



**NATIONAL SYSTEM FOR PRODUCING OFFICIAL FOSSIL ENERGY
AND MINERAL RESERVE STATISTICS
- BOSNIA AND HERZEGOVINA-**

JANUARY 2019

Contents

A. BASIC DESCRIPTION OF THE NATIONAL SYSTEM FOR PRODUCING OFFICIAL FOSSIL ENERGY AND MINERAL RESERVE STATISTICS BOSNIA AND HERZEGOVINA	
1. Ministries/agencies/companies involved in the statistic system	5
1.1. Another institution in charge of energy and mineral resources statistic	6
2. Brief description of the legal basis for collecting fossil energy and mineral reserve statistics (e.g., the national statistical law or other relevant national legislation)	8
3. Brief description of relevant national policies/programs affecting fossil energy and mineral reserves (e.g., a sustainable mining policy)	10
4. Major national energy statistics databases/publications containing fossil energy and mineral reserve data and, where available, their Internet addresses	11
5. A brief summary of the financial and human resources devoted to the collection of fossil energy and mineral reserve statistics	15
6. Brief summary of any major statistical improvement programs underway or planned for the near future relevant to the completeness/quality of fossil energy and mineral reserve statistics	16

B. THE QUALITY OF THE OFFICIAL FOSSIL ENERGY AND MINERAL RESERVE STATISTICS IN BOSNIA AND HERZEGOVINA	
1. Timeliness: the delay between the reference period and the date of public release	19
2. Frequency: the interval (months, quarters, years) between release	19
3. Time series: the earliest and most recent dates for which statistics are available	20
4. Coverage: the completeness of the data in terms of periods; are there periods for which data were not collected?	22
5. Accessibility: the ease with which users can access the statistics	23
6. Interpretability: the availability of information, such as metadata, to help users understand the statistics	23
7. Transparency: the availability of information regarding the methodology used to the gather the statistics	25
8. Accuracy: the availability of information regarding the degree to which the information correctly describes the phenomena it was designed to measure	26

9. Consistency: the degree to which data are collected in a consistent manner across time	27
10. Coherence with international frameworks: the degree to which the statistics are coherent with the concepts and definitions used in the UN-FC and UN-SEEA	27
C. SET OF RECOMMENDATIONS FOR THE IMPROVEMENT IN OF FOSSIL ENERGY AND MINERAL RESERVE STATISTICS IN BOSNIA AND HERZEGOVINA	
1. A list of gaps in fossil energy and mineral reserve statistics prioritized from most to least important	31
2. A list of changes required in fossil energy and mineral reserve statistics to make them coherent with the UN-FC and UN-SEEA	32
3. Overcoming of the main obstacles standing in the way of improving fossil energy and mineral reserve statistics (institutional, legal, technical and human/financial).	32

THE LIST OF ACRONIMES

BA	BOSNIA AND HERZEGOVINA
EU	EUROPEAN UNION
FB&H	FEDERATION OF BOSNIA AND HERZEGOVINA
HZHB	HRVATSKA ZAJEDNICA HERCEG-BOSNA
IPA	INSTRUMENT FOR PRE-ACCESSION ASSISTANCE
PU	POWER UTILITY
RS	REPUBLIC OF SRPSKA
SFRY	SOCIALISTIC FEDERATIVE REPUBLIC YUGOSLAVIA
TPP	THERMAL POWER PLANT
WBIF	WESTERN BALKANS INVESTMENT FRAMEWORK

1. Basic description of the national system for producing official fossil energy and mineral reserve statistics Bosnia and Herzegovina

1.1. Ministries/agencies/companies involved in the statistic system

Statistics of Bosnia and Herzegovina include collection, processing and dissemination activities to implement statistical programs or other statistics required for Bosnia and Herzegovina. It is characterized by regional decentralization that reflected administrative and political state organization.

There are three statistical institutes within the Bosnia and Herzegovina (Figure 1). According to the law on statistics, the competent authorities for organizing, producing and disseminating statistics are:

- the Agency for statistics of Bosnia and Herzegovina at the level of the state,
- the Federal Office of Statistics for the Entity of Federation of Bosnia Herzegovina and the Republic of Srpska Institute of Statistics for the Entity of the Republic Srpska.

In addition, the Central Bank of BiH compiles monetary and balance of payments and financial statistics for BiH.

Main characteristic of the collection of data related with fossil energy and mineral reserve is dispersion. Key institutions responsible for data collection on fossil energy and mineral explorations and defined reserves (database establishing and maintaining) are Geological Survey of the RS and Geological Survey of FB&H. Here we remark, that in B&H there is no geological institution on national level, just entity geological surveys.

Geological Survey of RS is a part of the Ministry of Industry, Energy and Mining of RS and provides data on mineral resources harvested in synergy with the Ministry. In Federation Geological Survey is under direct jurisdiction of FB&H Government.

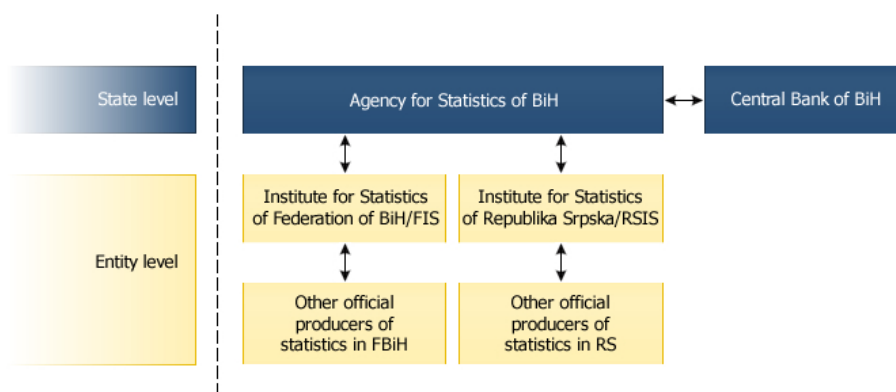


Figure 1: Statistical system of B&H (source Agency for statistics of Bosnia and Herzegovina)

Regarding statistic of energy and mineral resources situation is more complex.

Production of energy in Bosnia and Herzegovina is, under Dayton peace agreement which play the role of the Constitution of B&H, under entities responsibility, the Republic of Srpska (cover 49% of Bosnia territory) and Federation of Bosnia and Herzegovina (cover 51% of the Bosnia territory).

On the other side electricity transmit is regulated on the national level (common company for both entities).

Three legal subjects responsible for energy production are:

- Power Utility of the Republic of Srpska
- Power utility of FB&H
- Power Utility of Croatian community Herceg-Bosna

The first one is responsible for the territory of the Republic of Srpska, the next two for the Federation of B&H.

Further, the first one is under the Government of the Republic of Srpska and next two under the Government of the Federation of B&H.

Under responsibility of PU FB&H operate two thermal power plants, under PU RS additional two. Third company PU of HZHB provides electricity production only in hydro power plants (Figure 2).

Metallic and non-metallic mineral resources exploitation is under exclusive jurisdiction of the entities (Republic of Srpska and Federation of B&H).

1.2. Another institution in charge of energy and mineral resources statistic

It is necessary to emphasize, than in accordance with entity legislation, in the first order the Law on Mining (article 5 of the Law on Mining of RS and article 7 of the Law on Mining of FB&H) and Law on geological explorations (article 3 of the Law on Geological Explorations in both, RS and FB&H) mineral resources in both entities encompass:

- metallic mineral resources
- non-metallic mineral resources
- fossil fuels (coal, oil, gas)
- geothermal energy
- groundwater (mineral, thermal and thermo mineral) and
- secondary mineral resources.

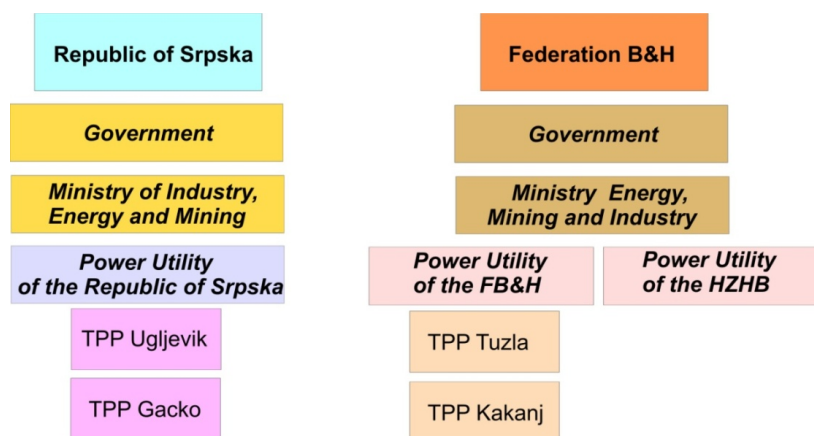


Figure 2: Organization of the electricity production from fossil fuels in Bosnia and Herzegovina

