



EUSALP EU STRATEGY FOR THE ALPINE REGION

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EUSALP ENERGY SURVEY UPDATE – 2019

Report

80 million people, 7 countries, 48 regions,
mountains and plains addressing together
common challenges and opportunities



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INTRODUCTORY NOTE

Macro-regional strategies provide a framework for cooperation, coordination, and consultation between and within states and regions. They depict an opportunity for greater regional cohesion and more coordinated implementation of European sectoral policies in transnational territories that are confronted with common challenges and opportunities. The EU Strategy for the Alpine Region (EUSALP) is the fourth macro-regional strategy endorsed by the Council in 2015. It covers a territory inhabited by 80 million people and includes 48 regions from seven countries of which five countries are EU member states, namely, Italy, Austria, Germany, France, Slovenia, Switzerland and Liechtenstein. Since 2016, nine thematic Action Groups, composed of regional and national representatives, carry out activities and projects that support the implementation of the EUSALP Action Plan. Action Group 9 has the mission “to make the territory a model region for energy efficiency and renewable energy”. The activities pursued by Action Group 9 shall back the implementation of the Energy Union Package that strives for more energy security, an integrated European energy market, an increase of energy efficiency, decarbonization of the economic sector and support of research, innovation and competitiveness in Europe. The 2030 climate and energy framework of the European Union has settled on revised – more ambitious – targets in 2018, aiming for at comprising a 40% reduction of greenhouse gases by 2030 compared to 1990, as well as a 32,5% increase of energy efficiency and a share of 32% for renewable energy sources at European level. By 2050, the European Union aims to become carbon neutral – an economy with net-zero greenhouse gas emissions.

Reliable energy data are the basis for decision-makers to define, to implement, and to monitor the effectiveness of energy policies. To implement a well-informed macro-regional energy strategy that responds to the needs and challenges of the territory, Action Group 9 developed the EUSALP Energy Survey to collect regional and national energy data aggregating them to macro-regional data as well as medium and long-term policy goals defined by the functional units in the territory. The survey is a first attempt to implement a stable monitoring system for energy data in the macro-region.

The present report follows up on the ENERGY SURVEY 2017, available online at www.alpine-region.eu, by providing updated information on energy production/consumption in the regions of the EUSALP area.

Ulrich Santa and Benjamin Auer, EUSALP Action Group 9 coordination team

SUMMARY

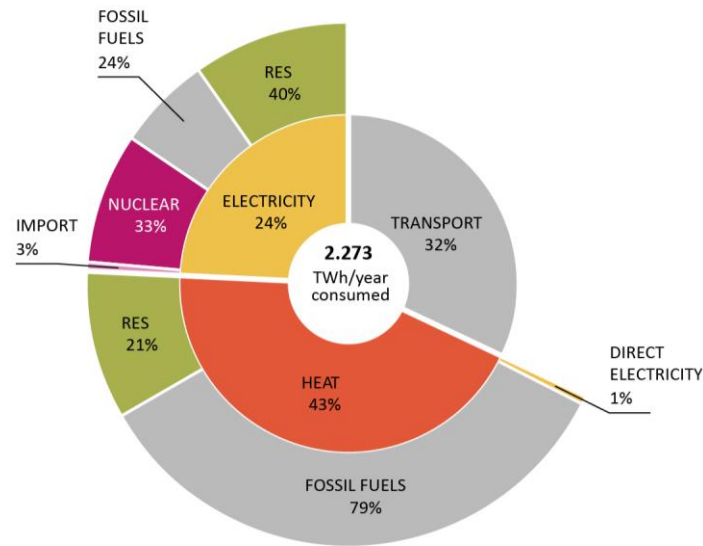
The macro-regional Strategy for the Alpine Region (EUSALP) was launched by the European Union in 2015, as “*an integrated framework to address common challenges faced by a defined geographical area*”. This area includes and surrounds the Alps, embracing five European member states plus Switzerland and Liechtenstein. It covers more than 440.000 km² (near 10% of the EU-28 plus Switzerland and Liechtenstein), is densely inhabited and an engine of the economy (about 80 millions of inhabitants that generate 3.100 Trillion € of gross domestic product, respectively corresponding to 15% of the EU population and 20% of GDP).

To translate the EUSALP strategy into actions, nine Action Groups (AG) are established. Among them, the EUSALP Action Group 9 has the mission to “*make the EUSALP territory a model region for energy efficiency and renewable energy*”. For this reason, in 2016, it developed the online EUSALP Energy Survey, meant to be sent to each territory’s representative, in order to collect data on the energy production mix, consumption sectors, energy policy strategies, and defined energy policy targets. The EUSALP ENERGY SURVEY 2017 developed by the EUSALP Action Group 9 was the first attempt to offer a clear and systematic overview of the EUSALP energy data, both on the consumption and production side. Compared to traditional desk research, it has had the great added value of combining quantitative data with qualitative ones, directly provided by the territories.

Now, the EUSALP ENERGY SURVEY UPDATE 2019 provides the opportunity to update some data and to gain new insights for policy measures and investment priorities in the territories, again working on a bottom-up process. It is also a way to compare different data collection methodologies and to test the active response from interested stakeholders to training activities in this field. The information has been collected by an online questionnaire during the update campaign held from July to October 2019, supplemented by bilateral interactions, trying to overcome inconsistencies and missing values.

Fifteen out of twenty-five territories (identified according to the NUTS - Nomenclature of Territorial Units for Statistics, and considering Switzerland as a whole) filled in the EUSALP ENERGY SURVEY UPDATE 2019 questionnaire, some of them only partially. For this reason, the overall energy figure of EUSALP still refers to the first EUSALP ENERGY SURVEY 2017, which provided broader coverage. On the basis of the collected data, it was possible to generate some general energy figures for the EUSALP area. Resulting

yearly energy consumption was estimated at approximately 2.300 TWh, mainly related to heating needs (43% of total final energy consumption), then transport (32%) and electricity (25%). The EUSALP ENERGY SURVEY 2017 also estimated the renewable energy sources (RES) share in heating and electricity.



Source: Eurac Research

Figure A: EUSALP energy consumption and share of RES (EUSALP ENERGY SURVEY 2017)

The EUSALP ENERGY SURVEY UPDATE 2019, by keeping a similar investigation framework, introduces some specific questions or more detailed requests on:

- RES in the transport sector;
- RES installed capacity;
- Heat pumps contribution in the heating and cooling sector;

Moreover, local energy consumption is for the first time broken down by the reference sector (Industry, transport, residential, services, agriculture/forestry, fishing, energy branch, others).

The results of the quantitative questions are reported for each NUTS in SECTION 1 “Territorial factsheets”, complementing them with some general data and previously collected energy data (source: EUSALP ENERGY SURVEY 2017). Finally, they are integrated with qualitative information on energy data collection methodologies and purposes, methodologies and storage systems, difficulties encountered in filling the questionnaire.

Thanks to data provided, 18 updated territorial energy balances have been designed, visualized in “dough-nut charts”. The inner circle of the chart is composed by the shares assigned to “electricity”, “heating and cooling” and transport”, whereas the external returns the energy sources, by distinguishing among “Renewable energy sources – RES”, “fossil fuels”, “nuclear” and “electricity import”.

In the case of local electricity production exceeding the consumption and multiple energy sources, two different scenarios (namely Scenario A and B) have been designed, considering:

- Overabundant locally generated power from RES:
 - Scenario A - the electricity need is completely satisfied by RES (theoretically possible);
 - Scenario B - local consumption of fossil fuels (most realistic, because small plants may be used in remote locations or to satisfy single needs);
- Overabundant locally generated power from nuclear or fossil fuel:
 - Scenario A - RES are primarily used at the local level (theoretical green share of the territory);
 - Scenario B - the same energy mix is locally used and exported electricity (most realistic, because all plants are feeding the grid).

While the EUSALP ENERGY SURVEY 2017 gave evidence about the remaining potentials of RES in the territories thanks to the respondent’s personal feeling, the EUSALP ENERGY SURVEY UPDATE 2019 renovates the qualitative section posing questions on:

- Successful examples of local public policies sustaining RES or energy efficiency;
- Existence of Renewable Energy Communities
- Strategic sectors and investment priorities to achieve climate-energy goals.

The majority of answers return the existence of public policies to sustain the energy renovation in buildings and small-scale renewable energy generation which seems to work fine or at least partially good.

Energy communities seem to be not a very common or common situation in the EUSALP, except for a few territories.

The most relevant investment sector is “energy efficiency”, while “mobility” and “heating and cooling” follow having a similar magnitude. The less mentioned is “electricity production”. Interestingly, “mobility” is also the sector receiving the largest share of “low priority” answers, thus indicating a contesting view among respondents and/or territories.



Once again, from data collection and control activities, it clearly emerges the need for more harmonized and simplified procedures of energy data sharing, in order to obtain a more precise macro-regional data set, and establish the EUSALP Energy Observatory, to be kept updated and accessible to target groups. The EUSALP Energy Observatory could assess the effectiveness of adopted measures by executing regular updates of harmonized energy data, in comparison to implemented political and financial frameworks and targets set by local energy strategies and will provide assistance to territories to fill and keep the EUSALP ENERGY SURVEY updated regularly.

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INTRODUCTION

The EUSALP Strategy

The EUSALP (2015) is the fourth EU macro-regional strategy, following those for the Baltic Sea region (2009), for the Danube region (2010) and for the Adriatic and Ionian region (2014)¹. The EUSALP concerns 7 Countries, of which 5 EU Member States (Austria, France, Germany, Italy, and Slovenia) and 2 non-EU countries (Liechtenstein and Switzerland), and 48 regions (overall 50 territorial entities, see Fig. 1). The Alpine region is a unique territory, which has an important potential for dynamism but is facing major challenges, such as:

- economic globalization that requires the territory to distinguish itself as competitive and innovative by developing the knowledge and information society;
- demographic trends characterized particularly by the combined effects of aging and new migration phenomena;
- climate change and its foreseeable effects on the environment, biodiversity and on the living conditions of its inhabitants;
- the energy challenge at the European and worldwide scales, which consists of managing and meeting the demand in a sustainable, secure and affordable way;
- its specific geographical position in Europe, as a transit region but also as an area with unique geographical and natural features which set the framework for any future developments.

Macro-regional strategies provide an opportunity to improve cross-border cooperation among the alpine States as well as identify common goals and implement them more effectively through transnational collaboration.

¹ This paragraph is mainly based on contents provided by the official EUSALP website. For any further and more detailed info please refer to <https://www.alpine-region.eu/>.



Figure 1: Eusalp Territories

The EUSALP Action Groups

On 28th July 2015, the EUSALP Action Plan was adopted, which aims to translate the identified common challenges and potentials of the EUSALP territory into concrete actions. The Action Plan is divided into three thematic policy areas and one cross-cutting policy area (see Table 1) and focuses on 9 actions.

Table 1. EUSALP objectives

1st Thematic Policy Area: Economic Growth and Innovation	2nd Thematic Policy Area: Mobility and Connectivity	3rd Thematic Policy Area: Environment and Energy
AG 1 – AG 2 – AG 3	AG 4 – AG 5	AG 6 – AG 7 – AG 8 – AG 9
OBJECTIVE Fair access to job opportunities, building on the high competitiveness of the region	OBJECTIVE Sustainable internal and external accessibility to all	OBJECTIVE A more inclusive environmental framework for all and renewable and reliable energy solutions for the future
Cross-cutting Policy Area: Governance, including Institutional Capacity		
OBJECTIVE A sound macro-regional governance model for the region (to improve cooperation and the coordination of action)		

1st. Thematic Policy Area: fostering sustainable growth and promoting innovation in the Alps: from theory to practice, from research centers to enterprises

- AG1: to develop an effective research and innovation ecosystem
- AG2: to increase the economic potential of strategic sectors
- AG3: to improve the adequacy of the labor market, education, and training in strategic sectors

2nd. Thematic Policy Area. Connectivity for all: in search of a balanced territorial development through environmentally friendly mobility patterns, transports systems and communication services, and infrastructures

- AG4: To promote inter-modality and interoperability in passenger and freight transport
- AG5: To connect people electronically and promote accessibility to public services

3rd. Thematic Policy Area: Ensuring sustainability in the Alps: preserving the Alpine heritage and promoting sustainable use of natural and cultural resources

- AG6: To preserve and valorize natural resources, including water and cultural resources
- AG7: To develop ecological connectivity in the whole EUSALP territory
- AG8: To improve risk management and to better manage climate change, including major natural risks prevention

- AG9: To make the territory a model region for energy efficiency and renewable energy

EUSALP Action Group 9 has the mission to make the territory a “model region for energy efficiency and renewable energy”. The activities carried out by the Action Group that rest on the European energy policy framework that is inter alia provided by the EU’s Energy Efficiency Directives, the European energy and climate package with its targets for 2020 and 2030 as well the Energy Union Package.

The EUSALP Energy Survey Update 2019

In 2017, the AG9 commissioned the “EUSALP ENERGY SURVEY 2017”. The Institute for Renewable Energy of Eurac Research (EURAC) carried out the collection and analysis of the relevant data, presenting the main findings in this “EUSALP ENERGY REPORT 2017”.

The EUSALP ENERGY SURVEY UPDATE 2019 provides the opportunity to update some data and to gain new insights on policy measures and investment priorities in the territories, again working on a bottom-up process. It is also a way to compare different data collection methodologies and to test the active response from interested stakeholders to training activities in this field. The information has been collected by an online questionnaire during the update campaign held from July to October 2019, supplemented by bilateral interaction, trying to overcome inconsistencies and missing values.

Nineteen out of twenty-five territories (identified according to the NUTS - Nomenclature of Territorial Units for Statistics, and considering Switzerland as a whole) filled the EUSALP ENERGY SURVEY UPDATE 2019 questionnaire, some of them only partially.

The following SECTION 1 provides the updated territorial factsheets, also reporting the previously collected general and energy data (source: EUSALP ENERGY REPORT 2017 - ANNEX 1), while SECTION 2 returns the aggregated results on investment priorities in the EUSALP.

SECTION 1 – TERRITORIAL FACTSHEETS

This section provides information on data collection methodology and the updated territorial factsheets, also reporting the previously collected general and energy data (source: EUSALP ENERGY REPORT 2017 - ANNEX 1).

Territories and contact persons

The list of investigated territories, related contact person details, and raw data is provided in ANNEX 1 (for internal use only, available for AG9 communication and research purposes), and comprises 25 entities: 1 EU country (Slovenia), 2 non-EU countries (Liechtenstein and Switzerland), 22 EU regions, Provinces or Ländern (9 Austrian, 8 Italian, 3 French and 2 German).

Energy data collection and harmonization

The EUSALP ENERGY SURVEY UPDATE 2019 focuses on questions related to energy production and consumption. Some of them are interrelated, and they offer the possibility to double-check the data (and conversely pose doubts where divergences arise):

- In the section “Energy Balance” primary energy production, energy import and export, gross inland energy consumption, and final energy consumption data were required, but not subjected to further investigation.
- In the section “Share of Energy by Sources”, the gross final energy consumption is analyzed from the perspective of energy carriers, by distinguishing various RES, fossil fuels or nuclear energy. The gross final consumption in the transport sector is also analyzed by energy carriers.
- In the section “Gross final consumption of electricity from RES” data is asked following the Directive 2009/28/EC, including RES installed capacity.
- In the section “Gross final consumption of electricity from non-renewables” data about fossil fuels and nuclear energy is asked.
- The section “Gross final consumption for heating and cooling from renewables” again refers to the Directive 2009/28/EC, including a focus on different biomass sources, heat pump types and related installed capacity.

- The section “Gross final consumption for heating and cooling from non-renewables” investigates the total fossil fuels and specific vectors (i.e. coal, oil, gas, non-renewable waste).
- The section “Final energy consumption by sectors” concludes the quantitative data collection by asking the consumption related to the industry, transport, residential, services, agriculture/forestry, fishing, energy branch and others.

Energy data and installed capacity have been automatically harmonized by the unit of measurement (we decided to use GWh and TW) and then checked for consistency, by comparing single values with the expected sum/difference of other values (identified as *).

All the respondents have been invited to double-check ambiguous data and to amend it. In case of missing answers (identified as N.A.) or questionable values, some elaborations based on data provided by the respondent for different questions or on amended data have been introduced (identified as **).

Thanks to data provided, updated territorial energy balances have been defined, visualized in “doughnut charts”. The inner circle of the chart is composed by the shares assigned to “electricity”, “heating and cooling” and transport”, while the external returns the energy sources, by distinguishing among “Renewable energy sources – RES”, “fossil fuels”, “nuclear” and “electricity import”.

In the case of local electricity production exceeding the consumption and multiple energy sources, two different scenarios (namely Scenario A and B) have been designed, considering:

- Overabundant locally generated power from RES:
 - Scenario A - the electricity need is completely satisfied by RES (theoretically possible);
 - Scenario B - local consumption of fossil fuels (most realistic, because small plants may be used in remote locations or to satisfy single needs);
- Overabundant locally generated power from nuclear or fossil fuel:
 - Scenario A - RES are primarily used at the local level (theoretical green share of the territory);
 - Scenario B - the same energy mix in locally used and exported electricity (most realistic, because all plants are feeding the grid).

Energy data accuracy

Respondents have the possibility to specify the measurement unit, reference year², data source (national statistics, local statistics or collection, own calculation), and accuracy level (low, medium and high).

The following table reports the aggregated results based on the most recurrent data source(s) mentioned by each territory.

Table 1: EUSALP ENERGY SURVEY UPDATE 2019 - Data source and accuracy

Data source	Number of EUSALP territories
National statistics	9
National / local statistics	2
Local statistics / collection	7
Local collection / own calculation	1
Data completeness/confidence level	Number of EUSALP territories
High	6
Medium / high	3
Medium	10

² The reference year of general data and energy data is in brackets. In case of various years the most recurred is mentioned.

AT11 – BURGENLAND

General data: Eurac internal database – EUROSTAT (2015)

Size (km ²)	Population (inh.)	Density (inh/km ²)	GDP (Mil. €)	GDP per capita (€)
3,964	288,178	73	7,962	27,629

Energy data: EUSALP ENERGY SURVEY (2011)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)	Energy consumption – transport sector (GWh)
5,000	9,722	1,528	1,361*	3,056
	9,030**		4,447**	

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Export – electricity (GWh)
	9,706	1,546	4,434	3,802*	4.843	5.947	779**
					3.753*		

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purpose of energy data collection in the NUTS is to feed Austrian Statistics.

