JOINT INTEGRATED POLICY FOR LOW-CARBON ECONOMY IN CROSS-BORDER REGION

Ref. No.CB006.1.11.165

MANUAL FOR SELF-ASSESSMENT OF CARBON CONSUMPTION

November, 2017

The project is co-funded by EU through the Interreg-IPA CBC Bulgaria–the former Yugoslav Republic of Macedonia Programme.

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FOREWORD

This handbook is created within the framework of Project“Joint Integrated Policy for a Low Carbon Economy in the Cross-BorderRegion”. The handbook aims to present examples of good practices in the Cross-Border Region between Bulgaria and Macedonia related to the transition of the Cross-BorderRegion towards a Low-CarbonEconomy.

For this purpose, the following examples of good practices for transition to a Low-Carbon Economy were selected, as they were the subject of a visit during the Study Tour in the Blagoevgrad Region:

- Energy Efficiency Practices - Energy Efficiency through renovation of residential buildings in Blagoevgrad;
- Use of Renewable Energy Sources (RES) for public needs - "Radost" Kindergarten Center - Simitli, using a Geothermal Source;
- Production of energy from RES - Water cascade "Retige", Kremen;
- Low Carbon Industry - production of pellets from industrial waste;
- Natural Tourism Practices - Dancing Bears Readaptation Park Belitsa;

And the following examples of good practices for transition to a Low-Carbon Economy were selected from the Eastern Planning Region, which were part of a Study Trip:

- Energy efficiency practices and using renewable energy in kindergartens in Vinica and Pehcevo
- Low-carbon practices in construction sector - energy efficiency buildings, hotel “Gogov” Pehcevo
- Solar panels for production of electricity (RES) in Municipality of Delcevo;
- Self -sustainable green energy production from RES – Fish farm and restaurant “Vodenica” near Delcevo
- Sustainable use of natural resources for tourism development – Marsh eco system and adrenaline park Pehcevo

The manual also includes a questionnaire, which can aid public institutions (municipalities) or private business organizations to self-assess the carbon footprint they leave during their activities.

ENERGY EFFICIENCY PRACTICES - ENERGY EFFICIENCY THROUGH RENOVATION OF RESIDENTIAL BUILDINGS IN BLAGOEVGRAD

The National Energy Efficiency Programme for large residential buildings was launched in 2015 with a decision of the Council of Ministers of Republic of Bulgaria.
The main objective of the Programme is the renovation of large (multi-family) residential buildings by implementing energy efficiency measures to ensure better living conditions for citizens in large residential buildings, thermal comfort and higher quality of the living environment. Through the National Program for Energy Efficiency of Large Residential Buildings, the country is aiming to improve the energy efficiency indicators of the dwellings, in line with the objectives set by the European Commission (EC). For instance, in Bulgaria there are more than 70,000 panel dwellings built during the planned economy. Many of these homes are in poor condition, given their advanced age (over 30 years).

By implementing energy efficiency measures in large residential buildings, it is believed that it contributes to:

- Improved level of energy efficiency of large residential buildings and lowering the energy costs;
- Improving the life-cycle performance of buildings;
- Improving the living conditions in accordance with the sustainable development criteria.

Expected results and effects are related to:

- Reduced heating costs for households;
- Improved housing infrastructure and change in the appearance of cities;
- Cleaner Environment - saved Greenhouse Gas Emissions (CO_2, etc.);
- Extend the life of the buildings, which will improve their market value.

As of October 2017, under the National Energy Efficiency Programme, a total number of 2022 large (multi-family) residential buildings have been approved and a total of over BGN 2 billion (EUR 1 billion) has been allocated.
Blagoevgrad District is second in number of buildings approved for rehabilitation with a total of 189 large residential buildings, of which 117 are completed.

For additional information:
Ministry of Regional Development and Public Works of the Republic of Bulgaria
http://www.mrrb.government.bg/bg/energijna-efektivnost/nacionalna-programa-za-ee-na-mnogofamilni-jilistni-sgradi/

EXAMPLE OF USAGE OF RENEWABLE ENERGY SOURCES (RES) FOR PUBLIC NEEDS - "RADOST" KINDERGARTEN CENTER - SIMITLI, USING A GEOTHERMAL SOURCE

Kindergarten Center "Radost" is one of the biggest kindergartens in Simitli Municipality. It has more than 60 years of history, and in the beginning the groups were housed in landscaped buildings, but in the 1970's two kindergartens were built with special buildings in the Oranovo District and the Simitli kindergarten. Consequently, more groups are found in adapted buildings, and now the Kindergarten "Radost" has 9 groups - 7 whole-day and two nursery groups. In 2009 the newly built two buildings - one for kindergarten with 4 groups for 100 children - were opened, the other one is the "Winnie the Pooh" Nursery Center for 50 children. The central building, which was built in the 70's of the last century, has been completely renovated, with modern furnishings, thermal insulation and spacious halls.The garden also has a modern kitchen that meets all the requirements for preparing good and quality food for all children in the Municipality, including a dairy kitchen for the youngest.