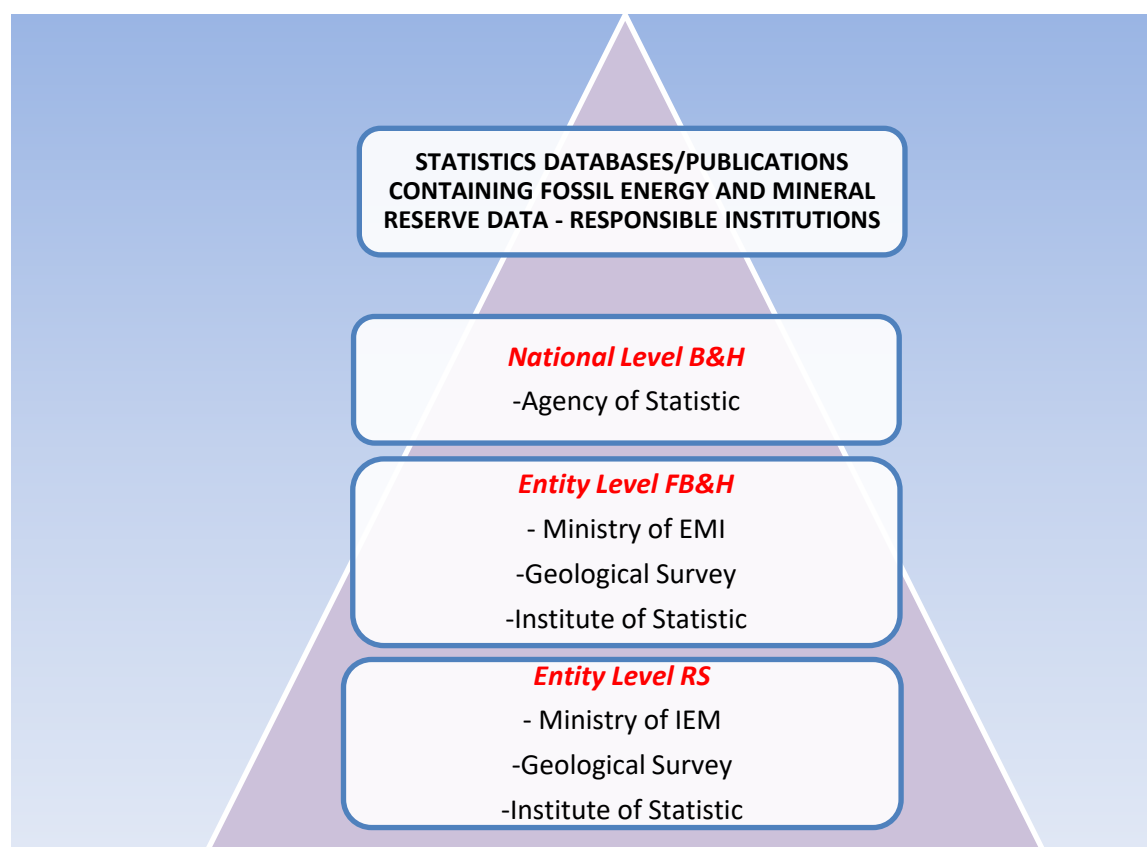


Figure 3: Brief recapitulation of the institutions provide statistic on fossil energy and mineral resources

Related with mineral resources, most important institution for data collecting are Ministries of the Energy, Industry and Mining RS and Ministry of Energy, Mining and Industry in FB&H with entity geological surveys (each entity has a separate geological survey), but they do not provide data for official statistic of energy and mineral resources.

The role of these institutions will be explained in detail in the following text.

1.3. Brief description of the legal basis for collecting fossil energy and mineral reserve statistics (e.g., the national statistical law or other relevant national legislation)

Legal basis for statistic preparation on national and entity level refer to fossil energy and mineral reserve is prescribed by the following laws:

- National level:
 - B&H Law on Statistic (Official Journal of B&H, 26/04) [available on http://www.bhas.ba/dokumenti/stat.zakon-en.pdf](http://www.bhas.ba/dokumenti/stat.zakon-en.pdf) (in English language)
- Entity level:
 - RS: Law on Statistic (Official Journal of RS, 85/03) [available on http://www2.rzs.rs.ba/static/uploads/pravni_akti/o_zavodu/ZakonOStatisticiRS.pdf](http://www2.rzs.rs.ba/static/uploads/pravni_akti/o_zavodu/ZakonOStatisticiRS.pdf) (In Serbian Language)
 - FB&H: Law on Statistic (Official Journal of FB&H, 63/03 and 9/09) [available on http://www.fmks.gov.ba/kultura/legislativa/fbih/63.pdf](http://www.fmks.gov.ba/kultura/legislativa/fbih/63.pdf) (In Bosnian Language)

Data harvesting on both, fossil energy and mineral resources production per sectors (energy, metallic and non-metallic), in accordance with the above mentioned laws is in charge of national and entity statistic institutes. These institutes are duty to deliver data to Agency of Statistic of B&H in accordance with the Law on Statistic of B&H (Official Journal of B&H, 26/04).

Further, the activities related with data collection of energy and mineral resources are dispersed by some other institution in B&H, sometime with overlapping of the activity.

In the Republic of Srpska, in accordance with Law on Statistic, main institution in charge of statistic preparation and publishing is Statistic Institute of RS (article 4, paragraph 1) but also the Ministry of Finance, the Ministry of Interior, the Ministry of Justice, the Ministry of Labor, Veterans and Invalids, the Fund of Health Insurance, the Institute for Health Protection, the Banking Agency and the Hydrometeorological Institute (article 4, paragraph 2). These institutions apply unique methodologies and unique statistic standards, harmonized with adopted standards in B&H and basic principles of official statistic adopted by UN Commission (article 5 of the Law).

In accordance with article 6, paragraph 1, of the Law on Statistic of FB&H the main institution in charge of statistic preparation and publishing in FB&H is Statistic Institute of FB&H. Because the more complex interior organization of FB&H than RS, there are also cantonal branch offices, responsible for data collecting in 10 cantons (paragraph 3 of the same article). In accordance with article 7 of the Law, responsible institutions for data collecting are also the ministries of FB&H, administrative organizations, public institutions and other authorized institutions.

But most comprehensive data on energy and mineral resources are collected by entity Ministries responsible for mining and geology. In fact, each company deal with exploitation of a mineral resource is legally obligated to submit, one time per year, *The Book on Reserves* to the responsible ministry at the

entity level (up to March 31 for the previous year): to the Ministry of the Energy, Industry and Mining in RS and to the Ministry of Energy, Mining and Industry in FB&H.

This obligation is prescribed by the entity Laws on Geological Explorations:

- Laws on Geological Explorations of RS (Official Journal of RS, 110/13), article 13;
- Laws on Geological Explorations of FB&H (Official Journal of FB&H, 9/2010), article 37.

1.4. Brief description of relevant national policies/programs affecting fossil energy and mineral reserves (e.g., a sustainable mining policy)

Usually, national policies effecting fossil energy are contained in an energy strategy. In fact, here are two strategies, one in each entity.

- Framework Energy Strategy for FB&H up to 2035 available on http://www.fbihvlada.gov.ba/file/20170606%20Okvirna%20energetska%20strategija%20FBiH_Radna%20verzija_v2.pdf in Bosnian language;
Energy Strategy of RS up to 2035 available on https://www.google.com/search?rlz=1C1CHBF_enBA831BA832&ei=jDNIXIfjG4i8kwWAwqeYAAQ&q=energetska+strategija+srpske+do+2035&oq=energetska+strategija+srpske+do+2035&gs_l=psy-ab.3...2574.5434..5618...0.0..0.148.1279.10j4.....0....1..gws-wiz.....0i22i30j33i160j33i21.tTm7JnVLAi4 available in Serbian language;

Both strategies were prepared in 2017, in cooperation with UK partners. The aim of the strategies is prioritization of the key energetic strategic goals, with clear definition of the priorities, taking into account principles of the free market and market factors not controlled from the national level.

The strategies are in line with policy of sustainable development, considering three main aspects:

- supply security;
- price competitiveness and
- decarbonization approach.

Strategies emphasize that only with efficient energy sector and effective resources utilization, entities and Bosnia and Herzegovina in general, could provide parallel convergence related with accepted EU obligation and policies.

The measures proclaimed in the strategies put the energy sector as leading factor of stability and sustainable development of the national economy. The secondary effects should be reflected in employment, decreasing of public debt and increasing of competitiveness.

These strategies represent, among all other things, tool for IPA - *INSTRUMENT FOR PRE-ACCESSION ASSISTANCE* and WBIF - *WESTERN BALKANS INVESTMENT FRAMEWORK*.

funds withdrawal as well as attraction of domestic and foreign investors in the sector.

Main strategic goals proclaimed in the entity energy strategies are split into 5 groups:

1. sector transformation with the aim of cost effectiveness and money saving which will be Energy resources efficient use
 - invested in new technologies, production and services
 - restructuring and modernization of the coal sector
 - adequate utilization of the renewable energy resources
 - intensification of hydrocarbon explorations and exploitations
2. Safe and available energy
 - covering of domestic electricity consumption with own production and further market integration
 - diversification of acquisition directions and continuation of physical integration of coal and gas sector at national and regional level
 - adequate development and maintenance of domestic energy infrastructure
3. Efficient energy use
 - further development and applying of the energy efficiency measures in final consumption
 - active informing of the end users about measures and benefits of energy efficiency
 - development and introduction of the efficiency measures in transformation, transmission and distribution of electricity and VE cogeneration
4. Energy transition and environment responsibility
 - reduction of harmful gasses emission
 - CO₂ emission reduction
 - improvement of oil quality control
5. Development and harmonization of the legal and institutional framework
 - harmonization of the legal policy with EU
 - providing of the appropriate staff for future challenges in the sector

From the list above, it is obvious that restructuring and modernization of the coal sector is one of the key priorities.

