**WP5**

**Task 5.3: “INTEGRATED SUSTAINABLE ENERGY PLAN AND SEAP/SECAP (ONLY MITIGATION PART) DRAFTING AND ADOPTION ACKNOWLEDGEMENT”**

**SF\_5.3c: SECAP Executive Summary template**

**CRES**

# Sustainable Energy and Climate Action Plan

## Executive Summary

### Vodnjan, Croatia

April 2019

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| Slikovni rezultat za grad vodnjan logo |  | https://www.covenantofmayors.eu/templates/com/images/logos/logo-en.png |

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| https://www.covenantofmayors.eu/templates/com/images/eu-flag.png | This project has received funding by the European Union’s Horizon 2020 research and innovation programme under grant agreement No 695944 |

**Introduction**

The Municipality of Vodnjan is located in Istria, Croatia. The area is 105 km2 and the population of 6119 inhabitants.

The territory is divided in 2 part: coastal zone (9 km of coast) and hinterland zone (rural). It is an area of ancient traditions developing on the remnants of the prehistoric forts, which have existed in the wider area since ancient times. VODNJAN/DIGNANO managed to maintain its outstanding characteristics of a Medieval urban and rural centre, so that today it resembles a man with a rich history. Its wide area with innumerable characteristic kažuni or casite (little stone houses) built in the technique of dry-stone walls denoting property stands as witness to a millennium of its inhabitants being engaged in agriculture, especially olive-growing and wine-growing as the basis of their own material prosperity.

According to the legend, it developed out of the association of seven villas, which were part of the colonial goods of Pula. VODNJAN/DIGNANO was known as early as Roman times as VICUS ATTINIANUM and listed in historical records in 932 at the time of Pietro Candiniano, to whom the Istrian towns were giving amphorae of „good wine" in exchange of protection. Inside the historic nucleus, the town preserved its characteristic Medieval look with atria and narrow streets, irregularly winding among houses, with cobble roads and facades made of cobble stone, old streets still impressively recognizable by their Gothic, Venetian, Renaissance and Baroque style and many churches rich with memories and art. Among many, in the old town there is St. Jacob Church or "delle Trisiere" that was designated as a parochial church as early as 1212, a church that witnessed some important historical events such as the peace agreement with Pula in 1331 and the writing of the Statute of 1492.

The vision is that Municipality of Vodnjan will encourage the agricultural sector (as one of the most important local economic activity) to reduce CO2 emission with the conversion to more sustainable agricultural methods.

With a clear will to build a more sustainable, attractive, liveable, resilient and energy efficient territory, the Municipality of Vodnjan has committed to the following:

* promotion of energy efficiency and renewable energy sources
* encouragement of sustainable measures for local community
* capacity building and taking actions
* smart cities concept development
* sustainable mobility development

**(MITIGATION part)**

**Emission inventory approach**

**Monitoring Emissions**

The Municipality of Vodnjan - Dignano, as a new member of the CoM Initiative developed a Baseline Emissions Inventory (BEI) in order to evaluate the progress of the actions’ implementation, the achievements made in the future so and define the necessary corrective actions in case they are needed.

*Figure 1. Status of implementation of actions*

*Figure 2. Overall budget spent*

*Figure 3. Estimated greenhouse gas emissions reduction according to the implementation status of the actions*

*Figure 4. Greenhouse gas emissions per sector*

*Figure 5. Final energy consumption per sector*

In total, in the monitoring year 2017, CO2 emissions in the city were 28,444.48 tons of CO2 and energy consumption was 123,565.26 MWh. Energy consumption in the transport sector was 95,107.06 MWh, which is 76.97% of total energy consumption, while in the building sector it was 28,137.10 (22.77%) and 321.09 MWh in the public lighting sector (0.26%).

**Baseline Emissions Inventory (BEI)**

The baseline Emissions Inventory was elaborated for 2017 (baseline year) and for the calculation of the emissions, the activity-based approach has been adopted, while the reduction target was 40.00% or 11,377.56 4 t CO2in the year 2030.

