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Emily Finney
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27th May 2016

Dear Emily,

National Natural Resource Policy Sustainability Appraisal Scoping Report

Thank you for your e-mail of 25th April 2016 consulting Natural Resources Wales on the Scoping Report for the Sustainability Appraisal (SA) of the National Natural Resource Policy (NNRP). Our comments on the Strategic Environmental Assessment (SEA) aspects are made in the context of our responsibilities under the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004, and in our statutory role as advisers to Welsh Government on the natural heritage and resources of Wales.

Natural Resources Wales are currently developing our approach to Sustainability Appraisal consultations, in particular in relation to where the wider socio-economic aspects fall outside of our statutory role in SEA, but where there is clear scope for us to add value by commenting more broadly where this falls within our remit, and where we have the expertise to do so.

In developing our response we have consulted widely with relevant technical specialists within Natural Resources Wales, and have received much valuable and detailed comments back which we have used to inform our response. We present our general comments below, followed by detailed technical comments in the attached Annex 1.

Our general comments are as follows:

1. We welcome and support the development of the NNRP, together with your commitment to SA and SEA.

2. We welcome the informal opportunities that you have offered us to comment on a draft of the scoping report, and for generally incorporating our informal comments into this final version for formal consultation.

3. We welcome the clear and 'easy to follow' structure of the SA of this new national policy.

4. The first section, *Introduction to the National Natural Resource Policy*, is well written, and provides a clear definition of the sustainable management of natural resources (SMNR).

5. Several internal consultees fed back that they had difficulties in identifying exactly what it was that was being appraised – the Scoping Report tells us why an NNRP is important, as well

as describing some of the questions that the Scoping Appraisal should cover, but it is not clear what the NNRP will contain in terms of policies. In other words, there is lots of description, but little by way of what the NNRP might look like, making it difficult to advise on how it might be appraised in a meaningful way.

6. Wales-specific data: we reiterate that it is helpful to state explicitly whether the data referred to in the Scoping Report is specific to Wales, or is UK-wide (or another subset of the UK, e.g. England and Wales).

7. Key sustainability issues: we reiterate that it is not entirely clear how these have been identified, and more explanation on this would be helpful. Do they come straight from the baseline information presented immediately before them? For example, in Table 6.1 on p. 23 there is no mention of soil biodiversity, despite soil issues being flagged up in 3 out of 7 of the 'Key challenges for SMNR' table in p 8.

8. Draft appraisal framework questions (p. 67, Table 7.1): we reiterate our view that guide questions within this should follow from the discussion in Section 6. We question, therefore, whether environmental crime or food security should be specifically mentioned, worthy though they may be, given that they do not appear to be raised as issues anywhere in Section 6. Food security is mentioned in the National Natural Resources Policy Statement, but environmental crime is not mentioned anywhere except in the Scoping Report guide questions. In addition, see the 5th paragraph of section 7 of Annex 1 in relation to food security, and the need for it to be clearly defined.

9. Also in relation to the Draft appraisal framework questions, we make the following substantive comments:-

i. The question regarding reducing emissions should include explicit reference to sequestration (principally in terms of woodland planting and management, and peatland restoration);

ii. There should be a guide question that emphasises the importance of rigorous energy management which captures the essence of the energy hierarchy, namely; reduce consumption, increase efficiency, increase renewables, low carbon, conventional (similar to the waste hierarchy question);

iii. In the first guide question relating to landscape we suggest adding 'the special qualities' of designated landscapes and their 'settings' after 'Help to maintain and enhance';

We hope the above is of use. Should you have any queries regarding these comments, please do not hesitate to contact Anne MacDonald or Roger Matthews, via strategic.assessment@cyfoethnaturiolcymru.gov.uk.

Yours sincerely,

Howard Davies

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Cyfoeth Naturiol Cymru
Natural Resources Wales

Annex 1

1. General

In putting this formal consultation response together, we asked a wide range of relevant technical specialists within Natural Resources Wales, to provide us with comments on the NNRP SA Scoping document in relation to their respective areas of expertise, to help inform our response. As well as asking them to respond to the SA questions set out in 8.1 on p. 77, we also asked them to consider the following questions:-

a. The characterisation of and information on the baseline environment and identification of existing challenges and issues in the areas that are likely to be relevant to the policies – is this accurate, and is there anything missing?

b. The objectives and criteria (guide questions) for use in the assessment process – are they comprehensive, and framed in a way that will allow the identification and consideration of significant effects?

c. The identification of other plans and programmes which should be considered in relation to links and interactions with the NNRP – is there anything missing?