Unfortunately, The Mineral Resources Management Strategies (some kind of Mining Strategy) were not prepared yet. The strategies would be prepared on the entity level, separate for the RS and FB&H.

In RS it is not prepared yet, despite the fact that the strategy is requested by actual The Law on Mining, article 8, paragraph 1 (Official Journal of RS, 62/18), but also by the previous Law from 2012. Similar situation is in FB&H.

The Strategy of Fundamental Geological Exploration in the Republic of Srpska (*not online available*), which defines direction of future explorations of prioritized mineral resources (energy, metallic and non-metallic) was adopted by the Parliament of RS in 2014. The strategy, together with monograph *The Mineral Resources of the Republic of Srpska* (prepared by Geological Survey of RS) contains data on each mineral resources explored in the past in RS, from 1912 to nowadays) is a most important start point for the preparation of The Mineral Resources Management Strategy.

1.5. Major national energy statistics databases/publications containing fossil energy and mineral reserve data and, where available, their Internet addresses

Surveys has established Geological Information Systems, with module named *Mineral Resources*, but the systems are not yet developed in a way that interesting parties can download data directly from internet. Information systems are based on ESRI GIS.

It is mentioned above that each company extracted some mineral resource has duty to send annual report - *The Book on Reserves*, to the **ministry in charge of mining and geology**. Differently from data stored and published by the statistic institutes (*not based on data from ministries*), which are more general (mostly general information for some mineral resource, e.g. for all coal deposits ore production), these reports refer each exploited deposit and beside data of quantity contain also data of quality (e.g. for coal: sulphur content, ash, caloric value, moisture etc). In the other words, data collected by ministries are more detail than those published by the statistic institutes. Unfortunately, there is no obligation of the ministries to publish mineral reserves book on regular base in both entities (e.g. annually).

Beside this data, database of geological surveys in RS and FB&H contained also information about the results of all mineral resources exploration in the past. Some of these are deposits with defined reserves (quantity and quality), some are registered just as mineralization interesting for further geological explorations.

As is mentioned above, there is not internet accessible database on energy and mineral reserves but data could be obtained on request from the ministries and geological surveys, in accordance with Law on Geological Explorations, in both entities.

Data on energy produced from fossil sources and mineral resources production on the national level are published by Institute for Statistic of B&H, annually, in *The Statistic Year Book*. There are also some periodical publications.

More detail analyses are provided on the entity level, by entity statistic institutions in their *Statistic Year Books*. For RS it is available on http://www.rzs.rs.ba/front/category/8/?left_mi=287&add=287 and for FB&H on <http://fzs.ba/index.php/publikacije/statisticki-godisnjaciljetopisi/>.

Furthermore, related with energy production, e.g. statistic Institute of RS, publish annually document named *The Energy Statistic - Annual Release*. There is possible to find data on total gross production, total net production, energy received and energy delivered by the Republic Srpska, transmission and distribution losses etc., but data about share between hydro and thermal power plants production in all above mentioned aspects (*source: Energy Statistic - Annual Release for 2017*).

In addition, the Institute publish *The Balance of coal - Annual Release*, contains data on gross production, consumption etc.

Web addresses of the institution provide this type of data is listed in the table below.

Table 2: *Institution provide data on fossil energy and mineral reserves*

Institution	Entity	Web address
Ministry of Industry, Energy and Mining	Republic of Srpska	http://www.vladars.net/eng/vlada/ministries/MIEM/Pages/default.aspx
Geological Survey	Republic of Srpska	http://www.geozavodrs.com/#
Institute of Statistics	Republic of Srpska	http://www.rzs.rs.ba/
Ministry of Energy, Mining and Industry	Federation of B&H	http://www.fmeri.gov.ba/
Geological Survey	Federation of B&H	https://www.fzsg.gov.ba/
Institute of Statistics	Federation of B&H	http://fzs.ba/
Agency of Statistics	B&H	http://www.bhas.ba/index.php?lang=en

Information systems of the national and entity statistic institutes are robust but in public domain there are restricted data available also via different quite simple on-line queries.

National level - B&H

The content of database of the SI of B&H is possible to check on <http://dissemination.bhas.ba/webdissemination/cp.aspx?l=b&t=2>, but there are just data on consumer indexes for different sectors for the period 2005-2010.

Entity level - RS

SI of RS provides to check e.g investments in sector of ore and stone extraction per year, production and supplying by electricity, etc. It is also possible download this data in *.xls, *.xlsx and *.XML format. There are just indicators for investments in stone and ores excavation for the period 2005-2017, available in local currency (KM or BAM-Covertible Bosnian Mark, approximately ration 1 euro = 1.95 BAM).

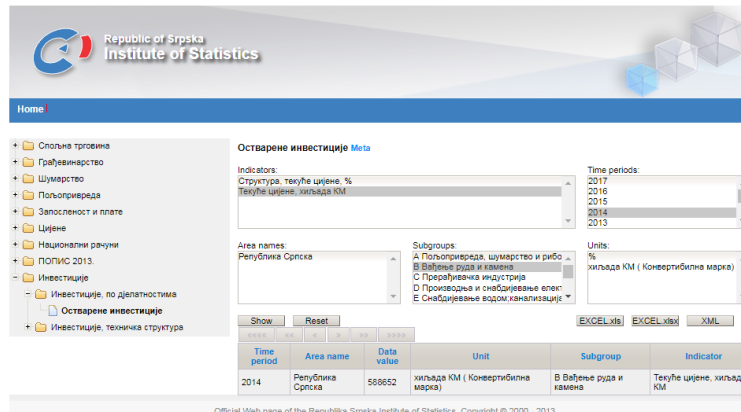


Figure 4: Prescreen of the public available database of Institute of Statistic RS, ore and stone extraction data obtained by simple query (<http://www3.rzs.rs.ba/rzs/faces/indicators.xhtml>)

The query is prepared just in Serb language, Cyrillic letter (<http://www3.rzs.rs.ba/rzs/faces/indicators.xhtml>) but result of the search is available in English as well (Figure 4).

On the other side, statistic institutions publish different kind of papers as a part of statistic dissemination activities, usually on annual base and most important are:

- *The Statistic Year Book* - contain, among all other things, data on coal production and production of other mineral resources on national and entity level available on http://www.rzs.rs.ba/front/category/8/?left_mi=287&add=287
- *The Energy Statistic - Annual Release* - data on total gross production, total net production, energy received by Republic of Srpska, energy delivered by Republic of Srpska, transmission and distribution losses, data about share between hydro and thermal power plants in all above mentioned aspects (http://www2.rzs.rs.ba/static/uploads/saopstenja/energetika/2017/Bilans_Elektricne_Energije_2017.pdf)
- *The Balance of Coal - Annual Release* - data on gross production, consumption etc. (<http://www.rzs.rs.ba/front/article/3200/>)

Utrošak energenata u termoelektranama Fuel use in thermal power plants								
	2017			2018			2017	2018
	VI	VII	VIII	VI	VII	VIII	I-VIII	I-VIII
Mrki ugalj Brown coal Lignit	331.108	392.459	396.869	310.700	402.901	438.235	2.598.035	2.429.864
Loživo ulje, sumpor <1% Fuel oil, sulphur <1% Loživo ulje, extra lako Fuel oil, extra light Dizelska goriva Diesel fuel	97.831	240.712	224.872	157.485	192.774	236.176	1.457.201	1.238.633
	85	285	53	66	115	159,4	1.690	1.866
	96	141	190	45	114	130	1.053	913
	43	61	61	51	53	64	426	399

Figure 6: Prescreen of the public available documents Short-term indicators of energy statistics published on monthly base, Statistic Institute of FB&H (<http://fzs.ba/index.php/category/mjesečni/>)

- The Monthly Statistical Review of the Federation of B&H, with data on ore and stone extraction;

	VI 2017 VI 2016	VII 2017 VII 2016	VIII 2017 VIII 2016	IX 2017 IX 2016	X 2017 X 2016	I-X 2017 I-X 2016	
Ukupno industrija Prema GIG-u 2009.	0,2	8,0	11,5	8,1	3,1	3,9	Total industry According to MIGs 2009.
AI Intermedijarni proizvodi	-1,9	11,2	8,0	9,3	10,7	3,0	Intermediate goods
AE Energija	1,3	8,4	13,6	6,7	-7,7	2,8	Energy
BB Kapitalni proizvodi	1,1	-2,6	6,7	8,2	6,5	5,5	Capital goods
CD Trajni proizvodi za široku potrošnju	13,2	7,8	2,3	10,0	-0,5	5,7	Consumer durables
CN Netrajni proizvodi za široku potrošnju	1,7	12,4	14,5	13,1	6,9	6,5	Consumer non-durables
Prema područjima i oblastima KD BiH 2010							According to KD BiH 2010, sections and divisions
B Vadenje ruda i kamena	12,6	18,0	15,2	7,8	12,1	9,4	Mining and quarrying
05 Vadenje ugljena i lignita	16,9	15,2	11,7	8,2	14,0	10,5	Mining of coal and lignite
07 Vadenje metalnih ruda	-8,0	56,1	49,7	-56,3	-43,8	-5,9	Mining of metal ores
08 Vadenje ostalih ruda i kamena	-9,1	15,4	32,5	18,6	10,6	5,5	Other mining and quarrying

Figure 7: Prescreen of the public available documents Monthly Statistical Review of the Federation of B&H, Statistic Institute of FB&H, in violet data on ores and stone extraction (<http://fzs.ba/index.php/publikacije/mjesečni-bilteni/>)

The content of database of the SI of B&H is possible to check on
<http://dissemination.bhas.ba/webdissemination/cp.aspx?l=b&t=2>

1.6. Access to information

The conditions on public information access are defined by the set of different guidance, indexes, request form and laws. All information about it on national level are available in
(http://www.bhas.ba/index.php?option=com_content&view=article&id=212ba&Itemid=0&lang=ba).



