



Chapter 12

Socio-economics, Tourism and Recreation

Table of contents

Socio-economics, Tourism and Recreation	3
12.1 Introduction	3
12.2 Legislation, Policy and Guidance	3
12.2.1 Legislation	3
12.2.2 National Policy	3
12.2.3 Local Policy	3
12.2.4 Guidance	4
12.3 Consultation	4
12.4 Assessment Methodology and Significance Criteria	5
12.4.1 Study Area	5
12.4.2 Desk Study	5
12.4.3 Significance Criteria	6
12.4.4 Limitations to Assessment	6
12.5 Baseline Conditions	6
12.5.1 Socio-economics	6
12.5.2 Tourism	8
12.5.3 Recreation	9
12.6 Potential Effects	10
12.6.1 Mitigation by Design and Embedded Mitigation	10
12.6.2 Construction	10
12.6.3 Operation	11
12.6.4 Wider Effects	13
12.6.5 Recreation Enhancements	13
12.6.6 Non-Domestic Rates	13

12.7 Mitigation	13
12.7.1 Construction Mitigation	13
12.7.2 Operation Mitigation	13
12.8 Residual Effects	13
12.8.1 Construction	13
12.8.2 Operation	14
12.9 Cumulative Assessment	14
12.9.1 Construction	14
12.9.2 Operation	14
12.10 Summary	15
12.11 References	15

List of Figures

Figure 12.1 Socio-economics, Tourism and Recreation Receptors
Figure 12.2 Proposed Bike Facilities

List of Technical Appendices

None



Chapter 12

Socio-economics, Tourism and Recreation

12.1 Introduction

1. This chapter of the Environmental Impact Assessment (EIA) Report evaluates the effects of the Proposed Development on socio-economics, tourism and recreation.
2. The assessment has been undertaken on the basis of the Proposed Development consisting of up to eight turbines with each turbine having an electricity generating output of up to 5.6MW, and therefore having a potential total installed capacity of approximately 45MW.
3. This chapter is intended to be read as part of the wider EIA Report, with particular reference to **Chapter 5: Landscape and Visual, Chapter 9: Noise, Chapter 11: Access, Traffic and Transport, Chapter 13: Other Issues** and **Figure 12.1: Socio-economics, Tourism and Recreation Receptors**.

12.2 Legislation, Policy and Guidance

4. This section details the legislation, national policy and local policy that is relevant to the Proposed Development.

12.2.1 Legislation

5. Land Reform (Scotland) Act 2003 (as Amended) The land reform act provides a right of access for walkers, horse-riders and cyclists to most land and inland water. These legal rights are based on the principle of responsible access, with obligations both on the access users and on the managers of the land.
6. The legislation also states that local authorities develop a Core Paths plan to establish and designate a network giving the public reasonable access throughout their area. Such a system of paths may include footways, footpaths, cycle tracks and bridleways. Rights of access and Core Paths are considered as part of the recreation and tourism assessment within this chapter.

12.2.2 National Policy

12.2.2.1 National Planning Framework 3 (NPF3) (Scottish Government, 2014a)

7. The National Planning Framework 3 (NPF3) outlines the long-term spatial Government Economic Strategy for Scotland. The NPF3 emphasises the Scottish Government's commitment to increasing sustainable economic growth across all areas of Scotland. It also provides an Action Programme which identifies the implementation of the strategy.
8. The NPF3 states that one of Scotland's visions is to become a world leader in low carbon energy generation, including onshore energy generation. It identifies the key sectors in Scotland as energy; food and drink; life sciences; tourism; financial and business services; universities and the creative industries.

12.2.2.2 Scottish Planning Policy (SPP) (Scottish Government, 2014b)

9. The SPP sets out national planning policies that reflect Scottish Ministers' priorities for operation of the planning system and for development and use of land. The Scottish Government's central purpose is to focus government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth. A core value of the planning service is to facilitate "sustainable economic growth, particularly the creation of new jobs and the strengthening of economic capacity and resilience within communities."
10. The Supporting Business and Employment policy identified that the planning system should:
 - "promote business and industrial development that increases economic activity while safeguarding and enhancing the natural and built environments as national assets"; and
 - "give due weight to net economic benefit of proposed development."
11. The SPP also states that "Proposals for business, industrial and service uses should take into account surrounding sensitive uses, areas of particular natural sensitivity or interest and local amenity and make a positive contribution towards placemaking."
12. With regard to tourism, the SPP Promoting Rural Development states that "Plans should set out a spatial strategy which... promotes economic activity and diversification, including, where appropriate, sustainable development linked to tourism and leisure, forestry, farm and croft diversification and aquaculture, nature conservation, and renewable energy developments, while ensuring that the distinctive character of the area, the service function of small towns and natural and cultural heritage are protected and enhanced."

12.2.2.3 Scotland's Economic Strategy (Scottish Government, 2015)

13. Scotland's Economic Strategy stated one of the four priorities for sustainable growth is "Investing in our people, infrastructure and assets" in which the Scottish Government will prioritise investment to ensure that "Scotland protects and nurtures its nature resources and captures the opportunities offered by the transition to a more resource efficient, lower carbon economy." Another action within the Scotland's Economic Strategy is to "Invest in Scotland's infrastructure to help Scottish businesses to grow, innovate, and create good quality employment opportunities."

12.2.3 Local Policy

12.2.3.1 Dumfries and Galloway Local Development Plan 2 (Dumfries and Galloway Council, 2019)

14. The following Local Development Plan policies are relevant to the socio-economics, tourism and recreation assessment:
 - Policy OP1 Development Considerations: includes the promotion of sustainable development by "assisting the development of the local economy through sustainable economic growth."
 - Policy ED10 Galloway and Southern Ayrshire Biosphere: the policy states that "The Council supports the designation and aims of the Biosphere and will encourage development that demonstrates innovative approaches to sustainable communities and the economy, and supports the enhancement, understanding and enjoyment of the area as a world class environment. Development must be appropriate to the role of the different zones within the Biosphere."
 - CF4 Access Routes: states that "Development proposals should not impact adversely on any of the ... access routes and Core Paths." The policy also includes "New development should consider access issues at an early stage of the design process and, where appropriate, incorporate new and enhanced access opportunities, linked to wider access networks and green networks."
 - IN1 Renewable energy: Dumfries and Galloway Council "will support development proposals for all renewable energy generation and/or storage which are located, sited and designed appropriately." It also states the requirement for any development to assess the impact on tourism, recreational interests, public access and net economic impact.
 - IN2 Wind Energy: Dumfries and Galloway Council "will support wind energy proposals that are located, sited and designed appropriately." It also states the requirement for the socio-economic benefits, cumulative impacts, tourism, recreational interests and public access impacts to be considered for proposed developments.

12.2.3.2 Dumfries and Galloway Core Paths Plan

15. Dumfries and Galloway has designated Core Paths, which are key public access routes, within their jurisdiction. A map showing the location of the Core Paths is available on the Dumfries and Galloway website (Dumfries and Galloway Council, 2020).

12.2.4 Guidance

16. There is no specific guidance available on approaches to assessing the effects of a proposed onshore windfarm development on socio-economics, tourism and recreation. The methodology used has been based on professional experience and draws on industry reports on the sector including, for example:

- Onshore Wind: Economic Impacts in 2014 (RenewableUK, 2015); and
- Economic benefits from onshore windfarms (BVG Associates, 2017).

12.3 Consultation

17. This section considers the scoping responses that form part of the scoping opinion and shows where the responses have been addressed in this chapter. A list of the consultees, their responses and how they have been addressed are summarised in **Table 12.1**.

