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EUROPEAN UNION
Danube Transnational Programme
DanuP-2-Gas

Deliverable D.T2.2.1

# Infrastructure Report - Slovenia

Activity A.T2.2: Infrastructure analysis

March 2022

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## DOCUMENT CONTROL SHEET

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| The potential for exploitable organic residue for each participating country listing key aspects such as location, amount, transport options and costs. |

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## IMPRINT

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## Responsible Partner for the compilation of this document

LP Technology Centre Energy - University of Applied Sciences Landshut (DE)
ERDF PP1 Energy Agency of Savinjska, Koroška and Šaleška Region (SI)

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# CONTENT

# 1. METHODOLOGY

In the process of data acquisition for the DanuP-2-Gas project, we have identified some obstacles, specificities, and exceptions that we would like to present in this report. Given that there is no comprehensive or general legislation in the Republic of Slovenia adopted in the area of an on-field implementation and the operation of RES infrastructure, or that these areas are too often covered by several laws that are mostly inconsistent, and even conflicting sometimes, the situation is consequently reflected in the practice. These areas are definitely becoming gradually regulated (new legal acts, laws, strategies and guidelines are being annually adopted), but public and private investors still have some hard time and lack some support, not so much by the implementation and construction process itself, but especially in the long-term operation process, which should also be financially profitable, and not just environmentally friendly, carbon-free and useful. Nevertheless, there are quite a few examples of good practices in the field of the operation of renewable energy plants, present in the country, especially in the field of photovoltaic technology, which is also becoming increasingly useful for private household use. The data on biomass, biogas, photovoltaic and wind renewable energy plants, was collected by market research, by contacting the key stakeholders (Holding of the Slovenian Power Plants, Slovenian Public Energy Agency, etc. ) and using a free database in the form of an online tool - *Atlas of Sustainable Energy*, which is being maintained and updated by the company Borzen d.o.o., which operates as a concessionaire of the Republic of Slovenia in the field of implementation of support schemes for renewable energy sources and cogeneration. The *Atlas of Sustainable Energy* is available at the following link:

http://www.trajnostnaenergija.si/Trajnostna-energija/Proizvajajte/Atlas-trajnostne-energije

The data on the operational hydropower plants in Slovenia, was provided with the expert research of the Slovenian energy market. Information on the location, nominal power and electricity production of hydropower plants (larger and smaller sizes), located in the country, were also available on the following links:

https://www.dem.si/sl/elektrarne-in-proizvodnja/elektrarne/?id=20190904091433O6

https://www.he-ss.si/

https://www.seng.si/hidroelektrarne/

https://www.sel.si/elektrarne

Furthermore, the collection of data on the biogas plants, was very problematic, due to the various unknows (ownership, locations, state of operation or bankruptcy etc.). The problem is that all the Slovenian biogas plants are runed privately and owned by foreign companies or are runed in line with the agricultural activity, by the local farmers. When being constructed some 10 to 15 years ago, the biogas plants were operated by newly opened Slovenian companies, by cooperatives, farmers etc. However, since the production of biogas on such a small scale, clearly wasn't so financially feasible and profitable when being put into practice, most of the biogas plants have been sold to foreign companies, and some of them are still in the bankruptcy proceedings. Some have already changed multiple owners, some were purchased by curious Slovenian investors, looking to earn and additional profit, and some are still not operational, since the former owners are still being law-suited for environmental pollution, which

happened due to the poor care for the biomass plants and the immediate surroundings, and thus the consequential excretion of the manure into the nearby ecosystems.

The data on the industrial plants, was collected by an extensive market research. With our expert assessment, we were able to identify only 4 important representatives, whose operation significantly affects the balance of the Slovenian energy sector and are therefore the largest four private consumers of electricity and natural gas in our country. Most of the data was provided through an extensive internet research as well as telephone communications, to which the selected companies did not respond well. Some data is also available in the annual reports of the identified companies. It is available on the following websites:

https://www.sij.si/sl/druzba/investitorji/letna-porocila/

https://www.talum.si/porocila.html

https://www.salonit.si/

Slovenian electricity transmission network is operated by a national concessionaire ELES d.o.o. The company also takes care of transformer substations, to which any larger energy producer might be connected, such as a potential P-2-G hub. The connection points were identified at the existing transformer substation's locations. The substations are located next to the big cities, towns and main capitol entrances, as well as next to large facilities, factories, power plants and industrial zones. The substations (connection points) were located with the use of an online tool (regularly updated by ELES d.o.o.) - *Public electricity transmission network map*, which is accessible on the official website of the concessionaire, is available at the following link:

