Renewable Energy Country Profile
Version 0.6b

These profiles are a work in progress. They are presented to the international community for review and comment. The profiles are undergoing continual updating for technical content, formatting, grammar, and other issues. Each country profile will be modified on a continuous basis as new information is made available.

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10.0 FR Yugoslavia

10.1 Overview of Electricity Supply

The energy sector remains damaged after the Kosovo conflict in 1999. Infrastructure remains in a state of disrepair, thus leading to frequent and prolonged blackouts, especially over the winter months. In response, emergency grants are planned to rebuild the damaged systems to restore power.

Table 7-5
Installed Generation Capacity

Fuel	Number of Units	Capacity (MWe)	Percent of Capacity
Nuclear	--	--	--
Thermal	N/A	7,966	73.6%
Hydro	N/A	2,864	26.4%
Other Renewables			
Total	N/A	10,830	100%

1.1.1 Wind Resources

Current Status of Wind Energy

There are no operational wind turbines in FR Yugoslavia.

The republics of the former Yugoslavia were among the least dependent of the Central and Eastern European states on the former Soviet Union for their energy needs. This was due to extensive utilization of hydroelectric power and greater freedom of choice in the source of fossil fuel imports. Prior to the war, the country was one of the more prosperous in the region, boasting living standards approaching those in some Western European countries. However, conditions have deteriorated significantly in the last two years, with day-to-day survival the main issue of concern for most citizens of the region.

A country wide wind-atlas is not available.

No information concerning legal frame work was available.

No industry association or manufacturer was identified.

No Project was identified

Wind Energy Resource Potential

Due to insufficient data no statement can be made for the technical potential for wind energy development in FR Yugoslavia. Nevertheless, there must be some potential at least at the Adria coast.

It would be recommended to asses country wide wind energy resources by state of the art wind measurements.

Identification of Areas/Projects with High Potential for Wind Energy

Based on Croatian experience sites along the Adria coast of FR Yugoslavia, must be suitable.

Barriers/Incentives for Wind Energy

Specific incentives for the implementation of wind projects in FR Yugoslavia are not known.

Specific barriers to the implementation of wind projects in FR Yugoslavia shall probably include:

- Lack of knowledge of country's wind energy resource potential.
- Current political situation

Table 1-3. FR Yugoslavia Wind Energy Profile.

Current status of windenergy	
Installed capacity	None
Projects under construction	None
Supporting regulations?	None
Industry association?	No
Wind energy resource potential	
Level of information available	Poor
Highest wind class	Insufficient data
Country-level wind atlas available?	No
Estimated potential	Insufficient Data
Estimated potential	Insufficient Data
Target established?	No
High wind speed locations	Adria Coast
Identification of areas/projects with high potential for wind energy	
Recommended strategic assessments	Study 1 : Country wide appraisal of wind resources, by state of the art wind measurements at 50 m Study 2 : an appraisal of legal and economical frame work
Identified areas/projects	None
Incentives/barriers for wind energy	
Significant incentives	No significant incentives
Significant barriers	• Poor knowledge of wind resources • Political situation
Overall Prospects	**Poor** There was no information available on wind energy in FR Yugoslavia. Combined with the current political situation the prospects were wind energy development during mid-term are poor.

ENERGY COUNTRY RENEWABLE PROFILES

COUNTRY: FR YUGOSLAVIA (SERBIA & MONTENEGRO)

CONTENTS

RENEWABLE ENERGY PROFILE OF FR YUGOSLAVIA (SERBIA & MONTENEGRO)

Most of the information and evaluation in the Report on FR Yugoslavia , or whatever has been left of it (Serbia and Montenegro), is based on the work of Nicos Vassiliou, NV Consultants, Cyprus, with data drawn largely from the FR Yugoslavia's Statistical Yearbook 2001; and on the European Renewable Energy Study, particularly the inputs of Davor Skrlec, Enconet International.

