



Regional perspective:
Overcoming problems in
data collection and analysis -
The experience of the
Medjimurje county in Croatia

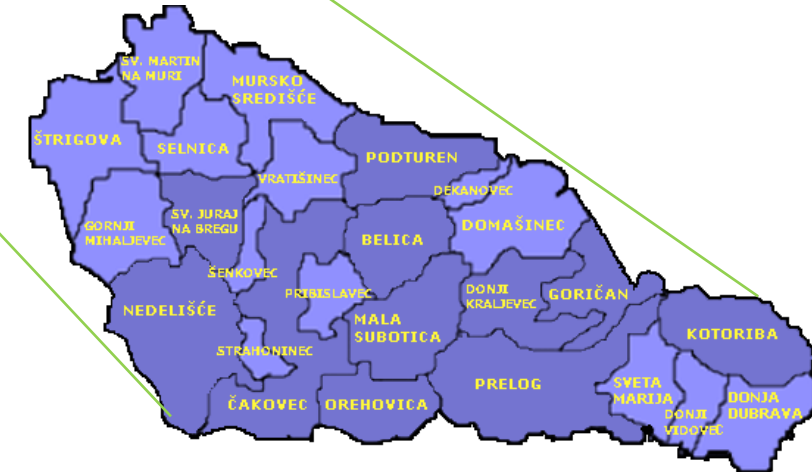


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About us – Medjimurje County, Croatia



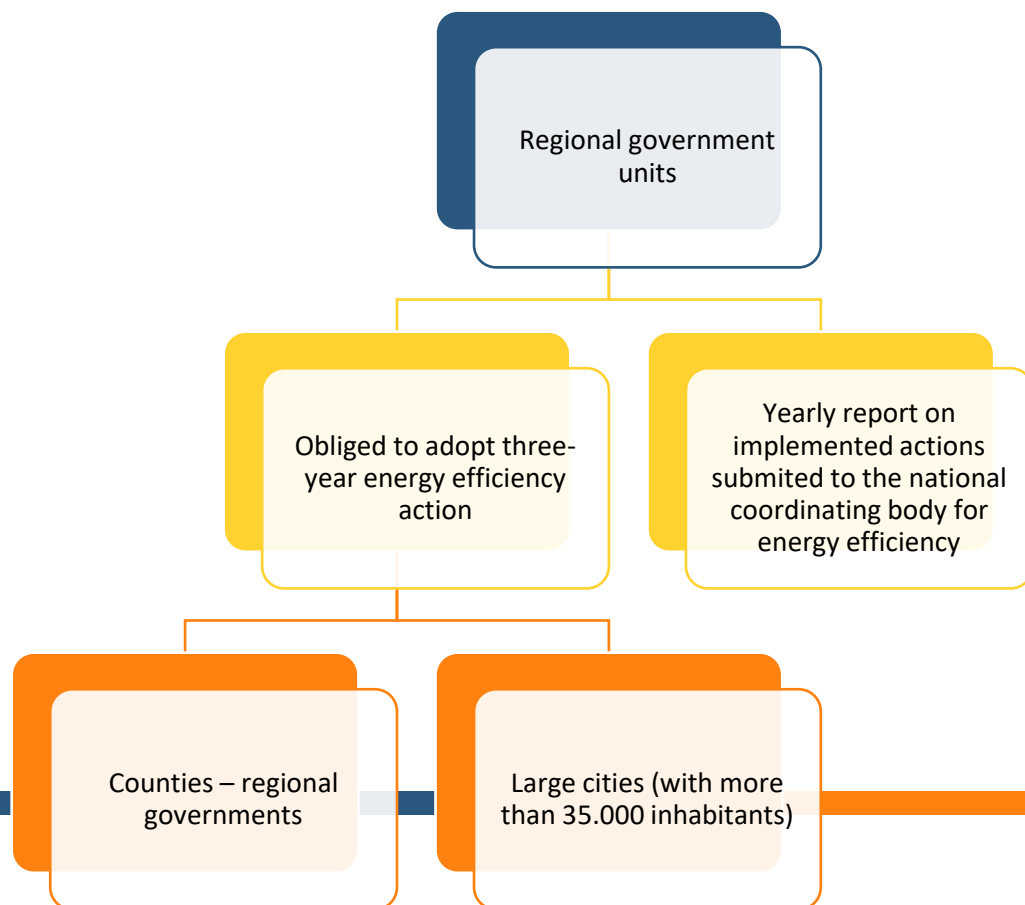
- Population: 105.250 (2021)
- Area: 729,58 km²
- Population density: 144,26 inhabitants/km²
- Administrative divisions: 3 towns and 22 municipalities
- Number of villages: 131
- Status of regional authority (County) obtained in 1992
- Day of the County: April 30



Planning context

Regional mandate on planning

- Mandated by the Croatian Energy Efficiency Act (OG 127/14, 116/18, 25/20, 32/21, 41/21)