https://arcgis1.eles.si/ELES_GIS/

The natural gas transmission network is operated by a company Plinovodi d.o.o., which is also a national concessionaire. However, the company does not share the data on transmission substation's locations publicly, due to legal and different protective reasons. Only the locations of transnational connection points, where the transmission network crosses the national borders are made public. Thus, the natural gas connection points were determined at locations, where the transmission network intersects with large city, town, industrial zone, factory, etc. The connection points were determined based on the assumption, that the natural gas transmission network substation can be installed at any location of the grid (e.g., directly for the operation of P-2-G hub). The data was collected directly using concessionaire's website and by the analysis of the document; *10-year development plan for the transmission gas network for the period from 2022 to 2031*. The map of the natural gas transmission network and the data on the transnational connection points, are both publicly available at the following links:

https://www.plinovodi.si/sl/prenosni-sistem/razvojni-na%C4%8Drt/

https://www.agen-rs.si/documents/10926/106759/10-letni+razvojni+na%C4%8Drt+prenosnega+plinovodnega+omre%C5%BEja+za+obdobje+2022-2031/bd4b4d36-1b98-46aa-a6bc-d12933134577

The water supply (transmission) network, however, is, in the Republic of Slovenia operated in a slightly different way, as compared to the natural and electricity transmission network. Water supply network and sewerage systems in the country are operated, implemented, financed, and constructed on a local level, by municipalities or by local public utility companies, which control, operate and also charge for the use of the local communal goods. Water catchments, sewage treatment plants, public water

supply network and other important infrastructure are planned by each individual municipality or the competent utility company. Thus, there are no major connection points, which could be important for our research or are just impossible to define, due to the dispersion of the public water resources. In any case, larger plants and facilities such as a potential P-2-G hubs, must obtain a special operating permit, which also includes water abstraction (commercial abstraction of water from the local water supply network, use of private water resources, directly on the private estate, the use of water from national catchments, lakes, rivers etc.).

Therefore, for the purpose of this research, we performed an internal expert analysis, by which we determined and located the closest natural water sources (lakes, rivers, ponds, catchments, flooded gravel pits etc.) to the different locations, collected in the infrastructure database and important for the possible P-2-G hub creation. Two online tools were used for the research; *Atlas of the Environment*, and *Spatial Information System of the Municipalities*, where all publicly available geographical, environmental, and spatially planned information can be observed at the municipal level. The online tools are available at the following links:

http://gis.arso.gov.si/atlasokolja/profile.aspx?id=Atlas_Okolja_AXL@Arso

https://www.geoprostor.net/PisoPortal/vstopi.aspx

The transnational links or connection points were located, in the same way as all other important connection points described in the previous paragraphs. The links were divided on to entry and exit points. We identified 17 transnational links, 6 located on the natural gas transmission network, and 11 located on the electricity transmission network.

The potential of the transport hubs was identified at different transport junctions (road, rail, and water transport crossings). In the country of the Republic of Slovenia, river transport is not carried out due to the use of hydro energy on all major Slovenian rivers; Sava, Šoča, Drava and Savinja. Although the country is connected to the Adriatic Sea by more than 40 km of coastline, there is only one significant freight port located in Slovenia, and that is the Port of Koper, which supplies not only the whole country, but other neighbour ones as well. All other transport hubs are thus represented by the locations of freight railway stations, or where the rail and road traffic cross each other. The freight railways stations were identified with the use of the data, which was shared by the company Slovenske železnice d.o.o. (Slovenian Railways), which takes care of the construction and operation of all railway infrastructure, transport, and traffic. A list of freight railway stations is available at the following link, under the chapter 1.3:

