

NPA GLOW2.0 - Green energy technologies for tourism growth

Specification of capacity training programme

(Deliverable 1.1.1)

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Interreg



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GLOW2.0

Northern Periphery and Arctic

Acronyms

AR	Augmented reality
CBP	Capacity Building Programme
DMO	Destination Management Organisation
VR	Virtual reality
GLOW2.0	Green energy technologies for tourism growth project
LP	Lead Partner
NPA	Northern Periphery and Arctic
TAs	Tourism Associations
WP	Work Package
WPs	Work Packages

1. Introduction

NPA GLOW2.0 - Green energy technologies for tourism growth, aims to support enterprises and public organisations in developing tourism flow during the dark winter months. Dark skies are an attraction that has been utilized too little in the past in Northern Periphery and Arctic (NPA) regions, even though areas with little or no light pollution have huge potential to enhance tourism experience. During the project, enterprises should gain technical and business capacity relating to dark skies tourism concepts. These might be:

- Astrotourism, aurora borealis and star gazing;
- winter activities relating to darkness;
- knowledge about light pollution and ways to preserve the environment from excessive lighting.

One way of enhancing technical and business expertise of businesses will be through a Capacity Building Programme (CPB). The programme will focus on awareness and understanding about Dark Sky theme and concepts, and helping target group(s) develop/ enhance service offers within this framework, including low threshold testing of immersive technologies. NPA GLOW2.0 partners have during the first project period (12.2022 – 05.2023) worked towards identifying the needs of the target audience. The target audience have been tourism product and service providers from 4 participating countries – Finland, Ireland, Norway and Iceland. This was realised via a survey questionnaire.

This report gives a summary of the survey findings, and specifies the needs of target audience for creation of a formal capacity building and training programme, including synergies with other project activities in other project Work Packages (WPs).

2. Background of the specification of capacity training programme

The specification for the capacity training programme concentrates on respondents':

- knowledge of dark skies science concepts, technologies and techniques for preserving dark skies;
- technical capacity in using immersive and other digital technologies;
- marketing awareness and skills, and;
- networking potential for regional impact.

Based on the outcomes, the combined project consortium expertise, and potential limitations e.g., budgets, the main items and balance of elements of training, knowledge access and mentoring, with means of delivery to be considered in designing the formal capacity building and training programme are offered.

2.1. Survey background

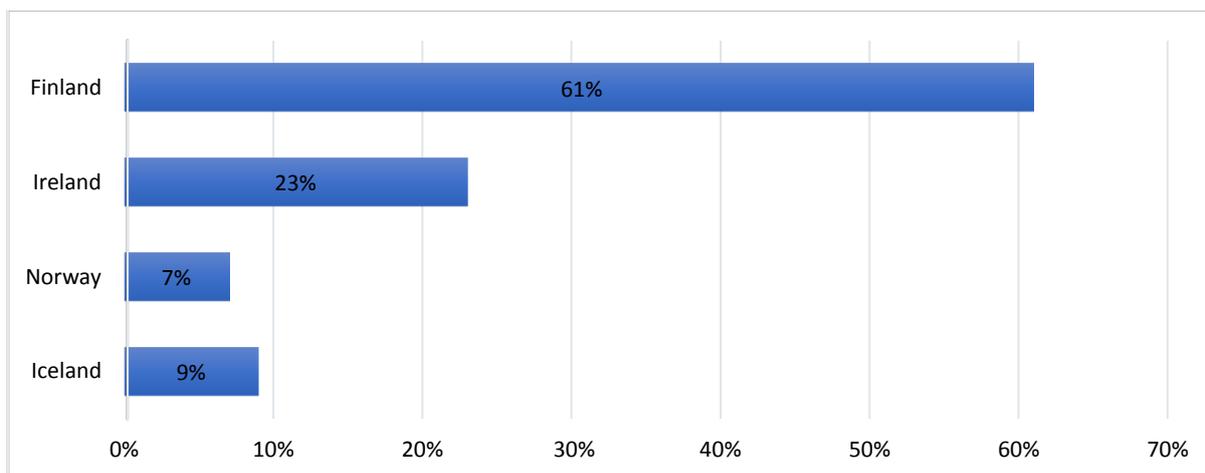
The survey is a joint effort by all NPA GLOW2.0 partners who worked together to identify the needs of target audience during the first project period 12.2022 – 05.2023. The English language questionnaire was drafted by WP leads, after which it was refined with all partners in collaboration during the project's first partner physical meeting in Finland, Joensuu (February 2023).

The questionnaire was thereafter translated by partners into four more languages i.e., Finnish, Norwegian, Icelandic, and Irish Gaelic. These were then transformed into a survey using Webropol platform hosted by the project's Lead Partner (LP) Karelia University of Applied Sciences (Karelia UAS). The survey was available for respondents in five languages i.e., English, Finnish, Norwegian, Icelandic, and Irish Gaelic. The questionnaires were also available in print in for use in instances of need e.g., during regional events, meeting with target groups, or limited internet access.

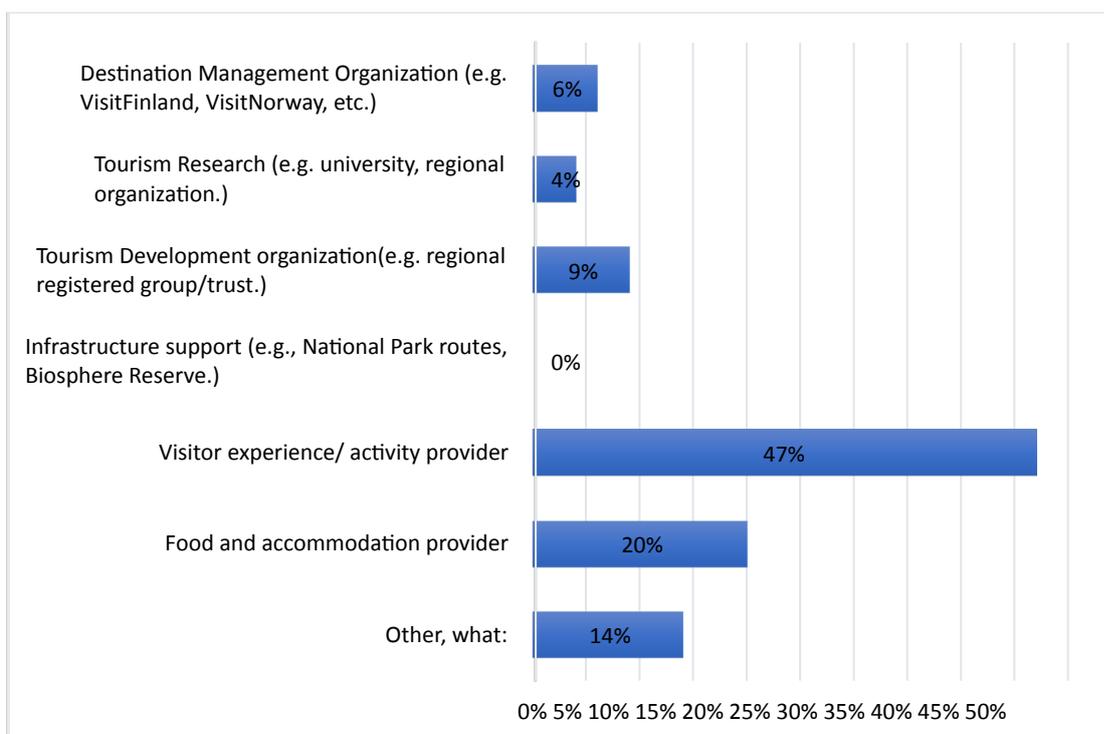
All survey questions were mandatory except for one i.e., Q 10 asking respondents about immersive technologies preferences. The survey was open between 1.4.2023 – 15.5.2023 until 16:00 (Helsinki Time). A total of 99 responses were received by the deadline. This specification of capacity building is therefore based on the data by 99 respondents (n = 99) that answered to the survey within the deadline.