2. Marine

In relation to the specific questions set out in 1 above:-

i. Baseline – we consider the document represents an accurate picture of the current baseline from a marine perspective, and see that this has used the Wales Marine Evidence Report which, outside of the State of Natural Resources Report (SoNaRR), is the most up to date source of information for the Welsh marine area.

ii. We note there is an apparent inconsistency on p. 17 where two separate figures are given for the % coast in designated sites (both 70 and 75% are quoted). In fact we suspect that they are both correct since one refers to designation as SAC/SPA and the other to the whole MPA network (which therefore considers a wider range of sites including SSSIs and Ramsar sites). It therefore currently reads as somewhat confusing – we suggest using the 75% of coastline coverage by the MPA network as the most appropriate figure.

iii. Objectives and Criteria – we are broadly satisfied with the objectives and criteria proposed to underpin the SA. However, we question whether the landuse/ geology/ soil category ought to incorporate marine aggregates, which it currently does not (though marine aggregates policy is considered in the list of plans and programmes)?

iv. Plans and programmes – the list is fairly comprehensive from a marine perspective, but we have identified 3 additional relevant documents:
    a. The OSPAR Convention (Convention on the Protection of the Marine Environment of the N-E Atlantic);
    b. The EU Marine Spatial Planning Directive;
    c. EU Regulation1143/2014 on Invasive Alien species.

3. Terrestrial habitats and species

6.2 Biodiversity, Flora and Fauna

i. Much of the baseline data appears to be snapshot data, which for species is acceptable because it relates mostly back to the last Article 17 report, and is quite high level. Assuming that the data in SoNaRR will be the baseline against which the impact of the NNRP will be measured in the future, it is worth bearing in mind that the best/only data we have for a lot of habitats and species groups is not up to date, or in some instances hasn't even been collected.

ii. The key challenges and topics look acceptable from a terrestrial habitats and species perspective, and appear to cover the relevant legislation. The key objectives and policy messages also appear to be acceptable, other than to suggest that for the biodiversity 5th guide questions, *'Reverse the decline in Wales's biodiversity'* ideally would also say "*by protecting and enhancing priority habitats and species*" just to make it a bit more specific.

iii. Section 6.2 doesn't appear to refer to the NERC s42 list (NERC Act is in the list) or the new Environment Act s7 list - Biodiversity Duty, which applies to priority habitats and species of importance. Reference to this should be included, especially as all public bodies have to report their efforts and the changing status of those species and habitats, presumably via SoNaRR. The SA refers to the UK BAP list, but it is our understanding that this has more or less been superseded by the statutory s42 and now s7 lists.

4. Water

P. 12, Table 5.1, Key Objectives and Policy Messages Arising from the Review of Plans and Programmes Land Use:

We suggest adding 'Manage land to enhance water quality and reduce flood risk.'

Baseline

i. We recommend that there is reference to the need to tackle mine-water pollution;
ii. The reasons for promoting water efficiency are not set out – we suggest that the document should say why we want to achieve this i.e. to reduce abstraction pressure, reduce energy use, and reduce discharges, etc.

Flood Risk

The promotion of Sustainable Drainage Systems (SuDS) in the document is not strong enough. Government have the tools to make this the first choice approach, and this should be reflected in the text. In addition, SuDS should not just be mentioned in relation to flood risk, or seen as relevant only to urban situations - P. 46 repeats the assumption that SuDS is an urban only tool. SuDS should be applied as a catchment wide approach, so should equally sit in Land Use.

P. 37 – 6.6 Land Use, Geology and Soil

We are concerned that the text around metal mining underplays the issue. There are over 1300 metal mine sites in Wales. The result is a legacy of metal mine pollution affecting many rivers across Wales, with Zinc, Lead and Cadmium discharges. Nine of the ten worst metal mine polluted catchments in the UK are in Wales, with 700km of river affected.