Figure 8: Prescreen of the web page with information on public information availability

1.7. A brief summary of the financial and human resources devoted to the collection of fossil energy and mineral reserve statistics

Today, the Institute for Statistic of RS has 133 employees, 90 women (67.7%) and 43 men (32.3%). Institute for statistic of FB&H employs 180 , 53 men (29.5) and 127 (70.5%) women, organized in 9 subunits. Within subunit Sector for Bussines Statistics, Department for Statistic of Industry, Construction and Energy is in charge of energy statistic. None subunit responsible for mineral resources statistic.

In accordance with the Rule on Internal Organization of the Statistic Agency of B&H, from 2015, there are planned 192 employees, organized in 10 subunits.

The lack of appropriate staff, but also financing, in statistical institutions of B&H is recognized and analyzed in detail in the Strategy. In the next table there are key findings.

Table 3: Human resources of statistic institutions in B&H (source: Strategy of statistic B&H up to 2020)

Risk description	Probability	Consequence	Measures
Insufficient number of employee	High	High	Provide sufficient number of employees
Appropriate staff	Moderate	Moderate	Appropriate planning and staff education
Qualifications of staff for tasks	Moderate	High	Appropriate work activities and tasks
Staff changes	Moderate	High	Care about employee, stimulation measures and preparation of the analysis of staff fluctuation
Staff absences	Moderate	Moderate	Provide appropriate substitution, analysis of the causes

Beside statistical institution, in addition, estimated staff devoted to energy and mineral resources statistic in other institutions is given in the following table.

Table 4: Estimation of the staff devoted to energy and mineral resources statistic in other institutions

Institution	Entity	Staff devoted to the data collection on energy and mineral resources
Ministry of Industry, Energy and Mining, department for mining and geology	Republic of Srpska	3
Geological Survey	Republic of Srpska	2
Ministry of Energy, Mining and Industry	Federation of B&H	3
Geological Survey	Federation of B&H	2
Total		10

Briefly, from two previous table it is possible to conclude that number of employees in all institutions deal with energy and mineral resource statistic is insufficient and structure of current employees is not appropriate (regarding qualifications). It request systematic and prompt reaction in the next period.

1.8. Brief summary of any major statistical improvement programs underway or planned for the near future relevant to the completeness/quality of fossil energy and mineral reserve statistics

In accordance with Stabilization and Association Agreement there is prescribed obligation of harmonization of the official statistic system in B&H with EU standards.

The aims and measures for the achievement of these standards were provided in key document, The Strategy of Statistic Development in B&H up to 2020 (available on <http://www.bhas.ba/planiprogram/STRATEGIJA%20%20RAZVOJA%20STATISTIKE%20BIH%202020FINAL%20BH.pdf>) . The strategy was financed by IPA Twinning Project and implemented by the Denmark Statistic. Twinning is a European Union instrument for institutional cooperation between Public Administrations of EU Member States and of beneficiary or partner countries. Twinning projects bring together public sector expertise from EU Member States and beneficiary countries with the aim of achieving concrete mandatory operational results through peer to peer activities.

Within the strategy, in strategic priority 6, improvement and development of statistic area, there are following recommendations related with energy: "Taking into account recommendations of the Ministry Council of the Energy Community, during the strategic period, activities related with high statistic

information quality ensuring in the energy sector, will be provided. Further, considering importance and consequences of the new directive on renewable energy resources adoption, it is necessary to establish reliable statistical data. In B&H, problem of the lack of statistic data on energy is obvious as well as emphasized obstacles in harvesting of data and information. Detail and comprehensive and reliable statistic is mandatory prerequisite for observation of the energy statistic, on national as well as international level. Strategic measures for this purpose include:

- establishing of statistic exploration on biomass consumption;
- establishing of the system for data observation on production, consumption and losses of energy in accordance with IEA/EUROSTAT technologies;
- knowledge improvement about preparation of energy balance statistic;
- improvement of the availability of statistic data with the aim to provide regular observation of the indicators on the energy efficiency;
- improvement and harmonization of the methodologies of the statistical evidences for the industry with EU standards with overall aim of establishing of database necessary for observation and estimation of the indicators of energy efficiency in the industry;
- providing of the statistical data for preparation of the indicators on energy consumption."

Harmonization and development of the official statistic, in the line with above mentioned strategy and measures for the improvement, resulted in the past years (from 2009 to 2016) in fulfillment of the program tasks and goals for the period 2005-2008 and 2009-2012.

In addition, it is verified by the Eurostat mission in B&H (Adapted Global Assessment - AGA), who provided general assessment on harmonization of national statistic system of B&H with EU standards, including "Fundamental Principles of Official Statistic of United Nations", "European Statistic Praxis Codex" and the Eurostat document "Compendium of Statistical Requests". Base on this AGA proposed acceptance of the 3rd statistical program.

The statistical program for the period 2017-2020 is available on
(http://www.bhas.ba/planiprogram/STATISTICKI%20PROGRAM%20BIH%202017_2020.pdf).

In accordance with the Strategy and program 2017-2020, the harmonization and improvement, with the aim of full EU statistical standards achievement, will be continued in upcoming years. In focus of the period will be:

- optimization of the process and tasks in statistic production
- improvement and development of the statistic areas

Planned development must be in the line with requests of domestic and international users of statistical data, but also in line with tasks necessary in process of EU accession. It is emphasized in the strategy, that realization of the goals also depends on available human and financial resources, but also assistance of the international institutions.

2. The quality of the official fossil energy and mineral reserve statistics Bosnia and Herzegovina

2.1. Timeliness: the delay between the reference period and the date of public release

In general, statistical institutes in B&H represent very organized institutions (for local conditions) with probably shortest period between reference period and public release of the documents than other institutions. Monthly Statistical Reviews are available in download section on the web site just few days after reporting period is expire. E.g. in October 29th on official web page of the SI of FB&H monthly review for September was available and not available yet on the official web page of SI of the RS. But this delay is not longer than 40 days (for monthly review) between reference period and release. Annual publication are released just after the beginning of the year for previous one.

2.2. Frequency: the interval (months, quarters, years) between release

There are different intervals of publication of key statistical documents contain data on energy and mineral resources:

- monthly
- annual



Figure 9: Prescreen of the public available Statistical Yearbook and Monthly Statistical Review of the Federation of B&H



Figure 10: Prescreen of the public available Statistical Yearbook and Monthly Statistical Review of the Republic of Srpska

2.3. Time series: the earliest and most recent dates for which statistics are available

The review is given for national and entity levels.

National level - Bosnia and Herzegovina

The Agency for Statistic of B&H publishes *the Statistic Year book* from 2014.

The Agency for Statistic of B&H publishes *the Statistical Energy Balance* from 2014 as well. The methodology of data collection and balance calculation, as well as form and content, are harmonized with standards and recommendations of IEA/OECD and Eurostat.

Short-term Indicators of Energy Statistic is monthly published documents, available from November 2016.

The useful document related with coal, metallic and non metallic ore and stone production is the *Business Statistic - Volume index of Industrial Production in B&H*, published monthly last 10 years, available from 2008 to 2017. Section B, Mining and Quarrying contain data on monthly excavation of coal and lignite, metal ores, other mining and quarrying.

B	VADENJE RUDA I KAMENA	4,8	5,2	-8,9	7,2	-6,7	3,9	B	MINING AND QUARRYING
05	Vađenje ugljena i lignita	5,2	-0,2	-2,9	3,1	-6,5	1,4	05	Mining of coal and lignite
07	Vađenje metalnih ruda	-22,1	38,0	-22,2	29,9	-13,9	14,9	07	Mining of metal ores
08	Vađenje ostalih ruda i kamena	22,9	2,1	-17,4	2,3	-3,2	13,8	08	Other mining and quarrying

Figure 11: Section B, Mining and Quarrying, Business Statistic - Volume index of Industrial Production in B&H, published monthly

Entity level - Republic of Srpska

The Statistic Year Book is regularly published by the institute one time per year and on the web page it is available for download from 2009.

Monthly Statistical Review is available for each month from September 2012.

Quarterly Statistical Review is available for the period 2008-2013 (on http://www.rzs.rs.ba/front/category/369/?left_mi=318&add=318).

There is also monthly release Industrial Turnover index and contain data on monthly energy turnover (<http://www.rzs.rs.ba/front/category/77/>).