3. Verification of needs of target groups

The survey was answered by 99 respondents. A total of 60 respondents answered for Finland, 23 for Ireland, 7 for Norway, and 9 for Iceland.

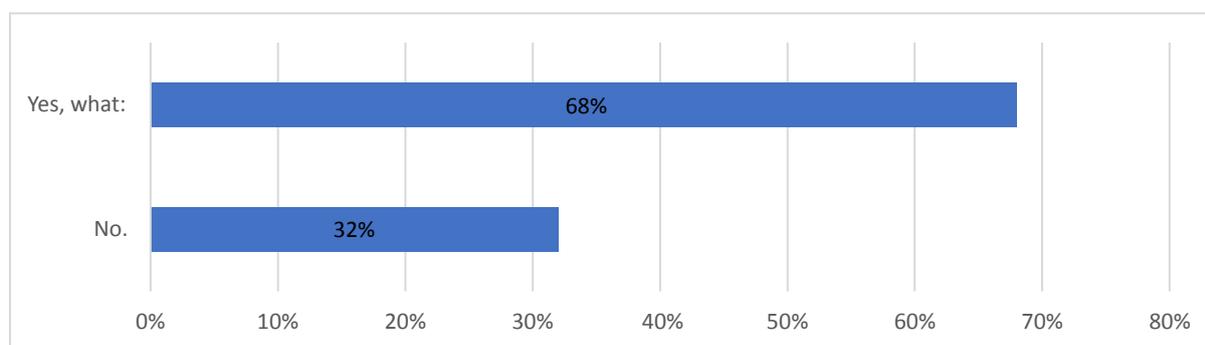


Over 70% of all respondents consisted visitor experience/ activity providers. Even though some that were unsure about where their services fall and specified them under “other” , most of these technically fall within the visitor experience/ activity, or food and accommodation categories.



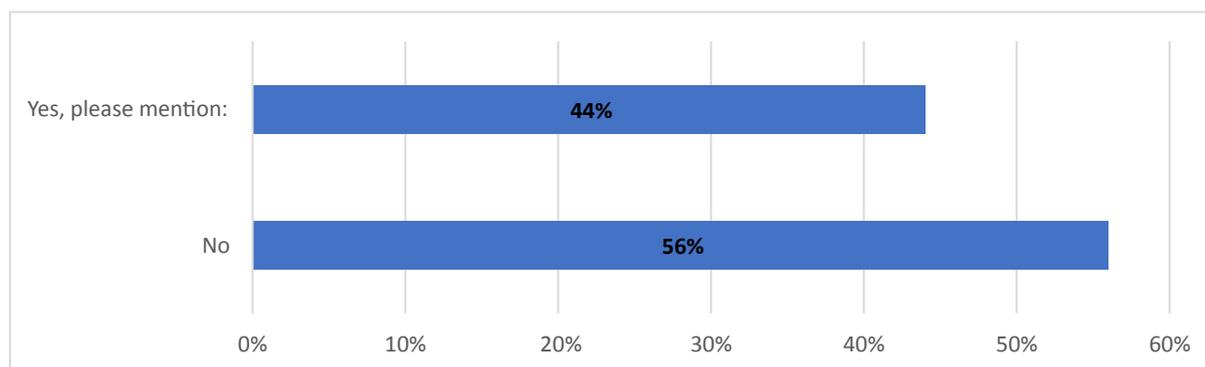
3.1. Knowledge of dark skies science concepts, and technologies and techniques for preserving dark skies

Majority respondents have knowledge of tourism products or services linked to dark sky concepts such as star gazing, night photography, northern lights watching or other similar, that are associated with use of darkness of nature (n = 99).



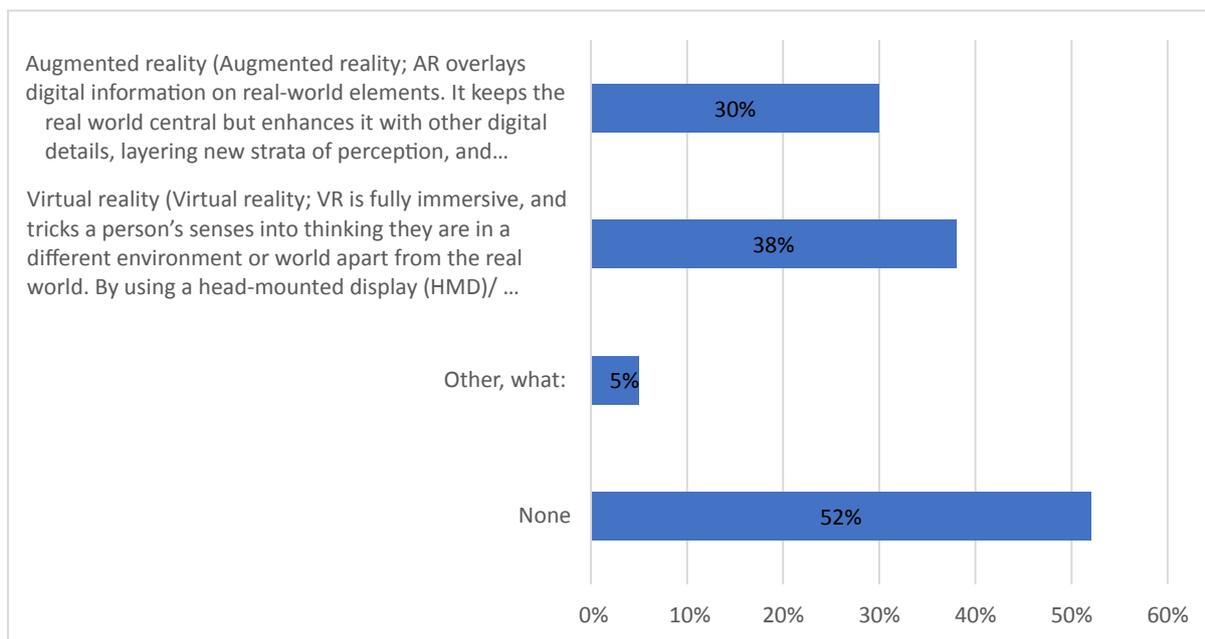
	Yes	No
Finland	80% (n=48)	20% (n=12)
Ireland	44% (n=10)	56% (n=13)
Norway	100% (n=7)	0% (n=0)
Iceland	22% (n=2)	78% (n=7)
Total	68% (n=67)	32% (n=32)

However, technology-based solutions (e.g., websites, mobile apps, virtual reality applications etc.) used to deliver night sky-type experience such as star gazing, northern lights watching, etc are not known to most respondents (n = 99).

