

**ELEKTRANI NA
MAKEDONIJA**

**MACEDONIAN
POWER PLANTS**

ELEKTRO ENERGETSKI SEKTOR VO MAKEDONIJA



EAEM

ENERGETSKI SEKTOR RAZVOJNA STRATEGIJA

Celi na razvojnata strategija :

- Liberalizacija na sektorot
- Osnovawe na energetski pazar
- Privlekuvawe na stranski i privatni investitori

Republika Makedonija e potpisnik na Atinskiot Memorandum-2002 za vospostavuvawe na Integriran Regionalen Pazar na Energija vo Jugo Isto~na Evropa do 2005

- Dr`avna Agencija za Energija
- Regulatorno telo
- Prenosen Sistem Operator
- Distributiven Sistem Operator



ELEM

ENERGETSKI SEKTOR

Restrukturiranje na ESM i podelba na četiri kompanii:

AD ELEM *Preduzeće za proizvodstvo na električnu energiju*

AD MEPSO *Preduzeće za prenos na električnu energiju, upravljanje sa visoko naponskom mrežom, upravljanje na EE sistem i operator na pazaru*

AD ESM *Preduzeće za distribuciju na električnu energiju do krajnjih potrošača*

AD TEC *Negotno Preduzeće za proizvodstvo na električnu energiju*

AD ELEKTRANI NA MAKEDONIJA

ELEKTRANI NA MAKEDONIJA

Akcionersko Društvo vo dr`avna sopstvenost

- So ELEM rakovodi menaxerski tim – **Upraven Odbor** nazna~en od **Nadzoren Odbor**
- ^lenovite na Nadzorniот Odbor gi nazana~uva **Vladata na Republika Makedonija**
- **Upravniот Odbor e sostaven od 7 ~lenovi:**
 - Generalen direktor i pretsedatel na UO
 - Zamenik na Generalen direktor
 - Direktor za razvoj i investicii
 - Direktor za proizvodstvo
 - Direktor za komercija
 - Direktor za finansii
 - Direktor za pravni raboti

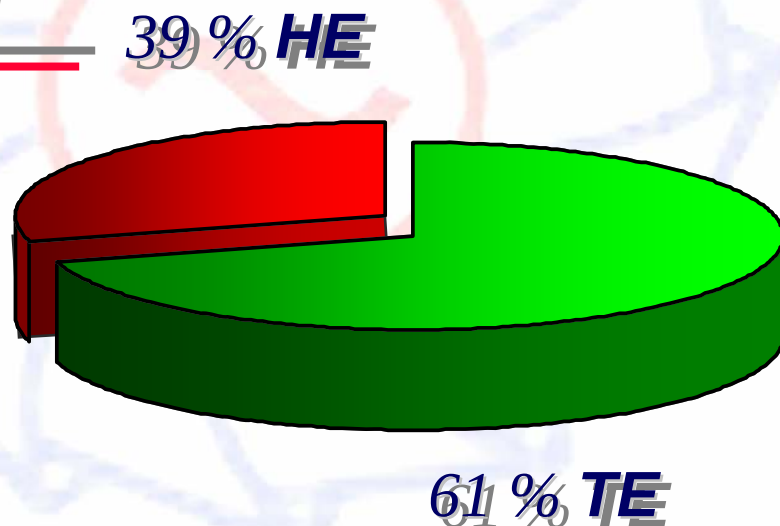
INSTALIRANI KAPACITETI

Elektrani MW %

TE 795 61

HE 504 39

Vkupno 1299

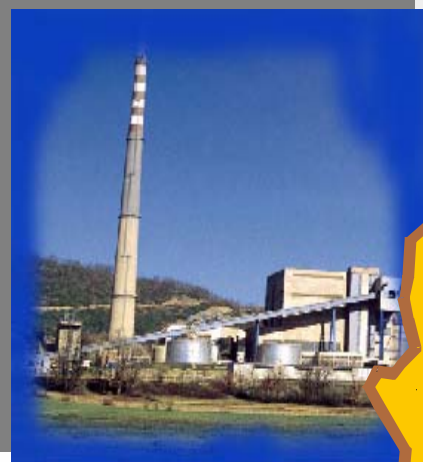


TERMO ELEKTRANI

МАКЕДОНИЈА

ТЕЦ ОСЛОМЕЈ

ТЕЦ БИТОЛА 1,2,3

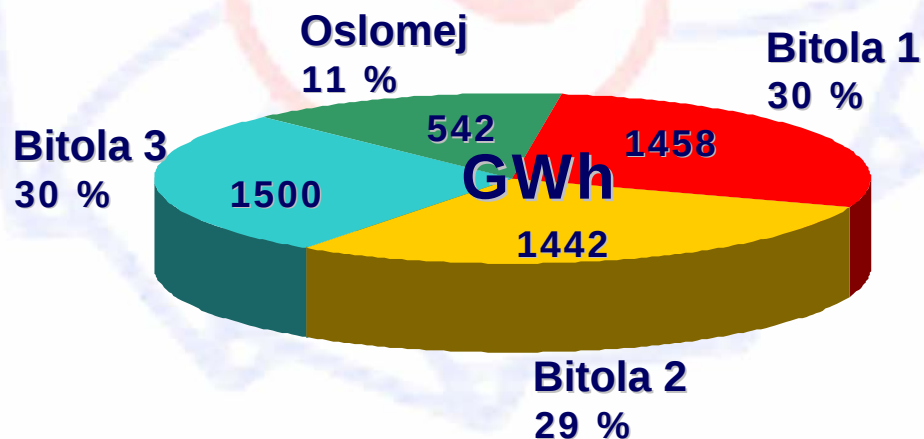


TERMO ELEKTRANI

- OSNOVNI PODATOCI -

- Bitola 1 225 MW
- Bitola 2 225 MW
- Bitola 3 225 MW
- Oslomej 120 MW

Vkupno 795 MW





ELEM

REK BITOLA

**Vo sestavot na Rudarsko Energetskiot
Kombinat rabotat 3 proizvodni edinici i
Površinskiot kop Suvodol**



TEHNI^KI PARAMETRI

• Instalirana snaga	675 MW
• Broj na agregati	3
• Proizvodstvo na el.en.	4.400 GWh
• Proizvodstvo na jaglen	6,5 mil t
• Traewe na remontu	45 dena



ELEM

REK OSLOMEJ

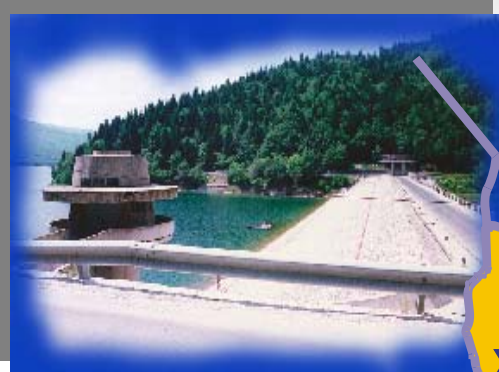
**Vo sestavot na Rudarsko Energetskiot
Kombinat raboti 1 proizvodna edinica i
Površinskiot kop Oslomej-Zapad**



TEHNI^KI PARAMETRI

• Instalirana snaga	125 MW
• Broj na agregati	1
• Proizvodstvo na el.en.	550 GWh
• Proizvodstvo na jaglen	700.000 t
• Traewe na remontu	30 dena

HIDRO ELEKTRANI

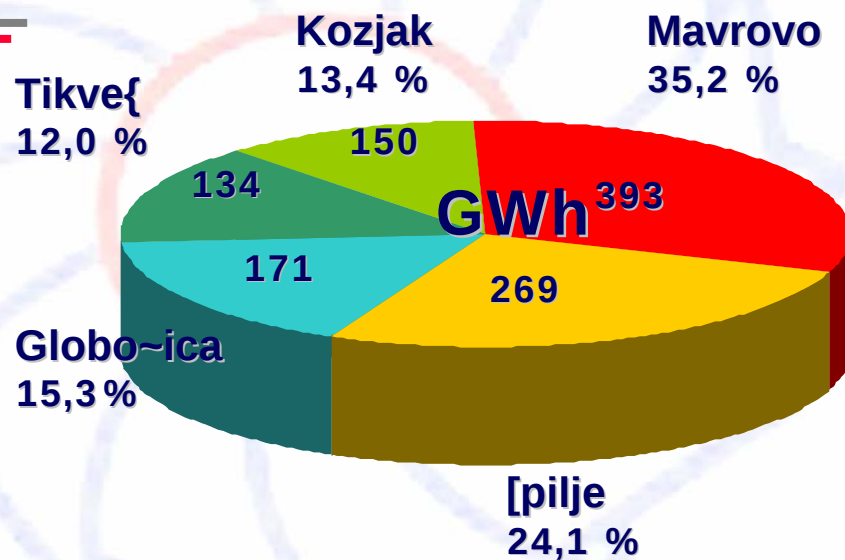


HIDRO ELEKTRANI

- OSNOVNI PODATOCI -

1 Mavrovo	182 MW
2 Globo~ica	42 MW
3 Tikve{	116 MW
4 [piqe	84 MW
5 Kozjak	80 MW

VKUPNO	504 MW
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HE MAVROVO

VO SISTEMOT RABOTAT 3
HIDROELEKTRANI:

- ❖ HE VRUTOK
- ❖ HE RAVEN
- ❖ HE VRBEN



TEHNI^KI PARAMETRI

- | | |
|---------------------|------------------------|
| • Prose~en dotok | 9.50 m ³ /s |
| • Proizvodstvo | 393 GWh |
| • Visina na branata | 61.90 m |
| • Instalirana snaga | 182 MW |



HE GLOBO^ICA

**HIDROELEKTRANATA E
DERIVACIONEN TIP SO
7.7 km TUNELSKI DOVOD**



TEHNI^KI PARAMETRI

- **Prose~en dotok** 28.0 m³/s
- **Proizvodstvo** 171 GWh
- **Visina na branata** 90.0 m
- **Instalirana snaga** 42 MW

HE TIKVE[

**HIDROELEKTRANATA E
DEL OD POVE]ENAMENSKI
SISTEM**



TEHNI^KI PARAMETRI

- | | |
|---------------------|------------------------|
| • Prose~en dotok | 27.0 m ³ /s |
| • Proizvodstvo | 134 GWh |
| • Visina na branata | 113,50 m |
| • Instalirana snaga | 116 MW |

