POIANA RUSCĂ SHPP

for a greener future

→ project 2021 / 585702
→ project 2024 / 388078

March 25th, 2025

CONTENTS

KEY POINTS

HIDROELECTRICA

01.

HIDROELECTRICA
general overview

01. Hidroelectrica at a Glance

#1 Electricity Producer in Romania with 100% Renewable Energy Portfolio of Scale

#1 electricity generation player in Romania

~28.3%
of electricity generation in Romania(1)

~95%
of Romanian hydropower capacity

8.3 TWh
energy delivered to the grid

One of the Leading European renewable platforms with 100% green portfolio

6.3 GW
hydropower capacity

108 MW
onshore wind operating capacity

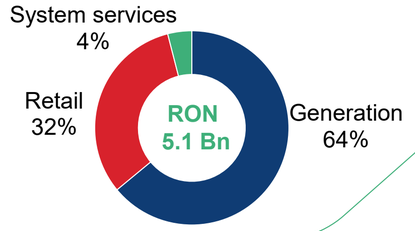
~0 kt
CO_2 footprint from generation

Established opportunity for further diversification and integration into energy vertical

Multiple opportunities to expand into other renewable technologies

~12%
share of energy retail market(2)

H1 2024 Revenue



Source: Company Analysis, Autoritatea Naţională de Reglementare în domeniul Energiei (Romanian Energy Regulatory Authority) annual reports

Notes:
1. Average market shares between 2018 and 2023, based on total energy delivered to the grid as per Company information
2. Based on market shares of competitive market suppliers as per ANRE 2024 June report