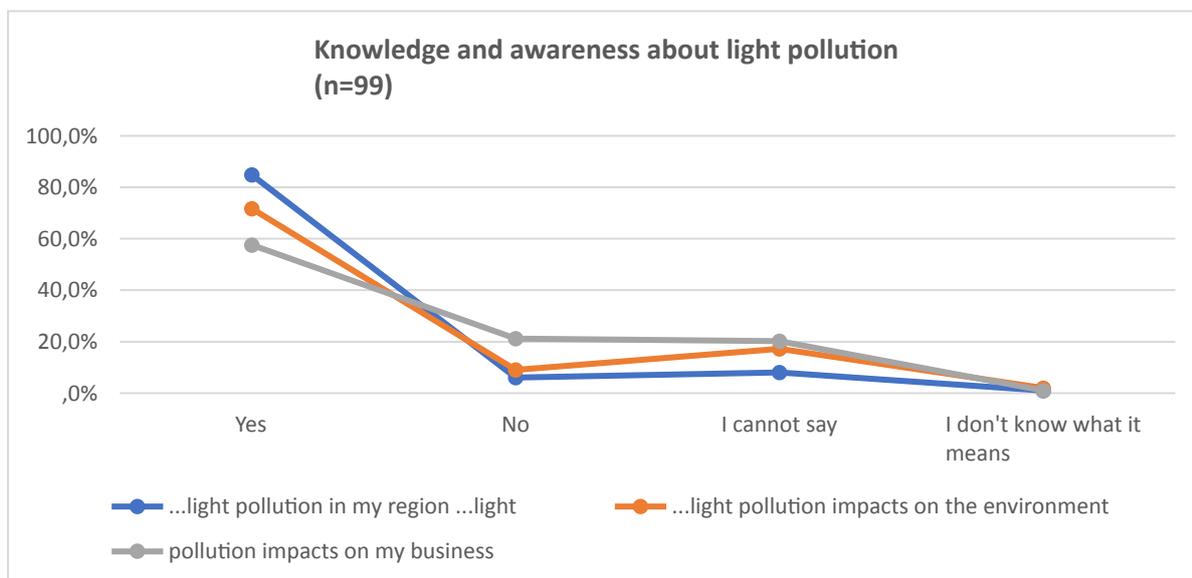


	Yes	No
Finland	52% (n=31)	48% (n=29)
Ireland	30% (n=7)	70% (n=16)
Norway	57% (n=4)	43% (n=3)
Iceland	22% (n=2)	78% (n=7)
Total	44% (n= 44)	56% (n=55)

In addition, **over half of respondents have neither used, tested or experienced immersive technologies** (n = 99).



Majority respondents feel aware about light pollution and that they have knowledge about light pollution impacts in their regions (n = 99).



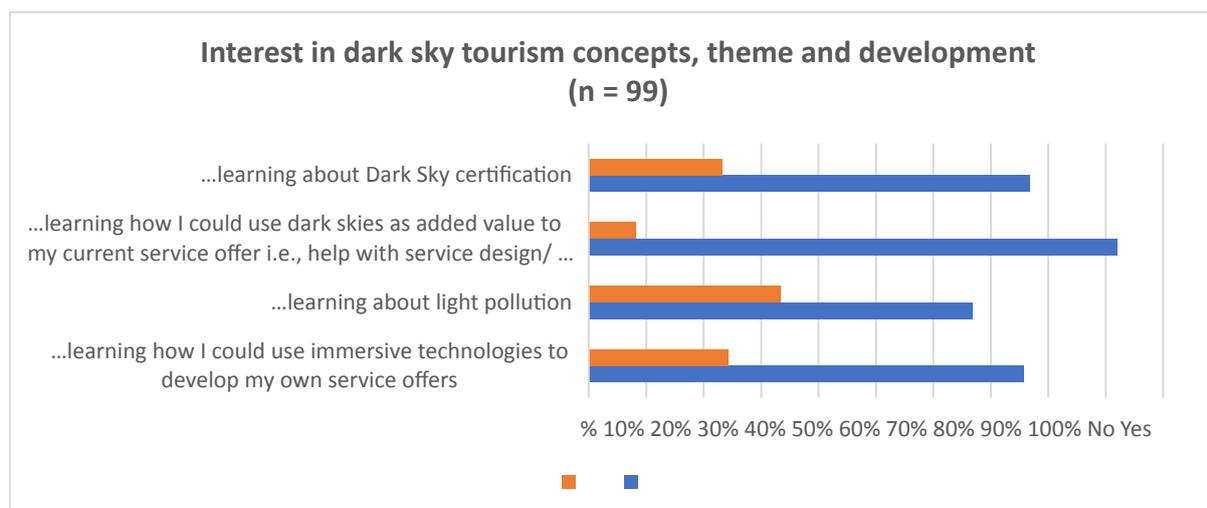
Knowledge and awareness about light pollution impacts...	Yes	No	cannot say	don't know what it means
...in my region	86,3%	6,2%	6,3%	1%
...on the environment	74%	10%	15%	1%

...on my business	60%	19%	20%	1%
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However, **there is a varying trend across regions on awareness and knowledge about light pollution impacts on (i) the environment and on (ii) own businesses.**

Knowledge and awareness about light pollution impacts...	Yes	No	cannot say	don't know what it means
Finland (n=60)				
...in own region	90%	3%	7%	0%
...on the environment	75%	8%	17%	0%
...on own business	65%	13%	22%	0%
Ireland (n=23)				
...in own region	74%	13%	9%	4%
...on the environment	78%	13%	5%	4%
...on own business	44%	35%	17%	4%
Norway (n=7)				
...in own region	100%	0%	0%	0%
...on the environment	86%	0%	14%	0%
...on own business	57%	43%	0%	0%
Iceland (n=9)				
...in own region	67%	11%	22%	0%
...on the environment	22%	11%	56%	11%
...on own business	45%	22%	33%	0%

Nevertheless, there is high interest by respondents across all regions to enhance services under the Dark Sky thematic framework, and/ or improve understanding about the concepts: (i) **identifying possibilities/ added value to own services within the dark sky theme** (92%), (ii) **improving knowledge science concepts (dark sky certifications, light pollution)**, (iii) **understanding techniques for preserving dark skies** (77%), as well as (iv) **learning about/ testing technologies that could be used to improve existing service offers/ potentially result in new tourism offers** (76%).



