

Short Project Summary

Cebren & Galiste Hydropower Project Republic of Macedonia

A strategic investment opportunity at the heart of South-East Europe's integrated electricity market



Outline

➤ **Macedonian Power Sector**

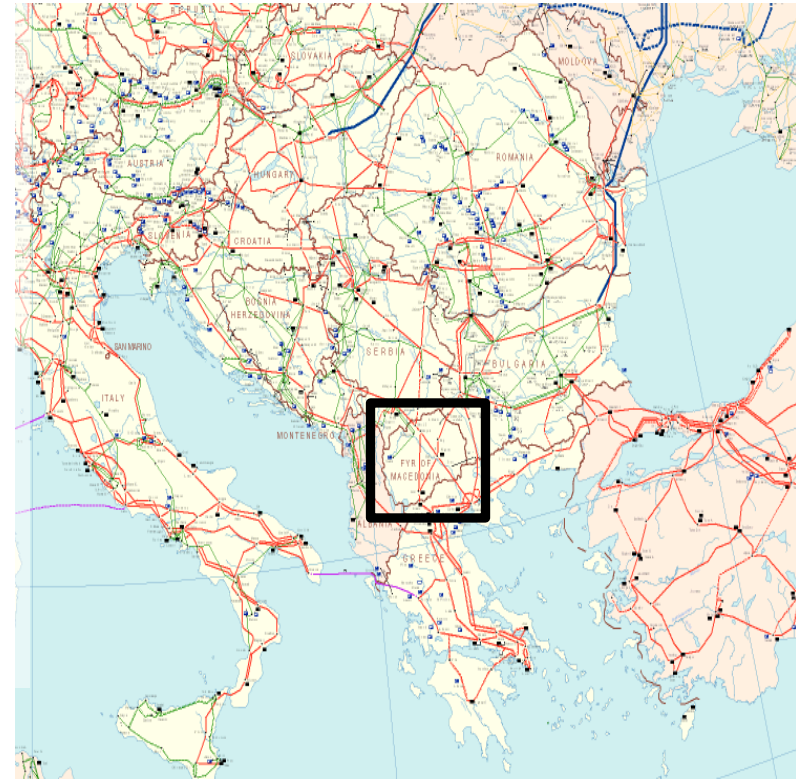
- Cebren and Galiste HPP project
- Macedonia - investor friendly destination

South East Europe's electricity hub

- Macedonia's grid is connected to
 - Greece, Kosovo, Serbia and Bulgaria
- Main trading pattern in the region is a flow of electricity from the north (Romania and Bulgaria) to the south.
 - Hungary, Romania and Bulgaria are important exporters
 - Serbia and Macedonia are main transit countries
- Diversified mix facilitates opportunities for trade.
 - Regional generation mix historically based on thermal and nuclear energy



Key transit route at the cross-road of electricity flows.



Fully liberalized and integrated market by 2015 (Energy Community of SEE)

Strategic objectives of the Government:

1. Sector Liberalization

- Internal market opening for all consumers except households since January 2008
- Internal market opening for all consumers including households after January 2015

2. Establishment of a liquid energy market

- Republic of Macedonia signed the Athens Memorandum-2002 to achieve Integrated Regional Electricity Market in South East Europe by 2005 and Energy Community Treaty-2005

3. Attracting Foreign and Private Investors

Unbundled sector, established private sector presence

- **State owned entities:**

- JSC ELEM - Power generation, State Owned.
- JSC MEPSO – Ownership of the transmission system, TS operator, electric power system operator and market operator, State Owned.
- JSC TPP Negotino – Energy generation (Heavy Oil), Independent electric power producer (“IPP”).

- **Private entities:**

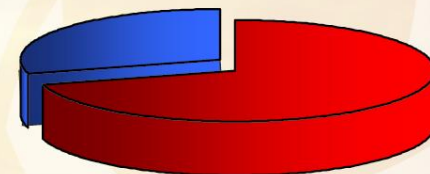
- JSC ESM – Energy distribution and distribution system operator, Privatized in April 2006. Majority owned by EVN (Austria).
- Gas fired Combined cycle cogeneration plant (IPP), Joint Venture of Toplifikacija and ITERA (to be operational end 2010/beginning of 2011)

Significant energy deficit

Domestic electricity demand	~9,000 GWh
Electricity generation:	
• Hydro	~1,500 GWh
• Thermal (lignite)	~5,000 GWh
• <u>Thermal (oil)</u>	~ 500 GWh
• Imports	~2,500 GWh