01. Generation portfolio

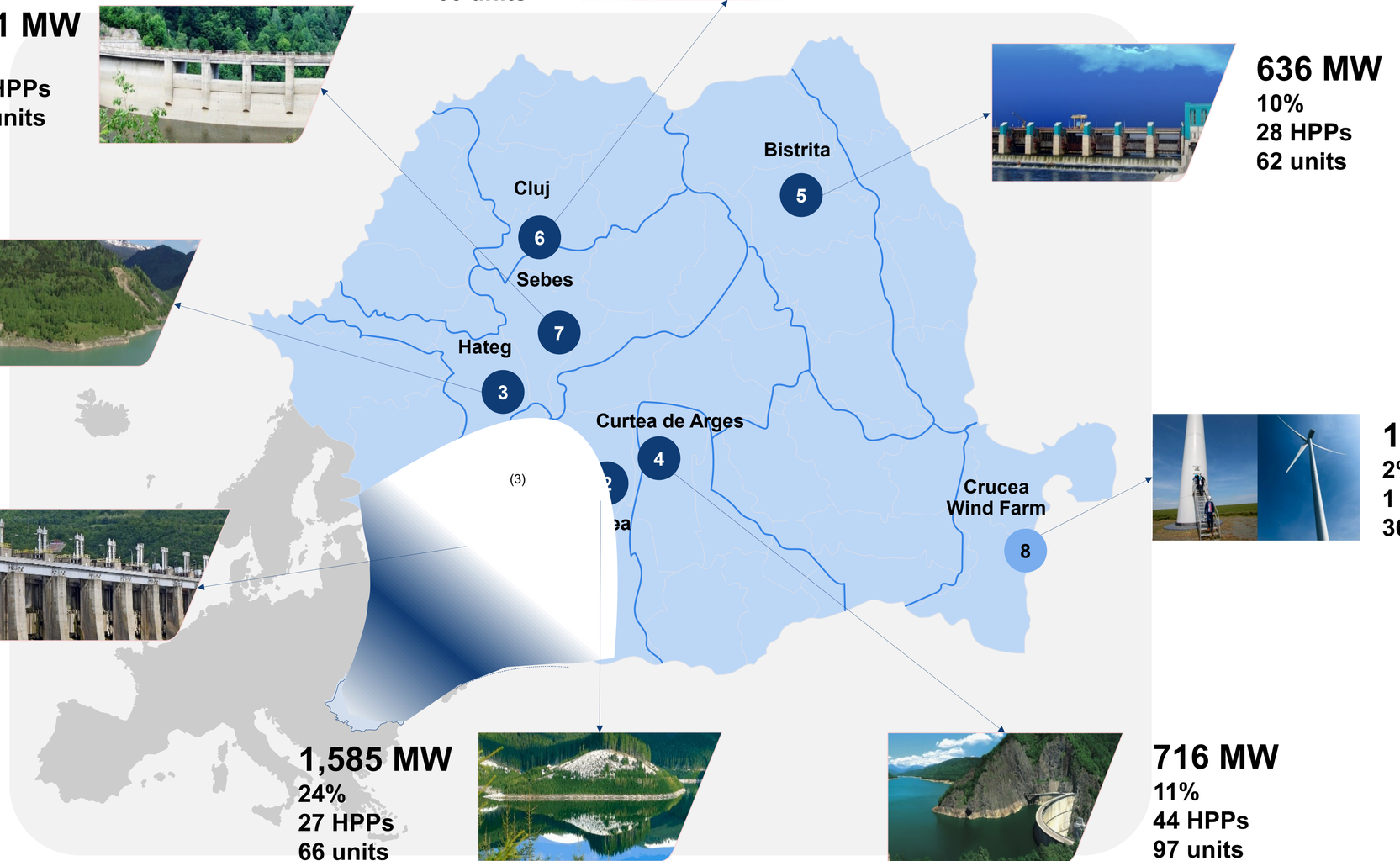
6.3 GW
Hydropower Capacity

0.1GW
Wind Capacity

8
Branches

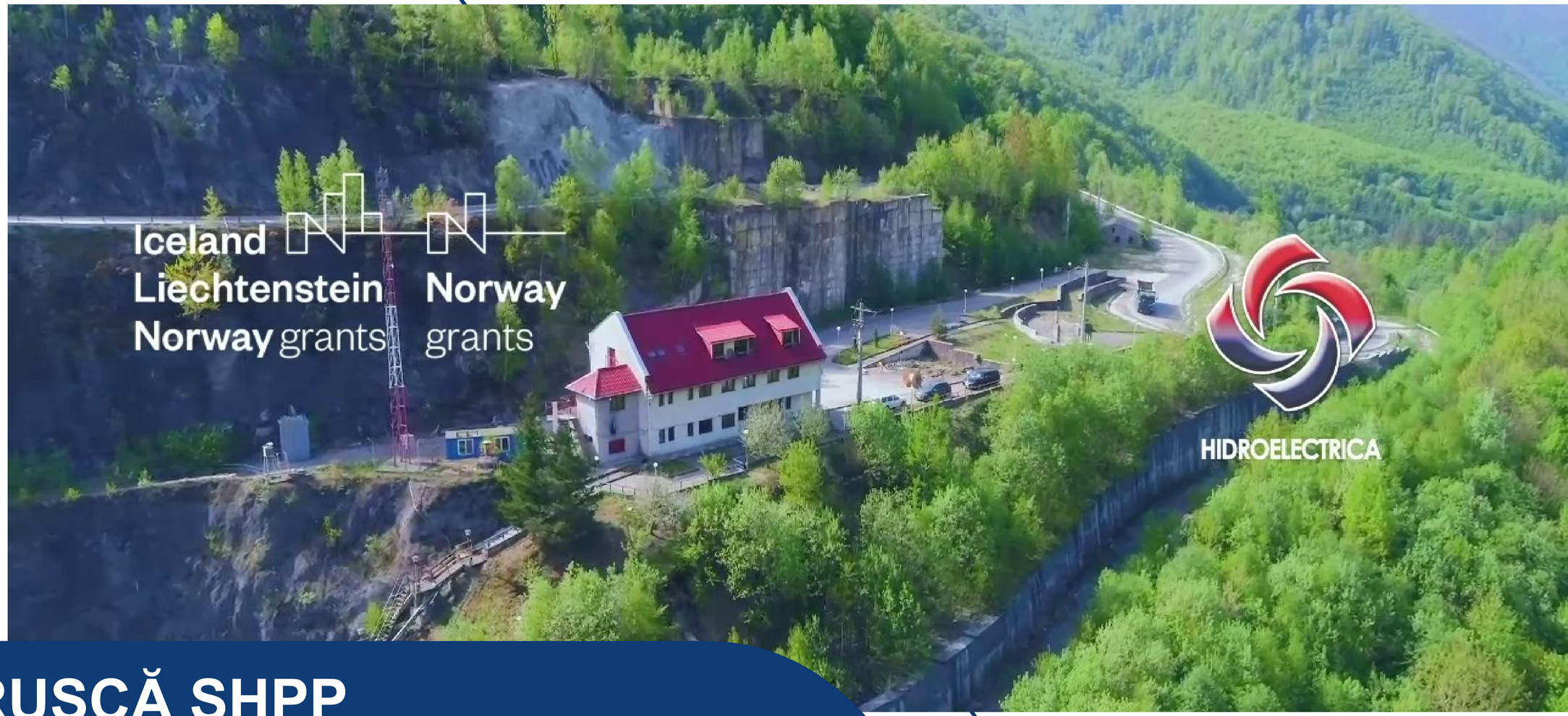
187
Power Plants

Provider of
Balancing Services
to the GRID



Notes:
1.Installed capacity as at August, 31st 2024, according electricity generation licence issued by ANRE

02.A



POIANA RUSCĂ SHPP
Scope and objectives

02.A Scope and objectives

Development of available hydropower potential of the reserve flow set to be continuously discharged downstream Poiana Ruscă dam, according water management permit, for generating clean renewable energy in a new grid connected capacity and contribute to the collective global mission to reduce CO2 emissions.

OBJECTIVES

- Build a new small hydro power plant using modern technologies, equipped with a fully automated Francis hydro unit, designed to operate 7/24/365, in the flow limits set out in the water management permit
- Increase the existing renewable generation capacity with 0.23 MW
- 1.45 GWh/year additional electricity generation from renewable resources

BENEFITS

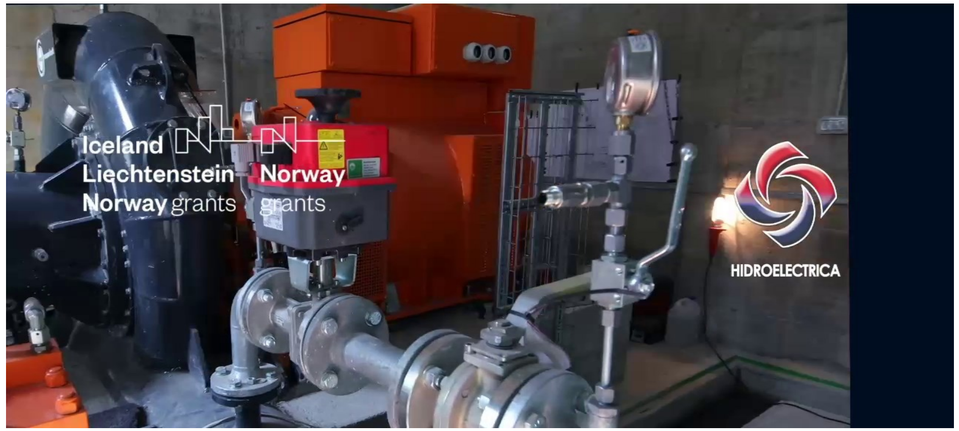
Population → **clean and cheap energy for approx. 1.000 houses**