Consultee	Response	Action
Dumfries and Galloway Council – Access Officer	<p>The site is affected by a Core Path recorded in the Dumfries and Galloway Core Paths Plan. Core Path No.39 runs through the proposed site. This route is also recorded as the Romans and Reivers Trail, which is promoted as one of Scotland’s Great Trails.</p> <p>The developer should ensure access remains possible along the Core Path at all times during the construction phase of the development.</p>	<p>Part of Core Path 39 (Ae Forest Large Circular), Romans and Reivers Long Distance Route, Regional Cycle Route 10, Caledonian Cycleway and Locharbriggs-Beattock local cycle route would be upgraded and used for construction access for the Proposed Development. In addition, power transmission and control cables from the Site to the operational Harestanes Windfarm substation/control building would be laid in a trench adjacent to this path within the Site Boundary.</p> <p>An Access Management Plan (AMP) would be prepared as part of the Construction Environmental Management Plan (CEMP) in order to ensure access for users of the Core Path 39 (Ae Forest Large Circular), Roman and Reivers Long Distance Route, Regional Cycle Route 10, Caledonian Cycleway and Locharbriggs-Beattock local cycle route is maintained throughout the construction period. Occasional temporary local diversions may be required to be implemented to facilitate the construction as described in Section 12.6.1.</p> <p>The CEMP would be based on the Outline CEMP presented in Appendix 4.1: Outline Construction Environmental Management Plan.</p> <p>Section 12.6 of this chapter provides further detail on the potential effects on recreational receptors and Section 12.7 presents the proposed mitigation measures.</p>
Dumfries and Galloway Council	There are a number of ‘Core’ paths including a National Cycle Route that	A CEMP and AMP would be drafted by the Principal Contractor in order to ensure maintained

Consultee	Response	Action
– Roads Department	run through or adjacent to this site. This area is widely used by walkers and by mountain bikers as one of the popular ‘7 Stanes’ centres and there is a Café, Bike Shop and car parks at the Ae Forestry and Land Scotland offices. It would be appropriate that accommodations and mitigations be made to ensure the safety of walkers and cyclists during construction works, and such accommodations and mitigations should meet with the approval of the Councils’ Access Team and the Sustainable Travel Team.	<p>access and safety for users of Core Path 39 (Ae Forest Large Circular), Roman and Reivers Long Distance Route, Regional Cycle Route 10, Caledonian Cycleway and Locharbriggs-Beattock local cycle route. The AMP would be submitted and approved by the Dumfries and Galloway Council Access Team and Sustainable Travel Team prior to the commencement of construction works.</p> <p>The CEMP would be based on the Outline CEMP presented in Appendix 4.1: Outline Construction Environmental Management Plan.</p> <p>Section 12.6 of this chapter provides further detail on the potential effects on these receptors and Section 12.7 presents the proposed mitigation measures.</p>
Scottish Rights of Way and Access Society (ScotWays)	No comments to make at this time.	No action is required.
British Horse Society	<p>Suggestion that the Proposed Development could provide “<i>alternative multi-use (catering for walkers, cyclists, horse riders and all abilities) routes be provided at all stages</i>” and keep the disruption to recreation to a minimum.</p> <p>The consultee noted that “<i>wind farm developers should work with local recreational groups to ensure that recreational amenity after construction is hugely facilitated for both local people and tourists.</i>” A link of the Scottish Outdoor Access Design Guide has been attached to the scoping opinion for the Applicant to consider.</p> <p>The consultee also commented that “<i>SPR [should] refer to horse riders and all abilities access takers in their literature and therefore become more inclusive and in keeping with the multi-use spirit of the Land Reform (Scotland) 2003 Act.</i>” It is also noted that “<i>equestrianism is worth £650 million to the Scottish economy annually.</i>”</p>	<p>Disruption to public access would be kept to a minimum during the construction of the Proposed Development. An AMP would be prepared as part of the CEMP to ensure access is maintained where possible.</p> <p>The assessment has considered the potential effects of the Proposed Development on recreational amenity. A number of recreational enhancement measures are currently being considered and would be progressed as part of the AMP. Recreational groups would be consulted regarding these enhancements if required.</p> <p>A potential enhancement includes promoting horse-riding routes around the proposed windfarm using existing and upgraded forest tracks.</p> <p>The assessment has considered potential effects on formal and informal users, including horse riders.</p> <p>Section 12.6 of this chapter provides further detail on the potential effects on horse riders and Section 12.7 the proposed mitigation and potential enhancement measures.</p>

Table 12.1: Consultation Responses

12.4 Assessment Methodology and Significance Criteria

12.4.1 Study Area

18. The socio-economic, recreation and tourism assessment has been based on industry best standards and professional judgement.
19. The 'local level' Study Area for the socio-economic assessment is the administrative area of Dumfries and Galloway. Scotland is the 'regional level' Study Area for the assessment of socio-economics impacts.
20. The tourism and recreation assessments focus on a 15km and 5km Study Area respectively, in order to capture any receptors most likely to be affected by the Proposed Development.
21. The cumulative assessment of effects considers other developments within 30km of the Proposed Development for socio-economics, tourism and recreation in accordance with the methodology set out in **Chapter 2: EIA Process and Methodology**. A 30km Study Area has been used to capture the potential cumulative effects that may arise from the zone of influence from the Proposed Development (15km) and a cumulative scheme (15km).

12.4.2 Desk Study

22. A desk-based baseline data collection exercise has been undertaken, which included a review of available information in order to determine baseline conditions. The following data sources have been reviewed:
 - Ordnance Survey Mapping;
 - National Records of Scotland;
 - Office for National Statistics NOMIS;
 - Dumfries and Galloway Council Core Paths map;
 - Office of National Statistics;
 - Scottish Index of Multiple Deprivation 2016;
 - Scottish Tourism Alliance;
 - VisitScotland;
 - Walkhighlands Website;
 - Scotland's Great Trails website; and
 - Sustrans website.

12.4.2.1 Scope of the Assessment

23. The following effects of the Proposed Development have been considered in the assessment, in accordance with the EIA Scoping Report and EIA Scoping Opinion:
 - Spend per annum, estimated job generation and gross value added (GVA) during construction and operation;
 - Direct and indirect effects on tourism during construction and operation;
 - Direct and indirect effects on recreation (including for example rights of way, Core Paths and other routes) during the construction and operation; and
 - Cumulative effects on employment and tourism in conjunction with other developments.
24. The impacts of the Proposed Development are considered at varying spatial levels according to the nature of the impact as described in **Section 12.4.1**.

12.4.2.2 Assessment of Socio-economics Effects

25. The assessment of the generation of employment opportunities, spend per annum and GVA has been based on the RenewableUK research assumptions and the scale and size of the Proposed Development. Research

undertaken by BVG Associates on the economic benefits from onshore windfarms has also been considered as part of the assessment.

26. Based on the RenewableUK study, the weighted average construction cost of an onshore windfarm development was calculated to be approximately £1.32 million per MW installed capacity. The study suggested that for the construction of an onshore windfarm development that there is one employee per £137,942 (2015 figures) in turnover and a GVA / Turnover rate of 0.432. The RenewableUK study provides an assumed regional breakdown of construction cost spend as stated in **Table 12.2**.

Geographical Region	Regional Breakdown of Construction Cost Spend (%)
Local (Dumfries and Galloway)	12%
Scotland	36%
UK	47%
Outside the UK	53%
Total for the Development	100%

Table 12.2: Construction spend estimate (RenewableUK, 2015)

27. For the operational and maintenance phase, an assumed average cost of approximately £59,867 per MW installed capacity per annum has been applied, as well as the average turnover per employee of £121,935 and the GVA / Turnover rate of 0.430. These assumptions are based on the outcomes of the 2015 research undertaken by RenewableUK which also provides a regional breakdown of operational and maintenance cost spend, as set out in **Table 12.3**.

Geographical Region	Regional Breakdown of Operational and Maintenance Cost Spend (%)
Local (Dumfries and Galloway)	42%
Scotland	58%
UK	87%
Outside the UK	13%
Total for the Development	100%

Table 12.3: Operation and maintenance spend per annum (RenewableUK, 2015)

28. The results of the 2017 BVG Associates research have been considered in the assessment. Based on the eight windfarms considered, with a combined capacity of 474MW, the research indicates that the development and construction represent a total investment of around £1.6 billion, which is almost £3.4 million per MW. This research provides a benchmark of investment cost per MW.
29. The Applicant also has provided a breakdown of previous spend in Dumfries and Galloway¹, including:
 - Hotels - £128,000;
 - Private leasing - £13,000;
 - Civil engineering - £500,000;
 - Technical specialist services - £245,000;
 - Fencing - £50,000;
 - Tyres and garage services - £15,000;
 - Public relations and design - £10,000;
 - Council services - £380,000;
 - Building merchants - £50,000;
 - Construction - £139,000;
 - Forestry services - £2,000,000; and
 - Surveying - £100,000.

¹ Comprises Kilgallioch, Ewe Hill and Glen App Windfarms during Development and Construction

12.4.2.3 Assessment of Tourism Effects

30. A qualitative assessment has been undertaken based on the changes in availability, accessibility, severance, and amenity on tourist receptors (tourist attractions and tourist accommodation) during the construction and operation of the Proposed Development. For the purpose of this assessment, amenity is considered to be a combination of visual amenity, air quality and noise levels experienced by users of tourist attractions.
31. A qualitative assessment of the impacts of the Proposed Development on visitors' decisions to holiday in the Study Area has also been undertaken based on Scotland specific research, such as:
 - VisitScotland Position Statement (VisitScotland, 2014): and
 - BiGGAR Economics research document 'Wind Farms and Tourism Trends in Scotland' (BiGGAR Economics, 2017).