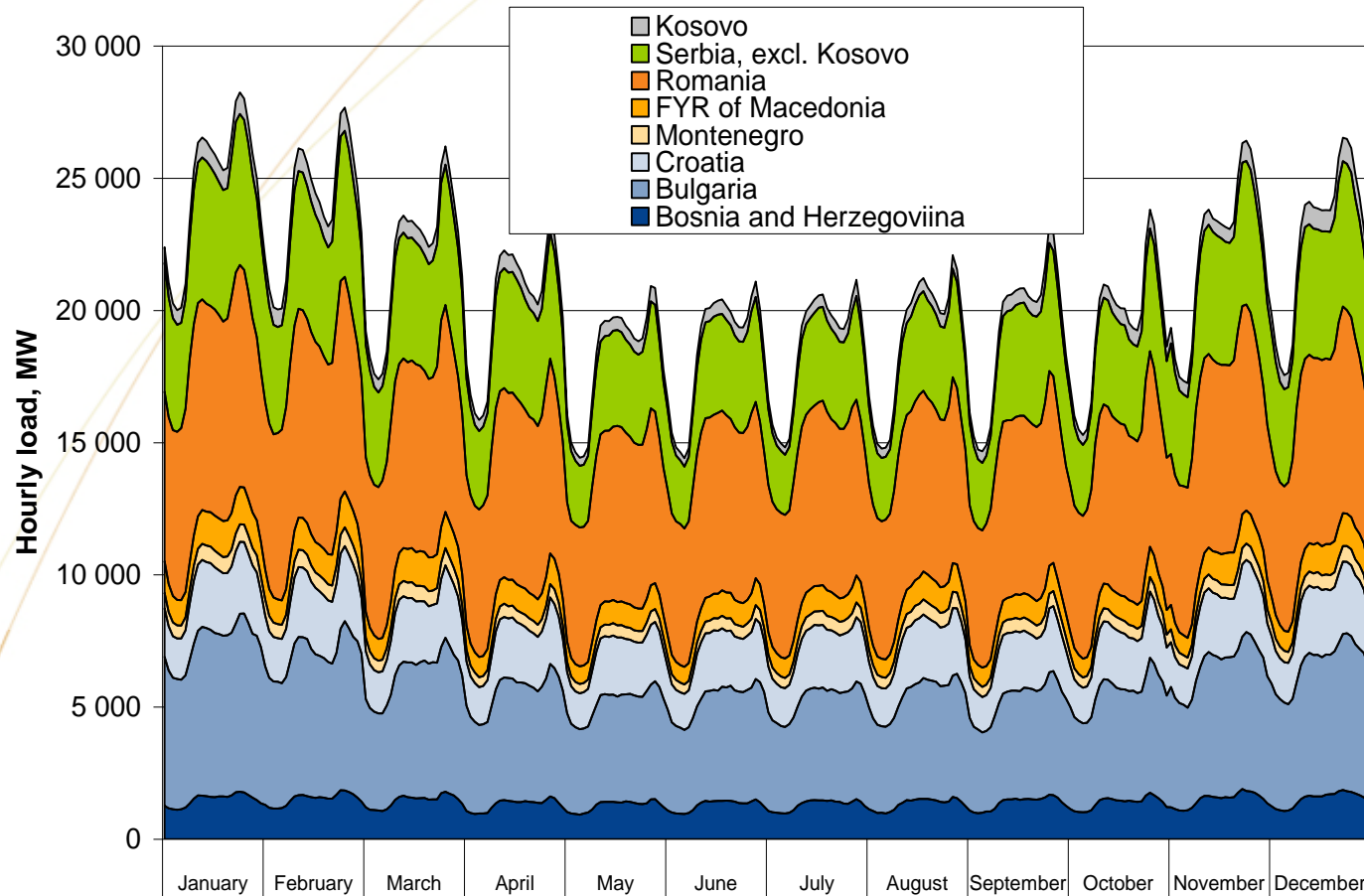


Plants	MW	%
TPP	800.0	60.2
HPP	528.4	39.8
Total	1328.4	



Highly variable seasonal demand in the region

- Rather large variation in regional load: the hourly load is highest during the cold months which depends on the need for heating.
- Peak demand adds approximately 5,000 – 10,000 MW to the base load in the Balkans.
→ This is the market to be targeted by the Cebren and Galiste HPP ←



Projected significant demand growth in the region

- Several of the countries in South East Europe have experienced rather fast growth in electricity demand the last couple of years. Among these are Albania, Croatia and Macedonia.
- Total demand growth in Albania, Bosnia Herzegovina, Croatia, Greece, Kosovo, Macedonia and Serbia is expected to grow by 2,3 % a year until 2030.