Even though there are variations across the regions on key areas of interest, **the most important interest across all regions is similar, i.e., all respondents want to learn how to use dark skies as added value to current service offers.**

Interest in dark sky tourism concepts, theme and development per region	Yes	No
Finland (n=60)		
how immersive technologies could be used to develop own service offers	77%	23%
light pollution	68%	32%
how to use dark skies as added value to current service offers i.e., help with service design/ marketing for dark skies tourism offers	95%	5%
Dark Sky certifications	75%	25%
Ireland (n=23)		
how immersive technologies could be used to develop own service offers	87%	13%
light pollution	83%	17%
how to use dark skies as added value to current service offers	96%	4%
Dark Sky certifications	96%	4%
Norway (n=7)		
how immersive technologies could be used to develop own service offers	71%	29%
light pollution	43%	57%
how to use dark skies as added value to current service offers	71%	29%
Dark Sky certifications	57%	43%
Iceland (n=9)		
how immersive technologies could be used to develop own service offers	44%	56%
light pollution	33%	68%
how to use dark skies as added value to current service offers	78%	22%

Dark Sky certifications	56%	44%
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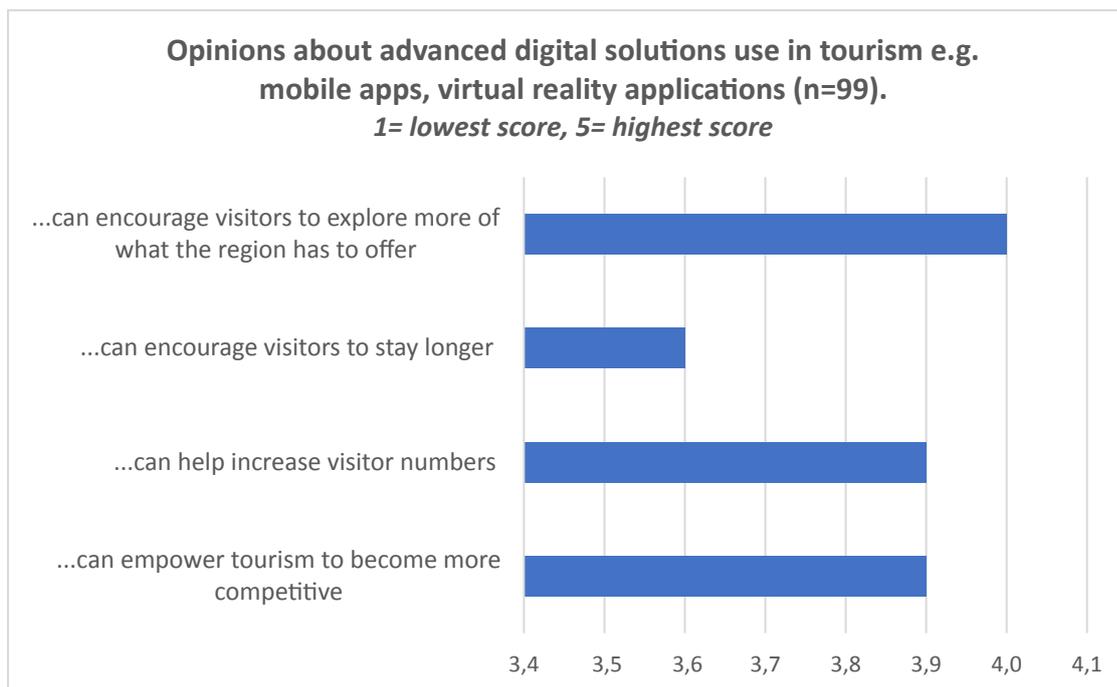
*Interest in receiving project information: Fin= 83%, Ireland= 100%, Norway= 86%, Iceland= 89%.

3.1.1. Common and regional issues to consider for capacity building programme

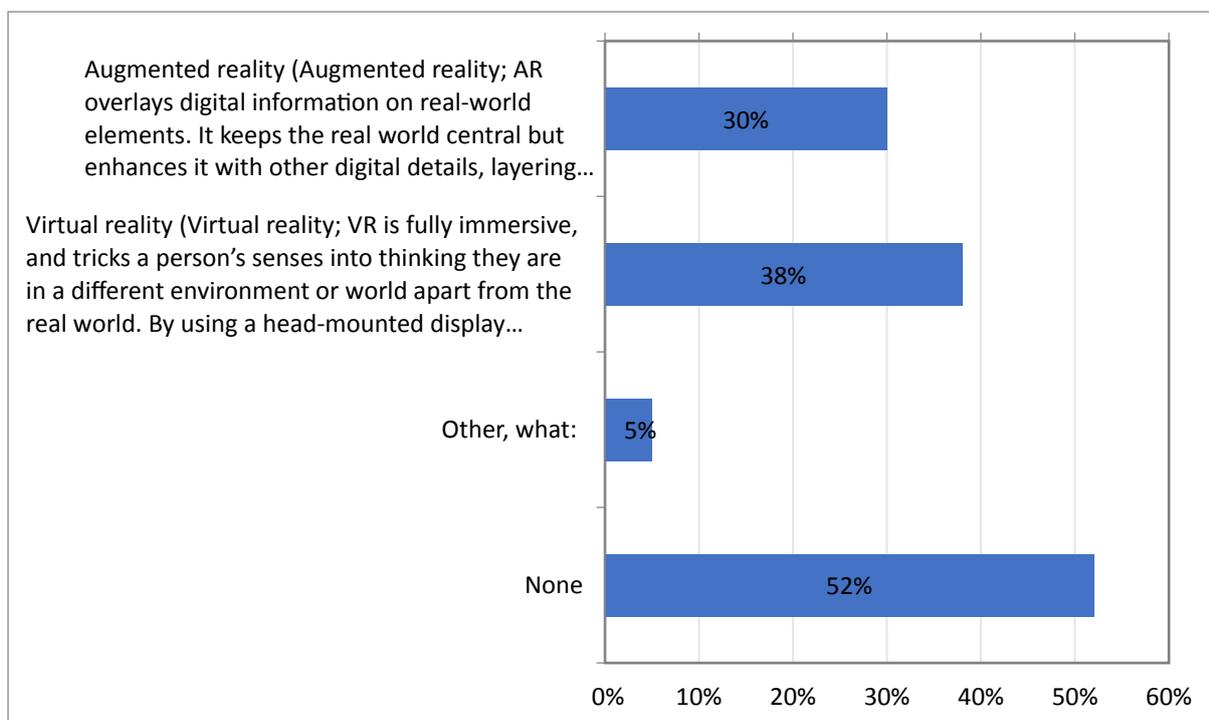
- **Identifying possibilities/ added value to own services within the dark sky theme** is most important for respondents in all participating regions.
- **learning about/ testing technologies** that could be used to improve existing service offers/ potentially result in new tourism offers is of interest in Finland (77%), Ireland (87%), Norway (71%). In Iceland, this is little under half (44%).
- **learning about light pollution** is most important in Ireland (83%) and Finland (68%). In Norway, just under half the respondents (43%) are interested, and even lower interest in Iceland (33%).
- **understanding techniques for preserving dark skies** (i.e., dark sky certification) is of interest across all participating regions. Highest interest is in Ireland (96%) and Finland (75%). Just over half respondents' state interest in this in Norway and Iceland (average of 57%).
- over 80% of all respondents that answered to the survey are **interested in receiving information about the project activities, results and outputs**.

3.2. Technical capacity in using immersive and other digital technologies

Respondents feel that **advanced digital solutions** e.g., mobile apps, virtual reality applications use in tourism offer added value to tourism. According to respondents, digital solutions **can most importantly encourage visitors to explore more of what the region has to offer** (score 4/5), **help increase visitor numbers** (score 3.9/5), and **empower tourism to become competitive** (score 3.9/5). Technologies can to some extent also **encourage visitors to stay longer at destinations** (score 3,6/4).



Even though immersive technologies are considered an asset, majority respondents are not familiar with technologies and their potential applications in tourism. Out of all respondents (n=99), over half (52%) have neither used nor experienced any technologies.



The **key challenges in adoption or implementing technology solutions** in tourism are stated as **financial costs of developing solutions** (58%), and **lack of the relevant skills in the organization** (59%).