12.4.2.4 Recreation

32. A qualitative assessment has been undertaken to assess the effect of the Proposed Development on informal and formal recreation facilities and activities, including designated routes, within 5km of the Site Boundary.
33. The assessment considered changes in accessibility, severance, and amenity on the recreational receptors during construction and operation of the Proposed Development. For the purpose of this assessment, amenity is considered to be a combination of visual amenity, air quality and noise levels experienced by users of the recreational facilities and activities.

12.4.3 Significance Criteria

34. The socio-economics, tourism and recreation assessment has been based on industry best standards and professional judgment. The significance level attributed to each effect has been assessed based on the magnitude of change due to the Proposed Development, and the sensitivity of the affected receptor.
35. The overall significance of the likely socio-economics, tourism and recreation effects has been based on the below.

12.4.3.1 Sensitivity

36. Determining the sensitivity of receptors is based upon the baseline conditions. Specific values in terms of sensitivity are not attributed to the resources / receptors due to their diversity in nature and scale, however the assessment instead takes account of the qualitative (rather than quantitative) 'sensitivity' of each receptor and, in particular, on their ability to respond to change.

12.4.3.2 Magnitude

37. The impact magnitude relates to whether the Proposed Development would result in changes to the receptor and the scale of these impacts. Specific values in terms of magnitude are not attributed to each resource / receptor, however the impact magnitude is considered qualitatively.
38. The duration of impact is also considered, with more weight given to permanent changes than to temporary ones. Temporary effects are considered to be those associated with the construction works, and may be short, medium or long term. Permanent effects are generally those associated with the completed development.

12.4.3.3 Significance

39. The likely significance of an effect takes into consideration the sensitivity of the receptor and the magnitude of an impact and uses the matrix and descriptors of the likely significance of effect set out in **Chapter 2: EIA Process and Methodology**. The descriptors that have been used to determine the level of effects predicted to occur are:
 - Major beneficial or adverse effect – where the Proposed Development would result in a significant improvement (or deterioration) of the existing environment.
 - Moderate beneficial or adverse effect – where the Proposed Development would result in a noticeable improvement (or deterioration) of the existing environment.
 - Minor beneficial or adverse effect – where the Proposed Development would result in a small improvement (or deterioration) of the existing environment.

- Negligible – where the Proposed Development would result in no discernible improvement (or deterioration) of the existing environment.

40. For the purposes of this assessment, a moderate or major effect has been considered significant.

12.4.4 Limitations to Assessment

41. The assessment is based on desk-based studies using a combination of publicly available sources and information provided by consultees. In order to maximise the economic effects associated with the proposed Development, it will be necessary for local contractors to engage with the opportunities that arise and increase awareness of these opportunities.

12.5 Baseline Conditions

12.5.1 Socio-economics

12.5.1.1 Renewable Energy Employment and Investment

42. National Statistics shows that in 2019, wind energy in Scotland accounted for 73.1% (22,326 GWh) of all renewable energy generated, followed by hydro energy with 17.6% (5,362 GWh) (Department for Business, Energy & Industrial Strategy, 2020).
43. The Office for National Statistics (ONS) (ONS, 2019) survey estimated that the onshore wind sector in Scotland had a total turnover of £2.84 billion, including £1.435 billion direct and £1.405 billion indirect turnover in 2017. The survey estimated that there were 5,800 full-time equivalent (FTE) jobs in the onshore wind sector in Scotland in 2017, including 2,300 direct FTE and 3,500 indirect FTE.
44. The RenewableUK study suggests that direct, supply chain and wider economic benefits as a result of the onshore wind sector would provide benefits throughout the UK. The report indicates that the annual cost of operating and maintaining an onshore windfarm ranges from £23,000 to £130,000 per MW installed. The study also indicates the proportion of construction, and operation and maintenance spend in the local area, region, the UK and outside the UK. The average construction and operation and maintenance cost per MW installed, as well as the per employee cost in turnover, turnover rate and GVA for onshore windfarm are also reported in the RenewableUK report. This information informs the socio-economics assessment and is presented **Section 12.6**.
45. The BVG Associates 2017 study of eight onshore windfarms in the south west of Scotland concluded that local windfarm expenditure for the eight onshore windfarms is in three key aspects: local suppliers working on the windfarms; accommodation for workers on the windfarms; and expenditure from community payments, rent and rates. Four main categories account for the overall aggregated development and capital expenditure (local, Scottish and the UK), which are project development and management; turbines; civil works; and electrical works. Meanwhile, the overall aggregated operational expenditure consists of: transmission operations, maintenance and service (OMS); windfarm OMS; and decommissioning. The study also indicates that annual funds from the eight windfarms for distribution by communities was approximately £2.5 million at 2016 prices.
46. The BVG study states that a total of £1,276 million GVA in the UK and a total of £297 million local value added (LVA) has been estimated over the lifetime of the eight windfarms. The study also estimates that the eight windfarms would generate 31,118 UK FTE years including 7,768 local FTE years, as well as generating £814 million UK earning including £194 million local earning over the lifetime of the eight projects. This research has been considered within the socio-economic assessment presented in **Section 12.6**.

12.5.1.2 Population

47. **Table 12.4** provides a breakdown of the different age groups of the Dumfries and Galloway, Scotland and Great Britain population in 2019. Great Britain has been included in the baseline section to provide context for the baseline conditions. Dumfries and Galloway had a smaller proportion of working age population (aged between 16 and 64) when compared to Scotland and Great Britain.

Population Group	Dumfries and Galloway	Scotland	Great Britain
Total Population	148,860	5,463,300	64,903,100
Population aged between 16-64	58.4%	64%	62.5%

Table 12.4: Population and Demography in 2019 (National Records of Scotland, 2019) (NOMIS ,2011)

12.5.1.3 Deprivation

48. The Scottish Index of Multiple Deprivation (SIMD) 2020 (SIMD, 2019) uses a combination of information relating to seven 'domains': income; employment; health; education and skills; housing; geographic areas; and crime to create an overall score of deprivation. Deprivation is scored between SIMD deciles (1 to 10), with Decile 1 being most deprived and Decile 10 being least deprived.
49. The Site is in Mid and Upper Nithsdale Ward, and Mid Nithsdale part (S01007566) on the SIMD website. The SIMD 2020 ranks Mid Nithsdale as Decile 7 with an overall deprivation rank of 4,199. It does not fall within the top 20% most deprived area within Scotland.

12.5.1.4 Economic Activity

50. The NOMIS Job Densities Report (NOMIS, 2020) is available on a Local Authority-wide and sub-regional level basis and indicates the availability of employment and labour demand. As of 2018, the job density levels (i.e. the ratio of total jobs to the population aged 16-64) in Dumfries and Galloway was 0.89. This is higher than both the averages across Scotland (0.82) and Great Britain (0.86) and indicates that there is a higher availability of employment opportunities within Dumfries and Galloway when compared with Scotland and Great Britain.
51. **Table 12.5** shows that the rate of economic activity of working age people in the labour force in Dumfries and Galloway is largely in line with the Scotland and Great Britain rate of economic activity. Meanwhile, the unemployment rate in Dumfries and Galloway is slightly lower than the rate for both Scotland and Great Britain between 2019 and 2020. However, the average gross weekly income in Dumfries and Galloway is also lower when comparing to the Scotland and Great Britain average in 2019.

	Dumfries and Galloway	Scotland	Great Britain
Economic Activity Rate (age 16-64) (2019-2020)	74.1%	74.5%	76.0%
Unemployment Rate (age 16-64) (2019-2020)	2.9%	3.3%	3.9%
Average Gross Weekly Pay for Full-Time Workers (2019)	£480.8	£577.7	£587.0

Table 12.5: Economic Indicators (2019-2020) (NOMIS, 2020)

52. There were estimated to be a total of 57,000 employee jobs in Dumfries and Galloway in 2018, of which 64.9% were full-time and 35.1% were part-time (NOMIS, 2020). **Table 12.6** shows the breakdown of total employees by each industry sector in 2018.

Industry Sector	Dumfries and Galloway (%)	Scotland (%)	Great Britain (%)
B: Mining and quarrying	0.1	1.1	0.2
C: Manufacturing	10.5	7.2	8.1
D: Electricity, gas, steam and air conditioning supply	0.4	0.7	0.5
E: Water supply; sewerage, waste management and remediation activities	1.1	0.8	0.7
F: Construction	5.3	5.5	4.7

Industry Sector	Dumfries and Galloway (%)	Scotland (%)	Great Britain (%)
G: Wholesale and retail trade; repair of motor vehicles and motorcycles	17.5	13.9	15.2
H: Transportation and storage	4.4	4.3	4.8
I: Accommodation and food service activities	8.8	8.1	7.6
J: Information and communication	0.9	3.2	4.2
K: Financial and insurance activities	1.1	3.5	3.5
L: Real estate activities	1.6	1.3	1.7
M: Professional, scientific and technical activities	7.0	7.1	8.7
N: Administrative and support service activities	5.3	8.2	9.1
O: Public administration and defence; compulsory social security	4.4	6.3	4.3
P: Education	8.8	7.8	8.9
Q: Human health and social work activities	19.3	15.7	13.2
R: Arts, entertainment and recreation	2.6	2.8	2.5
S: Other service activities	1.8	2.1	2.0

Table 12.6: Proportion of total employees in each industry sector in 2018 (NOMIS, 2020)

53. Overall, the data shows that Dumfries and Galloway supports a broad range of industries. The proportion of total employees across the industry sectors in the Local Study Area are broadly in line with the national average. However, certain industries have a **higher** proportion of total employees than their regional and national averages, including manufacturing (10.5%), wholesale and retail trade; repair of motor vehicles and motorcycles (17.5%), human health and social work activities (19.3%). The latter industry sector is the largest employment industry sector within Dumfries and Galloway.

