

Participating countries

SLOVENIA

The country report for Slovenia was prepared by the Slovenian Forestry Institute and Raci Ltd.

Current situation on CHP and biomass CHP in the national energy sector.

Slovenia is a country poor in fossil fuels, in particular those of high quality. The existing energy system based on hydroelectric power plants is largely exploited. Due to Slovenia's specific natural conditions in the Alpine and Sub-alpine area, the environment is very vulnerable, which makes the construction of new power plants both a demanding and costly intervention. Slovenia's dependency on imported energy has reached as much as 81 %, although it should not exceed 65 %. The use of energy per inhabitant is within the average of the European Union, while the consumption per unit of GDP is 2.5 times higher, which means that energy is not used as efficiently as in the EU. With respect to this situation, it is understandable that the Resolution on Efficient Energy Supply and Use in Slovenia (1996) gives special emphasis to the improvement of efficiency, and to the increase of consumption (production) through renewable energy sources.

On national level data about power production are collected by Statistical Office of the Republic of Slovenia. There are three important surveys at national level:

- The statistical survey of electricity and heat production in public power plants which covers public supply undertakings which generate electricity for sale to third parties as their primary activity;
- The statistical survey of autoproducers which covers autoproducer undertakings which generate electricity and/or heat wholly or partly for their own use as an activity which supports their primary activity;
- The statistical survey of heat supply that covers heat only plants and heat distribution companies.

Total gross production of electricity in Slovenia was 13.624 GWh (in year 2000), of which 32 % was produced in CHP plants (Table 1). The majority of all CHP plants are public plants, but also autoproducers are very important producers of electricity and heat. By our definition autoproducers are producer undertakings that generate electricity and heat wholly or partly for their own use as an activity that supports their primary activity. They may be privately or publicly owned. From the Biomass CHP point of view the category of autoproducers is very important. According to our data almost all Biomass CHP plants are in wood processing industry and they are in category of autoproducers - they produce electricity and heat mainly to support their primary production.

The majority of CHP plants in Slovenia are producing electricity and heat from lignite, brown coal, fuel oil and natural gas, only 1 % of power from CHP plants is produced from biomass (table 2). Among biomass only wood, wood waste and biogas are used as a fuel in CHP plants.

If we study heat supply in last 5 years we can see that the net production has increased (index is 1,13). Especially the production of CHP plants has increased (for 555 TJ in last 5 years), but unfortunately not on the account of biomass.

Electricity production by type of producers and net power of plants, 2000¹ (GWh, MW)

GWh	total	Total		Public plants		Autoproducers		Male HE ²⁾
		electricity only	CHP plants	electricity only	CHP plants	electricity only	CHP plants	Small HE ²⁾
TOTAL								
Gross production	13624	9247	4377	9061	3927	96	450	90
Own use by power plants	829	324	505	323	463	1	42	1
Net production	12795	8923	3872	8738	3464	96	408	89
Net power (MW)	2631	1768	863	1678	767	19	96	71
Hydroelectric power plants								
Gross production	3834	3834	-	3648	-	96	-	90
Own use by power plants	63	63	-	62	-	1	-	1
Net production	3771	3771	-	3586	-	96	-	89
Net power (MW)	860	860	-	770	-	19	-	71
Conventional thermal plants								
Gross production	5029	652	4377	652	3927	-	450	-
Own use by power plants	553	49	505	49	463	-	42	-
Net production	4476	603	3872	603	3464	-	408	-
Net power (MW)	1115	252	863	252	767	-	96	-
Nuclear power plant								
Gross production	4761	4761	-	4761	-	-	-	-
Own use by power plants	212	212	-	212	-	-	-	-
Net production	4549	4549	-	4549	-	-	-	-
Net power (MW)	656	656	-	656	-	-	-	-

1) The figures are rounded, so the sums might not be totally correct.

2) Estimate for small private hydroelectric power plants.

Source of data: Statistical Office of the Republic of Slovenia, 2001

Fuel use in conventional thermal plants, (year2000)

	Unit	Total			Public plants		Autoproducers ¹⁾	
		Total	Electricity only	CHP plants	Electricity only	CHP plants	Electricity only	CHP plants
Brown coal, imported	1000 t	426	-	426	-	347	-	79
Brown coal, domestic	1000 t	749	609	140	609	140	-	-
Lignite	1000 t	3718	-	3718	-	3718	-	-
Wood and wood waste	1000 t	133	-	133	-	-	-	133
Fuel oil, extra light	1000 t	2	2	-	2	0	-	0
Fuel oil, sulphur below 1%	1000 t	51	-	51	-	2	-	49
Fuel oil, sulphur 1% and more	1000 t	-	-	-	-	-	-	-
Other liquid fuels	1000 t	285	-	285	-	-	-	285
Natural gas	mio Sm ³	225	1	224	1	-	-	224
Bio gas	mio Sm ³	9	-	9	-	-	-	9

¹⁾Fuel use for electricity production and for heat production for sale and for own use is included.

Source of data: Statistical Office of the Republic of Slovenia, 2001

Balance of heat supply

	Unit	1995	1996	1997	1998	1999	2000
Net production							
	TJ	8097	8191	7972	8098	8149	9172
Heat only plants	TJ	2420	2230	2126	2037	2153	2940
CHP plants	TJ	5677	5961	5846	6061	6266	6232
Fuel use¹⁾							
Brown coal	1000 t	221	234	208	254	240	205
Lignite	1000 t	205	192	161	161	156	159
Wood and wood waste	1000 t	41	41	33	30	30	28
Fuel oil, extra light	1000 t	3	2	2	3	5	4
Fuel oil, sulphur below 1%	1000 t	7	17	7	2	1	1
Other liquid fuels	1000 t	0
Natural gas	mio Sm ³	78	88	87	93	94	121
Final consumption							
	TJ	8097	8191	7972	8098	8149	8181
Households	TJ	3876	4446	4589	4465	4330	3952
Other consumers	TJ	4221	3745	3383	3633	3819	4229

Source of data: Statistical Office of the Republic of Slovenia, 2001

RTD and Demonstration projects on biomass CHP

There are no RTD or Demonstration projects on biomass CHP in Slovenia at the moment. Only demonstration projects on biomass fuelled district heating systems exist (PHARE project in towns: Gornji Grad, Preddvor, Solčava and Nazarje).