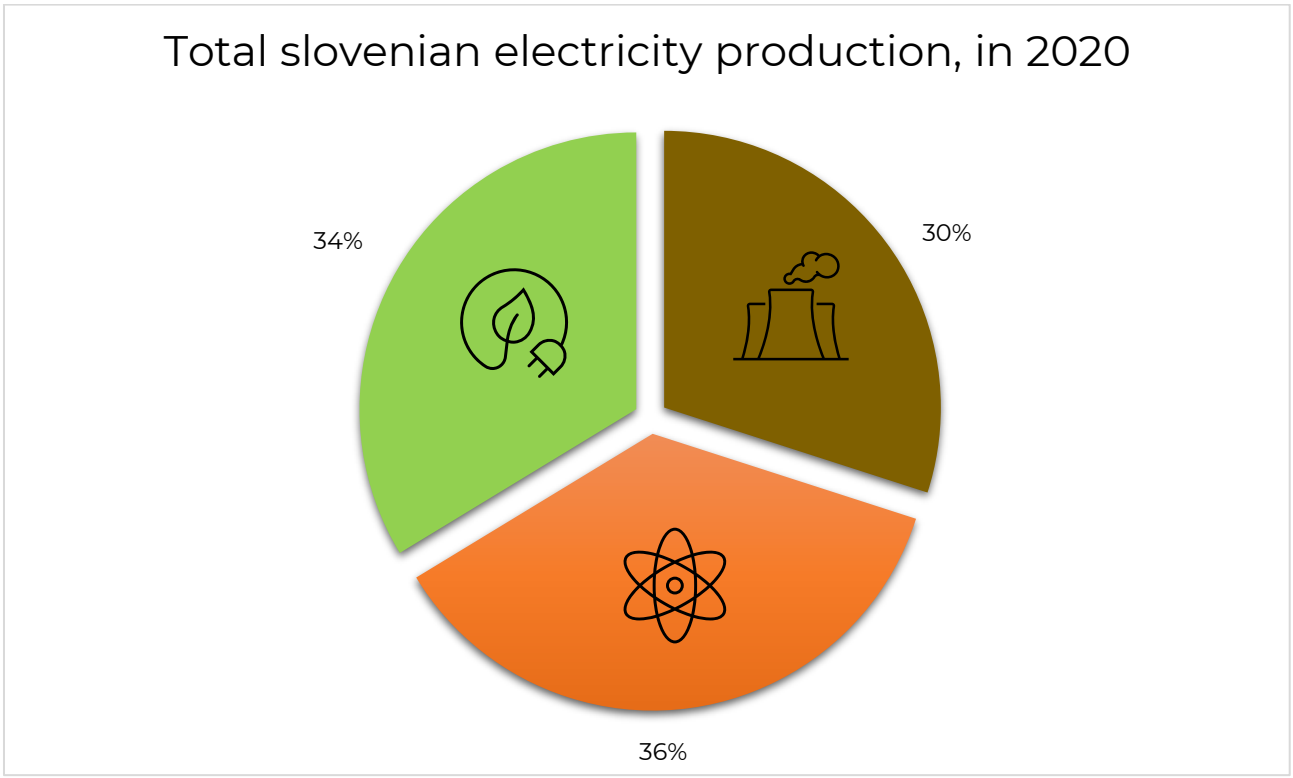
https://ice.slo-zeleznice.si/Predpisi/TAR080003(01012022).pdf

The addresses of all registered companies were collected with the extensive online research. In the same way, the legal names, or any other characteristics, which are described in the infrastructure database, were collected. The exact locations of the companies, plants, connection points, transnational links, and transport hubs, were extracted using online tool, *Google maps*, which is available at the following link:

https://www.google.com/maps

# 2. BRIEF DESCRIPTION OF SLOVENIAN INFRASTRUCTURE LANDSCAPE

The energy mix of the Slovenian energy system is represented by the operation of major and minor energy systems. Major energy systems include the continuous operation of major hydroelectric power plants, located on the rivers Sava, Drava and Soča, Nuclear power plant Krško, major thermal power plants (Šoštanj, Trbovlje, Ljubljana) and Gas-fired power plant Brestanica. There are 4 major groups of hydroelectric power plants in Slovenia, divided by different areas and rivers in the country, which are organized as 4 independent entities: Soča power plants Nova Gorica (sl. *SENG*), Drava power plants Maribor (sl. *DEM*), Hydroelectric power plants on the lower parts of the river Sava (sl. *HESS*), and Sava power plants Ljubljana (sl. *SEL*). There are only three major thermal power plants left in Slovenija: Thermal power plant Šoštanj (which is the biggest one), Thermal power plant Trbovlje and Heating power plant Ljubljana. The minor energy systems of the Slovenian energy mix are represented by minor hydroelectric power plants, two wind turbines (Wind turbine Razdrto and Wind turbine Dolenja vas), smaller operating biomass power plants, various sets of photovoltaic power plants (currently the largest one; Solar power plant Prapretno, with nominal power 3,036 MWp) and operating biogas power plants, which are mostly located in the east part of the country.




Source: Statistical Office of the Republic of Slovenia (slo. SURS)

In Slovenia, one third of electricity is still produced from carbon sources, more than a third is obtained from nuclear energy, and a third directly from renewable energy sources (water, solar, wind, biogas, biomass etc.).

In February 2020, the Slovenian government adopted the *National Energy and Climate Plan* (*NECP*), outlining the energy strategy targets for 2030, with an outlook for 2040. By 2030, Slovenia aims to have renewable energy (RES) make up at least 27% of total energy

usage, while making up 43% of total electricity consumption. It is also expected that two thirds of energy consumption in buildings will be sourced from RES.

