EEB briefing document

Input to SWMI public consultation - ELBE River Basin

To the attention of

The International Commission for the Protection of the Elbe River (IKSE/MKOL)

and the Water Directors for Austria, Czech Republic, Germany and Poland and members of the **Elbe River Basin Community „FGG Elbe"**

Brussels 22/06/2020

Dear Mr. RNDr. Petr Kubala,
Dear Ms. Heide Jekel,
Dear Mr. Lukáš Záruba
Mr. Dr. rer. nat. Slavomír Vosika
Dear Ms. Ulrike Hursie,
Dear Dr. Gregor Ollesch,
Dear Ms. Sandra Naumann,
Dear Mr. Marcin Białek,

The European Environmental Bureau (EEB) welcomes the opportunity to provide its comments in relation to the Significant Water Management Issues (SWMI) for the River ELBE.

The EEB is the largest network of environmental citizens' organisations in Europe. It currently consists of over 160 member organisations in more than 35 countries (all EU Member States plus some in accession and neighbouring countries), including a growing number of European networks, and representing about 30 million individual members and supporters.

The following briefing only aims to highlight issues linked to the energy-mines-water nexus and provides suggestions to promote a forward-looking energy transition that is fully compatible with protecting water resources. This briefing is only about SWMI that are relevant to the water-(thermal) energy-mines nexus. It is therefore in no way meant to be exhaustive as to other SWMI issues that are equally relevant (e.g. hydropower, agriculture related, other water pressures or biodiversity impacts on aquatic life).

We hope that this briefing will enable relevant decision makers to identify the raised issues as SWMI and to properly address them in the development of the 3rd version of the River Basin Management Plans for the ELBE.

The EEB explicitly supports comments submitted by our members on this public consultation e.g. Grüne Liga, BUND, ClientEarth, where applicable.

Overall assessment of the pre-consultation document on Significant Water Management Issues (SWMI) on the Elbe River

The EEB welcomes that in the first draft of the SMWI (A-level) consultation document for the Elbe River[1] (herewith referred to as 'SWMI pre-consultation document A level') the following aspects are to be addressed at the international level (A-level):

- water body structure and continuity;
- reduction of chemical and nutrients pollution, highlighting in particular mercury pollution as a remaining issue to tackle at source;
- Impacts due to climate change.

Some SMWI issues are listed to be dealt with at the national or regional level (item B). We would like to address some of those items, and in particular:

1) "harmonization" of environmental quality standards;
2) definition of best available techniques;
3) impacts of active or inactive lignite mining activities, especially on groundwater

[1] https://www.ikse-mkol.org/fileadmin/media/user_upload/D/05_EU-Richtlinien/Wasserrahmenrichtlinie/Anhoerungsdoku_WWBF/IKSE_Anhoerungsdokument_WWBF2019_171019.pdf

We consider that those issues shall also be dealt with at the A level (international) and be listed explicitly as SWMI relevant for the A level discussion as well (see more information under SWMI issue no 2).

SWMI Issue no 1: The continuation of lignite mining activities and the operation of thermal power plants shall be recognised as a main bottleneck to the achievement of the good status for the Elbe river and also be dealt with under the A-level

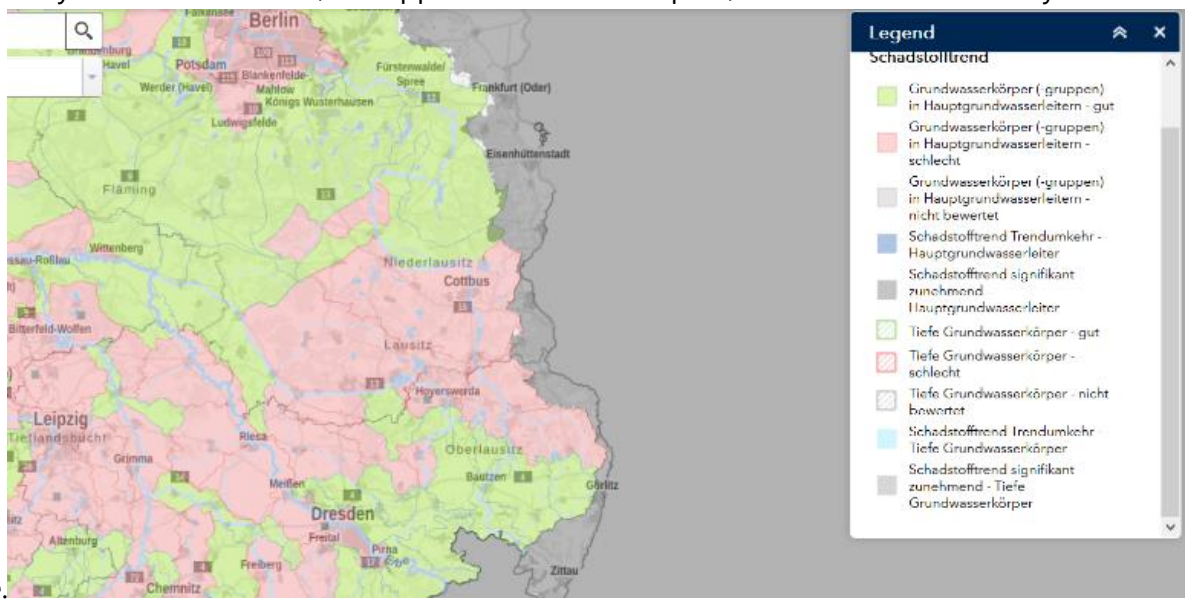
The below section is not meant to be exhaustive but aims to highlight some SWMI linked to good status of the ELBE river affected by coal/lignite operations.

Lignite mining specific results are presented below.

1) Germany[2]

Failings in good chemical status

Groundwater: the chemical status is rated as BAD for groundwater in the lignite mining region, especially for the Black Elster, the upper Havel and the Spree, all of which are tributary to the Elbe.