Base case

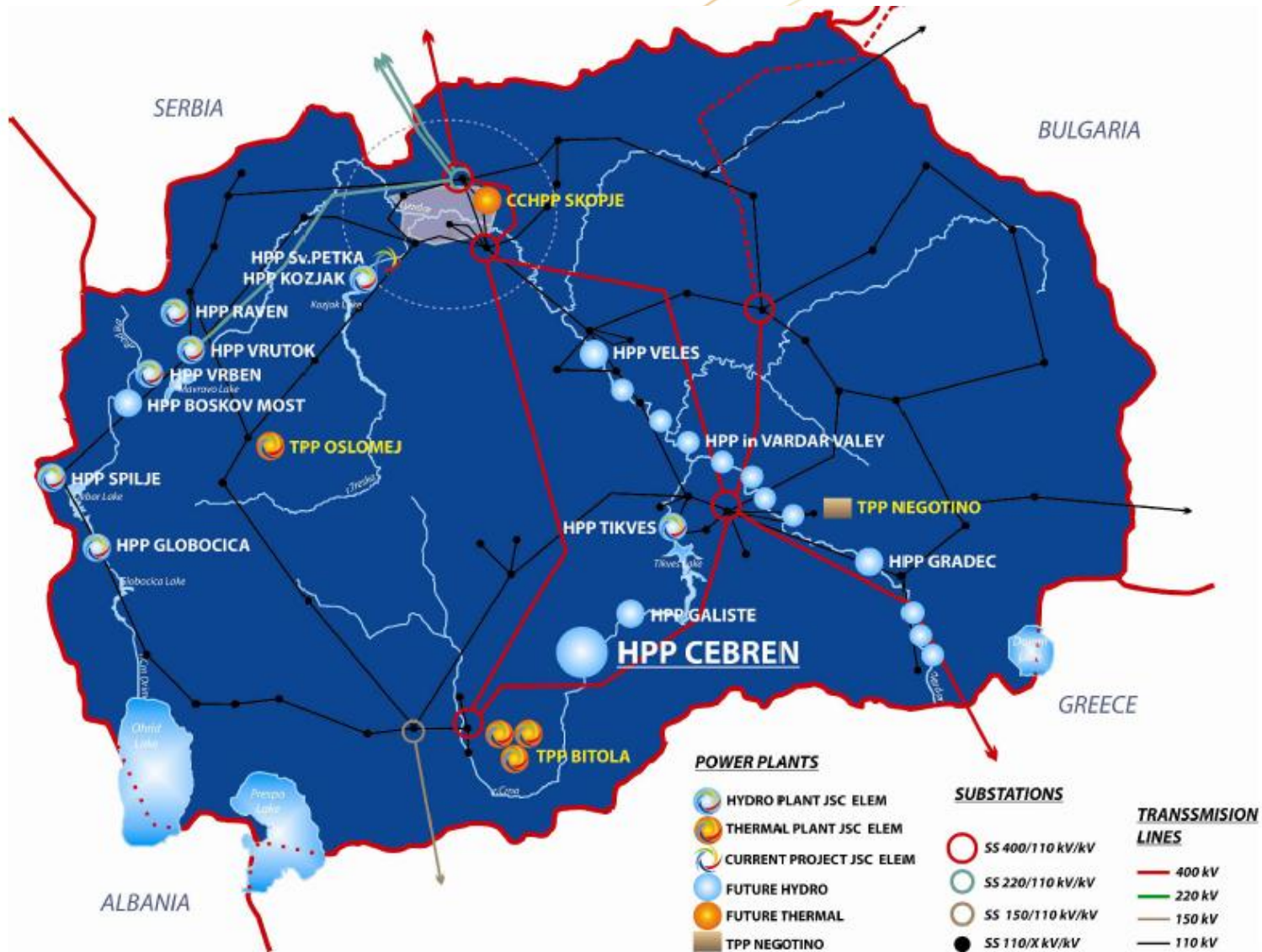
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Montenegro	5,5	5,6	5,7	5,8	5,9	6,0	6,2	6,3	6,4	6,5	6,7
Bosnia	13,2	13,5	13,8	14,0	14,3	14,6	14,9	15,1	15,4	15,7	16,0
Albania	9,5	9,8	10,2	10,6	11,1	11,5	12,0	12,4	12,9	13,5	14,0
Serbia	37,5	38,1	38,6	39,1	39,7	40,2	40,8	41,4	42,0	42,5	43,1
Croatia	22,1	22,7	23,2	23,8	24,4	25,0	25,6	26,3	26,9	27,6	28,3
Macedonia	10,4	10,7	10,9	11,2	11,5	11,8	12,1	12,4	12,7	13,0	13,3
Greece	65,6	67,3	69,0	70,7	72,4	74,1	75,8	77,6	79,4	81,2	83,1
Total	163,8	167,6	171,4	175,3	179,2	183,2	187,3	191,4	195,7	200,0	204,5