Data on ore and aggregates sale could be found in database of the SI RS. There is no data structured per mineral resources (e.g. separately for lead, zinc, cooper, bauxite, coal, aggregates etc.). The data are available for the period 2005-2017. Further, the database contains investment in electricity production and supply, together with gas, steam and climatization data, without any other detail information (e.g. production of electricity based on coal).

Energy Statistic - Annual Release is also publication of the IS RS available from 2012 (http://www.rzs.rs.ba/front/article/2765/?left_mi=None&add=None).

Entity level - Federation B&H

The Statistic Year Book is regularly published by the institute one time per year and on the web page it is available for download from 2006 (<http://fzs.ba/index.php/publikacije/statisticki-godisnjaciljetopisi/>).

Monthly Statistical Review is available for each month from February 2008 (<http://fzs.ba/index.php/publikacije/mjesecni-bilteni/>).

Thematic publication Industrial production, could be found in <http://fzs.ba/index.php/publikacije/godisnji-bilteni/industrija/>, provide from 2008 , among all other things, data on production of:

- quarrying of ornamental and building stone,
- limestone,
- gypsum,
- chalk and slate,
- gravel and sand pits,
- mining of clays and kaolin
- chemical and fertilizer minerals
- extraction of salt

Short-term Indicators of Energy Statistic is published monthly from 2015.
(<http://fzs.ba/index.php/publikacije/saopcenjapriopcenja/energetika/>).

The review of the most important publications related with energy and mineral resources and available time series are given in the table below.

Table 5: Published documents by statistic organizations of B&H related with energy and mineral resources and their time series

No	Document	Publisher	Available from - to (year)	Remark
1	Statistic Yearbook	AS B&H	2008-2017	Annually
2	Statistical Energy Balance		2014-2017	Annually
3	Short-term Indicators of Energy Statistic		2016-2018	Monthly
4	Business Statistic - Volume index of Industrial Production in B&H		2008-2018	Monthly
5	The Statistic Year Books	IS RS	2009-2017	Annually
6	Monthly Statistical Review		2012-2017	Monthly
7	Quarterly Statistical Review		2008-2013	Quarterly
8	Industrial Turnover index		2008-2017	Monthly
9	Energy Statistic - Annual Release		2012-2017	Monthly
10	The Statistic Year Books	IS FB&H	2006-2017	Annually
11	Monthly Statistical Review		2007-2018	Monthly
12	Short-term Indicators of Energy Statistic		2015-2018	Monthly
13	Industrial production		2008-2017	Annually

2.4.Coverage: the completeness of the data in terms of periods and periods for which data were not collected

In general, four different periods in statistic could be identified in B&H during the past,

Statistic data harvesting in B&H has long tradition, but from 1992 its organization is different than before 1992. Before 1992 the statistic data are collected on the level of Bosnia and Herzegovina, in that moment one of the six constitutive republics in former SFRY.

Of course, in the period before 1992 data are collected and presented in accordance with domestic standards harmonized with earlier international standards in modern and very comprehensive way.

During the period 1992-1995, because the four years war, statistical data had been collected in accordance with availabilities in war circumstance. Statistic is mostly focused on demography, because the intensive moves of the population but also huge rate of mortality. Anyhow, in this period whole industry was out of function (inactive or destroyed). It is main reason why statistical data are more restricted for this period than before and after.

Period from 1995-2000 could be considered as a period of re-establishing of the destroyed institutions in B&H, and establishing of new institutions on the entity and state level. Here are statistical data more detail and reliable than between 1992-1995.

After 2004 and took into enforce the national and entity Laws on statistic situation is rapidly improved. The relations between entity statistic institutes and national Agency for Statistic are defined by Law on Statistic of B&H and entity laws (Law on Statistic of FB&H and Law on Statistic of RS) as well as by the *Agreement on application of the unique methodologies and statistical standards in preparation of statistic data in B&H* (from 2005). The laws are in high degree harmonized with EUROSTAT document "Directions and recommendations for the preparation of the basic statistical legislation documents in transitional countries with transition to market economy". **Explanation given in comment !**

Statistic in B&H is improved especially after 2013 (after adoption of the Strategy of Statistic) when serious harmonization with international standards was started and in that sense, here is big improvement in last 6 years.

2.5.Accessibility: the ease with which users can access the statistics

In general, three statistical organizations: the Agency for statistics of Bosnia and Herzegovina at the level of the state, the Federal Office of Statistics for the Entity of Federation of Bosnia Herzegovina and the Republika Srpska Institute of Statistics for the Entity of Republika Srpska are three most important organization related to collecting the data.

But regarding the mineral resource statistic, especially those refer to the reserves of mineral resources, the ministries responsible for mining are most relevant institutions, together with Geological Surveys. As it mentioned, each mining company has obligation to deliver the status of the reserves up to March 31st for the previous year to the Ministry responsible for mining, Ministries of the Energy, Industry and Mining of FB&H and the Ministry of Industry, Energy and Mining of RS. Information on mineral resources not in exploitation, but with some reserves defined in the past, are available in the archives of two

geological surveys. This data are not public available for download, but some of data could be provided from responsible ministries on request and in accordance with actual legislation.

The web addresses of these institutions are given in the table 2.

2.6. Interpretability: the availability of information (metadata) to help users understand the statistics

National level – Bosnia and Herzegovina

The list of Reference Metadata in Euro SDMX Metadata Structure is possible to find in:

- -ESMS - http://www.bhas.ba/?option=com_content&view=article&id=361&lang=en
- Classifications - http://www.bhas.ba/?option=com_content&view=article&id=86&lang=en
- Methodology - http://www.bhas.ba/?option=com_metodologija&lang=en

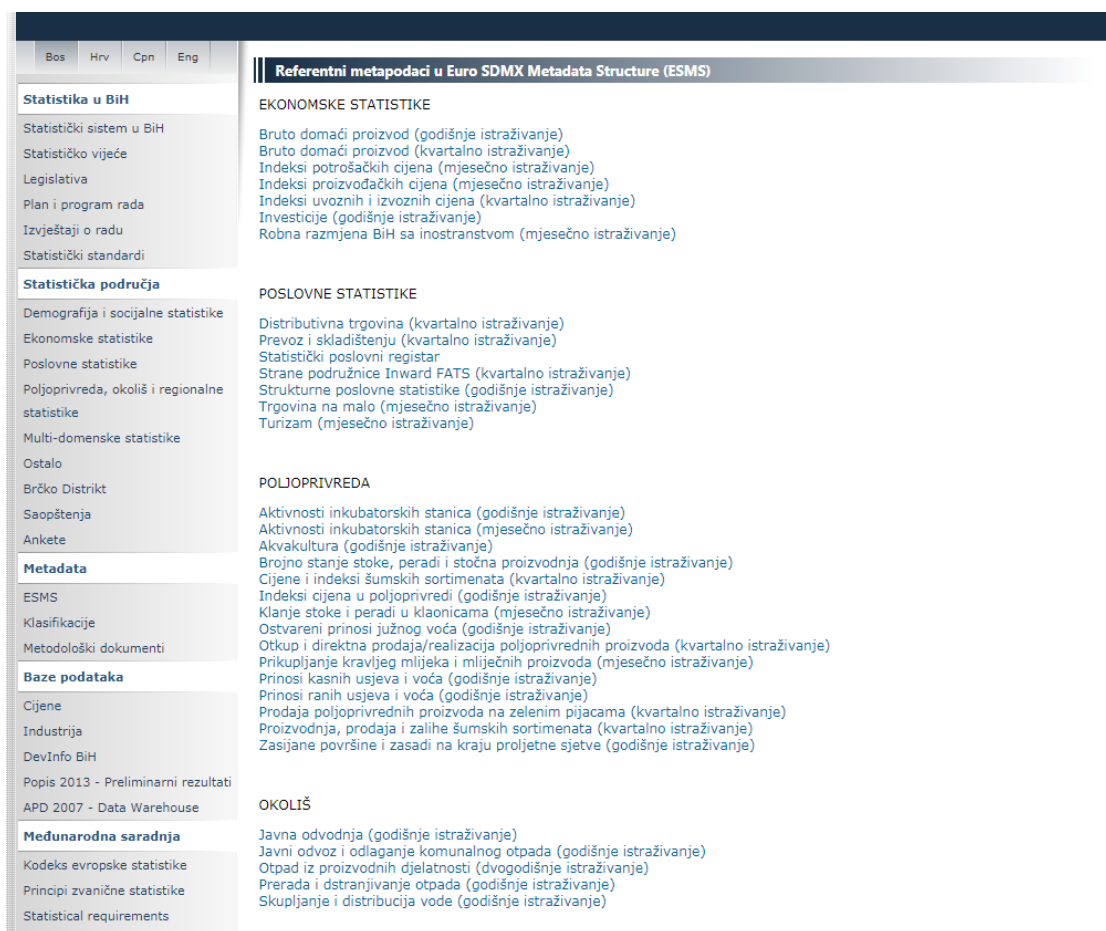


Figure 12: Prescreen of the public web page of SI of B&H, Reference Metadata in Euro SDMX Metadata Structure

Entity level - Federation B&H

- Classifications - <http://fzs.ba/index.php/klasifikacije-i-metodologije/klasifikacije/>
- Methodologies - <http://fzs.ba/index.php/klasifikacije-i-metodologije/english-metodologije/>

Entity level - Republic of Srpska

- ESMS - http://www.rzs.rs.ba/front/article/3076/?left_mi=332&add=332 contain mostly economic statistics
- -Classifications - http://www.rzs.rs.ba/front/category/341/?left_mi=286&add=286
- -Methodologies - http://www.rzs.rs.ba/front/category/366/?left_mi=313&add=313

2.7. Transparency: the availability of information regarding the methodology used to the gather the statistics

In accordance with the laws on statistic, national and entities, there is a free access to information necessary for the estimation of statistic data quality, particularly methods and procedures following the statistic preparation.

