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Draft Guidance on the 2030 Biodiversity Strategy river restoration targets

A Eurelectric response paper

August 2021

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We stand for

The vision of the European power sector is to enable and sustain:
- A vibrant competitive European economy, reliably powered by clean, carbon-neutral energy
- A smart, energy efficient and truly sustainable society for all citizens of Europe

We are committed to lead a cost-effective energy transition by:

investing in clean power generation and transition-enabling solutions, to reduce emissions and actively pursue efforts to become carbon-neutral well before mid-century, taking into account different starting points and commercial availability of key transition technologies;

transforming the energy system to make it more responsive, resilient and efficient. This includes increased use of renewable energy, digitalisation, demand side response and reinforcement of grids so they can function as platforms and enablers for customers, cities and communities;

accelerating the energy transition in other economic sectors by offering competitive electricity as a transformation tool for transport, heating and industry;

embedding sustainability in all parts of our value chain and take measures to support the transformation of existing assets towards a zero carbon society;

innovating to discover the cutting-edge business models and develop the breakthrough technologies that are indispensable to allow our industry to lead this transition.

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WG Hydro

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BIODIVERSITY STRATEGY 2030

RIVER RESTORATION GUIDANCE: DOCUMENT FOR RECORDING REVIEW COMMENTS

[1]MEMBER STATE: EURELECTRIC

[2]REVIEWERS: EURELECTRIC'S STRUCTURE OF EXPERTISE

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
Eurelectric's key messages to the European Commission draft Guidance on the 2030 Biodiversity Strategy river restoration targets i.e. establishing at least 25 000km of free-flowing rivers by 2030 Eurelectric, assesses this draft publication, provided by the European Commission to the Member States, as a helpful tool to provide technical guidance in the interpretation and implementation of the target of the Biodiversity Strategy 2030 to establish at least 25,000 km of free-flowing rivers by 2030. We support both, the document's non-binding nature as well as its emphasis on the removal of obsolete barriers. Removing obsolete barriers does not affect the hydropower sector as . Hydropower plants that are actively generating renewable electricity and renewable flexibility are not obsolete. However, requirements to change flow regimes certainly can risk Europe loosing renewable energy, vital flexibility and storage necessary, all provided by hydropower for the energy transition. Our comments focus on five main issues, which may give the reader a better grasp of the scope of the document and help to clarify the linkages between this document, existing EC directives, and other interconnected guidance documents, such as the CIS guidance documents supporting the implementation of the Water Framework Directive (WFD). 1. First, the document under consultation targets natural rivers in high status (according to the WFD). This is mentioned several times in the draft, but should be placed and stressed at the very beginning of the document in order to avoid misunderstanding of the scope. This would also acknowledge the key role of Heavily Modified Water Bodies (HMWB) to secure existing uses such as the generation of renewable electricity or flood protection. Currently, the non-scope of the draft for HMWB cannot be easily found. The difference of targets and implementation steps for different water bodies (Natural, Artificial and Heavily Modified water bodies) must be made clearer in wording and should be made visible throughout the entire publication to clarify the scope. Eurelectric calls on the European Commission to ensure that the final version clearly defines that Heavily Modified Water Bodies (HMWB) and Artificial Water Bodies (AWB) are not part of the remit of this report.					

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
2. Second, we welcome the draft's strong link to the WFD and other official documents as it stresses the importance to refer to existing definitions. The WFD Common Implementation Strategy has produced more than 30 guidance documents, which are key documents for authorities and stakeholders to find common ways of implementing the directive. However, in this draft guidance there are some additional interpretations in the references to the WFD, which are not completely in line with the WFD or CIS guidance documents. In our understanding, some proposed definitions for free flowing river are too stringent and could prevent finding cases to implement the BDS strategy. If the assignment of water bodies is carried out properly, then the 'High Status' according to the WFD shall satisfy also the target of a 'free-flowing status' of specific river stretches. *As an example of additional interpretation is a statement claiming that it is mandatory to put in place mitigation measures to restore continuity as much as possible to meet good potential of HMWB. However, also CIS guidance document 37 clearly stated, that river continuity is not a target itself. Mitigation measures to enhance river continuity shall be considered and possible improvement of BQEs assessed. After the assessment the most cost-effective mitigation measures to reach BQEs in good potential shall be implemented.* Eurelectric calls on the European Commission to acknowledge the strong links between biodiversity and water policy and, therefore, to align the draft guidance with existing regulation and guidance papers. 3. Third, we welcome the concept of "river functional units" (RFU) which implies a site-specific definition of "free-flowing" taking into account the local conditions such as tributaries, adjacent floodplains, and local biodiversity. We appreciate the open definition of RFUs allowing Member States to assess free flowing rivers on a case-by-case basis. The Guidance Document should set a more specific **procedural** framework for this definition so that a case-by-case delineation can be done to reflect local conditions. We propose to introduce the new "river functional unit" (RFU) concept at the beginning of the document. Furthermore, we stress that connectivity *per se* is not an ecological goal. Aiming river connectivity only makes sense when it is related to the life cycle of the local aquatic fauna. Eurelectric calls on the European Commission to acknowledge the case-by-case definition of RFUs very clearly to allow a thorough site-specific implementation of the current guideline. 4. Fourth, priorities for interventions in removing obsolete barriers have to take into account not only ecological costs and benefits, but also have to consider adverse impacts on water uses based on a comprehensive cost-benefit assessment covering all socio-economic dimensions. For instance, impoundment structures can limit the impacts of droughts by storing water, raising and stabilizing the groundwater tables, providing refuge areas for aquatic populations. Impoundment structures can also limit the impacts of floods by reducing leaching and river bed erosion. Eurelectric appeals to the European Commission to consider such existing uses – and even potential future uses – especially in the context of climate change when defining and prioritizing "obsolete barriers".					