Key challenges in adoption or implementing technology solutions	n	Percent
Constantly changing technology	45	46%
Resistance/or lack of interest from the end user	22	22%
The financial cost of (developing) these solutions	57	58%
The lack of the relevant skills in the organization	58	59%
Concerns about personal data	11	11%
Financial viability	37	37%
Other, what?	11	11%
None	6	6%

Despite technologies being unfamiliar to majority respondents (52%), **there is high interest among them for learning possibilities of technologies in tourism service development. AR technologies are most favored**; 57% of respondents choose it as first preference. VR is first preference to about 43% of the respondents.

Preference for technologies (n = 79)	1st preference	2nd preference
Augmented Reality (AR)	57%	43%
Virtual Reality (VR)	43%	57%

Note: this was not a mandatory question during survey why respondent number is lower (n = 79).

Across participating countries, **AR is most preferred technology, except for Iceland** where VR was most preferred by over 70% of respondents.

Preference for technologies across participating countries (n = 79)	AR	VR
Finland	59% (n= 49)	41% (n=49)
Ireland	52% (n=21)	48% (n=21)
Norway	80% (n=5)	20% (n=5)
Iceland	25% (n=4)	75% (n=4)

Immersive technologies for tourism can, according to respondents, **encourage visitors to explore more of what the region has to offer, help increase visitor numbers, and empower tourism to become competitive**, and potentially encouraging visitors to stay longer at destinations.

Respondents consider the technologies an asset that could be used in developing service offers. However, majority of them are not familiar with the technologies and their potential applications in tourism. Out of all respondents (n=99), over half (52%) has neither used nor experienced any technologies. The **key challenges in adoption or implementing technology solutions** in tourism are **financial costs of developing solutions** (58%), and **lack of the relevant skills in the organization** (59%).

Despite the challenges and setbacks, there is **high interest across all regions in learning possibilities for technologies in tourism service development**. This comes clear in the question that was optional i.e., Q.10 about technology preference, where 80% of all respondents answered to it anyway. **AR technologies are most favored in Finland, Ireland and Norway** (59%, 52%, 80% respectively), while **VR is predominantly favored in Iceland (75%)**.

3.2.1. Common and regional issues to consider for capacity building programme

- **Most respondents** over half (52%) of those that answered to the survey (n=99), **have neither used nor experienced any technologies**.
- **There is high interest across all regions** in learning how **technologies could be used to improve existing service offers/ potentially result in new tourism offers**. However, **financial costs of developing solutions and lack of the relevant skills in the organization have been the main challenges/ barriers** for adoption or implementing technology solutions.
- There are **differences in preference of technologies across participating countries**. **AR technologies are most favored in Finland, Ireland and Norway** (59%, 52%, 80% respectively), while **VR is predominantly favored in Iceland (75%)**.
- The technical capacity in use of immersive technologies, and varying preferences could be considered during hiring specialist immersive equipment, training and testing.

3.3. Marketing awareness and skills and potentials areas for networking

According to respondent feedback, various activities could be offered in companies that could benefit from more tourists during dark months of year in own areas. Various options considered of potential under dark sky thematic marketing were offered by respondents as part of answers to the survey. These, including features specific or dominant to each region can be seen in detail in the annexes 1 – 4 attached to the report.

In comparing the five most dominant features that stood out in the various regions, **in Finland, Northern lights watching, snowshoeing, sauna, bonfire, and star gazing** were five most prominent offers ¹.

In Ireland, hiking, walking or trekking was most prominent, followed by **paddling, canoeing or boating, winter swimming, star gazing and sup-boarding** ².

In Norway, Northern lights watching, snowshoeing, husky safari, midnight-sun, and downhill skiing were five most prominent offers.

In Iceland, Horseback riding, northern lights watching, cross-country skiing, outdoor bathing tub, midnight sun, snowmobile safaris and downhill skiing as main offers. In looking at the region as a whole, there are similarities across regions which could be used in thinking also potential network areas across the regions.

In chapter 3.2 (immersive and other digital technologies), **most respondents, over half (52%)** of those that answered to the survey (n=99), also answered that they **have neither used nor experienced any technologies**. However, **respondents consider the technologies an asset that could be used in developing service offers**.

Immersive technologies for tourism can, according to respondents, **encourage visitors to explore more of what the region has to offer, help increase visitor numbers, and empower tourism to become competitive**, and potentially encourage visitors to stay longer at destinations. Immersive technologies, such as augmented (AR) and virtual reality (VR), are stated by research as gaining momentum in the consumer market, and has potential of creating value for both businesses and consumers. ³

According to respondents, the **key challenges/ barriers in adoption or implementing technology solutions** in tourism are **financial costs of developing solutions** (58%), and **lack of the relevant skills in the organization** (59%). Despite the challenges and setbacks, there is **high interest across all regions in learning possibilities for technologies in tourism service development**. This comes clear in the question that was optional i.e., Q.10 about technology preference, where 80% of all respondents answered to it anyway. **AR technologies are most favored in Finland, Ireland and Norway** (59%, 52%, 80% respectively), while **VR is predominantly favored in Iceland (75%)**. Introducing target group(s) to technologies, by sharing of immersive technology possibilities in tourism, potential applications in own service design, and technology(ies) testing sessions could offer ideas and ways for product - service development.

¹ Ref: Annex 1

² Ref: Annex 2

³ M. Claudia Tom Dieck & Dai-in Danny Han 2022.

3.3.1. Common and regional issues to consider for capacity building programme

- **Key features of regions, including most favored activities relating to Dark skies and related elements can be useful considerations for service design** (including branding and promotion), and designing of digital communication for promotion and sales.
- **Identifying potential partnerships with tourism agencies and other tourism operators** could be done by mapping similarities of offers by product and services providers, and/or similarities in regional strengths/dominant features across participating countries.
- **Learning journeys** (part of WP2) **could be useful for initiating and encouraging networking across target groups and regions.**

4. Specification of Capacity Building Programme

A. Planning (P1):

- **Needs:** Survey results (Activity 1.1) implemented in joint cooperation with partners
- **Specification of capacity training programme:** based on needs of survey i.e., Activity 1.1
- **Internal resources:** timelines designated to capacity building programme, partners budgets, expertise of consortium, expertise of associated partners
- **External resources:** external expertise and equipment budgets, outsourcing needs
- **Modes of implementation:** considering language, needs connection to other Work Package activities, results and/ or outputs

B. Themes and content (P1)

Aims (themes)	Content
I. Improving knowledge of dark skies science concepts, and technologies and techniques for preserving dark skies.	
Dark sky in sustainability science	- light pollution, its effects on human, animal and vegetation health, and effects on biodiversity - ensuring buy-in for SMEs- really need to encourage them to act upon this and become ambassadors for protecting night skies in their areas. Use of case studies may be beneficial.
Dark sky as added value to tourism	- phenomena of the night skies: meteor showers, aurora borealis, yearly happenings of the night sky etc - Storytelling: finding/helping find local stories, oral histories here too, regional/global mythologies, nocturnal fauna and flora e.g., bat watching, owl watching - Dark sky certification: different certifications available and criteria - Dark sky tourism is a niche tourism sector, Provide a case study(ies) or examples
Responsible/ sustainable dark sky tourism	- lighting techniques awareness; what is available (colors of bulbs and effects, EU, regional policies). - tourism Logistics - highlight the importance of responsible tourism, promoting low impact on practices, while also raising awareness on light pollution.
II. Enhancing technical capacity in using immersive and other digital technologies	
Immersive and other technologies applications in tourism	- VR, AR, 360 photography & video: practical uses and concrete examples in tourism and marketing to adapt into own practice, incl. accessibility to technology and service providers - learning differences between technologies, restriction of use e.g., light, motion.