P. 42

The Ground Water chemical figure quoted of 55% is incorrect - in actual fact there were 22 Ground Water Bodies achieving Good status which gives a figure of 58%. Also on p. 42, it isn't stated that the figures quoted are based on the first River Basin Management Planning cycle only. This means we end up with two different figures for 2015 when talking about WFD classification (i.e. a certain water body network, standards and methods were used in the first cycle – so the data here is based on those. But for the second cycle the network, some standards and methods have changed – so we get slightly different results for the baseline for the start of the second cycle than at the end of the first cycle). This could be overcome by simply including the following text in the relevant paragraph: 'Under the standards set in the first River Basin Management Planning cycle (2009-2015) by the WFD'.

P. 43

The pie charts should reflect the WFD colour scheme for Good (green), Moderate (yellow) and Poor (orange). Also on p. 43, the second paragraph reads 'The 'Wales' Marine Evidence Report' (2015) highlights that no transitional or coastal water bodies in Wales fail the assessment of chemical status, based on priority hazardous substances defined in the WFD. However, in numerous instances, ecological status /potential has not been reported as good and will not achieve good status / potential by the end of the current cycle of plans (i.e. 2009 to 2015), typically due to technical feasibility, natural conditions or disproportionate costs'. This is apparently old information based on a previous assessment, and the first sentence is no longer accurate - we suggest that this is deleted.

Coastal water quality

i. P. 43 – the statistics for Bathing Waters could be updated for 2015 as the new Bathing Water Directive, which has stricter water quality standards, has now come into force. Of the 102 beaches, 82 were classified as Excellent, 16 were classified as Good and 4 were Sufficient. The results can be found here;

ii. We note that reference to shellfish waters has not been included. These are surely of socio-economic value to Wales, and subject are to water quality issues. Currently Welsh shellfish waters are classified by the FSA as Class B or Class B-LT (Long Term);

iii. P. 70, Table 7.1 Draft Appraisal Framework, final bullet point of 6. Water – reducing the discharge of pollutants to the water environment incorporates diffuse pollution so it doesn't need to be mentioned separately.

5. Energy

Since energy is not captured under its own heading, many of the energy related issues sit under the Climate Factors and Economy sections, and this is appropriate. There are also some elements covered under Materials Assets.

There are two key issues for consideration:-

i. The key messages that stand out on energy in the document are mainly around increasing the renewable energy supply and moving towards a low carbon economy. It is our view that there should be a greater emphasis on rigorous energy management which captures the essence of the energy hierarchy (similar to the waste hierarchy), namely; reduce consumption, increase efficiency, increase renewables, low carbon, conventional. This should start with energy demand reduction, and then with improving energy efficiency, before different types of energy supply are considered. This approach would be more beneficial in achieving the Sustainable Management of Natural Resources (SMNR) and addressing climate change issues.

ii. In addition, the document should have a greater emphasis on renewable energy and low carbon via a greater role for small scale 'distributed' sources of generation instead of major infrastructure projects. This would be a good platform, as local generation not only addresses the issue of demand and supply (closer integration of electricity, heat, storage, demand side management and transport), but will also benefit communities and would indicate that energy developments are based on wider environmental, social and economic qualities. This will help to address the challenge of 'unlocking and realising potential' mentioned in the document, and contribute to some of Welsh Government's (WG's) aspirations. Having said that, we recognise that different approaches are needed in Wales including both large projects which deliver 'big hits' in relation to climate change and energy security, and smaller projects which help secure the support of civil society for energy efficiency and other behavioural changes.

In relation to plans and Programmes, we suggest that the following should be considered in relation to energy;

- EU Energy Efficiency Directive 2012/27/EU;
- Energy Act 2016 (received Royal assent on 12th May 2016 – mostly about the role for the newly established Oil & Gas Authorities, but also captures wind power);
- Welsh Government's 2012 Energy Wales: A Low Carbon Transition (this is referred to in the main document but is not on the list);
- Welsh Government's 2015 Green growth Wales: Investing in the Future;
- Welsh Government's 2015 Green growth Wales: Local Energy;
- Energy efficiency in Wales: A Strategy for the Next 10 years 2016-2026.