12.5.1.5 Local Businesses

54. The Forest of Ae is a commercial forest with Adrenalin Uplift providing paid mountain bike uplift and private bike hire services (Adrenalin Uplift, 2020). Ae Forest Bike Shop and Café is located 3km south west of the Site Boundary (see **Figure 12.1: Socio-economics, Tourism and Recreation Receptors**); it provides mechanical service for bikes and a cafe for visitors and mountain bikers.

12.5.1.6 Baseline Socio-economic Context Summary

55. The economic studies referred to indicate that onshore windfarm projects in Scotland are expected to provide a positive impact on the local economy, as well as the UK during both construction and operation.
56. The working age population in Dumfries and Galloway is lower than the regional average. However, the unemployment rate for working age population is also lower than the regional and national rate. This, along with the higher job density level, indicates that Dumfries and Galloway is likely to have a relatively higher availability of economic opportunities when compared with Scotland. The largest employment industry sector in Dumfries and Galloway is human health and social work activities, followed by wholesale and retail trade, repair of motor vehicles and motorcycles. Over 10% of the population also work in the manufacturing sector in Dumfries and Galloway. A

marginally smaller proportion of the population are working in the construction industry in Dumfries and Galloway when compared to Scotland.

57. There are mountain bike and catering businesses located in the Forest of Ae (approximately 3km south west of the Site Boundary); it is assumed the users are predominantly mountain bikers travelling to the area, local residents and tourists.

12.5.2 Tourism

12.5.2.1 Scotland's Tourism Strategy

58. Scotland's Tourism Strategy (Scottish Tourism Alliance, 2012) was launched in 2012 and states that the key attributes of growth for tourism in Scotland are:

- Nature, Heritage and Activities;
- Business Tourism;
- Destination Towns and Cities; and
- Events and Festivals.

59. It also sets out the tourism strategy to deliver an additional £1 billion growth or more in visitor spend to £5.5 - £6.5 billion by 2020. The strategy identifies three main pillars of growth, as well as the global emerging markets. It also identifies the potential assets could be developed in Scotland, such as creating walking and cycling, adventure tourism, food and drink, and local history and culture in rural destinations. Other assets identified as having growth potential include activities and adventure; business tourism; cruises; golf; mountain biking; and sailing.

60. A Review of the Tourism Scotland 2020 Strategy (Scottish Tourism Alliance, 2018) shows that the total overnight visitor spend; total growth markets overnight spend; and tourism turnover have generally been growing between 2012 and 2017.

61. Both Scotland's Tourism Strategy and the Tourism Scotland 2020 Yearly Review have not indicated that windfarm projects are considered to be a barrier to tourism growth.

12.5.2.2 Dumfries and Galloway Regional Tourism Strategy 2016-2020 (Dumfries and Galloway Council, 2016)

62. The tourism strategy aims to increase value of tourism to £330m; increase volume, length of stay and extend tourism season to 2.6m visitors; and increase direct and indirect jobs to 7,300 in Dumfries and Galloway by 2020.

63. The strategy identifies that there are eight sectors of target tourism growth, including: nature-base tourism; outdoor activities; waterfront; art, culture and heritage; food and drink; marine; business tourism; and gardens. It also aims to create and maintain a diverse range of countryside access.

12.5.2.3 VisitScotland Position Statement

64. The Position Statement (VisitScotland, 2014a) states that "*windfarms have a limited impact on visitors' decisions to holiday in Scotland.*" It also indicates that no evidence has been found by the Scottish Parliament's Energy Committee that windfarms have a negative effect on tourism industry. VisitScotland also note that "*Renewable energy brings visitors to Scotland in its own right and encourages them to spend money in our tourism businesses.*"

12.5.2.4 Tourism in Scotland's Region

65. Tourism provides an important contribution to the national, regional and local economies. Key Facts on Tourism in Scotland 2018 (VisitScotland, 2019a) indicates that the sustainable tourism employment in Scotland was approximately 206,600 in 2017, with most jobs created in relation to beverage serving activities; hotels; and amusement and recreation activities. There was approximately £4,127.1 million GVA generated in Scotland in 2017 as a result of tourism.

66. Tourism in Scotland's Regions 2013 (VisitScotland, 2014b) shows that there were 5,300 sustainable tourism jobs in Dumfries and Galloway and approximately £68.1 million GVA generated due to tourism in 2011. Tourism in Scotland's Regions 2016 (VisitScotland, 2017a) shows that for Dumfries and Galloway, there were 6,500

sustainable tourism jobs in 2015 and approximately £132.7 million GVA generated due to tourism in 2014. This indicates that tourism is a growing industry in Dumfries and Galloway.

67. Tourism in Scotland's Regions 2016 (VisitScotland, 2017a) reported that there were 630,000 trips to Dumfries and Galloway from Great Britain in 2016 and 42,000 from overseas, with the average duration of stay being 4.2 and 5.8 nights respectively. The annual average accommodation occupancy rate in Dumfries and Galloway was 52% for hotels, 40% for guest houses and 'bed and breakfasts', and 42% for self-catering accommodation in 2016.

68. Scotland's Visitor Survey 2015 and 2016 (VisitScotland, 2017b) shows that the main reasons that tourists were attracted to Dumfries and Galloway were: the scenery and landscape (63%); "*I have spent a holiday / short break in [Dumfries and Galloway] before and wanted to do so again*" (43%); and "*to get away from it all*" (41%). The most popular activities during their visit in Dumfries and Galloway were:

- Sightseeing (70%);
- Short walk/stroll (61%);
- Visiting historic house, stately home, castle (48%);
- Visiting a beach (44%);
- Visiting a woodland/forest area (43%);
- Visiting a visitor/heritage centre (35%);
- Shopping (33%);
- Visiting a cathedral, church, abbey, religious building (33%);
- Watching wildlife, bird watching (32%); and
- Long walk, hike or ramble (30%);

69. Whilst local data is not available, it is considered that reasons for visiting the local area would be broadly similar, however, it is anticipated there would be an emphasis on mountain bike trails and long distance walking.

12.5.2.5 Tourist Attractions

70. According to VisitScotland, the five major tourist attractions in Dumfries and Galloway are listed in **Table 12.7**. The closest major tourist attraction, Mable Forest, is located approximately 19.6km south of the Site Boundary at its closest point.

Regional tourist attractions	Visitors numbers	Approximate distance to the Site Boundary
Gretna Green Famous Blacksmiths Shop	770,602	35.2km south east
Galloway Forest Park	368,366	38.5km west
Threave Garden	96,357	39.8km south west
Mable Forest	69,496	19.6km south
Dalbeattie Forest	49,823	34.0km south west

Table 12.7: Regional Visitor Attractions (VisitScotland, 2019b)

71. Local tourist attractions within the 15km Study Area (see **Figure 12.1: Socio-economics, Tourism and Recreation Receptors**) have been identified using VisitScotland's database of visitor attractions (VisitScotland, 2019c), other internet searches and consultation response from the Scoping Report. These are presented in **Table 12.8**.