The methodology for energy data collection in the NUTS has not changed recently.

Energy balance and share of RES

Energy consumption in Burgenland is mainly related to heat (45%), then to transport (39%) and electricity (16%). The 100% of electricity needs are covered by RES, there is also an export of 779 GWh/y (equal to 33% of the quantity of electricity produced). 50% of heat demand is covered by fossil fuels. Remaining 50% of heat needs are covered by RES. RES in transport: N.A

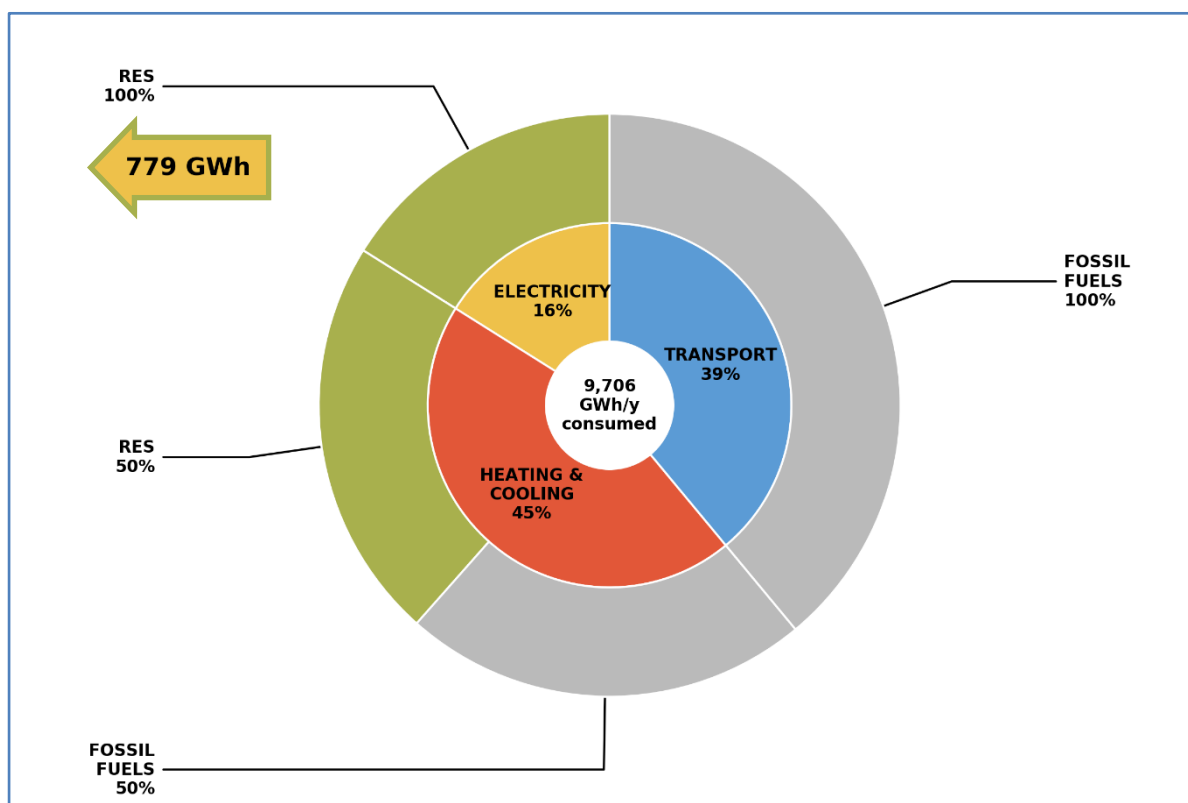


Figure 2: Energy consumption in Burgenland

- Electricity: Wind provides 98% of renewable electricity production (1TW of installed capacity), while PV 2% (0.05 TW of installed capacity). Hydropower production is very limited (installed capacity is N.A.)



- Heating and Cooling: Biomass provides 50%, while heat pumps cover 11% of renewable heat production. Moreover, space heating systems equipped with other types of electric appliances different from heat pumps which directly use electricity (e.g. electric heaters, electric radiators, etc.) are very common.

Final Energy Consumption by sectors (GWh)

Industry: 1,944

Transport: 3,802

Residential: 1,420

Services: N.A.

Agriculture/Forestry: N.A.

Energy branch: N.A.

Others: N.A.

AT21 – KÄRNTEN

General data: Eurac internal database – EUROSTAT (2015)

Size (km ²)	Population (inh.)	Density (inh/km ²)	GDP (Mil. €)	GDP per capita (€)
9,542	557047	58	18610	33408

Energy data: EUSALP ENERGY SURVEY (2014)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)*	Energy consumption – transport sector (GWh)
22,859	9,365	4,908	9,690	6,970
	23,359**		11,480**	

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Export – electricity (GWh)
	25,444	5,222	5,186	8,444	10,472*	11,4000	2,180**
			11,777**				

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purpose of energy data collection in the NUTS is to answer normative requirements.

The methodology for energy data collection in the NUTS has not changed recently.

Data are stored using spreadsheets.

Energy balance and share of RES

Energy consumption in Kärnten is mainly related to heating and cooling (46%), then to transport (33%) and finally to electricity (21%). Electricity need is completely satisfied by local RES, there is also an export of 2,180 GWh/y (equal to 35% of the quantity of electricity produced). RES also dominate the heating branch (63%). 13% of gross consumption in the transport sector is also provided by RES.

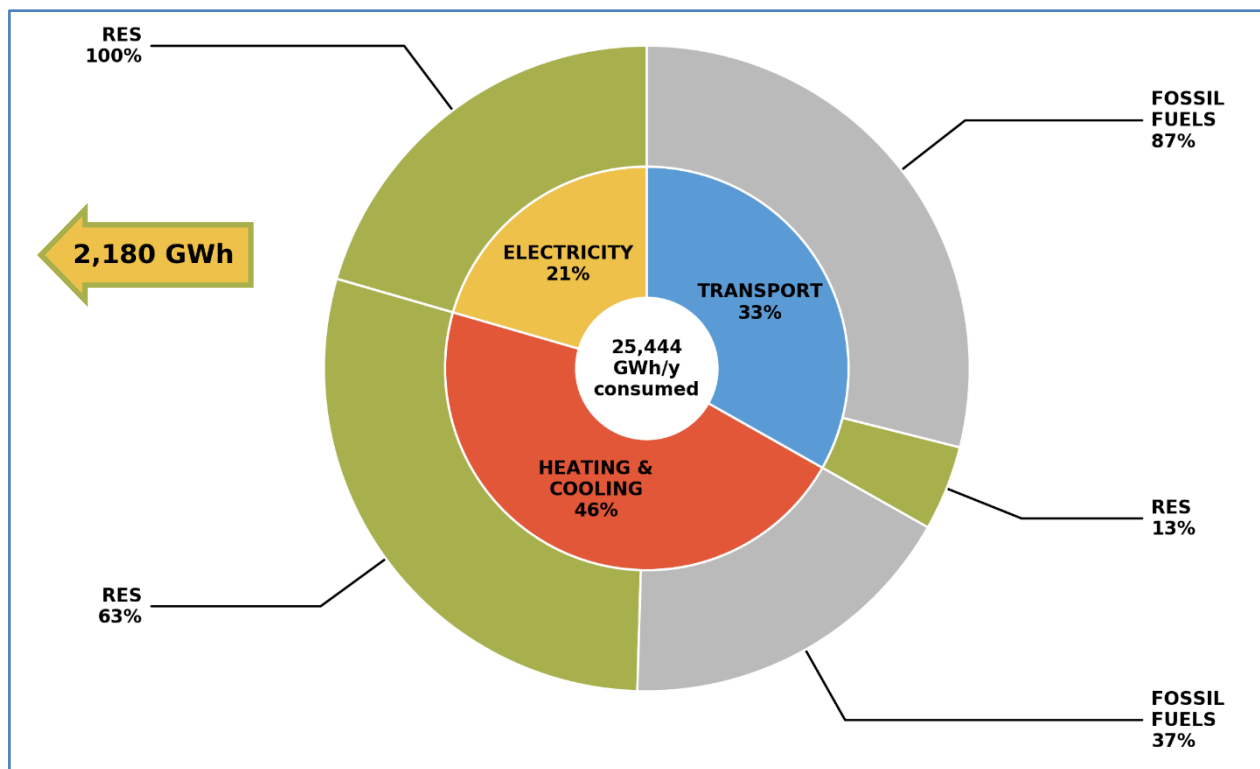


Figure 3: Energy consumption in Kärnten

- Electricity: Hydropower provides 98% of renewable electricity production. PV production is responsible for 2%.
- Heating and Cooling: Biomass provides 92%, while solar thermal energy covers 7% of renewable heat production. Moreover, space heating systems equipped with other types of electric appliances

different from heat pumps which directly use electricity (e.g. electric heaters, electric radiators, etc.) are quite common.

Final Energy Consumption by sectors (GWh)

Industry: 9,611 (37%)

Transport: 8,000 (31%)

Residential: 5,000 (19%)

Services: 2,000 (8%)

Agriculture/Forestry: 472 (2%)

Energy branch: 694 (3%)

Others: N.A.

AT12 – NIEDERÖSTERREICH

General data: Eurac internal database – EUROSTAT (2015)

Size (km ²)	Population (inh.)	Density (inh/km ²)	GDP (Mil. €)	GDP per capita (€)
19,202	1,635,695	85	53,408	32,652

Energy data: EUSALP ENERGY SURVEY (2015)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)	Energy consumption – transport sector (GWh)
138,644	67,131	11,069		27,697
	64,326**	11,069**	25,560**	

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

Energy production (GWh)	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Export – electricity (GWh)
	68,698	11,638	19,610*	29,166	10,643	43,916*	973**
			27,271**		23,877*		

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

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* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purpose of energy data collection in the NUTS is to develop the annual energy report of the province of Lower Austria. The main difficulties in data collection concern: Biomass–electric–production, Biomass–heat–production, fossil–energy–consumption: because this amount is not available in our energy–statistic–date; so it has to be calculated from different Sheets. The methodology for energy data collection in the NUTS has not changed recently.

Energy balance and share of RES

Energy consumption in Niederösterreich is mainly related to transport (42%), then to heat (41%) and finally to electricity (17%). Electricity need is theoretically completely satisfied by locally generated power from RES, which is overabundant (scenario A). In practice, 5% is provided by local consumption of fossil fuels (scenario B), while there is an export of 973 GWh, (equal to 8% of RES production). On the other hand, RES cover 35% of thermal needs and 6% in transport.

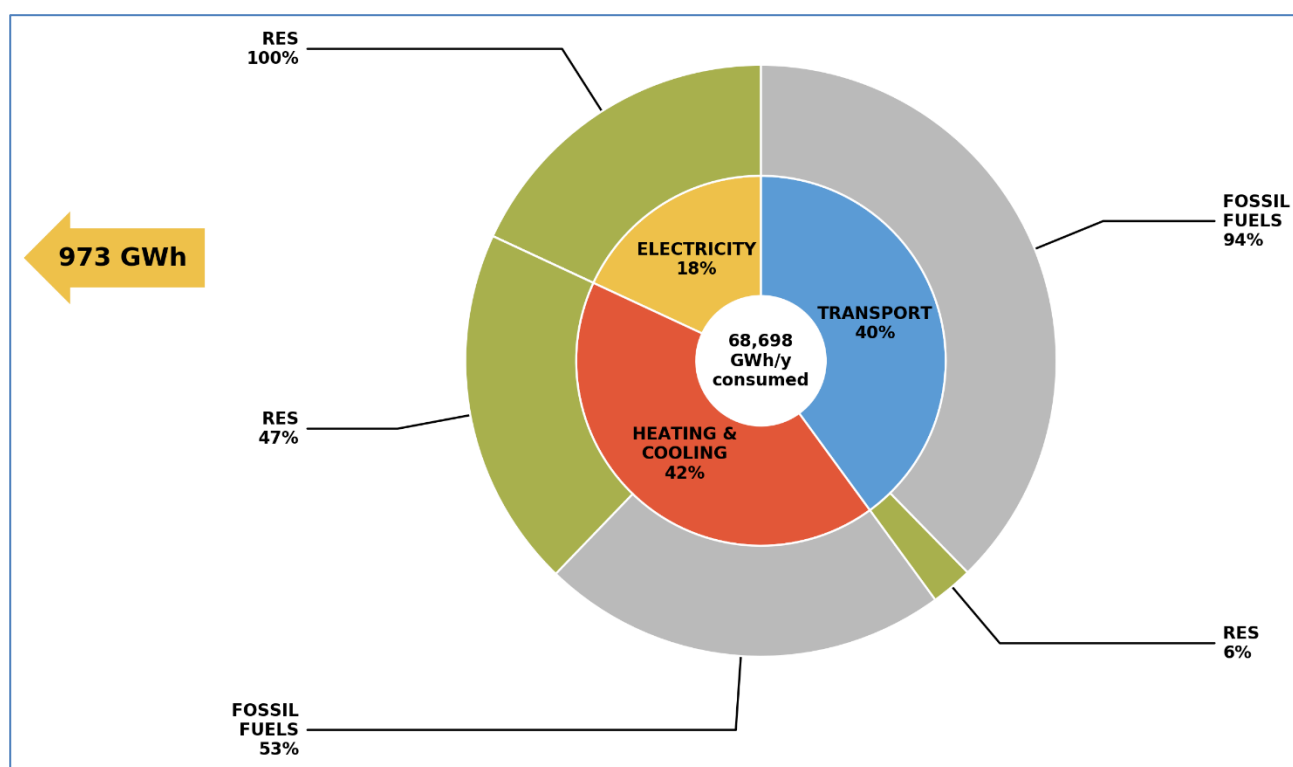


Figure 4: Energy consumption in Niederösterreich – Scenario A

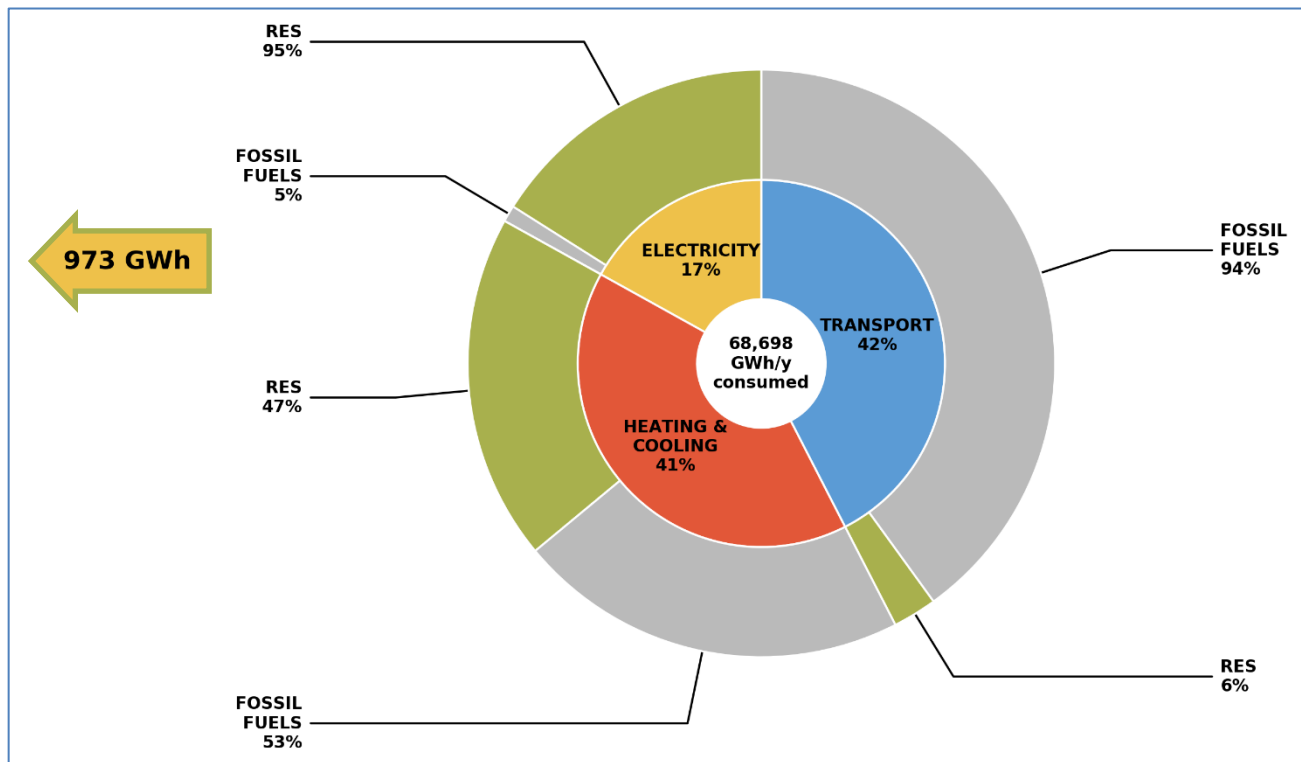


Figure 5: Energy consumption in Niederösterreich – Scenario B

- Electricity: Hydropower provides 60% of renewable electricity production (installed capacity is N.A.), while wind 30% (1.66 TW of installed capacity). Biomass and PV production are limited respectively to 8% and 2% (0.32 TW of installed capacity for PV)
- Heating and Cooling: Biomass provides 62%, while heat pumps cover 3% of renewable heat production. Moreover, solar heating 5% and other renewable sources 33%. Directly use of electricity (e.g. electric heaters, electric radiators, etc.) is not common.

Final Energy Consumption by sectors (GWh)

Industry: 17,082 (20%)

Transport: 29,166 (34%)

Residential: 16,246 (19%)

Services: 4,340 (5%)

Agriculture/Forestry: 1,826 (2%)

Energy branch: 6,058 (7%)

Others: 11,941 (14%)

AT31 – OBERÖSTERREICH

General data: Eurac internal database – EUROSTAT (2015)

Size (km ²)	Population (inh.)	Density (inh/km ²)	GDP (Mil. €)	GDP per capita (€)
11.985	1.435.335	120	58.138	40.505

Energy data: EUSALP ENERGY SURVEY (not specified)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)*	Energy consumption – transport sector (GWh)
26.666	62.500	13.083	13.384	18.333

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

Final energy consumption	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	
67,220	86,049	14,604	5,561*	18,610*	23,332	38,888	
		15,343*	32,371**				

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

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* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purposes of energy data collection in the NUTS are to answer normative requirements and for energy planning. The methodology for energy data collection in the NUTS has not changed recently.