Testing of technologies as base for ideation	- low threshold testing possibilities for new technologies for SMEs and organisations, base for ideation on how to use.
III. Marketing awareness and skills and networking for regional impact	
Dark sky concept in product – service development	<p>- Service Design: (i) knowing your customers: designing offerings according to their needs, expectations and values (ii) customer centered service creation/adaptation of offerings relating to dark skies, product design (creating a sellable product for the right channels) (iii) good practices for services happening in the dark (using torches, volume of noise etc) (iv) local stories, oral histories (v) regional/global mythologies relating to dark skies (vi) tourism factors own stories</p> <p>(vii) Dramatic structure (Aristotle, dramatic arc) as a framework of a service</p> <p>- Storytelling as added value in tourism offerings (i) how to use stories in both marketing and during service: what stories, how & when to use them, storytelling during service (ii) experience design: using stories to create stronger memories, adding value by deepening the meaning of the experience, recommendation marketing</p>
Networking for regional impact, added value from creative industry & food providers:	<p>- regional networking: -direct engagement with destination business support organisations (DMO, TAs, etc.) with a view to having a section to promote Dark Skies Experiences /Offerings -cooperation with associated partners – transnational networking - learning journeys and other events as forum for networking -peer-to-peer learning and networking across the consortium of partners</p>

To consider:

Should we create our own Dark Sky Rangers program?

- for wilderness guides, SMEs, natural park personnel
- Should we create a certificate for the program, proof of competence?

May potentially be very beneficial as it would create a platform for education, encourage community engagement and the protection of dark skies. We need to create a buy from the whole community so programs can also be built upon in the future. Create/ Supply logo for the business/ website etc. Market Branding

C. Means of delivery (P2)

Themes	Mode of delivery (*To be finalised during P2)
I. Improving knowledge of dark skies science concepts, and technologies and techniques for preserving dark skies.	
Science: light pollution impacts & effects	- self-study modules - webinars / series of webinars
Phenomena of the night skies	- workshops for selected groups - workshops open for all target groups - self-study modules/brochures - webinars with specialists
Dark sky certification	- self-study modules - webinars / series of webinars
Lighting techniques	- self-study modules - webinars / series of webinars - thematic workshop(s) to apply lighting techniques to their own environment
Tourism Logistics	- self-study modules - webinars / series of webinars
II. Enhancing technical capacity in using immersive and other digital technologies	
VR, AR, 360 photography & video: practical uses and concrete examples in tourism and marketing	- workshops for selected groups - workshops open for all target groups - leaflet/brochure/guidebook/ handbook
Learning differences between technologies, restriction of use e.g., light, motion	- events for testing and showcasing technologies - leaflet/brochure/guidebook/handbook
Testing of technologies as base for ideation	- events for testing and showcasing technologies - workshops for selected groups
III. Marketing awareness and skills and networking for regional impact	
Dark sky concept in product - service design	- 1:1 sessions - webinars / series of webinars - seminars / series of seminars - thematic workshops for selected groups
Storytelling as added value in tourism offerings	- webinars / series of webinars - thematic workshop(s)
Storytelling as a competitive edge in tourism offerings	- webinars / series of webinars - thematic workshop(s)
Regional networking for regional impact	- regional events
Transnational networking for regional impact	- Learning journeys as forum for networking

To consider:

Economic opportunities & Benefits: Dark sky tourism is a niche tourism sector, provide case study(ies) or examples.

Sustainable tourism practices: highlight the importance of responsible tourism, promoting low impact on practices, while also raising awareness on light pollution.

Resources/ Material provided on the course: comprehensive resource such as handbooks, reference guide covering key concepts, offering best practices and tips related to Dark skies tourism could be provided (local dark sky destination, stargazing techniques & sustainable tourism practices).

Practical tools: this could include observation guides, sustainable tourism checklists or sample itineraries with our logo in place.

Interactive Activities: Field Trips to visit dark sky park where participants can experience stargazing first-hand and learn about the local ecosystem and cultural heritage. Group Discussions to share experiences and ideas and challenges related to dark sky tourism.

Evaluation & Feedback: follow up with participants ensure they have gained the knowledge they require, provide additional support. Review the feedback to see if training program needs alterations/updating in the future.

D. Synergies across work packages to consider for Capacity Building Programme

(P2) WP1.

A1.3 Implementation of the capacity building programme in the different areas based on the needs of the target audience (P3 – P5).

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).

WP2.

A2.4 Learning journey learnings (P1 – P3)

Based on the work in WP1, the learning journey in each region in the adoption of the relevant technology solution will be mapped and the learning journey will be reported upon for the relevant technology solutions.

A2.5 Development, Roll-out, promotion and marketing of all technology outputs (P1 – P5)

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.

Deliverables

▪ **D2.5.1 Regional Workshops and Events (P3)**

Organising Capacity Building Workshops for SMEs in Immersive Technology Development Processes and Service Design Processes.

A2.6 Adopting and adapting Service Design methodologies to support SMEs in developing their service/product for the Dark Sky's Tourism Economy (P1 - P5)

Developing and implementing the adoption of Service Design in SMEs as a tool for Innovation and/or marketing.

Deliverables

▪ **D.2.6.1 Regional Workshops and Events (P3)**

Organising Capacity Building Workshops for SMEs in Service Design Processes.

WP3:

Activity 3.3 Regional workshops (P3 - P4)

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.

