

# LOCAL REPORT FOR CIRCULAR ECONOMY CRITICAL FACTORS (D.T1.2.4)

---

Subtitle

Version 1  
MM YYYY

---





## TABLE OF CONTENT

<b>1. Assessment of critical factors for modelling closed-loop systems in the selected industrial park .....</b>	<b>2</b>
1.1. Basic Pilot Area Characterization .....	2
1.2. Circular Economy Awareness and Current Practices .....	2
1.3. Scope and Availability of Preliminary Modeling Data .....	15
1.4. Conclusions and Recommendations for Overcoming Barriers in Obtaining Data .....	16
<b>2. ASSESSMENT OF MARKET BARRIERS ANALYSIS FOR THE CREATION OF AN EFFICIENT MODEL OF INDUSTRIAL SYMBIOSIS .....</b>	<b>17</b>
2.1. Local legislative environment .....	18
2.2. Assessment of Market factors .....	20
2.2.1. Absence or Presence of Waste Types .....	20
2.2.2. Demand for Critical Raw Materials .....	20
2.2.3. <i>Motivating Factors and Cooperation</i> .....	20
2.2.4. <i>Availability of Infrastructure</i> .....	21
2.3. Conclusions and recommendations .....	22
<b>3. Assessment of availability industrial &amp; waste management information .....</b>	<b>23</b>
3.1. Accessibility of waste generation /management information .....	23
3.2. Recommendations for information exchange .....	25
<b>4. Assessment of limits to access mature cleanup techs .....</b>	<b>26</b>
4.1. Mapping waste management technologies in the environment of the selected pilot area .....	26
4.2. Gap analysis of waste recycling /management technologies .....	26
4.3. Recommendations to improve availability of waste management technologies in the environment of the pilot area .....	27
<b>5. References .....</b>	<b>27</b>



# 1. Assessment of critical factors for modelling closed-loop systems in the selected industrial park

## 1.1. Basic Pilot Area Characterization

**Table 1: Pilot Area Description**

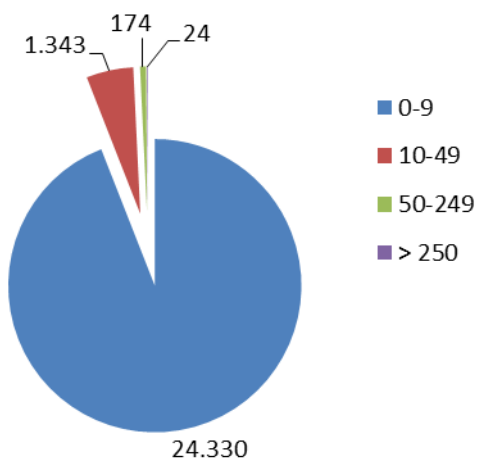
Name / Location Pilot Area: municipalities in Padua and Vicenza provinces served by ETRA Spa (Veneto region – Northern Italy)
<p>Number of Enterprises in the Pilot Area:</p> <ul style="list-style-type: none"> <li>• 391474 in Veneto region</li> <li>• 82429 in Padua province</li> <li>• 69704 in Vicenza province</li> <li>• 25871 estimation for ETRA area based on # of inhabitants</li> </ul> <p>Number of Manufacturing Enterprises in the Pilot Area:</p> <ul style="list-style-type: none"> <li>• 44432 in Veneto region</li> <li>• 7374 in Padua province</li> <li>• 8520 in Vicenza province</li> <li>• 2541 estimation for ETRA area based on # of inhabitants</li> </ul>
<p>Number of Enterprises potentially Involved in the Pilot Study include the following:</p> <p>SME- Small and Medium Sized entities:_____</p> <p>Large-sized entities*: _____</p> <p>Industrial Sectors: characterization of the industrial sectors is deeply discussed in the following paragraphs</p>

\* Large-size entities are companies: Employing more than 250 employees; OR Having an annual net revenue more than 50m euros, AND having an aggregate amount of the balance sheet more than 43m euros.