HE [PILJE

HIDROELEKTRANATA E PRIBRANSKA



TEHNI^KI PARAMETRI

- Prose~en dotok 46.5 m³/s
- Proizvodstvo 269 GWh
- Visina na branata 112 m
- Instalirana snaga 84 MW

HE KOZJAK



TEHNI^KI PARAMETRI

- Prose~en dotok
- Visina na brana
- Instalirana snaga
- Prose~no proizvodstvo

22.7 m³/s

126.00 m

80.0 MW

150.00 GWh

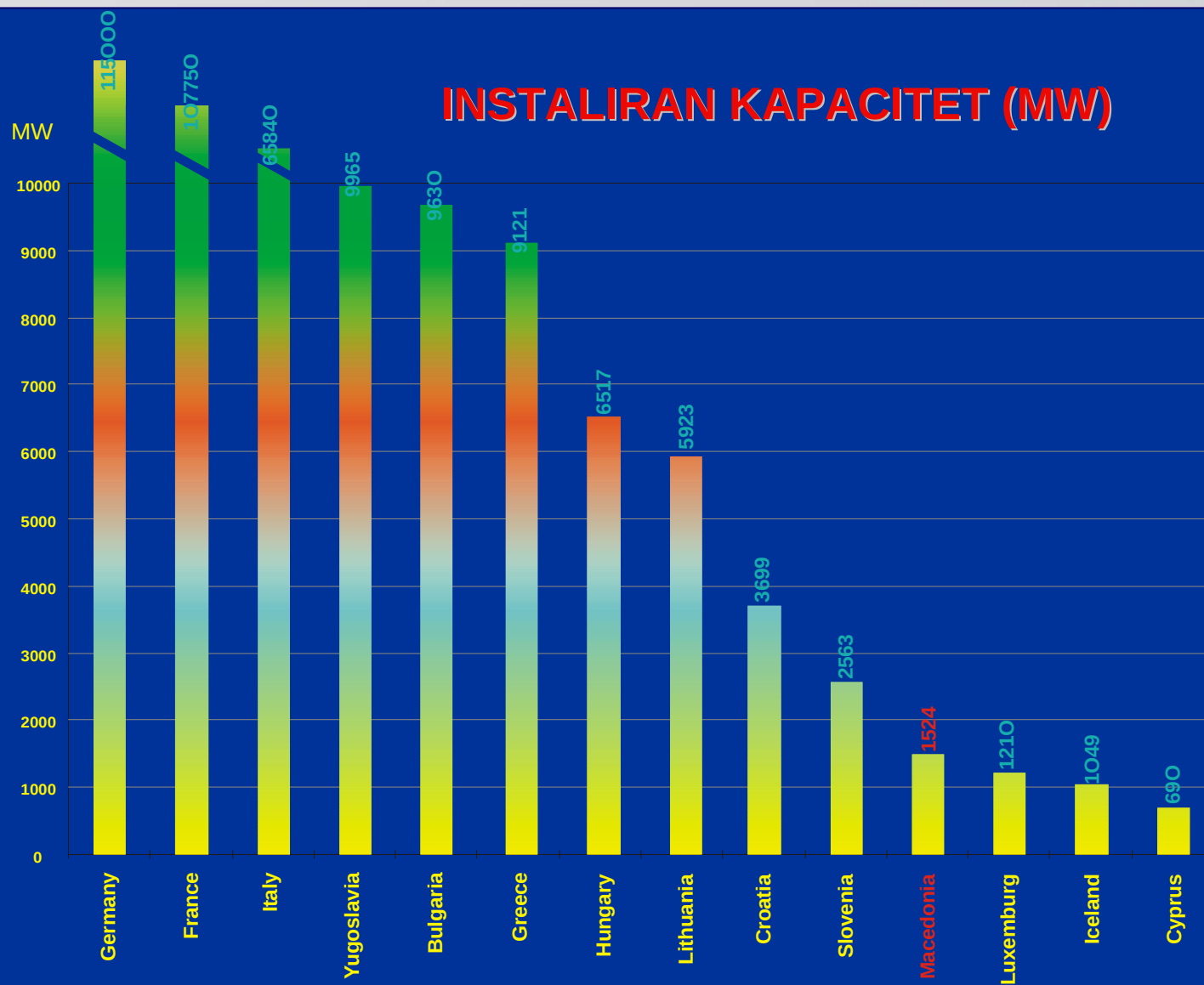


ELEM

PRENOSNA MRE@A



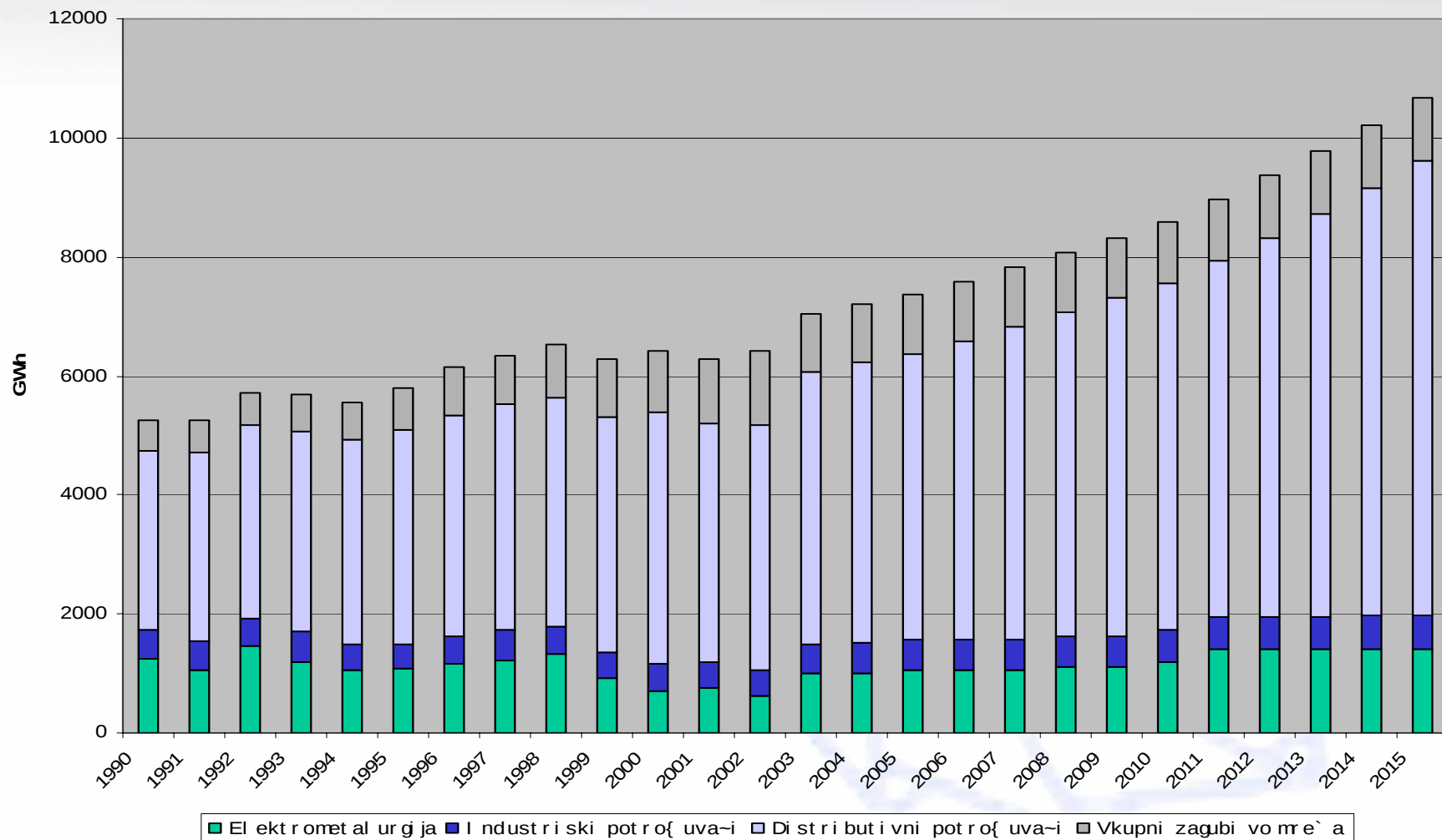
SPOREDBA





ELEM

REALIZACIJA I PROGNOZA NA POTROŠUVA^KATA



RAZVOJ

- **PROJEKTOVANJE NA RUDNICITE NA JAGLEN**
- **IZGRADBA NA NOVI HE**
- **REVITALIZACIJA NA ELEKTRANITE**
- **IZGRADBA NA NOVI GASNI ELEKTRANI**
- **OBNOVLIVI IZVORI NA ENERGIJA**

PROEKTI VO IZGRADBA

- **REVITALIZACIJA NA POSTOJNITE HE**
- **HE Sv. PETKA**
- **RUDNIK BROD-GNEOTINO**

REVITALIZACIJA NA GOLEMITE HE

CELI NA PROJEKTOT:

- Zgolemen kapacitet 40 MW
- Zgolemeno proizvodstvo 13,7 GWh
- Namaleni trošoci na proizvodstvo
- Namaleni ispadi



[EST NAJGOLEMI HE:

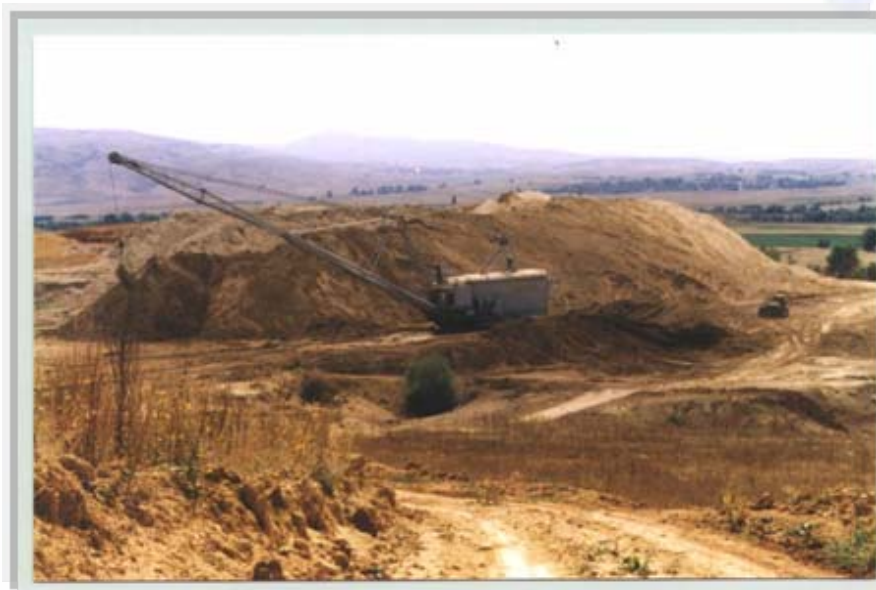
- HE Vrutok 150 MW
- HE Raven 19.2 MW
- HE Vrben 12.8 MW
- HE Globočica 42 MW
- HE [pilje 84 MW
- HE Tikveš 116 MW