1. GENERAL INFORMATION ON THE COUNTRY

1.1 The fate of FR Yugoslavia is well known: Its ethnic conflict, the war and the insistence of its former dictator President Milosevic ***** to keep control over member states of Federal Yugoslavia. Now FR Yugoslavia controls only Serbia and Montenegro.

1.2 The military action by the U.S.A. to get rid of Milosevic and restore democracy has been successful but has delivered a heavy toll on the country's people and infrastructure, particularly power generation. Prior to the war, the country was one of the more prosperous in the region, boasting living standards approaching those in some Western European countries. But as a result of the forementioned events GDP in 2001 was 50% of the level in 1990 (Country Profile of FR Yugoslavia for the Johannesburg Summit 2002).

1.3 Serbia's population in 1991 was 9,8 million. By 2000 it had only grown by 5% to 10,3 million. That of Montenegro was 0,62 million. The population of Serbia's capital Belgrade in 2000 is estimated at 1,75 million. Serbia's total area is 88.361 km of which 4.258.717 is arable and 2.312.867 is under forest. In the case of Montenegro the total area is only 13.812, its arable area 185.822 and the area under forests 545 011.

1.4 FR Yugoslavia's GDP was 196.516 million dinar at market prices in 1999. This was estimated to be equivalent to 10.376 million U.S. dollars and corresponded to a per capita amount of U..S$976 in 1999 on the basis of the average market exchange rate or US$1.397 on the basis of the official exchange rate. The latter had dropped by about 19% from US$1.715 per capita in 1998, reflecting the impact of the ethnic conflict and war on the peoples' income.

***** Currently in the hands of the European Court of Crimes against Humanity.

2. ENERGY OVERVIEW OF FR YUGOSLAVIA (SERBIA)

2.1 Energy Policy

We could not secure any report on the energy policy being pursued by the new democratic Government of FR Yugoslavia. However, we presume that like some of their other former compatriots (Croatia, Slovenia, FYR Macedonia etc) they also intend to liberalize and privatize the energy sector. However, their immediate and medium-term priority must be to reconstruct the country's electricity infrastructure, which was heavily bombed during the recent war. The loss in installed energy capacity and consumption are reflected in Tables 1 and 2.

Meanwhile, even though explicit statements on renewable energy policy could not be secured, implications on it may be derived by the following paragraph dealing with Programmes and Projects in the Environmental Field:

" According to the Resolution of the Policy of the Environmental Protection in FR Yugoslavia, the policy has been designed as a specific, unified and long-term programme and a component of the integral economic system of FRY. The principal goals of the policy of cleaner production and waste minimization are as follows: to reduce waste generation; to introduce a low-waste material technology and recycling of waste in interconnected industrial production; to introduce programmes for the enhancement of production along with the reduction of energy consumption; to give importance to the preventive approach by reducing quantities for final disposal either through prevention of waste (by "clean technologies" and lengthening the lifetime of products and device treatments of waste), or by re-use (recycling); and to implement the "polluter pays" principle, meaning that the greatest responsibility for the produced waste lies with the one who produces such waste.**"** (FR Yugoslavia's Country Profile for the Johannesburg Summit 2002).

2.2 Present Energy Situation

The recent and present energy situation in FR Yugoslavia (Serbia and Montenegro), are portrayed in Tables 1, 2 and 3.

Table 1 shows the installed capacities in 1998 and 1999 of power plant, analysed by type of plant and location such as Montenegro, Serbia – Central Serbia, Vojvodina, Kosovo and Metohia.

It also shows the destruction or loss of capacity as a result of the events in 1998 and 1999: 16% loss by Serbia and none for Montenegro.

The prime power plant capacity for FR Yugoslavia was 8.917 MW in Montenegro. Of this corresponding capacities of hydro power plant were: FR Yugoslavia 3.692 MW (41%), 3.033 MW Serbia (38%) and 658 MW (75%) Montenegro.