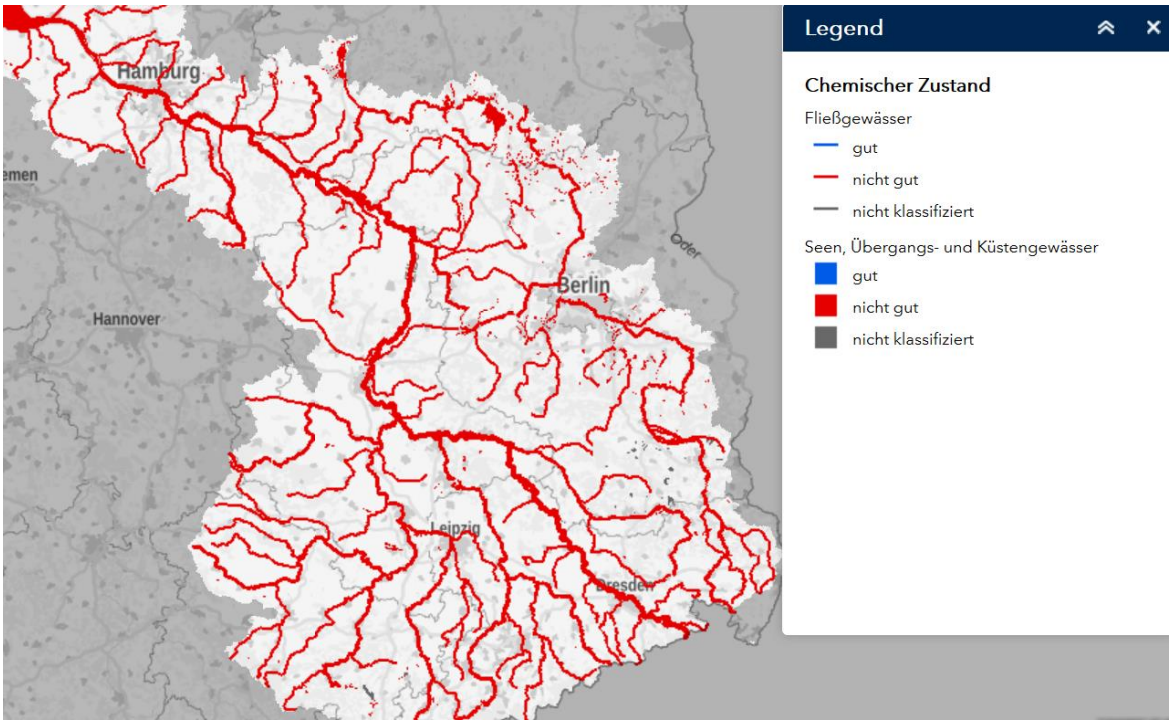


[2] The research below is sourced from a study commissioned by the EEB to Michael Bender / Gruene Liga;

BAD status is also linked to lignite mining activities, the main driving forces being sulphate pollution from lignite mining and acidification a well as over-abstraction of groundwater.

Failings for surface water

The chemical status is rated as "BAD" for almost all Elbe related river basins



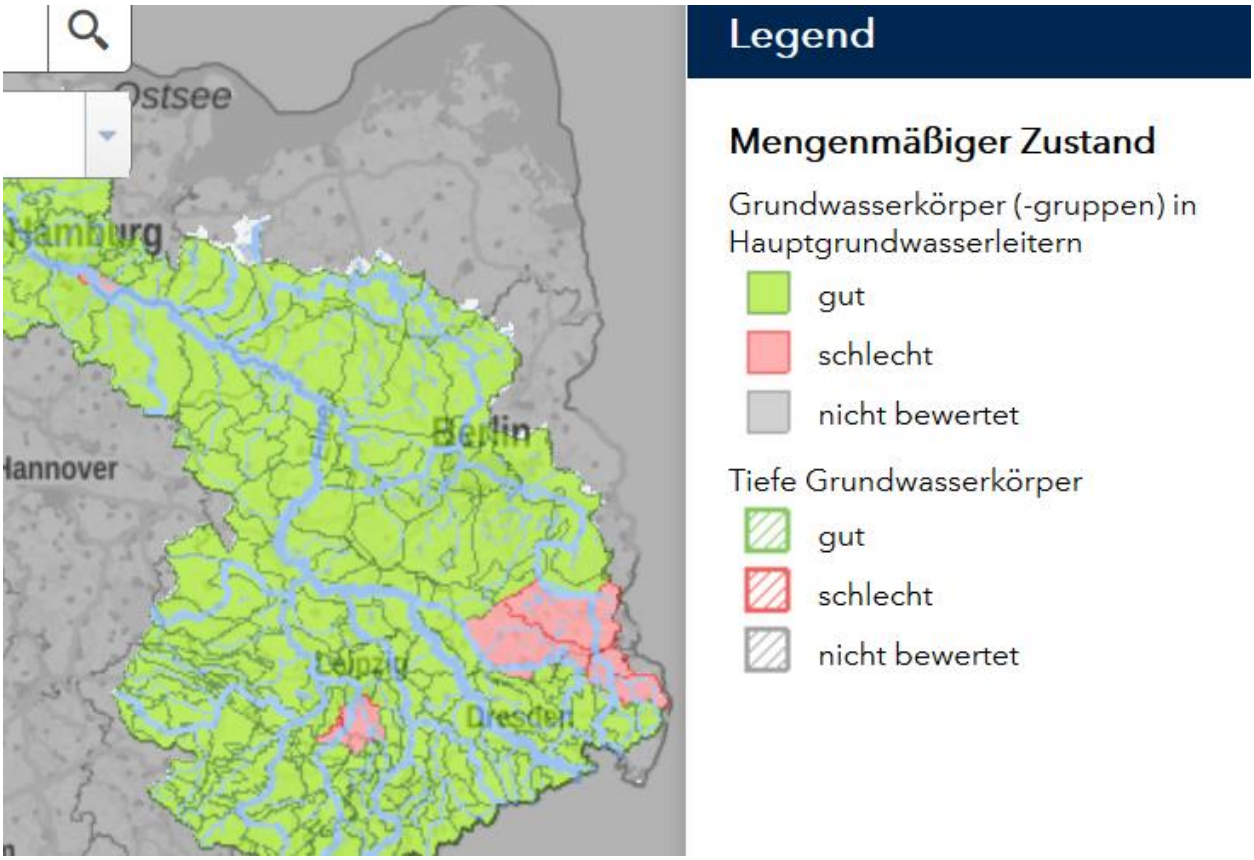
Not good ecological status

The FGG ELBE has already identified lignite mining related damages as a main cause for failing to achieve the good water status. Under Point III. (Sustainable Water Management) 3. "Status and Need for Action the consultation document"[3] states that out of 228 groundwater bodies in the German Elbe Catchment 7 fail good quantitative status due to ground water abstractions.

[3] Consultation document significant water management issues - Die Flussgebietsgemeinschaft (FGG) Elbe Anhörung zu den wichtigen Wasserbewirtschaftungsfragen für die Aufstellung des Bewirtschaftungsplans WRRL für den dritten Bewirtschaftungszeitraum in der Flussgebietsgemeinschaft (FGG) Elbe, https://www.fgg-elbe.de/anhoerung/wichtige-wasserbewirtschaftungsfragen-2020.html?file=files/Downloads/EG_WRRL/anh/bew-fr/wwbf_2020/Anhoerungsdokument-WWBF_final.pdf

Less stringent objectives due to mining activities have also been set for 11 surface water bodies in the Elbe River Basin, while time extensions are used in other cases. It can be assumed that for the 3rd River Basin Management Plan less stringent objectives will be applied for further surface water bodies.

https://geoportal.bafg.de/mapsfggelbe/



Failing groundwater quantity status is linked to lignite mining
https://geoportal.bafg.de/mapsfggelbe/

a) Mining area Lausitzer Revier (Saxony and Brandenburg)

Groundwater body SP 2-1 (Niesky)
The active open pit mine Reichwalde currently abstracts about 60 Mio. m^3/a. ground water that also affects neighbouring groundwater bodies SP3-1 and to a lower degree NE 1-1 (Muskauer Heide). The abandoned mine of Bärwalde is already filled to the lake Bärwalder See, and serves as a water reservoir. For groundwater body SP 2-1 less stringent objectives are set for the quantitative status.