RUDNIK BROD-GNEOTINO

CELI NA PROJEKTOT

- Prodol`uvawe na eksploatacioniot vek na rudnikot Suvodol
- Snabduvawe na TE Bitola so gorivo vo slednite 30 godini



TEHNI^KI PARAMETRI

- | | |
|--------------------------|-------------|
| • Geolo{ki rezervi | 108 mil t |
| • Eksploatacioni rezervi | 33 mil t |
| • Godi{no proizvodstvo | 2.5 mil t |
| • Kalori~na mo{ | 7.848 kJ/kg |

HE Sv PETKA

**Realizacija na 1-ta faza:
izgradba na pristapen pat
i evakuacioni organi**



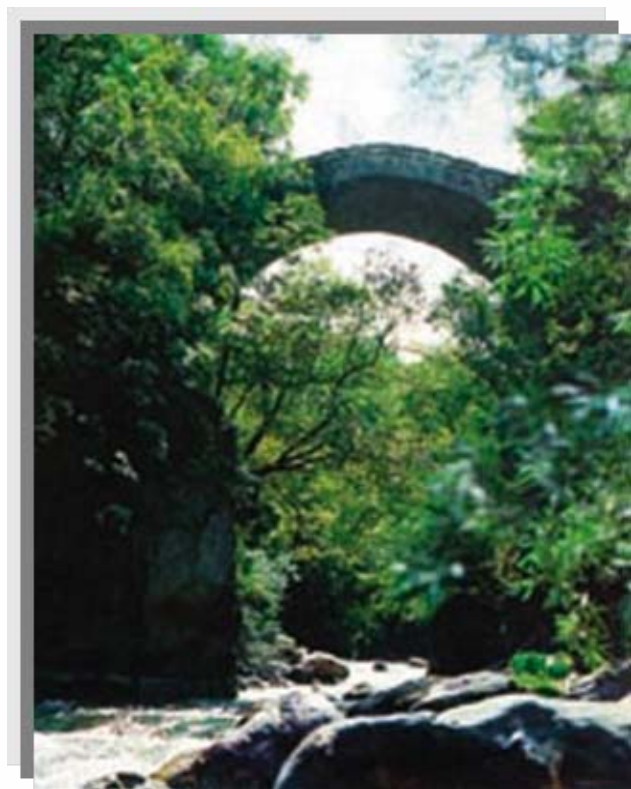
TEHNI^KI PARAMETRI NA HE

- Prose~en protok **21.85 m³/s**
- Prose~no proizvodstvo **63 GWh**
- Visina na brana **69.00 m**
- Instaliran kapacitet **36.40 MW**
- Period na izgradba **5 godini**

RAZVOJNI PROEKTI

HE BO[KOV MOST

**PROJEKT JE SE REALIZIRA KAKO BOT
KONCESIJA**



TEHNI^KI PARAMETRI

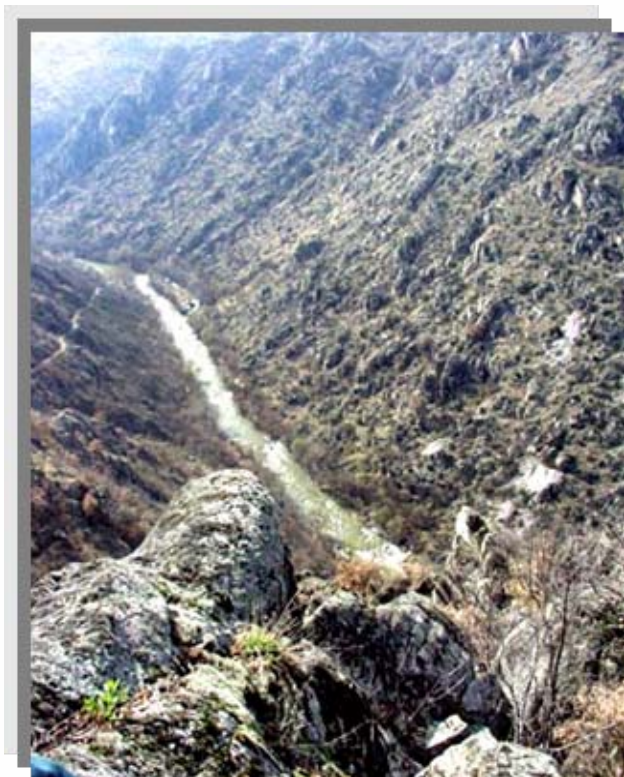
- | | |
|----------------------|------------------------|
| • Prose~en dotok | 5.64 m ³ /s |
| • Proizvodstvo | 126 GWh |
| • Visina na branata | 42.50 m |
| • Instalirana snaga | 70 MW |
| • Period na izgradba | 4.5 godini |



ELEM

ISKORISTUVAVE NA CRNA REKA HE ^EBREN

PROEKTOT JE SE REALIZIRA KAKO BOT
KONCESIJA



TEHNI^KI PARAMETRI

- | | |
|----------------------|-------------------------|
| • Prose~en dotok | 27.70 m ³ /s |
| • Proizvodstvo | 840/786 GWh |
| • Visina na branata | 192.60 m |
| • Instalirana snaga | 333/347 MW |
| • Period na izgradba | 6 godini |



ELEM

ISKORISTUVAWE NA CRNA REKA *HE GALI[TE*

PROJEKTOT JE SE REALIZIRA KAKO BOT
KONCESIJA



TEHNI^KI PARAMETRI

- | | |
|----------------------|-------------------------|
| • Prose~en dotok | 30.70 m ³ /s |
| • Proizvodstvo | 262 GWh |
| • Visina na branata | 141.50 m |
| • Instalirana snaga | 194 MW |
| • Period na izgradba | 5 godini |



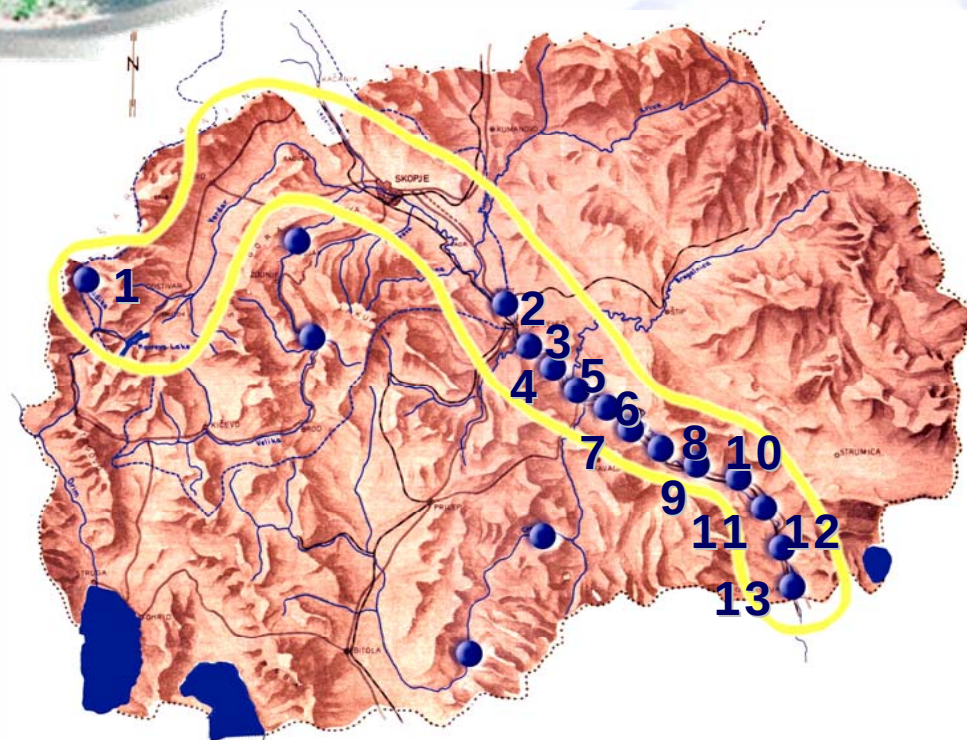


ELEM

PROEKT VARDARSKA DOLINA

Fisibiliti Studijata gi obrabotuva:

- ENERGETSKIOT SEKTOR
- ZEMJODELSKIOT SEKTOR
- ZAŠTITA NA ŽIVOTNA SREDINA
- MOŽNA PLOVNOST



1. Akumulacija Lukovo Pole
2. HE Veles
3. HE Babuna
4. HE Zgropolci
5. HE Gradsko
6. HE Kukuri-ani
7. HE Krivolak
8. HE Dubrovo
9. HE Demir Kapija
10. HE Gradec
11. HE Miletkovo
12. HE Lavato
13. HE Gevgelija