Environment → **470 tones CO2/year reduction**

→ **permanent discharge of reserve flow**

Business → **additional revenues**

→ **compliance with EU CO2 reduction strategies**



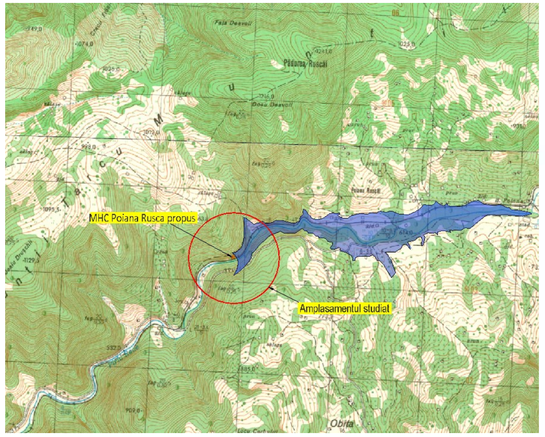
HIDROELECTRICA

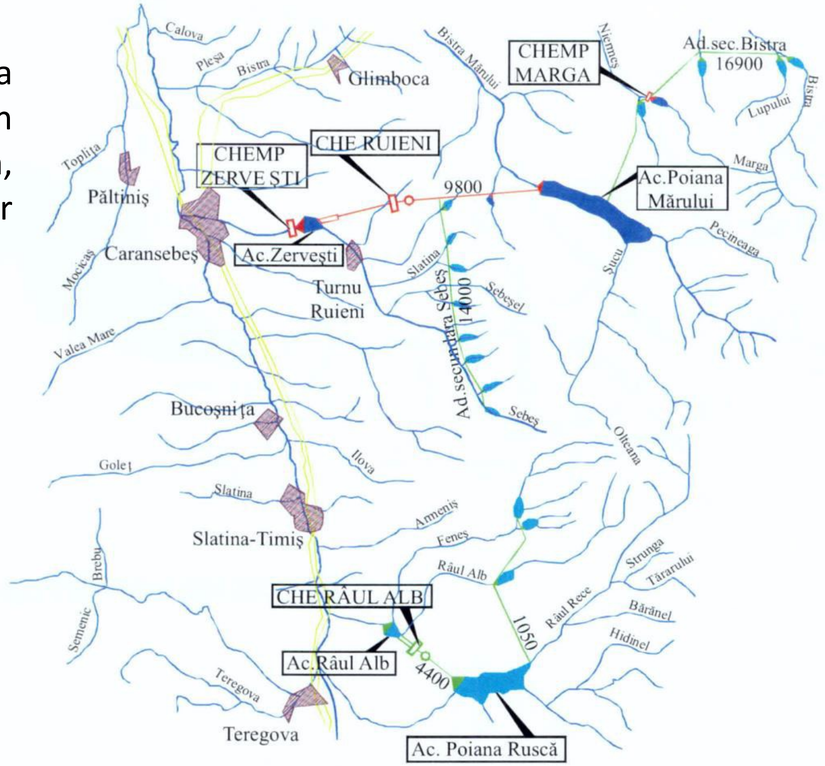
02.B

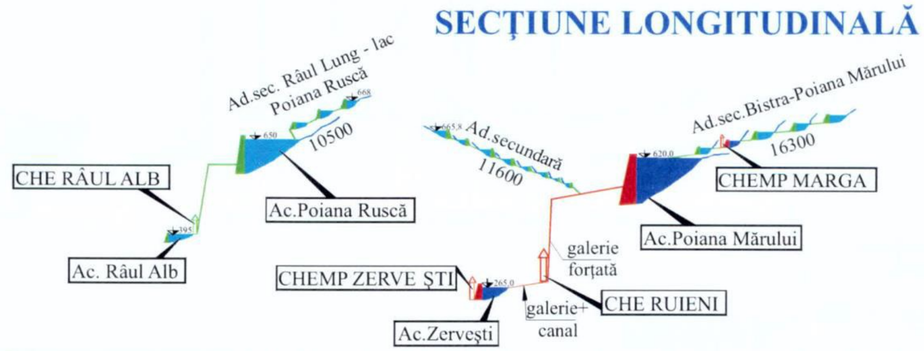
POIANA RUSCĂ SHPP
Technical elements

02.B Project location

SW Romania, outside the Teregova commune, Rusca village, Caras Severin county, within the Timis river basin, being located in the minor and major riverbed of the Raul Rece river