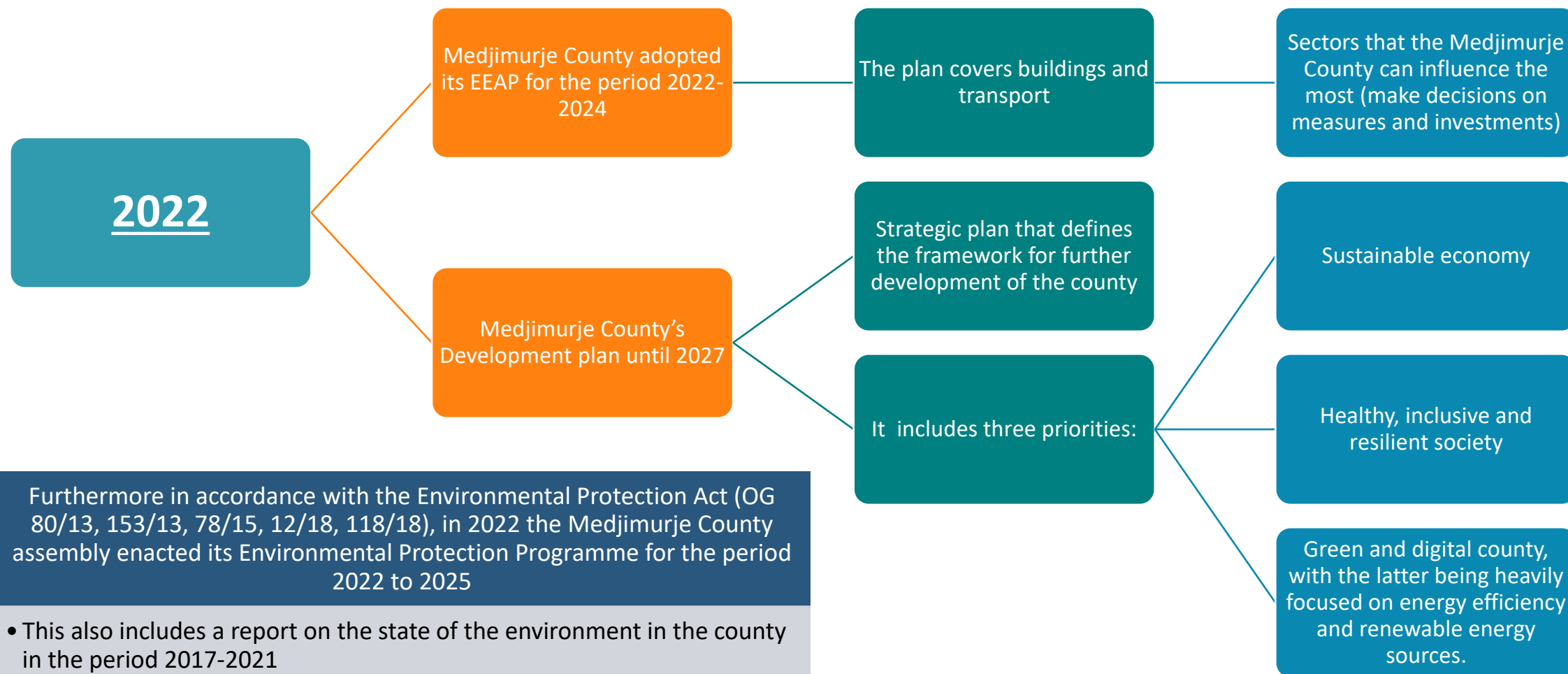


The Croatian Strategic Planning and Development Management Act (OG 123/17, 151/22)

- Mandates that every regional government needs to adopt a Development Plan

An umbrella document which prescribes the main development principles and needs of the county