About 14 % of the area is in bad chemical status due to sulphates leading to this classification for the whole ground water body.

Groundwater body SP 3-1 (Lohsa-Nochten)
Lignite mining directly affects about 145 square kilometres representing about 34 % of the area of the groundwater body. The active open pit mine Nochten produces 19 Million tons of lignite to a depth of 100 m. 115 Million m^3/a groundwater is abstracted. Less stringent objective for quantitative status are applied.

The filling of the abandoned pit mine holes in Werminghoff II, Scheibe, Dreiweibern, Lohsa II and Burghammer is almost completed.

About 76 % of the groundwater bodies area has high concentrations of sulphate leading to bad chemical status and less stringent objective.

Groundwater body SE 1-1 (Hoyerswerda)
The restauration of abandoned open pit lignite mines Heide (active until 1967) and Laubusch (active until 1962) takes place on an area of about 28 square kilometres representing about 21% of the total area of the groundwater body SE 1-1 (132 km^2). The groundwater level, however, has also been affected by open pit mining in neighbouring groundwater bodies SP 3-1 (Lohsa-Nochten) and SE 4-1 (Schwarze Elster). Consequently, over decades at least half of the groundwater bodies area had been affected by abstractions.

For the moment (Early 2013) the restauration of the groundwater level in the former mine Heide in the Western part of the groundwater body has been completed, whereas in the Northern part of Laubusch - 1/3 of the groundwater body - the planned groundwater level has not been reached yet. Temporarily lowered groundwater levels were necessary for geotechnical restauration measures. Permanent pumping and drainage will be necessary to protect the city of Hoyerswerda from damages especially on the buildings in the old town district.
Rising groundwater levels are generally assumed to lead to an improved situation in the 2nd River Basin Management Cycle. However, good quantitative status is predicted not before 2027. In the

after-mining landscape the groundwater flow will permanently change as the mine hole lakes Laubusch and Heide V/Heide VI redirect some of the water stream locally.

The river Schwarze Elster has been relocated and channelized on the whole stretch over groundwater body SE 1-1.

Sulphate content has been measured in 2009 with only 27 % of the area achieving good chemical status (below 240 mg/l). Most of the area has class II Sulphate concentrations between 240 and 600 mg/l, 7% class III (up to 1,400 mg/l and 5% class IV with up to 3,000 mg/l sulphate. Class V is below 1%. The prediction shows that these relations will change only slightly for the period until 2015, 2021 and 2027. Less stringent objectives for chemical status are applied over the complete period.

Groundwater body SE 4-1 (Schwarze Elster)

The mining area in groundwater body SE 4-1 comprises 355 square kilometres representing about 20% of the total area. Water abstractions affected half of the area. Most of the mining area is in restauration (17%), whereas active lignite mining takes place in the mine Welzow Süd on 3% of the area with a production of 20 t/a. Water abstraction for this mine amounts to 140 m^3/Minute. 20 m^3/Minute are used to directly stabilise the water flow in neighbouring surface waters. About 1/3rd of the abstracted water is treated for drinking water purposes or for production uses of the local industry.

In groundwater body SE 4-1 several bigger pit hole lakes are about to be flooded.

Good chemical status concentrations of sulphate are archived for 58% of the area in 2009, with little change predicted for the time until 2027. Thus, the groundwater body SE 4-1 cannot achieve good status until 2027. Less stringent objectives are applied.

Groundwater body HAV-MS-2 (Mittlere Spree)

Lignite mining fields occupy an area of about 278 square kilometres representing about 16% of the groundwater bodies area (1,749 km^2). Half of the mining fields is still active (Welzow-Süd, Cottbus-Nord and Jänschwalde) whereas the other half is in restauration, mainly in the former mines of Gräbendorf, Greifenhain, Seese-Ost, Seese-West, Schlabendorf-Nord and Schlabendorf-Süd. In Cottbus-Nord and Jänschwalde, about 20 Million tons of lignite are extracted annually. Part of the extracted water is used for supporting the regional water balance, and as cooling water for the lignite coal power station Jänschwalde. Another 20 tons of lignite are extracted in Welzow Süd annually. Welzow Süd was active primarily in groundwater body SE 4-1 (Schwarze Elster), but continues into groundwater body SE 4-1.

The maximum extension of groundwater abstraction area affected 60% of the groundwater body HAV-MS-2, with active mining also affecting neighbouring groundwater bodies. Groundwater level has risen to the planned levels in the North-West region, including filling the pit hole lakes by 2013. Less stringent objectives apply for quantitative status at least until 2027.

About 43% of the groundwater body HAV-MS-2 were measured with sulphates concentrations above 240 mg/l, resulting in bad chemical status for the whole groundwater body. Little change in the ratio was predicted until 2027. Less stringent objectives are applied for the whole period.

Surface water bodies in the area are partially affected by sulphates, iron, ammonia and acids. The after-mining pit hole lakes fail good ecological/chemical status.

b) Mining area Mitteldeutsches Revier (Saxony, Sayony-Anhalt)

Groundwater bodies SAL GW 059 (Weißelsterbecken mit Bergbaueinfluss) and SAL GW 051 (Zeitz-Weißenfelser Platte)

The lignite mining area of both groundwater bodies together comprises about 315 square Kilometres, representing about 39% of the area. In the active open pit mine Vereinigtes Schleenhain, 10 to 11 Million Tons of lignite are abstracted annually. Water abstraction accounts for 35 to 40 Million m^3 annually. In the active pit mine Profen about 9 to 10 Million tons lignite are extracted annually. About 50 Million m^3 groundwater are abstracted annually. In groundwater body SAL GW 059 (Weißelsterbecken mit Bergbaueinfluss) a variety of former lignite pit mines is in restauration, including Espenhain, Zwenkau und Cospuden, Bockwitz, Borna-Ost, Kraft I, Neukirchen, Borna, Witznitz, Deutzen and Haselbach, and some smaller ones.

Groundwater abstraction for lignite mining has practically affected the whole area of both groundwater bodies. Less stringent quantitative status objectives apply for SAL GW 051 (Zeitz-Weißenfelser Platte) and SAL GW 059 (Weißelsterbecken mit Bergbaueinfluss) at least up to 2027.

For 2009, the reporting year for Sulphates in both groundwater bodies, there were no areas in good chemical status. Surface waters are affected by Sulphates and Iron intrusions. Less stringent objectives for chemical status apply at least until 2027 for both groundwater bodies.

Groundwater bodies VM 1-1 (Lober-Leine) und VM 2-2 (Strengbach)

The area of the abandoned lignite mines comprises 21 square Kilometres is VM 1-1 (Lober-Line) and 16 square kilometres in VM 2-2 (Strengbach). Former mines Delitzsch-Südwest und Breitenfeld lay completely within these groundwater bodies area, while former mines

Goitsche/Baufeld Holzweißg-West and Goitsche/Baufeld Rösa only partially. No active mines are left in the area of these groundwater bodies. The planned after-mining groundwater levels have already been reached for a large part of the area, so that quantitative status is reported as good for both groundwater bodies.