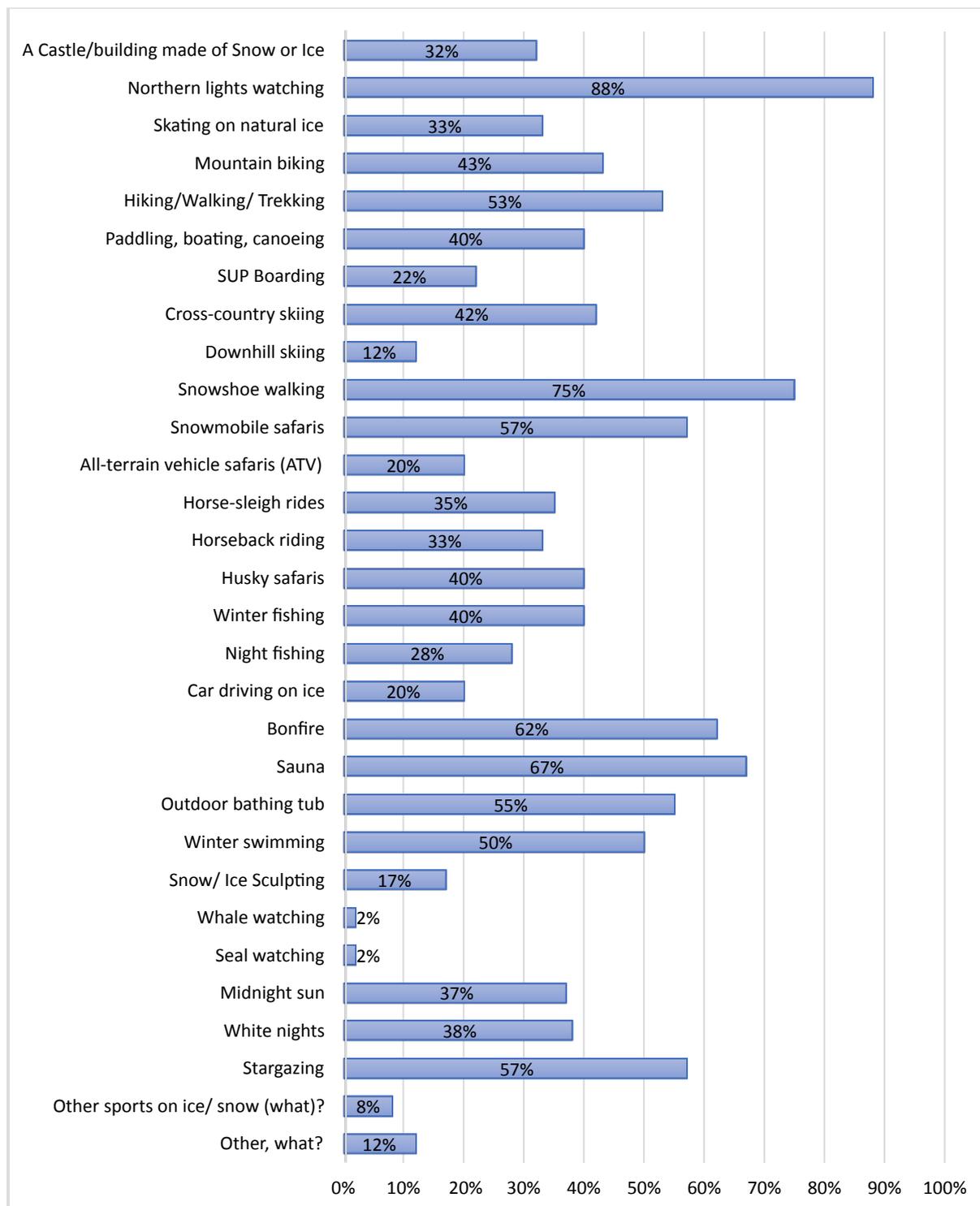
Deliverables

▪ **D.3.3.1 Minutes of workshops with list of agreed actions (P4).**

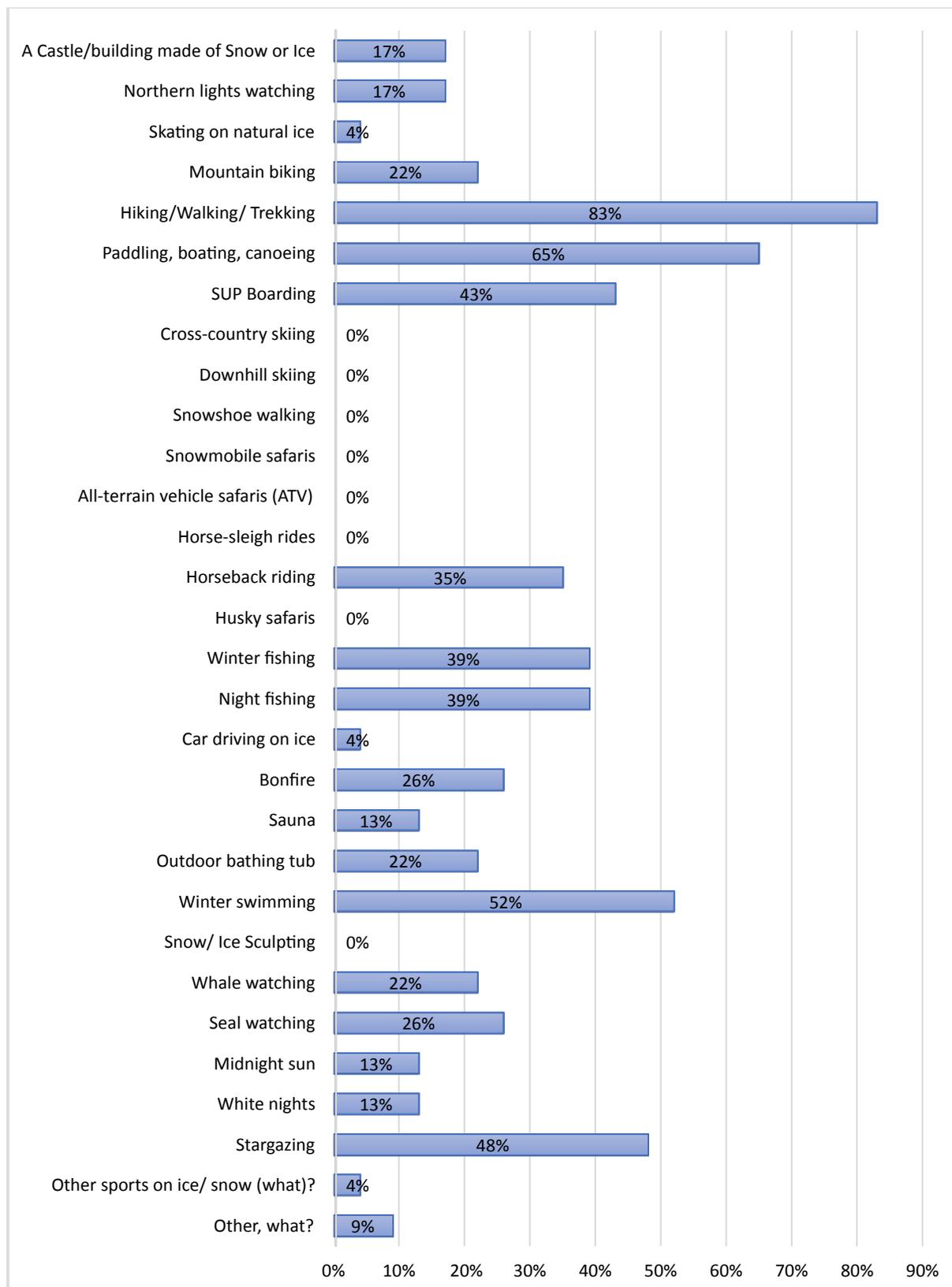
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M. Claudia Tom Dieck & Dai-in Danny Han, 2022. The role of immersive technology in Customer Experience Management, *Journal of Marketing Theory and Practice*, 30:1, 108-119, DOI: 10.1080/10696679.2021.1891939.