Alongside the adoption of the *NECP*, Slovenia is preparing the *Spatial Development Strategy of Slovenia 2050*, which also defines the impact of various RES on environment and nature. Accordingly, the strategy prohibits the installation of wind power plants in protected areas and restricts it to areas far away from settlements. Furthermore, the use of solar power is currently envisaged only on areas of construction land, infrastructure facilities and devalued areas (e.g., abandoned areas of mineral excavations, waste landfill, etc). The strategy is being prepared by the Ministry of the Environment and Spatial Planning and is expected to be completed shortly.

Investments in the renewables sector are highly dependent on the availability of financing mechanisms. The *Slovenian Energy Agency* is the main concessionaire for tenders for the feed-in support scheme. Power plant operators, awarded by public tender, may choose between guaranteed purchase and operating premium. If they choose guaranteed purchase, the Centre for RES/CHP (CP), under the support of Borzen, d.o.o., takes the electricity from the power plant and sells it to the market (the producer is thus included in the special balance group, operated by CP). If they choose the operating premium, the producers sell the energy on the market, while CP only pays a premium as a difference between the full (guaranteed purchase) price and the market price, which is determined annually, also based on plant type. Eligible for the feed-in support are the producers with power plants of installed capacity up to 10MW, excluding wind power plants, where the installed capacity may be up to 50MW.

In March 2020, the Slovenian government adopted *the Decree on Small Installations for the Production of Electricity from Renewable Energy Sources or Through High Efficiency Cogeneration*. It sets out the types of installations for energy production from renewable energy sources and high-efficiency cogeneration that do not require a building permit, e.g., "small power plants". Solar power plants with the maximum power of up to 1MW are, according to the Decree, considered small power plants and do not require a building permit to be installed. The Decree simplifies investing in renewables and it represents a welcome change as procedures for obtaining building permits in Slovenia can be time-consuming. As certain regions in Slovenia are windy, there are many opportunities for the construction of wind power plants. The main obstacle on the path towards building new hydro and wind power plants are NGOs and locals, who oppose the construction of such power plants. Recently, the government identified the development of hydro power plant Mokrice, on the river Sava as a main focus and priority in the forthcoming cohesion period. Moreover, recent changes in the law restricted the influence of NGOs in the process for obtaining building permits.

The government also adopted the *Act on the Promotion of the Use of Renewable Energy Sources*, which sets out measures to promote and increase energy efficiency, particularly to improve the energy efficiency of buildings, achieve security of energy supply and boost the use of renewable energy sources. There are many (co)financing opportunities for the investments in the energy sector available, especially in renewables, and especially now, at the start of a new cohesion period. In addition to tenders for the feed-in support scheme, which are published around twice a year, additional co-financing mechanisms are available. Loans by SID Bank, the Slovenian development and export bank, are available to public sector and ESCO companies for the energy renovation of public sector buildings. Eco Fund, the Slovenian Environmental Public Fund, also

provides several options for obtaining non-refundable funding sources for investment in energy efficiency.

## 2.1 ELECTRICAL ENERGY SECTION

The price of electricity in Slovenia, consists of three chargeable parts: a) network charge (greed/operators fee) – by different tariffs, b) the current price of electricity in the market – by different tariffs, and c) other financial charges, charged by the state (taxes, contributions, excise duties, etc.).

**Network charge/Operators fee**

In our country, the operators fee or a network charge is annually determined by the national regulative company, the Agency for Energy, which determines the actual network charge in accordance with the *Act on the Methodology for Determining the Regulatory Framework and the Methodology for Charging the Network Charge for Electricity Operators*, adopted by the Government of the Republic of Slovenia. According to the above-mentioned regulative, the network charge is calculated and presented in different tariffs, for different groups and sets of energy use. Every year, the Agency for Energy publishes a table of predetermined network charge tariffs, both for customers on the electrical transmission and distribution system. The network charge tariffs are valid for one annual season. The network charge tariffs are available at the following link: https://www.agen-rs.si/-/tarifne-postavke-omreznine and are presented in the next two tables, for the year of 2022.

Tariffs of the network charge for the electricity customers on the transmission system for the year of 2022