Local tourist attractions	Approximate distance to the Site Boundary
Ae 7stanes Mountain Bike Trails	365m west
Ae 7stanes car park	3km south west
Ae Forest Bike Shop and Cafe	3km south west

Local tourist attractions	Approximate distance to the Site Boundary
Closeburn Castle	7.9km west
Lochmaben Golf Club	8.2km south east
Applegarthtown Wildlife Sanctuary	8.6km south east
Moffat Golf Club	9.0km north east
Cample Line	9.8km west
Moffat Museum	10.1km north east
Dumfries and Galloway Aviation Museum	10.5km south
Simply the Best Destination – Moffat Mill	10.6 north east
Moffat Fishery at the Green Frog / Green Centre and Shopping at the Green Frog / The Green Frog Soft Play	10.7km north east
Thornhill Golf Club	10.7km west
Annandale Cycles	10.9km north east
17 Reasons	10.9km north east
Dalscone Farm Fun	11.0km south
Robert Burns Ellisland Farm	11.1km south west
Lockerble Farmers Market	11.2km south east
Moffat Alpacas	11.4km north east
Morton Castle	11.6km north west
Restore Me: Acupuncture & Reflexology	11.7km north east
Dryfesdale Lodge Visitors' Centre Trust	12.0km south east
Lightshot Photography	12.2km west
Voila Boutique	12.3km north west
The Art Hut	12.4km south east
Heathhall Garden Centre	12.6km south
Dalscone Farm Fun	12.6km south
Dock Park / Ruthwell Cross	12.8km south
Chariots of Fire Equestrian Centre	12.8km east
Lockerbie Golf Course	13.0km south east
Dumfries and Country Golf Club	13.1km south
Tarff Valley Town & Country - Shopping	13.9km south
Drumlanrig Castle	15km north west

Table 12.8: Local Tourist Attractions

72. Tourist accommodation has also been identified within the 15km Study Area using VisitScotland's accommodation database (VisitScotland, 2019d) and other internet searches. The tourist accommodation is listed in **Table 12.9**.

Location	Tourist Accommodation	Approximate distance to the Site Boundary
Ae	One bed and breakfast	7.4km south west
Auldgrith	One inn, one campsite and one self-catering accommodation	7.7 - 9.7km south west
Thornhill	Eight self-catering accommodation, one inn and two hotels	8.9 - 13.7km west
Moffat	Two bothies, two bunkhouses, six hotels, eight guesthouses, 14 self-catering accommodation, five bed and breakfasts, one camping and caravanning club site and one inn	6.1 - 12.1km north east

Location	Tourist Accommodation	Approximate distance to the Site Boundary
Lochmaben	Three self-catering accommodation, one inn, one caravan and camping site and one hotel	5.5 - 9.4km south east
Lockerbie	Four hotel and one bed and breakfast	11.4 - 12.2km south east
Boreland	One guesthouse	12.6km east
Dumfries	Five self-catering accommodations, six hotels, six bed and breakfasts and five guesthouses	10.5 - 14.8km south west and south

Table 12.9: Local Tourist Accommodation

12.5.2.6 Summary of Baseline Tourism Context

73. Tourism is a growing industry in Dumfries and Galloway with tourists travelling from Great Britain and overseas. The majority of the tourists are attracted to Dumfries and Galloway's scenery and landscape.
74. There are no main regional tourist attractions based on the most visited tourist attractions on the VisitScotland website located within the Study Area. However, numerous local tourist attractions and tourist accommodation are located in the Study Area. The local tourist attractions include Ae 7stanes mountain biking, golf courses, museums and castles. The majority of the receptors surround Forest of Ae, with the closest local tourist attraction located in Forest of Ae, and closest tourist accommodation located approximately 5.5km south east of the Site. This suggests that the area surrounding the Proposed Development is popular with tourists.

12.5.3 Recreation

75. A number of formal and informal recreational routes are located within the 5km Study Area. These are presented in **Table 12.10**.

Recreational Routes	Approximate distance to the Site Boundary
Core Path 39 (Ae Forest Large Circular)	within the Site Boundary
Core Path 521 (Closeburn to Moffat)	within the Site Boundary
Romans and Reivers Long Distance Route	within the Site Boundary
Forest tracks within Forest of Ae	within the Site Boundary
Regional Cycle Route 10	within the Site Boundary
Caledonian Cycleway	within the Site Boundary
Heritage path: Beattock Drove Roads, Forest of Ae heritage path	within the Site Boundary
Heritage path: Daer Water to Kirkpatrick	within the Site Boundary
Locharbriggs-Beattock local cycle route	within the Site Boundary
Ae 7Stanes Mountain Bike Trails	365m west
Forestry and Land Scotland Trails: Ae Naze Trail	1.8km west
Forestry and Land Scotland Trails: Water of Ae Riverside Trail	1.8km west
Forestry and Land Scotland Trails: Green Hill Trail	1.8km west
Core Path: Dalswinton to Ae	3.2km west
Core Path: Annandale Way	3.2km east
The Annandale Way Long Distance Route	3.2km east
Core Path: Barony to Parkgate	3.4km south

Table 12.10: Recreational Routes (Dumfries and Galloway Council, 2020; Heritage Paths, 2020; walkhighlands, 2018)

76. There are several recreational facilities and activities located in the 5km Study Area, including:
- Forest of Ae (within the Site Boundary);
 - Ae Bike Shop and Café (approximately 3km south west of the Site Boundary); and
 - Forest of Ae car park (approximately 3km south west of the Site Boundary).
77. Based on knowledge of the Site, it is understood that deer stalking is also undertaken within the Site Boundary.

12.6 Potential Effects

78. This section outlines the potential effects during the construction and operation of the Proposed Development, including embedded mitigation measures.

12.6.1 Mitigation by Design and Embedded Mitigation

79. The following section details good practice mitigation measures that would be implemented as part of the construction and operation of the Proposed Development.

12.6.1.1 Embedded Mitigation during Construction

80. A CEMP would be prepared by the principal contractor and agreed with Dumfries and Galloway Council prior to the start of construction. The Outline CEMP (see **Appendix 4.1: Outline Construction Environmental Management Plan**) would form the basis of the CEMP. The CEMP would include measures for the principal contractor to work proactively with contractors and suppliers to provide employment opportunities in the local area. It is anticipated that the principal contractor would hold a local 'meet-the-buyer' open day. This would provide an opportunity for local contractors and suppliers to present their business to the principal contractor. The CEMP would also include public liaison (e.g. public notices) that would be issued prior to the commencement of construction works informing local residents and businesses of dates and durations of the works.
81. The CEMP would include an AMP which would be agreed in consultation with the Dumfries and Galloway Council Access Team and Sustainable Travel Team. The AMP would ensure continued access to Core Path 39 (Ae Forest Large Circular), Romans and Reivers Long Distance Route, Regional Cycle Route 10, Caledonian Cycleway and Locharbriggs-Beattock local cycle route. However, occasional temporary local diversions might be implemented in order to facilitate construction. Areas immediately surrounding the construction activities may be temporarily diverted during construction for informal recreational activities such as walking, cycling, horse riding and deer stalking. The area and duration of such restrictions would be kept to a minimum as is required for the work to be conducted safely and efficiently. In addition, in keeping with good practice for construction sites, notices would be placed in prominent locations around the Site with details of any areas with restricted access. The diversions and restricted access are not anticipated to be in place throughout the full 12 months of the construction period, but only during specific phases of the construction period.

12.6.1.2 Embedded Mitigation during Operation

82. When maintenance activities are undertaken during the operation of the Proposed Development, appropriate safety measures including adequate warning signs and exclusion areas would be required to ensure safety for walkers, cyclists, horse riders and deer stalkers. There may be limited occasions where; Core Path 39 (Ae Forest Large Circular), Roman and Reivers Long Distance Route, Regional Cycle Route 10, Caledonian Cycleway and Locharbriggs-Beattock local cycle route may need to be diverted during some specialist maintenance works. This would depend on the nature of activity and is anticipated to be an infrequent.

12.6.2 Construction

12.6.2.1 Socio-economics

83. The Proposed Development includes eight turbines with a capacity of around 5.6MW each, giving a combined generating capacity of approximately 45MW. Therefore, using assumptions in the 2015 RenewableUK research,

(£1.32 million per MW installed capacity) it is estimated that total construction spend for the Proposed Development would be approximately £59.4 million.

84. According to the research by RenewableUK, on average, 47% of the construction costs are spent in the UK, 36% is spent in the Scottish economy and 12% spent directly in the local area. **Table 12.11** summarises the construction spend across each geographical region.

Geographical Region	Region Breakdown	Estimated Spend
Dumfries and Galloway	12%	£7,128,000
Scotland	36%	£21,384,000
UK	47%	£27,918,000
Outside UK	53%	£31,482,000
Total for the Proposed Development	100%	£59,400,000

Table 12.11: Projected Construction Spend. Source: WSP calculations based on RenewableUK assumptions (RenewableUK, 2015)

85. As shown in **Table 12.11** the Proposed Development is estimated to generate approximately £59.4 million of construction spend, of which, approximately £7.1 million and £21.4 million are anticipated to benefit the local and Scottish economy respectively.

86. The RenewableUK research also indicates that, on average, there is one employee per £137,942 in turnover and a GVA² / Turnover rate of 0.432. Using these assumptions, employment generated by the Proposed Development and the amount of GVA contribution can be estimated based on the construction spend and is presented in **Table 12.12**.