**Final Energy Consumption & Corresponding CO2 Emissions**

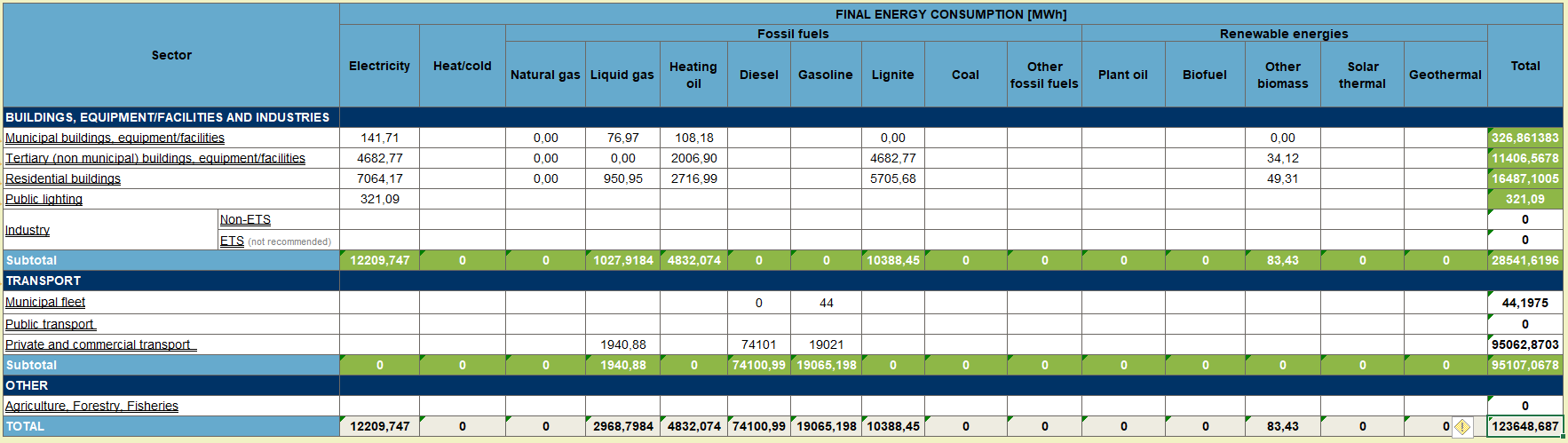
The methodology adopted in order to calculate the Final Energy Consumption and the corresponding CO2 emissions in the Municipality of Vodnjan was a bottom – up approach and the emission factors used are presented in the table below.

*Table 1; CO2 emission factors adopted [t/MWh]*

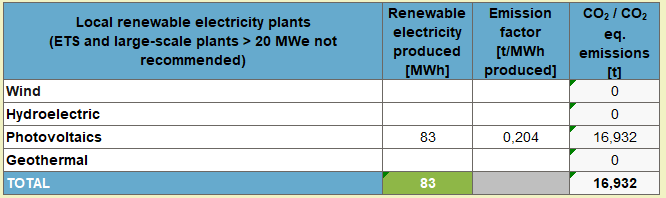
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Electricity** | | **Heat/cold** | **Fossil fuels** | | | | | | | | **Renewable energies** | | | | |
| **National** | **Local** | **Natural gas** | **Liquid gas** | **Heating oil** | **Diesel** | **Gasoline** | **Lignite** | **Coal** | **Other fossil fuels** | **Plant oil** | **Biofuel** | **Other biomass** | **Solar thermal** | **Geothermal** |
| **0,323** | **0,323** | **0,000** | **0,000** | **0,244** | **0,264** | **0,000** | **0,000** | **0,000** | **0,000** | **0,000** | **0,000** | **0,000** | **0,000** | **0,000** | **0,000** |
| **0,158** | **0,158** |  | **0,202** | **0,227** | **0,267** | **0,267** | **0,249** |  |  |  |  |  | **0,000** |  |  |

Taking into account the guidelines published by the Covenant of Mayors for Climate and Energy as well as the EC Joint Research Centre on how to develop a SEAP/SECAP, the Final Energy Consumption, the Energy Supply and the corresponding CO2 emissions per activity sector, in the Municipality’s territory are presented in the following tables.

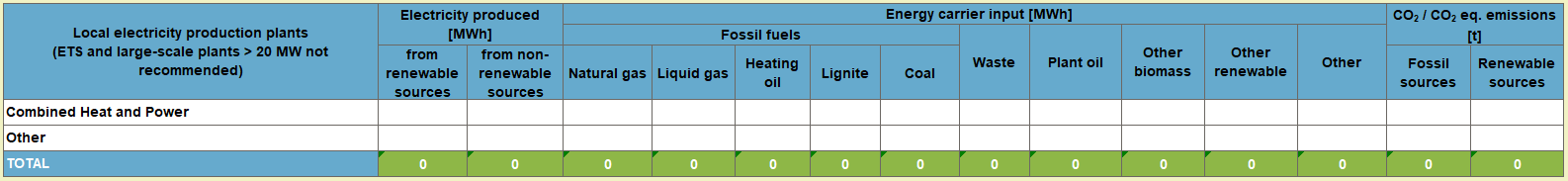
*Table 2: Final Energy Consumption per activity sector in Municipality of Vodnjan*



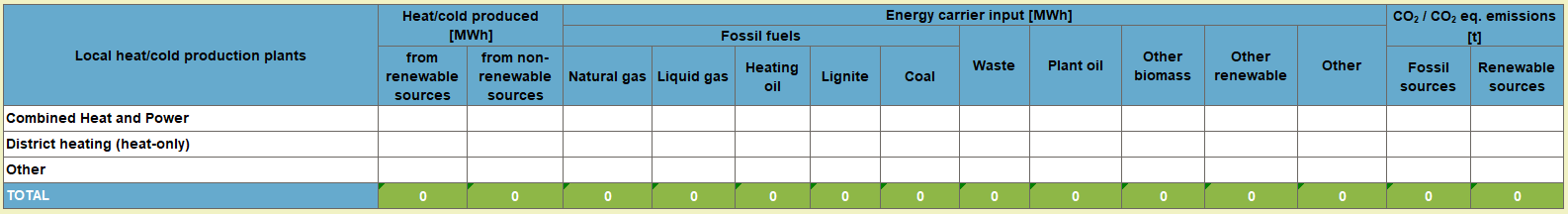
*Table 3: Local/distributed electricity production (Renewable energy only)*



