

Case study

“Integrated energy and water resources management in Serbia to using UNFC system“



RESOURCE MANAGEMENT WEEK 2021

ENABLING SUSTAINABILITY PRINCIPLES IN RESOURCE MANAGEMENT



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I. Energy resources - Coal of Tamnava – West field

Review of environmental and social-economic data (E-axis)



- ❑ **The categories A+B+C₁ of balance and exploitation reserves are codified with the class of commercial projects into E category of UNFC system, as E1,**
- ❑ **The categories of A+B+C₁ of out-balance reserves A+B+C₁, as E2**

National Classification	Category	UNFC definition	Reasoning for the classification
Balance A+B+C ₁	E1	Development and operation are confirmed to be environmentally-socially-economically viable.	<ol style="list-style-type: none"> 1. Environmental and socio-economic data (E-axis) are in accordance with the legislation, considered at several levels of projects 2. On the basis of positive assessments, the necessary approvals and consents were obtained 3. They have been proven by successful exploitation over decades
Out-balance A+B+C ₁	E2	Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future	<ol style="list-style-type: none"> 1. At this moment, due to the spatial distribution of reserve categories, the existing technique and technology cannot be excavated profitably 2. Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future

The information on project feasibility and maturity (F-axis)



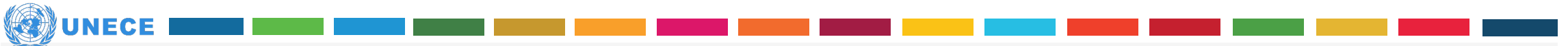
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- ❑ **The categories A+B+C₁ of balance and exploitation reserves are positioned in the F-axis of UNFC, as F₁.**
- ❑ **The quantity of outbalance reserves is not profitable for mining, without additional data, and is therefore classified into sub-category F₂,**

National Classification	Category	UNFC definition	The reasoning for the classification
Balance A+B+C ₁	F1	Technical feasibility of a development project has been confirmed	<ol style="list-style-type: none"> 1. Exploitation is performed, in accordance with the legal approvals of the competent authority, and on the basis of approved mining projects and feasibility studies, which are sufficient details 2. They have been proven by successful exploitation over decades
Outbalance A+B+C ₁	F2	Technical feasibility of a development projects is subject to further evaluation	<ol style="list-style-type: none"> 1. At this moment, due to the spatial distribution of reserve categories, the existing technique and technology cannot be excavated profitably 2. Technical feasibility of a development projects is subject to further evaluation

Review of (geological) knowledge, reliability and confidence (G-axis)



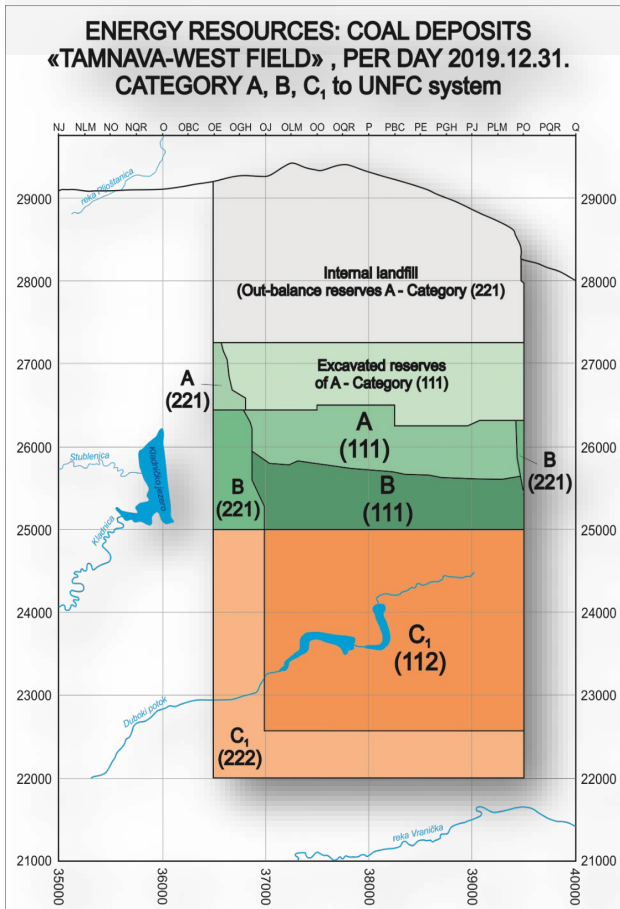
- The categories A and B of balance/exploitation reserves are recognized in G-axis, as category G₁,
- The category C₁ as G₂