Sulphates concentrations are below 240 mg/l on 20% of groundwater body VM 1-1 (Lober-Leine) and on 3% of groundwater body VM 2-2 (Strengbach). Less stringent objectives apply for chemical status for both groundwater bodies.

Economically feasible technical measures for reducing sulphates concentrations on a large scale are reported as "not available".

Reporting in WISE Water Framework Directive Database:

Surface water bodies: Based on an analysis from the WISE databases, we find that 98% of the surface water bodies that exceed the EQS mercury limits in water have only one source- diffuse atmospheric deposition. 43% of the limits exceeded are annual average limits, almost 38% are maximum allowable concentrations. While most of the exemptions provided are on the basis of technically infeasible clause of the article 4(4) of the Water Framework directive, authorities have claimed that they will be able to achieve good chemical status by 2027.

Groundwater bodies:
In the case of groundwater bodies belonging to the river basin district DE5000, 39 water bodies have an exemption for sulphate and mining related pressures account for 19 of them.

Mine waters as a point source of pollution are responsible for pollution pressure in three of the water bodies. The water body 'DEGB_DEST_SAL-GW-051' has sulphate pollution pressure due to mine waters, diffuse sources and as well as because of altered ground water levels.

Among the mining pressures, exemptions for natural conditions were provided for six water bodies, while Art 4(5) for technical feasibility issues and disproportionate cost were provided for eleven water bodies, and Art 4(4) technical feasibility issues and disproportionate cost were provided for nine water bodies.

Among the water bodies provided exemptions under Art 4(4) or Art 4(5), eight would achieve good chemical status only beyond 2027 and for three water bodies, the date by which good status can be achieved is 'unknown'**.**

Likewise, in the case of Nickel and Cadmium, groundwater bodies were largely affected by mining related pressures both point and diffuse sources. In some cases, the duration to achieve good chemical status was reported to be beyond 2027.

2) Poland

Less than 1% of the Elbe river basin district area lies in Poland so this section is not developed further. The large amount of coal and lignite combustion plants in Poland should however be taken into account as a source of diffuse pollution, in particular mercury (via the air stack deposition route), leading to the non-achievement of good chemical status of water bodies in the Elbe river basin district.

Negative impacts are also due to water abstraction for cooling water purposes.

3) Czech Republic

Surface waters: Industrial facilities regulated by the Industrial Emissions Directive 2010/75/EU are the cause for EQS exceedance of mercury in six surface water bodies. In two water bodies this was an annual average exceedance, and in four a maximum allowable concentration exceedance. For

these six water bodies, exemptions have been granted beyond 2027. For five of the cases, exemptions under Art 4.4 and Art 4.5 were used.

Apart from IED facilities being a direct cause for EQS exceedances, thermal power plants are the main source of mercury emissions to air in the EU[4]. Mercury exceedances due to diffuse atmospheric deposition is reported for 28 water bodies (27 cases of maximum allowable concentration exceedances and one case of both) in the Czech part of the Elbe river basin.

21 of the exemptions granted were beyond 2027, under art 4.4 -and art 4-5 technical feasibility cases.

Groundwater bodies: The Czech Republic also reports issues on sulphates. The following exemptions have been applied on this parameter as anthropogenic pressures resulted 'unknown'. However, a clear link to lignite mining activities can be established.

Exemptions applied: art 4-4 technical feasibility to eleven water bodies, for seven of which the Czech authorities reports that they cannot achieve good chemical status before 2027.

Additionally, it reports two exemptions on chemical status for mercury due to diffuse atmospheric deposition (CZ12110 and CZ6222).

Sixteen water bodies report an exemption for Cadmium and will not achieve good chemical status before 2027. Five of them report atmospheric deposition as a source and the rest "P1-5 - Point - Contaminated sites or abandoned industrial sites". All exemptions for delayed good status are technical feasibility with mostly art 4-5 of the WFD.

4) Austria

Austria does not operate any lignite mine or lignite power plants and comprise less than 1% of the Elbe river basin and is therefore not developed further. Austria reported issues due to phosphate and nitrates pollution for groundwater, but unlike Germany not for mining related pressures.

[4] European Environment Agency, European Pollutant Release and Transfer Register, https://prtr.eea.europa.eu/

SWMI Issue no 2: Require competent authorities to set stricter requirements to enable compliance promotion with relevant environmental quality standards (EQS).

The SMWI pre-consultation document of the IKSE/MKOL proposed the following issues to be addressed at the national or regional level (item B). We would like to address some of those items, and notably:

1) "harmonization" of environmental quality standards;
2) definition of best available techniques;
3) impacts of active or inactive lignite mining activities, especially on groundwater

The policy framework set under items 1 and 2 are set at EU level, but leave a large discretion on their implementation to member states permitting authority. It is however clear that the stringency of their implementation is of transboundary relevance, as the implementation affects downstream operators and users of the same water streams. This is particularly important for pollutants that have properties of persistency and accumulation such as mercury, for which the stack release route is more relevant.

As reported in the section below with the example of the new EU pollution standards for Large Combustion Plants, due to be fulfilled by August 2021 the latest, the margin of discretion left to national permitting authorities are of such scale that the more effective BAT in relation to pollution prevention negatively affecting good chemical and ecological status of the Elbe will not be implemented.

It is therefore both in the competence and responsibility of the IKSE/MKOL (A level) and the member states (B level) to ensure that necessary pollution prevention measures are applied consistently in regards to sources negatively affecting the Elbe.

Moreover, it is the IKSE/MKOL's responsibility to develop and update the International Plan of the River Basin for the Protection of the Elbe River, which shall formulate key measures to achieve a good quantitative condition of all underground and surface water bodies.

It is for the A level to implement a holistic view on how the good quantitative condition within the whole river basin is to be achieved. The IKSE/MKOL is the only decision-making body that will not act in the national interests (which may be primarily aimed to shield its industry or consider most

cost-effective measures limited to its geographical scope). The same consideration is valid to address negative impacts such as water pollution occurring from upstream sources from heavy industry.

Thermal combustion plants: For any discharge to a receiving water body (thermal combustion), the strict BAT-AEL for water release shall apply (BAT 15 LCP BREF[5]) as the maximum emission limit value, and permits shall require compliance by April 2021 the latest.

Industrial activities can affect the chemical status of the Elbe due to pollution discharges. In relation to coal/lignite power plants, the direct discharge levels are not reported due to high reporting thresholds for direct discharge, set to 5kg/year per facility. The CZ facility Sev.en EC, a.s. - Elektrarna Chvaletice (PRTR ID code CZ0046) reports a cadmium level of 12,8kg for the year 2017, indicating an ineffective wastewater treatment compared to similar plants.