Energy balance and share of RES

Energy consumption in Oberösterreich is mainly related to heating and cooling (49%), then to transport (28%) and finally to electricity (23%)³. 73% of electricity needs are covered by RES. 68% of heating and cooling demand is covered by fossil fuels. Remaining 32% of heating needs are covered by RES. RES in the transport sector count by 7%.

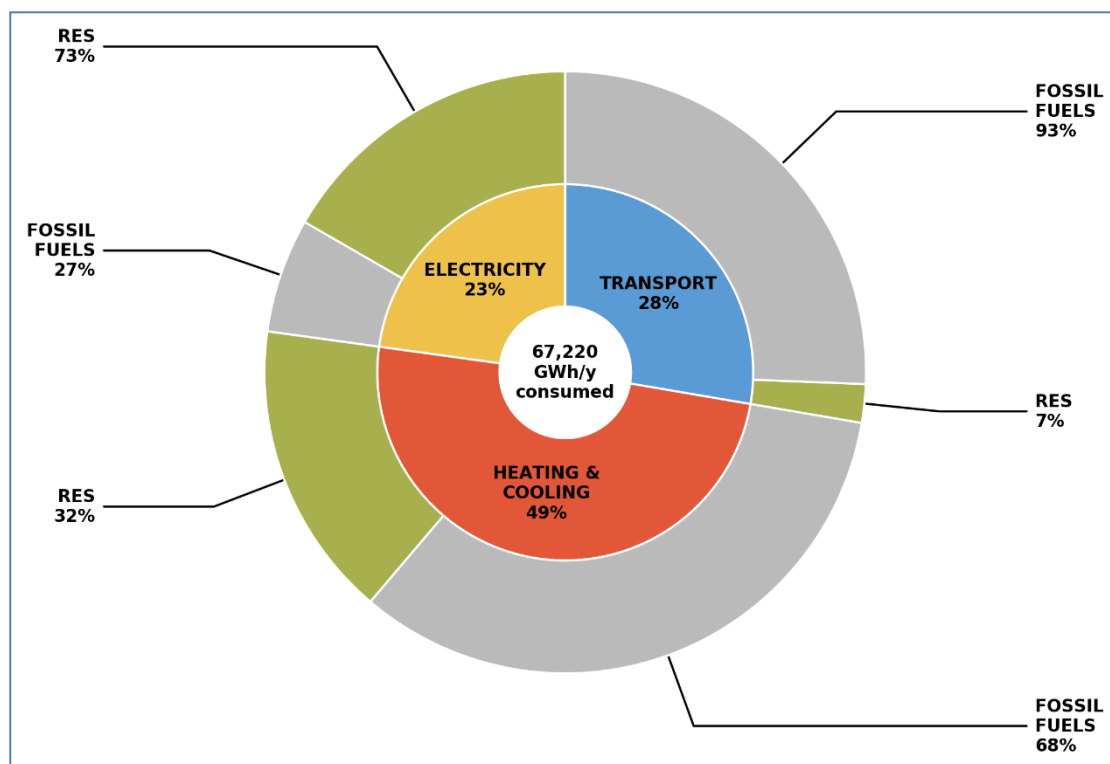


Figure 6: Energy consumption in Oberösterreich

³ The sum of numeric value behind the percentages is comparable to the reported final energy consumption of 67,222 GWh), or 77% of the declared gross final energy consumption (86,049 GWh).

- Electricity: Hydropower provides 89% of renewable electricity production (installed capacity is 1.80 TW), while PV 2% (0.3 TW of installed capacity) and wind 1% (0.05 TW of installed capacity). Biomass production provides the remaining 8%.
- Heating and Cooling: Biomass provides 39%, while heat pumps cover 4% of renewable heat production. Other renewable sources 44%. Directly use of electricity (e.g. electric heaters, electric radiators, etc.) is not common.

Final Energy Consumption by sectors (GWh)⁴

Industry: 29,444 (34%)

Agriculture/Forestry: 1,389 (2%)

Transport: 18,661 (22%)

Energy branch: 18,398 (21%)

Residential: 14,166 (17%)

Services: 3,611 (4%)

⁴ The sum of numeric value is comparable to the declared gross final energy consumption (86,049 GWh).

AT32 – SALZBURG

General data: Eurac internal database – EUROSTAT (2015)

Size (km ²)	Population (inh.)	Density (inh/km ²)	GDP (Mil. €)	GDP per capita (€)
7.159	538.102	75	24.943	46.354

Energy data: EUSALP ENERGY SURVEY (2015)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)	Energy consumption – transport sector (GWh)
7.082**	18.020**	3.872**	7.559**	6.589**

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	
	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	

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[Info on data collection](#)

The questionnaire EUSALP Energy Survey Update was not compiled. Quantitative data are available on Statistik Austria (2017)



https://www.statistik.at/web_de/statistiken/energie_umwelt_innovation_mobilitaet/energie_und_umwelt/energie/energiebilanzen/index.html

AT22 – STEIERMARK

General data (2015)

Size (km ²)	Population (inh.)	Density (inh/km ²)	GDP (Mil. €)	GDP per capita (€)
16.414	1.220.495	74	43.326	35.499

Source: Eurac internal database – EUROSTAT

Energy data: EUSALP ENERGY SURVEY (2015)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)*	Energy consumption – transport sector (GWh)
16.111	49.610	9.556	24.694	15.379

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	
	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	

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Info on data collection

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AT33 – TIROL

General data: Eurac internal database – EUROSTAT (2015)

Size (km ²)	Population (inh.)	Density (inh/km ²)	GDP (Mil. €)	GDP per capita (€)
12.651	728.435	58	30.762	42.230

Energy data: EUSALP ENERGY SURVEY (2014)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Energy consumption – transport sector (GWh)	Electricity production (gross energy) (GWh)*	Heat consumption (final energy), including direct elec. use (GWh)*
7.981	26.035	5.257	11.351	6.748	7.386
	26.806**				

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	
	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

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AT34 – VORARLBERG

General data: Eurac internal database – EUROSTAT (2015)

Size (km2)	Population (inh.)	Density (inh/km2)	GDP (Mil. €)	GDP per capita (€)
2.620	378.175	144	16.115	42.613

Energy data: EUSALP ENERGY SURVEY (2015)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)	Energy consumption – transport sector (GWh)
	10.919	1.708	5.298	3.913

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	
	12,230	3,429	4,742**	4,059	1,938	6,863	
		2,091*			2,771*	9,459*	

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[Info on data collection](#)

The main purpose of energy data collection in the NUTS is for monitoring.

The methodology for energy data collection in the NUTS has not changed recently.

Data are stored using spreadsheets.

Energy balance and share of RES

Energy consumption in Vorarlberg is mainly related to heating and cooling (39%), then to transport (33%) and finally to electricity (28%). 100% of electricity needs are covered by RES. 86% of heating and cooling demand is covered by fossil fuels. Remaining 14% of heating needs are covered by RES. RES in transport sector data is N.A.

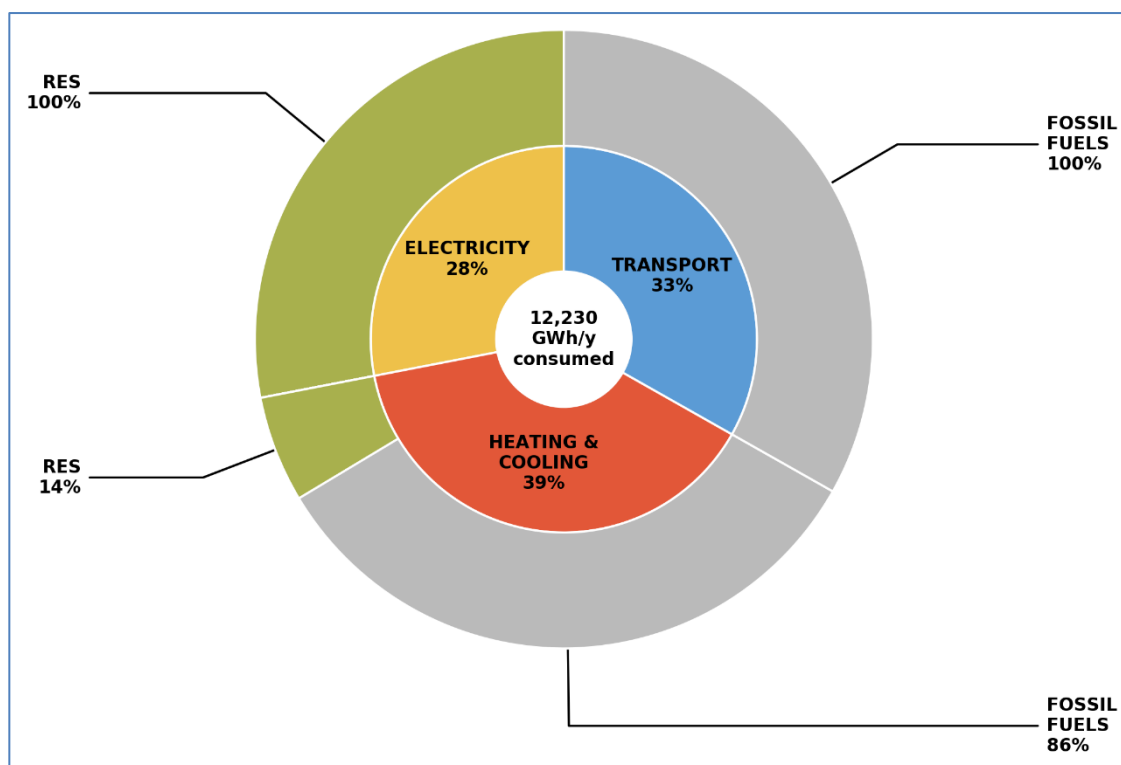


Figure 7: Energy consumption in Vorarlberg

- Electricity: Hydropower provides 95% of renewable electricity production (installed capacity is 1.32 TW), while PV 4% (installed capacity N.A.) and biomass 1% (installed capacity N.A.).
- Heating and Cooling: Biomass provides 40%, while heat pumps cover 34% of renewable heat production. Solar heating provides 26%. Directly use of electricity (e.g. electric heaters, electric radiators, etc.) is not common.



Final Energy Consumption by sectors (GWh)⁵

Industry: 2,745 (23%)

Transport: 4,059 (34%)

Residential: 3,381 (28%)

Services: 1,049 (9%)

Agriculture/Forestry: 159 (1%)

Energy branch: 678 (6%)

⁵ The sum of numeric value is comparable to the declared gross final energy consumption of 12,230 GWh.

AT13 – WIEN

General data: Eurac internal database – EUROSTAT (2015)

Size (km2)	Population (inh.)	Density (inh/km2)	GDP (Mil. €)	GDP per capita (€)
412	1.794.799	4.357	86.537	48.215

Energy data: EUSALP ENERGY SURVEY (2015)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)	Energy consumption – transport sector (GWh)
5.883	36.792	8.216	15.242**	13.336

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	
	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	

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Info on data collection

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FR71 – AUVERGNE–RHONE ALPES

General data: Eurac internal database – EUROSTAT (2015)

Size (km2)	Population (inh.)	Density (inh/km2)	GDP (Mil. €)	GDP per capita (€)
69.711	7.884.096	113	250.087	31.720

Energy data: EUSALP ENERGY SURVEY (2014)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)*	Energy consumption – transport sector (GWh)	Electricity production (gross energy) (GWh)*
137.480	221.283	58.896	84.301	70.971	118.192
	214.168**				

Energy data: EUSALP ENERGY SURVEY – UPDATE (2016)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Gross final energy consumption from nuclear (GWh)
	609,652	36,110	5,780	73,786	48,716	132,602	74,982
	213,874**	60,815**	79,246**		37,254*		32,820

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purpose of energy data collection in the NUTS is to develop energy planning tools and monitoring. The main difficulties in data collection concern the unavailability of some info, to estimate it some models have to be developed. The methodology for energy data collection in the NUTS has not changed recently). Data is stored on a structured database (e.g. MySQL, PostgreSQL, MariaDB, Oracle BYOL o SQL).

Energy balance and share of RES

Energy consumption in Auvergne–Rhône Alpes is mainly related to heating and cooling (37%), then transport (25%) and finally to electricity (28%).

Assuming RES are primarily used at the local level, electricity need is satisfied at 45% by locally generated power from RES, at 1% by fossil fuels and at 54% by electricity from nuclear plants (Scenario A). Moreover, 56% of overall electricity from nuclear plants is exported (42,162 GWh).

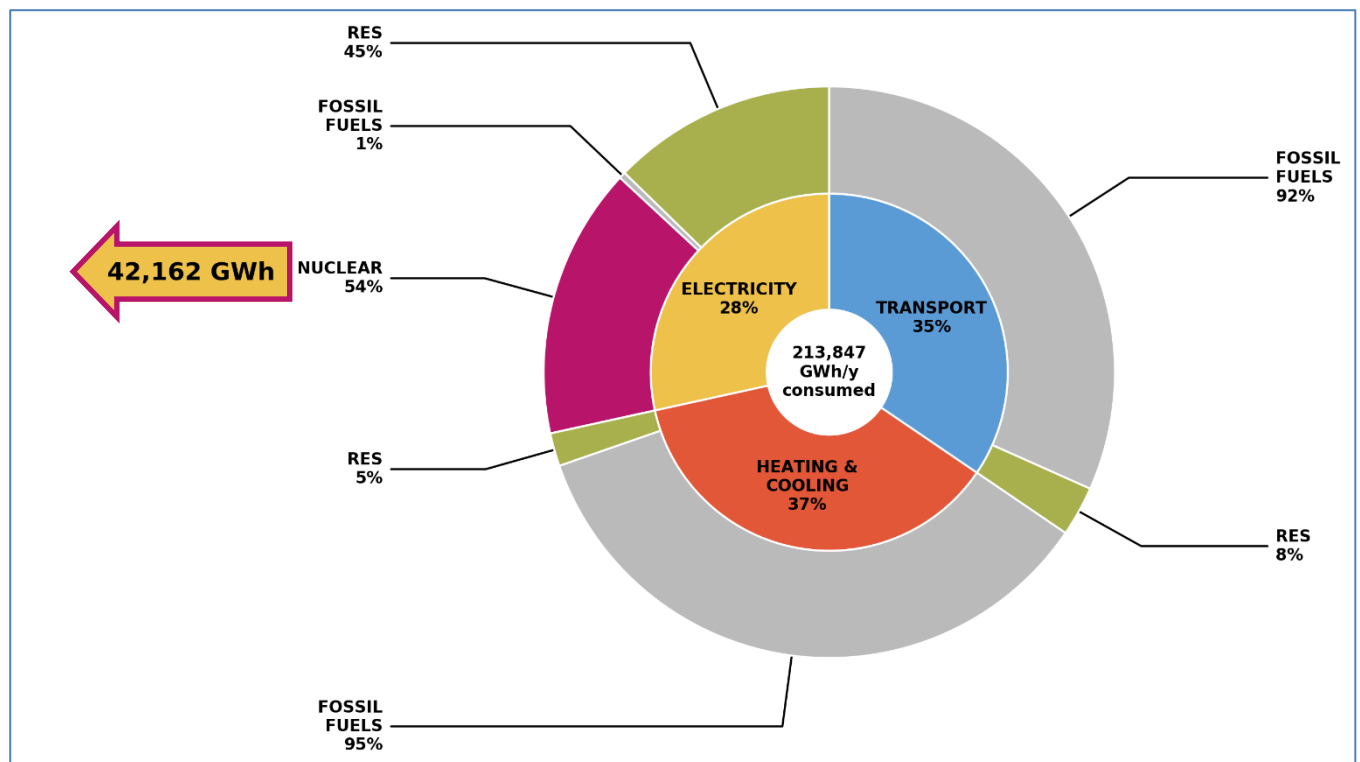


Figure 8: Energy consumption in Auvergne–Rhône Alpes - Scenario A

The other way around, assuming the same energy mix in locally used electricity and exported, RES count for 26%, fossil 1%, and nuclear 73% (Scenario B).

In both cases, RES cover 5% of thermal needs and 8% in transport.

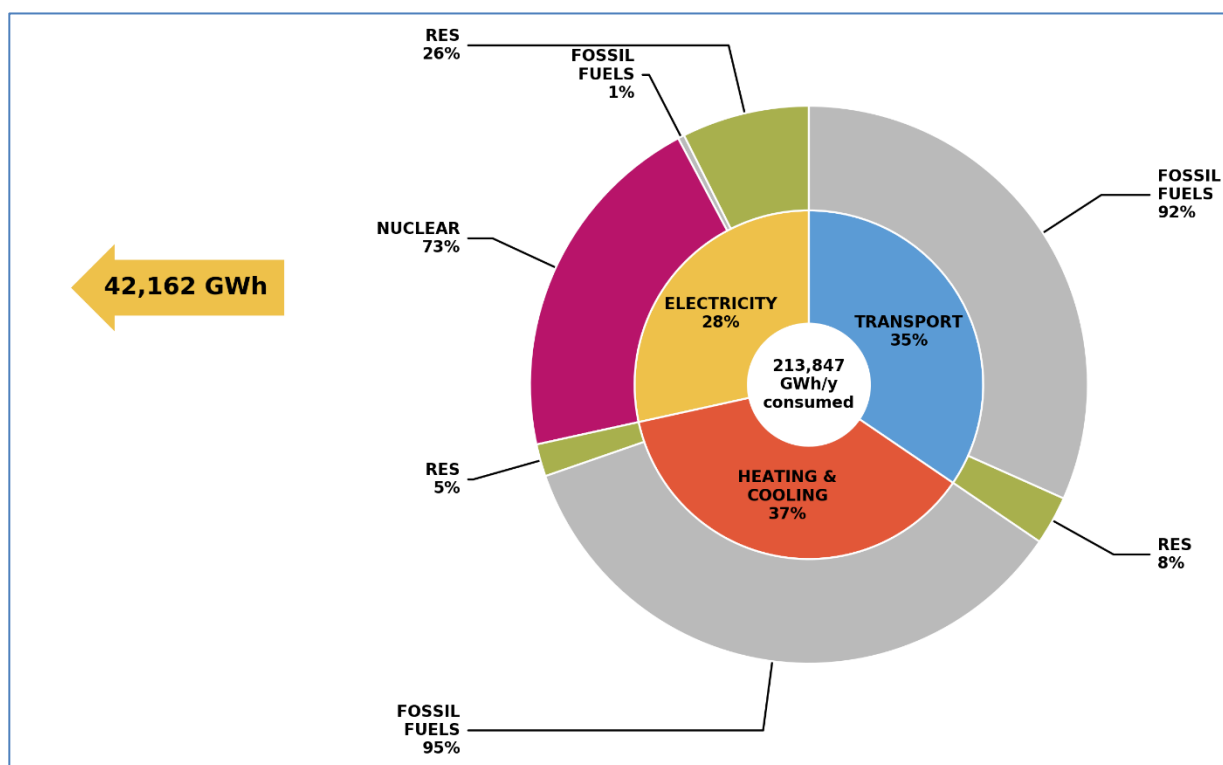


Figure 9: Energy consumption in Auvergne-Rhône Alpes - Scenario B

- Electricity: Hydropower provides 69% of renewable electricity production (installed capacity is 11.15 TW), while biomass 27%. Wind and PV production are both limited to 2% and 7% (0.44 TW and 0.70 TW of installed capacity respectively);
- Heating and Cooling: Biomass provides 46%, while solar heating 6%. Heat pumps data is 47%⁶, while direct use of electricity (e.g. electric heaters, electric radiators, etc.) is also common.