Legislation and support mechanisms

In Slovenia no special law about renewable sources of energy exist. Also there is no special legal instrument for promotion of biomass CHP plants.

At the moment there are only few legal documents regarding biomass CHP plants:

- **Energy Conservation Strategy for Slovenia (1996):**
 - Special emphasis is given to the promotion of renewable sources of energy (*according to this document share of wood biomass as energy source should double by the year 2010 (from 4 to 8 %)*). To reach this goal some action from the state should be taken (subsidies, investments, CO₂ taxes, special prices for "green electricity" – electricity produced from biomass).
 - There were 8 biomass CHP in Slovenia in 1994 (*heat production 60 MWh and electricity production 8.5 MWh*)
 - The strategy anticipates investments in 6 new biomass CHP plants till 2010 (*The estimate value of the investment is 12 mill. €*).

- Action programme for use of wood biomass in Slovenia (from 2001 to 2010)
 - It is still just a proposal of the government to the parliament (it was not accepted yet).
 - It doesn't anticipate any investment in biomass CHP, only in biomass district heating systems (50 new systems), biomass installation's in industry (100 new installation's) and biomass heating systems for individual houses (5000 new individual heating systems).
 - Investments in installations in industry can also include biomass CHP plants.
 - The estimate value of the investment is 179 mill. €

- **National energy programme (from 2001 to 2010)**
 - According to the law we should have a national energy programme.
 - It is still in preparation, a special emphasis should be given also to biomass CHP plants.

- **Tax on burdening the air with carbon dioxide**
 - According to current legislation users of fossil fuels are entitled to certain tax deductions based on former fuel consumption, electricity generation and measures for efficient energy consumption, former fuel consumption contributing the major part of the deductions.
 - An amendment should come into force soon, cancelling all the deductions based on former fuel consumption, thus making biomass a more interesting energy source.

- **Tax on waste deposition**
 - Tax on waste deposition is among other things based on the content of organic carbon in the waste, this carbon contributing to much higher taxes.
 - With use of biomass as energy source two taxes can be avoided. First, tax on waste deposition, and second CO₂ tax, that should be paid for substitute fossil fuel.

Existing CHP plants

There were only 8 biomass CHP plants in Slovenia in 1995. According to an available database (Ministry of the Environment and Spatial Planning, RACI) there are 6 CHP plants in Slovenia. Five of them are autoproducers installed in wood processing industry. One plant was part of wood processing factory but with downfall of the factory it was sold separately to a private company, which now produces and sells power to different small companies in close neighbourhood. Only one plant is selling surplus electricity and heat to the grid. They all have old out-of-date combustion technologies.

Waste wood from wood processing industry is used in all five plants. Three of them are using only waste wood from their production; two plants are buying wood waste from different suppliers.

The sixth plant is located in a sewage water cleaning plant, using biogas as fuel for gas engines. Three engines (250 kW_{el} each) are installed at this plant, but two of them are out of

commission. The installed electric power of all this five plants is 5.2 MW_{el}. Average annual production is 15.4 GWh of electric power and 190.5 GWh of heat.

A short description of the 5 CHP plants in wood processing industry is given below. All the details are given in Appendix 1.

- **Lipa**

Lipa is an old plant in wood processing industry. It was constructed in 1984 and is located in Adjovscina. It acts as an auto producer – it generates electricity and heat mostly for their own use as an activity that supports their primary activity, though producing electricity only 6 months per year. The plant has the only steam engine for producing electricity from biomass in Slovenia. There are two boilers and 4 heat exchangers. The Lipa power plant supplies annually 46.4 GWh of district heat and 0.02 GWh of electricity. The produced electricity covers 20% of the plant's needs of the unit

- **Kaminik**

Operating since 1968, the Kaminik is an old, privately owned CHP plant built in wood processing industry. Electricity and heat are sold to 55 small companies in neighbourhood. Reconstruction will start this year because there is planning to start with new technology. The surplus will be sold to the grid. The annual production of heat is 12.9 GWh, which covers 100% of their own needs. The grid electricity produced is 2.7 GWh.

- **Merkescha Furnirnica**

Merkescha Furnirnica is owned by a private wood processing industry in Celje and it was constructed in 1977. It acts as autoproducer – generating electricity and heat mostly for their own use as an activity that supports their primary activity and selling the surplus of electricity and heat to the grid. The turbine was reconstructed in 2001. The annual production of district heat is 20 GWh and the grid electricity 1.2 GWh.

- **Novoles**

Novoles CHP plant is owned by a private wood processing industry in Straza and it was constructed in 1970. The produced electricity and heat is used for the needs of the plant. They are using wood remains from their own production but they are officially buying the wood remains from different parts of factory. The annual production of district heat is 66.4 GWh and the grid electricity is 7.4 GWh per year.

- **Tanin**

Tanin CHP plant is owned by a private wood processing industry and is operating since 1978. The produced electricity and heat is used for their own use as an activity that supports their primary activity. The fuel consists of woodchips and bark from their own production so the cost of wood fuel is zero. The annual production of grid electricity is 4.1 GWh and the annual production of district heat is 91.2 GWh.