| **Electricity consumption** | | **Operators fee / Network charges - Tariffs** | | | |
|---|---|---|---|---|---|
| **Voltage level** | **Annual operating hours** | **Power Tariff (EUR / kW / per month)** | **Monthly transferred electricity (EUR / kWh)** | | |
| | | | **Higher Tariff** | **Lower Tariff** | **Uniform tariff** |
| **High voltage (110 - 400 kV)** | T ≥ 6000 hours | 0,93077 | 0,00154 | 0,0012 | - |
| | 6000 > T ≥ 2500 hours | 0,99541 | 0,00141 | 0,00108 | - |
| | T < 2500 hours | 1,07303 | 0,00149 | 0,00115 | - |
| **Medium voltage (1 - 35 kV)** | T ≥ 2500 hours | 1,81269 | 0,0004 | 0,00031 | - |
| | T < 2500 hours | 1,79284 | 0,00052 | 0,00041 | - |
| | T ≥ 2500 hours | 1,06597 | 0,00204 | 0,00158 | - |
| | T < 2500 hours | 0,87304 | 0,00324 | 0,0025 | - |
| **Low voltage (0,4 kV)** | T ≥ 2500 hours | 1,17104 | 0,00163 | 0,00127 | - |
| | T < 2500 hours | 1,01686 | 0,00261 | 0,00199 | - |
| | T ≥ 2500 hours | 1,02508 | 0,00221 | 0,0017 | - |
| | T < 2500 hours | 0,89838 | 0,00302 | 0,00231 | - |
| | Charging on EV charging stations | 0,44919 | 0,00151 | 0,00117 | - |
| | without measuring power | 0,37893 | 0,00567 | 0,00436 | 0,00523 |
| | households | 0,37893 | 0,00567 | 0,00436 | 0,00523 |

Source:(https://www.agen-rs.si/documents/10926/32579/Tarifne-postavke-omre%C5%BEnine-za-leto-2022/b0c431a4-d808-497c-8402-6f74c7c89018)

Tariffs of the network charge for the electricity customers on the distribution system for the year of 2022

| Electricity consumption | | Operators fee / Network charges - Tariffs | | | |
|---|---|---|---|---|---|
| Voltage level | Annual operating hours | Power Tariff (EUR / kW / per month) | Monthly transfered electricity (EUR / kWh) | | |
| | | | Higher Tariff | Lower Tariff | Uniform tariff |
| High voltage (110 - 400 kV) | T ≥ 6000 hours | - | - | - | - |
| | 6000 > T ≥ 2500 hours | - | - | - | - |
| | T < 2500 hours | - | - | - | - |
| Medium voltage (1 - 35 kV) | T ≥ 2500 hours | 1,19466 | 0,00032 | 0,00024 | - |
| | T < 2500 hours | 1,17882 | 0,00043 | 0,00032 | - |
| | T ≥ 2500 hours | 2,06583 | 0,00563 | 0,00433 | - |
| | T < 2500 hours | 1,53291 | 0,00893 | 0,00687 | - |
| Low voltage (0,4 kV) | T ≥ 2500 hours | 3,0365 | 0,00580 | 0,00448 | - |
| | T < 2500 hours | 2,48828 | 0,00922 | 0,00710 | - |
| | T ≥ 2500 hours | 4,52176 | 0,01418 | 0,01091 | - |
| | T < 2500 hours | 3,7126 | 0,01921 | 0,01477 | - |
| | Charging on EV charging stations | 1,8563 | 0,00960 | 0,00739 | - |
| | without measuring power | 0,39524 | 0,03615 | 0,02779 | 0,00523 |
| | households | 0,39524 | 0,03615 | 0,02779 | 0,00523 |

Source:(https://www.agen-rs.si/documents/10926/32579/Tarifne-postavke-omre%C5%BEnine-za-leto-2022/b0c431a4-d808-497c-8402-6f74c7c89018)

According to the higher tariff, electricity is charged between 06.00 and 22.00, ie during the day. According to the lower tariff, electricity is charged between 22.00 and 06.00 of the next day, ie during the night. According to the uniform tariff, the price does not change during the day-night period.

The electricity transmission system in the Republic of Slovenia is operated only by the company ELES d.o.o. The national distribution system is operated exclusively by the company SODO d.o.o., which performs the economic public service of the electricity distribution operator on the territory of the Republic of Slovenia. It provides the distribution network services with a reliable, secure, and efficient electricity supply for more than 933.000 users in the Republic of Slovenia.

Pursuant to the contract on the lease of electricity distribution infrastructure and the provision of services for the electricity distribution system operator, the following distribution companies carry out distribution activities on behalf of company SODO:

Elektro Celje, d.d.,

Elektro Gorenjska, d.d.,

Elektro Ljubljana, d.d.,

Elektro Maribor, d.d.

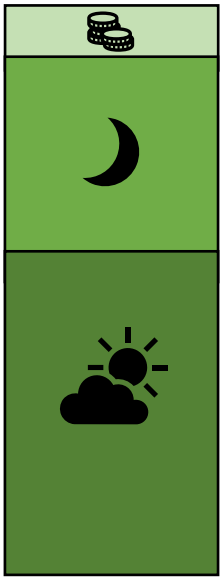
Elektro Primorska, d.d.