At present, at “Radost” Kindergarten Center work 15 pedagogical specialists - kindergarten teachers and about 30 people supporting staff, who serve almost all kindergartens in Simitli Municipality.

The swimming pool is the latest acquisition of the “Radost” Kindergarten and is operatedsince 2016.

In the kindergarten, an innovative heating system has been implemented in the same building as the indoor swimming pool. In fact, the system uses the heat of the mineral water for heating, and the heat pump system also ensures the cooling of the rooms during the hot months.

In this regard, “Radost” Kindergarten Center is a very good example of the optimal use of renewable energy sources of high potential (such as mineral water and geothermal energy) for public purposes, which reduces heating costs compared to conventional sources (naphtha, gas, coal), and on the other hand, it is environmentally friendly.

For additional information:
https://www.facebook.com/%D0%94%D0%93-%D0%A0%D0%B0%D0%B4%D0%BE%D1%81%D1%82-%D0%A1%D0%B8%D0%BC%D0%B8%D1%82%D0%BB%D0%B8-126971227331552/

Simitli Municipality:
http://simitli.bg/

PRODUCTION OF ENERGY FROM RES - WATER CASCADE "RETIGE", KREMEN

"Retizhe Cascade" was put into operation on 7th of September 2004 within the land of the village of Kremen, Bansko municipality, in the Pirinmountain.

The "Retizhe Cascade" ranks first in powerfrom the built in Bulgaria after 1990 small Hydro Power Plants (HPP) of running water., with a altitude of 936 m between the water catchment height (1618 m above sea level) and the elevation of the last Hydro Power Plant (682 m) and the length of the pipelines, a total of 10 375 m.

The Cascade includes 3 small-scale Hydroelectric Power Plants (HPP) on running water with a total power of 7.43 MWh and an annual output of over 23 million KWh of ecologically clean energy. For the production of energy are used the waters of the river Retizhe, which originates from Popovo Lake and the Kremenski Lakes, situated in the southeast slopes of the North Pirin.

The investor of the project is Avers Ltd., a company registered in 1997 with the aim of construction of energy sites for the production of electricity, including Hydroelectric Power Plants, production and sale of electricity.

An interesting note is that in the Cascade was developed and realized project of Pelton turbines based on tested concept models of General Electric Hydro and manufactured by a Bulgarian manufacturer. In the Cascade is also implemented, a fully automated and dispatching Cascade Management of the small Hydropower Plants, based on a SCADA system consisting of TSX 24 telemetry stations, the latest generation of SERCK CONTROLS, and a high-speed radio network for data transmission;

During the construction of the “Retizhe Cascade”, the turbine work wheels were made entirely of machine-driven, compact disk using state-of-the-art technologies, combining the advantages of 3D modeling and precision processing of machines with digital programming control.

The “Retizhe Cascade” could be an example of optimal use of the power of the Mountain Rivers to produce renewable energy.

For additional information:
https://www.avers-bg.eu/Avers/Avers.php

LOW CARBON INDUSTRY - PRODUCTION OF PELLETS FROM INDUSTRIAL WASTE

In the past few years, the tendency to recover waste from the wood processing and furniture industry has begun to be transformed into pellets used for energy purposes (heating).

Such example could be given with Mebelfab AD - Blagoevgrad, which was established as a woodworking enterprise in 1964.

In 1997 the factory was privatized and more than 97% of the capital was owned by private individuals. In 1998, a closed production cycle was achieved - from the primary processing of raw materials, which are of local origin, to production of the final product.

In 2004 and 2006, new, modern equipment was purchased, which allows production of a wide range of solid beech wood products. At present the accent of production activity falls on the production of chairs and tables for houses, restaurants and gardens.

In July 2007, a subsidiary was registered in Germany - MÖBELFAB – GMBH, based in Berlin, aiming at the direct realization of the products from the factory on the European markets.