AKUMULACIJA LUKOVO POLE

**PROJEKTOT JE SE REALIZIRA KAKO DEL
OD MAVROVSKIOT SISTEM**



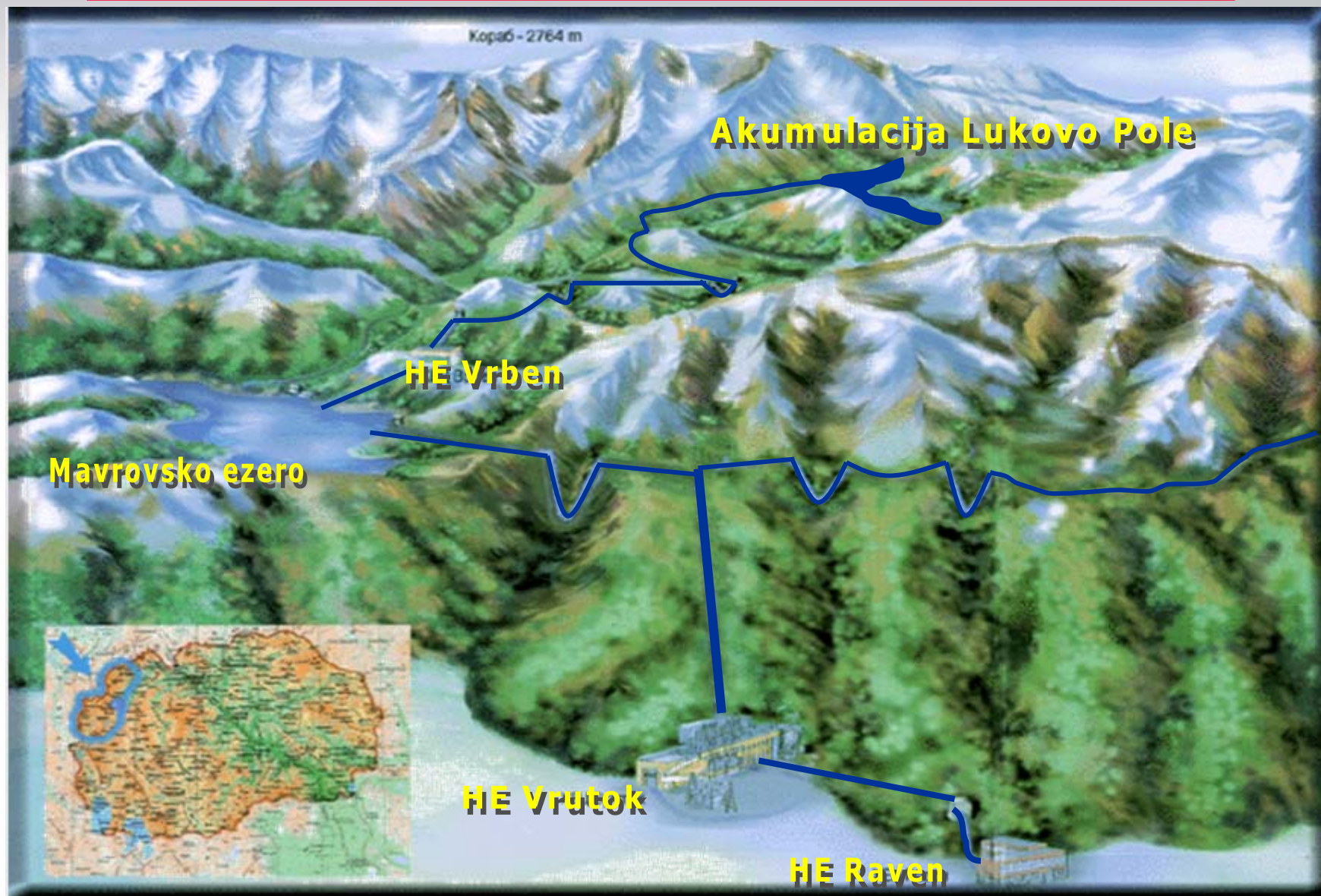
TEHNI^KI PARAMETRI

- | | |
|----------------------|------------------------|
| • Prose~en dotok | 4.17 m ³ /s |
| • Proizvodstvo | 110 GWh |
| • Visina na branata | 84.90 m |
| • Period na izgradba | 4 godini |



ELEM

AKUMULACIJA LUKOVO POLE



HE VELES

**PROJEKT JE SE REALIZIRA KAKO BOT
KONCESIJA**



TEHNI^KI PARAMETRI

- | | |
|----------------------|-------------------------|
| • Prose~en dotok | 86.30 m ³ /s |
| • Proizvodstvo | 300 GWh |
| • Visina na branata | 69 m |
| • Instalirana snaga | 93 MW |
| • Period na izgradba | 7 godini |

HE GRADEC

**PROJEKT JE SE REALIZIRA KAKO BOT
KONCESIJA**



TEHNI^KI PARAMETRI

- | | |
|----------------------|-----------------------|
| • Prose~en dotok | 153 m ³ /s |
| • Proizvodstvo | 252 GWh |
| • Visina na branata | 42.50 m |
| • Instalirana snaga | 54.60 MW |
| • Period na izgradba | 4 godini |



ELEM

VARDARSKA DOLINA

HE KUKURICANI



TEHNI^KI PARAMETRI:

- Prose~en dotok $147,6 \text{ m}^3/\text{s}$
- Instaliran protok $240 \text{ m}^3/\text{s}$
- Instalirana snaga 17 MW
- Godi{no proizvodstvo 80 GWh





ELEM

PODINSKI SLOEVI VO SUVODOL

CELI NA PROJEKTOT

- Prodol`uvawe na eksploatacioniot vek na rudnikot Suvodol
- Snabduvawe na TE Bitola so gorivo vo slednite 30 godini



TEHNI^KI PARAMETRI

- | | |
|------------------------|-------------|
| • Prv podinski sloj | 3.3 mil t |
| • Vtor podinski sloj | 54.8 mil t |
| • Godi{no proizvodstvo | 4 mil t |
| • Kalori~na mo} | 7.210 kJ/kg |



ELEM

RUDNIK @IVOJNO

CELI NA PROJEKTOT

- Prodol`uvawe na eksploatacioniot vek na rudnikot Suvodol
- Snabduvawe na TE Bitola so gorivo vo slednite 30 godini



TEHNI^KI PARAMETRI

- | | |
|--------------------------|-------------|
| • Geolo{ki rezervi | 106 mil t |
| • Eksploatacioni rezervi | 69 mil t |
| • Godi{no proizvodstvo | 2.5 mil t |
| • Kalori~na mo} | 8.200 kJ/kg |

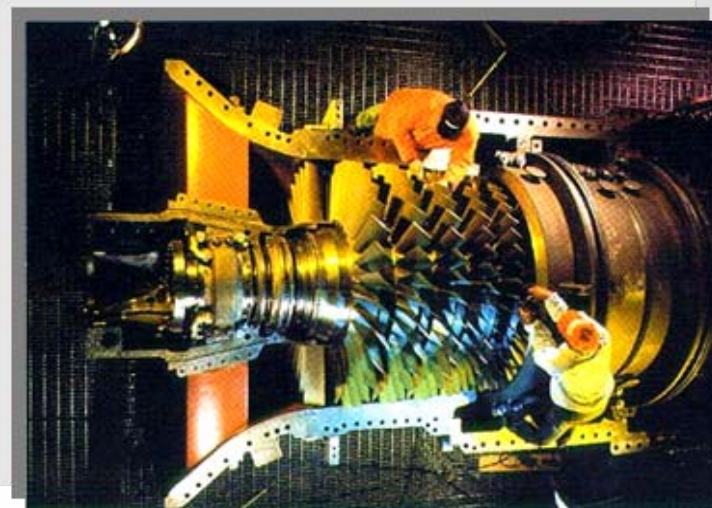
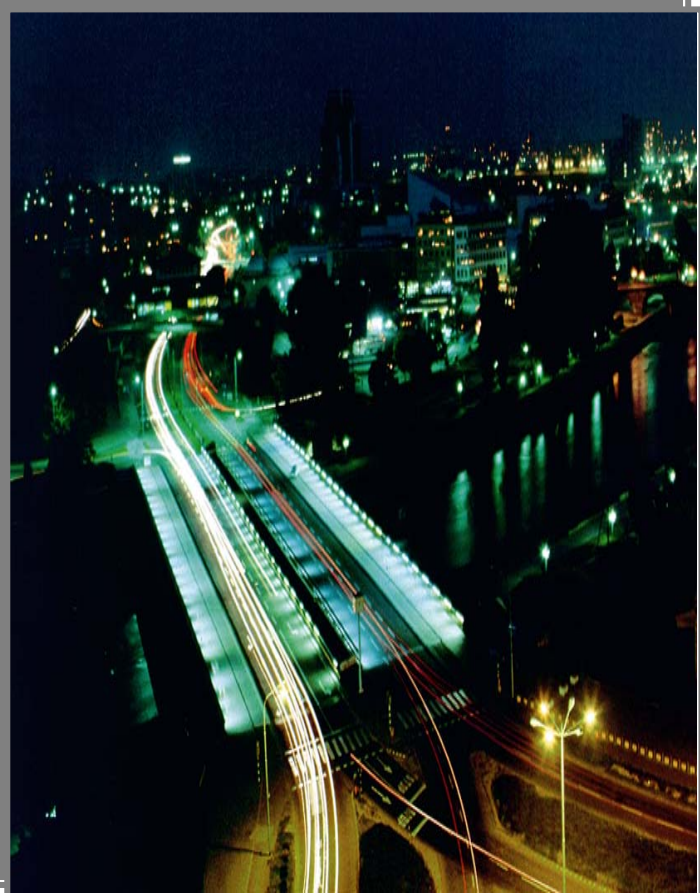


ELEM

TE-TO ENERGETIKA

PROJEKTOT JE SE REALIZIRA

IPP



TEHNI^KI PARAMETRI

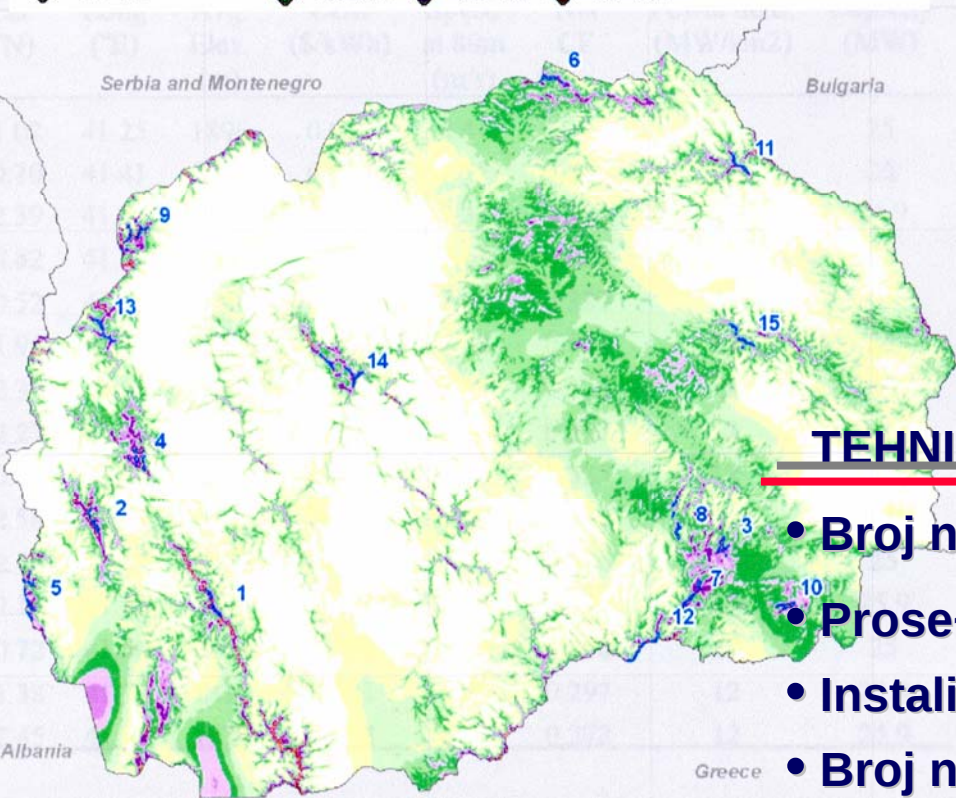
- Instalirana snaga-elektri~na 190 MW
- Instalirana snaga-toplinska 150 MW
- Proizvodstvo na el.en. 1.100 GWh
- Proizvodstvo na toplina 620 GWh
- Potro{uva~ka na gas 333 mil nm³