HYDROPOWER DEVELOPMENT

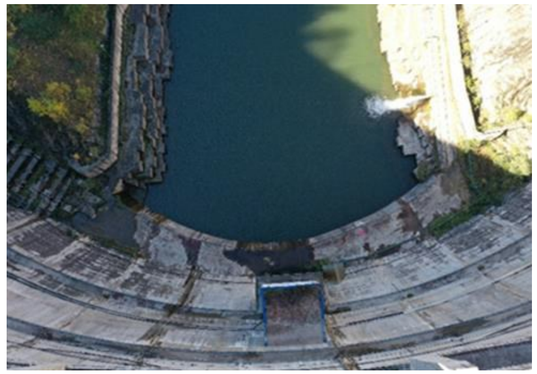
Bistra-Poiana Marului-Ruieni-Poiana Rusca HPD, investment objective approved by the Decree of the State Council no. 289/1981, located in the eastern part of Caraș Severin County, having in operation 2 lakes (Poiana Mărului and Poiana Ruscă), 2 HPPs (Râul Alb and Ruieni) and 2 SHPPs (Marga and Zervești), with a total installed capacity of 195.5 MW and a designed electricity production in an average hydrological year of 372 GWh.

02.B

Initial status

POIANA RUSCA DAM

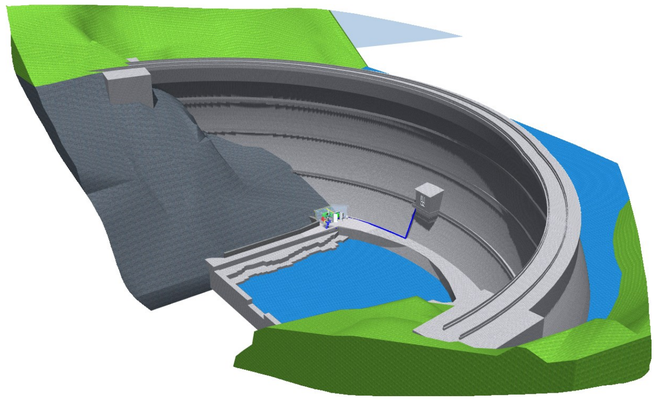
finally commissioned in November 2006, built of concrete and arch-shaped, with the normal top-water level of 631.50 mASL and the minimum operating level of 615.00 mASL. The lake has a useful volume of 12.67 million m3 and ensures the supply of Râul Alb HPP, having Pi = 40 MW and Ep = 66 GWh/ year. The operation of the Poiana Rusca dam is regulated by the Environmental, Water Management, Dam Safety bodies.

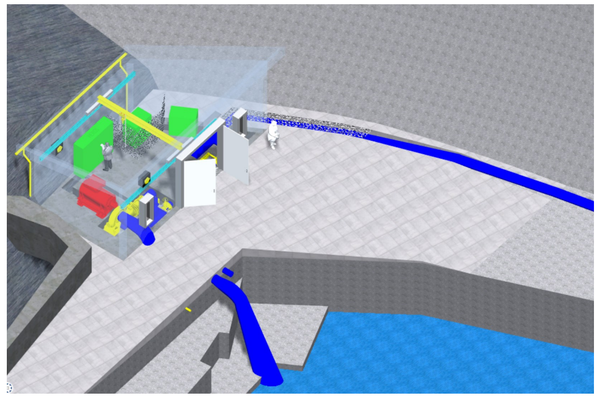


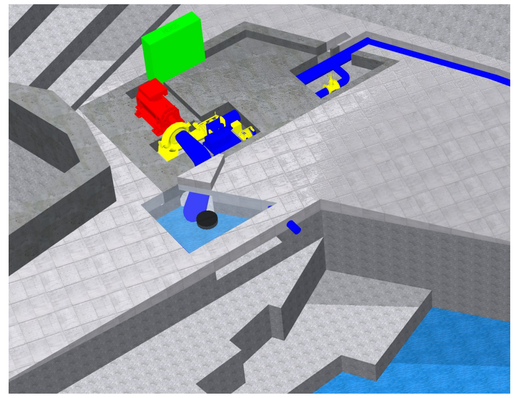
02.B Design elements

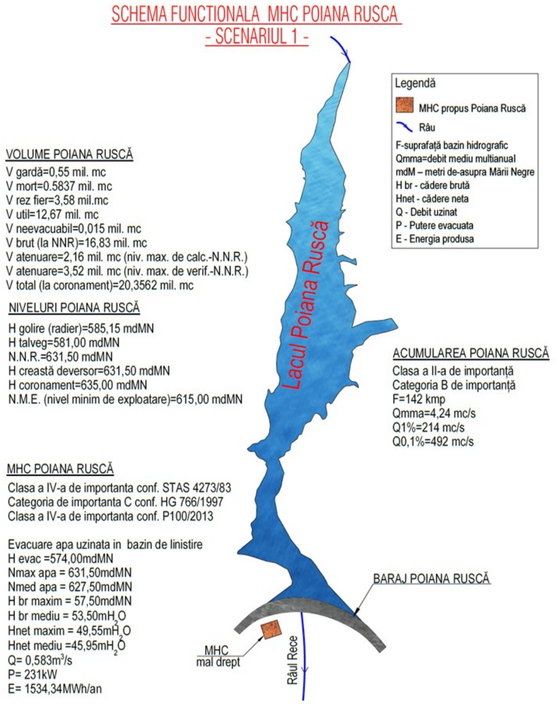
MAIN DESIGN PARAMETERS

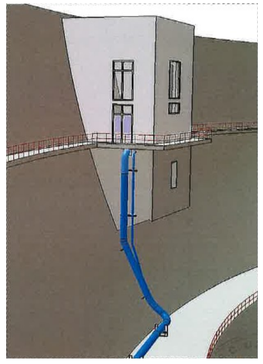
- upsteam level (NWL) = 631.5 mdM
- downstream level = 574 mdM
- Hb max = 57,5 m
- Hb max frequency = 53,5m
- Qi summer = 0,583m3/s
- Qi winter = 0,309 m3/s