The current biota limit set for mercury is breached in the Elbe River (e.g. In Germany, 65.5% of the Elbe related water bodies have been classified as failing to achieve good chemical status). The WFD requires a phase out of this PBT pollutant to be achieved at the latest in 2024. For Large Combustion Plants, and especially using coal/lignite[6], the maximum ELV for direct wastewater discharge shall be 0.2µg/l, which is achieved with membrane techniques at the waste treatment plant.

For mercury release to air, the maximum ELV of lignite/coal combustion shall be set to 1µg/Nm^3, which is achieved with dedicated mercury controls. Permits shall require compliance by August 2021 the latest. The level of 1µg/Nm^3 (annual average) is also considered as BAT/BEP by the UNEP Minamata guidance.

Industrial activities can affect the chemical status of the Elbe due to pollution discharges that also deposit from the air to the water pathway (immission). In relation to coal/lignite power plants, the operators have reported mercury emissions to be 2 806kg per year[7].

[5] http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1503383091262&uri=CELEX%3A32017D1442
[6] Mercury captured in the waste gas phase and removed from the scrubbers may end up in the waste water-treatment effluent
[7] 2017 data reported to E-PRTR

This implies that significant air pollutants that bioaccumulate and that are persistent (mercury is highlighted) will be emitted via the stacks of those plants. This may worsen the chemical status of the surface waters, which is already marked as in bad chemical status.

For the Priority hazardous substances (cadmium and mercury), a continued operation of lignite combustion will considerably undermine the phase out objective in relation to mercury pollution in surface waters. 75 large coal and lignite fired Large combustion Plants of about 49GWth capacity operate in the Elbe River basin, which are particularly relevant for mercury pollution due to the high mercury concentration in the inputs of the fuels burned.

The average stack concentration for the largest plants is estimated to 9µg/Nm³[8] (ranging from 1,3µg/Nm³ DE HKW Moorburg up to 25µg/Nm³ for CZ Plzenska teplarenska, a.s. - Centralni zdroj tepla - source A), meaning that the full potential of pollution control at source has not been implemented for all those point sources.

The LCPs located at the Elbe and using the Elbe water for cooling/wet scrubbing purposes emit in average 2.806kg of mercury to air[9] each year.

If the strict Best Available Techniques requirements set under the 2017 LCP BREF (as confirmed by the Minamata BAT/BEP guidance of max 1µg/Nm³) would be implemented, the mercury pollution load could be cut by 2.5 tonnes each year, but it would still result in a residual pollution load of about 312kg/year.

Assuming a continued operation under the new river basin timeframe (e.g. up to 2027), the potential mercury pollution load savings would be at least 17.457kg of avoidable mercury via the air, partially preventing the emission via stack deposition into surface waters such as the Elbe.

The breakdown on the main mercury to air emission sources are as follows (top 5 sources per country).

[8] Source EEB calculations based on LCP-D and EPRTR reporting, data available as standalone background document

[9] Based on 2017 data , EEB industrial plant data viewer from PRTR https://public.tableau.com/profile/schaible#!/vizhome/UnderDevelopment_EEB_LCP_DataViewertest4_15880952402100/HomePage?publish=yes

NOTE: The E-PRTR has high reporting thresholds for mercury to air emissions of 10kg/year for each emitting facility. The fact that many lignite/coal combustion plants do not report emissions does not mean they do not emit mercury (unless these did not operate), it just means that the level is below 10kg/year. [10]

Plant name (country)	Current average emission (mercury) in concentrations µg/Nm3 and load (kg/yr)	Possible air emissions pollution avoidance assuming full BAT implementation (1µg/Nm³), **in kg, per year of operation**	Possible pollution prevention gains in kg for the period up to 2027 (3rd RBMP cycle), **over 7 years**
DE Boxberg IV	13,5µg/Nm³ , 536kg	496	3 474
DE Jaenschwalde E	22,27µg/Nm³, 344kg	329	2 300
DE Schkopau	15,87µg/Nm³, 340kg	319	2230
DE Jaenschwalde F	22,27µg/Nm³ , 328kg	313	2 192
DE Scholven	4,86µg/Nm³ , 79kg	63	438
DE HWK Chemnitz Nord	12,85µg/Nm³ , 56kg	52	360
Sub-total Germany (coal/lignite) which reported emissions	***1799,5kg (average conc. 10µg/Nm³)***	***1 647***	***11 529***
CZ Pocerady	7,26µg/Nm³ , 188kg	162	1 135
CZ Tusimice	4,74µg/Nm³ , 86kg	68	475
CZ Prunerov 2	6,19µg/Nm³ , 78kg	65	457
CZ Alpiq Kladno	9,21µg/Nm³ , 76kg	68	477
CZ Chvaletice	5,03µg/Nm³ , 74kg	60	417
Sub-total Czech Republic (coal/lignite) which reported emissions	***1006 kg (average conc. 8µg/Nm³)***	***847 kg***	***5 928***

[10] Data based on 2017 reported emissions, EEB industrial plant data viewer

PL	*Data not available due to high reporting thresholds*		
Total (all coal/lignite LCPs) which reported mercury emissions 32 LCPs (21 in CZ, 11 in DE)	**2 806 kg**	**2 494 kg**	**17 457 kg**

The continued operation of lignite/coal combustion implies that significant air pollutants will be emitted via the stack of those plant, which may worsen the chemical status of the surface waters. For the Priority hazardous substances (cadmium and mercury), a continued operation of lignite combustion - which can contain high mercury inputs - will considerably undermine the phase out objective in relation to mercury pollution in surface waters.

The current biota EQS set for mercury is poorly achieved in the Elbe. In Germany, where 65.5% of the Elbe river basin lies, all water bodies have been classified as failing to achieve good chemical status. This is due notably to the consideration of the mercury biota limit[11]. However, because mercury is a global pollutant relevant for many other water bodies, it is appropriate for the IKSE/MKOL to be mandated to set the relevant criteria and obligations to prevent mercury release from this source, and inter-alia to be able to veto the lignite mining extension.

Obviously, switching away from mercury intensive fuels (such as coal/lignite) will not only protect the Elbe water body but also other EU water bodies from chemical pollution. However, the transition to non-thermal energy generation is also necessary to contrast climate change, which in turn will worsen drought situations affecting water availability. The lignite/coal combustion is further exerting significant negative pressures on the water ecosystem, groundwater availability and quality (see next section).

[11] European Commission, "COMMISSION STAFF WORKING DOCUMENT Second River Basin Management Plans - Member State: Germany", https://ec.europa.eu/environment/water/water-framework/pdf/3rd_report/CWD-2012-379_EN-Vol3_DE.pdf

Lignite mines: Backfilling in mines of residues/sludges from coal/lignite combustion (fly ash/residues from flue gas treatment or sludges) should be prohibited, storage sites must be equipped with leach free sealants and subject to periodic monitoring (at least 3 times per year) of ground water/surface quality.

The operation of coal/lignite power plants also generates various harmful residues potentially harming the Elbe water body. Heavy metals will not disappear, on the contrary they will remain in the fly ashes, which need to be properly disposed of.