Planning context

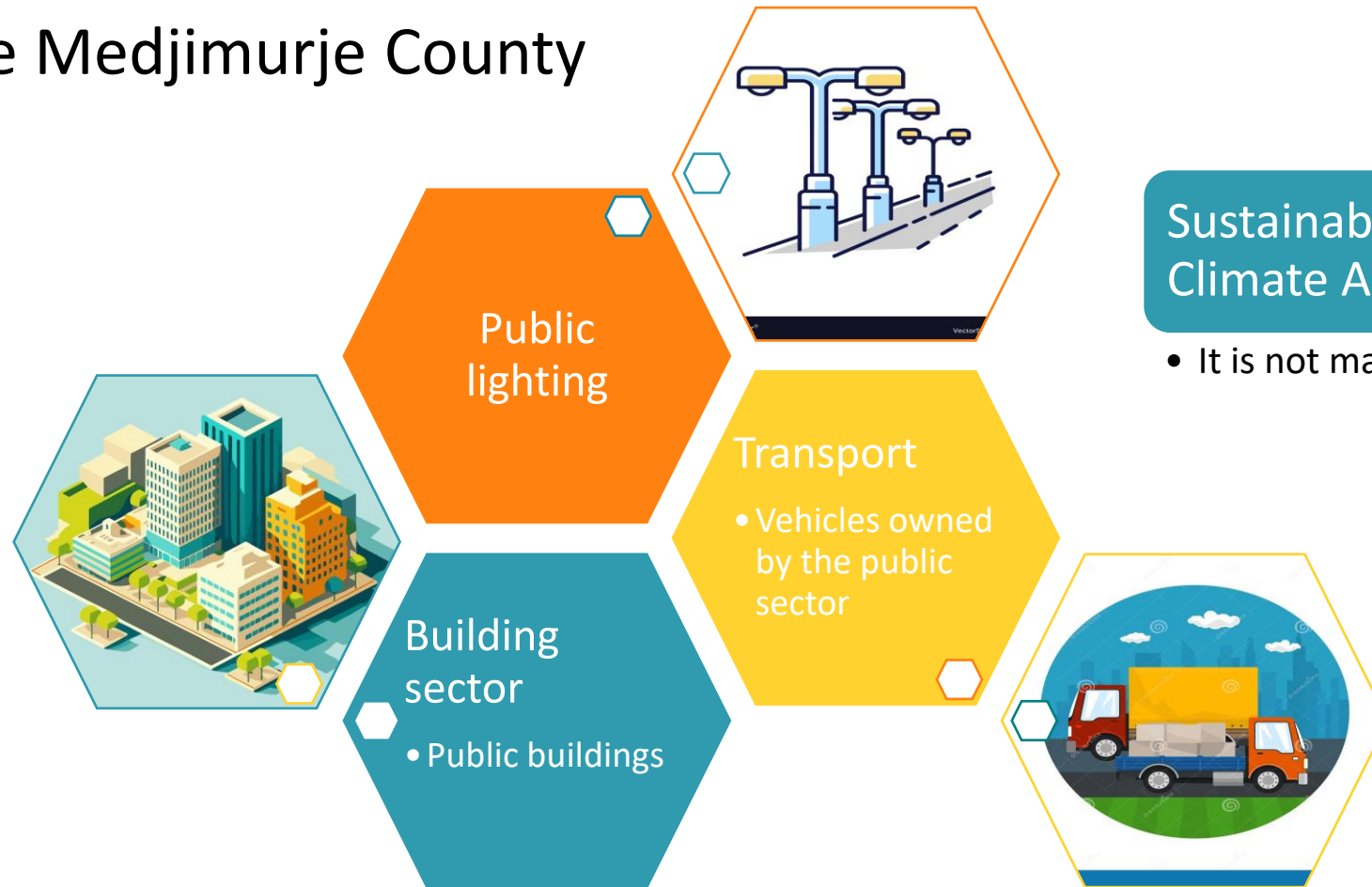


Furthermore in accordance with the Environmental Protection Act (OG 80/13, 153/13, 78/15, 12/18, 118/18), in 2022 the Medjimurje County assembly enacted its Environmental Protection Programme for the period 2022 to 2025

- This also includes a report on the state of the environment in the county in the period 2017-2021
- Other programmes include: the Air Protection Programme for the period 2022-2025 and the for of Climate Change Mitigation, Adaptation and Protection of the Ozone Layer Programme for the period 2022-2025

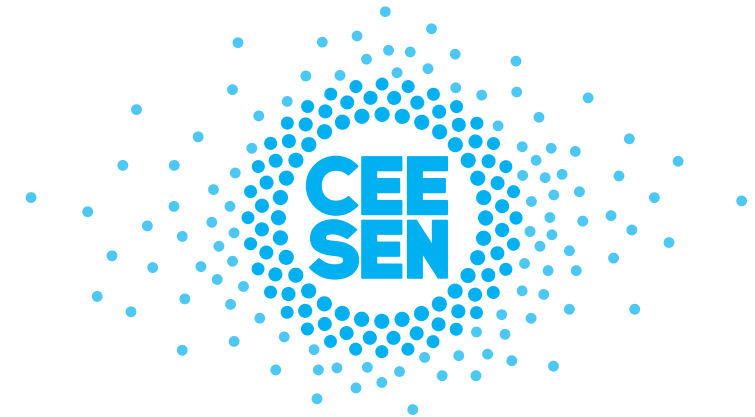
Energy Efficiency Action Plan (EEAP)

- Data at the Medjimurje County level



Energy and Climate Action Plan (ECAP+)

- Pilot document → CEESEU-DIGIT
- *New type of uniform, holistic, cross-sector Energy and Climate Plans (ECAP+) for regional implementation*
- Aims towards just transition:
 - Definition of just energy transition
 - Energy security
 - Energy poverty
 - Addressing climate change



CEESEU-DIGIT

Central and Eastern Europe Sustainable
Energy Union's Design and Implementation
of regional Government Initiatives for a just
energy Transition

Data collection

Inventory year

- How to choose the inventory year?
 - Check data availability
 - Take into account disruptions of energy consumption (e.g. COVID)
- How did we choose the inventory year?
 - 2022 – not all data was available at the time
 - 2021 – post COVID year - no real consumption
 - 2020 – COVID year - no real consumption
 - **2019** – real consumption → inventory year