ELEM

ENERGIJA NA VETER

MERNA KAMPAVA VO SORABOTKA SO NORVE[KATA VLADA



TEHNI^KI PARAMETRI

- Broj na potencijalni lokaciji 20
- Prose~na brzina na veter 6,7-8,4 m/s
- Instalirana snaga po lokacija 25-33 MW
- Broj na veternici po lokacija 10-15
- Proizvodstvo po lokacija 100 GWh

ELECTRIC POWER SECTOR IN MACEDONIA



ELEM

POWER SECTOR DEVELOPMENT STRATEGY

Development Strategy Objectives :

- **Sector Liberalization**
- **Power Market Establishing**
- **Attracting Foreign and Private Investors**

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

- **State Energy Authority**
- **Energy Regulatory Authority**
- **Transmission System Operator**
- **Distribution System Operator**



ELEM

POWER SECTOR

Restructuring of ESM and establishing of four companies:

JSC ELEM *Company for electric power generation*

JSC MEPSO *Company for power transmission, transmission system operator, electric power system operator and market operator*

JSC ESM *Company for electric power distribution and distribution system operator*

JSC TPP Negotino *Company for electric power generation*

JSC MACEDONIAN POWER PLANTS

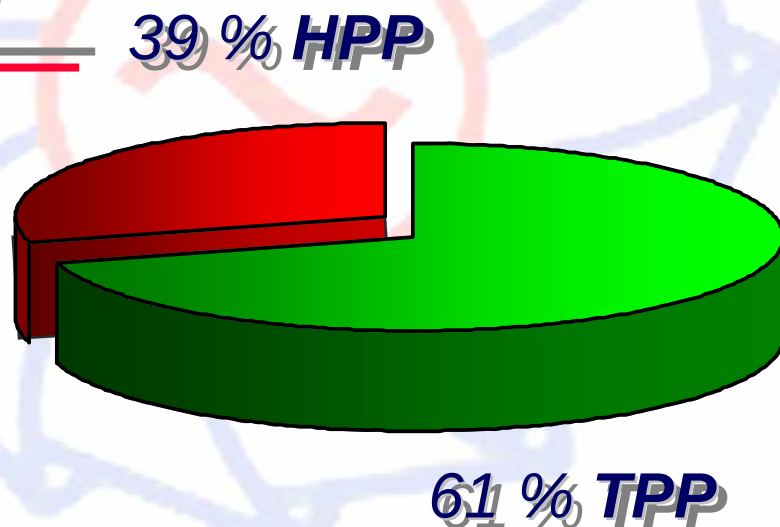
MACEDONIAN POWER PLANTS

State Owned Joint Stock Company

- **ELEM is managed by the Managing Board appointed by Supervisory Board**
- **The members of Supervisory Board are appointed by the Government of the Republic of Macedonia**
- **Management Board consists of 7 members:**
 - **General manager and the President of the Management Board**
 - **Deputy General manager**
 - **Manager for Development and Investments**
 - **Manager for Generation**
 - **Manager for Commerce**
 - **Manager for Finance**
 - **Manager for Legal Affairs**

INSTALLED CAPACITY

Plants	MW	%
TPP	795	61
HPP	504	39
Total	1299	



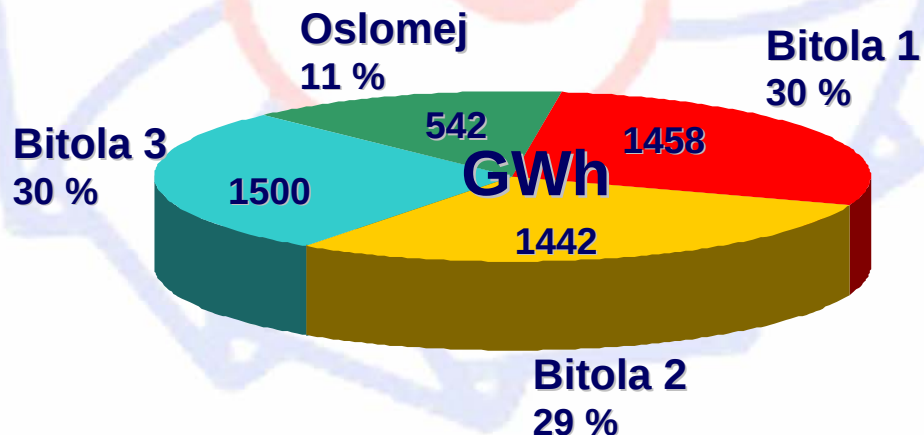
THERMAL POWER PLANTS



THERMALPOWER PLANTS

- BASIC DATA -

➤ Bitola 1	225 MW
➤ Bitola 2	225 MW
➤ Bitola 3	225 MW
➤ Oslomej	120 MW
Total	795 MW





ELEEM

MPC BITOLA

The branch consists of 3 generation units and open-pit mine Suvodol



TECHNICAL PARAMETERS

• Installed capacity	675 MW
• Number of units	3
• Electricity generation	4.400 GWh
• Lignite production	6,5 mil t
• Maintenance outage	45 days



ELEEM

REK OSLOMEJ

The branch consists of 1 generation unit and open-pit mine Oslomej-Zapad



TECHNICAL PARAMETERS

- | | |
|--------------------------|-----------|
| • Installed capacity | 125 MW |
| • Number of units | 1 |
| • Electricity generation | 550 GWh |
| • Lignite production | 700.000 t |
| • Maintenance outage | 30 days |

HYDRO POWER PLANTS

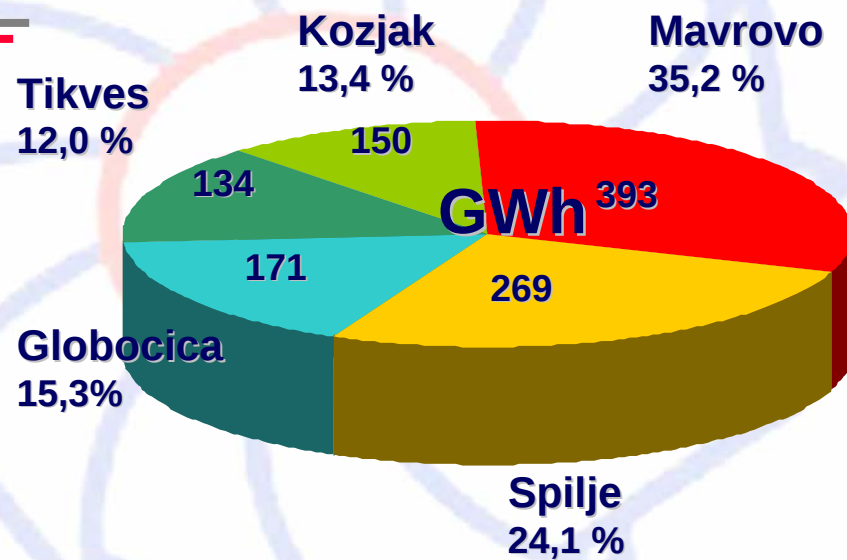


HYDRO POWER PLANTS

- BASIC DATA -

1 Mavrovo	182 MW
2 Globocica	42 MW
3 Tikves	116 MW
4 Spilje	84 MW
5 Kozjak	80 MW

TOTAL	504 MW
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HPP MAVROVO

**THE SYSTEM CONSISTS OF
3 HYDRO POWER PLANTS:**

- ❖ **HPP VRUTOK**
- ❖ **HPP RAVEN**
- ❖ **HPP VRBEN**



TECHNICAL PARAMETERS

- | | |
|--------------------|------------------------|
| • Average flow | 9.50 m ³ /s |
| • Generation | 393 GWh |
| • Dam height | 61.90 m |
| • Install capacity | 182 MW |



HPP GLOBOCICA

**HYDRO POWER PLANT IS
DERIVATION TYPE WITH
7.7 km LONG INTAKE TUNNEL**



TECHNICAL PARAMETERS

- Average flow 28.0 m³/s
- Generation 171 GWh
- Dam height 90.0 m
- Installed capacity 42 MW

HPP TIKVES

**THIS HYDRO POWER PLANT
IS A PART OF MULTI
PURPOSE SYSTEM**



TECHNICAL PARAMETERS

- **Average flow** 27.0 m³/s
- **Generation** 134 GWh
- **Dam height** 113,50 m
- **Installed capacity** 116 MW

HPP SPILJE

**HYRDO POWER PLANT IS
ADJANCED TO THE DAM**



TECHNICAL PARAMETERS

- **Average flow** 46.5 m³/s
- **Generation** 269 GWh
- **Dam height** 112 m
- **Installed capacity** 84 MW

HPP KOZJAK



TECHNICAL PARAMETERS

- | | |
|----------------------|------------------------|
| • Average flow | 22.7 m ³ /s |
| • Dam height | 126.00 m |
| • Installed capacity | 80.0 MW |
| • Average generation | 150.00 GWh |