We use again the Turów plant as an example: Turów's residue concentrations of mercury and cadmium are reported as very low estimates (in the order of 0,1mg/kg and 2mg/kg respectively) of the total furnace mass. Residual manganese levels are reported in the range of 239mg/kg for the Turów power plant, which seem realistic. The drinking water quality (good indicator) limit for manganese is set to 50µg/l[12].

Based on the reported fly ash amount generated by 12 lignite boilers operating in the Elbe river body, and assuming very low mercury residue levels (as set out below), the additional pollution load of just a few heavy metals such as mercury, cadmium and manganese contained in fly ash residues are evaluated to be at least in the following range during the 3rd RBMP period (7 years):

Fly ash volume: 21,84 Million tonnes
Mercury +18,1 tonnes
Cadmium: +296,7 tonnes
Manganese: +41.558 tonnes

3 illustrative examples are used for coal/lignite plants operating in the Elbe River Basin[13]:

Boiler ID	Declared fate of fly ash	Amount of Fly ash in tonnes	Kg of mercury	Kg of cadmium	Kg of manganese
DE Jaenschwalde (6 units)	"landfill"	2.446.679 tonnes	245kg Assuming low concentration 0,1mg/kg	4 893kg assuming low cd	585 tonnes

[12] Source EEB, LCP BREF information exchange data
[13] ~~source~~ LCP BREF information exchange, based on 2010 reported data.

				concentration 2mg/kg	
Continued operation for 7 years			1 713 kg	34,2 tonnes	4 093 tonnes
DE Schkopau	Refilling open cast mine	261.887	52,4kg reported 0,2mg/kg	105kg (assuming low level of 0,4mg/kg)	165 tonnes
Continued operation 7 years			367kg	733 kg	1155 tonnes
CZ Tusimice (2 units)	Reclamation / restoration of open cast mines, quarries, and pits	297.961 tonnes	37kg Assuming low concentration 0,1mg/kg	855kg Assuming low concentration 2,87mg/kg	71.213 kg Assuming concentration 239mg/kg
Continued operation 7 years			261kg	5.986 kg	498 tonnes
Potential extra heavy metals contained in fly ash residues for 7 years continued operation of 20 lignite plants that reported data (covering		21,84 Million tonnes	18,116 tonnes	296,7 tonnes	41.558 tonnes

In most cases the fly ashes are dumped in the mines as "backfilling material" or are landfilled, transferring pollution to another medium, where they may leach into groundwater or surface waters.

The impacts due to additional residues / waste from lignite mine extraction activities need to be properly accounted for and addressed at the source.

SWMI Issue no 3: external damage due to mining activities and thermal power combustion plants operation, including environmental and resource costs, are not accounted for. Water abstraction for mine drainage as well as cooling water as well as any storage infrastructure use must be recognized as water services and be subject to cost recovery in a fair and equal manner for all users of the Elbe water.

The recent report "The consumptive water footprint of the European Union energy Sector"[14] highlights that the EU currently does not explicitly account for water resource use in its energy related policies. The same report highlights the water amounts required for certain types of energy production: high for wood, reservoir hydropower, first generation agrofuels, moderate for fossil fuels and nuclear energy and low for water efficient types such as solar, wind, geothermal and run-off river hydropower. The average water footprint for energy production is evaluated to 1068 litres per day. It is evident that the choice of energy sources has a direct impact on the level of water stress and water scarcity. Water is essential for food security, as well as for energy security. The average water footprint in relation the thermal Power Plants assessed in this report (>50MWth) is estimated to 136 m^3 TJ^{-1} for gas, 572 m^3 TJ^1 for coal and lignite.

Germany: The FGG ELBE has already identified lignite mining related damages as a significant issue for achieving the good water status. Under Point III. (Sustainable Water Management) 3. Status and Need for Action, the consultation document[15] states that, out of 228 groundwater

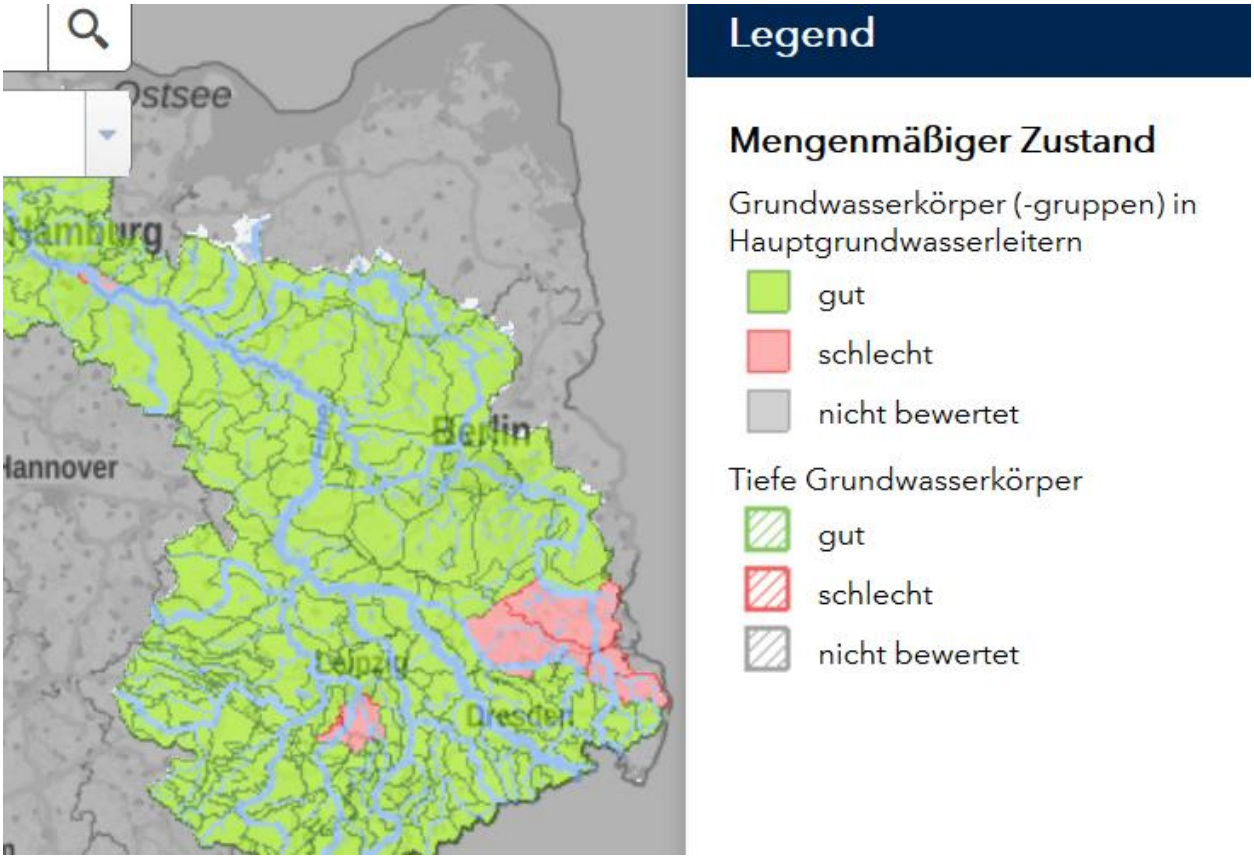
[14] Davy Vanham et al 2019 Environ. Res. Lett 14 104016 https://iopscience.iop.org/article/10.1088/1748-9326/ab374a