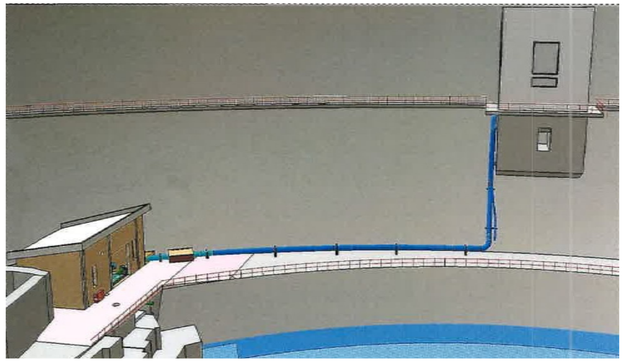


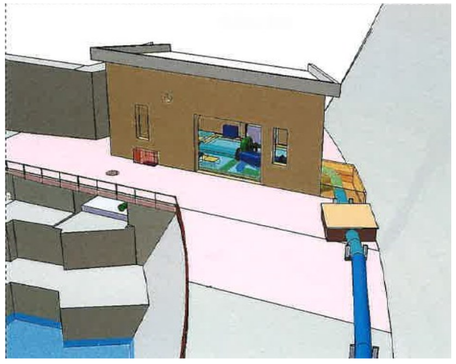


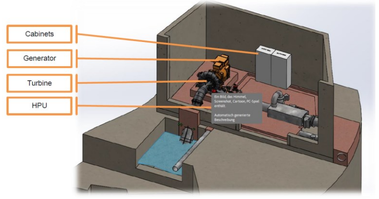




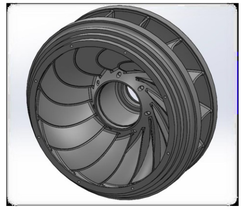


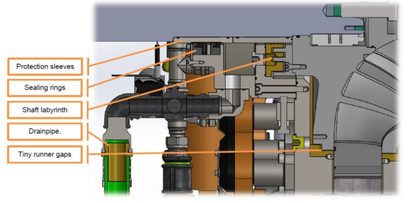




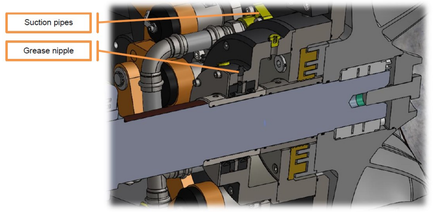


Picture 1: 3D view of Poiana-Rusca





Picture 6: 3D-Model shaft sealing - Poiana-Rusca



Picture 7: 3D-Model lubrication point - Poiana-Rusca

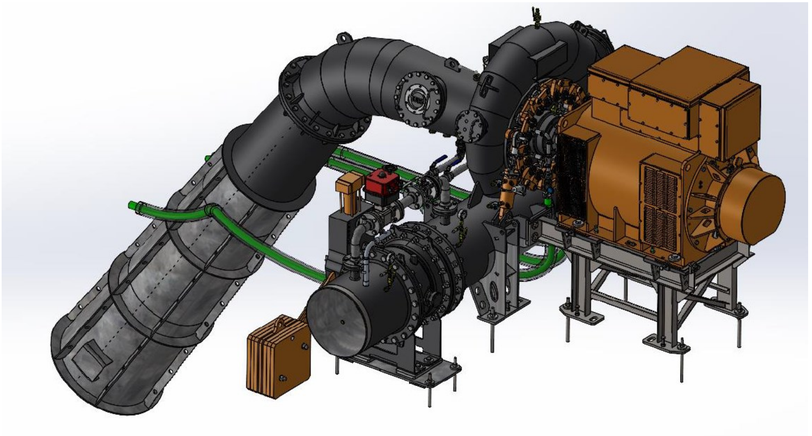
02.B SHPP components

Headrace pipeline (DN 500, L=68m)
DN 500 mm steel pipeline with a total length of 68 m, replacing the old one, starting from the dam bottom outlet valves house, including the replacement of the 2 existing valves and the installation of a fine thrash rack with a 7.5 mm clearance provided with trash rack clogging installation.

Bypass pipeline
DN 300mm steel pipe with a total length of 13 m, connected to the headrace pipeline before entering the turbine, equipped with 2 valves, a manually operated slide valve and a conical jet gate valve for flow regulating.

Plant building
Full concrete structure for protecting the equipment against landslides and avalanches, having an irregular shape with an area of 57.83 m^2 (length L1 = 11.40 m, L2 = 8.00 m, width l1 = 5.95 m, l2 = 6.90 m), located to have as minimum cuts and interventions as possible on the concrete structure of the dam.