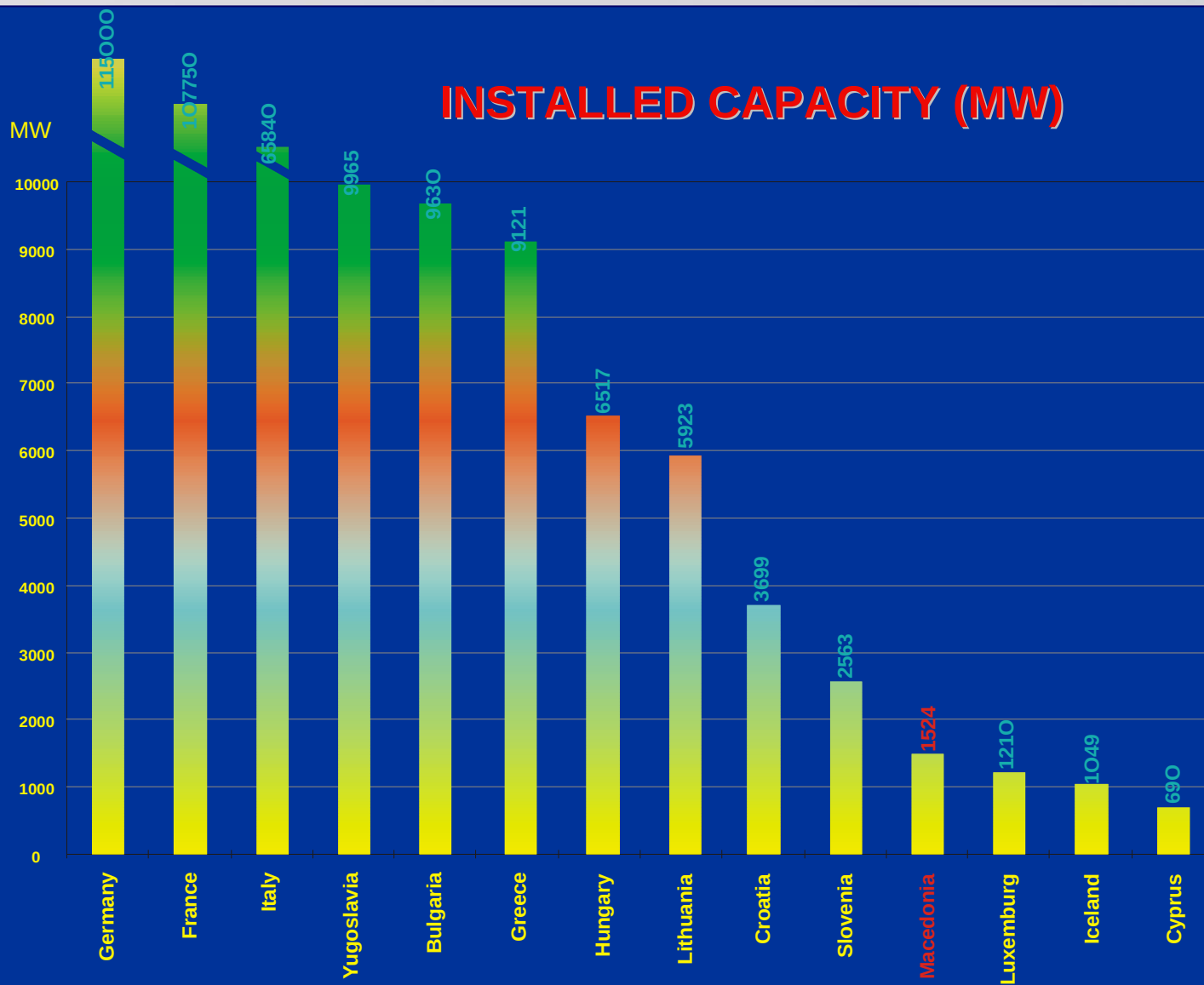


ELEEM

TRANSMISSION NETWORK



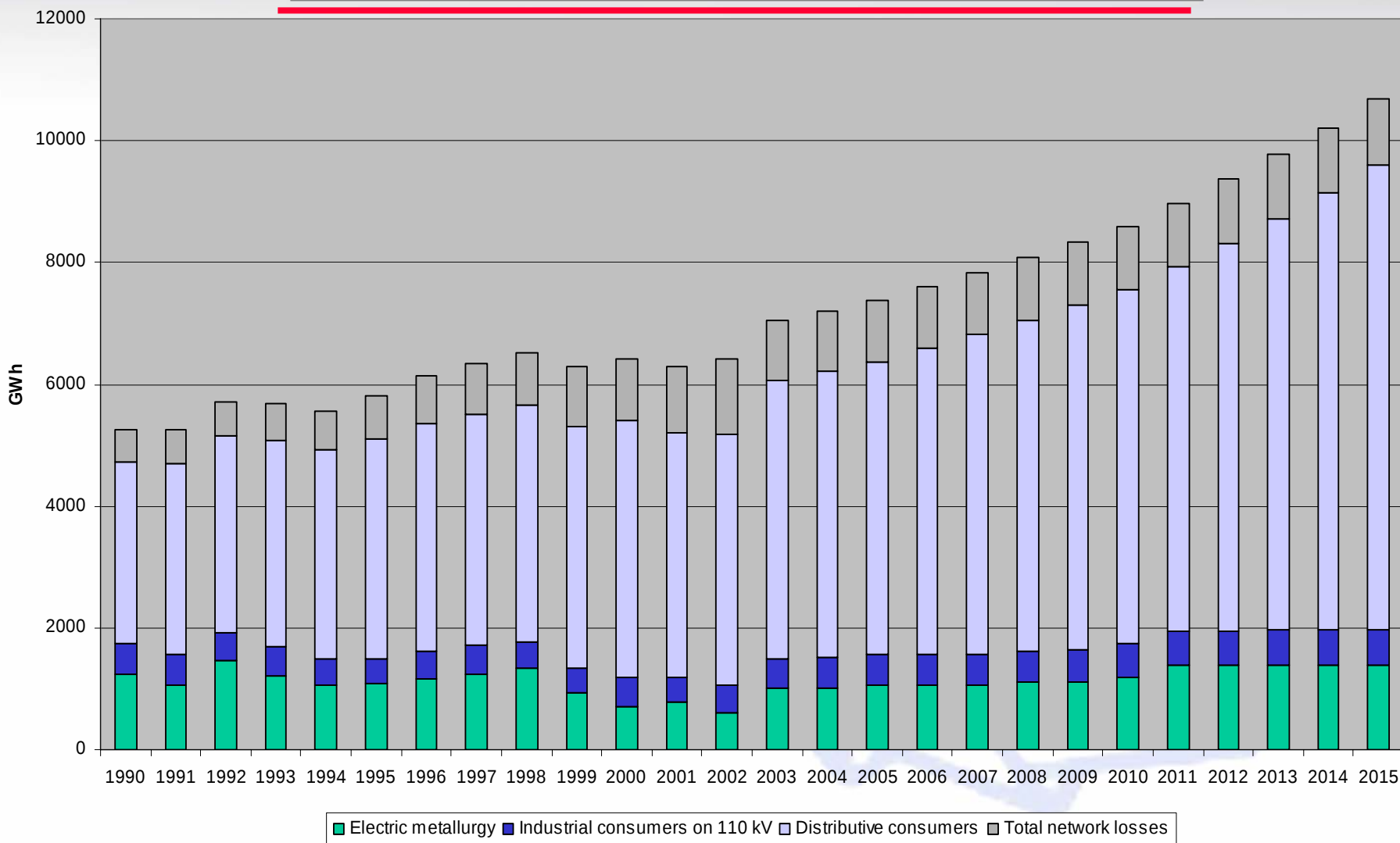
COMPARISON





ELEEM

HISTORY AND FORECAST OF DEMAND



DEVELOPMENT

- **EXTENSION OF THE COIL MINING**
- **CONSTRUCTION OF NEW HPPs**
- **REHABILITATION OF EXISTING HPPs**
- **CONSTRUCTION OF NEW CCPPs**
- **RENEWABLE ENERGY SOURCES**

PROJECTS UNDER CONSTRUCTION

- **REHABILITATION OF THE EXISTING HPPs**
- **HPP Sv PETKA**
- **MINING BROD-GNEOTINO**

REHABILITATION OF LARGE HPP's

GOALS OF THE PROJECT:

- Increased capacity 40 MW
- Increased generation 13,7 GWh
- Reduced operating costs
- Reduced outages



SIX LARGEST HPP's:

- HPP Vrutok 150 MW
- HPP Raven 19.2 MW
- HPP Vrben 12.8 MW
- HPP Globocica 42 MW
- HPP Spilje 84 MW
- HPP Tikves 92 MW



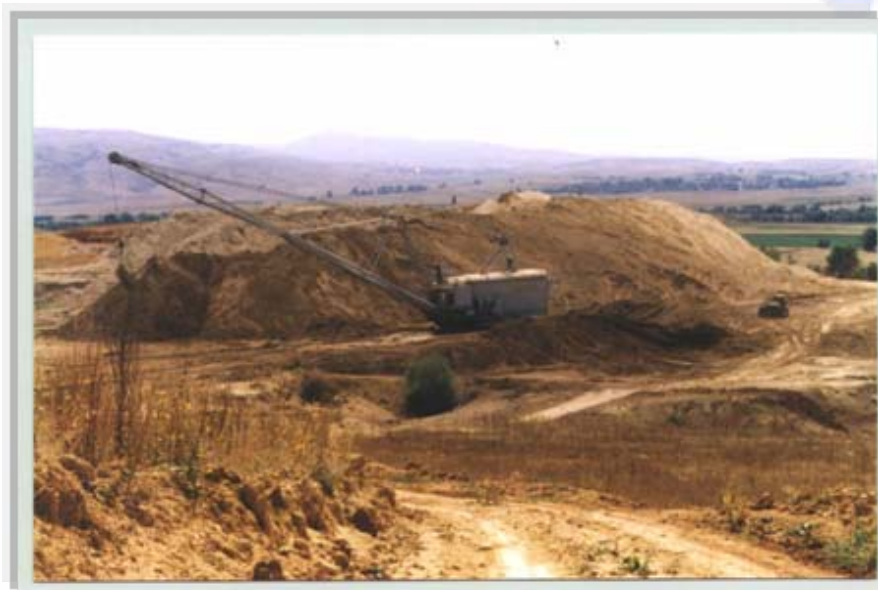


ELEEM

BROD-GNEOTINO LIGNITE MINING

GOALS OF THE PROJECT

- Extension of operating life of mine Suvodol
- Supply of TPP Bitola with fuel in next 30 years



TECHNICAL PARAMETERS

- | | |
|------------------------|-------------|
| • Geological deposit | 108 mil t |
| • Exploitable deposits | 33 mil t |
| • Annual excavation | 2.5 mil t |
| • Caloric value | 7.848 kJ/kg |