Final Energy Consumption by sectors (GWh)⁷

Industry: 41,273 (7%)

Transport: 73,789 (12%)

Residential: 62,681 (10%)

Services: 32,813 (5%)

Agriculture/Forestry: N.A.

Energy branch: 238,175 (39%)

Fishing: N.A.

Others: 156,018 (26%)

⁶ Electricity RES = 2,306 GWh* (1 – 1/4), having estimated an average SPF of 4.

⁷ The sum of final energy consumption is close to the declared Gross Final energy consumption of 609,652 GWh.

FR43 – FRANCHE COMTÉ

General data: Eurac internal database – EUROSTAT (2015)

Size (km ²)	Population (inh.)	Density (inh/km ²)	GDP (Mil. €)	GDP per capita (€)
16.306	1.179.184	72	29.799	25.271

Energy data: EUSALP ENERGY SURVEY (2015)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)	Energy consumption – transport sector (GWh)
	39.775	8.681	3.888	12.303
			18.791**	

Energy data: EUSALP ENERGY SURVEY – UPDATE (2016)

	Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	
	39,775	N.A.	N.A.	14,100	2,075	26,936	
					4,707**		

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purpose of energy data collection in the NUTS is to develop energy planning tools and monitoring. Info on data storage system N.A.

Energy balance and share of RES

Data on energy consumption in Franche-Comté related to heating-cooling and electricity are N.A. The transport sector counts for 35% of gross final energy consumption.

- Electricity: Hydropower provides the 80% of renewable electricity production (installed capacity is 0.47 TW), while wind 10% (installed capacity is 0.09 TW) and PV 5% (installed capacity is 0.05 TW). Electricity from biomass is 6%;
- Heating and Cooling: Biomass provides 99%, while solar heating 1%. Heat pumps data is N.A., while direct use of electricity (e.g. electric heaters, electric radiators, etc.) is also common.

Final Energy Consumption by sectors (GWh)

Industry: 9,200 (23%)

Agriculture/Forestry: 800 (2%)

Transport: 14,100 (36%)

Energy branch: 200 (1%)

Residential: 11,600 (30%)

Services: 3,400 (9%)

Others: N.A

FR82 – PACA

General data: Eurac internal database – EUROSTAT (2015)

Size (km2)	Population (inh.)	Density (inh/km2)	GDP (Mil. €)	GDP per capita (€)
31.845	4.989.435	157	152.771	30.619

Energy data: EUSALP ENERGY SURVEY (2015)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)	Energy consumption – transport sector (GWh)
16.800	149.917	64.464	4.107	50.972
	149.695**		34.481**	

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Gross final energy consumption from nuclear (GWh)
	141,000	35,900	4,763	49,600	17,164	105,886	17,950 (imported)
		37,243*	54,157				

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purposes of energy data collection in the NUTS is to develop energy planning tools. The main difficulties in data collection concern: individual renewable energy sources (e.g. biomass, solar thermal, etc). The methodology for energy data collection in the NUTS has not changed recently ([http://oreca.maregionsud.fr/ressources/gestion-documentaire/resultat-de-la-recherche.html?tx_egestiondoc_pi1\[validerRecherche\]=Valider&tx_egestiondoc_pi1\[categorieCherche\]=1&no_cache=1&cHash=c48cb1d6ec549dc858082cd7e1310401#.XSwwDnduKUK](http://oreca.maregionsud.fr/ressources/gestion-documentaire/resultat-de-la-recherche.html?tx_egestiondoc_pi1[validerRecherche]=Valider&tx_egestiondoc_pi1[categorieCherche]=1&no_cache=1&cHash=c48cb1d6ec549dc858082cd7e1310401#.XSwwDnduKUK)) . Data is stored on spread sheets.

Energy balance and share of RES

Energy consumption in PACA is mainly related to heating and cooling (38%), then transport (35%) and finally to electricity (26%).

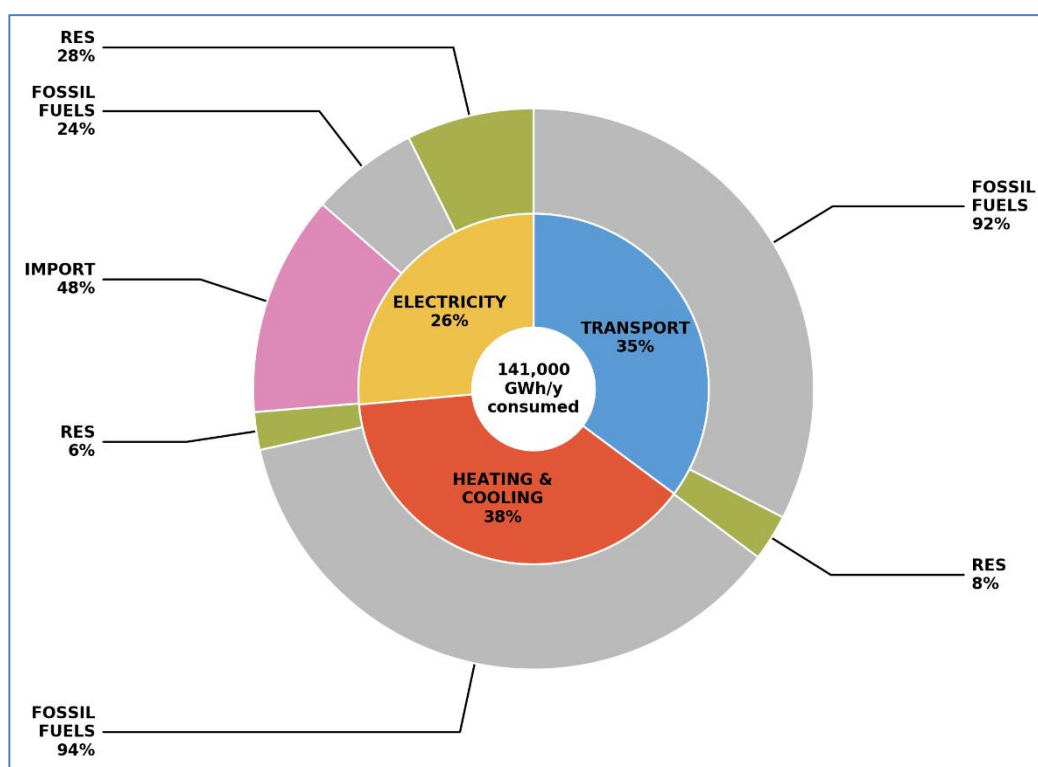


Figure 10: Energy consumption in PACA

Electricity need is satisfied by imported electricity (from nuclear plants, 48%), locally generated power from RES covers 28%.

On the other hand, RES cover 6% of thermal needs and 8% in transport.

- Electricity: Hydropower provides 77% of renewable electricity production (installed capacity is 3.55 TW). Biomass and PV production are limited respectively to 15% and 7% (1.20 TW of installed capacity for PV), while wind only 1% (0.05 TW of installed capacity for PV)
- Heating and Cooling: Biomass provides 94%, while solar heating 6%. Heat pumps data is N.A. Moreover, and other renewable sources 76%. Directly use of electricity (e.g. electric heaters, electric radiators, etc.) is not common.

Final Energy Consumption by sectors (GWh)

Industry: 40,800 (22%)

Transport: 49,600 (27%)

Residential: 28,800 (15%)

Services: 19,200 (10%)

Agriculture/Forestry: 1,500 (1%)

Energy branch: 46,400 (25%)

Fishing: N.A.

Others: 11,941 (14%)

DE1 – BADEN–WÜRTTEMBERG

General data: Eurac internal database – EUROSTAT (2015)

Size (km ²)	Population (inh.)	Density (inh/km ²)	GDP (Mil. €)	GDP per capita (€)
36.015	10.716.644	298	461.740	43.086

Energy data: EUSALP ENERGY SURVEY (2015)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)	Energy consumption – transport sector (GWh)
50.666	284.076	65.891	128.365**	89.820

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Gross final energy consumption of nuclear electricity (GWh)	Gross final energy consumption imported electricity (GWh)
290,942	72,200	127,773	92,532	37,899	192,212	18,395	14,677**

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purpose of energy data collection in the NUTS is to develop energy planning tools and monitoring. Info on data storage system N.A.

Energy balance and share of RES

Energy consumption in Baden–Württemberg is mainly related to heating and cooling (43%), then transport (32%), and electricity (25%). Electricity need is satisfied by locally generated power from RES (23%), electricity from nuclear plants (26%), fossil fuels (31%) and imported electricity (20%).

On the other hand, RES cover 17% of thermal needs and 4% in transport.

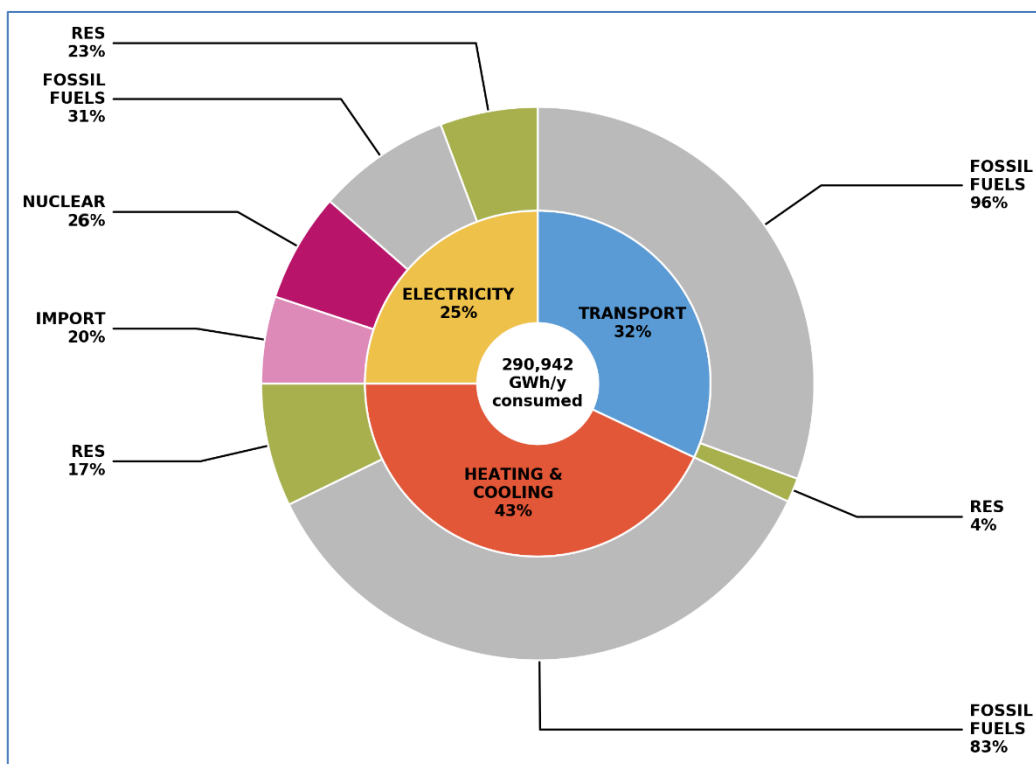


Figure 11: Energy consumption in Baden–Württemberg

- Electricity: Hydropower provides 26% of renewable electricity production (installed capacity is 0.89 TW), while biomass 27%. Wind and PV productions are 13% and 33% (1.53 TW and 5.85 TW of installed capacity respectively);

- Heating and Cooling: Biomass provides 83%, while solar heating 9% (installed capacity is 2.90 TW). Heat pumps data is 8%, while direct use of electricity (e.g. electric heaters, electric radiators, etc.) is not common.

Final Energy Consumption by sectors (GWh)

Industry: 62,139 (21%)	Agriculture/Forestry: N.A
Transport: 92,886 (32%)	Energy branch: N.A
Residential: 80,268 (28%)	Fishing: N.A
Services: 55,751 (19%) ⁸	Others: N.A

⁸ Services also contains Agriculture/Forestry and Fishing.

DE2 – BAYERN

General data: Eurac internal database – EUROSTAT (2015)

Size (km2)	Population (inh.)	Density (inh/km2)	GDP (Mil. €)	GDP per capita (€)
70.550	12.843.514	182	548.360	42.950

Energy data: EUSALP ENERGY SURVEY (2013)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Energy consumption – transport sector (GWh)	Electricity production (gross energy) (GWh)*	Heat consumption (final energy), including direct elec. use (GWh)
95.170	388.641	77.535	123.641	83.120	187.464

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

	Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Gross final energy consumption of nuclear electricity (GWh)
	391,787	35,306	60,238	132,482	80,998	256,389	95,159
		81,489**	177,816**			279,646**	31,143**

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purpose of energy data collection in the NUTS is to develop energy planning tools and monitoring. The main difficulties in data collection concern Gross final energy consumption which is not a category of the Bavarian energy Balance sheet. The methodology for energy data collection in the NUTS has not changed recently (available at www.stmwi.bayern.de/energie-rohstoffe/daten-fakten/energiebilanz-2016/). Data is stored on spreadsheets.

Energy balance and share of RES

Energy consumption in Bayern is mainly related to heating and cooling (45%), then transport (34%), and electricity (21%). Electricity need is satisfied by locally generated power from RES (43%), electricity from nuclear plants (38%) and fossil fuels (19%).

On the other hand, RES cover 23% of thermal needs and 4% in transport.

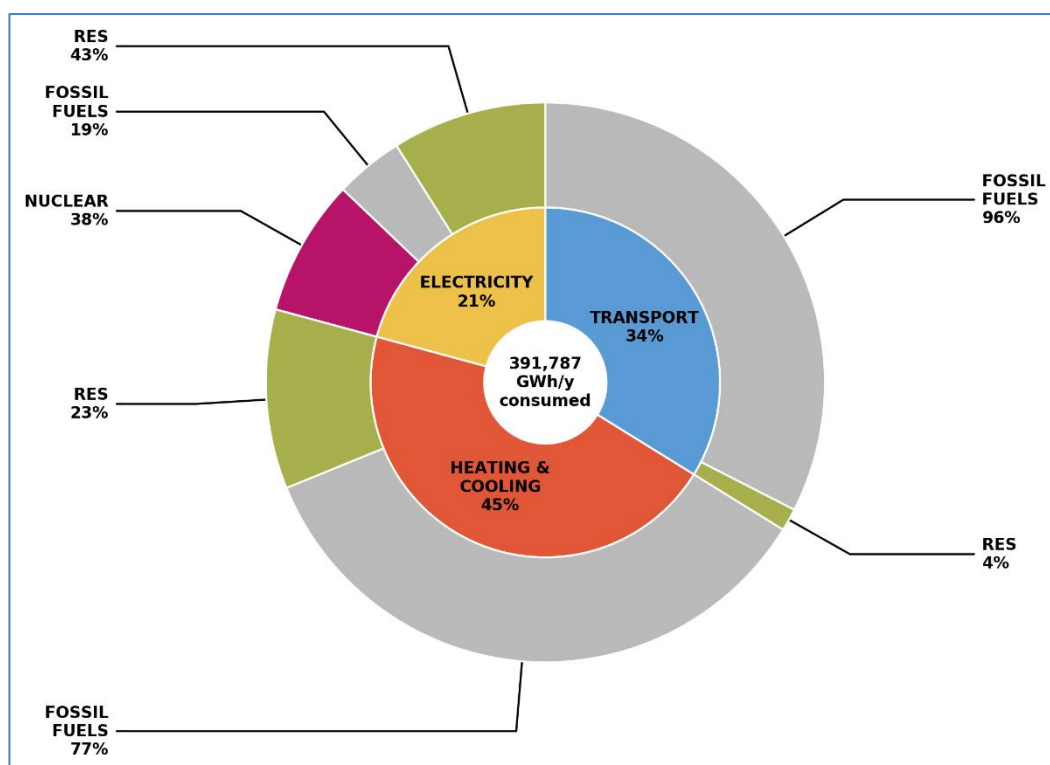


Figure 12: Energy consumption in Bayern

- Electricity: Hydropower provides 33% of renewable electricity production (installed capacity is 2.52 TW), while biomass 24%. Wind and PV productions are 12% and 30% (2.51 TW and 11.80 TW of installed capacity respectively);
- Heating and Cooling: Biomass provides 87%, while solar heating 7% (installed capacity is N.A). Heat pumps share is 7%, while data on direct use of electricity (e.g. electric heaters, electric radiators, etc.) is N.A.

Final Energy Consumption by sectors (GWh)

Industry: 86,942 (22%)	Agriculture/Forestry: N.A
Transport: 132,246 (34%)	Energy branch: N.A
Residential: 172,217 (44%) ⁹	Fishing: N.A
Services: N.A	Others: N.A

⁹ Please note numbers refer to the sector households and other consumers, including other businesses, trade, services.