Both the Green Growth documents quoted above part of a programme aimed at fostering economic growth, development and social equity, while ensuring that our natural assets can continue to provide the resources and environmental services on which our wellbeing relies. They focus on the

sustainable use of natural resources by stimulating investment and innovation, which will help create a new economic model and deliver economic growth.

6. Landscape and cultural heritage

1. Characterisation and information

i. In relation to identification of existing challenges and issues, we suggest that the Scoping Report should review the Management Plans of Wales' designated landscapes which are supported by State of the Park / AONB reports. These reports and plans provide indications of the pressures and trends, and responses by nationally designated landscapes managed to maintain and enhance a range of benefits and services for society. This recommendation is also relevant to the question about relevant plans and programmes for consideration.

P. 8, Key challenges table

ii. In relation to the text next to the 'Retaining the distinctiveness of our places and historic landscapes' entry, this appears to suggest that most impacts occurred during the mid-20th Century, including in relation to energy – is this correct i.e. hasn't the significant wind energy development occurred over the last 20 years. We suggest that you should also add that the character of the landscape was impacted by developments relating to settlement expansion and the design, scale and character of that expansion.

iii. P. 10 Key challenges - there should be a challenge relating to 'conserve and enhance distinctive landscapes', without which there isn't a link to the Key challenges for SMNR on p. 9.

P. 14, Table 5.1, Key Challenges / objectives

i. Note that Heritage Coast is a non-statutory designation;

ii. We suggest rewording the text relating to AONB's and National Parks, to also refer to their special qualities, and their settings – this is more specific and should better enable identification and consideration of significant effects;

iii. Remove 'natural' from the second bullet point;

iv. Consider adding reference to Green Infrastructure, possibly replacing 'townscapes'.

v. Add 'seascapes' to …Protect and enhance the quality.

P. 58, 6.12 Landscape and Seascape

i. The last paragraph would benefit from adding that landscape contributes a significant value to the economy through tourism, etc. For example Wales' three National Parks attract 12 million visitors per year spending £1 billion on goods and services (Arup 2013);

ii. This section would also benefit from the addition of the following or similar text, after the first paragraph of the baseline section:- 'Diverse, multifunctional landscapes where ecosystems

are maintained in good condition and sustainable land management practice is undertaken should be more resilient in providing a range of services and opportunities for well-being, social and economic benefit.'

P. 59

i. The Landscape Map of Wales needs to be renamed the National Landscape Character Map;

ii. We welcome the reference to LANDMAP, but recommend that this also states that it is the key landscape baseline for Wales. This section may also benefit from a map of the Visual & Sensory layer of LANDMAP to show the level of diversity and distinctiveness of Wales' landscape offered by LANDMAP.

P. 64, Table 6.18

i. This table could benefit from the addition of the benefits and services that landscape provide. In particular, we support including prosperous into the Wellbeing Goals delivered by landscape and seascape. This is supported by our evidence of £1 billion spend and of 12 million visitors to the three National Parks, and the more than 3.5 million visitor trips attributed to coastal tourism in 2013, with the most popular draws being landscape, countryside and the beach (this brought £602 million to the economy, with growth predicted at 10%);

ii. We suggest adjusting the wording to add quality, so that it reads 'The need to conserve and enhance landscape and seascape character and quality, taking into account the effects of climate change'. In addition, we suggest that Table 6.19 is also updated to include quality.

P. 73, Table 7.1, Draft Appraisal Framework

i. This should reflect the additions covered above around adding quality, and benefits / services of landscape;

ii. In the guide questions we suggest adding 'the special qualities' of designated landscapes and their 'settings' after 'Help to maintain and enhance….';

iii. In addition, we suggest adding 'prosperous' to the Wellbeing Goals delivered by landscape;

iv. We welcome the reference to designated and non-designated landscapes and seascapes i.e. all landscapes matter;

v. Quality could be added to the second bullet so it refers to character and quality.

7. Agriculture

P. 7, 2. Why are we doing Sustainability Appraisal (SA)

It is reassuring to see that "In accordance with the principles of SMNR, namely to promote and engage in collaboration and co-operation, wider stakeholders will be engaged though development of the SoNaRR and the NNRP. Likewise, wider stakeholders will have an opportunity to comment on the SA through consultation on the Environmental Report, which will set out findings of the SA. This would seem to be the only way in which the Farming

Unions (as the representatives of those managing the land) will be able to input to the NNRP itself (we note that the SA consultation is only sent to NRW, CADW and Natural England, Historic England and the EA).