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
5. Fifth, the science of dam removal is still in its infancy, there is still insufficient scientific knowledge about the ecological effectiveness of dam removal measures as well as on their potential risks for unique biotic communities which are highly adapted to the peculiarities of the existing ecosystems. We, thus, appreciate the actions to improve science-based knowledge for further restoration actions and to follow an approach of adaptive management. We think this chapter should be more elaborated as well as pointing out the open questions concerning risks and challenges of dam removals. Eurelectric calls on the European Commission to provide research and innovation funding mechanisms for scientific and non-scientific partners to commonly increase the knowledge and develop content-based measures to successfully implement the 2030 Biodiversity Strategy.					
Eurelectric	General remarks			Overall, this draft publication can be seen as helpful tool, provided by the European Commission to the Member States to encompass technical guidance in interpreting and in taking action on the target of the Biodiversity Strategy 2030 to establish at least 25,000km of free-flowing rivers by 2030. However, in order to highlight the storyline, the draft **text would gain a lot by streamlining and shortening** of the many redundancies that might come from a multiple authorship. Regarding **funding** of implementation measures, we believe that integrating this new environmental target into existing support schemes will not increase its reachability and/or will reduce the effectiveness of existing tools aiming at other targets.	
Eurelectric	1	7	50-52	We approve the purpose of "picking low-hanging fruit" to improve the aquatic environment by removing facilities that no longer have a function or are subject to ownership responsibility. At the same time, old constructions may have derivative functions and have value for new user groups, and ecosystems have adjusted over time to these facilities. These conditions must be assessed for each case and the environmental benefit accounted for. In light of the mentioned lag in implementation of the WFD, it is crucial that the draft biodiversity strategy does not impose an additional administrative burden.	Add that measures must be assessed in context with the current water body, environmental objectives and RBMP
Eurelectric	1	7-8		Chapter 1 in general: Removal of barriers is presented as “objective on its own”. In the logic of the WFD, at least, hydromorphological measures are not a goal in itself, but the basis for improvements in the living conditions for natural species (as measured by biological quality elements). This logic should be reflected here.	Add an explanation that in frame of the WFD, removal of barriers is not an aim in itself. Explain how it is meant to contribute to nature restoration through improved connectivity, etc. this clarification is important to ensure that the most effective measures are prioritised properly.

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
Eurelectric	1	8	67-71	We wonder why the EC mentions only two groups of addressees, namely Member States' authorities experts and practitioners on river restoration. This approach neglects the role of stakeholders who are and will be obliged to implement not only the BDS 2030 targets but also other EU legislation, such as the WFD and the Nature Directives. Early involvement of all affected stakeholder groups such as industries, science and others could increase the long-term and sustainable implementation of the guidance.	Include all stakeholders as addressees
Eurelectric	1	8	87-89	It is stated in the guidance that natural rivers are its scope of application and the BDS 2030 also sets target to remove primarily obsolete barriers. Heavily modified (and artificial) waterbodies shall be clearly indicated of being out of the document's scope.	Add: This guidance provides information and practical guidance for Member States to act on the BDS 2030 river restoration targets, specifically the establishment of free-flowing rivers by removing barriers and restoring floodplains and wetlands **in natural rivers**.
Eurelectric	1	8	90	Eurelectric supports the voluntary nature of this commission document and its non-binding legal nature. as this allows Member States to take into account links to the respective legal and regulatory framework at national level in order to find best-fitting solutions for implementation.	No change proposed
Eurelectric	1	8	91-94	This guidance does not fully follow WFD nor Natura directives requirements. Its status of "complementing other methodological guidance documents…" gives this guidance document a too strong status in implementing the WFD and managing Natura 2000-areas.	Proposal: replace "complements other…" with " give additional support to…"
Eurelectric	2	9	97	There are now two guidance documents under elaboration on related topics regarding sediments. One is this draft guidance on the Biodiversity Strategy elaborated by the European Commission, and a second one is a specific CIS guidance document on sediment management, elaborated by the dedicated CIS Working Group "Ecostat". To avoid unnecessary administrative burden and the risk that additional layers of administrative requirements are put on top of the existing processes instead of being integrated in it, these two processes should not further progress in silos.	There needs to be cross-references about which document is covering which aspects of sediment management and it would be very helpful for the potential users to receive an explanation under which circumstances and at which steps in the river basin management plan implementation these two guidance documents provide assistance.

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
Eurelectric	2	9	97, first bullet point	In the first bullet point, the EC clarifies its understanding of free-flowing rivers as supporting the four dimensions of connectivity, namely longitudinal, lateral, vertical and temporal. In addition, the EC defines a free-flowing river as not impaired by any anthropogenic barrier. This last additional remark contradicts the four dimensions mentioned earlier as it leaves out anthropogenic measures in rivers that had been installed aiming at the protection of human being or human development over decades, sometimes even over centuries.	Remove sentence with “not impaired by any anthropogenic barrier”
Eurelectric	2	9	97, last bullet point	The overall goal should be on sustainable solutions, combining long-lasting ecological, social and economic targets and could be facilitated by fostering a dialogue with concerned stakeholders, science and others during the phase of developing the guidance. The existing lack of a comprehensive scientific understanding of river ecological and hydromorphological processes, in particular at river basin level should be filled by research & innovation as well as by adaptive management.	Add reference to long-lasting, sustainable solutions, based on sound scientific knowledge; to R&D and to adaptive management.
Eurelectric	2	9/10	97, 117	Free- flowing river: Lateral connectivity should be established only with existing floodplains	(2), lateral (connectivity to existing floodplains and riparian areas)
Eurelectric	2	10	97, 119	A free-flowing river is not impaired by any anthropogenic barrier. Although this definition looks very precise at first glance, it does raise some questions. In particular, the question arises as to when a barrier (length, size, shape, ...) represents an impairment. Therefore, we propose to set the definition of "free-flowing" in context to the definition of high status (WFD) for better interpretability. Barriers passable for organisms, sediment and nutrients, having a negligible influence on the river, should be excluded.	Set the definition of "free-flowing" in context to the definition of high status (WFD) for better interpretability. A free-flowing river is not impaired by any anthropogenic barriers, which are not passable for organisms, sediment or nutrients
Eurelectric	2	10	133	The definition of obsolete barrier should be clarified. Over decades and even centuries, a barrier can change and/or add purposes (i.e. tourism, irrigation, etc.) not related with the original scope. The proposed definition may be misinterpreted: *“which do not guarantee anymore the functions they have been built for”*. In the draft guidance, the	We suggest to add: The assessment of whether a dam is deemed to be obsolete has to be done via a case by case assessment taking into consideration all local, regional and national particularities.