Main equipment
- Horizontal shaft Francis turbine, WWS WASERKRAFT FSP-D-460-42 with Hn=53.1m, Qi=0.58m^3/s, n=1,000 rpm, D_{runner}=460 mm, Hs=2.2, P= 0.264 MW;
- High Pressure Unit, WWS WASSERKRAFT F2-32-S-RKS-010
- Synchronous three-phase generator AEM SH 400 SA6, brushless, self-excited, self-cooled with Pn=320kVA, Un=400V, f=50Hz, n=1,000 rpm;
- Automatic Voltage Regulator – ABB UNITROL 1005 Light;
- Main Inlet Valve, TIS, butterfly valve DN 500mm PN 10bar, with hydraulic operation;
- Electric control and automation boards;
- Hydro unit auxiliary system;
- Manually operated, LIFSOR LMR 336 3,2 tf single-beam overhead travelling crane;
- A radar level transducer for the continuous measurement of the water level in the stilling basin;
- Ultrasonic flow transducer to measure the reserve flow;
- Hydrostatic level transducer to measure the water level in the lake.



Picture 3: 3D-Model turbine - Poiana-Rusca

Electrical installations of the SHPP building :
- Indoor and outdoor electrical installations Internal services (lightning, power circuits);
- Grounding Rp< 1ohm;
- Grounding system OlZn40x4mm;
- Data network (internet)- connection in the bottom outlet gates house
- Video surveillance;
- Electrical panel internal services.

Grid connection
According Technical Connection Permit issued by Retelete Electrice Banat, using 300 m 0,4 kV cables up to the 20 kV line, replacing the existing dam connection point.

02.C

POIANA RUSCĂ SHPP
Economic aspects

02.C

Feasibility elements

General estimate 2022

6,7 mil. lei

Indicators with mixed financing (grant + own sources)

IRR 20,21%

B/C 2,91

Parameters

Pi = 0,2 MW

Ep = 1,5 GWh/an

Durată

24 luni

2020 – Feasibility Study 4C Project Consulting SRL

2022 – General estimate update by Engineering Department Hidroelectrica

Investment total value:

5,7 mil. lei out of wich:

1,1 mil lei civil works

3 mil lei equipment

1 mil lei installation works and services

0,6 mil lei engineering, taxes and project management

Grant EEA&Norway grants:

462.000 Euro grant, representing 60% of:

771.049 Euro total eligible costs

02.D

POIANA RUSCĂ SHPP
Implementation

02.D Main project – 585702/2021

26.01.2023 – turnkey contract signing

06.02.2023 – start of engineerig phase

26.04.2023 – grid connection contract signing

31.05.2023 – technical design approval

06.07.2023 – start the construction works

10.08.2023 – grid connection installation contract signing

29.09.2023 – completion of concrete cuttings works

07.12.2023 – completion of plant concrete works

13-14,19.12.2023 – FAT of the technological system and machinery

22.01.2024 – start the equipment installation works

27.03.2024 – completion of SHPP headrace

01.04.2024 – concreting of SHPP building floor and draft tube

11.04.2024 – completion of hydro unit installation

11.04.2024 – completion of the SHPP grid connection energy cable installation

15.04.2024 – concrete works for stilling basin passage platform

14.06.2024 – completion of connection works of the heardace steel pipe to the dam bottom outlet valves house

19.06.2024 – signing of construction works completion protocol - SHPP

19.06.2024 – signing of construction works completion protocol – grid connection installation

20.06.2024 – signing of equipment installing works completion protocol

25.06.2024 – signing of 72 hour trial test completion

26.06.2024 – signing of the commisioning protocol for Poiana Ruscă SHPP

26.06.2024 – Poiana Rusca SHPP inauguration visit and ribbon cutting ceremony

26.06.2024 – project closure event organization

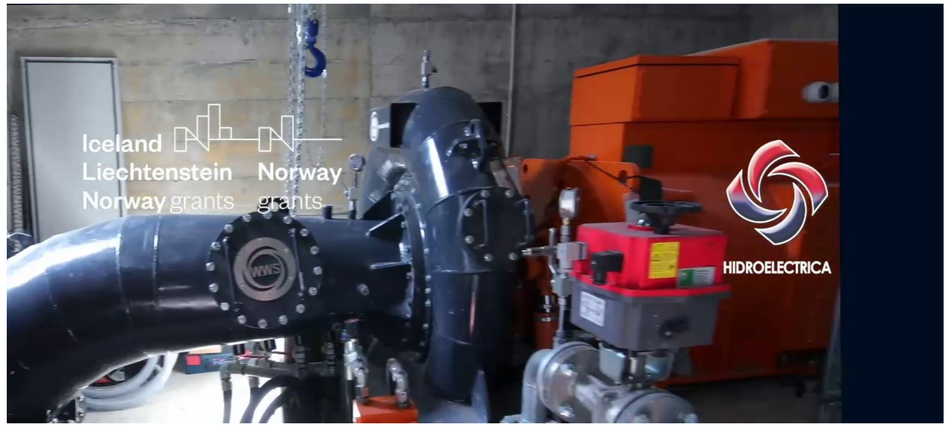
Contracts:

The construction of Poiana Rusca SHPP started in January 2023 with engineering services, followed by construction works, installations, equipment manufacturing, erection and commissioning, in this regard being signed 3 contracts for works, services and equipment supply:

- ❑ SHPP – Consortium UZINSIDER GENERAL CONTRACTOR si WWS WASSERKRAFT GmbH
- ❑ Grid connection instalation HE - COMRANADO SRL
- ❑ Grid connection tariff – E-Distributie Banat

Contractors:

- ❑ 4C PROJECT CONSULTING – feasibility study
- ❑ GENERAL DESIGN TECH – technical project
- ❑ UZINSIDER – general contractor
- ❑ WWS WASSERKRAFT – equipment
- ❑ COMRANADO - grid connection