P. 8, 3. National Natural Resources Policy (NNRP)

"*Key challenges for the SMNR include: Maintaining our productivity capacity*" - this is one challenge related to agriculture, but the real challenge is how this challenge relates to all of the others, especially in relation to habitat and water quality. In other words, the progressive intensification of agriculture is likely to impact adversely on other aspects of Natural Resource Management (NRM), unless such intensification takes place in a sustainable way. Furthermore, sustainable intensification is much more difficult in the dairy sector than in the arable sector (see Elliott, J., Firbank, L.G., Drake, B., Cao, Y. & Gooday, R (2013). Exploring the Concept of Sustainable Intensification. ADAS - http://publications.naturalengland.org.uk/publication/6286901725102080). See also italicised text below.

P. 12, Table 5.1 Key Objectives and Policy Messages Arising from the Review of Plans and Programmes

The section on Land Use, Geology and Soil talks about promoting sustainable patterns of land use and advises that the SA Framework should include objectives/questions relating to this. However, it is not clear that the more intensive use of land (e.g. using more inputs to produce more outputs on a given unit of land) has been addressed in the SA Framework. This issue has implications for water quality, biodiversity and greenhouse gas (GHG) emissions, and looking at gross changes in land use only (e.g. converting agricultural land to housing or forests for example) will not be sufficient to address what is happening in the Welsh countryside. (see italicised text below).

P. 39, Land Use and Soil

The Baseline section appears sketchy by comparison with the section on biodiversity. Whilst there is some text on soils, forests and carbon stores, there is little on enclosed farmland (e.g. arable and improved permanent grasslands which are bounded by hedges, fences and walls). This broad habitat occupies c50% of the surface area of Wales, but, apart from the reference on p. 40 to "soil formation has been affected due to various human impacts including increased crop and livestock production" there does not appear to be other references to agriculture. This seems like a significant omission when you consider there has been a growth of 20% in Welsh milk production, for example, over the last ten years (with knock-on effects on water quality in particular) – we suggest that this warrants including in the key issues section on p. 41. However, we accept that p. 43 does say that "The main reasons for water body failure in Wales are pollution from abandoned mines and contaminated land, agricultural pollution, barriers to fish migration and impoundments". The italicised text at the end of this section provides some baseline information on agriculture in Wales that may be of use.

P. 70, How we will conduct the Sustainability Appraisal

Having highlighted the omission of agriculture from the Baseline, it seems contradictory to question the use of questions such as "Will the SA Help to maintain and enhance food security, taking into account the effects of climate change?" However, this does seem an

odd question to ask when food security hasn't been mentioned in the consultation document before now. In addition, questions about food security often include value judgements, not least whether we are talking about food security in the UK (which is maintained by overseas trade as well as by home grown production) or food security at global level (which relates just as much to the money that poorer people have available to buy food as it does to the amounts of food available on the world market and the amounts produced in any particular country). It may be that the consultation document is actually referring to issues such as food miles or the critical mass needed for the long term survival of Welsh agriculture and the food processing sector (e.g. both of which could be arguments for producing more food in Wales), but, if so, the rationale for highlighting food security needs to be clearly defined.

The text below provides some baseline information on agriculture in Wales that may be of use, and was produced by a Natural Resources Wales colleague who has also been involved in the preparation of text for SoNaRR:

"Agriculturally improved grasslands characterised by various strains of rye-grass and clover now predominate throughout much of Wales, with an estimated total coverage of 1,027 million ha (Habitats of Wales, 2010). During the latter part of the 20th Century, these highly productive grass crops largely replaced semi-natural pastures and hay meadows. In addition, much of the land formerly devoted to hay cropping is now used for the production of silage. This is used for stock feed over the winter period together with concentrates and forage crops such as oats, barley and maize (National Ecosystem Assessment for Wales, 2008)

Within the improved grassland category, the area of grassland less than five years old (leys) has increased significantly from 115,056 ha to 157,501 ha over the period 2005-15 (Estimates from Welsh Agricultural Survey, June 2015). The expansion in the proportion of improved grassland now devoted to more productive leys (from 11% to 15% over the last ten years) suggests that the use of enclosed farmland is intensifying

The number of sheep and lambs in Wales peaked at 11.8 million in 1998 before declining to 8.2 million in 2009. Numbers then increased steadily to 9.7 million in 2014 before falling back to 9.5 million in 2015. The number of breeding ewes now stands at 4.7 million – a decline of 15% since 1999. (Estimates from Welsh Agricultural Survey, June 2015).