- Figures in GWh.
Source: Econ Pöyry , 2009.

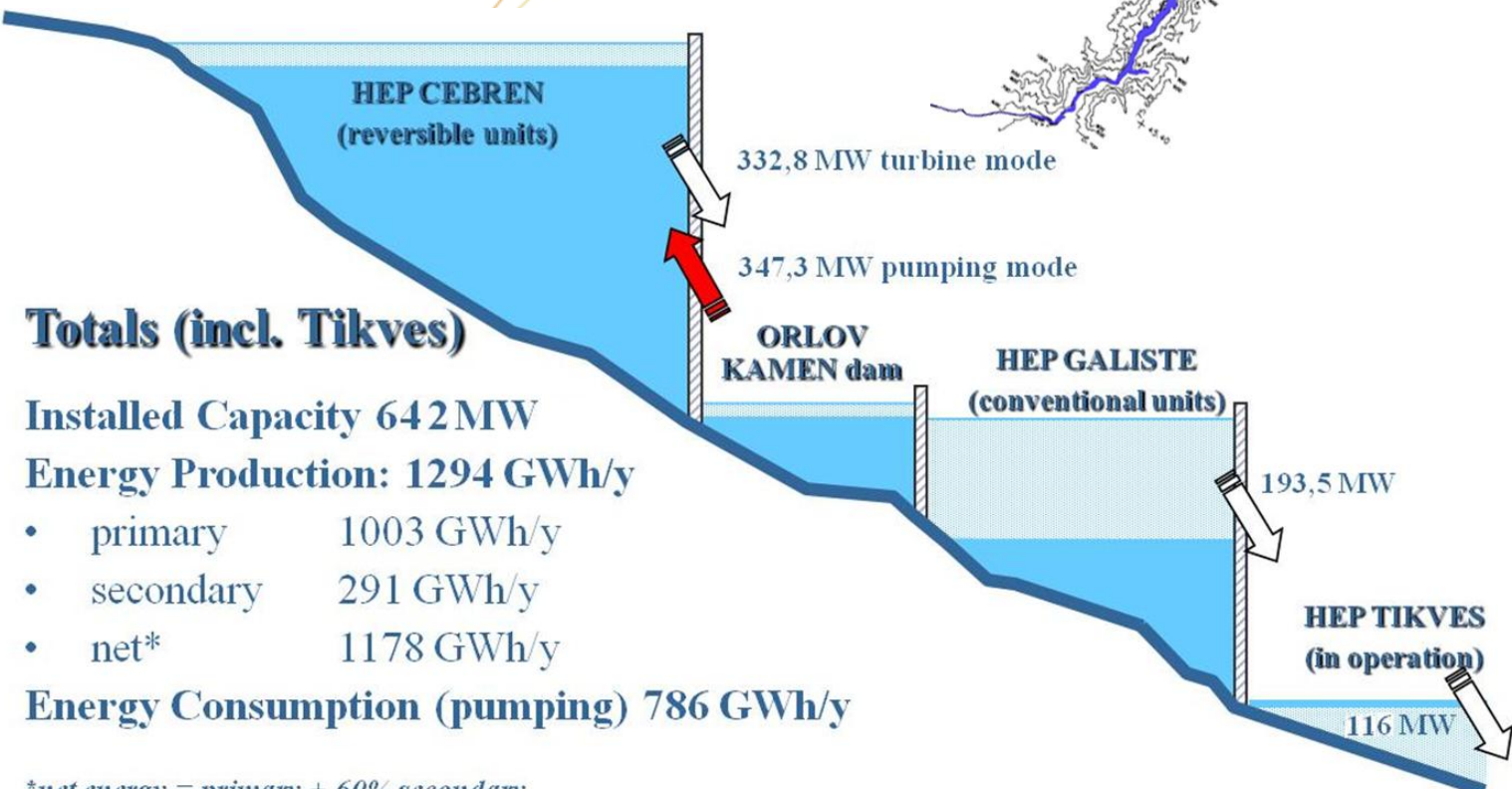
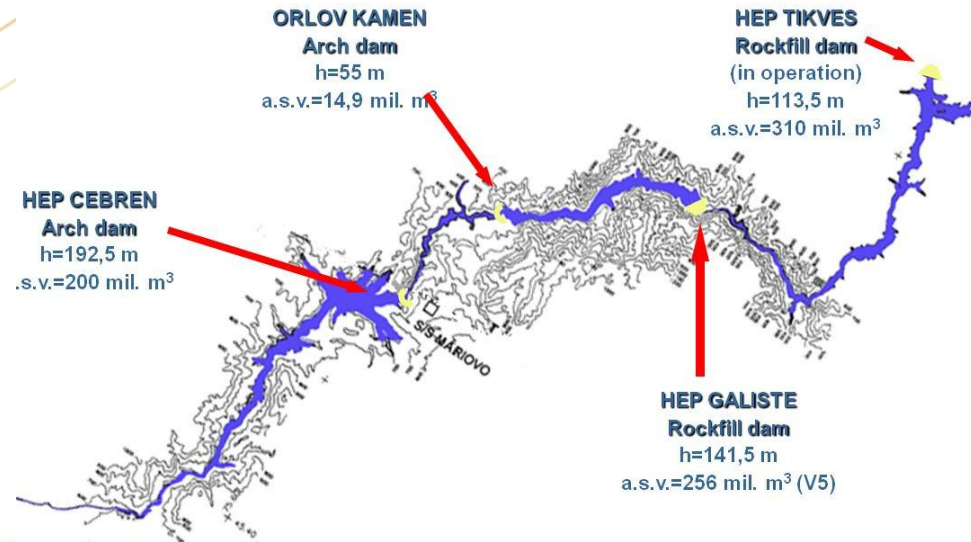
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- **Cebren and Galiste HPP project**
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Cebren & Galiste HPP