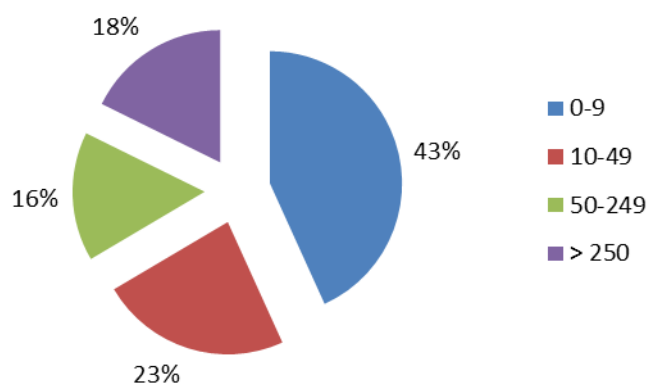
The following pie charts are estimated values based on the number of inhabitants.



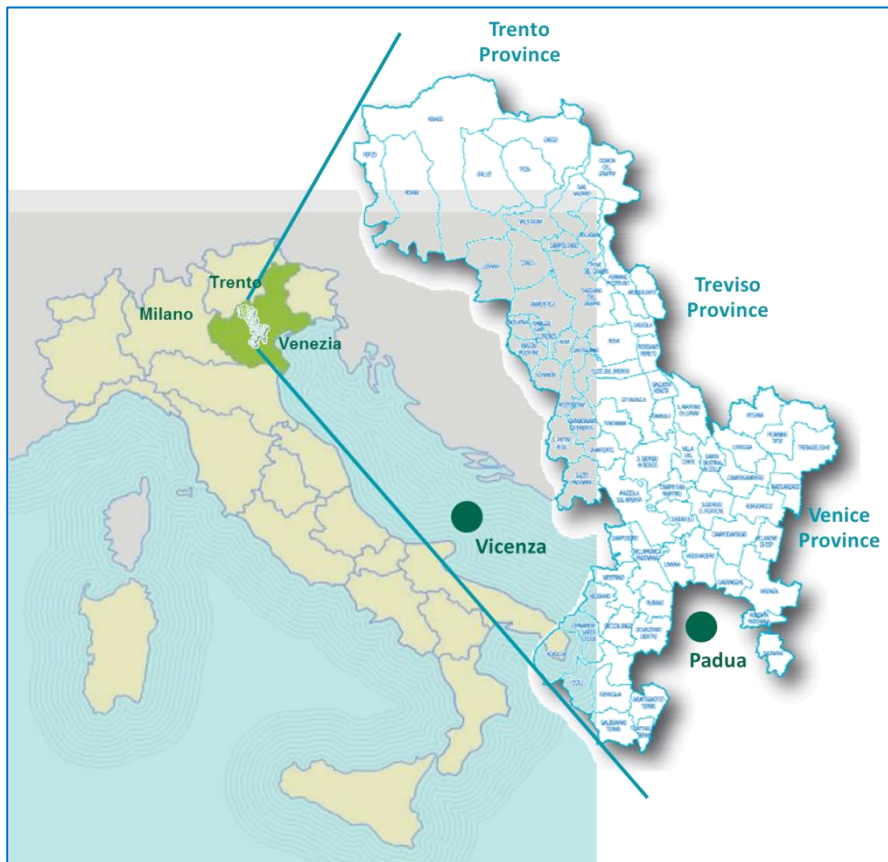
**Active enterprises by number of employees class**



**total employees by number of employees class**



### *Location of the pilot area*



Veneto is the eighth largest region in Italy, with a total area of 18,407.4 km<sup>2</sup> (7,106.98 sq. miles). It borders to the East with Friuli Venezia Giulia, to the South by Emilia-Romagna, to the West with Lombardy and to the North by Trentino-Alto Adige. It has about 4.9 million inhabitants, which makes Veneto the fifth most populated region in Italy.

In 74 municipalities in Veneto region, ETRA provides mainly waste management and integrated water service, serving a population of 592,998 inhabitants (ISTAT 2016). The municipalities are located along the Brenta River which extends from the Asiago plateau to the Euganean hills including the area of the Bassanese, the northern part of the province of Padua and the urban belt around the municipality of Padua.