More lambs are now being produced from fewer ewes with progressive increases in lamb carcase weights, averaging 0.7 kg by 2011 (Hybu Cig Cymru, 2013). Such productivity gains correlate with changes in the utilisation of enclosed farmland and more semi-natural habitats, with the former now undergoing more intensive management (Silcock et al 2012).

Cattle numbers peaked at 1.6 million in 1975, but had declined to 1.1 million by 2015. The current numbers of breeding female beef cattle (208,600) are more than 20 per cent less than in 2004. One possible reason is that market forces no longer benefit the retention of beef females for future breeding, but favour the fattening of these animals for sale as meat. The changing nature of Common Agricultural Policy (CAP) support payments (previously based partly on numbers of livestock, but now based partly on land area) could be another contributory factor (Estimates from Welsh Agricultural Survey, June 2015).

The number of Welsh dairy farmers has fallen by 30% (from 2500 to 1758) over the last decade (AHDB Dairy 2016). By contrast, the size of the dairy herd increased by 3% (from 238,386 to 246,331) over the same period, whilst the volume of milk delivered to processors also grew by 20% between 2004/05 and 2012/15 (Welsh Government Rural Payments Agency, 2016). The bulk of this increase in milk production took place in the last three years and provides further evidence for the more intensive use of enclosed farmland."

8. Forestry

P. 12, Table 5.1, Key Objectives and Policy Messages Arising from the Review of Plans and Programmes Land Use:

Under Land use, this should include 'Sustainably manage and enhance Wales' woodlands' – note WG's target of increasing the area of woodland cover in Wales by 5%, and that much of Wales's native woodland is currently unmanaged.

9. Climate change

Overall, in terms of climate change the NNRP scoping document provides good consideration of climate change within the climatic factors sections of the report, and the broad statements around climate change are correct. However, we would make the following points, which largely refer to the Baseline and Evolution of the Baseline sections of 6.9 Climatic Factors:-

i. While the scoping report does recognise the importance of carbon sequestration, in terms of the Draft Appraisal questions, it is not explicit that reducing emissions should include consideration of sequestration (principally in terms of woodland planting and management, and peatland restoration) – we therefore suggest that it is important to explicitly cover this;

ii. The emission figures are correct, but would benefit from being broken down by sector. That way, the sector reductions that are presented would be more meaningful, and it would help the reader understand where we might concentrate our efforts on where to achieve the most significant and likely future reductions. For example, the reduction in the waste sector is impressive (66%), but this sector accounts for only around 2.5% of total Welsh emissions.

iii. The report is correct to use UKCP09 in this context, but it would be useful to add a note saying that these projections are in the course of being reviewed and new estimates are due to be published in 2018 (the "UKCP18" projections). The report could also usefully reference the more recent figures presented in the most recent Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report, published in 2014.

iv. In terms of consideration of adaptation, there is repeated reference to 'predictions' which while a minor point, it is important to understand that they are correctly 'projections', and that there is a need to recognise that there are a range of scenarios and uncertainty captured within the UKCP09, as well as other uncertainties out with.

v. The figures are said to be "based on a medium emission scenario with 90% probability". These figures relate to the Central or 50% probability estimate – not the 90% probability estimate. Also, there is no point in the climate experts (principally the Met Office) producing probability-based projections, if policy-makers choose only to quote figures for one level of probability. How we deal with risk will be a key issue for the NNRP, and we do have good information in relation to future climate – so we should use it. In other words the report should quote figures for the 10% - 90% probability levels, which is what the creators of the projections recommend.

vi. Developing this theme further, the report chooses to quote figures for the Medium Emission Scenario only. UKCP09 gives projections for Low and High Emission Scenarios too, and all three should be used – particularly given that, globally, we are currently on a High Emission trajectory. Presenting all three together would highlight the difference that our global actions on emissions reduction can make.