**Electricity market price**

The first part of the electricity market price differs by each individual electricity supplier and is charged for each kilowatt hour consumed in the higher, lower, or uniform tariff, as already presented before.

The second part of the electricity market price is presented by a flat-rate cost charged by electricity suppliers in the Republic of Slovenia for fixed costs related to fixed invoices held to the customers and are usually arise from the method of payment (regular bills, e-invoices, etc.).

**Market price**



→ Flat-rate cost (Mostly 5 - 15 % of the el. market price, or also 0%)

→ **X** kWh of Lower Tariff (Mostly 25 - 40 % of the el. market price)

→ **X** kWh of Higher Tariff (mostly 50 - 65 % of the el. market price)

According to the *Report on the national energy situation in Slovenia 2020*, published by the Agency for Energy, the average cost of the electricity market price (kWh consumption of higher tariff + kWh consumption of lower tariff + flat-rate cost), described in this chapter, was 66 € / MWh at the end of the 2020 or 0,066 € / KWh.

The growth of this particular part of the electricity price in the period of 2016 - 2020, can be found in the above-mentioned report, available at this link:

https://www.agen-rs.si/documents/10926/38704/Poro%C4%8Dilo-o-stanju-na-podro%C4%8Dju-energetike-v-Sloveniji-v-letu-2020/6ef6ecb0-4e1c-4ead-83eb-7da6326cd77f

The prices are available on page 101. It is clearly visible, that the market price part of the electricity price, has risen, in recent years. So, it has, for more than 10 €, from the year of 2016.

**Other financial charges**

Other financial charges, cover value added tax (VAT), an excise duty on electricity and three other types of contributions: contribution for the operation of marker operator, contribution for the support of energy efficiency, and the contribution for ensuring support for the production of electricity, with RES and CHP sources.

*The Act on value added tax* regulates the system and introduces the obligation to pay value added tax on the territory of the Republic of Slovenia for the supply of goods, purchase of goods from the European Union (which are made on the territory of Slovenia

for payment), provision of services, etc. Article 41, of the act, determines the VAT rate, which is charged and paid at the general 22% rate of the tax base and is the same for the supply of goods and service. The electricity, gas, heating or cooling energy and similar goods are also subject to taxation at the rate of 22%.

The Act on value added tax is available at the following link:
http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO4701

The amount of the current excise duty is determined by the *Decree fixing the excise duty level for electricity*, which is available at the following link:
http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED8506

Table of excise duty amounts in force

| Rate | Annual consumption | Amount |
|---|---|---|
| **I.** | 0 - 20 MWh / per year | 1,525 € |
| **II.** | 20 - 160 MWh / per year | 1,525 € |
| **III.** | 160 - 10.000 MWh / per year | 1,525 € |
| **IV.** | over 10.000 MWh / per year | 0,90 € |

Source: (http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED8506)

Excise duty is calculated on a simple basis, namely:

Excise duty = consumption per accounting period x excise duty amount (related to the rate presented in the upper table)

The contribution for ensuring support for the production of electricity, with RES and CHP sources is regulated by *the Decree on the method of determining and calculating the contribution for ensuring support for the production of electricity from high-efficiency cogeneration and renewable energy sources,* available at this link: http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED8405

The contribution for ensuring support for the production of electricity, with RES and CHP sources is calculated, by multiplying the grid power (kW) and coefficient of the contribution, which is determined by the *Decree on the method of determining and calculating the contribution for ensuring support for the production of electricity from high-efficiency cogeneration and renewable energy sources*.

The contribution for the support of energy efficiency is determined by the *Decree on energy savings requirements,* which also determines, that the contribution is paid by the final customer. The decree is available at the following link:

http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED6636

The contribution is set at 0.08 cent per kilowatt hour (0,0008 €/kWh). Final customers pay the funds in the form of a contribution to the price of energy or fuels to the operator, where it exists, and for other energy sources to the supplier of energy or fuels, which transfers them to the Eco Fund. The calculation is:

Contribution for the support of energy efficiency = consumption (kWh) x 0,0008 €/kWh

The contribution for the operation of the market operator is regulated by *Decree on the award of a concession and on the method of provision of a service of general economic interest – electricity market operator*. The Decree is available at the following link: http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED6120

It is set in the amount of 0,00013 €/kWh. This contribution is also calculated by multiplying kilowatt hours of electricity with the coefficient 0,00013 €/kWh.

As already presented in the second chapter, in Slovenia, one third of electricity is still produced from carbon sources, more than a third is obtained from nuclear energy, and a third directly from renewable energy sources (water, solar, wind, biogas, biomass etc.).

According to the *Report on the national energy situation in Slovenia 2020*, published by the Agency for Energy, the national electricity production in the year of 2020 was 15.748 GWh. We also imported 7.120 GWh and exported 6103 GWh of electrical energy.