ITH4 – FRIULI VENEZIA GIULIA

General data: Eurac internal database – EUROSTAT (2015)

Size (km2)	Population (inh.)	Density (inh/km2)	GDP (Mil. €)	GDP per capita (€)
7.710	1.227.122	159	35.669	29.067

Energy data: EUSALP ENERGY SURVEY (2008)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)*	Energy consumption – transport sector (GWh)
3.634	38.399	9936	10.833	8.165
	28.934**			

Energy data: EUSALP ENERGY SURVEY – UPDATE (2016–2017)

	Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Export – electricity (GWh)
	36,448	10,560	N.A.	6,338	7,711	31,610	1,474**
			19,550				

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purpose of energy data collection in the NUTS is to develop energy planning tools and normative requirements. The main difficulties in data collection concern heat data and transports data (biofuels). The methodology for energy data collection in the NUTS has not changed recently. Data is stored using DOC and PDF files.

Energy balance and share of RES

Energy consumption in Friuli Venezia Giulia is mainly related to heating and cooling (54%), then electricity (29%), and transport (17%). Assuming RES are primarily used at the local level, electricity need is satisfied at 31% by locally generated power from RES, remaining 69% by fossil fuels (Scenario A). Moreover, 17% of the overall electricity from fossil fuels is exported (1,474 GWh).

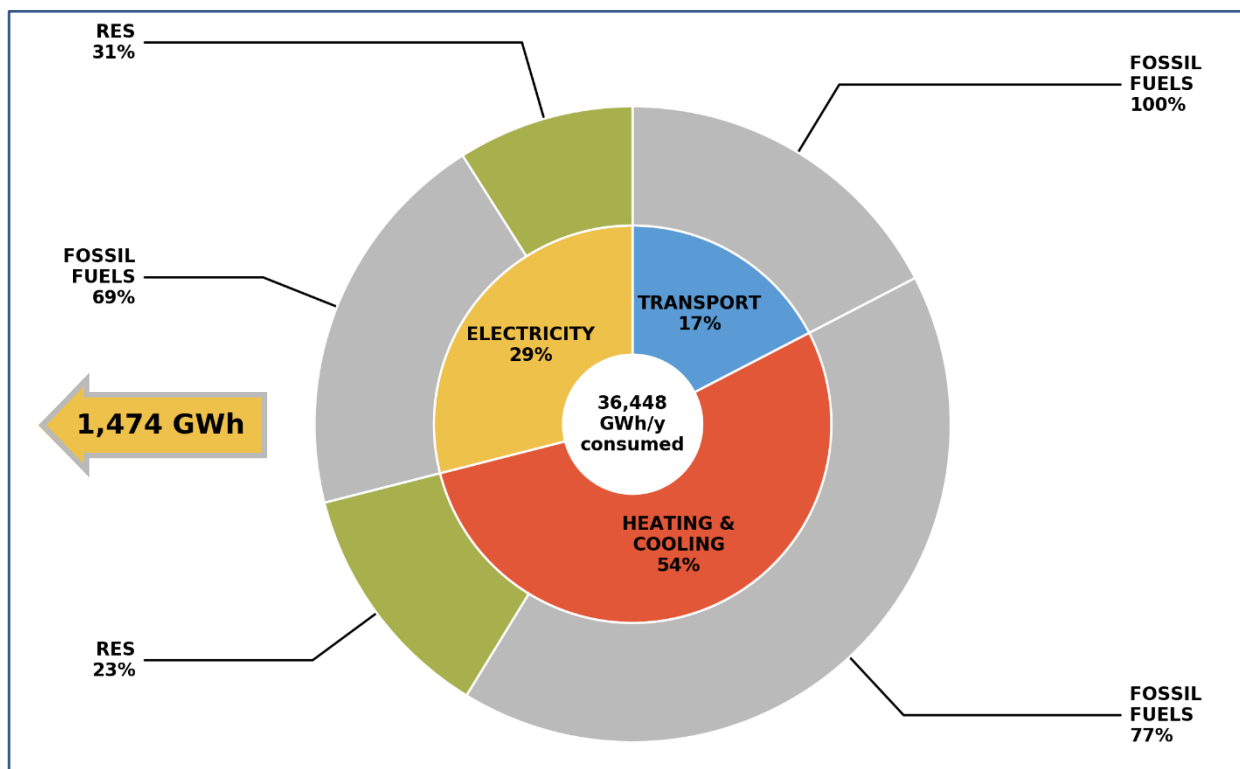


Figure 13: Energy consumption in Friuli Venezia Giulia (Scenario A)

The other way around, assuming the same energy mix in locally used electricity and exported, RES count for 27% while fossil 73% (Scenario B).

In both cases, RES cover 77% of thermal needs, while is close to 0% in transport.

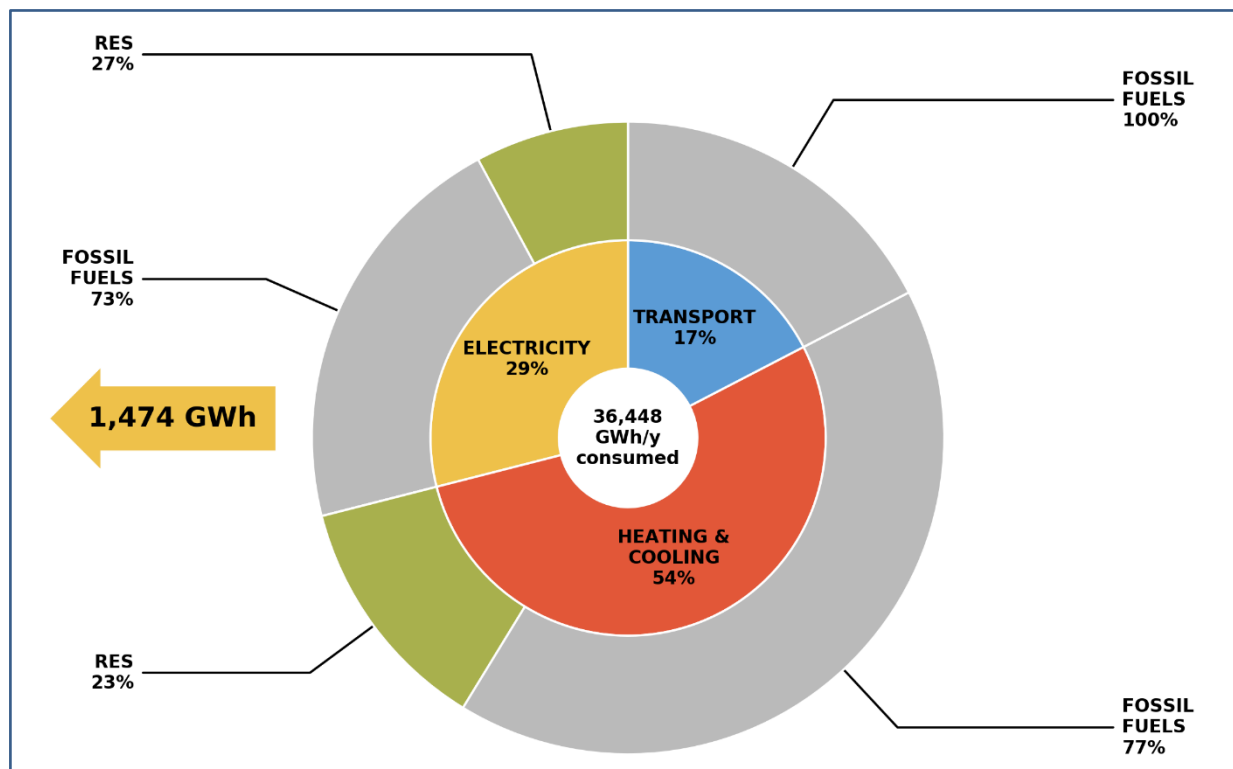


Figure 14: Energy consumption in Friuli Venezia Giulia (Scenario B)

- Electricity: Hydropower provides 53% of renewable electricity production (installed capacity is 0.52 TW), while biomass 23%, PV production 17% (0.52 TW of installed capacity for PV) and other RES 7%.
- Heating and Cooling: Biomass provides 59%, while solar heating 3%. Heat pumps share is 28% and other renewable sources 10%. Directly use of electricity (e.g. electric heaters, electric radiators, etc.) is N.A.

Final Energy Consumption by sectors (GWh) ¹⁰

Industry: 14,270 (39%)

Transport: 6,338 (17%)

Residential: 14,607 (40%)

Services: N.A.

Agriculture/Forestry: 616 (2%)

Energy branch: 640 (2%)

Fishing: N.A.

Others: 23 (0%)

¹⁰ Residential also includes Services. Agriculture/Forestry also includes Fishing.

ITC3 – LIGURIA

General data: Eurac internal database – EUROSTAT (2015)

Size (km2)	Population (inh.)	Density (inh/km2)	GDP (Mil. €)	GDP per capita (€)
5.423	1.583.263	292	47.663	30.104

Energy data: EUSALP ENERGY SURVEY (2011)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct use (GWh)	Energy consumption – transport sector (GWh)
28.197	29.609	6137	35.76	10.215
			13,257**	

Energy data: EUSALP ENERGY SURVEY – UPDATE (2016)

	Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Export – electricity (GWh)
	36,177	6,041	9,211	17,200	2,389	27,827	656**
			12,936**			34,335**	

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purpose of energy data collection in the NUTS is to develop energy planning tools and monitoring. The main difficulties in data collection concern biomass, as it is difficult to trace both the supply of fuel for domestic use and the combustion systems themselves, which are often placed side by side with a heating system already registered. The methodology for energy data collection in the NUTS has not changed recently, there are procedures and standardized format for data collection. Data is stored on a structured database (e.g. MySQL, PostgreSQL, MariaDB, Oracle BYOL o SQL).

Energy balance and share of RES

Energy consumption in Liguria is mainly related to transport (48%), then heating and cooling (35%) and electricity (17%). Assuming RES are primarily used at the local level, electricity need is satisfied at 9% by locally generated power from RES, remaining by fossil fuels (Scenario A). Moreover, 11% of overall electricity from fossil fuels is exported (656 GWh).

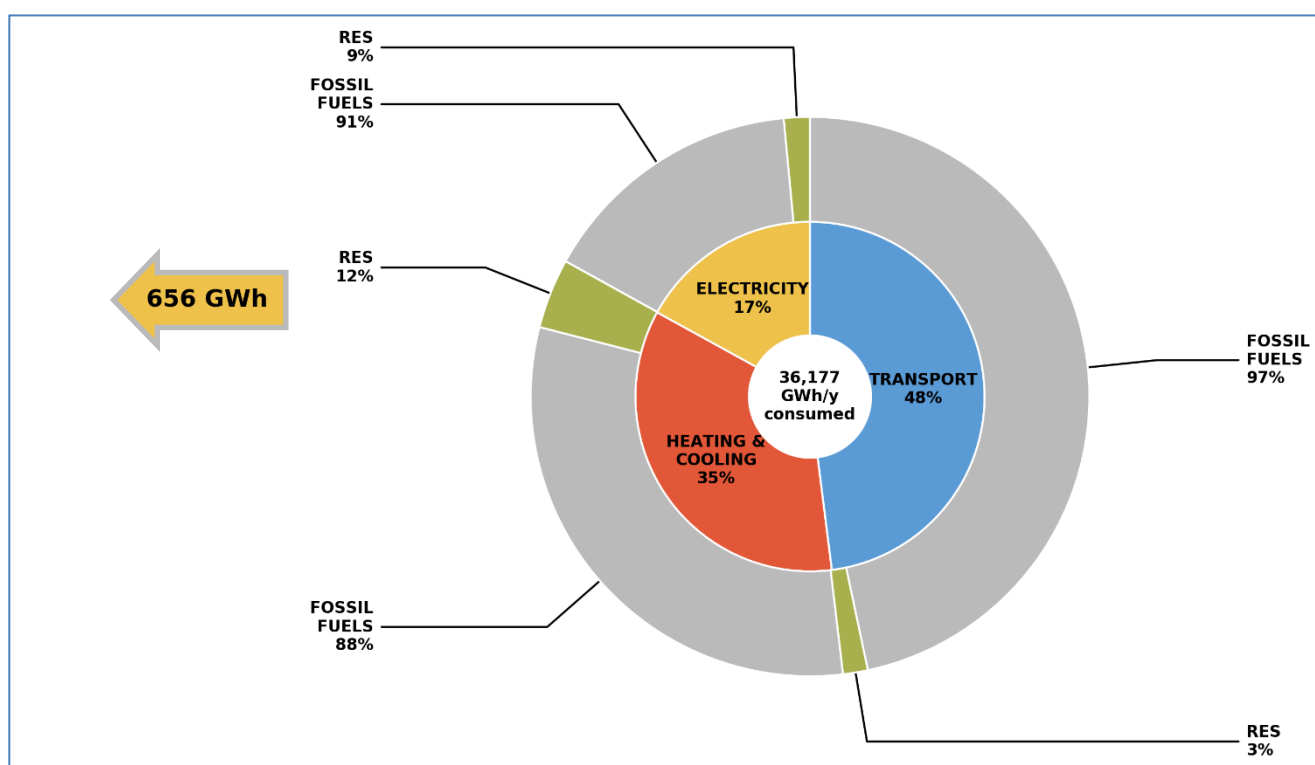


Figure 15: Energy consumption in Liguria – Scenario A

The figures remain similar also assuming the same energy mix in locally used electricity and exported: RES count for 8% while fossil 92%. In both cases, RES cover 12% of thermal needs and 3% in transport.

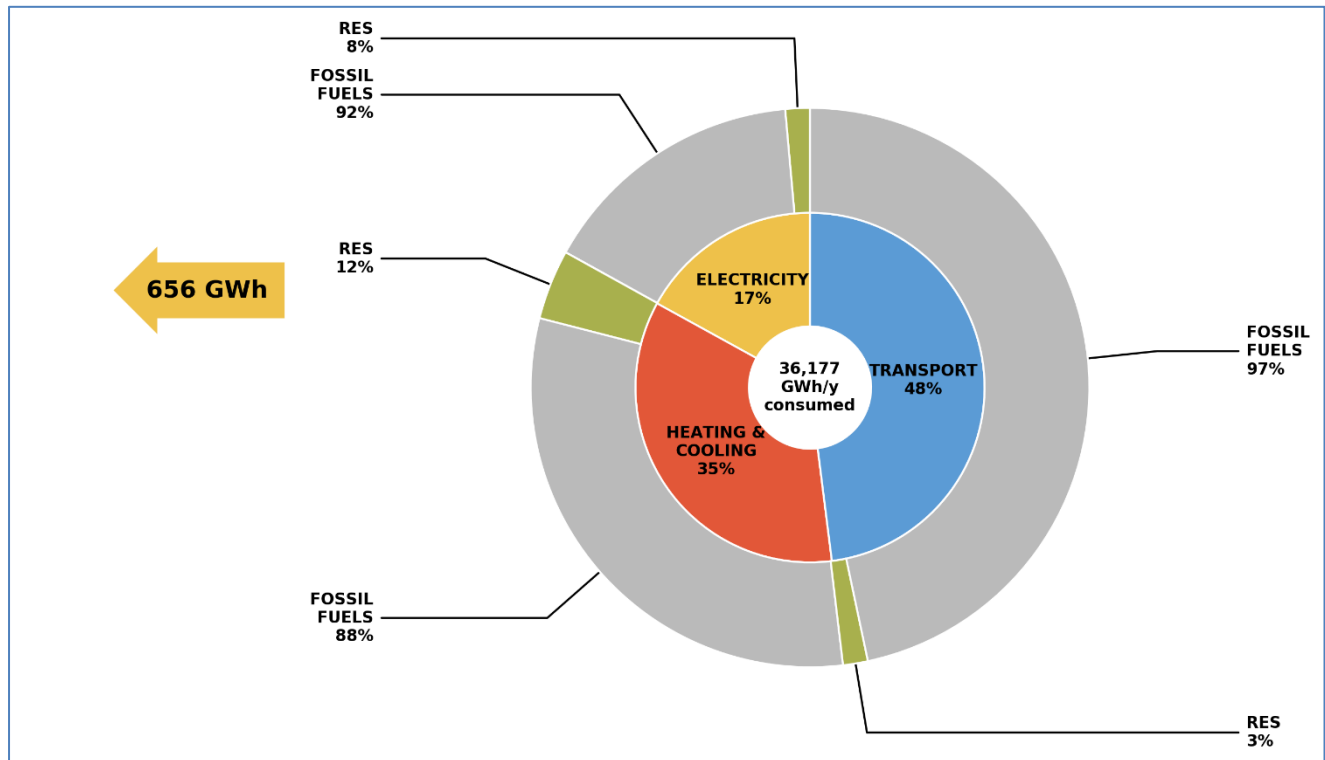


Figure 16: Energy consumption in Liguria – Scenario B

- Electricity: Hydropower provides 40% of renewable electricity production (installed capacity is N.A), while wind 24% (installed capacity is N.A) and PV 18% (installed capacity is N.A). Electricity from biomass is 18%;
- Heating and Cooling: Biomass provides 87%, while solar heating 3%. Heat pumps share is 10%, while direct use of electricity (e.g. electric heaters, electric radiators, etc.) is less common.

Final Energy Consumption by sectors (GWh)

Industry: 4,297 (11%)

Transport: 17,658 (47%)

Residential: 9,697 (26%)

Services: 4,005 (11%)

Agriculture/Forestry: 481 (1%)

Energy branch: 1,433 (4%)

Fishing: 39 (0%)

Others: N.A

ITC4 – LOMBARDIA

General data: Eurac internal database – EUROSTAT (2015)

Size (km ²)	Population (inh.)	Density (inh/km ²)	GDP (Mil. €)	GDP per capita (€)
23.876	10.002.615	419	357.200	35.711

Energy data: EUSALP ENERGY SURVEY (2014)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Energy consumption – transport sector (GWh)	Heat consumption (final energy), including direct elec. use (GWh)*
	271.195**	65.616**	70.559**	135.020**

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

	Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Final Energy consumption – imported electricity (GWh)
	282,950	67,429	N.A.	72,239	40,833	N.A.	N.A.
						222,327**	19,790**

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

[Info on data collection](#)

The main purposes of energy data collection in the NUTS is for energy planning and monitoring.

The methodology for energy data collection in the NUTS has not changed recently.

Data are stored using spreadsheets.

Energy balance and share of RES

Energy consumption in Lombardia is mainly related to heating and cooling (51%), then to electricity (24%) and to transport (25%). 26% of electricity needs are covered by RES, 45% by fossil fuels and 29% is imported electricity. 84% of heating and cooling demand is covered by fossil fuels. Remaining 16% of heating needs are covered by RES. RES in transport sector data is N.A.