[15] Consultation document significant water management issues - Die Flussgebietsgemeinschaft (FGG) Elbe
Anhörung zu den wichtigen Wasserbewirtschaftungsfragen für die Aufstellung des Bewirtschaftungsplans WRRL für den dritten Bewirtschaftungszeitraum in der Flussgebietsgemeinschaft (FGG) Elbe, https://www.fgg-elbe.de/anhoerung/wichtige-wasserbewirtschaftungsfragen-2020.html?file=files/Downloads/EG_WRRL/anh/bew-fr/wwbf_2020/Anhoerungsdokument-WWBF_final.pdf

bodies in the German Elbe Catchment, seven fail good quantitative status due to ground water abstractions. Within the German Elbe catchment lie some of the driest places in Germany. Low water levels due to natural processes as well as due to anthropogenic influences like water losses due to flooding of abandoned pit mines, increased precipitation in reservoirs and already flooded mining pit holes may have massive negative effects on biological quality components of rivers and smaller streams like the makrozoobenthos and submerse makrophytes.

The consultation document therefore rightly concludes that a quantitative water management system in the river basin is required to secure the ecological quality as well as water uses for the future that takes the needs of all users into account (energy production, drinking water, restoration of former pit mine landscapes). This will also consider increased uses for agriculture and irrigation. Reduction strategies for water uses that massively affect the waterflow must be reconsidered according to the principles of sustainability, the precautionary principle, and the polluter pays principle.

An especially increased need for regionally adopted programs and strategies is seen for the areas affected by lignite mining on the rivers Upper Havel, Schwarze Elster and Spree.



Failing groundwater availability status linked to lignite mining regions.
Source https://geoportal.bafg.de/mapsfggelbe/

On the topics of sustainable water management and climate change a resource background document was published in 2015 without being updated for the current consultation. The potentially usable water quantity for the Elbe Basin is calculated to be 27,403 Million m^3/year, total water abstraction is 5,451 Million m^3/year, re-released water amounts to 5,540 Million m^3/year.

Cooling water, with 3,512 Million m^3/year, has by far the biggest share of the water abstractions. The same numbers for the whole of Germany are: 33,036 Million m^3/year water abstractions, with cooling water amounting to 25,176 Million m^3/a and re-released water amounting to 36,892 Million m^3/year[16]. This document does not explain why the amount of re-released water exceeds the abstracted volume. It can be assumed that water that is abstracted for drinking consumption is treated in sewage plants, together with the stormwater also collected in the sewers.

Czech Republic:

[16] Source: BfG 2014 & DESTATIS 2013

In the Czech part of the Elbe river catchment (which is 33.7% of the total Elbe area), groundwater abstraction for the industry (including the extraction industry) is 18.5 million m^3/year of a total of 36.5 million m^3/year for the whole country. It is not clear if this includes mine drainage related abstraction[17].

Water abstraction and drainage of mining areas, as well as formation of depression cones in main usable aquifers groundwater of regional span, should both be listed as water management issues of *significant* value for the Elbe river basin at A and B level.

It is therefore appropriate to carefully assess the water availability for the various users and prioritize access to "essential" uses, such as for drinking water / food production.

A further breakdown can be made as follows in terms of estimated water use for lignite mining. The examples below are just for illustration and not meant to be exhaustive:

Country	Region/mining area	Lignite mining related abstraction, m^3 per year	Reference year/source
DE	Lausitz Nochten	115 Million	2009 (mining)
	Welzow Süd (Lausitz)	73,6 Million (140m3 per minute)	Lignite mining and cooling water, GRÜNE LIGA e.V.
	Jänschwalde + Cottbus Nord (Lausitz)	Not available (13 Million m3 is used to stabilise water level at Bird protection area DE 4152-401)	Lignite mining and cooling water, GRÜNE LIGA e.V.
	Reichwalde (Niesky)	60 Million m^3	Lignite mining and cooling water, GRÜNE LIGA e.V.
	Vereinigtes Schleenhain (Mibrag)	40 Million m^3	Lignite mining and cooling water, GRÜNE LIGA e.V.
	Profen (MIBRAG)	50 Million m^3	Lignite mining and cooling water, GRÜNE LIGA e.V.

[17] Source Ministry of Agriculture and the Ministry of the Environment of the Czech Republic, Report on water management in the Czech Republic in 2018, http://eagri.cz/public/web/en/mze/publications/publications-water/report-on-water-management-in-the-czech-5.html

CZ		Estimated at 8.5million M³	See footnote 16
POL		N/A	
AT	N/A	N/A	

The JRC PPDB plant database[18] provides an estimate of water withdrawal rates for thermal power plants operation. In that database, 21 thermal power plants relevant to the Elbe Basin contain the following range of water abstraction levels for one year of operation:
Water withdrawal: 43,02 million m³
Water Consumption: 34,9 million m³.

The Water Framework Directive explicitly includes the use of economic instruments (e.g. taxes or charges) to reach its objectives. The main economic concepts in WFD directive are cost recovery (fees for water use, including negative environmental impact), incentive pricing (water pricing is affecting the behaviour of users), and the polluter pays principle (ensuring fair contribution by different water users to cover environmental costs).

In the evaluation of the current River Basin Management Plans (RBMPs) the Commission stated that "progress on the implementation of the principle of cost recovery and the use of economic instruments has been limited, which limits the potential of promoting efficient water management"[19].

In Germany, water fees are regulated at the federal state level. The states concerned by the Elbe river basin include Brandenburg, Saxony, and Saxony-Anhalt. In Brandenburg, the fee for abstraction of cooling water from surface water is 0,0058€, and abstraction for groundwater for mine drainage is exempt from fees unless it is used for public water supply or cooling water, then the standard rate is applied (0.10 €/m3 for drinking water and 0.115 €/m³ for industrial use)[20]. In Saxony, the fee for cooling water is 0.005 (€/m^3), while drainage of lignite mines is exempt from

[18] https://data.jrc.ec.europa.eu/dataset/9810feeb-f062-49cd-8e76-8d8cfd488a05/resource/41225c68-6a1a-4e38-bc01-26f385ab88f9
[19] European Commission, Commission Staff Working Document: European Overview – River Basin Management Plans (2019) https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=SWD:2019:30:FIN&qid=1551267381862&from=EN
[20] Brandenburg Water Law - Brandenburgisches Wassergesetz (BbgWG), last amended 4. December 2017, current rates apply since 1st January 2018. https://bravors.brandenburg.de/gesetze/bbgwg Note however that only the commercially used share of abstracted water is subject to a fee (e.g. about 10%), the remainder re-discharged to rivers is dispensed.

fees[21]. In Saxony-Anhalt, the fee for cooling water abstraction from surface water is 0.01 €/m^3, while mine drainage for lignite mines is exempt from fees[22].