More than 90% of the products of "Mebelfab" AD - Blagoevgrad are exported abroad and there are many long-term customers in countries such as: Great Britain, Italy, the United States, Israel, Spain, Greece, Lithuania, The Netherlands, Germany etc.
The production base of the factory is located on an area of 26,000 square meters, of which 10,000 square meters are premises.

This includes the following installations:

- Machine room in which cutting, drilling, grinding and assembly of finished products takes place;
- 2 boiler installations;
- Drying chambers for timber;
- Cefla™ finishing installation;
- Storage room for containing dangerous chemicals and mixtures.

In June 2014, a shop for pellet production started operating as a waste-exchange facility to undergo one of the activities under R1-R11 codes under the Waste Management Act. As a raw material for the pellet production is used waste from the main activity of the plant: wood bark waste and bran, shavings, cuttings, wood, thrash boards.

Pellets are an end product having a higher added value than the raw material needed to produce them. Pellets are a very good alternative for heating purposes, than the use of fossil fuels or firewood as they have high energy density value, produce low ashes, and this directly contributes to the reduction of major air pollutants.

For additional information:
http://www.mebelfab.com/about-us.htm

NATURAL TOURISM PRACTICES - DANCING BEARS RE-ADAPTATION PARK BELITSA

The Dancing Bears Re-adaptation Park was officially opened on November 17, 2000, along with the first released and housed in the park bears. This is a result from the efforts of two foundations: “Four Paws” and “Brigitte Bardot” as well as Municipality of Belitsa. Currently, “Four Paws” Foundation has managed to save all 25 registered Dancing Bears in Bulgaria, and another 3 from Serbia. In 2017, the Riku bear - the first inhabitant from Albania in the Park - joined them. Since its inception, the Park has become a unique part of the tourism in Bulgaria, and in particular the region of Belitsa.

The Dancing Bears Park is a long-term project that has several main goals:

- Shelter all officially registered Dancing Bears and to provide them with friendly living space and professional human care;
- Involvement of public and political commitment to the problems related to the preservation and protection of animals;
- Raising young people in a positive attitude and interest in bear's life and in general to animal protection.

Located in the Southern Part of Rila Mountain in the area of Andrianov Chark, 12 km. from the town of Belitsa, Blagoevgrad District, the Dancing Bears Park stretches over 120 000 m^2at altitude of 1200 to 1 345 m. It was built with the help of world-renowned experts studying the behavior and habits of the Brown Bear. The Dancing Bears Re-adaptation Parkoffers its residents dense forests and hills for walks and seclusion, meadows and specially built sunbathing spots.

Different in size and shape lakes and sleeping lairs are also built. In this way, dancing bears are provided with a natural environment and a sheltered place for a peaceful life close to the normal one for their species. Here, for the first time, bears can feel and demonstrate their wild instincts and innate behavior suppressed during their exploitation among humans.

For additional information:
http://park.belitsa.com/

ENERGY EFFICIENCY PRACTICES AND USING RENEWABLE ENERGY IN KINDERGARTENS IN VINICA AND PEHCEVO

According to the National Strategy for energy efficiency of Republic of Macedonia, national and local Action Plans for Energy Efficiency need to be prepared each three years. In last five years concrete measures for energy efficiency of public buildings were implemented by municipalities, public entities and often in cooperation with local NGOs. In East region, several kindergartens have implemented variety of measures for energy efficiency leading towards reduction of CO_2 emission and in the same time providing decreasing of costs for energy and heating. Results from conducted carbon foot prints assessments in frame of the project Joint integrated policy for low-carbon economy in cross-border region, have showed that kindergartens 7th September in Pehcevo and GoceDelcev in Vinica have the lowest CO2 emission.

Kindergarten 7th September is active more than 30 years, with capacity of 100 children. In the period 2012-2017 several measured for energy efficiency were implemented:

- Termoisolation of the façade;
- Replacement of the old doors and windows with PVC;
- Replacement of old oil boiler for heating with two pellets boilers;
- Replacement of lights with energy efficiency lights;
- Installation of solar panel for hot water.

As a result of those measures total emission of GHG is equivalent of 21 tons CO_2/ year.Kindergarten GoceDelcev- clone 2 In Vinica has similar experience in implementation of energy efficiency measures:

- Termoisolation of the façade and roof
- Replacement of the old doors and windows with PVC
- Replacement of old oil boiler for heating with pellets boiler
- Replacement of lights with energy efficiency lights

As a result of those measure total emission of GHG is equivalent of 20,6 tons CO_2/ year, that is enormous reduction of GHG emission compared with 137,4tons CO_2/ year of Kindergarten Goce Delcev – clone 1 in Vinica and 162,4 tons CO_2/ year of Kindergarten 23th August in Berovo, were only replacement of doors and windows were implemented as energy efficiency measures.