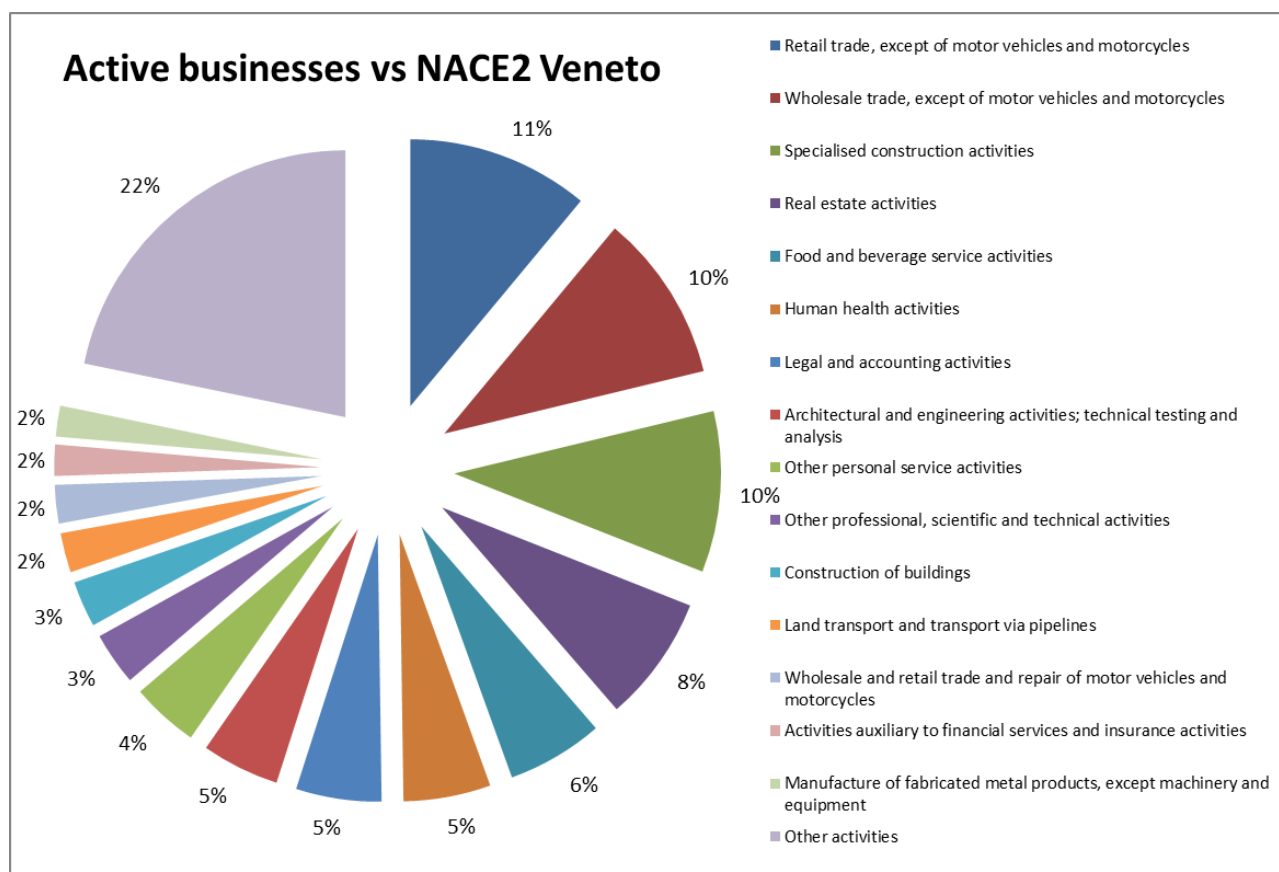
The territory where ETRA works is characterized by municipalities of small and medium demographic dimension: about 69% have less than 10,000 inhabitants, with a high population density (353 inhabitants/km<sup>2</sup>, compared to a regional average of 267 inhabitants/km<sup>2</sup> and an Italian average of 201 inhabitants/km<sup>2</sup> in 2015) and a widespread urbanization. Exceptions are the municipalities located on the Asiago plateau and the Valbrenta, characterized by mountain territory and a lower population density.