Data collection - Energy Demand Inventory

Buildings, equipment/facilities and industries

ENERGY INVENTORY DATA COLLECTION TEMPLATE

Inventory year

A. Final energy consumption

Sector		FINAL ENERGY CONSUMPTION [MWh]																
		Electricity	District heating and cooling	Fossil fuels								Renewable energies					Total	
				Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal		Geothermal
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES																		
Regional/Municipal buildings, equipment/facilities		13.313,50	0,00	37.294,08	0,00	244,75	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	103,73	0,00	0,00	50.956,06
	Regional/Municipal buildings, equipment/facilities	9.913,50	0,00	37.294,08	0,00	244,75	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	103,73	0,00	0,00	47.556,06
	Public lighting – ingerencija općina i gradova	3.400,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3.400,00
	Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00
Tertiary (non municipal) buildings, equipment/facilities		83.286,50	0,00	148.829,02	0,00	11.605,78	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	11.605,78	0,00	0,00	255.327,08
	Institutional buildings	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00
	Other	83.286,50	0,00	148.829,02	0,00	11.605,78	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	11.605,78	0,00	0,00	255.327,08
Residential buildings		113.200,00	0,00	296.824,25	0,00	35.501,21	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	300.000,00	0,00	0,00	745.525,47
Industry	Non-ETS	152.300,00	0,00	65.779,25	0,00	10.903,96	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-	0,00	0,00	228.983,21
	ETS (not recommended)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00
Buildings, equipment/facilities and industries not allocated		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00
Subtotal		362.100,01	0,00	548.726,60	0,00	58.255,70	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	#VRIJEDNOST!	0,00	0,00	1.280.791,82

Data collection - Energy Demand Inventory

Buildings, equipment/facilities and industries

ENERGY INVENTORY DATA COLLECTION TEMPLATE

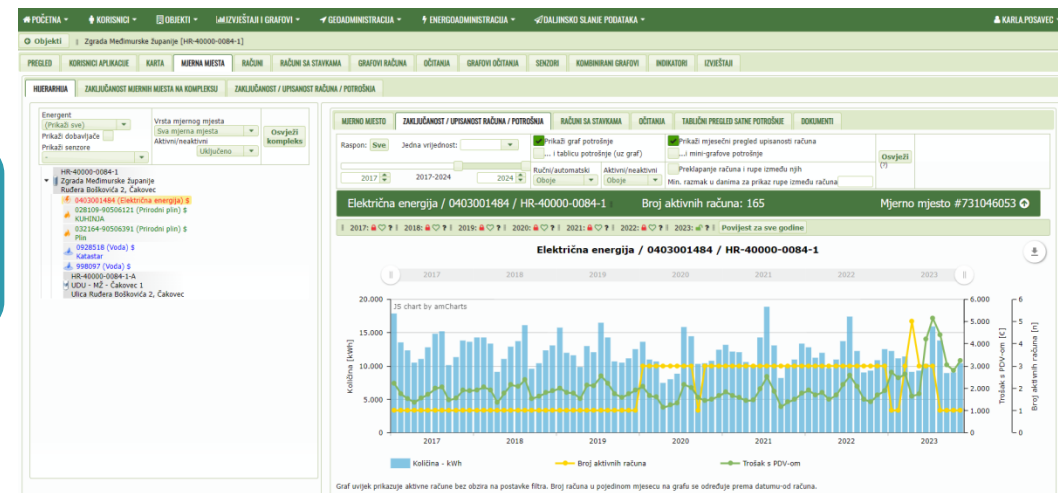
Sector	Electricity	District heating and cooling	FINAL ENERGY CONSUMPTION [MWh]								Renewable energies						Total
			Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	Geothermal	
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Regional/Municipal buildings, equipment/facilities	9.913,50	0,00	37.294,08	0,00	244,75	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	103,73	0,00	0,00	47.556,06
Public lighting - ingerencija općina i gradova	3.400,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3.400,00
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00

Data from ***Energy efficiency action plans*** (EEAP) and ***central Information energy management system*** (ISGE)

Medjimurje County or institutions founded by Medjimurje County own 135 public buildings

- MENEА - Monitors energy and water consumption through national, central Information energy management system (ISGE)

Estimation: 60% of the total number of public buildings



Data collection - Energy Demand Inventory

Buildings, equipment/facilities and industries

Example Medjimurje County

ENERGY INVENTORY DATA COLLECTION TEMPLATE

Sector	FINAL ENERGY CONSUMPTION [MWh]																
	Electricity	District heating and cooling	Fossil fuels								Renewable energies						Total
			Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	Geothermal	
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Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00

Electricity consumption in regional/municipal buildings (EEAP) = 6.195,94 MWh

Estimation: 60% of the total number of public buildings



$$6.195,94 \text{ [MWh]} * 60\% = \underline{3.717,56 \text{ [MWh]}}$$

Percentage of other public buildings!