Geographical Region	Estimated Turnover	Estimated Jobs Generated	GVA
Dumfries and Galloway	£7,128,000	52	£3,079,296
Scotland	£21,384,000	155	£9,237,888
UK	£27,918,000	202	£12,060,576
Outside UK	£31,482,000	228	£13,600,224
Total for the Proposed Development	£59,400,000	431	£25,660,800

Source: WSP calculation based on RenewableUK assumptions (RenewableUK, 2015)

Table 12.12: Estimated Job Generation and GVA During Construction

87. As shown in **Table 12.12**, the Proposed Development is estimated to generate 52 jobs in Dumfries and Galloway and GVA contributions of £3.1 million. Within Scotland, the Proposed Development is estimated to generate 155 jobs during construction and provide GVA contributions of £9.2 million.

88. The research undertaken by BVG Associates suggests investment of £3.4 million per MW installed capacity for the development, commissioning and operation of an onshore windfarm. This number is higher than the research undertaken by RenewableUK, which indicates a figure of £1.5 million per MW installed capacity. The assessment of the Proposed Development has used the RenewableUK figures and therefore provides a precautionary scenario in relation to the jobs generated during the construction of the Proposed Development.

89. Based on the expected scale of employment generation and GVA it is anticipated that the Proposed Development would have a direct, temporary, short-term (12 months) **Minor Beneficial** effect on socio-economic receptors in Dumfries and Galloway and a direct, temporary, short-term **Negligible** effect in Scotland.

² Gross Value Added is the most commonly used measure in economic impact assessments of sectors, organisations and public policy.

90. Local businesses in the vicinity of the Proposed Development include the Ae Forest Bike Shop and Café and Adrenalin Uplift. As detailed in **Chapter 11: Access, Traffic and Transport**, the construction of the Proposed Development would lead to increased traffic flows on the local road network, with a peak of 106 average daily movements (see **Table 11.10**). However, there would still be spare road capacity on the surrounding road network (see **Table 11.12**). In addition, there would be no road closures or diversions associated with the construction works. The construction of the Proposed Development would not directly impact on the 7stanes bike trails and they would remain open for the entirety of the construction period. The construction of the Proposed Development would directly affect Core Path 39 (Ae Forest Large Circular), Romans and Reivers Long Distance Route, Regional Cycle Route 10, Caledonian Cycleway and Locharbriggs-Beattock local cycle route; however, access would be maintained throughout the construction period with local diversions implemented where required. As discussed below, it is anticipated that there would be a minor adverse effect on amenity for these receptors. Therefore, there would be a **Negligible** impact on local businesses, including the Ae Forest Bike Shop and Café, during the construction of the Proposed Development.
91. As detailed in **Chapter 13: Other Issues**, the Proposed Development would lead to a net loss of 61.23ha of woodland area. However, the Applicant would provide appropriate compensatory planting. The extent, location and composition of such planting would be agreed with Scottish Forestry, taking into account any revision to the felling and restocking plans prior to the commencement of operation. As a result, the socio-economic effect on forestry businesses is assessed as **Negligible**.

12.6.2.2 Effects on Tourism and Recreation Local Tourist / Recreation Assets

92. As outlined in **Table 12.7** and **Table 12.8**, the closest tourist / recreation asset is the Ae 7stanes mountain biking facilities and trails. The Ae 7stanes car park and Ae Forest Bike Shop and Café is located approximately 3km south west from the Site Boundary, with the closest documented mountain bike trail located approximately 365m from the Site. As detailed in paragraph 90, there would be a limited impact on the access to the 7stanes bike trails. It is anticipated that due to the distance between the bike trails and construction works and type of recreational activity taking place (i.e fast paced) a change in amenity due to the Proposed Development would not detract from the mountain bikers overall experience in the Ae Forest. As a result, the effect is assessed as **Negligible**. Other recreational routes are discussed in the 'Recreational Routes' section below.
93. The next closest tourism asset (Closeburn Castle) is located just under 8km from the Proposed Development. Given the distance of the attraction and the Proposed Development and the low levels of construction traffic, it is unlikely that construction would affect access or amenity of this receptor and other tourism and recreation assets further afield. As a result, the effect is assessed as **Negligible**.
- #### Tourist Accommodation
94. A number of tourist accommodation providers are located within 15km of the Proposed Development (see **Table 12.9**). As described above, construction of the Proposed Development is considered unlikely to discourage tourists from visiting Dumfries and Galloway and the local area, including Ae. It is possible that nearby tourist accommodation would be required over the construction phase to accommodate construction workers. Since there are several accommodation lettings in the area, it is not considered that the construction of the Proposed Development would limit accommodation for tourists.
95. Overall, the construction effect of the Proposed Development on tourism is assessed to be a direct, temporary, short-term **Negligible**.

Recreation Trails and Activities

96. A number of recreational trails are located in close proximity to the proposed wind turbines. The location of the Site Boundary and wind turbines in relation to recreational trails are presented in **Figure 12.1: Socio-economics, Tourism and Recreation Receptors**.
97. The proposed construction access road would primarily be located along the access road for the operational Harestanes Windfarm. A number of forest tracks, including the existing access for the operational Harestanes Windfarm, would need to be upgraded in order to accommodate the construction traffic and abnormal loads. New access roads have also been proposed in order to link the existing forest tracks to the proposed wind turbines.

Upgrading the existing forest tracks and construction traffic using these routes would impact on recreational routes, including Core Path 39 (Ae Forest Large Circular), Roman and Reivers Long Distance Route, Regional Cycle Route 10, Caledonian Cycleway and Locharbriggs-Beattock local cycle route. However, an AMP would be implemented to ensure continued access throughout the construction period for users of these routes, including occasional local diversions where required. With these measures in place, the effect has been assessed as direct, temporary, short-term **Minor Adverse**.

98. Proposed cables from the Site to the operational Harestanes Windfarm substation and control building would be laid adjacent to Core Path 39 (Ae Forest Large Circular), Core Path 521 (Closeburn to Moffat), Romans and Reivers Long Distance Route, Beattock Drove Roads heritage path, Regional Cycle Route 10, Caledonian Cycleway and Locharbriggs-Beattock local cycle route. However, continued access for Core Path 39 (Ae Forest Large Circular), Roman and Reivers Long Distance Route, Regional Cycle Route 10, Caledonian Cycleway and Locharbriggs-Beattock local cycle route would be maintained throughout the construction period; with occasional local diversions being implemented where required. Therefore, the effect has been assessed as direct, temporary, short-term **Minor Adverse**.
99. Walking, horse riding, cycling and deer stalking would be restricted in the area surrounding the construction activities and construction compound for health and safety purposes. The area and duration of such restrictions would be kept to a minimum as required for the work to be conducted safely and efficiently. Considering the small area that would be affected and other recreational routes available, the effect has been assessed as direct, temporary, short-term **Negligible**.
100. With regard to amenity and the indirect effects on recreational users, it is anticipated that the construction of the Proposed Development would temporarily affect the visual amenity of users of Core Path 39 (Ae Forest Large Circular), Roman and Reivers Long Distance Route, Regional Cycle Route 10, Caledonian Cycleway and Locharbriggs-Beattock local cycle route.
101. As detailed in **Chapter 9: Noise**, best practice measures would be applied to control and minimise noise generated from construction activities. With these measures in place, it is anticipated that there would be no significant noise effects associated with the construction of the Proposed Development.
102. As detailed in the Outline CEMP (see **Appendix 4.1: Outline Construction Environmental Management Plan**), measures would be implemented during the construction of the Proposed Development in order to limit the generation and spread of dust.
103. Overall, the effect of the Proposed Development on recreational access and amenity during construction is assessed to be direct and indirect, temporary, short-term **Minor Adverse**.

12.6.3 Operation

12.6.3.1 Socio-economics

104. The Proposed Development would give a combined generating capacity of approximately 45MW. Therefore, using RenewableUK's weighted average operation and maintenance cost (£59,867 per MW installed per annum), it is estimated that the annual operation and maintenance investment would be approximately £2.7 million.
105. Research undertaken by RenewableUK indicates that 87% of the operation and maintenance spend for onshore windfarms benefits the UK, 58% benefits the Scottish economy and 42% benefits the local economy. **Table 12.13** summarises the operation and maintenance spend per annum for each geographical region.

Geographical Region	Region Breakdown	Estimated Spend
Dumfries and Galloway	42%	£1,131,486
Scotland	58%	£1,562,529
UK	87%	£2,343,793
Outside UK	13%	£350,222

Geographical Region	Region Breakdown	Estimated Spend
Total for the Proposed Development	100%	£2,694,015

Source: WSP calculations based on RenewableUK assumptions (RenewableUK, 2015)

Table 12.13 Operation and Maintenance Spend Per Annum

106. As shown in **Table 12.13**, the Proposed Development is estimated to generate approximately £2.7 million of operation and maintenance spend annually, of which, approximately £1.1 million and £1.6 million are anticipated to benefit the local and Scottish economies respectively.
107. The RenewableUK research also indicates that, on average, the turnover per employee is £121,935 and the GVA / Turnover rate is 0.430 per year. Using these assumptions, employment generated by the Proposed Development and the amount of GVA contribution can be estimated for the operation and maintenance phase and presented in **Table 12.14**. As detailed in paragraph 88, this assessment provides a worst-case scenario in relation to the jobs generated during the operation of the Proposed Development.