vii. At the very least there is a need to consider the range of scenarios and climatic change captured within the UKCP09 projections rather than, as in this report, solely quoting central estimates for a single emissions scenario. The SA needs to capture this uncertainty and also the climatic impacts that arise from extreme events – at least in terms of generic issues e.g. flooding, drought, low and high flows, heatwaves;

viii. The report is correct in identifying the "Climate Change Risk Assessment for Wales" (part of the UK Climate Change Risk Assessment published in 2012 – the "UK CCRA12"), but the UK Committee on Climate Change is close to finalising its Evidence Report for the next UK CCRA – the "UK CCRA18". This Evidence Report will be published in July 2016 and presents a comprehensive list of risks affecting both the Natural Environment and other sectors (e.g. Infrastructure; Business) as a knock-on consequence of changes in the Natural Environment – e.g. flooding; impact on water supply. As such it is a key document for considering environmental management in the context of sustainable development, and should certainly be referenced in this report. We are using the National Summary for Wales from this UK CCRA18 Evidence Report as the definitive basis for systematically considering climate adaptation in the SoNaRR Report, and should do so for NNRP also. All these exercises and documents should tie together, using the same source documents. We have fed our comments into the production of the UK CRA18 Evidence Report.

ix. Using the UK CCRA in this way highlights two further issues:
   a. Part of the process of undertaking the sustainability appraisal of the NNRP should be to ensure that the issues highlighted within the "Climatic Factors" section have actually been picked up and addressed in the other sections, as appropriate.
   b. Since the UK CCRA is undertaken every five years there should be a commitment within the SA to pick up each subsequent UK CCRA as it is published.

x. The report highlights the fact that "Wales' natural resources such as peatlands, wetlands, soils and forests, absorb and store carbon and can make an important contribution to climate change mitigation". Net fluxes from Land Use, Land Use Change and Forestry (as reported in the annual UK Greenhouse Gas Inventory) are relatively small – currently a small net sink equivalent to around 1.2% of emissions – but the carbon locked up in these stores is much

higher (many times Wales' annual emissions), and it would be good if this report quoted the relevant figures. They would highlight the priority, which is to keep these carbon stores where they are, as opposed to adopting land management practices that would cause their release to atmosphere.

xi. In relation to energy and greenhouse gas emissions, it is particularly important that energy efficiency is considered, not just renewables, which seems to be more of a focus at present.

10. Geology

We welcome the inclusion of conservation of geodiversity as a key role, policy message and reference to better management of sites, etc. However, it would beneficial to include Geodiversity as a standalone topic rather than within 'Land use, Geology & Soil'. A standalone Geodiversity topic would cover all aspects of geodiversity including:

- background to the geology of Wales,
- designated sites (geoparks, geological SSSI, RIGS)
- mineral wealth of Wales
- geohazards
- landscape, culture

The current section on geology has some errors and the background geology section could usefully be re-drafted. There are currently 2 UNESCO Global Geoparks in Wales (Fforest Fawr and GeoMôn) and approx. 300 geological SSSI. There should also be reference to RIGS (currently 800 sites).

There is also the wider influence of geodiversity on the landscape of Wales, both in terms of the shape of the land but also how the land is used. For example, the exploitation of our mineral resources, type of farming, communication routes, settlement pattern, building stones, etc.

In addition, we would like to flag up the following issues (some of which could be sorted if there was a Geodiversity topic):

i. Geodiversity is another important element of marine ecosystems, and describes the variety of rocks, fossils, minerals, natural processes, landforms and soils that underlie and determine the character of our landscape and environment;

ii. Geoparks are now ratified by UNESCO and should be termed UNESCO Global Geoparks. UNESCO Global Geoparks are on a par with World Heritage sites. There are two in Wales, namely Fforest Fawr in the western part of the Brecon Beacons and GeoMôn in Anglesey. Abberley & Malvern Hills is not an UNESCO Geopark and does not cross into Wales;

iii. UNESCO has already carried out research on the economic value of Geoparks. The 7 UK Geoparks contribute £18.7m to the local economy;

iv. There is reference to Geological Conservation Review (GCR) sites. It should be made clear that these are the building blocks of SSSIs. They have no protection unless they are notified as SSSIs;