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
				following examples on specific single uses can be found: "water supply OR flood protection, OR…" as well as generic qualitative characteristics: "too old, damaged, abandoned". A dam built to produce flour but converted to produce hydroelectricity cannot be considered obsolete. Obsolete barriers are those that have no proven use and will not be able to find a new one. We strongly support the proposed definition of "obsolete barrier" referring to a barrier which does not guarantee anymore the function that it has been built for points out clearly that there is no intention to remove any anthropogenic barrier in place for its original function. Furthermore, we suggest to add in this definition the case where the original intention of a barrier is advanced and enlarged to another function or even more. This can be the case when barriers serve at the same time the aims of flood protection and irrigation, navigation, or electricity generation. We underline the essential function of hydropower dams both for renewable energy production, flexibility, as well as flood and drought mitigation.	We suggest to complete with "that have no proven use and will not be able to find a new one." We suggest taking away the criteria "too old" because age is no measurement for the effectiveness of a barrier. We suggest to add in this definition the case where the original function of a barrier is advanced to another one.
Eurelectric	2.2.	11	183-184	"A river is considered stabilized after 50 to 100 years" Temporal continuity is an essential criterion. It is true that the equilibrium of rivers is established over a long time. Most small dams (weirs) have existed for more than a century. They are a factor that has determined the current biodiversity of the river. A sedimentary and ecological balance has been established. Removing the dam disrupts this balance.	Add: Before running the risk of disturbing the ecological balance situated around the dam, comprehensive environmental studies have to be conducted.
Eurelectric	2.2.	11	196	"presence of embankments, bank protections, barriers…". According to the definition provided for "barriers", this includes embankments and bank protections. To avoid confusion about the term definition, use a different word e.g. "dams".	Use "dams" or "weirs" instead of "barriers". General: add a comprehensive chapter on definitions

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
				A technical guidance document should provide clarity on terminology used to avoid further confusions. This could be achieved by including a more comprehensive DEFINITION section including a definition of barrier, dam, weir, etc	
Eurelectric	2.2.	12-13	205 ff	We agree that defining RFU is difficult, and support the notion that it should be done case-by-case to reflect local conditions,but it would still be good to include some more procedural guidance if possible.	Include some more procedural guidance, regarding the definition of RFU if possible.
Eurelectric	2.2.	13	245-246	"similar examples could be provided for longitudinal, vertical and temporal connectivity". Providing clarification is a key function of such guidance documents. The draft document seems incomplete without more definition of longitudinal connectivity.	Add definitions for longitudinal, vertical and temporal connectivity.
Eurelectric	2.2.	14	259-263	"smaller river infrastructures…can have multiple impacts… make them a potentially larger threat than large dams" is the state-of-the-art scientific assessment. This insight should result in a recommendation to focus on ecological effect and not infrastructure size when prioritizing measures.	Include recommendations to focus on ecological effect and cost-benefit analysis and not on the size of infrastructure when prioritizing measures.
Eurelectric	2.2.	14	263-264	"… … the cumulative impact… it is difficult to assess and often neglected…t." The impact on water and sediment circulation will depend on the height of the weir. Smaller weirs do not delay flows and are generally transparent to sediment transport by quickly reaching equilibrium with the river. Cumulative effects in this case are indeed not really proven and may vary with local situations. For example, a river in the French Pyrenees is equipped with successive dams. It is however in good ecological status. Moreover, In the case of a new dam project, the scientific environmental study showed the compatibility of this project with good ecological status.	Complete the paragraph to show the complexity of situations and avoid hasty judgement. Decision-making needs to be based on scientific facts and not on opinions. For this reason, existing tools like strategic environmental impact assessment d should be used.