$$6.195,94 \text{ [MWh]} + 3.717,56 \text{ [MWh]} = \underline{9.913,50 \text{ [MWh]}}$$

Data collection - Energy Demand Inventory

Buildings, equipment/facilities and industries

Data from **Energy efficiency action plans** (EEAP)

- Consumption sectors: educational, health and other
- Estimation: 60% of public buildings in the area of Medjimurje County



To get **total consumption** figure from EEAP needs to be **increased by 60%**

More detailed information can be requested from the local energy and gas distributor (DSO's)

ENERGY INVENTORY DATA COLLECTION TEMPLATE																	
Sector	FINAL ENERGY CONSUMPTION [MWh]																
	Electricity	District heating and cooling	Natural gas	Liquid gas	Heating oil	Fossil fuels					Renewable energies					Total	
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Regional/Municipal buildings, equipment/facilities	13.313,50	0,00	37.294,08	0,00	244,75	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	103,73	0,00	0,00	50.956,06
Regional/Municipal buildings, equipment/facilities	9.913,50	0,00	37.294,08	0,00	244,75	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	103,73	0,00	0,00	47.556,06
Public lighting – ingerencija općina i gradova	3.400,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3.400,00
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00

Data from document **Medjimurje County in figures (Statistical Yearbook)** for 2019

- more detailed information can be requested from the local electricity distributor (DSO)

Attention to units of measurement and conversion!

Data collection - Energy Demand Inventory

Buildings, equipment/facilities and industries

ENERGY INVENTORY DATA COLLECTION TEMPLATE

Sector	FINAL ENERGY CONSUMPTION [MWh]																
	Electricity	District heating and cooling	Natural gas	Liquid gas	Heating oil	Fossil fuels					Renewable energies					Total	
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Tertiary (non municipal) buildings, equipment/facilities																	
	83.286,50	0,00	148.829,02	0,00	11.605,78	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	11.605,78	0,00	0,00	255.327,08
Institutional buildings	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00
Other	83.286,50	0,00	148.829,02	0,00	11.605,78	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	11.605,78	0,00	0,00	255.327,08

- Calculated data from document **Medjimurje County in figures (Statistical Yearbook)**

- Electricity consumption of entrepreneurship minus electricity consumption of public sector (it is managed under entrepreneurship)
→ double rendering avoided

- Exact data from document **Medjimurje County in figures (Statistical Yearbook)**
- $m^3 \rightarrow MWh$

- Estimated data from **Medjimurje County in figures (Statistical Yearbook)**

- heating oil
- other biomass

5% of total consumption of natural gas and electricity

Data collection - Energy Demand Inventory

Buildings, equipment/facilities and industries

- Estimated data from **document Medjimurje County in figures (Statistical Yearbook)**
 - Estimated energy and natural gas consumption of the total consumption for Residential buildings
 - Heating oil - 5% of total consumption**

ENERGY INVENTORY DATA COLLECTION TEMPLATE																	
Sector	FINAL ENERGY CONSUMPTION [MWh]																Total
	Electricity	District heating and cooling	Natural gas	Liquid gas	Heating oil	Fossil fuels					Renewable energies						
						Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	Geothermal	
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES																	
Residential buildings	113.200,00	0,00	296.824,25	0,00	35.501,21	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	300.000,00	0,00	0,00	745.525,47
Industry	152.300,00	0,00	65.779,25	0,00	10.903,96	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-	0,00	0,00	228.983,21
ETS (not recommended)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00
Buildings, equipment/facilities and industries not allocated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00

- Exact data from **document Medjimurje County in figures (Statistical Yearbook)**

- Estimated data** according to *natural gas consumption*

Data collection - Energy Demand Inventory

Transport

ENERGY INVENTORY DATA COLLECTION TEMPLATE

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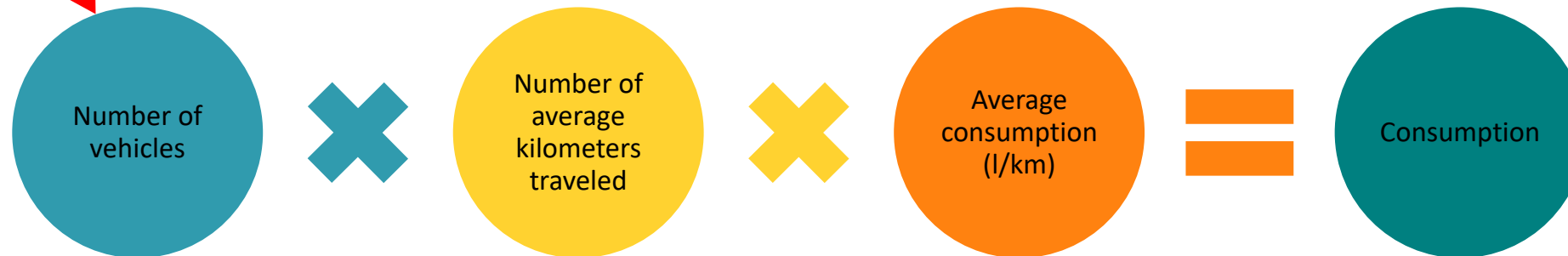
Data collection - Energy Demand Inventory