The report is available at the following link: https://www.agen-rs.si/documents/10926/38704/Poro%C4%8Dilo-o-stanju-na-podro%C4%8Dju-energetike-v-Sloveniji-v-letu-2020/6ef6ecb0-4e1c-4ead-83eb-7da6326cd77f

The information on import, export and the production can be found from pages 11 – 13.

## 2.2 NATURAL GAS ENERGY SECTION

In the Republic of Slovenia, supply of natural gas to the customer is provided by the natural gas supplier (transmission system operator) and the distribution system operator, which may be merged within one company or two different companies. If the supplier and the operator are not the same company, the customer may receive two separate invoices, one for the gas supply service and the other for the use of the network. Upon request, the customer can receive a joint single invoice on which the supplier charges for his own account the cost of gas supply and on behalf of the operator also the cost of using the network and performing consumption measurements.

The operator of the Slovenian transmission gas network is the company Plinovodi d.o.o. All companies engaged in the distribution of natural gas in Slovenia also act as suppliers of natural gas. In total, there are 13 operators (distributors) of the gas distribution system, providing gas for more than 80 local communities.

The end price of the natural gas consists of three main elements:

a) Gas market price
b) Network charge
c) Other financial charges

**Gas market price**

The market price part of the gas price is calculated as gas consumption (kWh), multiplied with the current price of the gas on the market (€ / kWh, € / MWh) etc.).

The price of gas varies according to different types of users - household and business users of gas energy.

According to the *Report on the national energy situation in Slovenia 2020*, published by the Agency for Energy, the average cost of the market gas price described in this chapter, for the average household user was around 28 € / MWh at the end of the 2020 or 0,028 € / KWh and around 22 € / MWh or 0,022 € / KWh, at the end of the 2020, for the average business user.

This particular part of the gas price did not change as much in the period from 2018 to 2020, according to the above-mentioned report, available at the following link:

https://www.agen-rs.si/documents/10926/38704/Poro%C4%8Dilo-o-stanju-na-podro%C4%8Dju-energetike-v-Sloveniji-v-letu-2020/6ef6ecb0-4e1c-4ead-83eb-7da6326cd77f

The gas prices are available from page 195 to page 200.

**Operators fee / Network charge**

The network charge for the natural gas distribution system represents a part of the end price of natural gas and is intended to cover the eligible costs of performing the economic public service of the distribution system operator. The network charge or operators fee of the natural gas represents the costs of distribution system operators and consists of:

a) the amount of network charge for distribution, which is calculated according to the connected capacity, granted annual capacity (estimated amount of annual consumption) and the amount of natural gas consumption. The amount of the network charge for distribution covers the cost of operation of the natural gas distribution system.

b) the amount of network charge for measuring the amount of consumption of natural gas, which depends on the size and type of measuring device, ownership of the measuring device and responsibility for maintenance and replacement of the measuring device. The amount of the network charge for measuring the amount of consumption covers the costs related to the implementation of measurements, distribution, archiving and processing of data of performed measurements and maintenance and replacement of measuring devices, if the distribution system operator is responsible for this.

The network charge may be additionally divided and calculated using different costs, related to the administrative activities, such as various flat rates, etc., by different distributors.

**Other financial charges**

There are 5 additional financial charges, for the gas price; value added tax (VAT), an excise duty on gas, contribution for the support of energy efficiency, contribution for ensuring support for the production of electricity, with RES and CHP sources and environmental tax on air pollution with CO2 emissions.

*a) The Act on value added tax* regulates the system and introduces the obligation to pay value added tax on the territory of the Republic of Slovenia for the supply of goods, purchase of goods from the European Union (which are made on the territory of Slovenia for payment), provision of services, etc. Article 41, of the act, determines the VAT rate, which is charged and paid at the general 22% rate of the tax base and is the same for the supply of goods and service. The electricity, gas, heating or cooling energy and similar goods are also subject to taxation at the rate of 22%.

*The Act on value added tax* is available at the following link: http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO4701

b) The contribution for ensuring support for the production of electricity, with RES and CHP sources is regulated by *the Decree on the method of determining and calculating the contribution for ensuring support for the production of electricity from high-efficiency cogeneration and renewable energy sources,* available at this link: http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED8405

The contribution for ensuring support for the production of electricity, with RES and CHP sources is calculated, by multiplying the gas consumption (kW) and coefficient of the contribution, which is determined by the *Decree on the method of determining and calculating the contribution for ensuring support for the production of electricity from high-efficiency cogeneration and renewable energy sources*.