### *Economic overview*

From the point of view economical features and productive system, the territory where ETRA operates can be compared to the average regional one. The following Figures describe the

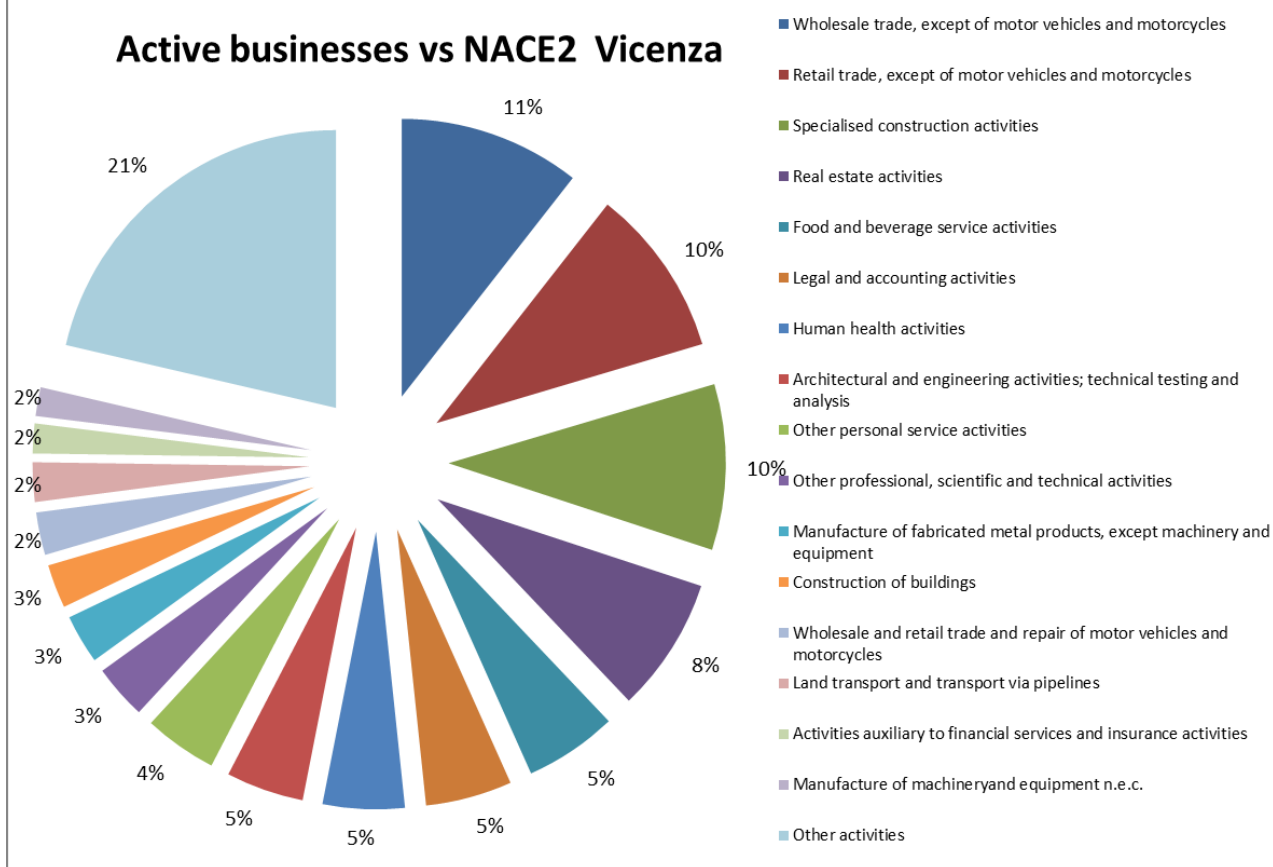


economic fabric of the Veneto region, Padua province and Vicenza province in terms of number of active businesses in 2015 according to ISTAT database. In order to obtain readable figures, activities weighting less than 1% on the total number have been aggregated in “Other activities”. It is clear that the discussion about the productive fabric of Veneto can be overlapped to the territory of ETRA that is shared between the described provinces, as mentioned before. This assumption led to consider the description of the economy of the whole Region reliable for the ETRA area.