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
				We support the assessment that cumulative impacts of multiple barriers along rivers still lack a comprehensive and satisfying scientific basis. Therefore, we wonder why the EC still claims for urgent action as this time pressure will inevitably lead to suboptimal results, either from the perspective of the affected ecosystems or from the regulatory implementation obligations including financing of measures.	Regional impact assessment is one tool that could be used on river basin scale to identify cumulative impacts, both negative and positive ones.
Eurelectric	2.2.		266	"an urgent step to take is to restore longitudinal continuity" We find it important to, as a first step, study and assess all impacts of potential dam removals (biological, hydromorphological, physico-chemical, sediments, etc.) before implementing them on a large scale.	Replace "to restore" by 'to study removal' Add information on the alternative approaches to achieve longitudinal connectivity beside dam removal.
Eurelectric	2.2.	15	280	Define the flood prone area for lateral connectivity extent is critical in alpine regions, where this would be the entire valley plain. Topology must be considered	Include topology as criterion
Eurelectric	3	15	286, first bullet point Third bullet point	"To reach good status under WFD, river continuity needs to be addressed in all river basin management plans. "This is an over-interpretation of the WFD, as continuity is a supporting quality element. In many cases, river continuity is affected quite a lot, but good status for BQEs could still be reached. BDS target in the way it is described in this document is also more demanding than high status, maybe reference value = upper limit for hymo in high status "Many of these habitats depend directly on the river system being in conditions that are as close as possible to natural conditions. The achievement of free-flowing status would thus be a necessary condition for the restoration of these habitats. It will also benefit other species, in particular migratory fish species, and their habitats." This is also an extended interpretation of the nature directives requirements aiming at reaching a favourable level of protection. Habitats could reach this level even though the conditions are close to natural. In some cases, protected habitats have even been born due to changed conditions	Ensure correct reference to WFD
Eurelectric	3.1.	16	291 ff	We fully support the intention the reach the BDS2030 goals in good alignment with the WFD and NDs. Reaching the "good	Add clarification on the scope = natural water bodies. No application for HMWB is intended.

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
				ecological status" according to the WFD makes clear that the BDS2030 refers to natural water bodies and not to HMWB. The BDS 2030 is therefore not applicable in HMWB.	
Eurelectric	3.1.	16	308 ff	We fully support the view from the EC on the importance to take into account the need to maintain different important uses such as inland navigation, electricity generation or agriculture. Respecting this importance is already set into practice with the instrument of HMWB in the WFD and the need to balance cost and benefits of implementing measures in advance of their prescription. The limitation of the area of application of the BDS2030 to natural water bodies already supports this view and needs to be stressed throughout the guidance paper.	Add clarification on the scope = natural water bodies. No application for HMWB is intended.
Eurelectric	3.1.	16	310-311	"The WFD… sets rules to ensure the integration of different objectives". It does not become clear to which WFD provisions this refers to. As this issue is really important, propose to elaborated in detail on this statement.	State which WFD rules to ensure integration of different objectives are referred to, and include some explanation on how these rules work and interact.
Eurelectric	3.2.	17	325-326	The definition quoted from CIS Guidance Document 37 is wrong: "best approximation to ecological continuum" is the definition of maximum ecological potential (MEP), not good ecological potential (GEP). GEP is defined as "close to best approximation to ecological continuum".	Introduce both, MEP and GEP, including their respective definitions in relation to ecological continuum, preferably quote directly: *"For heavily modified water bodies and artificial water bodies the alternative reference condition is maximum ecological potential (MEP) and alternative objective ~~of~~ is good ecological potential (GEP). In process to define MEP and GEP "best approximation to ecological continuum" is used (for more details see WFD CIS Guidance Document No. 37*)
Eurelectric	3,2,	17	329	Beside the categories of natural and HMWB, the WFD knows also AWB (Artificial Water Body). For the sake of completeness, this third category should be also mentioned, including the obligation to reach the target of GEP.	Add AWB (Artificial Water Body) category
Eurelectric	3.2.	17	334-337	We strongly support this clarification that BDS focuses on natural rivers, and that the objectives of WFD are the governing ones.	This should be made even clearer early in the guidance document, as some previous sections may cause confusion.
Eurelectric	3.2.	17	340-341	"… used as indicators to classify high, good and moderate status or potential".	Change to "high, good, moderate, poor and bad status or potential"

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
				However, the classification system has 5 classes, including "poor" and "bad". This should be represented correctly.	
Eurelectric	3.2.	18	368	"… corresponding to unimpacted hydromorphological conditions…": The WFD definition requires "totally, or nearly totally undisturbed conditions", we propose to align with this wording. . Even more, Article 4.7 WFD allows deterioration from high to good and even to less than good status.	Change wording to the more exact WFD-wording: "no, or only very minor alterations to the hydromorphological quality elements" - i.e. not any measure in itself, but the resulting impact on hydromorphology. Add reference to art. 4.7 WFD
Eurelectric	3.2.	18	371-375	Hydromorphologyis not part of the BQEs, but it serves the individual classification inform good to high status meaning that water bodies cannot be in high status even if BQEs are, if hydromorphologyis not.	Change to wording from WFD. MSs shall define class boundary for hydromorphology between high and good status.
Eurelectric	3.2.	18	376-378	2The correct identification of the required hydromorphological conditions necessary to achieve good ecological status or potential is a difficult task, and requires the use of biological assessment methods that are sensitive to the relevant hydromorphological pressures." Emphasis should be on correcting the shortcomings mentioned in the characterization and follow-up in RBMP, rather than adding additional administrative burdens to the implementation	Add: If BQEs reach good status, then hydromorphology conditions are good enough. Then assessing or monitoring the existing hydromorphology gives sufficient answers.
Eurelectric	3.2.	18	379 ff	The EC assessed implementation gaps in many MS in their second RBMPs relating to the way of assessment of hydromorphologcal quality elements. This gap might have been closed by MS in their third RBMPs that have to be finalized and submitted to the EC by the end of 2021. We doubt that setting up a process to implement the BDS2030 based on the insufficient assessment 6 years ago will lead to satisfying results at this point in time.	Propose to include the third RBMPs and their assessment (to be done by EC) into the implementation plan of the BDS2030 and hence not fostering prompt action beforehand.
Eurelectric	3.3.	18	388-390	"The WFD … requires action in those cases where hydromorphological pressures are causing failure to meet the WFD objectives. It is therefore unnecessary to undertake a free-flowing river action on a river in good status. A fortiori, it may be dangerous to disrupt temporal continuity. In addition, hydromorphological pressures are not only related to barriers. Agricultural practices in the watersheds are the	Complete the sentence with "where a study has shown that barrier removal will allow good status and that no other effects have been ignored (like hydromorphological pressure from agriculture or increased run-off of groundwater leading to an increased need for irrigation)"