National level – Bosnia and Herzegovina

All applied methodologies on national level are available on web page of the SI of B&H (http://www.bhas.ba/index.php?option=com_content&view=article&id=85ba&Itemid=&lang=en). Few methodologies is also translate in English language.

STATISTICAL STANDARDS
Quality report for statistical surveys - methodological guidelines for preparation
Quality report for statistical surveys
INDEXIS POTROŠAČKIH CIJENA 2010 (Local language only)
ANKETA O RADNOJ SNAGI 2011 (Local language only)
LABOUR FORCE SURVEY 2014
ANKETA O TROŠKOVIMA RADA 2012 (Local language only)
ANNUAL CROP STATISTICS 2013
CONSUMER PRICE INDEX 2014
EXPORT AND IMPORT PRICE INDICES OF BIH 2014
JUVENILE PERPETRATORS OF CRIMINAL OFFENCES 2013
ADULT PERPETRATORS OF CRIMINAL OFFENCES 2013
BASIC SCHOOLS 2013
STATISTIKA MLJEKA 2013 (Local language only)
PRODUCTION, SALES AND STOCKS OF FOREST ASSORTMENTS IN BOSNIA AND HERZEGOVINA 2014
SOCIJALNA ZAŠTITA U BIH 2013 (Local language only)
VISOKO OBRAZOVANJE 2013/2014 (Local language only)
SECONDARY SCHOOLS 2013
BIH INTERNATIONAL TRADE IN GOODS STATISTICS 2015
BIH INTERNATIONAL TRADE IN GOODS STATISTICS 2016
LABOUR FORCE SURVEY 2016
STATISTIKA OBRAZOVANJA - VISOKO OBRAZOVANJE ZA 2016/2017. (Local language only)
STATISTIKA OBRAZOVANJA - SREDNJE OBRAZOVANJE ZA 2016/2017. (Local language only)
STATISTIKA OBRAZOVANJA - OSNOVNO OBRAZOVANJE ZA 2016/2017. (Local language only)
STATISTIKA OBRAZOVANJA - PREDŠKOLSKO VASPITANJE I OBRAZOVANJE ZA 2016/2017. (Local language only)
KULTURA I UMJETNOST 2016 (Local language only)
LABOUR FORCE SURVEY 2017
BIH INTERNATIONAL TRADE IN GOODS STATISTICS 2017
UNIT VALUE INDICES OF EXPORT AND IMPORT OF BIH 2017
The basic principles of data security
Guidelines for correcting mistakes in published releases
Guidelines for taking over data from administrative sources
Strategija diseminacije BIH (Local language only)
Marks used in our publications

Figure 13: The list of the statistic standards used by SI of B&H

Entity level - Federation B&H

All applied methodologies in FB&H are available on web page of the SI of FB&H (<http://fzs.ba/index.php/klasifikacije-i-metodologije/english-metodologije>),

For the example there are also methodologies related with energy:

- **Methodology - Annual Energy Balance** (SI FB&H) (http://fzs.ba/wp-content/uploads/2018/01/Metodolo%C5%A1ko-uputstvo-Energetski-bilansi_BOS.pdf)
- **Methodology - Short-term indicators of energy statistic** (http://fzs.ba/wp-content/uploads/2018/01/Metodolo%C5%A1ko-uputstvo-kratkoro%C4%8Dna-energetika-cirilica_SRP.pdf)

Entity level - Republic of Srpska

All applied methodologies in RS are available on web page of the SI of RS (http://www.rzs.rs.ba/front/category/366/?left_mi=313&add=313) and there are the following methodologies:

- Administration of justice
- Agriculture and fishery
- Construction
- Culture and art
- Distributive trade
- Education
- **Energy**
- Environment
- External trade
- Forestry
- Gross fixed capital formation
- Health
- Hotels and restaurants
- Household budget survey
- **Industry**
- Information society
- Labour (wages and employment)
- Labour force
- National accounts
- Population
- Prices
- Research and development and innovation
- Social welfare

- Statistical Business Register
- Structural business statistics
- Tourism
- Transport

2.8. Accuracy: the availability of information regarding the degree to which the information correctly describes the phenomena it was designed to measure

Data in the different kind of the monthly and annual reports are collected by the producers or responsible authorities in charge of data deliverable related with some statistical branches. **I did not find this information !**

In concrete case, data on coal and mineral resources production are provided by the entity ministries responsible for energy and mining. Taking into account social responsibility of the ministries but also control mechanism (mining inspection) it could be assumed that data are delivered as much as possible in accurate way. Here is long tradition and clearly defined calculation procedures (coal and other mineral resources) but also some independent control measures to check data on production (e.g. Annual Report on Reserves Status, delivered from producer to the responsible ministry for each year). The measurement procedures are defined by entity the Laws on Mining and the Laws on geological Explorations and in detail by the Rules linked with mentioned Laws.

2.9.Consistency: the degree to which data are collected in a consistent manner across time

Regarding the consistency four periods should be identified, listed in the figure below (Figure 14).

The first one, up to 1992 when data are collected under unique methodology and standard in whole B&H, also unique with procedures in former Yugoslav republics (Serbia, Croatia, Montenegro, Slovenia, Macedonia). Main characteristic of this period is very quality and organized statistic.

The period 1992-1995 could be identified as gap in most of statistic data because the war, but, of course, there is dominant inactivity in industrial production and statistic for this area practically could not be collected.

Period 1995-2003 is characterized dominantly by independent statistic activities of entity statistic institutions and lack of the legally background for statistic on state level.

The last period, the period after 2003, started after adoption of new laws on statistic on state and entity levels. With these laws, mechanism of data harvesting on the entity and state level and relations of state and entity statistic organizations were established and methodologies and standards are mostly harmonized with EUROSTAT requirements. It significantly improved data quality and comprehensiveness.

up to 1992	1992-1996	1996-2003	2003-
Regularly collected in accordance with the statistic laws of SFRY and B&H	In general interruption, because of the war event	Period of statistic data collection on regularly base, but dominantly on entity level	Defined mechanism of statistic data harvesting on the entity and state level, harmonization of the methodologies and the standards with EUROSTAT requests

Figure 14: Key period related with statistic data collection across time in B&H

2.10. Coherence with international frameworks: the degree to which the statistics are coherent with the concepts and definitions used in the UN-FC and UN-SEEA

Former Yugoslavian countries usually use "old" Russian system of the mineral reserves categorization and classification. It is the case in Bosnia and Herzegovina as well. The reserves of mineral resources are split into the following categories (Table 6).

Table 6. Mineral reserves categorization and classification in B&H

Category of reserves	Class
A	Balance reserves
B	
C ₁	
C ₂	Non-balance reserves
D ₁	
D ₂	

In both entities, categorization of the mineral resources (also include coal) is prescribed in the above-mentioned the Laws on Geological Explorations and more detail in the Rules on Classification, Categorization and Reserves of Mineral Resources and Recording of mineral reserve database (in RS

Official Gazette 92/14 and in FB&H Official Gazette 36/12). Each mineral resource is specified in the Rules, with precisely defined procedures for determination of the categories and classes.

This classification mostly correspond to the Russian State Classification ([Figure 15](#)), comparable with another world wide used ([Table 7](#)).

But scientific and expert community in B&H, especially geologists has plentiful discussion about some other classification of the mineral resources (listed in the table below), but any of these classifications is not in officially in use yet (e.g. very frequently from foreign investors id requested JORC classification). In last few years it is also usually suggested from the foreign investors in mineral sector.

Table 7. *The list of the most usual classification of the mineral resources worldwide*

CIM standards	The CIM Definition Standards on Mineral Resources and Reserves (CIM Definition Standards) establish definitions and guidelines for the reporting of exploration information, mineral resources and mineral reserves in Canada.
CRIRSCO Code	The International Template for Reporting of Exploration Results, Mineral Resources and Mineral Reserves of the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) integrates the minimum standards being adopted in national reporting codes worldwide with recommendations and interpretive guidelines for the public reporting of exploration results, mineral resources and mineral reserves.
IIMCh Code	Certification Code for Exploration Prospects, Mineral Resources & Ore Reserves. This Code is the result of a Collaboration Agreement between the Institution of Mining Engineers of Chile (IIMCh) and the Ministry of Mining.
IMM Reporting Code	The Code for Reporting of Mineral Resources and Mineral Reserves sets out minimum standards, recommendations and guidelines for Public Reporting of Mineral Exploration Results, Mineral Resources and Mineral Reserves in the United Kingdom, Ireland and Europe.
JORC code	The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves.
NI 43-101	National Instrument 43-101 (the "NI 43-101" or the "NI") is a mineral resource classification scheme used for the public disclosure of information relating to mineral properties in Canada.
PERC Code	The Pan European Reserves and Resources Reporting Committee (PERC) Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves (further referred to as 'the Code') sets out minimum standards, recommendations and guidelines for Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves in the United Kingdom, Ireland and Europe.
Peruvian Code	This Code was prepared by a Joint Committee formed by members of the Lima Stock Exchange and by professionals dedicated to the exploration and evaluation of mineral resources.
Russian Code	Currently effective in Russia is the Code approved by the Decree of the Ministry of Natural Resources, RF No 278 of 11 December, 2006. Full title of the Document: Classification of resources/reserves and prognostic resources of solid minerals.