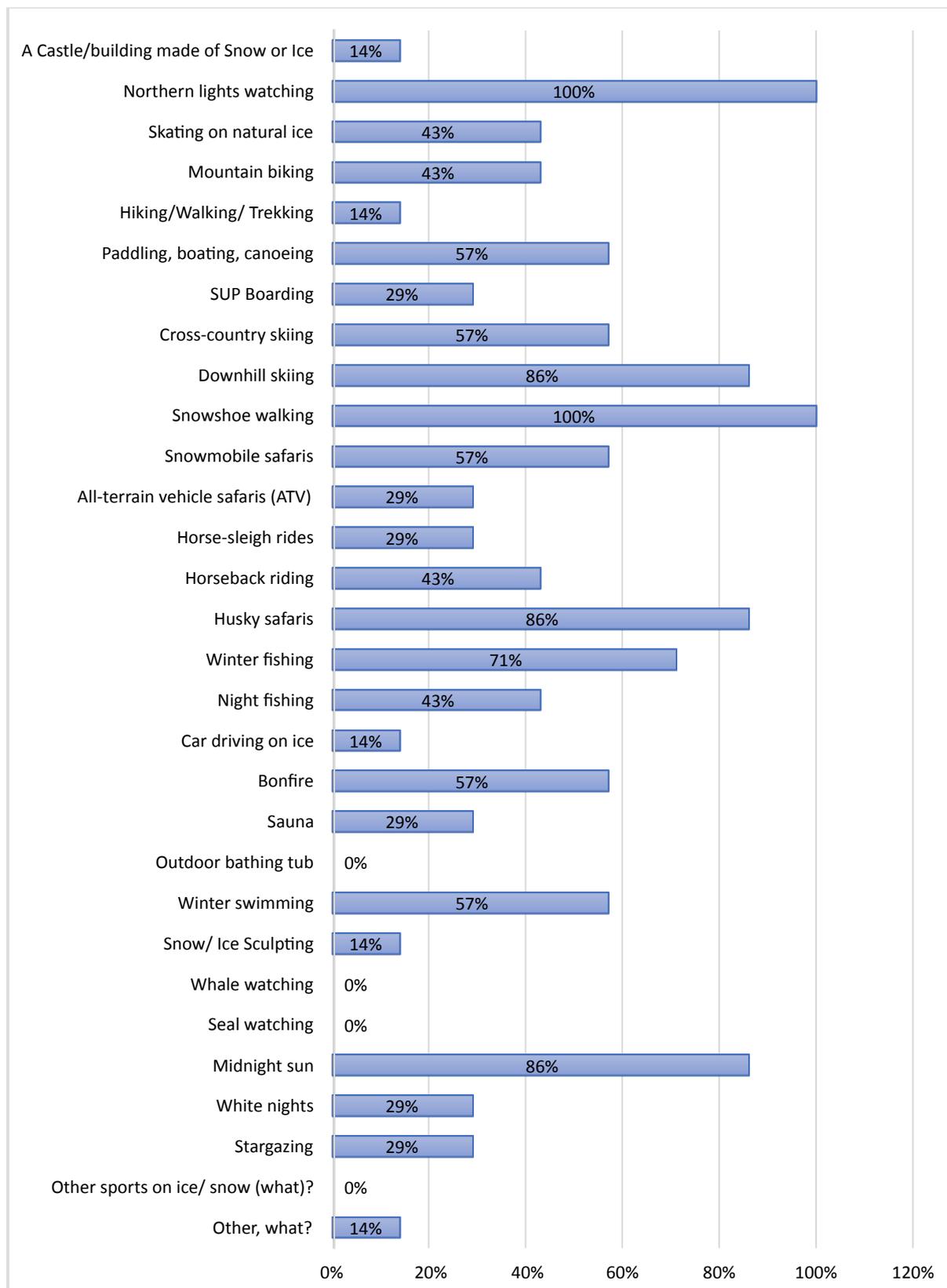
Annex 1. Activities could be offered in companies that could benefit from more tourists during dark months of year in Finland



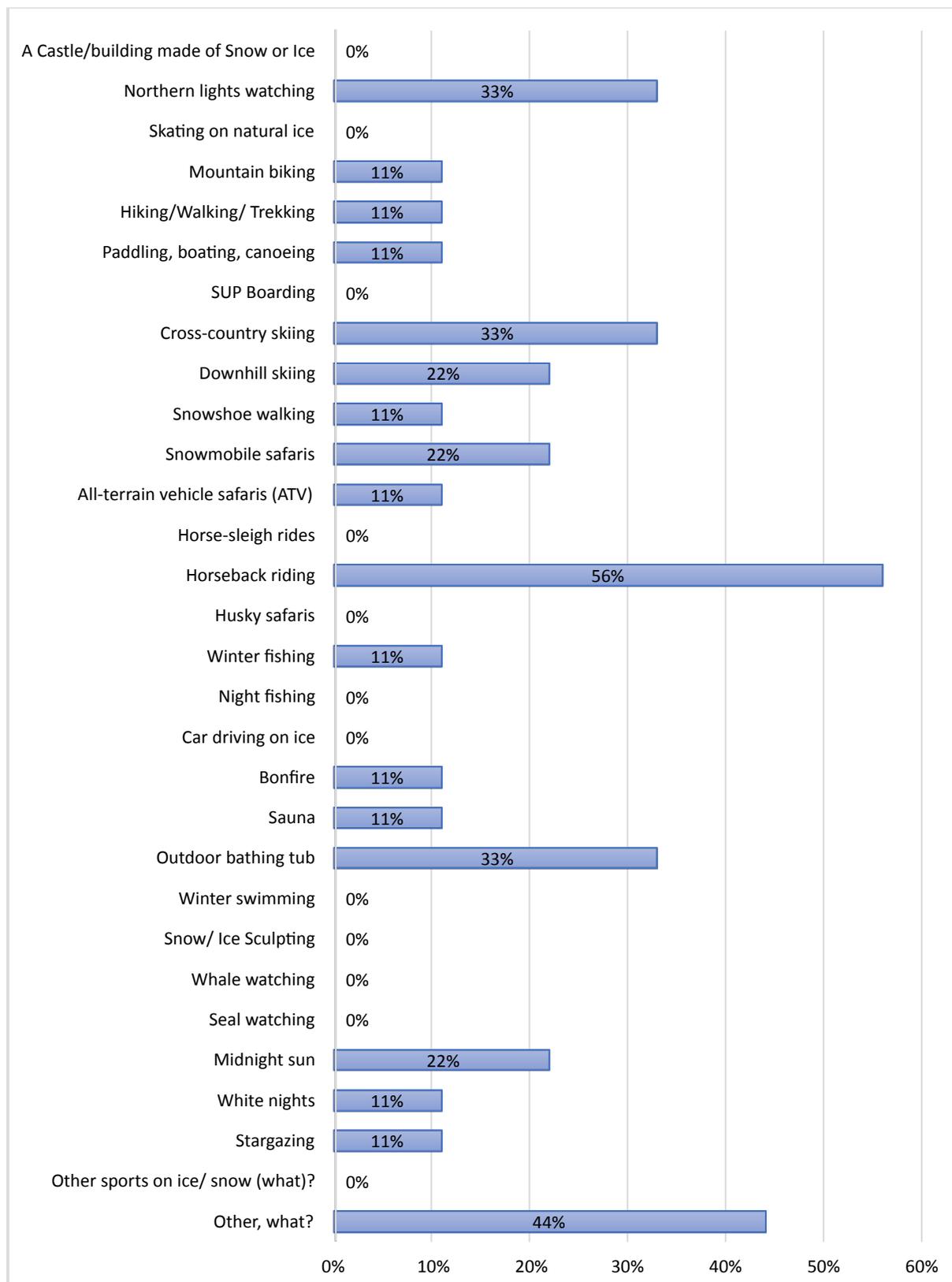
Annex 2. Activities could be offered in companies that could benefit from more tourists during dark months of year in Ireland



Annex 3. Activities could be offered in companies that could benefit from more tourists during dark months of year in Norway



Annex 4. Activities could be offered in companies that could benefit from more tourists during dark months of year in Iceland



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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