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
				source of sediment inputs. The link between these practices and the sediments stored by the weirs must be assessed. When the weirs are removed, these sediments will again be transported, which could have an impact on clogging or the transport of pollutants. This is an issue that should not be overlooked whereas hydromorphology often is identified as a pressure but is ultimately not responsible for not reaching the environmental target. Almost all EU water bodies are affected by hydromorphological pressures. However, this is in most cases not the main reason for failing to meet good status or potential. E.g. in Finland the main pressure which prevents reaching target is nutrient load from forests and agriculture.	
Eurelectric	3.3.	18	397-403	As the BDS2030 targets natural water bodies (and not artificial and HMWB), we suggest to refer to NWB only in depicting numbers related to implementation gaps. As a consequence, gaps to reach the GEP – the target in AWB and HMWB – is not relevant here and should not be quoted.	suggest to refer to NWB only in depicting numbers related to implementation gaps
Eurelectric	3.3.	18	397-403	The EC assessed implementation gaps from many MS in their second RBMPs relating to the way of assessment of hydromorphological quality elements. This gap might have been closed by MS in their third RBMPs that have to be finalized and submitted to the EC by the end of 2021. We doubt that setting up a process to implement the BDS2030 based on the insufficient assessment 6 years ago will lead to satisfying results at this point in time. We therefore propose to include the third RBMPs and their assessment into the implementation plan of the BDS2030 and hence not fostering prompt action beforehand.	Stress the importance of assessing the progresses in the third RBMPs before rushing into unsustainable an unaligned implementation measures.
Eurelectric	3.3.	19	431-434	This is also an extended interpretation: GES does not give any minimum criteria for hydromorphology. GES could be reached even if there are barriers, which prevent some migration or sediment flow. It depends on the impact on BQEs.	Throughout the draft guidance, it should be made clearer that hydromorphology serves as supporting quality element which implies that there have not been defined. minimum levels/criteria.
Eurelectric	3.3.	19	434-437	Ensuring free-flowing rivers is, in the view of the EC, related not only to the removal of barriers or making rivers passable with appropriate measures (these are not defined), but is also associated with “measures to ensure sufficient ecological flow conditions in the whole river basin”. From our point of view,	Add clarification on the scope of this draft guidance and the CIS guidance papers and avoid interferences.

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
				the second aim of ensuring e-flows is already covered by the WFD's requirement to reach continuity. Any mixture between the BDS2030 and the WFD will even more increase misunderstanding and, in the following, deficits in implementation.	
Eurelectric	3.3.	19	435-437	This aim contradicts the vital energy transition needs. If ecological flows are aimed in the entire catchment area, those rivers will lose storage and flexibility. The regime of flow is at least partly changed in almost all rivers and the current use needs to keep it changed. E-flows in the whole river basin could ruin possibilities to store water for hydropower, flood-protection and water supply. Flood plain ecosystems do not need total or nearly total natural flow regimes. So, a too stringent definition for free-flowing rivers makes it very difficult to find restorable river stretches.	Remove: "in the whole river basin"
Eurelectric	3.4.	19	442-443	If reference is made to the WFD, then this conclusion is not compliant, because Art 4.7 WFD gives the possibility to deteriorate.	Ensure alignment with WFD
Eurelectric	3.4.	19	445-447	This is an interpretation by the authors not corresponding to the WFD. If we look at intercalibrated BQEs, they can be reached in quite many cases even though river continuity does not exist at all. Depends on fish species typical for river types.	Don't misinterpret the WFD; don't mix up legal requirements with personal interpretations.
Eurelectric	3.4.	19	447-449	"However, barriers may in some cases be present at good status, as long as biological quality elements sensitive to continuity in water bodies anywhere upstream or downstream of the barrier are only slightly affected» Supported	Keep as is.
Eurelectric	3.4.	19	452	This is not written in the Annex V. If the classification system is approved and intercalibrated, then BQEs in GES shall be enough to meet GES.	Ensure alignment with WFD
Eurelectric	3.4.	20	453-354	"But removing a barrier will always be beneficial…". The balance of rivers is established over a long period of time (temporal continuity). Most of the small dams (weirs) have existed for more than a century. A sedimentary and ecological balance has been established. Erasing the dam disrupts this balance. Comprehensive ecological studies are needed before running the risk of removing the barriers of a river.	Avoid messages without scientific background or – at least – flag them as personal/political opinion of the author. Change "always" to "in some cases".

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
				Moreover, this requires monitoring after weir removals to compensate for certain processes that could be harmful to the river: disappearance of certain aquatic ecosystems especially in the old impoundments, recovery of sediments from the old impoundments during floods, lack of water during low-water periods, etc. This statement is known to be incorrect from long discussions in WFD CIS. There are cases, e.g. in alpine or other upper reach conditions, where there is no benefit for ecological status e.g. when the barrier is above any natural fish habitat. Also, some structures are now ecological niches, see lines 974-975 in the draft.	
Eurelectric	3.4.	20	458	"The concerned water bodies are designated as heavily modified water bodies, and for these it is not legally required…": it is not true that all water bodies that serve the functions mentioned are designated as HMWB. This is only done if good ecological status cannot be reached due to specific uses. This should be clarified. Similarly to HMWB, also in natural water bodies, there is no obligation to restore continuity "as much as possible", only as far as necessary to achieve GES.	Change statement to "The concerned water bodies are designated as heavily modified water bodies, if good ecological status cannot be reached due to specific uses. For these it is not…" .
Eurelectric	3.4.	20	460	"but it is mandatory to put in place mitigation measures to restore continuity as much as possible, without significantly impacting the use". This is incorrect. It is not mandatory to restore river continuity as much as possible.	Different mitigation measures to enhance river continuity shall be considered and possible improvement of BQEs should be assessed. Then the most cost-effective mitigation measures to reach BQEs in good potential shall be implemented.
Eurelectric	3.4.	20	461-462	"Typical measures will include bypasses for fish and sediment..."	Sediment continuity is not a supporting element for the definition of MEP in NWB or of GEP in HMWB. Hence, sediment bypass is not a measure that seems relevant to a significant extent in correctly designated HMWBs. The text in the draft guidance seems to be derived from the draft CIS guide on sediments. There is a need for coordination between that the two guidance papers. Furthermore, measures on decommissioned facilities and structures in natural rivers and possible benefits for sediment transport should be elaborated.