In terms of public Generators the capacities were somewhat higher: 10.079 MW publicly owned for FR Yugoslavia of which 3.763 MW (37%) hydro plant. There was also power equipment and engines totaling 896 MW in 1999, of which 69 MW were hydro-plant.

Table 1 INSTALLED CAPACITIES OF POWER PLANT IN FR YUGOSLAVIA By Type of Plant, Location and Energy Source 1998 and 1999

Figures in end-of-year MW

	YEAR	FR YUGO-SLAVIA	MONTE-NEGRO	SERBIA			
				TOTAL SERBIA	CENTRAL SERBIA	VOJ-VODINA	KOSOVO & METOHIA
1. PRIME POWER PLANTS							
Total	**1998***	**10.452**	**881**	**9.570**	**7.473**	**576**	**1.521**
“	**1999**	**8.917**	**881**	**8.036**	**7.473**	**563**	**-----**
(a) Public Hydro Plants		3.692	658	3.033	3.033	-	…..
(b) “ Thermo “		4.933	210	4.723	4.274	449	…..
(c) PPs of Enterprises for electric. distr.		26,1	-	26,1	26,1	-	….
(d) Ind. PPs ……		266	13,0	253	139	114	….
2. GENERATORS							
Total	**1998***	**11.837**	**957**	**10.880**	**8.389**	**750**	**1.741**
“	**1999**	**10.079**	**957**	**9.122**	**8.388**	**733**	**-----**
(a) Public Hydro Plants		3.763	696	3.067	3.067	-	……
(b) “ Thermo “		5.970	247	5.723	5.130	592	……
(c) PPs of Enterprises for electr. distr.		15,3	-	15,3	15,3	-	…..
(d) Ind. PPs ……..		330	14,0	316	176	141	…..
3. POWER EQT & ENGINES							
Total	**1998**	**1.001**	**41,8**	**960**	**745**	**109**	**106**
“	**1999**	**896**	**41,8**	**854**	**745**	**109**	**…..**
(a) Public Hydro Plants		69,0	4,8	64,2	64,2	-	….
(b) “ Thermo “		826	37,0	789	680	109	….
(c) PPs of Enterprises for electr. distr.		0,8	-	0,8	0,8	-	…..
(d) Ind. PPs ……..		-	-	-	-	-	….

* Data for 1998 are estimated
Source: Compiled by NV Consultants from the Statistical Yearbook 2001

The balance of generation and consumption of electricity for 1993 and 1998-2000 is shown in Table 2.

Gross electricity output peaked in 1998, dropping significantly in 1999 and picking up again in 2000 to reach 36 626 Gwh. Likewise total consumption rose from 32054 GWh in 1999 to 34377 in 2000. By far the biggest consumer category was households (lighting and apparatus), comprising about 46% of total consumption.

Table 2 FR Yugoslavia (Serbia and Montenegro):[1] Balance of Generation and Consumption of Electricity by Sector 1993 and 1998 – 2000

GWh

	1993	1998	1999[1]	2000[1]
1. Gross electricity output ……..	34 357	40 619	33 947	36 626
2. Consumption in power plants …….	2 394	2 624	1 893	2 249
3. Net electricity output of power plants ……	31 863	37995	32 054	34 377
4. Consumption ……	26 756	31 923	27 230	31 222
- Households (lighting and apparatus) ……..	15 427	16 372	14 748	16 946
- Business and social premises ……..	987	1 184	1 004	1 162
- Motors and apparatus of other consumers ……..	1 645	2 104	1 639	1 861
- Public lighting ……	274	339	300	334
- Public water supply ……	381	495	445	498
- Tramcars and trolleybuses ……..	52	45	46	67
- Electric railway traction ……..	203	219	138	169
- Manufacturing, mining and quarrying-total	6 573	9 917	7 536	9 180
Of which: electro-chemistry and electro-metallurgy……	2 097	4 137	2 674	3 599
- Water pumping into hydro-power plants reservoirs ……	1 042	988	1 156	743
- Agriculture …… …	172	260	218	262
- Differences ……..	8 225	7 498	6 620	6 015

1] Excluding Kosovo and Metohia
Source: Statistical Yearbook of Yugoslavia 2001

Consumption of Electricity and Fuel in Industry

Such consumption is shown by fuel type in Table 3.