The abstraction fee for abstraction of cooling water from surface water is 0.02€/m^3 (0.77 CZK/m^3) for the Czech part of the Elbe, which is lower that from other rivers in Czech Republic[23]. The fee is only 16% compared to the fee of 0.17 €/m3 (4.72 CZK/m^3) applied for other surface water abstractions. The average price of water for households was 1.4€/m^3 (38.1 CZK/m^3) in 2018.

EEB recommendations:

A minimal fee shall be required per water abstracted for the following uses:

a. Abstraction of groundwater/other water for mining activities (including coal washing/processing).
b. Abstraction of water for cooling tower purposes (thermal power plant).
c. Abstraction of water for diffuse dust management/other related activities.

In Brandenburg, the fee for abstraction of cooling water from surface water is 0,0058€, and abstraction for groundwater for mine drainage is exempt from fees unless it is used for public water supply or cooling water, then the standard rate is applied (0.10 €/m3 for drinking water and 0.115 €/m^3 for industrial use)[24]. In Saxony, the fee for cooling water is 0.005 (€/m^3), while drainage

[21] Saxony Water Law § 91, Sächsisches Wassergesetz vom 12. Juli 2013 (SächsGVBl. S. 503), das zuletzt durch Artikel 2 des Gesetzes vom 8. Juli 2016 (SächsGVBl. S. 287) geändert worden ist https://www.revosax.sachsen.de/vorschrift/12868-SaechsWG#p91

[22] Saxony Anhalt Water Law § 105, Wassergesetz für das Land Sachsen-Anhalt (WG LSA) * Vom 16. März 2011 https://www.landesrecht.sachsen-anhalt.de/perma?j=WasG_ST
https://www.revosax.sachsen.de/vorschrift/12868-SaechsWG#p91
Verordnung über die Erhebung eines Entgelts für die Entnahme von Wasser aus Gewässern für das Land Sachsen-Anhalt (Wasserentnahmeentgeltverordnung für das Land Sachsen-Anhalt - WasEE-VO LSA) Vom 22. Dezember 2011 https://www.landesrecht.sachsen-anhalt.de/bsst/document/jlr-WaEntgVSTpELS

[23] Ministry of Agriculture and the Ministry of the Environment of the Czech Republic, Report on water management in the Czech Republic in 2018, http://eagri.cz/public/web/en/mze/publications/publications-water/report-on-water-management-in-the-czech-5.html

[24] Brandenburg Water Law - Brandenburgisches Wassergesetz (BbgWG), last amended 4. December 2017, current rates apply since 1st January 2018. https://bravors.brandenburg.de/gesetze/bbgwg Note however that only the commercially used share of abstracted water is subject to a fee (e.g. about 10%), the remainder re-discharged to rivers is dispensed.

of lignite mines is exempt from fees[25]. In Saxony-Anhalt, the fee for cooling water abstraction from surface water is 0.01 €/m^3, while mine drainage for lignite mines is exempt from fees[26].

In order to value the use of the same water body in the same way within the various regions, the fee shall be set at least to the highest level applied in one of the regions of the Elbe river.

The fee shall also reflect the external environmental cost, and should in no way be less than what paid by competing energy providers such as hydropower. Where the origin of the water source/body is the same, the fee shall be at least the same level than applied in another country for a user of that same water source / body.

The International Commission should provide a clear ranking of the conflicting water uses and adapt the fees accordingly. Use for drinking water, making of drinks and prudent agricultural use should always be prioritised over industrial uses. A cascade of use hierarchy should be set for industrial uses and operators, who should be required to implement water use prevention and recycling techniques.

The ICPORP should require to carry out a quantification of water related eco-system damage cost due to impacts on the water bodies (both in terms of water quality and hydromorphological alterations) but also other relevant environmental impacts, e.g. the negative impact of mining related activities on Natura 2000 sites or wetlands. This should enable a proper application of the cost recovery principle. To achieve that, the following supporting actions should also be undertaken:

Groundwater monitoring around mining sites at least three times per year on the relevant pollutants under GD, WFD and DWD, with focus on heavy metals and sulphates, unless a more frequent monitoring requirement is set.

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[25] Saxony Water Law § 91, Sächsisches Wassergesetz vom 12. Juli 2013 (SächsGVBl. S. 503), das zuletzt durch Artikel 2 des Gesetzes vom 8. Juli 2016 (SächsGVBl. S. 287) geändert worden ist https://www.revosax.sachsen.de/vorschrift/12868-SaechsWG#p91

[26] Saxony Anhalt Water Law § 105, Wassergesetz für das Land Sachsen-Anhalt (WG LSA) * Vom 16. März 2011 https://www.landesrecht.sachsen-anhalt.de/perma?j=WasG_ST https://www.revosax.sachsen.de/vorschrift/12868-SaechsWG#p91

Verordnung über die Erhebung eines Entgelts für die Entnahme von Wasser aus Gewässern für das Land Sachsen-Anhalt (Wasserentnahmeentgeltverordnung für das Land Sachsen-Anhalt - WasEE-VO LSA) Vom 22. Dezember 2011 https://www.landesrecht.sachsen-anhalt.de/bsst/document/jlr-WaEntgVSTpELS

Water abstraction below 20% of the available renewable water resources, in line with the EU target[27], and by no means preventing the achievement of ecological flows supporting the good ecological status objectives.

SMWI Issue no 4: Inadequate reporting on water use/abstraction (levels), discharge related information (pollutants/temperature). Require an EU centralized level with real time-access.

The ICPORP should establish a forward-looking reporting and access to information portal, in relation to dissemination of information of water relevant issues. This is primarily a responsibility of national governments, but it could also be part of the recommendations for the SWMI regarding access to information and transparency, benchmarking progress and compliance promotion.

Monitoring results on water release, abstraction, and quality monitoring shall be tele-reported to a centralised EU database, e.g. the WISE/IED Registry / Revised PRTR, and shall be made actively available online within one month after the information has been generated. The information shall contain at least:

- ID code of the installation (IED Registry ID code)/mine;

- Water consumption per type of water body and type of purpose;

- Water release information per type of receiving body for the pollutants subject to monitoring, E-PRTR reporting, and other monitoring obligations in the format of concentration and loads, including annual average of pH and min/max temperature at release point, flow rates

- Other information that may affect water quality status e.g. waste disposal related

- Permit levels set on the above and annual compliance reports information (e.g. Art 14 of the IED to be included in the reporting under the IED)

[27] See COM(2011) 571 final, page 14
https://www.europarl.europa.eu/meetdocs/2009_2014/documents/com/com_com(2011)0571_/com_com(2011)0571_en.pdf

Other evidence on the correct implementation of the WFD e.g. application on the derogations, impact quantification and methods/calculations for cost recovery principle shall also be made publicly available in the data-reporting.

See further and more specific requests on access to information in Section 6 of EEB publication.