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
Eurelectric	3.4	20	463	Installation to prevent fish mortality should not be an appropriate measure in genera. l	Add: if necessary for specific fish-population
Eurelectric	3.5.	20	468	Wetlands: there are also many "anthropogenic" wetlands which rely on barriers for their continued existence (in the context of reservoirs, etc.). This should be acknowledged including a statement that pros and cons of barrier removal should be carefully considered. It is good practice to use Environmental Impact Assessment to identify positive and negative effects of an intervention, in this case the potential removal of a barrier. This should not been omitted in a governmental guidance.	Include a statement that in cases of wetlands relying to some degree on barriers pros and cons of barrier removal should be carefully considered.
Eurelectric	3.5.	21	516	Habitats cannot live on floodplains – adapt wording	Change wording: Among the species and habitats which are protected under the Birds and Habitats Directive, there are several freshwater ones but also terrestrial species ~~and habitats~~ that live on the floodplains of rivers and that depend on a functioning river system to thrive.
Eurelectric	3.5.	21	524-531	Does this mean, that NATURA 2000 areas do not have a favourable conservation status ?	Please give additional clarification
Eurelectric	3.5.	22	548	We agree with the assessment that the removal of barriers is one among other measures to reach a favourable conservation status.	For this reason this document should provide more guidance on the other options, to assist the users in identifying the most effective cost-benefit option through an assessment of the options.
Eurelectric	4	22	552. last bullet point	"it appears that there are no free-flowing rivers (i.e. from upstream to downstream and considering the different spatial dimensions) on EU territory, expect for few short rivers in remote areas". This is not proven by the data provided in chapter 4 (which mostly explains how big data gaps currently are), it seems incompatible with figure 6 (rivers in high status) showing significant clusters in different areas of Europe, and indirectly sets a very high expectation level towards the definition of free flowing rivers. In addition, "from upstream to downstream" sets an expectation that the whole river needs to be free-flowing, counter-acting the introduction of River Functional Units in chapter 2. Statement "in remote areas" should be deleted as being "remote" does not make the area less meaningful.	Despite data gaps, try to present a picture on where in Europe there might be free-flowing rivers including their characteristics, including RFU concept. Or omit the whole statement if data is inconclusive. Delete "in remote areas"

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
Eurelectric	4	23	555	"… river connectivity is a key component for river and floodplain functioning, for reaching good ecological status…". This statement is wrong, chapter 3 shows (correctly) that "free-flowing" is associated to high, not good, ecological status.	Correct statement to "…for reaching high ecological status…"
Eurelectric	4	23	570-571	"river continuity is considered under the WFD a key component of river ecological status as well of hydromorphological quality together with hydrology and morphology". In the WFD, continuity is part of hydromorphological supporting quality elements. On the other hand, BQEs are key components.	Adjust wording accordingly
Eurelectric	4.1.	24	628	Dam height as proxy for impact is not relevant. It might only be a proxy for removal costs, not including the replacement costs of lost services provided such as groundwater stabilisation, freshwater retention, new electricity generating options to replace the lost hydropower or other uses, burying toxic sediments, stopping spreading of invasive aquatic species.	Adjust wording: Remove height and age
Eurelectric	4.1.	25	665-672	Vertical connectivity: Different to other dimensions, no recommendations are given how to address knowledge gaps.	Include some narrative on addressing knowledge gaps also for vertical connectivity (table 2 has some material).
Eurelectric	4.2.	26	710-712	Figure 5: the concept behind "random forest regression" (5c) is not explained in the main text. Without explanation, it is not possible for the average reader to interpret / understand the figure.	Either explain the concept behind figure 5c similarly to how it is done for 5a and 5b, or delete concept and figure 5c from the report.
Eurelectric	4.2.	26	719	"… and allows undisturbed migration…": or almost undisturbed migration, see comments on line 368	Change sentence to "… and allows undisturbed or almost undisturbed migration…"
Eurelectric	4.2	26	722	The assessment of hydromorphological components in the WFD is clearly defined and assessed. It is hence a subjective opinion of the author that this assessment is not correct.	Delete sentence
Eurelectric	4.2.	29	786	"it appears there are no free-flowing rivers… on EU territory": There are free-flowing rivers – see comments to line 552	Delete sentence
Eurelectric	4.3.	29	809	"… and the achievement of good ecological status…": Chapter 3 shows (correctly) that "free-flowing" is associated to high, not good, ecological status. Correct accordingly.	Correct statement to "… and the achievement of high ecological status…"
Eurelectric	4.3.	30	832-835	"It is recommended to extend the monitoring and evaluation of the hydrological quality elements and thus of river continuity to all river water bodies, as required by the WFD."	Add "(including measures implemented to increase continuity: fish paths,etc.)" after "continuity".