Permits for contructions and operation:

Urbanism Certificate/ Construction permit – TEREGOVA CityHall

Environment – APM Caraș Severin

Water management – ANAR – ABA BANAT

Protected natural areas – ANANP

Grid connection – REȚELE ELECTRICE BANAT

Generation licence – ANRE

02.D Additional communication activities – 388078/2024

Contract:

All the additional communication activities related to Poiana Rusca SHPP project were contracted in a turnkey contract with a specialized company Draft Consulting SRL

Activities:

Media campaign

- Media campaign planning for setting up the objectives, content, targeted audience, media platforms, posts, monitoring process and rolling during 17-28.06.2024;
- Set of professional photos and videos of Poiana Rusca SHPP location and elements;
- Preparation of project presentation materials published online and used on social media platforms;
- TV spot – 30 seconds (concept, scenario, pre-production, filming, editing, graphics, visual effects) and distribution (media plan and monitoring) on local TV station (TVR Timișoara) – 50 appearances;
- Radio spot – 30 seconds (concept, scenario, voice selection, audio production) and distribution (media plan and monitoring) on local radion stations (Radio Reșița and Radio Timișoara) - 120 appearances (2 x 60);
- Posts on social media platforms: Facebook, LinkedIn and Instagram during TV and radio campaign.

Closure event

Organized in hybrid format near project location, in Caransebeș, for approximatively 40 persons (officials, citizens, business representatives and media representatives), being invited representatives from Hidroelectrica management and project team, designers, general contractor and subcontractors, PPC Retele Electrice Banat, local community, local and regional Authority, Water, Environment, ISU, local authorities, Innovation Norway and EEA, local and regional/national press.

The event was organized in two parts, first one a visit to Poiana Ruscă SHPP to inaugurate the new production capacity, commissioning Poiana Rusca SHPP in front of the audience and attend to ribbon-cutting ceremony and the second part a public event organized in Caransebeș and broadcasted online on social media (company Facebook page) for speeches, project presentations and dissemination of project objectives, benefits, results, achievements and impact

HIDROELECTRICA

03.A

EEA&NORWAY Grants
Financing calls

03.A Financing call key elements

EEA&NORWAY GRANTS

Financed by Island, Liechtenstein and Norway, with the following objectives:

- the reduce economic and social disparities in the European Economic Area (EEA)
- to strengthen relations between Iceland, Liechtenstein and Norway and the beneficiary states in Europe.

Instrument: **EEA Financial Mechanism 2014-2021**
Energy Programme Romania

Call 1.1 Increased capacity to deliver renewable energy - hydropower

7,2 mil EURO total budget

Expectations: increase the renewable electricity generation and CO2 emissions reduction
Results: increase installed hydropower capacity and the number of new and refurbished generation capacities

Restricted call – additional communication activities

0,11 mil EURO total budget

Expectations: Improving communication about already approved and continuing projects contributing for the achievement of the project goals among targeted audiences
Results: improve the communication and publicity activities for Poiana Rusca SHPP

HIDROELECTRICA

03.B

EEA&Norway Grants
Grant Offer Letter

03.B

Financing schemes

585702 - 2021

462.000 EURO
Total value

771.049 euro
Total eligible costs

60%
Intensity

3
Disbursements

30.09.2021

Grant approval

22.10.2021

GOL signed by Hidroelectrica

01.11.2021

Project start

30.04.2022, 31.10.2022, 31.04.2023, 30.10.2023, 06.02.2024, 30.07.2024

Interim reports

30.01.2023, 18.04.2024

Project modification requests

31.10.2023, 31.01.2024, 30.07.2024

Disbursement requests

30.06.2024

Project end date

388078 - 2024

22.840 EURO
Total value

20.556 euro
Total eligible costs

90%
Intensity

1
Disbursement

21.03.2024

Grant approval

22.03.2024

GOL signed by Hidroelectrica

22.03.2024

Project start

30.09.2024

Interim report

18.04.2024

Project modification requests

30.07.2024

Disbursement requests

30.06.2024

Project end date

03.B Outcomes and outputs

OUTPUT INDICATORS:

➢ Installed capacity for production of hydropower electricity (in MW):

Poiana Rusca SHPP installed capacity - 0.231 MW according to the generation license issued by ANRE

➢ Number of new or refurbished installations for production of hydropower electricity:

A new renewable energy generation capacity was created, with one complete hydro unit connected to the grid, delivering continuously renewable energy.

OUTCOME INDICATORS

➢ Estimated annual CO_2 emission reduction (in tonnes CO_2 eq./year):

470 tonnes CO2 will be reduced considering the electricity production of 1.534,34 MWh that can be reached during years with better hydrological conditions and water levels in the lake above 627.5 mdM, by adding clean renewable energy to the grid.

➢ Energy produced from hydropower sources (in MWh/year):

1,450 MWh/year - based on the power values generated during commissioning tests with a net head correspondent to the gross head with maximum frequency 53.4 m, for summer flow of 583 l/s and winter flow of 319l/s, 212 kW, respectively 119 kW, and considering the operating hours used in the Feasibility Study, the estimated annual energy production.
1,534.34 MWh/year - can be reached during years with better hydrological conditions, when water levels in Poiana Rusca lake are above the average level of 627,5 mdM.