SAMREC code	The South African Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves.
SEC Guide	Description of Property by Issuers Engaged or to be Engaged in Significant Mining Operations. Developed by the United States Securities and Exchange Commission.
SME Guide	A guide for reporting exploration information, mineral resources, and mineral reserves - USA.
UNFC Code	The United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC-2009) is a universally applicable scheme for classifying/evaluating energy and mineral reserves and resources - it is the successor to UNFC-2004.

CRIRSCO (JORC/CIM/ PERC/NAEN)	Resource		Measured	Indicated			Inferred	Exploration Potential or Exploration Target	
	Reserve		Proven	Probable					
Russian State Classification	Reserve		A, B and C1	B, C1 and C2			C2 and P1	P2 and P3	
UNFC-2009 (Chinese and Indian Classification)	Economic Evaluation (100)	Designed Mining with loss	Recoverable Reserve (111)	Probable Recoverable Reserve (121)		Probable Recoverable Reserve (122)			
		Designed Mining without loss							
	"E"	Marginal Economic (2M00)	Basic Reserve (2M11)	Basic Reserve (2M21)		Basic Reserve (122b)			
		Sub-Economic (2S00)	Resource (2S11)	Resource (2S11)		Resource (2S22)			
		Intrinsically Economic (300)			Resource (331)		Resource (332)	Resource (333)	Resource (334)
	"F"	Feasibility Evaluation	Feasibility (101)	Pre-Feasibility (020)	Scoping (030)	Pre-Feasibility (020)	Scoping (030)	Scoping (030)	Scoping (030)
	"G"	Geological Evaluation	Measured (001)			Indicated (002)		Inferred (003)	Predicted (004)

Figure 15: The example of the world wide use classifications and their comparison

The *UNFC classification* is not officially used in any document in B&H yet. It is quite unknown many experts deal with energy and mineral resources.

It will be for the first time applied by the experts of two geological surveys within the DARLIge Project (EU Commission financed project within the INTERREG Program), geothermal regional projects of six countries belong to Pannonia basin.

Also within RESEERVE project related with mineral resources in the Balkan region (KIC Program, Raw Materials project area), comprehensive analyses of methodologies and their comparison will be provide from German partner DMT GmbH & Co. KG, Essen, including UNFC classification. It will be good opportunity to make domestic experts more familiar with UNFC procedures.

Anyhow, the reserves calculated in accordance with domestic legal policy are not coherent with standards of developed countries and probably it will be topic for intensive discussion between scientists, expert and economist in upcoming years, especially during the period of accession of B&H to EU.

3. Set of recommendations for the improvement in of fossil energy and mineral reserve statistics in Bosnia and Herzegovina

3.1.A list of gaps in fossil energy and mineral reserve statistics in Bosnia and Herzegovina prioritized from most to least important

In national and entity statistic of fossil energy and mineral resources there is just set of reported data on production of key mineral resources:

In the Republic of Srpska it includes:

- coal
- lead and zinc
- iron
- bauxite.

In FB&H there are:

- lignite and coal
- salt and gypsum
- cement.
- quarrying of ornamental and building stone,
- chalk and slate,
- gravel and sand pits,
- mining of clays and kaolin
- chemical and fertilizer minerals.

On the national level it is more general, split into:

- coal and lignite
- metals
- other ores and stone

Actual procedures of the data collecting on fossil energy and mineral resources provide a base for more quality presentations of the extracted mineral resources per year, but also on reserves.

Priority 1: Data on extraction of all mineral resources could be collected very precisely in cooperation of statistic institutions with the ministries responsible for energy and mining:

- data on production of construction stone (e.g. limestone, dolomite and igneous rocks quarries)
- data on production of decorative stone
- data on production of clays (bentonite, caoline, fireproof etc).

Priority 2: Closer cooperation with the ministries and especially with geological surveys also can provide data about reserves of any fossil energy and mineral resources: **YES, it is the aim of Priority 2**

- metallic, ferrous and non ferrous: lead, zinc, iron, manganese, silver etc.
- non-metallic: quartz, quartz sands, clays, borosilicate, magnesite etc.
- energy: coal and geothermal
- groundwater, including mineral and thermal
- secondary mineral resources etc.

3.2 A list of changes required in fossil energy and mineral reserve statistics in Bosnia and Herzegovina to make them coherent with the UN-FC and UN-SEEA

It entails in the first order changes of the entities legal policy regarding mineral resources and reserves reporting. As it mentioned above, current classification mostly corresponds with the Russian National classification. As it visible from the **table 7**, this classification is quite easy comparable with another world wide used classification. Data collected as A, B, C1, C2, D1, D2 reserve classes are comparable, more or less, with UNFC key axis (E, F and G categories, but also subcategories).

Because of the short list of the key mineral resources in the entities, the task of reporting of the reserves in accordance with UNFC-2009, based on the available reports under national classification system, is realistically to provide one time per year.

There is necessary to provide some kind of pilot project related with this topic. It could be implemented e.g. by some UN body with office in B&H in cooperation with the responsible entity institutions.

Further, appropriate trainings in UNFC-2009 classification for the national experts are mandatory, to provide future consideration of this methodology as one of the possible reporting method on national level. Without it, the local experts and authorities will not considered anyhow the classification in national legislation in right way in the recent future. Also, national experts must be include in the different UN commissions (e.g. UNECE commission) to provide accurate information about methodology but also to disseminate the methodology values on the national level.

3.3.Overcoming of the main obstacles standing in the way of improving fossil energy and mineral reserve statistics in Bosnia and Herzegovina (institutional, legal, technical and human/financial).

a) *Institutional measures*, related with better presentation of the statistic in the area of fossil fuels and mineral resources must include more closely cooperation between key authorities, especially on the entity level.

Data collected by the entity ministries in charge of mineral resources status, but also geological surveys as a part of this ministry (in RS) or directly subordinated to the entity government (FB&H), will doubtless provide more quality reporting about this issue (Figure 16).

Of course, mechanisms for cooperation with statistic institutions on entity and state level must be provided as a part of the legal measures.

b) *Legal measures* must include adaptation of the legal mechanisms for providing of the above mentioned cooperation. Indeed, the cooperation mechanisms are provided in the actual legislation, but more in general way. It must be prescribed more detail, in a way to put the ministries and institutions in charge of mineral resources data collection explicitly in the related laws, not just in the form "...and the other institutions".

Further, here is necessary, by face to face meetings, introduce the representatives of the statistic institutions about the availabilities of, in the first order, the geological surveys, but also to define necessary procedures of mineral resources data collecting and format of delivery. The procedures and delivery formats should also be the issue of legal policy adaptation, not just in statistic area but also in geological laws and sub law documents.

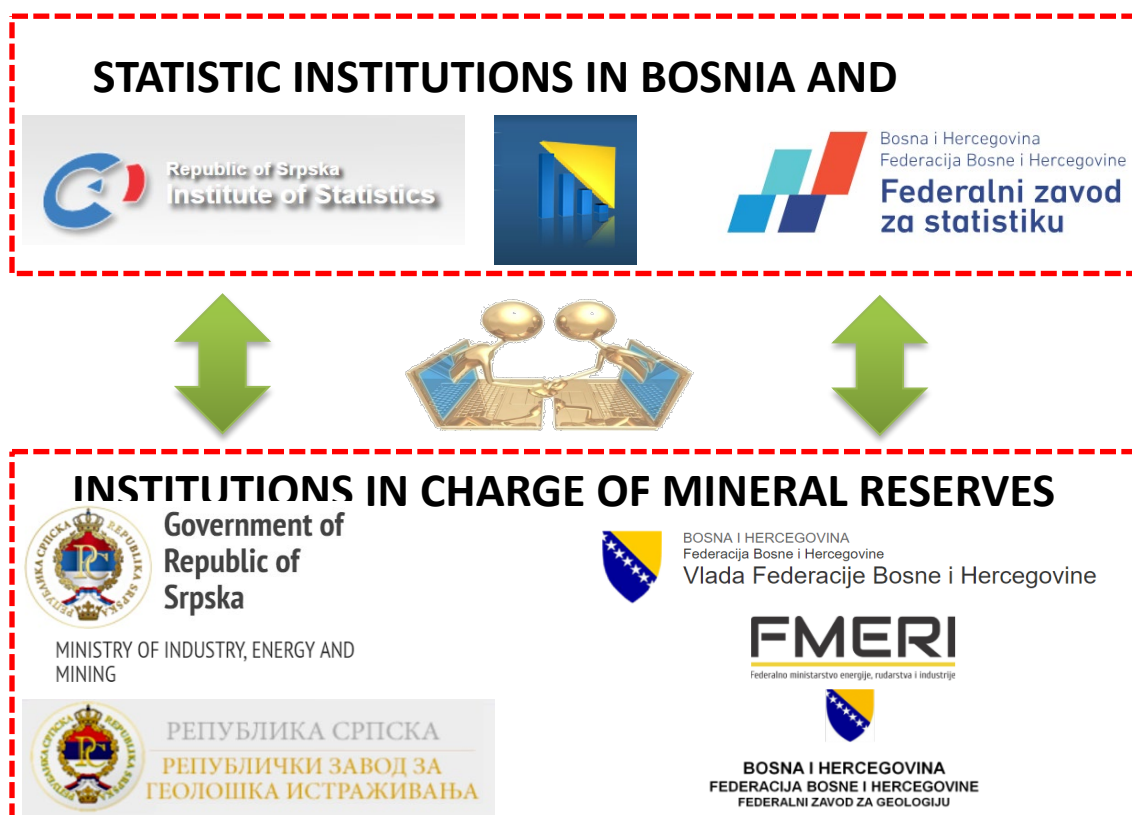


Figure 16. Key institutions which closely cooperation should be provide over bridging of the fossil energy and mineral resources statistic gap

c) *Technical solutions* - Current technical solutions, within the institution process the data related with mineral resources, represent probably one of the weakest point in the reporting chain. GIS solutions, as a standard tool in modern reporting, are not yet applied in mineral resources reporting system enough (e.g. as in water sector).