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
				It is also necessary to identify all measures implemented to improve continuity: fish pass, fish passage, sediment management, etc. and to evaluate their effectiveness in restoring continuity.	And point out that is also necessary to recall here that all measures should undergo a comprehensive cost-benefit analysis based on transparent criteria.
Eurelectric	5	31	854, second bullet point	recommendation of so-called "no-regret actions": We support the approach to start implementation in parallel to further research / data gathering, but measures should nonetheless be properly assessed and prioritised using all information already available.	Include information/recommendation on the need for proper prioritisation of measures based on an open public decision-making process and current cost-benefit assessment to allow for identifying the low hanging fruits in terms of both, effectiveness and efficiency. Avoid the use of "no-regret" term.
Eurelectric	5	31	858-860	Considering the BDS target stated as "at least 25,000 km of rivers will be restored into free-flowing rivers by 2030 through the removal of obsolete barriers and the restoration of floodplains and wetlands" it should be better stressed in the document that evaluations for connectivity restoration should be applied primarily to "obsolete" barriers, as defined in chapter 2. I.e. in chapter 5 the target is reported as "the BDS 2030 target of 25,000 km free-flowing rivers refers directly to the removal of barriers and the restoration of floodplains and wetlands…"	It should be clarified in the key messages and in the introduction, of chapter 5, that "all criteria and methods for connectivity restauration should be applied to obsolete barriers"; in coherence with the statements of WFD regarding to HMWB having specific uses.
Eurelectric	5.1.	31/32	863-868	"Conceptually, an improvement in longitudinal connectivity, through barrier removal, can be directly translated to km of free-flowing unimpeded river…" We disagree that the draft repeatedly and incorrectly explains the importance of all connectivity dimensions. This is not in line with the conceptual approach of the report and also the statements in lines 880-883. Also, avoid additional wording in already defined terms.	Remove text from "conceptually" in line 863 to "however" in line 868. Remove word "unimpeded".
Eurelectric	5	31-44		Chapter 5 in the current draft has lots of overlaps with chapters 2, 3 and 4. While the messages are consistent, this makes the report unnecessarily bulky and hard to read. We	Remove / shorten text on aspects already covered in earlier chapters

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
				assume that this arises from parallel work on chapters in the drafting process. We propose to address this in editing/streamlining.	
Eurelectric	5.2.	33	914-1216	General remarks to chapter 5.2.: Logically, the two sets of actions, even though they are proposed to be taken in parallel, should be reversed: the set containing science-based actions should have a primary role in the achieving of the BDS 2030 restoration target and its outcomes could also help in a more appropriate and effective identification and application of the obsolete barriers' removal actions.	The proposal is to reverse the two sets of actions, prioritizing the science-based actions including a proper cost-benefit assessment, and in particular focusing on the urgency and priority of defining a common and shared definition of Free-flowing Rivers (FFR) and River Functional Units (RFU).
Eurelectric	5.2.	33	921	"no-regret actions": see comment on line 854.	See comment on line 854.
Eurelectric	5.2.1	33-39	928-1117	Assumed that removing or reducing the fragmentation or increase the continuity is an improving of ecological status, it remains unclear in the draft guidance: - which should be the reference/quality conditions addressing the possibility to remove an obsolete barrier - what is the link (if any) between actual conditions of the hydric body under evaluation and optimal level of acceptance of the intervention in the cost benefits analysis. - which should be the expected improvement that can trigger the intervention It is expected that these aspects are correlated	Add information/ reference about the joint evaluation of [starting conditions/target species and habitat - costs acceptability - expected improvement] in order to better understand when the intervention is appropriate/necessary.
Eurelectric	5.2.1	34	958-959	It is stated in the text that, according to simulations, barrier removal will be most effective in the least fragmented basins. This cannot lead to the conclusion that the majority of the 25,000 km free flowing rivers have to be restored in the Balkans, Scandinavia, France and Greece (with least fragmented rivers). It must be ensured that restoration of free-flowing rivers is carried out where it is most efficient, keeping an equitable distribution across Europe in mind.	Add respective remarks

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
Eurelectric	5.2.1	34	968-970	Not only other pressures have to be addressed, but also other uses and socioeconomic benefits e.g. hydropower reduces negative effects of climate change	Address also socioeconomic benefits for measurement evaluation
Eurelectric	5.2.1	34/35	997-1010	The Governance & Support is very important for the success of the restoration at basin level. This should be further developed.	Consider adding an intersectoral approach between water management and biodiversity conservation at basin authority level, taking into account experience and tools from other sectors which address spatial and land use planning as well as current good practice in public decision making using SEA at plan/program level, regional Impact assessment for cumulative impact assessments at river basin level as well as ESIA at the project level.
Eurelectric	5.2.1.	35	1011-1017	For future proofing it is also important to secure water supply and stabilize ground water levels in the context of climate change.	Add: "Currently obsolete barriers may gain a new function in the context of climate change. For instance, impoundment structures can limit the impact of droughts by storing water, raising and stabilizing the groundwater tables, providing refuge areas for aquatic populations or to limit the impacts of floods by limiting leaching and bed erosion."
Eurelectric			1035	We support the intention of table 3 but we doubt if it possible to be understood in its current form. We propose to include the material (prioritisation of measures is a very important issue), but maybe not in a table but in an annex or text box with more space for more detailed descriptions. Box 2 and figure 8 work just fine and might serve as best-practice.	Include content of table 3 in text box(es) or annex to have sufficient space to explain content
Eurelectric	5.2.1.	36	1057, bullet point 4 in box no. 2	Age is no measurement for the effectiveness of a barrier	Remove bullet point 4 in box 2.
Eurelectric	5.2.1	36	1057, bullet point 5 in box no. 2	It should be stated that Step 5 in Box 2 is valid in case that the dam is obsolete and, thus, has no other value that should be calculated as a cost.	Add: Estimated cost, *given that the dam is obsolete*.
Eurelectric	5.2.1.	38	1114-1116	Box 3 and figure 9 offer interesting inputs, but it should be clarified whether the "free flowing river" objective can be reached in cases where the restoration goal is less than reference conditions due to planning restrictions. Are the definitions "not impaired by any barriers" (line 119) resp.	Add a clarification whether the concept of "free flowing rivers" requires the full attainment of reference conditions as defined in box 3. (if this is the case, implementation potential will be very restricted in more populated areas).