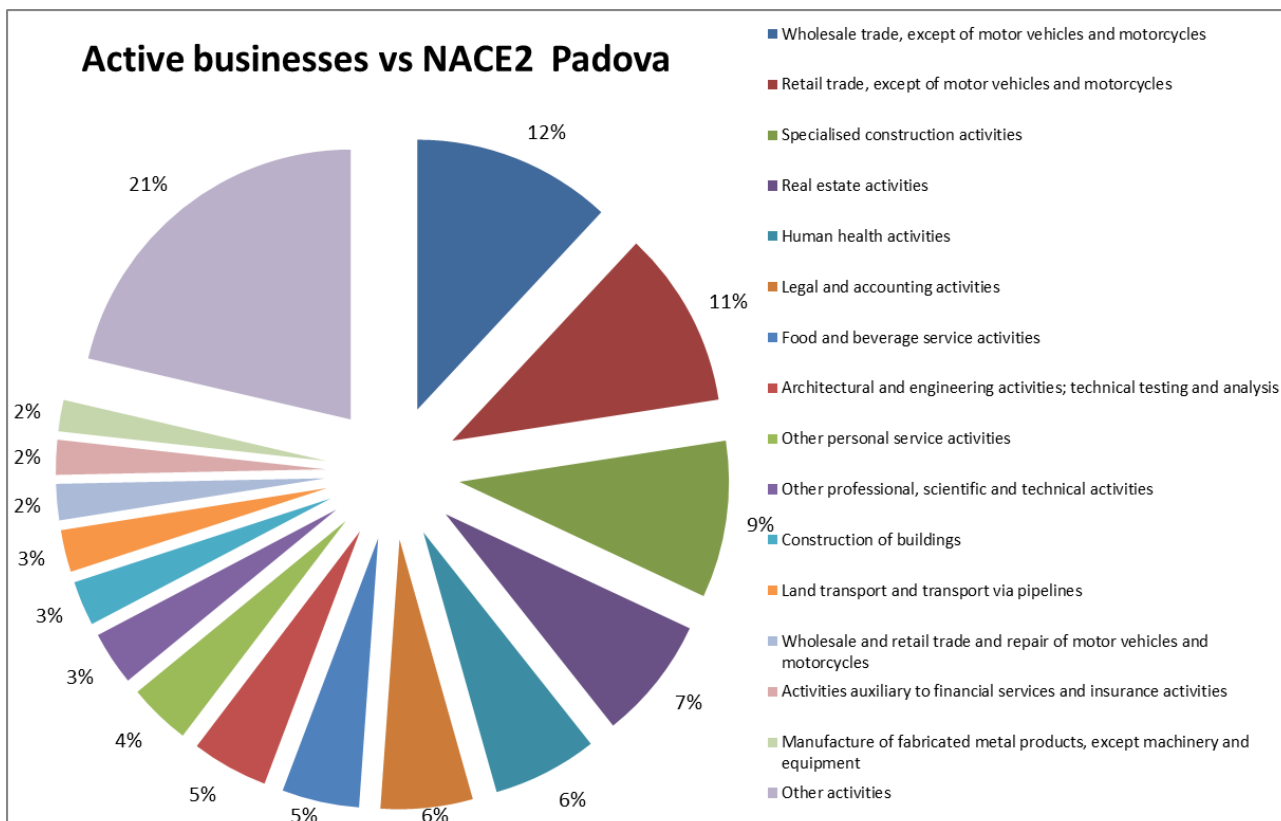




## Active businesses vs NACE2 Vicenza



## Active businesses vs NACE2 Padova





In 2015, the value of regional GDP was € 151,634m (Eurostat, 2017), and it currently accounts for 9.2% of the Italian GDP.

