent output as training materials for the institutions, SME involved.

2. Delivery Framework for Immersive Technology adoption in SMEs. 40 enterprises developed an Immersive Technology Solutions for Marketing. 10 enterprises adopted Service Design Methodologies in their Marketing or Innovation processes.

Main outputs:

RCO87\_1.3: Organisations cooperating across borders. Two organisations cooperating in use of the developed virtual planetarium among enterprises operating in the tourism market.

RCO116\_1.3: Jointly developed solutions. Engagement of stakeholders including regional

authorities, tourism agencies and communities in transfer of best practices within the dark skies economy. Increased awareness of potential opportunities within dark skies tourism for tourism sector.

**Aktiviteter**  
All the activities in the GLOW2.0 project are organised in 3 WPs.

WP1. Capacity building to develop training modules.

A1.1. Verify the needs of the target audience/ engage target audience.

A1.2. Develop capacity building materials.

A1.3. Implementation of the capacity building programme in the different areas based on the needs of the target audience.

A1.4. Review activity, amend and change if necessary, re-purposed as modules.

WP2. Immersive technology/virtual planetarium development.

A2.1. Developing the requirements specification for the immersive technology/virtual planetarium.

A2.2. Design and development of the immersive technology/virtual planetarium (across the scalable outputs).

A2.3. The build, test, revise across the scalable outputs.

A2.4. Identify the learning journey in each of the regions in the adoption of the relevant technology solution that has been created in that region.

A2.5. Development, Roll-out, promotion and marketing of all technology outputs.

A2.6. Adopting and adapting Service Design methodologies to support the SMEs in developing their service/product for the Dark Sky''s Tourism Economy.

WP3. Transnational astro-initiatives.

A3.1. Draw together a framework of criteria that are required for attaining and utilising Dark Sky status as a driver of tourism and economic development issues, tourism logistics.

A3.2. Identify the individual regional approaches in participating regions to dark skies.

A3.3. Regional workshops.

A3.4. Promotional message for Dark Skies as an important aspect of sustainability.

**Målgrupper**  
SMEs: tourism industry and in its supply chain would be involved through survey and interview to determine their needs, priorities and responsiveness to the capacity building and development of immersive technologies.

Regional public authority: involved in line with their economic development strategies and activities; will benefit from both capacity building and up-skilling.

Interest groups including NGOs: involved in applying project results beyond project period sharing of good practices realized in the project.

Sectoral agency: Trade groups representing tourism enterprises would be involved in

engaging with SMEs for capacity building purposes. Sectoral agencies will

also help communicate project actions to wilder audience.

Infrastructure and (public) service provider: knowledge of energy saving lighting certified for Dark Skies, determining optimum provision for tourists and their integration into local provision, potentially enhancing services for both.

HEI & R&D: would be involved to determine their capacity and willingness to undertake relevant technology transfer and development activities, as well providing inputs into technical training and service design.

Business support organisations not acting as partners benefit from

the techniques and material produced by the project, in terms of provision of

capacity building support to enterprises and access to European databases

and knowledge arising from previous projects (Digi2Market, Ruritage, CAST).

**Prosjektets regionale relevans**  
Norways'' tourism strategy (2021) focuses on sustainable tourism. A key pillar of the plan is an industry commitment to halve CO2 emissions by 2030 and reduce annual transport emissions by 10%. The strategy document suggests that up to 43,000 new tourism jobs could be created in Norway by 2030.

This projects will allow the destination to continue to improve when it comes to sustainable development, in alignment with the objective and goals of the project.

- Local Strategic Business and development plan:

https://www.futurum.no/sites/f/futurum.no/files/strategisk \_naeringsplan \_for \_ofoten \_20182021.pdf

Sustainable development of the destination. Alligns with the objective and goals of the project.

- Tourism Strategy Nordland County: https://www.nfk.no/\_f/p1/i05985b67 -3203 -4372 -a423 -

5b02a9bcc346/strategi -for -reiseliv -og -opplevelsesnaringer -i -nordland -2017 -2021.pdf Alligns with the objective and goals of the project.

- TFFK - the new strategy in progress; most likely to conclude with sustainable nature and cultural

inheritance management and development in line with the green transition.

- National tourism strategy: https://business.visitnorway.com/no/strategi-for-norsk-reiseliv/

**Prosjektorganisering**  
Management will be based on transnational teamwork among project partners led actively by the Lead Partner Karelia UAS. The consortium will form a management steering board for the project. This will be chaired by LP Karelia UAS, who will also provide secretariat services. All partners will commit to a partnership agreement, which lays out their roles in achieving project goals. Each work package will have a leader, responsible for reporting to the project coordinator. The consortium agreement will include a dispute regulation procedure to take care of any disputes among the partners, which will be finally resolved by the consortium management steering board as described above. Representatives of the partners will meet every month to discuss progress and make decisions on future actions. The partners will meet biannually throughout the project.

Quality includes a high standard of content and timely delivery. Quality of content will be assured in two ways. The first is a peer review of delivery by all the partners, so that each deliverable and output is scrutinized. The second is a review applying the European Framework for Quality Management Model.

Within the project, there is essential communication among the partners and associated partners to progress the project. Outside the project, the partnership will communicate with other regional agencies and similar bodies to promote the dark skies concept across the NPA.

**Samarbeidspartnere**  
The project partnership is a valuable mix of universities with expertise in immersive technology development and SME engagement, regional agencies and associated regional partners with expertise in Dark Sky arena. There are two universities as partners: Karelia UAS as LP (Finland) and UiT The Arctic University of Norway with expertise in programming, AR, VR application & tourism logistics. There are three universities as associate partners: Hólar university (Iceland) is an associate bringing its experience in dark skies research and immersive technologies. The University of Ulster (Northern Ireland) is to provide technical inputs in immersive technologies developed in the Digi2Market project. Värriö subartic research station (Helsinki University) research of light pollution.

Regional agencies are SSNV (Iceland) and Udaras (Ireland), both serving distinct areas in the two countries. They are complemented by Federation of North Lapland municipalities (Finland). WestBIC (Ireland) are a regional business support agency, who work closely with Udaras. SSNV also provide business support services.

Associated partners also include the Centre for Economic Development, Transport and the Environment/ North Karelia Biosphere Reserve (Finland) a UNESCO heritage and sustainable development model area and Snaeflessnes RP (Iceland) and Mayo Dark Sky accredited Park (Ireland).

UiT activities will be supported by Visit Narvik.

**Tids-/milepælsplan**  
Startdato: 01.01.2023 Sluttdato: 31.12.2025 Milepælsplan vedlagt søknad: Ja  
The total project implementation time is 36 months, divided into 6 equal periods. Project time plan is included in the attached main application form.