For additional information:
https://www.facebook.com/search/top/?q=detska%20gradinka%20pehcevo

https://www.facebook.com/%D0%94%D0%B5%D1%82%D1%81%D0%BA%D0%B0-%D0%B3%D1%80%D0%B0%D0%B4%D0%B8%D0%BD%D0%BA%D0%B0-%D0%93%D0%BE%D1%86%D0%B5-%D0%94%D0%B5%D0%BB%D1%87%D0%B5%D0%B2-%D0%92%D0%B8%D0%BD%D0%B8%D1%86%D0%B0-1701560823390906/

LOW-CARBON PRACTICES IN CONSTRUCTION SECTOR - ENERGY EFFICIENCY BUILDINGS, HOTEL "GOGOV" PEHCEVO

Buildings are the largest energy consumers. The building industry needs to deliver new and renovated buildings with a very high level of energy efficiency and use of renewable energy sources.A variety of international regulations, that are transposed to national level as well,have led to the creation of technical standardsto optimize the energy efficiency of buildings.

Hotel Gogov is new constructed building, positive example of applying low carbon practices, that is operational from 2016 .

The hotel is located in center of Pehcevo, with about 1000m^2 useful area and capacity of 50 guests. Additionally, Hotel Gogov has facilities and services for seminar tourism, with a fully equipped congress center, as well as SPA facilities.

High quality standards were applied in construction of the building, using energy efficiency construction materials, measures for isolation and using solar panels for hot water.

Heating system is also optimized for low carbon consumption. Central heating boiler is using pellets and cherry seeds and this way contributes directly to decreasing of GHG emission and air pollution.

For additional information:
http://www.hotelgogov.mk/

SELF -SUSTAINABLE GREEN ENERGY PRODUCTION FROM RES – FISH FARM AND RESTAURANT “VODENICA” NEAR DELCEVO

Fish farm "Vodenica" is located on the right side of the international road Delchevo-Blagoevgrad near the village of Zvegor.

Fish farm Vodenica is a family business of the Stamenkovski family that was initiated in year 2010, with construction of fish pools on the river Zvegorska for growing trout. In the second phase, a modern fish restaurant wasbuilt right to the fish farm. The entire infrastructure is located near the natural rarity values of the Pijanec-Malesh region that makes the building attractive and unique.

Location of the objet in rural area and out of the electricity power supply system, encouraged owners to solve the problem of energy supply with construction of independent combined system of photovoltaics and wind turbine that completely fulfill the needs for energy of the fish farm and restaurant.

The “Vodenica” is a complex that operates with its own electricity production, which receives part of the sun and a part of the wind, making the building one of the few on the list of such objects that produce green energy for their own needs.

The restaurant capacity is about 150 persons.

For additional information:

https://www.facebook.com/ribnikvodenica/

SOLAR PANELS FOR PRODUCTION OF ELECTRICITY (RES) IN MUNICIPALITY OF DELCEVO

Eastern Macedonia has the largest number of power plants with photovoltaic panels in the country.

One of the photovoltaic panels plant is located near Delcevo on the regional road Delcevo-Pehcevo. There are three stations for production of electricity.

In 2012the first plant”Solar1” was installed with panels and inventory, which convert the current from one-way to alternating. The maximum production is up to 50 kilowatts of electricity, usually 42-45 kilowatts. Also, there are instruments that measure the production of electricity, one for the owners, and the other is for EVN, and both sides get accurate data on how much electricity is produced.

On the next stage the owners decided to build two more plants, "Solar 2" and "Solar 3", which have power over 50 kilowatts, which is, in the group of 50 to 1 megawatt, making the value for the produced electric energy of 26 euros per kilowatt-hour. The total investment for all three plants reaches up to 250 thousand euros.