v. In addition to UNESCO Geoparks and GCR sites, there are also RIGS (Regionally Important Geodiversity Sites) which supplement the statutory protected geological SSSI network;

vi. The 'Biodiversity, Flora and Fauna' topic refers to nationally designated nature conservation sites. For SSSIs this includes geological features i.e. GCR sites;

vii. There is a short paragraph on p. 40 referring to geodiversity in the marine environment. This would benefit from greater clarity. In the marine environment, geodiversity underpins the provision of many ecosystem services by providing physical features that influence the functioning of the marine ecosystem. There are also geodiversity features which are important in their own right, such as the sarnau and drumlins. In addition, the spectacular coast of Wales is very important for geological study and attracting tourists. Other keys issues that could have an impact on coastal processes and landforms would be large infrastructure projects, marine dredging and climate change;

viii. In the section on material assets there should be more information on the mineral wealth of Wales;

ix. Reference to UNESCO Geoparks could be added to section 6.11 Cultural heritage;

x. The text on p. 37 does not mention the NE Wales coalfield. In addition, it underplays the decline in mining i.e. it is almost non-existent compared to 100 years ago.

11. Soils

P. 39, Land Use and Soil

This section might benefit from mention of the pressure in our urban environment of soil sealing due to development and in-fill.

12. Economy

i. Understanding economics is central to SMNR, but it is not appropriate to reduce everything to monetary values:

Economics is more than input-output tables and FTE employment, it is the study of the allocation of scarce resources to meet insatiable needs, and thus central to the SMNR. SMNR requires the adaptive management of three intersecting complex systems; those of nature, human society and the economy. Integrating our approach to these requires inter-disciplinary collaboration. If its scope is restricted merely to that sub-set of use values that are expressed through the market then it will fail to achieve this, and we will continue to deplete our natural resources unsustainably.

The economic objective should be to follow a path that maximises economic value over time, in line with the principles of sustainable development which are articulated in the Wellbeing of Future Generations (Wales) Act 2015 and the Environment (Wales) Act of

2016. Economic value can be attributed to use value and non-use value (which translate into the benefits and the intrinsic value of ecosystem services set out in the Environment Act). Non-use values should be quantified whenever possible but they cannot be monetised.

ii. **Management of renewable and non-renewable natural resources requires two different approaches:**
SMNR requires a distinction to be drawn between those that are renewable, and those that are non-renewable. Stewardship of the former requires the stock to handed on to future generations in at least as good a condition as it was received by the current generation. Stewardship of the latter requires that they be depleted no faster than substitutes or alternatives can be discovered or developed. An issue also arises as to the extent to which the rents extracted from non-renewable resources today should be invested in other assets, such as financial assets, to benefit future generations.

iii. **There is some evidence that we are starting to decouple economic growth from ever-increasing consumption of natural resources:**
Experimental statistics for raw material consumption (RMC) on a UK basis show a decline from 15.1 tonnes per person in 2001 to 10.3 tonnes per person in 2013. Excluding fossil fuels, which arguably are better measured in terms of ghg emissions rather than weight, the comparable comparison would be a fall from 10.3 t pc to 6.4 t pc. Given real economic growth over the period this implies an absolute decoupling of the economy since raw material equivalents (RME) on imports and exports should allow for the fact that most manufactures consumed in the UK are produced overseas. Other indicators of the development of a circular economy could be developed, but it would seem sensible first to produce Welsh estimates of RMC to ensure that the decoupling here can be established and the future trend monitored.

iv. **Data flows are becoming more important than goods flows in world economics:**
Cross border data flows now make a greater contribution to world output than cross border flows of material goods.

v. **Climate change is recognised as the greatest risk to the global economy:**
The latest edition of the World Economic Forum's Global Risk Report (WEF 2016) ranks a set of 29 global risks (including 5 environmental risks), with failure of climate change mitigation and adaptation identified as the highest impacting risk.

vi. **SMNR policy appraisal**
In appraising policies designed to overcome the information and market failures which beset SMNR, economic optimisation models need to be combined with biophysical models. Policy makers can then readily compare the Net Present Values generated with those produced by interventions in very different policy areas in line with Green Book guidance and the approach recommended by the NEA FO report.