National Classification	Category	UNFC definition	The reasoning for the classification
Balance A+B	G1	Product quantity associated with a project that can be estimated with high level of confidence	<ol style="list-style-type: none"> 1. Product quantity of A+B category balance/exploitation reserves associated with a project that can be estimated with high level of confidence (85 per cent and 70 per cent by law regulation) 2. Exploitation is performed, in accordance with the legal approvals of the competent authority 3. They have been proven by successful exploitation over decades
Balance C ₁	G2	Product quantity associated with a project that can be estimated with a moderate level of confidence	<ol style="list-style-type: none"> 1. Product quantity of C₁ category of balance reserves associated with a project that can be estimated with moderate level of confidence (50 per cent by law regulation) 2. Exploitation is performed, in accordance with the legal approvals of the competent authority

The Coal of Tamnava-West field - to the UNFC system



Mining producing of coal of open-pit Tamnava -West field

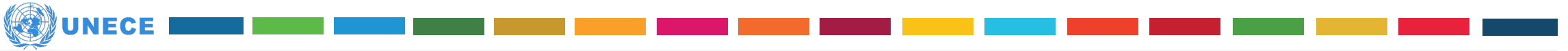


Total Products
Project of coal "Tamnava-West field"

Produced	Sold or used production			
	Production which is unused or consumed in operations			
	Class	E	F	G
The projects environmental and socio-economic viability and technical has been confirmed	Viable projects	1	1	1
	Potentially Viable Projects	2	2	1,2
The projects environmental and socio-economic viability and technical has yet to be confirmed	Non-Viable Projects	2	2	3
		3	2	1

II: Water resources – groundwater of Mt.Zlatibor area

Review of environmental and social-economic data (E-axis)



- ❑ **The groundwater from the spring Kraljeva voda (King waters) that is used for bottling, category A+B are in class E1.**
- ❑ **The groundwater Project fissure type IEBO 1719, A+B category are in class E.1.1.**

National Classification	Category	UNFC -definition	The reasoning for the classification
A+B cat. Groundwater Project-fissure type: Kraljeva voda (King waters)	E1	Development and operation are confirmed to be environmentally-socially-economically viable.	1. The data were confirmed by all obtained permits and decades of project work
A+B cat. Groundwater Project-fissure type: IEBO-1/19, Hemel-1 and IEBT-/11	E1.1	Development is environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions.	1. Development is environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions 2. At this moment, the projects do not have a water permit, but only consent as an intermediate phase

Assessment of information on feasibility and maturity of the project (F-axis)



- A+B category Groundwater Project-fracture aquifer: Kraljeva voda are in class F1**
- A+B category Groundwater Project-fracture aquifer: IEBO-1/19, Hemel-1 and IEBT-/11 are in class F.1.1**

National Classification	Category	UNFC-definition	The reasoning for the classification
A+B cat. Groundwater Project-fracture aquifer: Kraljeva voda	F1	Technical feasibility of a development project has been confirmed.	1. Feasibility has been confirmed in production
A+B cat. Groundwater Project-fracture aquifer: IEBO- 1/19, Hemel-1 and IEBT-/11	F1.1	Production is currently taking place	1. Feasibility is confirmed by current exploitation, but all types of permits have been not obtained

Overview of geological reliability and confidence in assessment (G-axis)