Geographical Region	Estimated Turnover	Estimated Jobs Generated	GVA
Dumfries and Galloway	£1,131,486	9	£486,539
Scotland	£1,562,529	13	£671,887
UK	£2,343,793	19	£1,007,831
Outside UK	£350,222	3	£150,595
Total for the Proposed Development	£2,694,015	22	£1,158,426

Source: WSP calculation based on RenewableUK assumptions (RenewableUK, 2015)

Table 12.14: Estimated Job Generated and GVA During Operations and Maintenance Without Operational Harestanes Windfarm

108. As the Proposed Development is an extension to an operational windfarm, there would be efficiencies with staff operating and maintaining the Proposed Development. It is anticipated that staff already employed by the Applicant to operate and maintain the operational Harestanes Windfarm would also assist with operating and maintaining the Proposed Development. However, it is anticipated that the Proposed Development would lead to job generation due to the increased number of wind turbines, potential to be of a different manufacturing type, and associated infrastructure (see **Chapter 4: Development Description**).
109. There are currently between 16 and 17 staff employed at the operational Harestanes Windfarm; this site consists of 68 wind turbines at a height of 125 m and with a generating capacity of 136 MW. The socio-economic calculations have identified that the Proposed Scheme would support nine jobs at the local level and 13 jobs at the Scottish level during operation. The calculations also predicted that the Proposed Development would generate approximately £486,539 of GVA at the local level and £671,887 at the Scottish level. However, taking the above efficiencies into account, it is anticipated that the Proposed Development would in practice be likely to generate around three to five jobs rather than nine at the local level, and four to six jobs at the Scottish level. It is also anticipated that in practice the Proposed Development would likely generate around £160,558 to £267,597 GVA at the local level and £208,285 to £309,068 at the Scottish level (see **Table 12.14**). The reduced job generation and GVA number is based on client liaison, industry knowledge and professional judgement.

Geographical Region	Estimated Jobs Generated	GVA
Dumfries and Galloway	3 to 5	£160,558 to £267,597
Scotland	4 to 6	£208,285 to £309,068

Table 12.14 Estimated Job Generated and GVA During Operations and Maintenance With Operational Harestanes Windfarm

110. At the operational phase, the Proposed Development is anticipated to have a direct, permanent, long-term **Negligible** socio-economic effect in Dumfries and Galloway and a direct, permanent, long-term **Negligible** effect in Scotland.

111. As detailed in **Chapter 13: Other Issues**, the Proposed Development would lead to a net loss of 61.23ha of woodland area. However, the Applicant would provide appropriate compensatory planting. The extent, location and composition of such planting to be agreed with Scottish Forestry, taking into account any revision to the felling and restocking plans prior to the commencement of operation. As a result, the socio-economic effect on forestry businesses is assessed as **Negligible**.

12.6.3.2 Effects on Tourism and Recreation Local Tourist Attractions and Tourist Accommodation

112. According to a research report published by BiGGAR Economics in 2017, onshore windfarms in Scotland do not cause a decrease in tourism employment either at a national or local level. The study investigated the onshore wind energy sector and employment in the sustainable tourism sector in Scotland between 2009 and 2015.

113. The BiGGAR Economics study indicates that both onshore wind turbine installation capacity and the sustainable tourism employment sector have seen growth between 2009 and 2015 at a national level in Scotland. The installed capacity has increased from 2 gigawatts (GW) in 2009 to 5.3 GW in 2015, where employment in sustainable tourism sector grew by 15%.

114. The BiGGAR Economics study identifies that at a regional level, four out of the nine analysed local authorities with onshore windfarms saw a larger increase in sustainable tourism employment when comparing with the Scottish average, whilst the remaining five saw less growth than the Scottish average. Overall, the study indicates that there is likely to be a very weak or non-existent relationship between growth in onshore wind installation and tourism employment.

115. The BiGGAR Economics study analysed 28 windfarms constructed between 2009 and 2015 at a local level. The study indicates that in the majority of cases (22 out of 28 windfarms) sustainable tourism employment performed better in the areas surrounding windfarms (within a 15km radius of the windfarm) when compared with the performance in the wider local authority.

116. In addition, as described in **Section 12.5.2.3**, the VisitScotland Position Statement states there is no evidence that indicates that windfarms have a negative effect on tourism industry.

117. Based on the above research results, it is considered that the Proposed Development would not affect tourism and tourism-based businesses (e.g. tourist accommodation) during the operational phase. As a result, the effect of the Proposed Development on tourism and tourism-based businesses (e.g. tourist accommodation) is assessed to be **Negligible** within the Study Areas.

Recreation

118. The Site would be accessible to the public, including users of Core Path 39 (Ae Forest Large Circular), Romans and Reivers Long Distance Route, Regional Cycle Route 10, Caledonian Cycleway, Locharbriggs-Beattock local cycle route and informal users (including horse riders), during the operational phase of the Proposed Development. It is envisaged that there would be temporary exclusions of the areas surrounding the wind turbines for maintenance works. It is anticipated that the Core Path 39 (Ae Forest Large Circular), Roman and Reivers Long Distance Route, Regional Cycle Route 10, Caledonian Cycleway and Locharbriggs-Beattock local cycle route may need to be diverted for maintenance works. However, the diversions are anticipated to be in place over a short time period and are anticipated to be infrequent. Considering the small area where access would be restricted (i.e. around the wind turbines) and limited time of the diversions, the effect has been assessed as direct, temporary, short-term **Negligible**.

119. Existing forest tracks that would be used as an access track for the construction works would be upgraded as part of the Proposed Development. The conditions of these tracks would therefore be improved as part of the Proposed Development and can be considered an enhancement over the baseline condition.

120. With regard to amenity and indirect effects on recreational users, a Landscape and Visual Amenity assessment has been undertaken for the Proposed Development which includes visual receptors such as Core Path 39 (Ae Forest Large Circular), Roman and Reivers Long Distance Route, Regional Cycle Route 10, Caledonian Cycleway and Locharbriggs-Beattock local cycle route. As described in **Chapter 5: Landscape and Visual**, mitigation measures would be implemented during construction including, for example, protection of vegetation. It is anticipated that the Proposed Development would not have significant visual effects on users of the Romans and Reivers Long Distance Route, Regional Cycle Network 10, Caledonian Cycleway, Locharbriggs-Beattock local cycle route, users of the Core Paths and for walkers, cyclists, horse-riders and mountain bike riders using the Forest of Ae. This is because the current routes, for most of these receptors, run through the operational Harestanes Windfarm, meaning the Proposed Development would not be a fundamental change to the character of the route.

121. As detailed in **Chapter 9: Noise**, it is anticipated that there would be no significant noise effects associated with the construction of the Proposed Development. It is also anticipated that there would not be a significant effect on air quality during the operation of the Proposed Development.

122. As a result, the effect of the Proposed Development on recreation is assessed to be a direct, permanent, long-term **Negligible**.

12.6.4 Wider Effects

12.6.4.1 Community Benefit Funding

123. The Applicant is committed to sharing the benefits from its operational windfarms with local communities and has made substantial investment in south west Scotland. Through its established presence in Dumfries and Galloway, ScottishPower Renewables has to-date contributed over £7,800,000 in community benefits. This includes over £2,300,000 paid as part of the operational Harestanes Windfarm, almost £3,500,000 paid as part of the Kilgallioch Windfarm, over £700,000 paid as part of our Wether Hill Windfarm and over £1,000,000 paid in associated with the Ewe Hill 6 and Ewe Hill 16 windfarms. Although located out with Dumfries and Galloway Glen App Windfarm (South Ayrshire) has also contributed more than £200,000 to communities in Dumfries and Galloway. These funds contribute to a variety of groups and organisations to assist them in delivering projects which ScottishPower Renewables has identified as having benefit to those living, working or visiting the surrounding area. This includes projects such as installing solar panels for Glencairn Green Bowling, contributing towards the development of Nith Valley Leaf Trust affordable environmentally friendly homes and contributing towards the purchase of a new Galloway Mountain Rescue vehicle.

124. The Applicant is committed to offering a package of community benefits to local communities. For the Proposed Development, the Applicant would hold discussions with local stakeholders to decide which communities would be appropriate to participate in any community benefits offered. It is expected that any community benefit funds could provide a long-term revenue which could be used to support community projects. Local communities would have the flexibility to choose how the money is spent and prioritise it on the things which matter most to them.