SUSTAINABLE USE OF NATURAL RESOURCES FOR TOURISM DEVELOPMENT – MARSH ECO SYSTEM AND ADRENALINE PARK PEHCEVO

Marsh eco-system ”Ezerce” is located on the east side of town Pehcevo, with specific flora and fauna. Starting from 2012, this area was recovered by the Municipality of Pehcevo and put in function of education and recreation of local residents and visitors, trough implementation of few projects supported by national and international donors. Final concept of the area is with educational boards for marsh biodiversity, walking paths, sightings, rest and recreation benches, children's playgrounds and other interesting contents. The surface around the marsh is arranged with plants and trees characteristic for the marsh ecosystem. A platform for observation is placed right on the marsh that can serve as an open classroom for the education of the target group of students and tourists, and the whole site is illuminated. In 2016, in cooperation of Municipality of Pehcevo with Hotel Gogov, an adventure trail was constructed in the pine wood near by the marsh ecosystem. The trail is 600 meters long, accompanied with 40 meters long zip-line that goes across the marsh.

The park is made up of three parts;

- An adrenaline pathway with 38 ramps, 26 of which are for adults only;
- Children's zip-line and children's section;
- Section, intended for the youngest, so that the whole family can spend part of the day of rest.

Visitors have possibility to have a multi-hour unforgettable experience in this unique educational and sports-entertainment tourist complex. This area is part of the promotional concept of Pijanec – Malesh, that include more than 30 localities in Municipalities Delcevo, Pehcevo and Berovo with main goal to implement eco-tourism, as a sustainable way of using of natural resources.

For additional information:
http://prirodapijanecmales.mk/
https://www.facebook.com/hotelGogov/app/137541772984354/

SELF-ASSESSMENT QUESTIONNAIRE

FOR CALCULATING THE CARBON PRINTING RELATED TO THE ACTIVITIES OF INSTITUTIONS (MUNICIPALITIES) AND BUSINESS ORGANIZATIONS

The following questionnaire was designed to help institutions (municipalities) and business organizations to calculate the carbon footprint associated with their activities.

IF YOU ARE INSTITUTION (MUNICIPALITY)

Please indicate the number of employees in the institution: .....

The population in your municipality according to the latest data is: .....

IF YOU A BUSINESS ORGANIZATION:

Sector: .....

Years of activity: .....

Your enterprise/company is:

A. Micro enterprise/company (up to 10 employees);

B. Small enterprise/company (10-50 employees);

C. Average enterprise/company (50-250 employees);

D. Large enterprise/company (over 250 employees).

1. Could you assess whether your employees are aware of the impact of global warming:

A. Not familiar;

B. Likely not aware of it;

C. Rather familiar;

D. Fully aware.

2. Would you say from the answers below, what is the impact of global warming on the activity of your institution / company?

A. Mostly negative

/if you chose option A, go to question 4/

B. Positive

/if you chose option B, go to question 5/

C. I do not think global warming is real or a big problem.

D. I have no opinion

3. (BUSINESS ORGANIZATIONS) Would you indicate from the answers listed below whether your company is involved in carbon dioxide emissions trading:

A. YES(Indicate the amount of traded emissions in the last reporting year: ..... tonnes)
B. NO
C. I am not aware of this process.

4. Do you use fossil fuels or their derivatives for heating purposes of buildings and facilities owned by your institution / company:
A. Yes;
/ If you answered yes, go to question 5 /
B. No.
/ If you have answered NO, go to question 6 /

5. What is the type of fuel and what is the amount used for heating purposes of buildings and facilities owned by your institution/company?

A. Coal;
A1. ...../ tons /
B. Natural gas;
B1. ..... / cubic meters /
C. Industrial Diesel;
B1. ..... / tons /
G. Other (please specify) .....

6. Would you indicate from the answers below what is the number and type of vehicles owned or used by all units and departments of your institution/company?

A. Lightweight vehicles ..... / pcs. /
B. Light-cargo vehicles ..... /pcs./
C. Freighters/Trucks ..... / pcs. /
D. For more than 5 passengers ..... / pcs. /
E. Other motor vehicles (please specify) ..... / pcs. /

7. Would you indicate from the answers below the type and amount of fuel consumed on an annual basis by the vehicles owned or used by all the units / departments of your institution / company, including for business trips:

A. Gasoline ...../ liters /
A1. 2015 ..... / liters /
B. Diesel ..... / liters /
B1. 2015 ..... / liters /
B2. 2016 ..... / liters /
C. Natural gas ..... / m^3 /
B1. 2015 ..... / m^3 /
B2. 2016 ..... / m^3/
D. I don't possess such information.

8. Would you indicate from the answers listed below, what percentage of employees in your institution / company are traveling from and to work with motor vehicles:

A. Up to 30%
B. Between 30% and 50%
C. Between 50% and 70%
D. Over 70%
E. Cycling / walking / other non-motorized vehicles;
F. I don't possess such information.