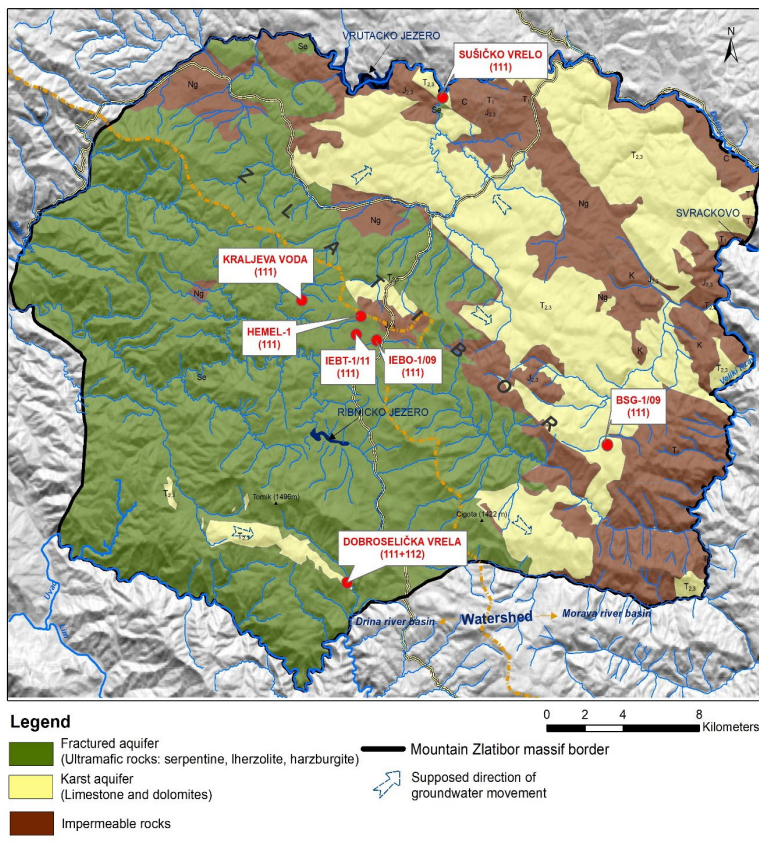
- A cat. Project karst aquifer: Sušičko vrelo and Dobroselička vrela are class G1**
- A cat. Project karst aquifer: Dobroselička vrela are in class G1**

National Classification	Category	UNFC -definition	The reasoning for the classification
A cat. Project karst aquifer: Sušičko vrelo and Dobroselička vrela	G1	Product quantity associated with a project that can be estimated with a high level of confidence.	1. Product quantity associated with a project that can be estimated with a high level of confidence (B-category)
A cat. Project karst aquifer: Dobroselička vrela	G1	Product quantity associated with a project that can be estimated with a moderate level of confidence	1. Product quantity associated with a project that can be estimated with a high level of confidence (C ₁ -category)

The Mt.Zlatibor area groundwater project - to the UNFC system



The producing of groundwater at Mt.Zlatibor area



Total Products
Project of groundwater of Mountain Zlatibor

Produced	Sold or used production			
	Production which is unused or consumed in operations			
	Class	E	F	G
The projects environmental and socio-economic viability and technical has been confirmed	Viable projects	1	1	1,2
	Potential ly Viable Projects	2		2,3
The projects environmental and socio-economic viability and technical has yet to be confirmed	Non-Viable Projects	2	2	3

some conclusions

- 1. For an understanding of Serbian categories of geological and balance reserves (mineral resources and reserves in Law) at the UNFC system has been done in the formal sense very little (there are only self-developed map conversion)**
- 2. The application of the UNFC system would provide a unique way of managing energy and water resources i.e. the fully support SDG, and strategies planning, industries, business, trade, international statistics, etc.**
- 3. The case study showed in an adequate professional and formal way the possible application of the UNFC system for energy and water resources in Serbia**
- 4. The pandemic COVID-19 has a higher impact on E-axis and a lesser impact on F-axis of the subject projects of the Case study**

☐ Case Study link:

➤ https://unece.org/fileadmin/DAM/energy/se/pdfs/UNFC/proj/integrated_water_RM/Cas_e_studies/UNFC_Case_Study_Serbia.pdf

Thank you!

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