This table illustrates clearly the levels of consumption over the decade 1991 to 2000 of electricity and other fuels.

Table 3 FR Yugoslavia: Consumption of electricity and fuel in industry[1] by type of fuel 1991 and 1998 – 2000[2]

'000t = thousand tonnes

	Year	Electricity GWh	Anthracite '000t	Coke '000t	Hard coal '000t	Brown coal '000t	Lignite '000t	Liquid fuels '000t	Mazout '000t	Natural gas mln m^2	Liquid gas '000
Industry - Total	**1991**	**14 888**	**22**	**63**	**93**	**1 164**	**35 369**	**194**	**1 153**	**1609**	**175**
	1998	**12 261**	**25**	**33**	**82**	**666**	**39 340**	**162**	**948**	**986**	**19**
	1999[2]	**10 832**	**11**	**15**	**77**	**462**	**28 762**	**95**	**649**	**1 021**	**15**
	2000[2]	**10 066**	**5.1**	**8.7**	**54**	**495**	**29 218**	**547**	**547**	**936**	**12**
Montenegro		**1 870**	**-**	**-**	**-**	**7.0**	**54**	**9.0**	**75**	**-**	**0.5**
Serbia		**8 196**	**5.1**	**8.7**	**54**	**488**	**29 164**	**102**	**472**	**936**	**12**
Central Serbia		6 404	1.4	5.1	53	429	29 152	56	306	268	9.0
Vojvodina		1 792	3.7	3.6	1.0	59	12	46	166	668	3.0
Kosovo and Metohia		---	---	---	---	---	---	---	---	---	---

1] Quantities used in generation, transmission and distribution of electricity included
2] Without data for Kosovo and Metohia.

3. THE RENEWABLE ENERGY SOURCES (RES) AND RESOURCES OF FR YUGOSLAVIA

3.1 Questions of availability of data

Although general indicative assessments have been made for RES as part of the European Renewable Energy Study on prospects in the EU and Eastern Europe, we have been informed by authoritative sources that specific information on the potential of wind, solar, hydropower and biomass for particular locations or areas "does not exist". Mr. Milan Dacic, the Coordinator of the Yugoslav UNFCC (United Nations Framework Convention of Climate Change) has informed us so on August 23, 2002. He was also speaking on behalf of Mr. Mamcilo Zivkovic, the Director of the Federal Hydrometeorological Institute.

Mr. Dacic has pointed out that they are now on the initial phase of producing a study on wind power potential for FRY and that "Similar studies for hydropower and solid and liquid wastes could be carried out".

In the sections which follow, we only present the fore-mentioned general evaluations and some raw data e.g. in Table 4 which includes weather, wind and sunshine data for 1999 and 2000.

3.2 Wind Data, Resources and Potential

Table 4 shows inter alia the areas of FR Yugoslavia where wind velocity exceeded 6 beaufort and the number of days this was the case.

The locations with the highest velocities in 1999 and 2000 were the following:-

- Crni Vrh = 256–223 days
- Ban. Karlovac = 128-155 days
- Vranje = 133-156 days
- Kopaonik = 134-144 days
- Nis = 81-105 days
- Beograd (Belgrade) = 130-114 days

Of cource, more long term data are desirable. But the information in question is indicative enough.

According to one estimate by Enconet International, the potential of wind resources in FR Yugoslavia amount to 15 PJ/year. However, this estimate should be reviewed in the light of the data in Table 4.