Transport

Data on the number of vehicles is from document Energy Efficiency Action Plan of Medjimurje county and informations from administrative department of the Medjimurje County

ENERGY INVENTORY DATA COLLECTION TEMPLATE

Sector	FINAL ENERGY CONSUMPTION [MWh]																
	Electricity	District heating and cooling	Fossil fuels								Renewable energies						Total
			Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	Geothermal	
TRANSPORT																	
Regional/ Municipal fleet	0,00	0,00	0,00	0,00	0,00	972,96	972,96	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1.945,91
Road	0,00	0,00	0,00	0,00	0,00	972,96	972,96	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1.945,91
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00



- Estimation:
 - 50% diesel vehicles
 - 50% gasoline vehicles

Data collection - Energy Demand Inventory

Transport

Example for Medjimurje County

ENERGY INVENTORY DATA COLLECTION TEMPLATE

Sector	FINAL ENERGY CONSUMPTION [MWh]																
	Electricity	District heating and cooling	Fossil fuels								Renewable energies						Total
			Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	Geothermal	
TRANSPORT																	
Regional/ Municipal fleet	0,00	0,00	0,00	0,00	0,00	972,96	972,96	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1.945,91
Road	0,00	0,00	0,00	0,00	0,00	972,96	972,96	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1.945,91
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00

105 vehicles owned by Medjimurje County



12.500

Average kilometers traveled per year



0,07

Average consumption per 1 kilometer (7l/100km)



0,01059

1 l diesel = 0,01059 MWh



2

Municipality vehicles

50% diesel vehicles

50% gasoline vehicles

Calculation:

$105 \times 12.500 \text{ km} = 1.312.500 \text{ km}$
 $1.312.500 \text{ km} \times 0,07 \text{ l/km} = 91.875 \text{ l}$
 $91.875 \text{ l} \times 0,01059 = 972,96 \text{ MWh}$
 $972,96 \text{ MWh} \times 2 = 1.945,91 \text{ MWh}$
 $1.945,91 \text{ MWh} / 2 = \underline{972,96 \text{ MWh}}$

Data collection - Energy Demand Inventory

Transport

Public transport covers the transport of students to school

ENERGY INVENTORY DATA COLLECTION TEMPLATE

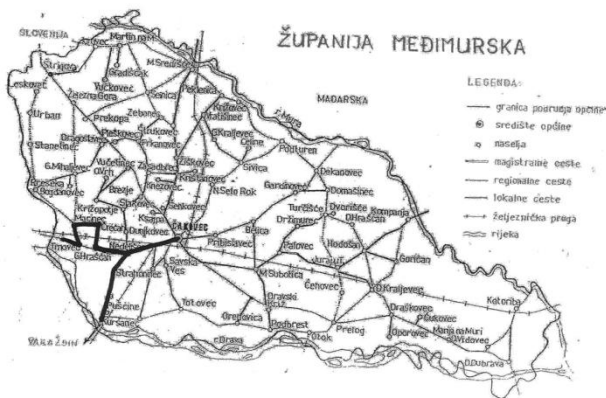
Sector	FINAL ENERGY CONSUMPTION [MWh]																
	Electricity	District heating and cooling	Fossil fuels								Renewable energies						Total
			Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	Geothermal	
TRANSPORT																	
Public transport	0,00	0,00	0,00	0,00	0,00	7.739,95	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	7.739,95
Road	0,00	0,00	0,00	0,00	0,00	2.150,07	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	2.150,07
Rail	0,00	0,00	0,00	0,00	0,00	5.589,89	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	5.589,89



- There is no exact data and we made an estimation
 - How did we estimated energy consumption for public transport?

Data collection - Energy Demand Inventory

Transport – Public transport - Road



Checked data:

Number of bus operators for student transportation

Number of lines on which student transport is carried out

Calculated the total number of kilometers per working days, weekend and holidays

Add up the total daily kilometers traveled to get a result on a weekly basis

Multiplied by the average number of weeks when classes are held

Finally result must be multiplied by the average consumption

Pay attention to the units of measurement!