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
				"unimpacted hymo conditions" (line 368) met if reference conditions are not met?	
Eurelectric	5.2.1.	39	1124-1125	"although widespread monitoring will not be possible, it is suggested that a number of key sites are carefully monitored…" Please provide criteria for selection, number, other requirements etc. for the key monitoring sites. There can be large disagreements on this in implementation.	Provide criteria for selection, number, other requirements etc. for the key monitoring sites
Eurelectric	5.2.2.	42	1180-1184	"Prioritize RFU for restoration using criteria (fragmentation, biodiversity, hydromorphological quality, local governance...)" Removing barriers as early as possible is a no return and dangerous option to the sense of temporal continuity. Its application as a priority action in the two RBMPs has proven to be inefficient on the ecological status. It is therefore necessary to place the removal of barriers in a less partial vision that includes all the continuities, all the anthropic pressures and based on a precise ecological study of its expected effects on the ecological status.	Complete after "local governance" with "taking into account all the anthropic pressures and based on a precise ecological study of its expected effects on the ecological status"
Eurelectric	5.2.2.	43	1215	Box 5: it would be good to discuss similarities and differences to defining water bodies in the WFD sense. Also, RFU definition is now discussed in both, chapter 2.2 and 5.2. Figure in box 5 is not understandable without further explanation.	Discuss similarities and differences to defining water bodies in the WFD sense. In editing, decide where in the report to discuss RFU definition (chapter 2.2 might be more logical) and consolidate all related material there. Delete figure or explain more
Eurelectric	5	33-39		Missing information	Feasibility elements should be considered before pursuing a potential barrier removal project. Consider to add guiding steps for river basin restoration. (see proposal at the end under missing topics).
Eurelectric	5.2.1		missing	Chapter 5.2.1 only covers longitudinal (942-1064) and lateral (1065-1117) connectivity. Table 4 exclusively addresses longitudinal connectivity. The other dimensions are not even mentioned.	Include recommendations for the other connectivity dimensions, or if this is not possible, expressly acknowledge this gap and state reasons (e.g., no known methods / types of measures yet). (EEA, 2018 (p.73) states in its status report of European Water that 95% of Europe's flood plains are used for other purposes. Isn't there a potential conflict of use regarding the restoration of lateral connectivity which should be addressed in this guidance document?)

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
Eurelectric				Missing topic	Overall, the guideline could include example plans and demonstrations of successful restoration projects (best practice).
Eurelectric				Missing topic	As a general suggestion, the guidance should include water bodies others than “rivers” such as ponds, headwater streams, temporal or ephemeral rivers, since they provide important and diverse aquatic habitats.
Eurelectric				Missing topic	Add examples of financial mechanism (even, if any, at national level) for dam removal and river/wetland restauration as a mitigation tool (biodiversity offset)
Eurelectric				Missing topic	Proposal to improve the decision-making steps for defining and mitigating obsolete river barriers: 1. Identifying and mapping obsolete river barriers 2. Verifying ownership / legal obligations, responsibilities /functions/purposes of these obsolete barriers 3. Perform a strategic environmental assessment (SEA) per river basin of a draft plan to remove obsolete river barriers including: a. Positive and negative environmental impacts of removing the identified obsolete barriers b. Mapping and quantifying of adverse impacts on water users (basic principle of the WFD) c. Option assessment for providing services which might be lost by removing barriers including their alternative replacement costs such as: • Groundwater table stabilisation, quantitative retention at river basin scale • Fresh water retention at river basin scale • Removing buried toxic sediments from food chain and drinking water supply • Risk of further spreading of invasive species • Aesthetics: tourists and locals tend to prefer looking at a water surface mirroring the surroundings rather than on a rock filled riverbed with a tiny trickle of water in summer

[3]Person	[4]Chapter	[4]Page	[4]Line	[5]Comment	Proposed change
					• Risk of causing property & economic damages due to flooding 4. Establish priorities for interventions based on facts obtained in step 3 and through a documented cost-benefit analysis in a draft plan, using transparent criteria (see proposal below) choosing most cost-efficient initiatives first 5. Meaningful and documented stakeholder consultation + an opportunity for public hearing/commenting of the plan 6. Publication of Plan to remove obsolete barriers showing established priorities 7. Environmental and Social impact assessment of prioritised infrastructures to be removed including positive and negative environmental, social and economic aspects of the removal project. 8. Meaningful and documented stakeholder consultation + an opportunity for public hearing/commenting of the project
Eurelectric				Missing topic	Fish migrating measures (up- and down-stream) have been studied and improved over decades and will, in many places, serve as a good connectivity measure for fish. These measures will improve BQEs. However, they will not make a free flowing river, but should be mentioned as tool in the total toolbox. According to the WFD objectives and measures should be evaluated based on cost-benefit and these measures will many places make benefit to an acceptable cost.

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[3] Include reviewer initials for each line
[4] Specify chapter, page and line/figure number/bullet in box
[5] Please describe the issue and provide a justification for any proposed change in the next column

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