Table 4 FR Yugoslavia: Meteorological data for main towns areas 1999 and 2000

		Ваздушни притисак, h Pa *Barometric pressure, hPa*	Релативна влажност ваздуха,% *Relative humidity, %*	год. Вредност *Annual value* *	Киша[3] *Rain days* [3]	Снежни покривач *Snow-fall*	Грмљавина *Thunder*	Јак ветар преко 6 бофора[4] *Strong wind exceeding 6 Beauforts*[4]	Сијање Сунца[5] *Sunshine duration*[5]
					број дана - *number of days*				
Бан. Карловац	1999	1005.9	78	11.8	140	39	37	128	2050.0
Ban. Karlovac	2000	1007.2	65	13.2	85	17	19	155	2571.7
Београд	1999	1000.7	73	12.5	161	48	36	130	1986.5
Beograd	2000	1001.6	62	14.2	129	20	21	114	2443.1
Бг. - Кошутњак	1999	992.1	71	12.1	134	49	26	81	-
Bg. - Košutnjak	2000	993.0	59	14.0	94	22	14	89	-
Црни Врх	1999	-	79	7.3	133	145	34	256	2022.7
Crni Vrh	2000	-	71	8.2	99	105	57	223	2488.4
Кикинда	1999	1006.6	77	11.6	141	46	39	124	2149.9
Kikinda	2000	1007.5	65	13.0	86	14	28	174	2554.3
Копаоник	1999	827.3	81	4.2	100	164	39	134	-
Kopaonik	2000	828.5	72	4.5	81	136	28	144	-
Краљево	1999	991.5	76	11.6	155	45	32	67	1784.9
Kraljevo	2000	999.4	67	12.9	106	35	28	91	2255.5
Лесковац	1999	989.2	76	11.4	130	44	36	77	1895.4
Leskovac	2000	990.3	66	12.2	91	46	30	82	2423.1
Лозница	1999	1003.0	76	11.9	149	46	34	40	1953.7
Loznica	2000	1003.9	67	13.1	18	13	27	44	2381.7
Неготин	1999	1010.6	73	12.4	117	31	32	73	2108.6
Negotin	2000	1011.8	68	13.1	86	18	26	76	2441.5
Ниш	1999	992.8	72	12.1	138	35	35	81	2010.2
Niš	2000	993.9	64	13.1	97	38	31	105	2399.6
Нови Сад	1999	1006.1	79	11.6	133	50	35	72	2074.9
Novi Sad	2000	1007.0	68	13.0	98	16	17	63	2520.3
Подгорица	1999	1009.9	65	16.4	97	2	46	23	2514.0
Podgorica	2000	1011.6	58	16.4	97	2	39	27	2482.0
См. Паланка	1999	1002.2	76	11.7	155	44	43	78	2077.8
Sm. Palanka	2000	1003.2	65	13.1	111	24	26	122	2591.9
Сомбор	1999	1005.9	74	11.4	136	53	36	100	2033.7
Sombor	2000	1006.7	63	12.8	101	11	24	99	2449.3
Ваљево	1999	994.7	77	11.6	161	49	35	12	1941.0
Valjevo	2000	996.7	73	12.8	114	20	28	17	2426.6
Врање	1999	965.7	72	11.5	124	37	35	133	2119.6
Vranje	2000	967.1	64	12.3	90	27	27	156	2495.5
Зајечар	1999	999.3	73	11.6	118	32	27	36	1879.0
Zaječar	2000	1000.4	67	12.4	87	32	15	15	2207.7
Златибор	1999	898.6	78	8.2	142	124	41	60	2035.2
Zlatibor	2000	899.8	69	9.2	101	102	44	94	2466.6
Зрењанин	1999	1006.4	76	11.7	126	45	33	74	2054.3
Zrenjanin	2000	1007.2	64	13.2	71	15	23	78	2552.9

Source: Federal Hydrometeorological Institute.

[1] Data relate to the mean annual, that is mean monthly values.

* Air temperatures

[2] Quantity of annual, that is of monthly falls.

[3] With 0,1mm and over of rain.

[4] Velocity of wind is shown according to the Beaufort scale 0-12.