*Table 4: Local/distributed electricity production*



*Table 5: B4. Local heat/cold production*



*Table 6: Baseline Emissions Inventory*

*Figure 3. CO2 emissions share per activity sector*

The greatest share in total emissions of CO2 in the monitoring year 2017 came for the transport sector. Emissions of CO2 caused by the transport sector in the monitoring year were 24,991.84 tons of CO2, which presents 87.86% of total CO2 emissions. The building sector emitted 3,401.91 tons of CO2, which presents 11.96% of total CO2 emissions. The smallest emissions of CO2 were from public lighting, 0.18% or 50.73 tons of CO2. In total, in the monitoring year 2017, CO2 emissions in the city were 28,444.48 tons of CO2.

**Key mitigation actions to put the overall strategy into actions**

The Municipality of Vodnjan, through its active participation in the actions of H2020 Empowering Project and with the rigorous support of the Istrian development agency - IDA, was empowered to identify the energy challenges, set priorities and define actions and measures to be implemented in its territory, in order to accelerate turning its vision reality.

The SEAP proposes 16 measures in the building sector, 8 measures in the transport sector and 1 measure in the public lighting sector.

*Table 6: The key measure in the building sector*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Action/Measure** | **Encouraging of thermal insulation of buildings envelope and roof in residential buildings** | | | |
| **Area** | *Building envelope* | | | |
| **Description** | *Energy management* | | | |
| **Priority** | High | | **Start Year** | *2019* |
| **Status of implementation** | *Ongoing* | | **Ending Year** | *2030* |
| **Main responsible for the measure** | *Residential buildings owners* | | | |
| **Stakeholders Involved** | *Residential buildings owners* | | | |
| **Estimated budget** | 60,000 € | | | |
| **Funding source** | *City budget*  *Istrian county*  *The Environmental Protection and Energy Efficiency Fund (Fond za zaštitu okoliša i energetsku učinkovitost - FZOEU)* | | | |
| **Expected results** | | | | |
| **Estimated CO2 reduction CO2/a** | | 508.82 t CO2 | | |
| **Estimated Energy savings MWh/a** | | 2,261.44 MWh | | |
| **Estimated Renewable energy production MWh/a** | | 0 | | |

*Table 6: The key measure in the transport sector*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Action/Measure** | **Replacement of existing vehicles with new vehicles complaint to EURO standards** | | | |
| **Area** | *Cleaner/efficient vehicles* | | | |
| **Description** | *Grants and subsidies* | | | |
| **Priority** | High | | **Start Year** | *2019* |
| **Status of implementation** | *New* | | **Ending Year** | *2030* |
| **Main responsible for the measure** | *The City of Vodnjan - DIgnano* | | | |
| **Stakeholders Involved** | *Vehicle owners* | | | |
| **Estimated budget** | 0 € | | | |
| **Funding source** | *Vehicle owners’ funds* | | | |
| **Expected results** | | | | |
| **Estimated CO2 reduction CO2/a** | | 4,874.14 t CO2 | | |
| **Estimated Energy savings MWh/a** | | 19,496.55 MWh | | |
| **Estimated Renewable energy production MWh/a** | | 0 | | |

*Table 6: The key measure in the public lighting sector*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Action/Measure** | **Modernization and expansion of public lighting system** | | | |
| **Area** | *Energy efficiency* | | | |
| **Description** | *Energy management* | | | |
| **Priority** | High | | **Start Year** | *2019* |
| **Status of implementation** | *Ongoing* | | **Ending Year** | *2030* |
| **Main responsible for the measure** | *The City of Vodnjan - DIgnano* | | | |
| **Stakeholders Involved** | *The City of Vodnjan - DIgnano* | | | |
| **Estimated budget** | 75,000 € | | | |
| **Funding source** | *City budget*  *The Environmental Protection and Energy Efficiency Fund (Fond za zaštitu okoliša i energetsku učinkovitost - FZOEU)* | | | |
| **Expected results** | | | | |
| **Estimated CO2 reduction CO2/a** | | 6.00 t CO2 | | |
| **Estimated Energy savings MWh/a** | | 37.97 MWh | | |
| **Estimated Renewable energy production MWh/a** | | 0 | | |

**Conclusions**

Afore given analysis of the monitoring emission inventory of CO2 and the comparison with the baseline emission inventory of CO2 points to the need of existing and new measures and activity implementation for CO2 reduction, especially in the building and transport sector in order to achieve total reduction in energy consumption and CO2 emission.