In the last years regional performance was strongly affected by the international crisis. GDP decreased in 2008 (-2.9%) and in 2009 (-5.5 %), while a recovery process started during period 2010 (+1.7%) and 2011 (+1%). However, the recovery path towards pre-crisis levels has been interrupted by subsequent national problems linked to sovereign debt stability and the emergence of difficulties associated with credit access. In the recent period (2011-2014), the GDP has registered again a negative trend (-1.5%).

In 2014, the regional growth rate was slightly positive (+0.6%), above the national dynamics (+0.1%), but below the European average growth rate (+5.1%); exports have been the main positive growth factor.

GDP PPS per capita amounted to €31,600 in 2015, which is equal to approximately 113% of the Italian average and to 109% of the one for EU.

The unemployment rate increased considerably in recent years, from 3.4% in 2008 to 6.8% in 2016 (Eurostat, 2017), below the National (from 6.7% to 11.7%) and the European trends (from 7.2% to 8.6%). In 2016, in Veneto Region the employment rate was higher (64.7%) than the national average (57.2%) although still below the European level (71.1%). The employment rate increased between 2015 and 2016 by +1.1%.

The industrial sector has a highly specialized and competitive manufacturing base, mostly comprised of SMEs. According to ISTAT data, in 2013, the region had almost 400,000 companies: 13% in industry, 15% in construction and 57.6% in the service sector.

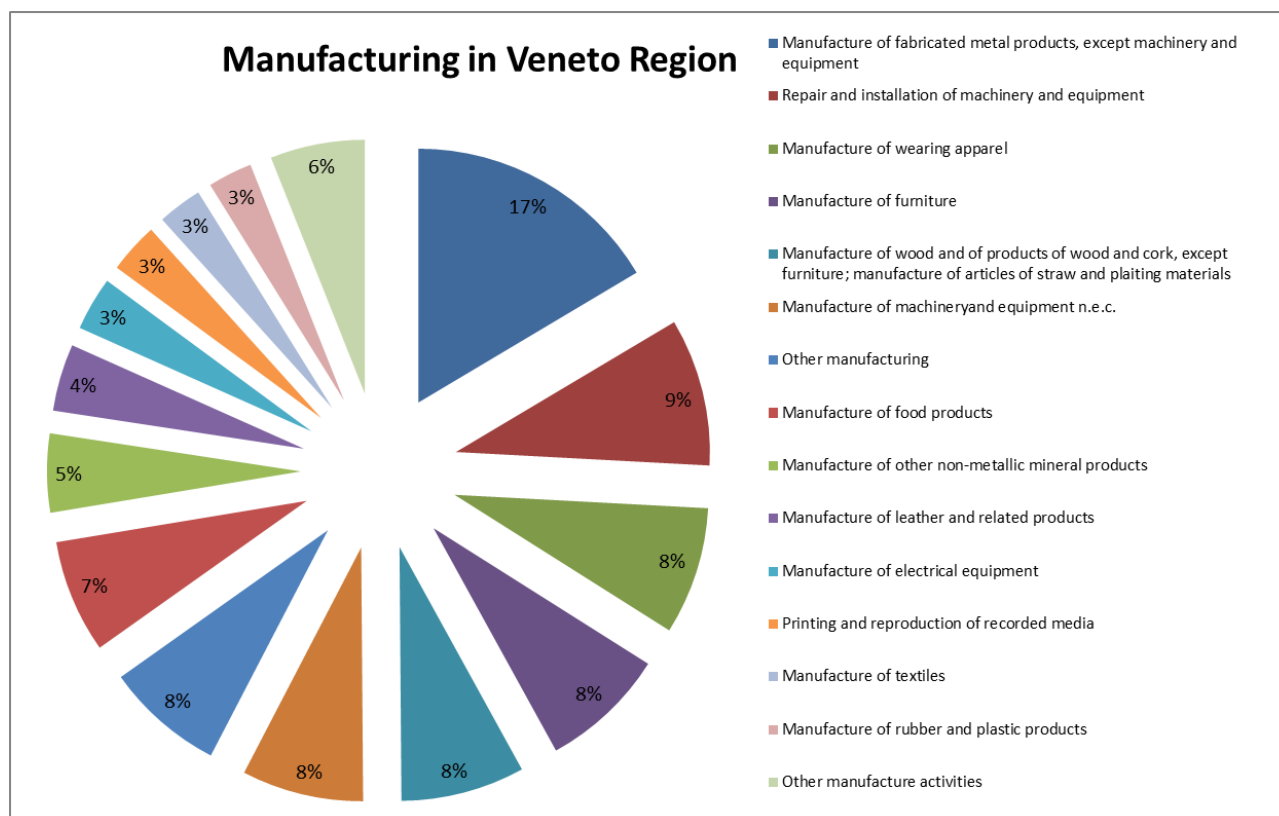
According to Centro Studi Unioncamere Veneto, in 2015, 437,130 active enterprises were recorded in Veneto, 2,000 units less in comparison to the previous year (-0.5%), confirming the negative trend of 2014 (-0.7%). However, the overall balance between companies registrations (+0.3%) and terminations (-3.7%) returned to be positive (+1,500 units) after 3 years of negative trend. Business services (+429 units) and tourism (+231 units) were the most dynamic sectors, whereas building and agriculture suffered the most (-1,000 units each). Capital Company (+3,000 units) has been the most common legal form. The total number of dissolution and liquidation proceedings decreased (7,721 units, -5.8%), whereas insolvency proceedings (bankruptcies and compromises) increased (1,474 units, +1.2%).