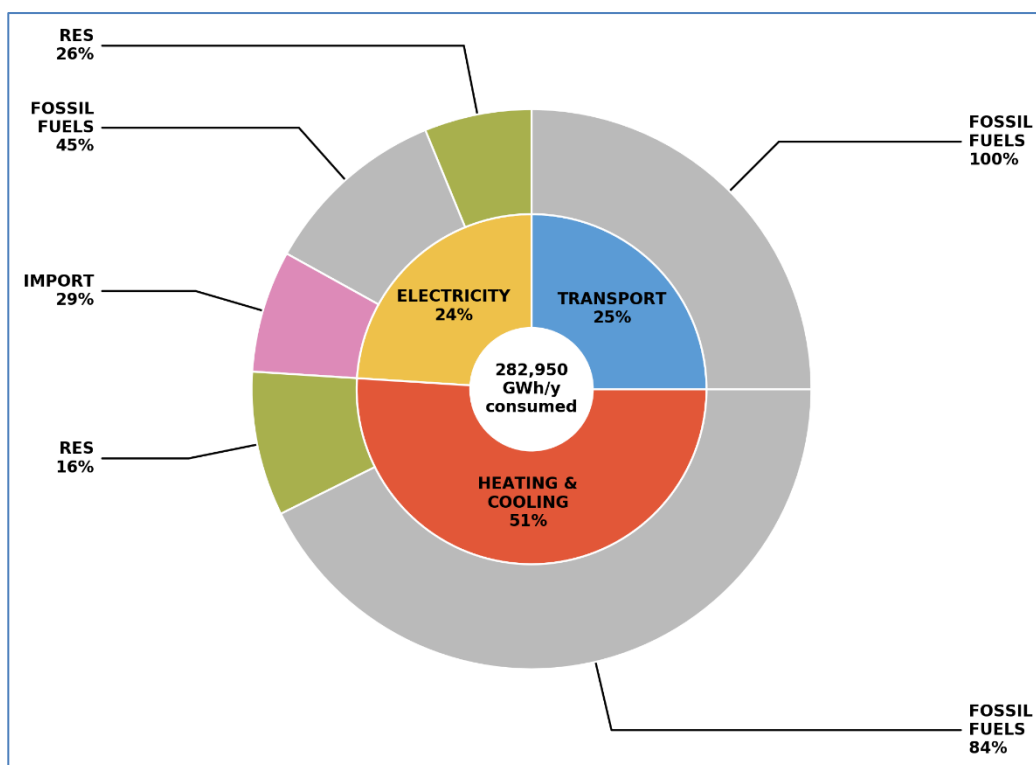


Figure 17: Energy consumption in Lombardia

- Electricity: Hydropower provides 62% of renewable electricity production (installed capacity is N.A TW), while PV 13% (installed capacity is N.A.) and biomass 23%.
- Heating and Cooling: Data is N.A. Directly use of electricity (e.g. electric heaters, electric radiators, etc.) is very common.

Final Energy Consumption by sectors (GWh)

Industry: 78,464 (28%)

Transport: 72,239 (26%)

Residential: 84,457 (30%)

Services: 38,285 (14%)

Agriculture/Forestry: 4,419 (2%)

Energy branch: 678 (6%)

Fishing: –

Others: –

ITC1 – PIEMONTE

General data: Eurac internal database – EUROSTAT (2015)

Size (km2)	Population (inh.)	Density (inh/km2)	GDP (Mil. €)	GDP per capita (€)
25.401	4.424.467	174	127.365	28.787

Energy data: EUSALP ENERGY SURVEY (2014)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)*	Energy consumption – transport sector (GWh)
	115.125	24.690	47.032	34.925
	106.647**			

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017–2018)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	
	121,859	25,500	58,464	39,925	22,576	99,284	

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

[Info on data collection](#)

The main purposes of energy data collection in the NUTS is for energy planning and monitoring.

The methodology for energy data collection in the NUTS has changed recently, the methodology will be on-line available soon (2020). The main difficulties in collecting data mainly concern thermal energy without a grid (i.e. biomass, solar thermal, etc.).

Data are stored using spreadsheets.

Energy balance and share of RES

Energy consumption in Piemonte is mainly related to heating and cooling (48%), then to transport (29%) and electricity (23%). 42% of electricity needs are covered by RES. 80% of heating and cooling demand is covered by fossil fuels. RES in transport sector data is N.A.

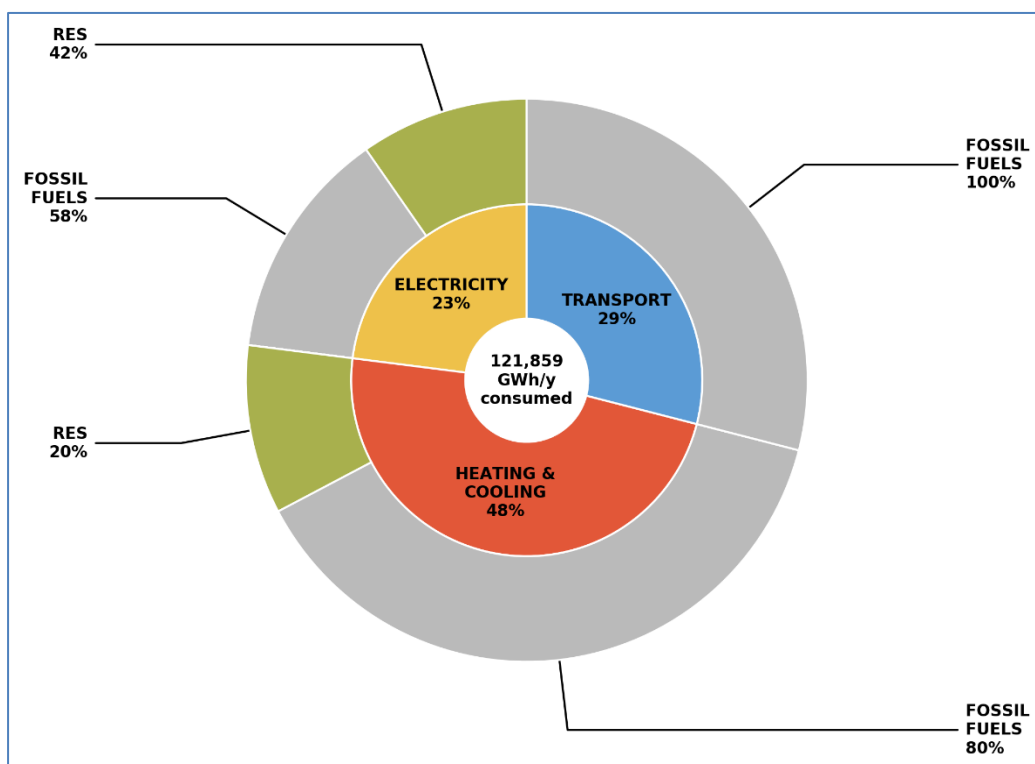


Figure 18: Energy consumption in Piemonte

- Electricity: Hydropower provides 66% of renewable electricity production (installed capacity is 3.83 TW), while PV 17% (installed capacity is 1.61 TW) and biomass 17% (installed capacity N.A.). Wind provides less than 1% (installed capacity is 0.02 TW).



- Heating and Cooling: Biomass provides 78%, while heat pumps cover 20% of renewable heat production (installed capacity N.A.). Solar heating provides 2% (installed capacity N.A.). Directly use of electricity (e.g. electric heaters, electric radiators, etc.) is not common.

Final Energy Consumption by sectors (GWh)¹¹

Industry: 24,121 (20%)

Transport: 34,925 (29%)

Residential: 53,486 (44%)

Services: –

Agriculture/Forestry: 2,582 (2%)

Energy branch: 6,804 (6%)

Fishing: –

Others: 3 (0%)

¹¹ Residential includes also Services. Agriculture includes also Fishing.

ITH1 – PROVINCIA AUTONOMA DI BOLZANO

General data: Eurac internal database – EUROSTAT (2015)

Size (km2)	Population (inh.)	Density (inh/km2)	GDP (Mil. €)	GDP per capita (€)
7.393	518.518	70	21.488	41.441

Energy data: EUSALP ENERGY SURVEY (2014)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)*	Energy consumption – transport sector (GWh)
15.085	12.408	2.846	6.151	3400

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Exported electricity (GWh)
	13,455	3,121	6,166	3,989	6,668	6,788 ¹²	2,575

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

¹² District heating not included.

Info on data collection

The main purposes of energy data collection in the NUTS is for energy planning and monitoring.

The methodology for energy data collection in the NUTS has not changed recently, the methodology will be on-line available soon (2020). The main difficulties in collecting data mainly concern biomass because there are no meters and heat pumps because their consumption is not included in electrical consumption. Data are stored using spreadsheets.

Energy balance and share of RES

Energy consumption in Provincia Autonoma di Bolzano is mainly to heating and cooling (47%), then transport (29%), and to electricity (24%). Electricity need is theoretically completely satisfied by locally generated power from RES, which is overabundant (Scenario A).

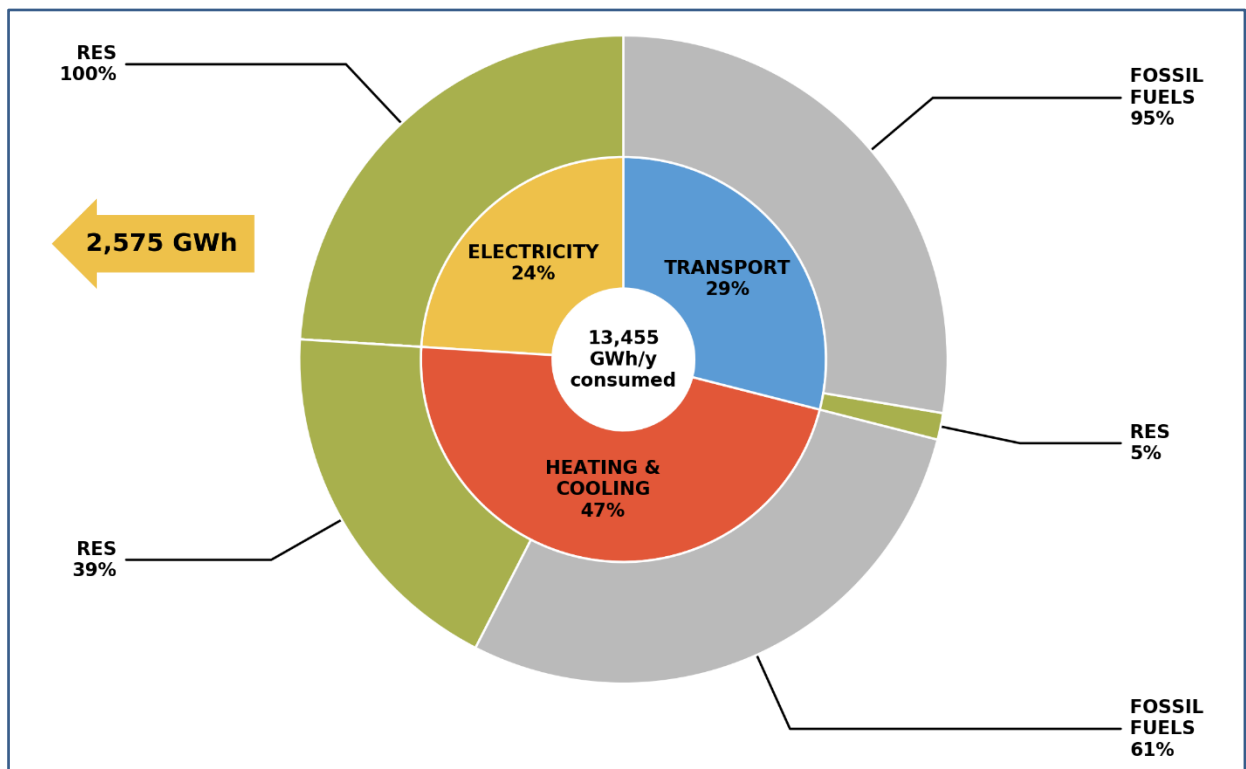


Figure 19: Energy consumption in Provincia Autonoma di Bolzano (Scenario A)

In practice, 7% is provided by the local use of fossil fuels (Scenario B), while there is an export of 2,575 GWh, (equal to 42% of RES). In both cases, RES cover 39% of thermal needs and 5% in transport.

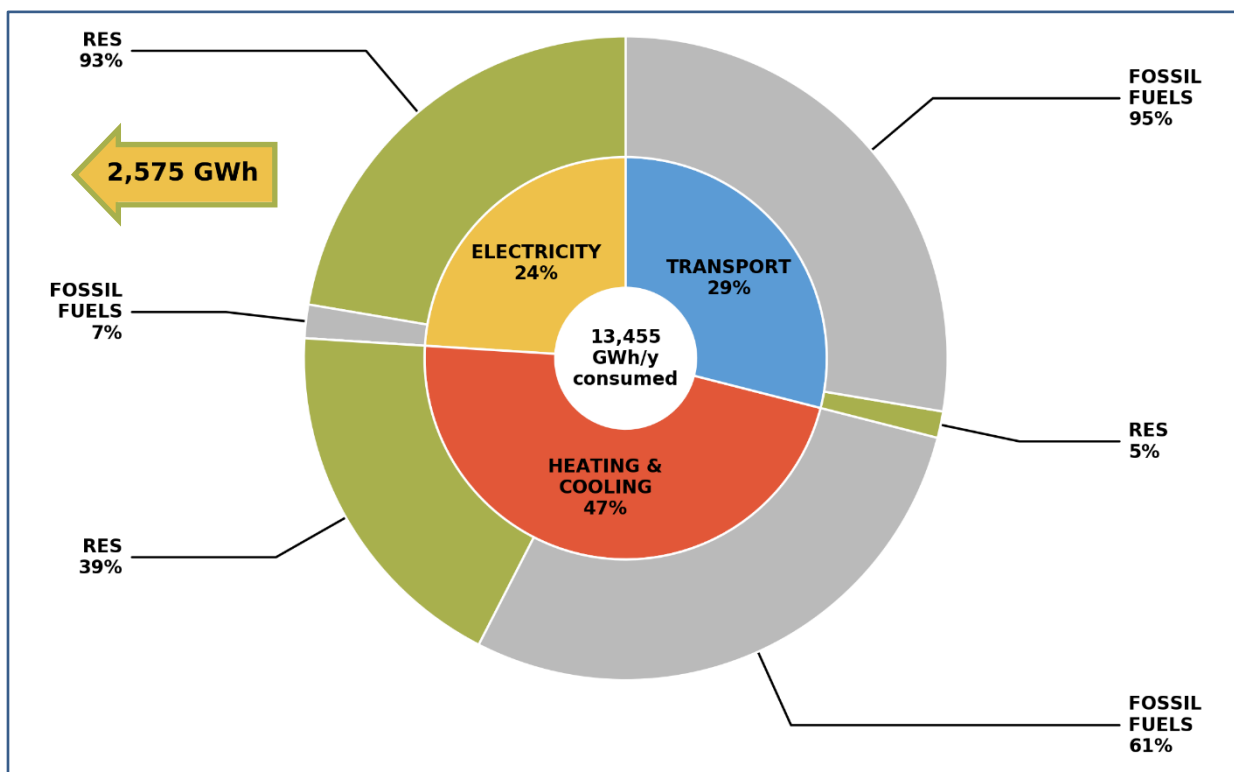


Figure 20: Energy consumption in Provincia Autonoma di Bolzano (Scenario B)

- Electricity: Hydropower provides 89% of renewable electricity production (installed capacity is 3.35 TW), while biomass 6%. PV production is 5% (0.42 TW of installed capacity).
- Heating and Cooling: Biomass provides 88%, while solar heating 3% (installed capacity is N.A). Heat pumps data is 8% (installed capacity is N.A), while direct use of electricity (e.g. electric heaters, electric radiators, etc.) is not common.

Final Energy Consumption by sectors (GWh)

Industry: N.A.

Transport: N.A.

Residential: N.A.

Services: N.A.

Agriculture/Forestry: N.A.

Energy branch: N.A.

Fishing: N.A.

Others: N.A.

ITH2 – PROVINCIA AUTONOMA DI TRENTO

General data: Eurac internal database – EUROSTAT (2015)

Size (km2)	Population (inh.)	Density (inh/km2)	GDP (Mil. €)	GDP per capita (€)
6.208	537.416	87	18.608	34.625

Energy data: EUSALP ENERGY SURVEY (2015)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)*	Energy consumption – transport sector (GWh)
	15.453	3.579		4.691
	15.403**		7.133**	

Energy data: EUSALP ENERGY SURVEY – UPDATE (2016)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Exported electricity (GWh)
	15,735	3,375	N.A	4,624	N.A	10,794	N.A
			7,689**		4,941**		

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purposes of energy data collection in the NUTS is for energy planning and monitoring.

The methodology for energy data collection in the NUTS has not changed recently. The main difficulties in collecting data mainly concern biomass. Data are stored on a structured database (e.g. MySQL, PostgreSQL, MariaDB, Oracle BYOL o SQL).

Energy balance and share of RES

Energy consumption in Provincia Autonoma di Trento is mainly to heating and cooling (49%), then transport (29%), and electricity (21%). Electricity need is completely satisfied by locally generated power from RES (100%). Electricity export is N.A. On the other hand, RES cover 20% of thermal needs. Data on transport is N.A.