OTHER INDICATORS:

➢ Number of staff trained in the project:

A number of 9 employees from Hidroelectrica – Caransebeș Subsidiary were trained by the General Contractor representatives During commissioning tests performed for Poiana Rusca SHPP, to operate and perform maintenance activities on the new generation capacity and all its equipment and installations.

➢ Estimated annual growth in turnover

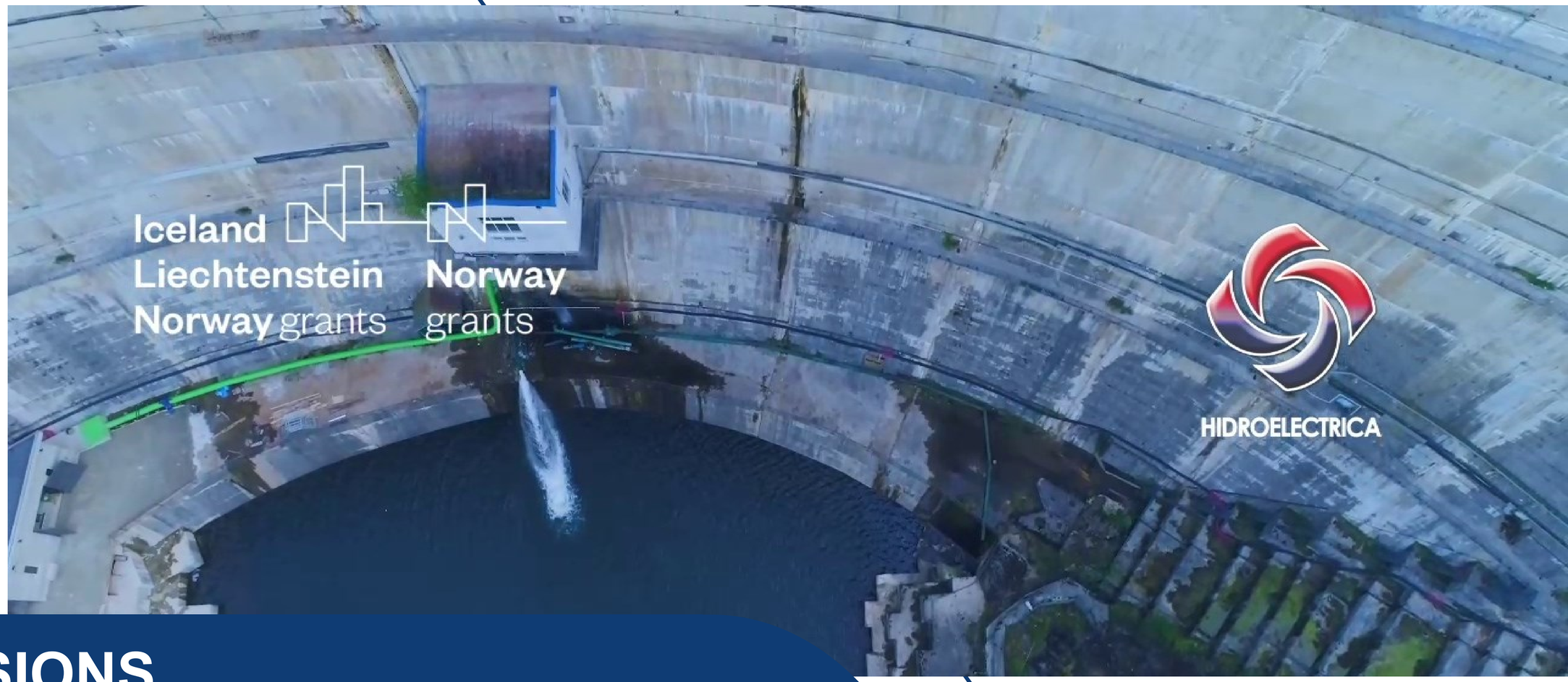
76,717.2 Euro - estimated based on the electricity production of 1,534 MWh/year and the electricity selling price of 50 Euro/MWh in 2019-2020 when the Feasibility Study was drafted.
Considering the electricity price evolution up to present values (DAM average price for 2023 – 103.74 Euro/MWh according OPCOM annual report), the estimated turnover will be more than double.

➢ Estimated annual growth in net operational profit

73,741.29 Euro - estimated based on the electricity production of 1,534 MWh/year and the electricity selling price of 50 Euro/MWh in 2019-2020 when the Feasibility Study was drafted.
Indicator accomplished, considering the increased revenues registered due to the actual doubled electricity price mentioned above.

HIDROELECTRICA

04



CONCLUSIONS

POIANA RUSCĂ SHPP

A sure small step towards a clean and sustainable future

Commissioning new RES capacity

A best practice example for multidisciplinary collaboration inside and outside the company

Results that can be replicated in locations with similar potential

Project scope reached

Existing hydropower potential developped

Project objectives accomplisihed

New generation capacity succesfully commissioned, with additional renewable capacity and clean electricity generation

Benefits on entire SHPP life cycle

Clean energy without CO2 emmissions, permanent downstream discharge of reserve flow, additional revenues, contribution to UE targets, policies and strategies implementation.

Maximum use of approved grant

Optimum allocation of approved funds

Thank you for your attention!

https://cdn.hidroelectrica.ro/cdn/mhc_poiana_rusca/TV_spot.mp4

www.eeagrants.org
Facebook, Twitter, LinkedIn, Instagram
YouTube: EEANorwayGrants
Mail: info-fmo@efta.int

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Mail: secretariat.general@hidroelectrica.ro