Agriculture is also important (nearly 10% of the national agricultural production) and agricultural companies, almost all mechanized and with a high level of specialization, are very competitive.

The Figure below shows a focus on the manufacturing sector in Veneto region, as it constitutes the most important segment of the economy where the principles of circular economy could be implemented. In particular, the weight of each manufacture activity (%) over the total number of active manufacturing businesses. Percentages less or equal 1% have been aggregated in "Other manufacture activities" (Manufacture of computer, electronic and optical products;



Manufacture of chemicals and chemical products; Manufacture of motor vehicles, trailers and semi-trailers; Manufacture of beverages; Manufacture of other transport equipment; Manufacture of basic pharmaceutical products and pharmaceutical preparations; Manufacture of coke and refined petroleum products; Manufacture of tobacco products). Notice that “Other manufacturing” is a category presents in the NACE catalogue.

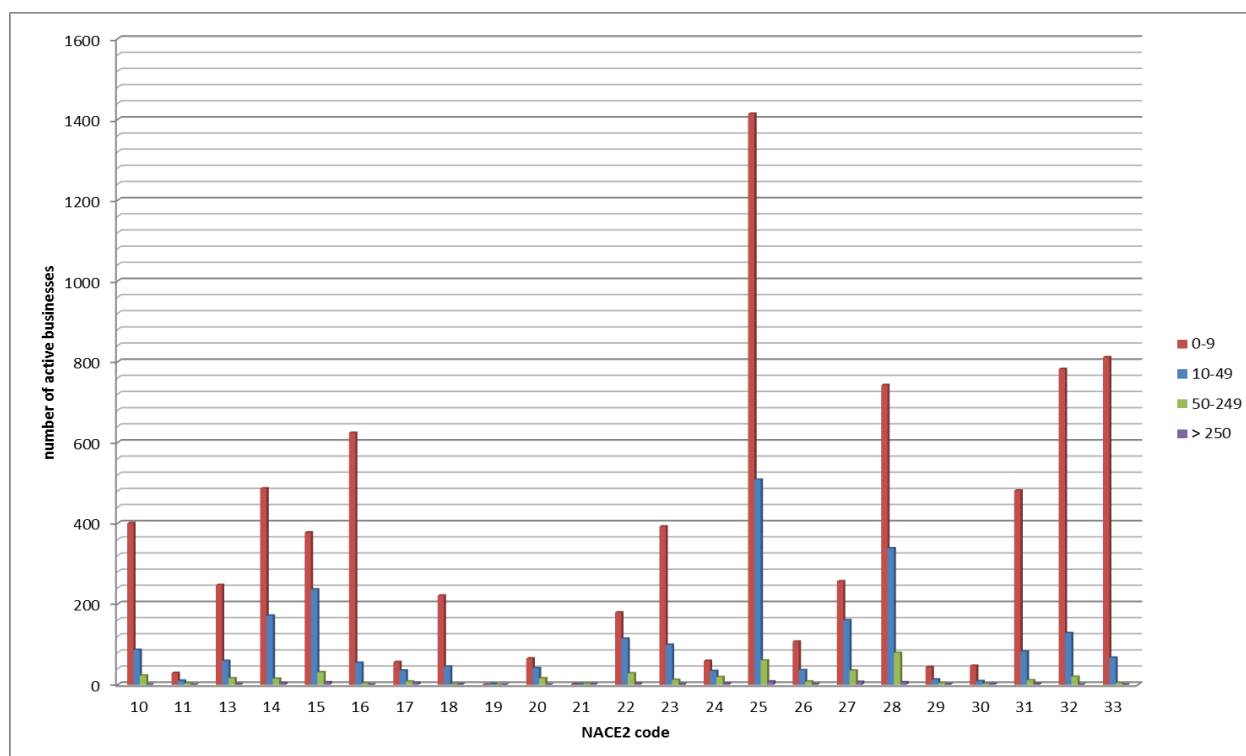


The following tables show detailed data on numbers of manufacturing enterprises and number of employees both for the Province of Vicenza and Padova. The prevalent dimension of enterprises belongs to the 0 to 9 employees class, followed by 10 to 249 employees class (ISTAT, 2015). Therefore, the economic fabric is characterized by SMEs.



Data type		number of active businesses					number of employees				
Employees size class		0-9	10-49	50-249	> 250	total	0-9	10-49	50-249	> 250	total
NACE2 code	NACE2 description										
10	Manufacture of food products	400	86	23	..	509	1416	1774	2306	..	5496
11	Manufacture of beverages	29	10	3	..	42	60	216	317	..	593
13	Manufacture of textiles	247	59	16	1	323	779	1132	1445	442	3798