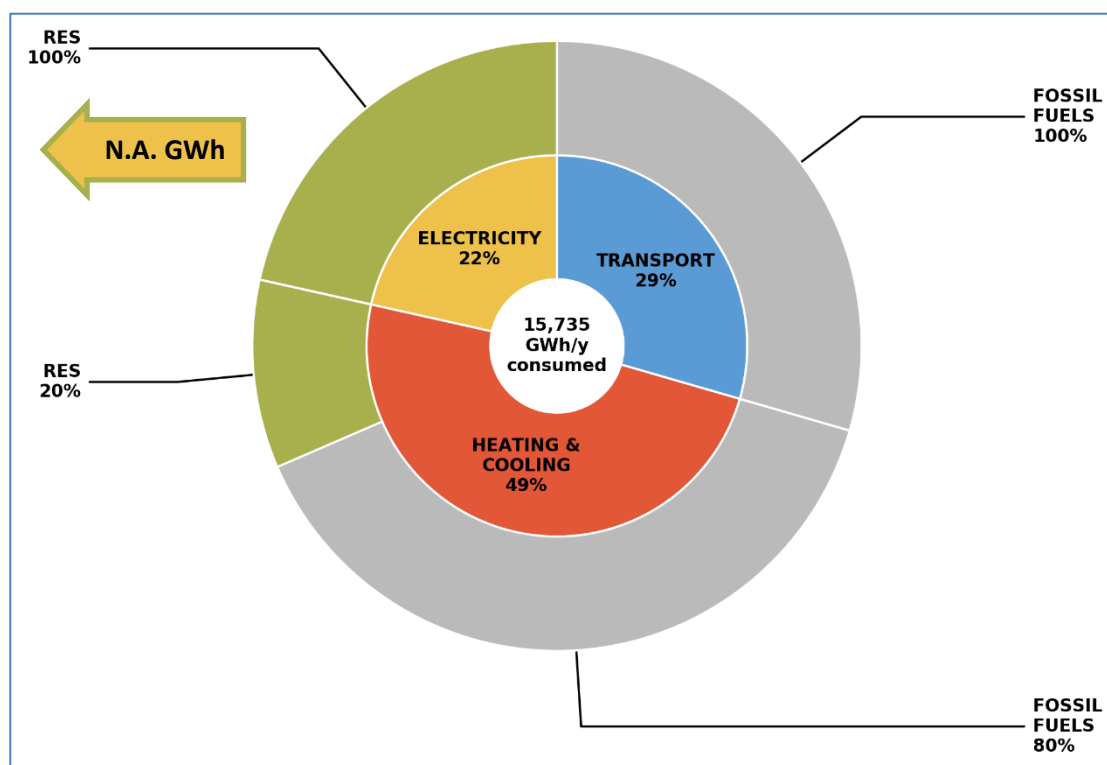


Figure 21: Energy consumption in Provincia Autonoma di Trento

- Electricity: Hydropower provides 94% of renewable electricity production (installed capacity is N.A.), while PV production is 5% (installed capacity is N.A.) and biomass 1%.

- Heating and Cooling: Biomass provides 100% of renewable heating. Heat pumps data is N.A (installed capacity is N.A), while direct use of electricity (e.g. electric heaters, electric radiators, etc.) is not so common.

Final Energy Consumption by sectors (GWh)¹³

Industry: 3,937 (28%9.

Transport: 4,624 (33%)

Residential: 3,691 (27%)

Services: 1,582 (11%)

Agriculture/Forestry: N.A.

Energy branch: N.A.

Fishing: N.A.

Others: N.A.

¹³ The sum is 13,833 GWh

ITH3 – VENETO

General data: Eurac internal database – EUROSTAT (2015)

Size (km2)	Population (inh.)	Density (inh/km2)	GDP (Mil. €)	GDP per capita (€)
17.749	4.927.596	278	151.634	30.772

Energy data: EUSALP ENERGY SURVEY (2010)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)	Energy consumption – transport sector (GWh)
	134.429**	31.742**	65.876**	36.811**

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	
	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

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* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The questionnaire EUSALP Energy Survey Update was not compiled.

ITC2 – VALLE D'AOSTA

General data: Eurac internal database – EUROSTAT (2015)

Size (km2)	Population (inh.)	Density (inh/km2)	GDP (Mil. €)	GDP per capita (€)
3.261	128.298	39	4.374	34.093

Energy data: EUSALP ENERGY SURVEY (2010)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)*	Energy consumption – transport sector (GWh)
	4.451	876	2.424	1.150

Energy data: EUSALP ENERGY SURVEY – UPDATE (2015–2017)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Energy export – electricity (GWh)
	4,695	1,137	3,525	1,161	3,825	3,023	N.A:
			2,432**				2,146**

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

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* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

[Info on data collection](#)

This section of the questionnaire EUSALP Energy Survey Update was not compiled.

Energy balance and share of RES

Energy consumption in Valle d'Aosta is mainly related to heating and cooling (51%), then transport (25%), and electricity (24%). Electricity need is completely satisfied by locally generated power from RES (100%), which is overabundant. Electricity export is 2,146 GWh (65% of local production). On the other hand, RES cover 23% of thermal needs and 0% in transport.

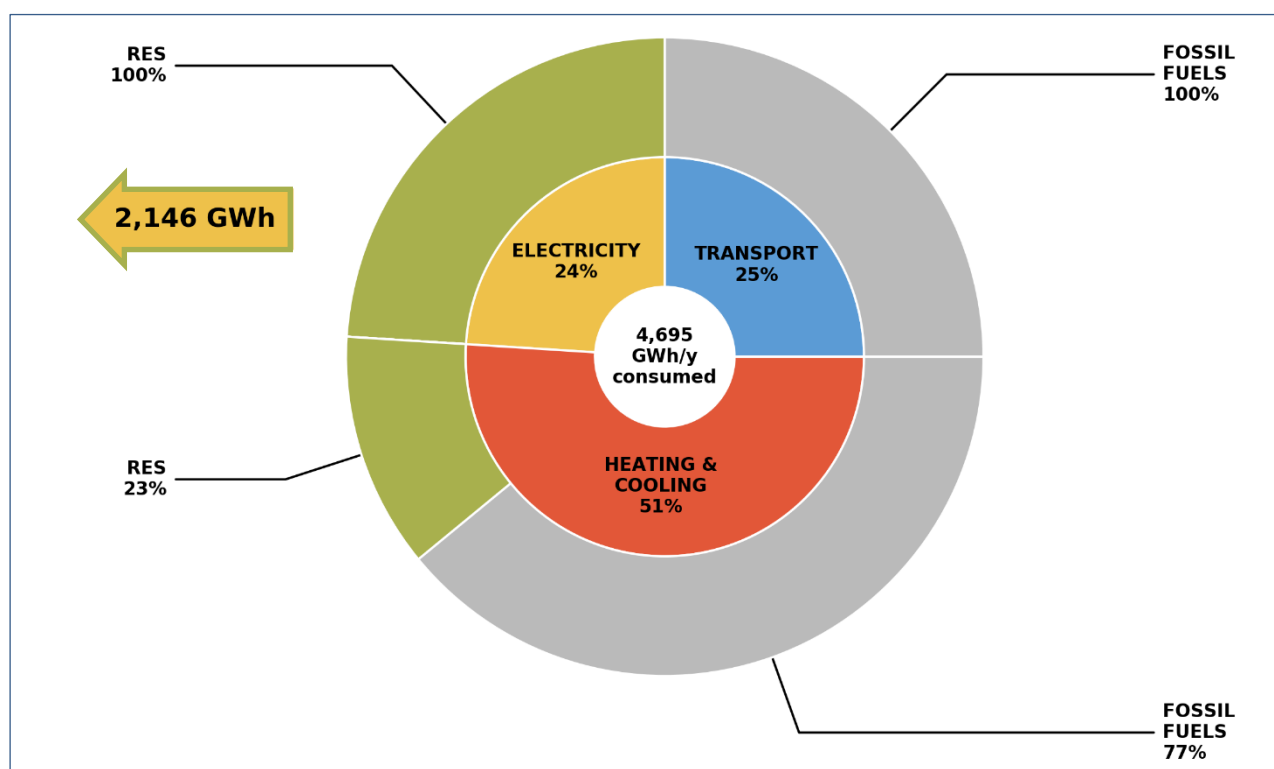


Figure 22: Energy consumption in Valle d'Aosta

- Electricity: Hydropower provides 99% of renewable electricity production (installed capacity is 0.95 TW), while PV 1% (0.02 TW of installed capacity), biomass and wind less than 1%.
- Heating and Cooling: Biomass provides the 80%, while solar heating 4% and heat pumps 4% (installed capacity is N.A.). Data on direct use of electricity (e.g. electric heaters, electric radiators, etc.) is N.A.



Final Energy Consumption by sectors (GWh)

Industry: N.A.

Transport: N.A.

Residential: N.A.

Services: N.A.

Agriculture/Forestry: N.A.

Energy branch: N.A.

Fishing: N.A.

Others: N.A.

LI – LIECHTENSTEIN

General data: Eurac internal database – EUROSTAT (2015)

Size (km ²)	Population (inh.)	Density (inh/km ²)	GDP (Mil. €)	GDP per capita (€)
160	37.366	234	5.607	150.064

Energy data: EUSALP ENERGY SURVEY (2015)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)*	Energy consumption – transport sector (GWh)
	1.237	394	588**	256**

Energy data: EUSALP ENERGY SURVEY – UPDATE (2018)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Gross final energy consumption from imported electricity (GWh)
	1,210	408	428	256	157	733	320**
			546**				

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

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* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purpose of energy data collection in the NUTS is monitoring. The methodology for energy data collection in the NUTS has recently changed due to national statistic needs. Data storage info: N.A.

Energy balance and share of RES

Energy consumption in Liechtenstein is mainly related to heating and cooling (45%), then to electricity (34%) and to transport (21%). The 22% of electricity needs are covered by RES, the rest is almost all imported electricity (fossil is <1%). 87% of heating and cooling demand is covered by fossil fuels. Remaining 13% of heating needs are covered by RES. There is no RES in the transport sector.

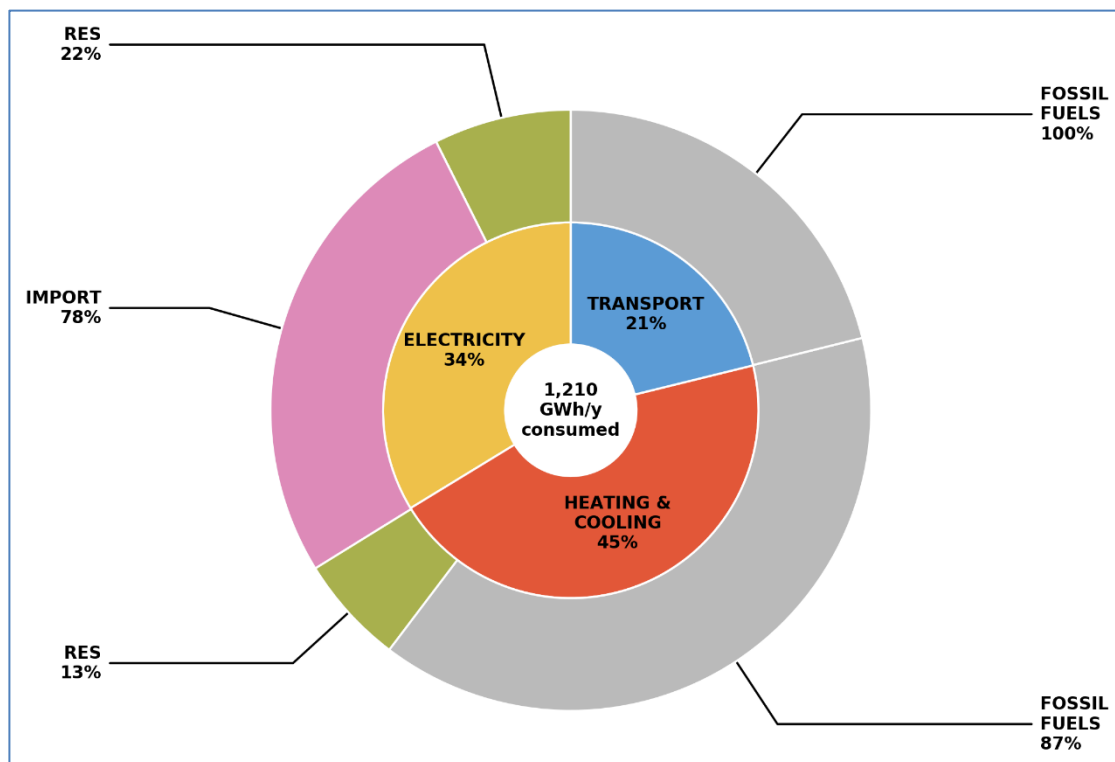


Figure 23: Energy consumption in Liechtenstein

- Electricity: Hydropower provides 72% of renewable electricity production (installed capacity is N.A.), while PV 28% (installed capacity is N.A.).

- Heating and Cooling: Biomass provides 86%, while solar heat covers 14% of renewable heat production. Data on heat pumps are N.A. Directly use of electricity (e.g. electric heaters, electric radiators, etc.) is very common.

Final Energy Consumption by sectors (GWh)

Industry: N.A

Agriculture/Forestry: N.A

Transport: 256 (N.A%)

Energy branch: N.A

Residential: N.A

Services: N.A

SI – SLOVENIA

General data: Eurac internal database – EUROSTAT (2015)

Size (km ²)	Population (inh.)	Density (inh/km ²)	GDP (Mil. €)	GDP per capita (€)
20.274	2.062.874	102	38.570	18.697

Energy data: EUSALP ENERGY SURVEY (2015)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)*	Energy consumption – transport sector (GWh)
39.606	55.219	12.894	21.398*	20.927

Energy data: EUSALP ENERGY SURVEY – UPDATE (2018)

Energy production (GWh)	Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	Gross final energy consumption from nuclear (GWh)
	58,581	16,326	N.A.	21,748	12,619	33,622	5,968
			20,507**				

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

"The gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced" in the local administrative unit "from renewable energy sources, excluding the production of electricity in pumped storage units from water that has previously been pumped uphill". For the collection of these data, we refer to the DIRECTIVE 2009/28/EC Article 5 Calculation of the share of energy from renewable sources by considering the NUTS.

The final energy consumption is the total energy consumed by end-users, such as households, industry, and agriculture. It is the energy that reaches the final consumer's door. Final energy consumption excludes energy used by the energy sector, including for deliveries, and transformation. It also excludes fuel transformed in the electrical power stations of industrial auto-producers, and coke transformed into blast-furnace gas where this is not part of overall industrial consumption but of the transformation sector. Final energy consumption in "households, services, etc." covers quantities consumed by private households, commerce, public administration, services, agriculture, and fisheries. (EUROSTAT GLOSSARY)

* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

Info on data collection

The main purposes of energy data collection in the NUTS are to develop energy planning tools and normative. The main difficulties in data collection concern the unavailability of some info (e.g., the subgroups of transport energy consumption and data about biomass). Also, the analysis of RES consumption by plant/subgroup is not available. The methodology for energy data collection in the NUTS has not changed recently, the methodological explanation is available at www.stat.si/StatWeb/Common/PrikaziDokument.ashx?IdDatoteke=8345. Data is stored on a structured database (e.g. MySQL, PostgreSQL, MariaDB, Oracle BYOL o SQL). The data is taken from the official national statistical office (SURS) and is available on the web site https://pxweb.stat.si/SiStatDb/pxweb/sl/HITRE_Repozitorij/HITRE_Repozitorij/H027S.px/table/tableViewLayout2/

Energy balance and share of RES

Energy consumption in Slovenia is mainly related to heating and cooling (35%), then to transport (37%) and electricity (28%).

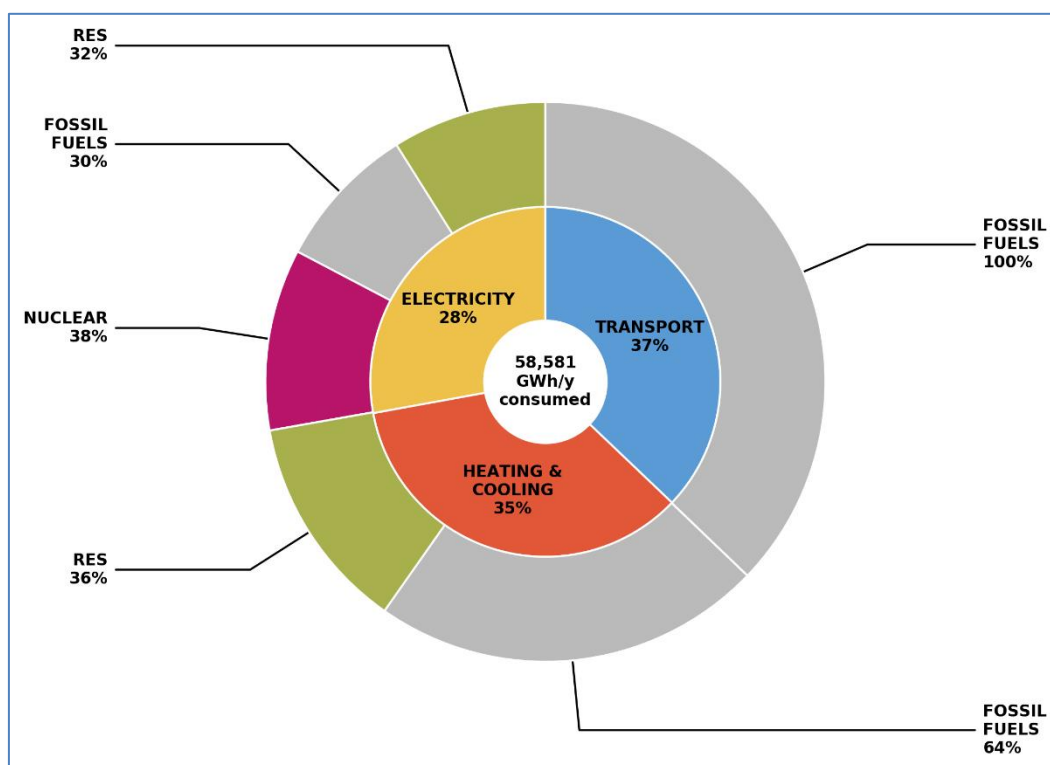


Figure 24: Energy consumption in Slovenia

32% of electricity needs are covered by RES, 30% by fossil fuels and 38% by nuclear energy. Electricity export is N.A. 64% of heating and cooling demand is covered by fossil fuels. Remaining 36% of heating needs are covered by RES. There is almost no RES in the transport sector.

- Electricity: Hydropower provides 90% of renewable electricity production (installed capacity is N.A.), while PV 5% (installed capacity is N.A.) and biomass 5%.
- Heating and Cooling: Biomass provides 77%, while solar heat covers 2% of renewable heat production and heat pumps 7%. Directly use of electricity (e.g. electric heaters, electric radiators, etc.) is common.

Final Energy Consumption by sectors (GWh)

Industry: 15,038 (24%)

Transport: 21,748 (34%)

Residential: 13,026 (21%)

Services: 5,850 (9%)

Agriculture/Forestry: 849 (1%)

Energy branch: 140 (0%)

Fishing: N.A.