Data collection - Energy Demand Inventory

Transport

Example for Medjimurje County

ENERGY INVENTORY DATA COLLECTION TEMPLATE

Sector		FINAL ENERGY CONSUMPTION [MWh]															
		Electricity	District heating and cooling	Fossil fuels							Renewable energies						Total
				Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	
TRANSPORT																	
	Public transport	0,00	0,00	0,00	0,00	0,00	7.739,95	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	7.739,95
	Road	0,00	0,00	0,00	0,00	0,00	2.150,07	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	2.150,07
	Rail	0,00	0,00	0,00	0,00	0,00	5.589,89	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	5.589,89

676.760 km per year (all bus lines together)



0,3



Average consumption per 1kilometer (30 l/100 km)



0,01059



1l diesel = 0,01059 MWh

Calculation:

$676.760 \text{ km} \times 0,3 \text{ l/km} = 203.028 \text{ l}$
 $203.028 \text{ l} \times 0,01059 = 2.150,07 \text{ MWh}$

Data collection - Energy Demand Inventory

Transport – Public transport – Rail



Example for Medjmurje County

Timetable - buy ticket

☐ One way

☒ Return journey

From

Via

Departure date

Return journey date

Additional departure options

▼

Number of passengers

1

▲▼

Discount

Regular Return

▼

Additional return options

▼

To

Return departure from

Class

2. class ▼

☐ Direct trains ☒ All trains

Number of passengers

0

▲▼

Discount

▼

Search



[illegible]

Source: HŽ Passenger Transport



The railway network in Medjmurje County

Attachment 2.13. Distance between official places, permitted/limited speeds and free profiles																	
Name of the station/section	Code	KM position	Status of the section [m]	Length of the section [km]	Main station distance [km]	Speeds (allowed or limited)										Free profiles	
						Driving direction A-B (direction according to the name of the station)					Driving direction B-A (direction opposite to the track name)						
						Track		Speed (km/h)			Track		Speed (km/h)				
						From km	To km	Track type	Permitted speed	Limiting technology	From km	To km	Track type	Permitted speed	Limiting technology		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
23. M501 DG - Čakovice - Kotoriba - DG																	
Čakovice DG		7480	0+000	10	1590	M501	51+000	51+044	100	+	51+044	51+080	100	+	51		
Čakovice - Žitavsko		7480	0+044	03	1590			+	+	+	+	+	+	+	51		
Macinec		7480	0+143	03	2073			+	+	+	+	+	+	+	51		
Macinec - Đurđevac		7480	0+143	03	2073			+	+	+	+	+	+	+	51		
Đurđevac		7480	0+205	03	2567			+	+	+	+	+	+	+	51		
Đurđevac - Čakovice		7480	0+205	03	2567			+	+	+	+	+	+	+	51		
Čakovice		7480	0+245	14	2747			50+000	50+000	35	+	47+000	47+000	35	+	51	
Čakovice - Čakovice-Buzinov		7480	0+245	14	2747			50+000	50+000	35	+	47+000	47+000	35	+	51	
Čakovice-Buzinov		7480	0+310	03	3197			+	+	+	+	+	+	+	51		
Čakovice-Buzinov - Mala Subotica		7480	0+310	03	3197			+	+	+	+	+	+	+	51		
Mala Subotica		7480	0+400	01	6307	M548			100	+			100	+	51		
Mala Subotica - Čakovice		7480	0+400	01	6307			+	+	+	+	+	+	+	51		
Čitlukovo		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Čakovice - Đurđevac		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Đurđevac		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Čakovice - Đurđevac		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Đurđevac		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Čakovice - Đurđevac		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Đurđevac		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Đurđevac - Goran		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Goran		7480	0+408	03	6337	M548			100	+			100	+	51		
Goran - Đurđevac		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Đurđevac		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Čakovice - Đurđevac		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Đurđevac		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Čakovice - Đurđevac		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Đurđevac		7480	0+408	03	6337			+	+	+	+	+	+	+	51		
Čakovice - Đurđevac		7480	0+408	03	6337			+	+	+	+						

Distance between train stations

Data collection - Energy Demand Inventory

Transport – Public transport – Rail

Example for Medjimurje County

ENERGY INVENTORY DATA COLLECTION TEMPLATE

Sector	FINAL ENERGY CONSUMPTION [MWh]																
	Electricity	District heating and cooling	Fossil fuels								Renewable energies						Total
			Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	Geothermal	
TRANSPORT																	
Public transport	0,00	0,00	0,00	0,00	0,00	7.739,95	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	7.739,95
Road	0,00	0,00	0,00	0,00	0,00	2.150,07	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	2.150,07
Rail	0,00	0,00	0,00	0,00	0,00	5.589,89	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	5.589,89

Checked data:

- Kilometers per route
- Multiplied by the total daily number of trains per route

Calculation was made for weekdays/weekends/Sundays and holidays



301.919,44 km per year



1,7483 l/km

Average consumption per 1 kilometer (174,83 l/100 km)



0,01059 l

1 l diesel = 0,01059 MWh

5.589,89 MWh

Data collection - Energy Demand Inventory

Transport

ENERGY INVENTORY DATA COLLECTION TEMPLATE																	
Sector	FINAL ENERGY CONSUMPTION [MWh]																
	Electricity	District heating and cooling	Fossil fuels					Renewable energies								Total	
			Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	Geothermal	
TRANSPORT																	
Private and commercial transport	0,00	0,00	0,00	0,00	0,00	263.814,77	263.814,77	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	527.629,54
Road	0,00	0,00	0,00	0,00	0,00	263.814,77	263.814,77	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	527.629,54