HPP Sv PETKA

**Realization of the 1st stage:
construction of the access
road and dam associated
facilities**



TECHNICAL PARAMETERS OF HPP

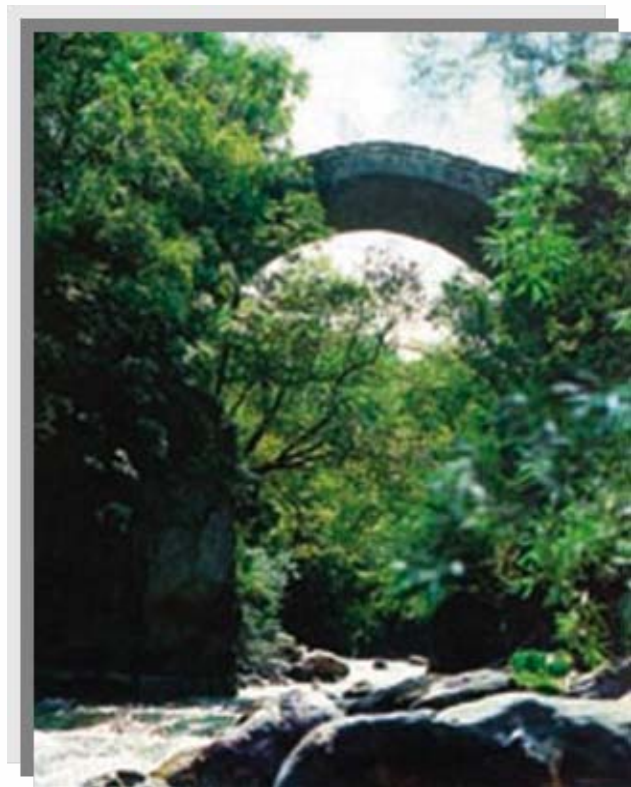
- | | |
|-----------------------|-------------------------|
| • Average flow | 21.85 m ³ /s |
| • Average generation | 63 GWh |
| • Dam height | 69.00 m |
| • Installed capacity | 36.40 MW |
| • Construction period | 5 year |

DEVELOPMENT PROJECTS



HPP BOSKOV MOST

**PROJECT WILL BE IMPLEMENTED AS A
BOT CONCESSION**



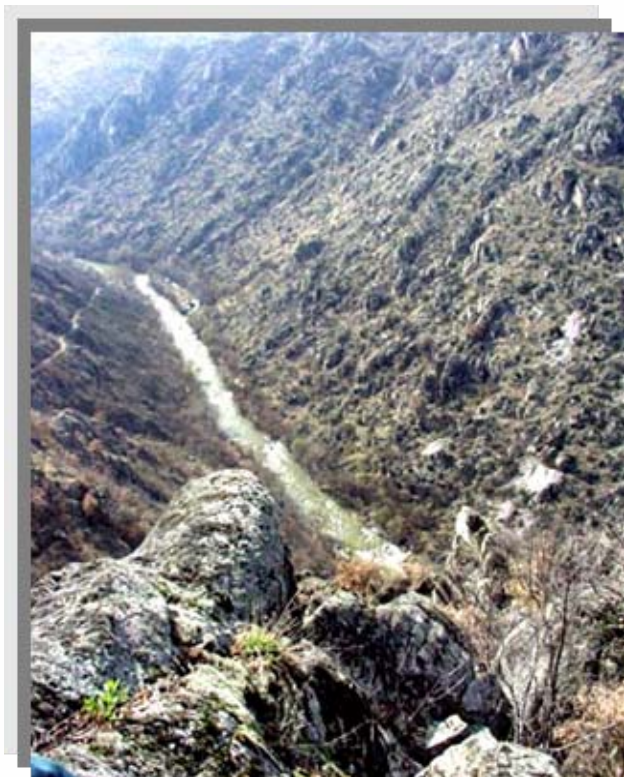
TECHNICAL PARAMETERS

- | | |
|-----------------------|------------------------|
| • Average flow | 5.64 m ³ /s |
| • Generation | 126 GWh |
| • Dam height | 42.50 m |
| • Installed capacity | 70 MW |
| • Construction period | 4.5 year |

UTILIZATION OF CRNA REKA

HPP CEBREN

**PROJECT WILL BE IMPLEMENTED AS A
BOT CONCESSION**



TECHNICAL PARAMETERS

- | | |
|-----------------------|-------------------------|
| • Average flow | 27.70 m ³ /s |
| • Generation | 840/786 GWh |
| • Dam height | 192.60 m |
| • Installed capacity | 333/347 MW |
| • Construction period | 6 year |

UTILIZATION OF CRNA REKA

HPP GALISTE

**PROJECT WILL BE IMPLEMENTED AS A
BOT CONCESSION**



TECHNICAL PARAMETERS

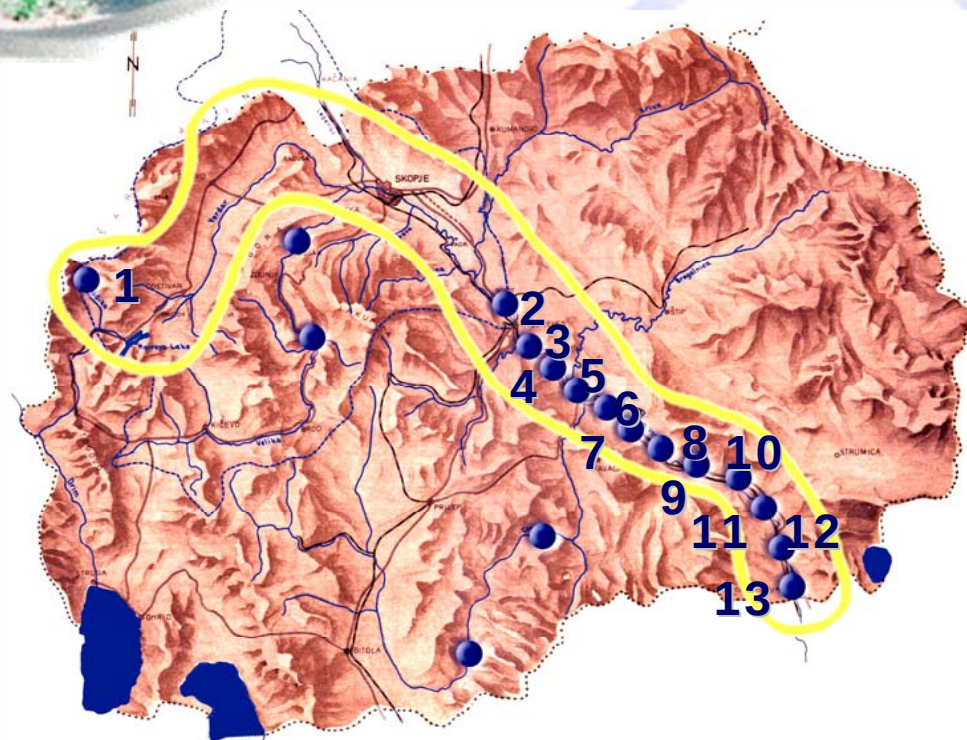
• Average flow	30.70 m ³ /s
• Generation	262 GWh
• Dam height	141.50 m
• Installed capacity	194 MW
• Construction period	5 year



VARDAR VALLEY PROJECT

The Feasibility Study deals with development of:

- ENERGY SECTOR
- AGRICULTURAL SECTOR
- ENVIRONMENTAL PROTECTION
- POSSIBLE NAVIGATION WAY



1. Storage Lukovo Pole
2. HPP Veles
3. HPP Babuna
4. HPP Zgropolci
5. HPP Gradsko
6. HPP Kukuricani
7. HPP Krivolak
8. HPP Dubrovo
9. HPP Demir Kapija
10. HPP Gradec
11. HPP Miletkovo
12. HPP Gavato
13. HPP Gevgelija

STORAGE LUKOVO POLE

**PROJECT WILL BE IMPLEMENTED AS A
PART OF MAVROVO SYSTEM**



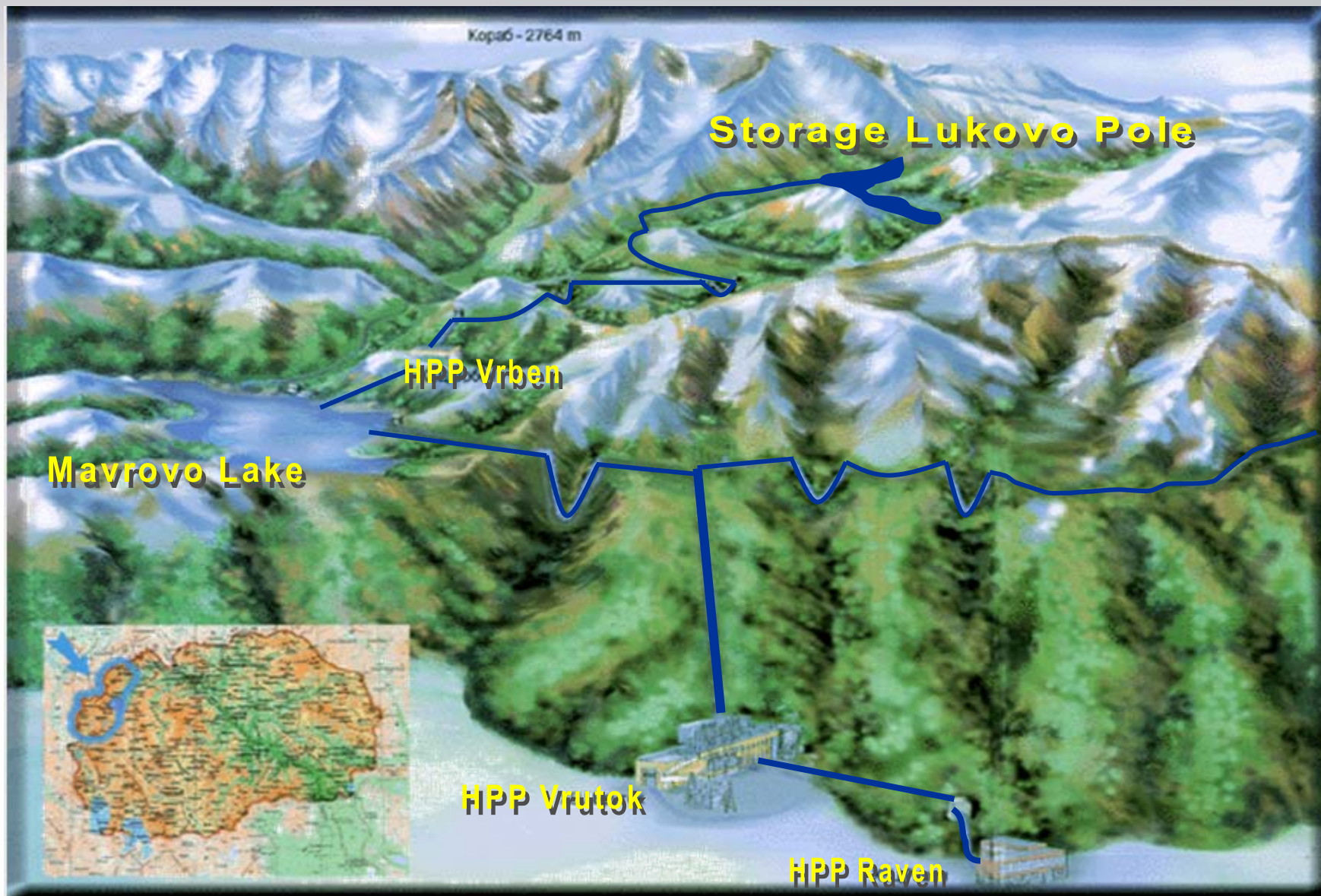
TECHNICAL PARAMETERS

• Average flow	4.17 m ³ /s
• Generation	110 GWh
• Dam height	84.90 m
• Construction period	4 year