Others: 6,443 (10%)

CHO – SWITZERLAND

General data: Eurac internal database – EUROSTAT (2015)

Size (km ²)	Population (inh.)	Density (inh/km ²)	GDP (Mil. €)	GDP per capita (€)
41.291	8.237.666	199,05	612.169	74.313

Energy data: EUSALP ENERGY SURVEY (2015)

Energy production (GWh)	Final energy consumption (GWh)	Final energy consumption – electricity (GWh)	Heat consumption (final energy), including direct elec. use (GWh)	Energy consumption – transport sector (GWh)
	232.712**	58.247**	89.665**	84.800**

Energy data: EUSALP ENERGY SURVEY – UPDATE (2017)

	Gross Final energy consumption (GWh)	Gross Final energy consumption – electricity (GWh)	Gross Final energy consumption – Heating and Cooling (GWh)*	Final Energy consumption – transport sector (GWh)	Gross final energy consumption from RES (GWh)	Gross final energy consumption from fossil fuels (GWh)	
	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	

The gross final consumption of energy means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry, and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission (Directive 2009/28/EC).

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* Automatic sum of data provided by the respondent for different energy sources

** Elaboration based on data provided by the respondent for different questions or on amended data

[Info on data collection](#)

The questionnaire EUSALP Energy Survey Update was not compiled.

SECTION 2 – QUALITATIVE INFO

The second section of the EUSALP ENERGY SURVEY UPDATE 2019 focuses on the qualitative assessment of local policies and examples sustaining small scale RES generation, energy efficacy, and renewable energy communities. Respondents are also asked to identify investment priorities in their NUTS.

Energy efficiency in buildings

- Q50. In your local administrative unit, is there in place any successful example of public policy to sustain the energy renovation in buildings? Please refer to the measure(s), whether local or national, you consider most interesting.

Table 2: Public policies to sustain the energy renovation in buildings

Q50	Number of answers
There is – It works partially	9
There is – It works fine	5
So-so	2
Don't know / N.A	2
There isn't	0
It doesn't work	0

The majority of answers return the existence of public policies to sustain the energy renovation in buildings. Such policies seem to work fine (5) or at least partially good (9), not so good in a few cases (2).

In particular, good results of energy renovation policies are claimed by MissionZeroV in Vorarlberg (<https://presse.vorarlberg.at/land/dist/vlk-58126.html>), energy efficiency law in Liechtenstein (Energieeffizienzgesetz www.energiebündel.li), Slovenia (http://www.mzi.gov.si/en/areas_of_work/energy/energy_renovation_of_buildings/) and in Lombardia. The latter has recently updated the provisions on efficiency and energy certification of buildings (L.R. 176/2017); the law contains requirements for new buildings; requirements for

nearly zero-energy buildings; requirements for buildings subject to major second-level renovations.

Positive results are also recognized by Burgenland, where attractive regional funding for renovation exists or by Baden-Württemberg. In this case, besides building codes on the national level, containing energy standards for buildings that undergo renovation, there are subsidy programs (Low-interest loans and investment grants) for energy renovations in buildings both on the national and regional levels.

Also, Italian NUTS have positive examples, as in Piemonte, where ERDF is providing grants for energy renovation of public buildings and some projects promoting energy efficiency are using Energy Performance Contracts or in Friuli Venezia Giulia, with some projects for energy savings in schools and hospitals developed and implemented within European programs. The Autonomous Province of Bolzano grants economical subsidies for the deep renovation of buildings and in the Autonomous Province of Trento exists a memorandum of understanding called “Il tuo Condominio Green” (Your green condominium). The Liguria region is also very active: at the regional level, there is a project named ENERSHIFT for the energy renovation of social housing by EPC. They have also promoted the ELENA program in the province of Savona and municipality of Genova for energy efficiency, public buildings, lightning and renewable energies like biomass. Moreover, the support to the energy renovation in buildings was guaranteed also by Regional Operative Program ERDF 2014-2020 - action 4.1.1.

Renewable energy sources and local energy communities

- Q51. In your local administrative unit, is there in place any successful example of public policy to sustain the small-scale renewable energy generation? Please refer to the measure(s), whether local or national, you consider most interesting?

Table 3: public policy to sustain the small-scale renewable energy generation

Q50	Number of answers
There is – It works fine	7
There is – It works partially	5

So-so	2
There isn't	0
It doesn't work	0

The majority of answers return the existence of public policies to sustain the small-scale renewable energy generation. Such policies seem to work fine (7) or at least partially good (5) or not so good in a few cases (2). In Baden-Württemberg small-scale solar PV is supported by a national feed-in tariff system. The use of renewable heating systems in existing buildings is supported by subsidy programs (Low-interest loans or investment grants). In Vorarlberg is encouraged the expansion of small hydropower plants and small-scale PV plants. In Piemonte, ERDF is providing grants for RES installation for SMEs (i.e. PV plants on the roof ranging from 20 to 200 kWp). In Liechtenstein again the energy efficiency law works fine (Energieeffizienzgesetz www.energiebündel.li).

Burgenland reports quite good results from funding for small PV plants for private households and Lombardia from the so-called “Bando accumulo 2019” (incentive measures for the diffusion of electricity storage systems from photovoltaic systems).

- Q52. The EU Winter Package 2016 is introducing a new energy market design. Among others, it recognizes the role of the “Energy Communities” as legal entities where citizens, SMEs, and local authorities come together, as final users of energy, to cooperate in the generation, consumption distribution, storage, supply, aggregation of energy from renewable sources, or offer energy efficiency/demand-side management services. In your local administrative unit, are there examples of energy communities? (see full definition at <https://www.rescoop.eu/definitions>)

Table 4: Existence of energy communities

Q52	Number of answers
So-so	7
Not common	2
Less common	2
Common	2
Very common	1

Energy communities seem to be not a very common or common situation in the EUSALP, except for Auvergne-Rhone Alpe, or Burgenland where there is the so called KEM Regions (Climate and Energy Regions) established, and about 30% of all villages are involved, or the Autonomous province of Bolzano, with various cooperatives for the common use of electric and thermal energy.

The majority of answers return an intermediate situation concerning energy communities (7): in Vorarlberg, they are more often active in the field of electricity production, Baden-Württemberg has a substantial number of local energy cooperatives producing and distributing renewable electricity or heat; the Autonomous province of Trento established the “Primiero Green Way”, In Lombardia, for example, the municipality of Tirano (SO) uses 100% of energy from renewable sources. In the municipality, there are 8 medium voltage producers, 3 of which are thermal cogeneration, 5 photovoltaic and 192 prosumers. The Piemonte Region recently approved the first Italian Law on Sustainable Energy Communities (<https://bit.ly/2Ms2HZy>), while in Slovenia the legislative framework is under construction.

Investment priorities

Q53. In your local administrative unit, to reach the current climate-energy goals, what is the strategic sector for public or private investments in energy? Please order the following sectors according to the planning investments.

The most relevant investment sectors is “energy efficiency”, while “mobility” and “heating and cooling” follow having a similar magnitude. The less mentioned is “electricity production”. Interestingly, “mobility” is

also the sector receiving the largest share of “low priority” answers, thus indicating a contesting view among respondents and/or territories.

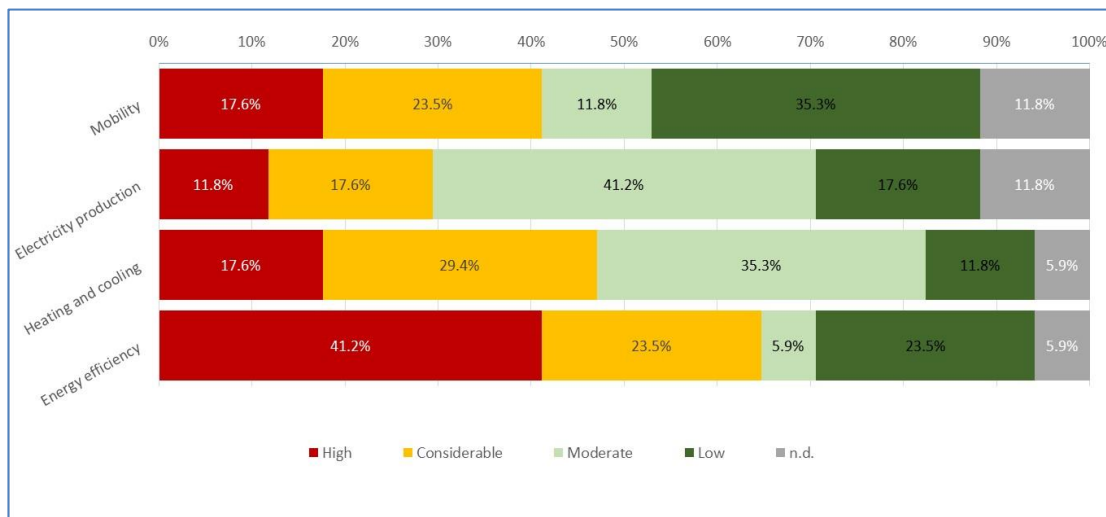


Figure 25: Strategic sector for public or private investments in energy to reach the current climate-energy goals

Q54. Please order the mobility measures according to the planning investments.

Within the measures dedicated to stimulating a more sustainable mobility, electromobility (e-mobility) and the use of shared vehicles (e.g. bicycles, cars, scooters, etc.) are the ones attracting more investments, according to respondents. Interestingly, the “railway” sector received similar shares

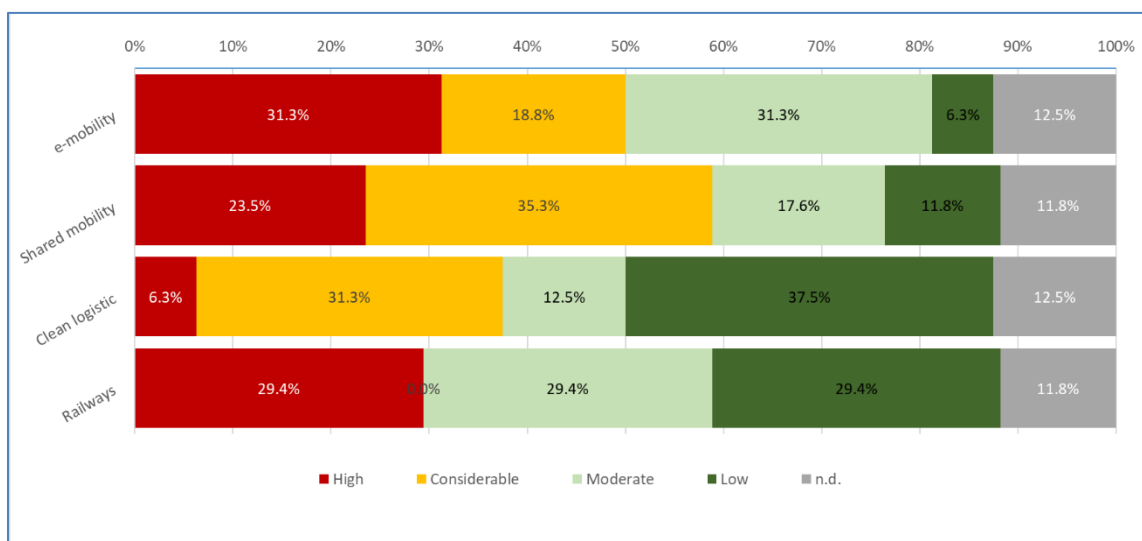


Figure 26: Mobility measures according to the planning investments

of “high priority” and “low priority” answers, thus indicating a contesting view among respondents and/or territories

Q55. Please order the electricity production measures according to the planning investments.

Among RES available for clean electricity production, main investments are foreseen in the “photovoltaic” (PV) sector, and in the “hydropower” generation too. The “electricity from biomass” is often mentioned as a low priority area. The “nuclear” sector received similar shares of “high priority” and “low priority” answers, thus indicating that probably territories having such power plants still will relying on this source in the future, and at least investments on existing plants are foreseen. The “clean coal” has been never mentioned as a high priority.

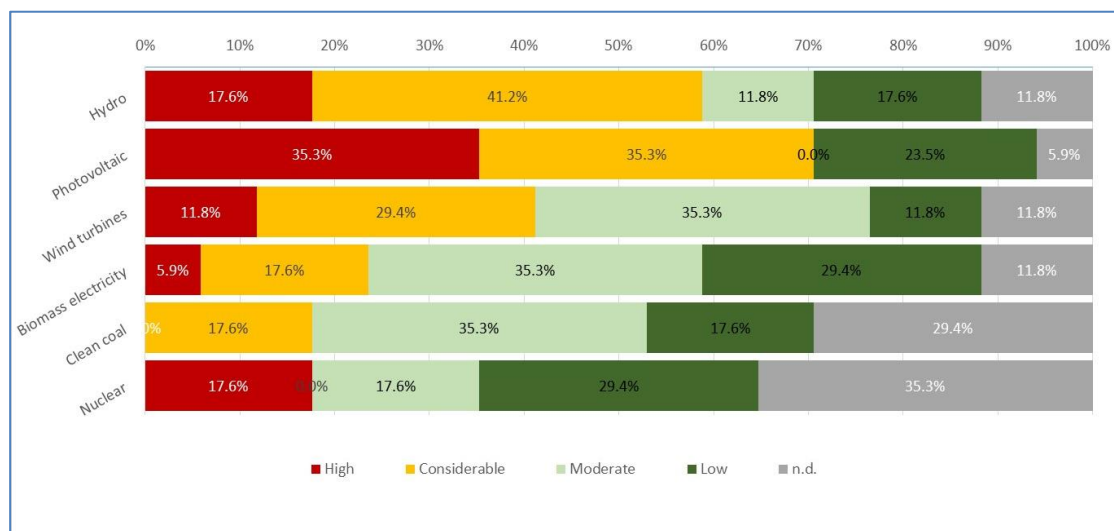


Figure 27: Electricity production measures according to the planning investments

Q56. Please order the heating and cooling measures according to the planning investments by technology

According to respondents, “heat pumps” are the main priority area of investment. The “thermal energy from biomass” and “low-temperature district heating” are also considered by the largest share of respondents/territories remarkable investment sectors. Only moderate investments are foreseen on “solar thermal” technologies. About “shallow geothermal” and “natural gas” the majority of answers indicate moderate or low investments.

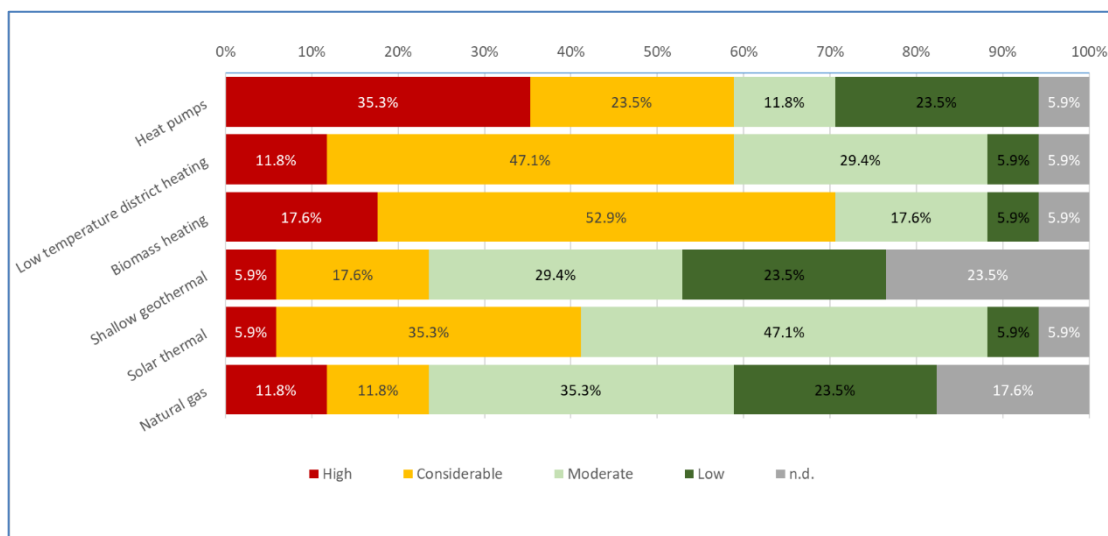


Figure 28: Heating and cooling measures according to the planning investments by technology

Q57. Please order the energy efficiency measures according to the planning investments by sector.

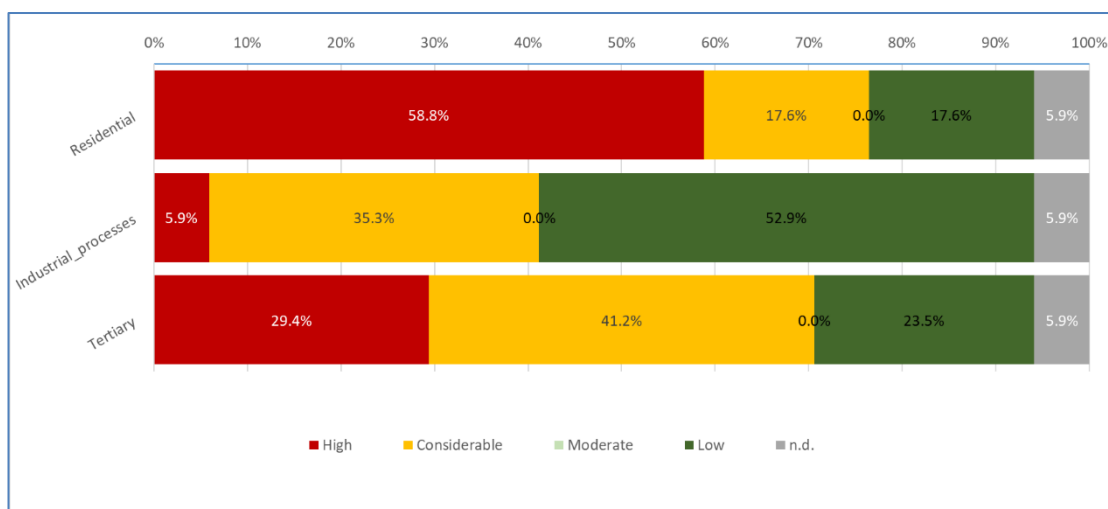


Figure 29: Energy efficiency measures according to the planning investments

The most relevant investment sector is undoubtedly the “residential”, although also the “tertiary” one has remarkable importance”, while on the contrary “industrial processes” is mentioned having a low priority by the majority of respondents.



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