The 642 MW Cebren & Galiste HPP



Totals (incl. Tikves)

Installed Capacity 642 MW

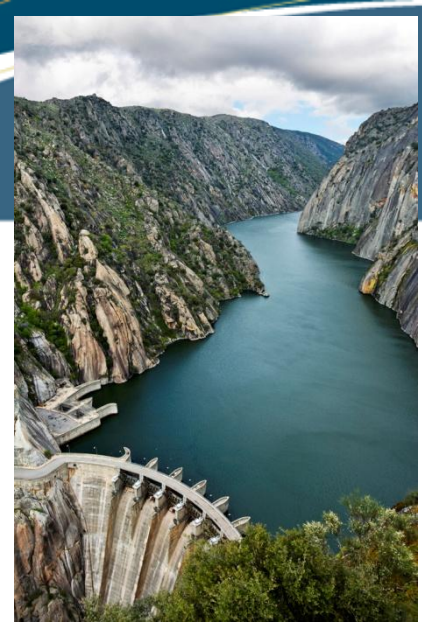
Energy Production: 1294 GWh/y

- primary 1003 GWh/y
- secondary 291 GWh/y
- net* 1178 GWh/y

Energy Consumption (pumping) 786 GWh/y

*net energy = primary + 60% secondary

Cebren & Galiste HPP project



- Two greenfield hydropower plants:
 - HPP Cebren (built first, to be completed within 8 years)
 - HPP Galiste (construction to start within 17 years)
- One existing hydropower plant:
 - HPP Tikves

- HPP Cebren **332,84MW (Pump / Storage)**
 - Can use and deliver energy quickly, storing the excess nocturnal energy generation, to meet diurnal peaking demand.
 - The HPP reversible units will use low cost energy (from the region) for pumping during night hours, this will improve the efficiency and prolong the life span of the TPP's

- HPP Galiste **193,50 MW**
 - Additional possibility to generate peaking energy.