The contribution is set at 0.099 cent per kilowatt hour (0,00099 €/kWh).

c) The contribution for the support of energy efficiency is determined by the *Decree on energy savings requirements,* which also determines, that the contribution is paid by the final customer. The decree is available at the following link:

http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED6636

The contribution is set at 0.08 cent per kilowatt hour (0,0008 €/kWh). Final customers pay the funds in the form of a contribution to the price of energy or fuels to the operator, where it exists, and for other energy sources to the supplier of energy or fuels, which transfers them to the Eco Fund. The calculation is:

Contribution for the support of energy efficiency = consumption (kWh) x 0,0008 €/kWh

d) Environmental tax on air pollution with CO2 emissions is regulated by the *Regulation on the environmental tax on air pollution caused by carbon dioxide,* available at the following link: http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED7380

The environmental tax is calculated by multiplying gas consumption (in kilowatts) with environmental tax coefficient, regulated by the state

e) The amount of Excise duty is regulated by the *Law on excise duties* or a *Decree determining the amount of excise duty on energy products*

Excise duty is also calculated, by multiplying gas consumption (in kilowatts) with the excise duty rate or coefficient.

The above-mentioned legal sources are available at the following link:

http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO7128

http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED7399

## 2.3 BIOCHAR SUPPLY SECTION

Biochar is not yet produced in Slovenia, nor as an energy source, nor as a secondary source for any production or other energy process. The information about Slovenian biochar market can only be provided from the traders. It is only available as an end product, sold in the retail. It is imported and soled as an agricultural fertilizer. There are some companies, which produce it, only in small amounts and only for the agricultural use. The biochar is produced by a pyrolysis process in a small scale, only by companies, which are engaged in the production of garden substrates, e.g. Humko d.o.o. It is sold in bags and by the litres, not kilograms. It is usually sold in 5, 10, 20 and 30 Litre bags. The average retail price of a litre, available on the market is around 1,00 €, with VAT included. The transport price is not available.

## 2.4 WATER SUPPLY SECTION

Sources of drinking or sanitary water in the Republic of Slovenia are distributed by various national and regional public utility companies (E.g., Public Utility Company of Velenje, Public Utility Company of Slovenj Gradec, Utility Kranj). In general, the legal area of water management is regulated by the *Water Act*, available at the following link:

http://pisrs.si/Pis.web/pregledPredpisa?id=ZAKO1244

The use of private water sources (wells, private water catchments, ponds, streams), directly on the parcel of the owner is permitted and therefore also charged, but the financing of all the necessary water infrastructure is really up to the owners of the private resources. However, the mentioned exploiters of private water resources are also obliged to pay all other costs related to the transport and treatment of wastewater to the competent public utility company and thus do not pay only for the discharge of communal wastewater, but also for its cleaning, the environmental tax for the discharge of wastewater, the treatment of rainwater, the discharge of rainwater, etc. VAT is also added.

The invoice for all other persons, with no possibility of using private water source, can highly differ in regards with the area of operation of each individual authorized public company or a concessionaire and can consist of several items, which of course vary from one authorized company to another:

a) Water fee (direct water cost) – It is calculated based on consumed sanitary water in cubic meters (X of $m^3$ multiplied with €/$m^3$)

The water fee is legally regulated by the *Decree on the methodology for pricing the services of obligatory municipal public utility services for environmental protection* available at the following link:

http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED6060

b) Network charge – Depends on the billing method of each individual authorized public company or a concessionaire. It can be billed as an individual item, or it can be billed under each item (E.g., The network charge of the water fee, the network charge of the wastewater discharge etc.). It is charged according to the tariffs set by individual public companies according to the diameter of the installed pipeline.

c) Environmental duty is charged due to environmental pollution of the wastewater discharge. It is regulated and legally determined by the *Decree on the environmental tax for environmental pollution due to wastewater discharge* available at the following link:

http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED6149

d) Wastewater discharge - It is charged at the discretion of the individual public company

e) Rainwater discharge - It is charged at the discretion of the individual public company

f) Wastewater treatment - It is charged at the discretion of the individual public company

g) Rainwater treatment - It is charged at the discretion of the individual public company

h) Value added tax (VAT) regulates the system and introduces the obligation to pay value added tax on the territory of the Republic of Slovenia for the supply of goods, purchase of goods from the European Union (which are made on the territory of Slovenia for payment), provision of services, etc.

Like some other goods, water is taxed at a reduced rate of only 9.5%. Reduced tax rates are presented in ANNEX I of the *Act on the value added tax*, which is available at the following link:

http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO4701

Water prices, especially water supply or water treatment prices, vary according to individual areas of Slovenia. For more detailed information, it would be necessary to contact the authorized public company responsible for the implementation of the communal activities in each individual area.