[5] Sunshine duration in hours

3.3 Solar Energy

As in the case of other countries in the area, solar irradiation levels in the former Yugoslavia, including Serbia and Montenegro, are amongst the highest in Europe.

The most favourable areas record a large number of hours, the yearly ratio of actual irradiation to the total possible irradiation reaching approximately 50%.

Table 4 shows that in the majority of the localities/areas listed, the duration of sunshine ranges from about 2.000-2.005 hours per year.

Of course, the monthly distribution is particularly important in determining utilization for heating; and whether back-up systems will be needed during periods of extended cloudiness.

In 1998 annual sales of solar flat plate collectors were around 250.000 m^2. Some 28.000 solar thermal units were in operation, replacing the equivalent of 0,14 TWh of fossil fuel derived energy being used mainly for water and space heating in the domestic and tourist sectors.

The total potential for solar active technologies has been estimated to be approximately 50-60% of heating demand in the cloudier central regions. The in-country manufacturing base for the whole of FR Yugoslavia was reported as being strong, with about nine firms in production. But the majority were operating at less than one fifth capacity. And it is not known how many of them have survived the recent crisis. The available expertise, however, indicates that as the economy recovers, it would be easy to accommodate growing demand.

As in other uses, photovoltaic conversion of solar energy is at a much earlier stage in comparison to solar thermal technology. The first production capability for PV cells was established in 1989, and the pre-crisis potential was put at only 0,5 of total energy consumption by the Year 2000. There is no information on the state of this plant at present (Year 2002).

3.3 Geothermal Energy

Studies and reports on the geothermal resources in other members of the former Yugoslav Federation (Slovenia, Croatia, FYR Macedonia and Bosnia Herzegovina) have been presented in our reports for these countries. We could not establish whether and to which extent geothermal resources exist and are being exploited also in Serbia/Herzegovina.

3.4 Biomass Energy

In FR Yugoslavia (Serbia/Herzegovina) extensive use is made of the residues of forests, plantations and crops.

In 2000 FR Yugoslavia exported U.S.$1,7 million of firewood and non-processed wood. Turnover by wholesale trade in firewood in 2000 was 16.700 m^3. But sale from production enterprises was reported as being only 12.600m^3 (22.800 m^3 in 1998).

Most probably these figures do not take account of fire wood used directly by rural communities, without entering the commercial market. Only household or special surveys might yield such information.

It has been estimated by Enconet that 200 ktoe of conventional transport fuel could be saved each year through methanol production from crops grown only on 3% of the total arable land. And another 260 ktoe/yr is considered available from agricultural wastes but few applications exist at the present time.

Table 5 provides areas and production from agriculture (crops and livestock).

Table 5. FR Yugoslavia Biomass Resource Data (FAO 2002a, FAO 2002b).

Biomass resource type	Total production	Production density
Primary crop production, tonne	(avg. 1999-2001, tonne)	(tonne /1000 Ha)
Total primary crops (rank among COO)	21,380,329 (11)	2,096 (11)
Top 10 primary crops		
Maize	4,978,667	488
Alfalfa for Forage & Silage	4,747,000	465
Clover for Forage & Silage	2,476,000	243
Wheat	2,346,667	230
Sugar Beets	1,999,204	196
Potatoes	748,631	73
Maize for Forage & Silage	527,000	52
Plums	373,333	37
Sunflower Seed	315,333	31
Grapes	312,752	31
Animal units, number	(number)	(number / 1000 Ha)
Cattle	1,641,500	161
Poultry	23,805,000	2,334
Pigs	4,229,500	415
Equivalent animal units	3,571,350	350
Forest products, cubic meters	(avg 1999-2000, cu meters)	(cubic meters /1000 Ha)
Wood fuel and charcoal	NA	NA
Wood residues	NA	NA

FR Yugoslavia, excluding Kosovo and Metohia had in 2000 an area under reforestation of 2 933 ha: 2 629 in state land and 304 in private sector ownership.