This solution is only applied in entities geological surveys, which are institutions responsible for Geological Information Systems in both entities. Data on mineral resources are stored in the geological information systems but based on the technical abilities (absence serves GIS licenses) data are not visible on the some web platform.

All institutions deal with mineral resources statistic must improve their technical possibilities to present it, especially in the internet. It entails significant financial resources. The more realistic scenario (based on the water sector experience) is to provide these resources from international financial support (within the some project aimed to improve it, similar like in water sector) that from domestic financing sources (entities government budgets).

d) *Human/financial obstacles*, of course, represent one of the most serious problems of the any branch improvement in B&H in general.

It is not realistic expect significant step forward of the financing of the statistic sector and geological surveys in circumstances of the economic crisis. On the other side it means serious difficulties in providing of the appropriate stuff and in addition the absence of the further strengthening of the mineral resources statistic sector.

The lack of appropriate staff in statistical institutions of B&H is recognized and in detail analyzed in the Statistic Strategy. The key findings are:

- Insufficient number of employee
- Inappropriate staff
- Inappropriate qualifications of staff for tasks
- Staff changes
- Staff absences

and proposed measures for solving are inseparable by the financial improvement.

APPENDIX

Annex A – Detailed review of quality of fossil energy reserve statistics

Statistic	Availability	Source	Quality Assessment	Comment
Reserves of fossil energy - coal	No public available data on reserves, just about production	<ul style="list-style-type: none"> National level: the Agency for statistics of Bosnia and Herzegovina at the level of the state, Entity level: the Federal Office of Statistics for the Entity Federation of Bosnia Herzegovina and the Republic of Srpska Institute of Statistics for the Entity the Republic of Srpska. 	<ul style="list-style-type: none"> <i>Timeliness</i>: Monthly Statistical Reviews are available in download section on the web site just few days after reporting period is expire. E.g. in October 29th 2018 on official web page of the SI of FB&H monthly review for September was available. But this delay is not longer than 40 days (for monthly review) between reference period and release. Annual Statistic book is released on national and entity levels just at the beging of the year for previous one (already available for FB&H for 2018) <i>Frequencies</i>: monthly, annual <i>Time series</i>: from 2008 on national level, from 2006 on entity level <i>Accessibility</i>: coal production – HIGH; coal reserves – LOW <i>Interpretability</i>: YES <i>Transparency</i>: YES <i>Accuracy</i>: YES <i>Consistency</i>: LOW <i>Coherence with international frameworks</i>: LOW 	The coal production statistic is probably best covered mineral resources statistic in B&G because it crucial importance for the economy in bot, national and entity level

Annex B – Detailed review of quality of mineral reserve statistics

Statistic	Availability	Source	Quality Assessment	Comment
Reserves of mineral reserves – <i>lead and zinc</i>	No public available data on reserves, just about production	<ul style="list-style-type: none"> Republic of Srpska Institute of Statistics for the Entity the Republic of Srpska. 	<ul style="list-style-type: none"> <i>Timeliness:</i> Annual Statistic book, provide this kind of information, is released on entity level at the beging of the year for previous one <i>Frequences:</i> annual <i>Time series:</i> from 2009 <i>Accessibility:</i> lead and zinc production – HIGH; lead and zinc reserves – LOW <i>Interpretability:</i> YES <i>Transprency:</i> YES <i>Accuracy:</i> YES <i>Consistency:</i> LOW <i>Coherence with international frameworks:</i> LOW 	There are just data for the Republic of Srpska because in FB&H there is no extraction of lead-zinc ores

Statistic	Availability	Source	Quality Assessment	Comment
Reserves of mineral reserves – <i>iron</i>	No public available data on reserves, just about production	<ul style="list-style-type: none"> Republic of Srpska Institute of Statistics for the Entity the Republic of Srpska. 	<ul style="list-style-type: none"> <i>Timeliness:</i> Annual Statistic book, provide this kind of information, is released on entity level at the beging of the year for previous one <i>Frequences:</i> annual <i>Time series:</i> from 2009 <i>Accessibility:</i> iron production – HIGH; iron reserves – LOW <i>Interpretability:</i> YES <i>Transprency:</i> YES <i>Accuracy:</i> YES <i>Consistency:</i> LOW <i>Coherence with international frameworks:</i> LOW 	There are just data for the Republic of Srpska because in FB&H there is no extraction of iron ores

NATIONAL SYSTEM FOR PRODUCING OFFICIAL FOSSIL ENERGY AND MINERAL RESERVE STATISTICS
BOSNIA AND HERZEGOVINA

Statistic	Availability	Source	Quality Assessment	Comment
Reserves of mineral reserves – <i>bauxite</i>	No public available data on reserves, just about production	<ul style="list-style-type: none"> Republic of Srpska Institute of Statistics for the Entity the Republic of Srpska. 	<ul style="list-style-type: none"> <i>Timeliness:</i> Annual Statistic book, provide this kind of information, is released on entity level at the beging of the year for previous one <i>Frequences:</i> annual <i>Time series:</i> from 2009 <i>Accessibility:</i> bauxite production – HIGH; bauxite reserves – LOW <i>Interpretability:</i> YES <i>Transparency:</i> YES <i>Accuracy:</i> YES <i>Consistency:</i> LOW <i>Coherence with international frameworks:</i> LOW 	There are just data for the Republic of Srpska because in FB&H there is no extraction of bauxite ores

Statistic	Availability	Source	Quality Assessment	Comment
Reserves of mineral reserves – <i>salt</i>	No public available data on reserves, just about production	<ul style="list-style-type: none"> Institute for Statistic of FB&H for the Entity Federation B&H. 	<ul style="list-style-type: none"> <i>Timeliness:</i> Annual Statistic book, provide this kind of information, is released on entity level at the beging of the year for previous one <i>Frequences:</i> annual <i>Time series:</i> from 2006 <i>Accessibility:</i> bauxite production – HIGH; bauxite reserves – LOW <i>Interpretability:</i> YES <i>Transparency:</i> YES <i>Accuracy:</i> YES <i>Consistency:</i> LOW <i>Coherence with international frameworks:</i> LOW 	There are just data for the FB&H, because in the Republic of Srpska there is no extraction of salt

NATIONAL SYSTEM FOR PRODUCING OFFICIAL FOSSIL ENERGY AND MINERAL RESERVE STATISTICS
BOSNIA AND HERZEGOVINA

Statistic	Availability	Source	Quality Assessment	Comment
Reserves of mineral reserves – <i>cement marls</i>	No public available data on reserves, just about production	<ul style="list-style-type: none"> Institute for Statistic of FB&H for the Entity Federation B&H. 	<ul style="list-style-type: none"> <i>Timeliness</i>: Annual Statistic book, provide this kind of information, is released on entity level at the beging of the year for previous one <i>Frequences</i>: annual <i>Time series</i>: from 2006 <i>Accessibility</i>: bauxite production – HIGH; bauxite reserves – LOW <i>Interpretability</i>: YES <i>Transprency</i>: YES <i>Accuracy</i>: YES <i>Consistency</i>: LOW <i>Coherence with international frameworks</i>: LOW 	There are just data for the FB&H, because in the Republic of Srpska there is no extraction of cement marls

Statistic	Availability	Source	Quality Assessment	Comment
Reserves of mineral reserves – <i>gypsum</i>	No public available data on reserves, just about production	<ul style="list-style-type: none"> Institute for Statistic of FB&H for the Entity Federation B&H. 	<ul style="list-style-type: none"> <i>Timeliness</i>: Annual Statistic book, provide this kind of information, is released on entity level at the beging of the year for previous one <i>Frequences</i>: annual <i>Time series</i>: from 2006 <i>Accessibility</i>: bauxite production – HIGH; bauxite reserves – LOW <i>Interpretability</i>: YES <i>Transprency</i>: YES <i>Accuracy</i>: YES <i>Consistency</i>: LOW <i>Coherence with international frameworks</i>: LOW 	There are just data for the FB&H, because in the Republic of Srpska there is no extraction of gypsum