ELEEM

AKUMULACIJA LUKOVO POLE



HPP VELES

**PROJECT WILL BE IMPLEMENTED AS A
BOT CONCESSION**

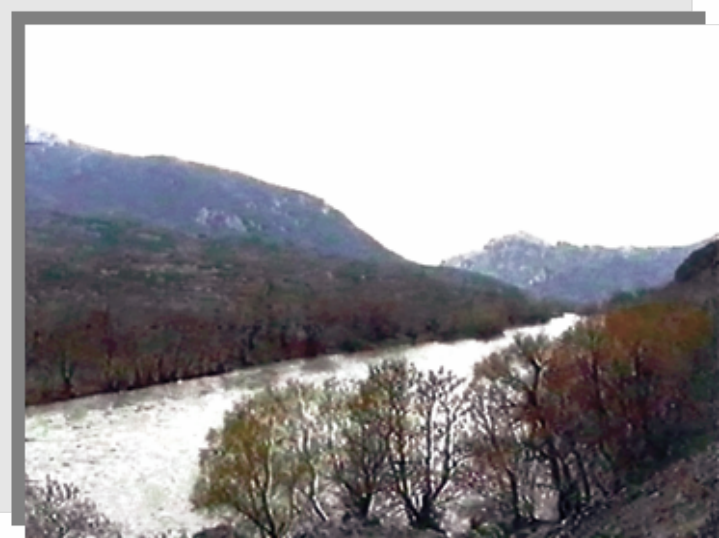


TECHNICAL PARAMETERS

• Average flow	86.30 m ³ /s
• Generation	300 GWh
• Dam height	69 m
• Installed capacity	93 MW
• Construction period	7 year

HPP GRADEC

**PROJECT WILL BE IMPLEMENTED AS A
BOT CONCESSION**



TECHNICAL PARAMETERS

• Average flow	153 m ³ /s
• Generation	252 GWh
• Dam height	42.50 m
• Installed capacity	54.60 MW
• Construction period	4 year



ELEEM

VARDAR VALLEY

HPP KUKURICANI



TECHNICAL PARAMETERS:

- Average flow 147,6 m³/s
- Installed flow 240 m³/s
- Installed capacity 17 MW
- Annual generation 80 GWh





ELEM

SUVODOL DEEP UNDERLYING SEAM MINING

GOALS OF THE PROJECT

- Extension of operating life of mine Suvodol
- Supply of TPP Bitola with fuel in next 30 years



TECHNICAL PARAMETERS

- | | |
|--------------------------|-------------|
| • First underlying seam | 3.3 mil t |
| • Second underlying seam | 54.8 mil t |
| • Annual excavation | 4 mil t |
| • Caloric value | 7.210 kJ/kg |



ELEM

ZIVOJNO LIGNITE MINING

GOALS OF THE PROJECT

- Extension of operating life of mine Suvodol
- Supply of TPP Bitola with fuel in next 30 years



TECHNICAL PARAMETERS

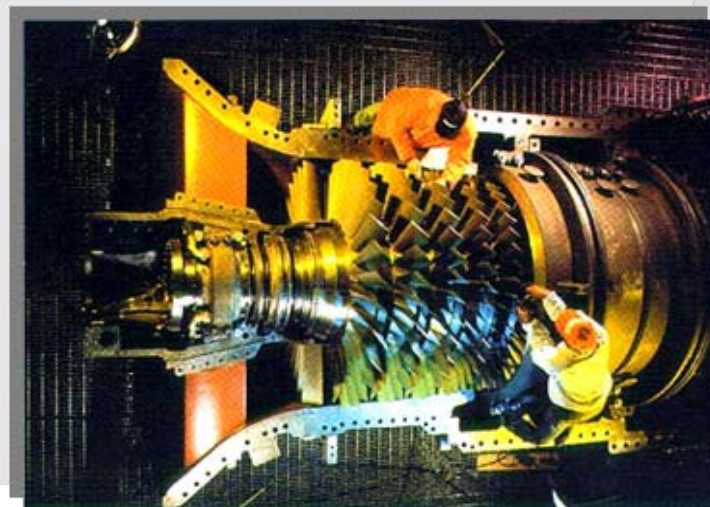
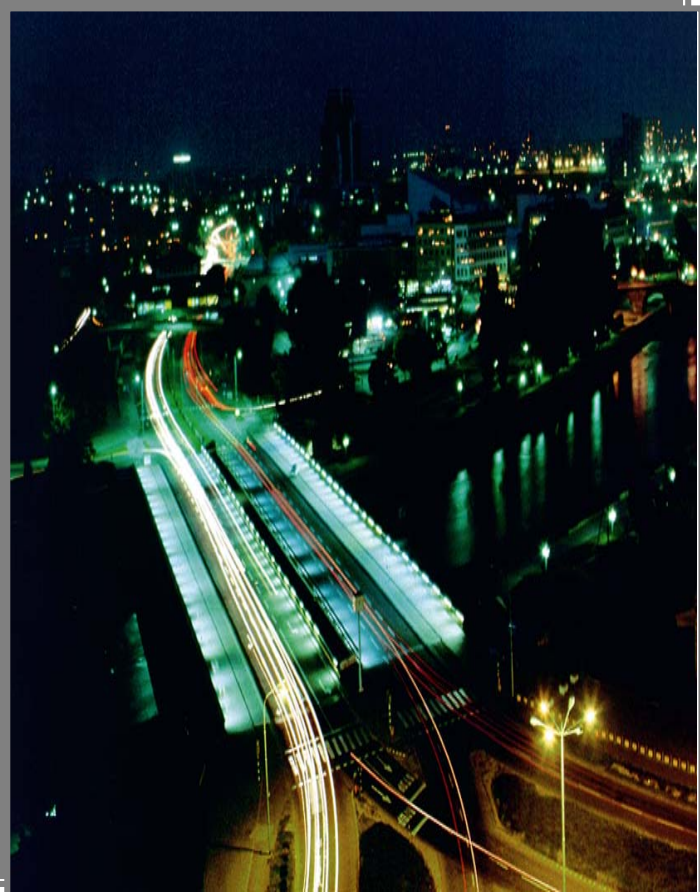
- | | |
|------------------------|-------------|
| • Geological deposit | 106 mil t |
| • Exploitable deposits | 69 mil t |
| • Annual excavation | 2.5 mil t |
| • Caloric value | 8.200 kJ/kg |



ELEM

CCHPP ENERGETIKA

**PROJECT WILL BE IMPLEMENTED
AS AN IPP**



TECHNICAL PARAMETERS

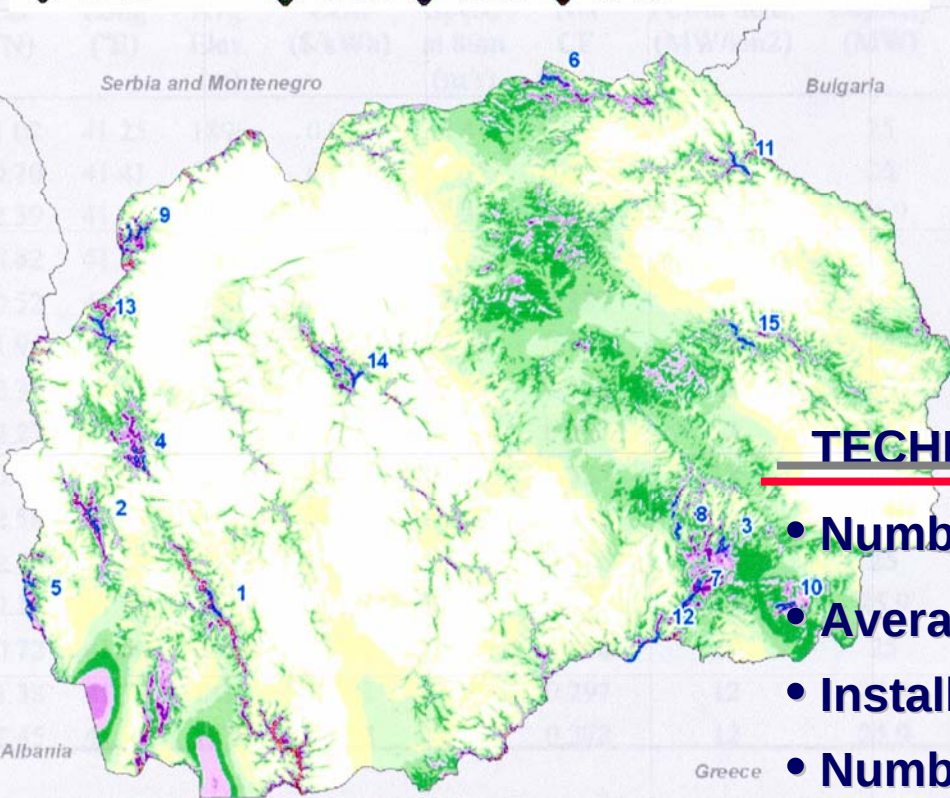
- | | |
|----------------------------------|-------------------------|
| • Installed capacity-electricity | 190 MW |
| • Installed capacity-heat | 150 MW |
| • Electricity generation | 1.100 GWh |
| • Heat production | 620 GWh |
| • Gas consumption | 333 mil nm ³ |



ELEM

WIND ENERGY

MEASURING CAMPAIGN IN COOPERATION WITH NORVEGIAN GOVERNMENT



TECHNICAL PARAMETERS

- Number of potential locations 20
- Average wind speed 6,7-8,4 m/s
- Installed capacity per location 25-33 MW
- Number of units per location 10-15
- Generation per location 100 GWh