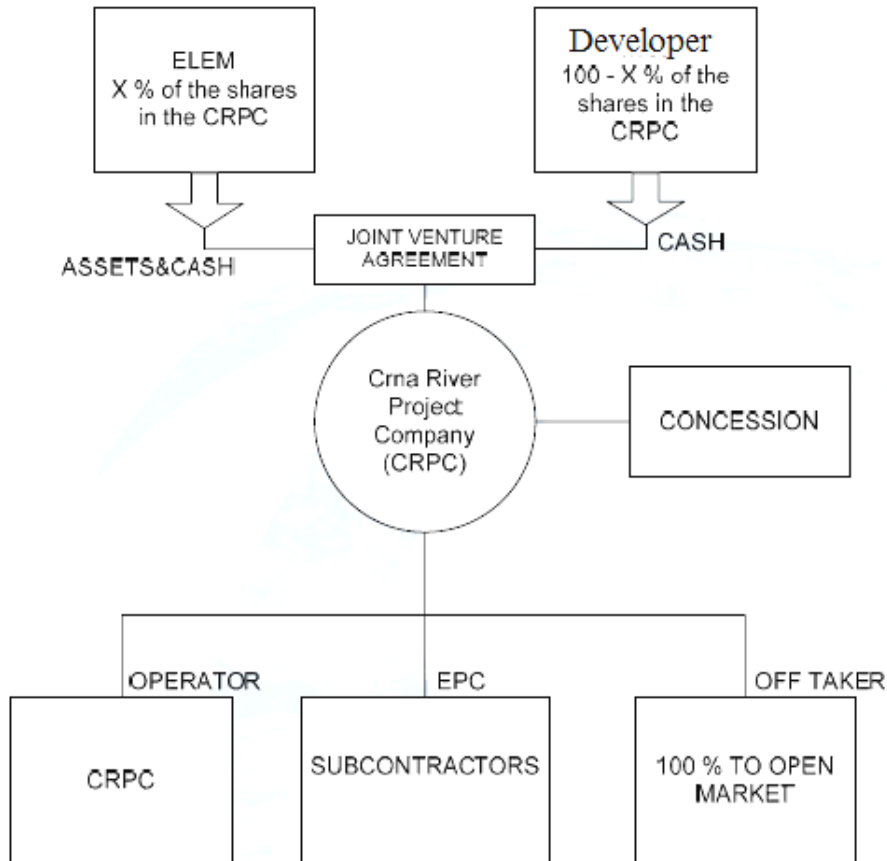
- HPP Tikves **116 MW (existing)**
 - Existing peaking plant, could provide additional flexibility and cash-flow support during the construction period of the two green-field hydropower plants.

Cebren & Galiste HPP project

- Feasibility Studies developed in 2004 under the EU funded Phare Program
 - Technical feasibility
 - Financial Feasibility
- Information available in the project dataroom to all Qualified Bidders.
- Estimated investment requirement: €420 mil. (Cebren HPP)
 - Galiste HPP can be financed using project finance/internal cash at a later stage

Project structured as a PPP

- Project to be developed through a mixed capital company between:
 - Private developer
 - ELEM (100% state owned and controlled energy generation company).



Public support through in kind contribution and risk mitigation

Government of Macedonia will contribute, through ELEM:

- HPP Tikves (existing peaking plant).
 - 116 MW
 - 140 GWh/year
- Land expropriation for the both sites and storages HPP Cebren and HPP Galiste.
- Construction of the access roads for HPP Cebren and HPP Galiste (including the required land expropriation).
- Environmental and Social Impact Assessment.
- Responsibility for obtaining licenses and permits.

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Macedonia: investor friendly

- **Open economy, with steady economic growth and low inflation rates.**
 - Ranked as the fourth 'best reformatory state' out of 178 countries ranked by the World Bank
 - Major improvements in the “Doing Business Report” and Wall Street Economic Freedom Index for the last three consecutive years
- **Government policies focused on attracting foreign investment:**
 - 10% tax rate on distributed profits
 - 0% tax rate on not distributed companies
- **Member of:**
 - World Trade Organization
 - United Nations
 - OSCE
 - Council of Europe
- **Potential candidate for membership in:**
 - European Union
 - NATO



Contacts

Nicola Saporiti

Investment Officer

IFC PPP Transaction Advisory

Tel: +1 202 250 4079

Email: nsaporiti@ifc.org

Martin Sobek

Investment Officer

IFC PPP Transaction Advisory

Tel: +43 676 945 9918

Email: msobek@ifc.org