Based on data from the police on the number of registered vehicles

Estimation:
50% diesel vehicles
50% vehicles are gasoline



Estimated
average car
consumption
(0,07 l/km)



Estimated
average annual
number of
kilometers
(12,500 km)



Consumption

Data collection - Energy Demand Inventory

Transport

Example for Medjimurje County

ENERGY INVENTORY DATA COLLECTION TEMPLATE

Sector		FINAL ENERGY CONSUMPTION [MWh]															
		Electricity	District heating and cooling	Fossil fuels							Renewable energies						Total
				Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	
Private and commercial transport		0,00	0,00	0,00	0,00	0,00	263.522,88	263.522,88	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	527.045,77
	Road	0,00	0,00	0,00	0,00	0,00	263.522,88	263.522,88	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	527.045,77

57.046 personal vehicles registered in the County of Medjimurje

- 168 → Vehicles owned by Medjimurje County and municipalities
- 12.500 → Average kilometers per year
- 0,07 → Average consumption per 1 kilometers (7l/100 km)
- 0,01059 → 1l diesel = 0,01059 MWh
- 2 → 50% diesel vehicles; 50% gasoline vehicles

Calculation:

$$\begin{aligned}
 &57.046 - 168 = 56.878 \\
 &56.878 \times 12.500 \text{ km} = 710.975.000 \text{ km} \\
 &710.975.000 \text{ km} \times 0,07 \text{ l/km} = 49.768.250 \text{ l} \\
 &49.768.250 \text{ l} \times 0,01059 = 527.045,77 \text{ MWh} \\
 &527.045,77 \text{ MWh} / 2 = \underline{\underline{263.522,88 \text{ MWh}}}
 \end{aligned}$$

Data collection - Energy Demand Inventory

Other

ENERGY INVENTORY DATA COLLECTION TEMPLATE																	
Sector	FINAL ENERGY CONSUMPTION [MWh]																
	Electricity	District heating and cooling	Fossil fuels								Renewable energies						Total
			Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	Geothermal	
OTHER																	
Agriculture, Forestry, Fisheries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00
Other not allocated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00
Subtotal	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

- There is no publicly available data for the agriculture sector for Medjimurje County
 - Data available on request!?

Data collection - Energy Production Inventory

ENERGY INVENTORY DATA COLLECTION TEMPLATE

Inventory year

B. Energy supply

B1. Local/distributed electricity production (Renewable energy only)

Local renewable electricity plants	Renewable electricity produced [MWh]	Renewable installed capacity [MW]
Wind	-	-
Hydroelectric	779.900,00	157,20
Photovoltaics	13.344,60	11,60
Geothermal	-	-
Sustainable Biomass	-	-
Other	-	-
TOTAL	793244,6	168,804

Publicly available data from document **Energy in Croatia 2019**

Publicly available data from document **2019 Annual report of HEP ODS (national DSO)**

Total installed capacity of photovoltaic power plants



Average annual production of photovoltaic power plants per kW of installed power



1000



Renewable electricity production in 2019 in the area of Medjmurje County in MWh

Data collection - Energy Production Inventory

ENERGY INVENTORY DATA COLLECTION TEMPLATE

Inventory year

Estimated data from document ***Energy in Croatia 2019***

B. Energy supply

B2. Local/distributed electricity production

Local electricity production plants	Electricity produced [MWh]		Energy carrier input [MWh]											CO ₂ / CO ₂ eq. emissions [t]	
			Fossil fuels					Waste	Plant oil	Other biomass	Biogas	Other renewable	Other	Fossil sources	Renewable sources
	from renewable sources	from non-renewable sources	Natural gas	Liquid gas	Heating oil	Lignite	Coal								
Combined Heat and Power	0	202,2945	-	0	0	0	0	0	0	0	0	0	0	-	0
Other (EIS and large-scale plants > 20 MW not recommended)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	202,2945	0	0	0	0	0	0	0	0	0	0	0	0	0

B3. Local heat/cold production

Local heat/cold production plants	Heat/cold produced [MWh]		Energy carrier input [MWh]											CO ₂ / CO ₂ eq. emissions [t]	
			Fossil fuels					Waste	Plant oil	Other biomass	Biogas	Other renewable	Other	Fossil sources	Renewable sources
	from renewable sources	from non-renewable sources	Natural gas	Liquid gas	Heating oil	Lignite	Coal								
Combined Heat and Power	0	0,78	-	0	0	0	0	0	0	0	0	0	0	-	0
District heating (heat-only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0,78	0	0	0	0	0	0	0	0	0	0	0	0	0

Publicly available data from document ***Register of renewable energy sources***

Conclusion

Depending on the sector and the type of data,
in most cases the exact data are easily available

Certain data needs to be researched and
estimated based on available data

Do not let this discourage you when planning
and creating data analyses!



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