125. The nature of the benefits associated with community benefit funding can be illustrated by the community benefit funding from existing operational windfarms owned by the Applicant. The operational Harestanes Windfarm community benefit fund is administered through Annandale and Nithsdale Community Benefit Company. Further details on the community benefit fund is available here: <https://ancbc.co.uk/>

12.6.4.2 Community Investment

126. In addition to the community benefits fund, the local community could also have an opportunity to invest in the Proposed Development through participation in a community investment scheme.

127. The Scottish Government Good Practice Principles for Shared Ownership of Onshore Renewable Energy Developments (Scottish Government, 2019) sets out the Scottish Government's view as how this can be achieved, supporting earlier commitments, including in its 2017 Onshore Wind Policy Statement (Scottish Government, 2017).

128. The Scottish Government is committed to shared ownership because it believes it can support greater partnership working, empower communities and build their capacity, generate income that can have a lasting legacy, and strengthen corporate social responsibility.

129. The Applicant would hold discussions with local stakeholders to decide which communities would be appropriate to participate in any opportunity to invest should they choose to do so. The Applicant is committed to keeping local communities informed as the project progresses and, in line with Scottish Government guidance, would provide information in a timely manner so the communities are able to fully assess the opportunity.

12.6.5 Recreation Enhancements

130. The Applicant is proposing to implement enhancements in addition to the Proposed Development as detailed in **Chapter 4: Development Description**. Proposed enhancements are detailed below:

- electric vehicle charging points in the Ae Forest carpark (subject to agreement);
- financial support to facilitate the purchase of E bikes for rental at the recreational centre (subject agreement);
- promotion of new electric bike routes within Forest of Ae (subject to agreement). The suggested location of the proposed routes is shown on **Figure 12.2: Proposed Bike Facilities**;
- promotion of family friendly / beginner biking routes or horse-riding routes around the proposed windfarm using existing forest tracks;
- provision of a shelter with tools for bike maintenance and a place to shelter / picnic within the windfarm (subject to agreement). The suggested location of the proposed bike shed and picnic area is shown on **Figure 12.2: Proposed Bike Facilities**;
- provision of information boards regarding the Proposed Development; and
- support for the employment of seasonal ranger to assist with the management of core footpaths in the area.

131. If the above enhancement measures were realised, then there would be a direct, permanent, long-term, **Minor beneficial** effect on recreation.

12.6.6 Non-Domestic Rates

132. The Proposed Development would be liable for non-domestic rates, the payment of which would contribute directly to public sector finances. Analysis of the rateable values of several windfarm development scenarios suggests that there is potential for a rateable value per MW of £17,700, and that the total rateable value would be up to £793,000.

133. Given a poundage rate of £0.498 per £1 of rateable value it is estimated that the Proposed Development could contribute up to £395,000 annually to public finances, and contribute £15.8 million over the first 40 years of its operational lifetime. However, the actual contribution would depend on variables such as the actual load factor, and the potential for any relief from non-domestic rates.

134. These non-domestic rates, by providing an additional revenue stream, would support the delivery of local government services.

12.7 Mitigation

12.7.1 Construction Mitigation

135. There are no significant adverse effects during construction and therefore no additional mitigation is required.

12.7.2 Operation Mitigation

136. There are no significant adverse effects during operation and therefore no additional mitigation is required.

12.8 Residual Effects

12.8.1 Construction

137. There are no significant adverse effects during construction as reported in **Section 12.6**.

12.8.2 Operation

138. There are no significant adverse effects during operation as reported in **Section 12.6**.

139. **Table 12.15** presents the summary of the residual effects of the Proposed Development on socio-economics, tourism and recreation.

Description of Effect	Pre-mitigation Effect		Mitigation Measure	Residual Effect	
	Magnitude	Significance		Magnitude	Significance
During Construction					
Estimated construction job generation and GVA in Dumfries and Galloway (approximately £3.1 million GVA and 52 jobs).	N/A	Minor Beneficial	No additional mitigation measures proposed.	N/A	Minor Beneficial
Estimated construction job generation and GVA in Scotland. (approximately £9.2 million GVA and 155 jobs).	N/A	Negligible	No additional mitigation measures proposed.	N/A	Negligible
Effects on tourism and tourism-based businesses (e.g. tourist accommodation)	N/A	Negligible	No additional mitigation measures proposed.	N/A	Negligible
Direct and indirect effects of the Proposed Development on recreational access and amenity.	N/A	Minor Adverse	No additional mitigation measures proposed.	N/A	Minor Adverse
During Operation					
Estimated operation and maintenance job generation and GVA in Dumfries and Galloway. (approximately £160,558 to £267,597GVA and three to five jobs jobs)	N/A	Negligible	No additional mitigation measures proposed.	N/A	Negligible
Estimated operation and maintenance job generation and GVA in Scotland. (approximately £208,285 to £309,068 GVA and four to six jobs)	N/A	Negligible	No additional mitigation measures proposed.	N/A	Negligible
Effects on tourism and tourism-based businesses (e.g. tourist accommodation)	N/A	Negligible	No additional mitigation measures proposed.	N/A	Negligible
Direct and indirect effects of the Proposed Development on existing	N/A	Negligible	No additional mitigation measures proposed.	N/A	Negligible

Description of Effect	Pre-mitigation Effect		Mitigation Measure	Residual Effect	
	Magnitude	Significance		Magnitude	Significance
recreational access and amenity.					
Direct effects on recreation if the enhancement measures identified in Section 12.6.5 were realised	N/A	Minor beneficial	No additional mitigation measures proposed.	N/A	Minor beneficial

Table 12.15: Residual Effects Table

12.9 Cumulative Assessment

140. This section presents the potential cumulative effects with the 21 cumulative schemes (excluding those that are already in operation) located within 30km of the Site as detailed in **Chapter 2: EIA Process and Methodology**. **Figure 5.8: Cumulative Location Plan** presents the location of the cumulative schemes surrounding the Proposed Development.

12.9.1 Construction

141. The construction of the Proposed Development along with these cumulative schemes would generate additional construction related spend, employment and GVA. It is anticipated that when considering the schemes cumulatively, there would be a **Minor Beneficial** effect on socio-economic conditions during construction.

142. As detailed within **Section 12.6**, evidence indicates that windfarms have a limited impact on visitors' decisions to holiday in Scotland. Therefore, it is anticipated that when considering the schemes cumulatively, there would be a **Negligible** effect on tourism during construction.

143. Due to the distance between the Proposed Development and cumulative schemes and limited impact of the Proposed Development on recreation, it is anticipated that there would be a **Minor Adverse** cumulative effect on recreation during construction.

12.9.2 Operation

144. The operation of the Proposed Development along with the cumulative schemes would generate additional operation and maintenance related spend, employment and GVA. In addition, there would be combined benefits in relation to community benefit funds and community investment offers. It is anticipated that when considering the schemes cumulatively, there would be a **Minor Beneficial** effect on socio-economic conditions during operation of the Proposed Development.

145. As detailed within **Section 12.6**, evidence indicates that windfarms have a limited impact on visitors' decisions to holiday in Scotland. Therefore, when considering the schemes cumulatively there would be a **Negligible** effect on tourism during operation.

146. It is anticipated that all recreational routes surrounding the cumulative developments would be accessible for the majority of the operation phase. It is anticipated that there would be temporary exclusions for maintenance works for the cumulative schemes, but this would be limited. In addition, it is anticipated that access to recreational routes and facilities would not be affected during the operation of the cumulative schemes. As such, it is anticipated that there would be a cumulative effect of **Negligible** on recreation during operation.

12.10 Summary

147. With the implementation of the embedded mitigation measures, it is anticipated that the Proposed Development would have a **minor beneficial** (not significant) residual effect on spend per annum, estimated job generation and GVA during construction and **negligible** (not significant) residual effect during operation. During construction and operation, the Proposed Development is anticipated to have a **negligible** (not significant) effect on tourism. It is anticipated that the Proposed Development would have a **minor adverse** (not significant) residual effect on recreation during construction, and a **negligible** (not significant) residual effect on existing recreation assets during operation.
148. The Proposed Development would also provide opportunities to the local community through community benefit funds and the shared ownership / community investment scheme. It is anticipated that the Proposed Development would also provide enhancements to the local area by upgrading sections of the existing forest tracks. Further enhancement opportunities are being proposed by the Applicant including, for example, the installation of electric vehicle charging points in Ae Forest carpark and provision of bike maintenance shelters, support for E-Bike rental (subject to agreement). The Applicant would also promote family friendly / beginner biking or horse-riding routes around the proposed windfarm, provide information boards regarding the Proposed Development and support the employment of a seasonal ranger to assist in the management of the core footpaths. If these enhancement measures were realised, there would be a **minor beneficial** (not significant) effect on recreation during operation.

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