Total exploitation of forest wood (cut timber, gross volume) amounted to 3.404.000 m^3, of which 2.662.000 m^3 from state and 741.000 m^3 from private ownership.

More detailed research will be essential if one were to establish more accurately the potential energy which could be produced in thermal and/or electrical terms by exploiting to a greater extent through cultivation of energy crops on unused or marginal land, as well as exploiting to a greater extent solid and liquid wastes, e.g. the additional potential of the following categories of residues and wastes:-

- Forest and agricultural residues including prunings and twigs from say vineyards, plantations and gardens.
- Solid and liquid manures from livestock farms and abattoirs.
- The organic and/or combustible component of MSW (Municipal Solid Waste) and sewage sludge (e.g. for biogas, electricity and heat energy through anaerobic digestion or incineration and pyrolysis/gasification).
- Extraction and utilization of landfill gas

Special indepth studies will be needed to establish relevant resources available and the part and extent to which exploitation could be made through appropriate technological routes, with due consideration for economic and financial viability and sustainability. The pricing of such RES products in comparison to those available in the market, with or without fiscal or monetary incentives, will be critical considerations in facilitating the active exploitation to a significant degree of any resources which may be arrived at.

3.6 Hydro-electric Energy

The installed capacities of Hydro Power Plants (HPPs) in 1999 were shown analytically for FR Yugoslavia, spelling out the share of Montenegro, Serbia (Central Serbia, Vojvodina and Kosovo & Metohia).

Out of the total electrical capacity of 8.917 MW (end of year) in 1999 hydro plants were shown to be as follows:

(a) Public Hydro Plants…….. 3.692
(b) Generators …… 3.763
(c) Power Equipment & Energy …. 896

IEA Key Energy Indicators for FRY (Federal Republic of Yugoslavia) display the following shares of TPES in 1999:

Hydro	8.7%
Other Commercial RES	1.6%
Coal	54,4%
Oil	24,3%
Gas	11,0%

These figures exclude electricity trade.

In absolute terms the production figures of electricity and hot water supply in FR Yugoslavia were as follows:

	1999		**2000**	
	mln kwh	**%**	**mln kwh**	**%**
Hydroenergy …….	13 789	40,6	12 030	35,0
Thermoenergy ……..	20 183	59,4	22 330	65,0
Total ……	**33 972**	**100,0**	**34 360**	**100,0**

These figures (Yearbook of Statistics p. 256) which differ slightly from those of Table 2, would suggest that in fact the share of hydro-energy (including presumably hot water from geothermal sources) was much more important than the figure of 8,7% of Hydro energy reported by IEA for 1999. The above figures would suggest a share of 35-40%.

No information is available on how far water resources and fluctuation in precipitation and river flows, would enable further "economic expansion" of hydro-power. Perhaps we should await the results of the assessment carried out by the authorities concerned (incl. the Hydrometeorological Institute, in FR Yugoslavia).

4. OVERALL ASSESSMENT/CONCLUSIONS

FR Yugoslavia, now comprising Serbia and Montenegro, has reconstructed power installations damaged by the recent war and its consumption of electricity is back to the level commensurate with the bad shape of its economy.

The share of RES in energy production and consumption is unusually high, primarily because of the contribution of hydropower 35-40%. No information is available in the prospects for additional expansion of hydropower. But there appear to be prospects for a significant expansion of wind and biomass energy. New detailed studies will be needed both for determining accurately such potential and for carrying out techno-economic feasibility studies and business plans as a basis for obtaining finance, particularly from the EBRD. Fiscal and monetary incentives will be needed at least in the "take-off stage".

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(6) Federal secretariat for Information, E-mail: office@ssinf.sv.gov.yu

5.2 References

(1) The European Renewable Energy Study: Prospects for Renewable Energy in the Community and Eastern Europe to 2010.
Annex 2: Country Profiles: Section on FR Yugoslavia
(**NB**: Only general assessment and one or two figures given on potential)
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