9. Would you indicate from the answers listed below, the average, daily, distance traveled by employees in your institution / company from and to work with motor vehicles:

A. Up to 5 km
B. From 5 to 10 km
C. From 10 to 20 km
D. I don't possess such information.

10. Would you indicate from the answers listed below, what is the approximate annual consumption of office paper in your institution / company:

A. Up to 50 kg **B.** Up to 100 kg **C.** Up to 150 kg
D. Up to 200 kg **E.** Up to 300 kg **F.** Over 300 kg

11. Would you indicate from the answers below, what is the total amount of electricity used by all units and departments of your institution / company:

A. 2015 ..... /kWh/

B. 2016 ..... / kWh/

12. Would you say from the answers listed below, what amount of electricity from the total amount used is produced from renewable sources:

A. 2015 ..... / kWh/

B. 2016 ..... / kWh/

13. (BUSINESS ORGANIZATION) If you are a company that produces electricity from RES, please indicate the amount of electricity produced and the quantity purchased from electricity suppliers?

A. Energy produced ..... / kWh/

A1. 2015 ..... / kWh/

A2. 2016 ..... / kWh/

B. Purchased energy ..... / kWh/

B1. 2015 ..... / kWh/

B2. 2016 ..... / kWh/

13. What is the amount of solid waste generated by the activity of your institution / company during:

A. 2015 ...../ Tons /

B. 2016 ...../ Tons /

14. Would you indicate from the answers listed below, the quantities of waste generated by your institution / company in the last calendar year, broken down according to the following categories:

A. Slowly Degradable Waste ..... / Kg /

/ Paper, Textiles, Straw /

B. Average-rate Degradable Waste ..... / Kg /

/ non-food organic waste such as gardens and parks waste /

C. Fast-rate Degradable Waste ..... / Kg /

/ Food and Waste Products from Domestic and Industrial Water Treatment /

E. Other ..... / Kg /

15. Would you indicate from the answers listed below the quantities of waste generated by the activity of your institution / company in the last calendar year, broken down according to the following categories:

A. Food Waste ..... / Kg /
B. Organic Waste from Gardens and Parks ..... / Kg /
C. Paper Waste ..... / Kg /
D. Waste from Wood ..... / Kg /
E. Textile Waste ..... / Kg /
F. Sanitary Materials ..... / Kg /
G. Rubber Wastes ..... / Kg /
H. Plastics ..... / Kg /
I. Metal Waste ..... / Kg /
J. Glass Waste ..... / Kg /
K. Other ..... / Kg /

16. Would you indicate from the answers listed below, what is the amount of waste water generated by your institution / company during:

A. 2015 ..... Waste water quantity / Liters /
B. 2016 ..... Waste water quantity / Liters /

17. Would you indicate from the answers listed below whether your institution / company owns an (industrial)Wastewater Treatment Plant:

A. YES;
/ If you have answered YES, go to Question No.18 /
B. NO;
/ If you have answered NO, go to question No.20 /
C. No, but we have plans about such installation;
D. It is not necessary.

18. Could you define the type of the Wastewater Treatment Plant?

A. Only with primary purification;
/ removes only physical pollutants /
B. With primary and secondary purification;
/ removes physical contaminants and apply a combination of biological processes leading to biodegradation resulting from the action of various microorganisms /
C. With a complete purification cycle.
/ Also remove pathogenic as well as residual amounts of Nitrogen or Nitrogen oxides and Phosphorites /

19. (BUSINESS ORGANIZATION) Would you indicate from the answers listed below, what is the volume of treated Industrial Water in the Treatment Plant as well as the volume or weight of the product (sludge) remaining in the purification process through:

A. 2015:

A1. Amount of sewage treated ..... / Liters /

A2. Sludge volume ..... / M^3 /

B. 2016;

B1. Amount of sewage treated ..... / liters /

B2. Sludge volume ..... / M^3 /

20. (BUSINESS ORGANIZATION) If your company discards but does not treat \ Waste Water from its operations, would you indicate where the Waste Waters discharged and the amounts involved?

A. River:

A1. Quantity ..... / Liters /

B. Open lagoon:

B1. Quantity ..... / Liters /

C. Closed sewage tank:

B1. Quantity ..... / Liters /

D. Septic Pit:

D1. Quantity..... / Liters /

E. Municipal Wastewater Network

E1. Quantity ..... / Liters /

E. Other

For additional information:

Online Carbon Footprint Calculators

https://www.myclimate.org

http://footprint.wwf.org.uk/

https://www.carbonfootprint.com/calculator.aspx