14	Manufacture of wearing apparel	486	171	15	4	676	1498	3273	1505	2193	8468
15	Manufacture of leather and related products	377	236	31	6	650	1308	4626	2658	2965	11556
16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	624	54	3	..	681	1625	858	272	..	2755
17	Manufacture of paper and paper products	56	35	8	5	104	237	755	799	4159	5949
18	Printing and reproduction of recorded media	221	45	1	1	268	642	765	54	657	2118
19	Manufacture of coke and refined petroleum products	..	2	..	..	2	..	28	..	..	28
20	Manufacture of chemicals and chemical products	65	41	16	..	122	238	846	1410	..	2494
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	1	1	2	1	5	4	38	248	970	1261
22	Manufacture of rubber and plastic products	179	114	28	3	324	676	2466	2758	1046	6946
23	Manufacture of other non-metallic mineral products	392	99	12	1	504	1211	1941	1100	1096	5348
24	Manufacture of basic metals	59	34	19	3	115	212	828	2054	2635	5729
25	Manufacture of fabricated metal products, except machinery and equipment	1414	508	60	8	1990	4833	9594	5506	3063	22996
26	Manufacture of computer, electronic and optical products	107	36	8	1	152	343	940	826	435	2544
27	Manufacture of electrical equipment	256	160	35	7	458	805	3200	3496	3523	11025
28	Manufacture of machinery and equipment n.e.c.	742	338	79	6	1165	2700	6589	7702	3222	20213
29	Manufacture of motor vehicles, trailers and semi-trailers	44	13	4	1	62	137	272	432	289	1131
30	Manufacture of other transport equipment	47	9	2	2	60	158	212	192	724	1287
31	Manufacture of furniture	481	82	11	2	576	1381	1656	1030	658	4725
32	Other manufacturing	782	128	20	..	930	2083	2303	1576	..	5962
33	Repair and installation of machinery and equipment	811	67	4	..	882	1663	1127	295	..	3085
	total	7820	2328	400	52	10600	24010	45440	37980	28077	135506

**Table 1 – Manufacturing sector in Vicenza Province**



**Figure 1 – Number of active enterprises by employees size class in Vicenza province**

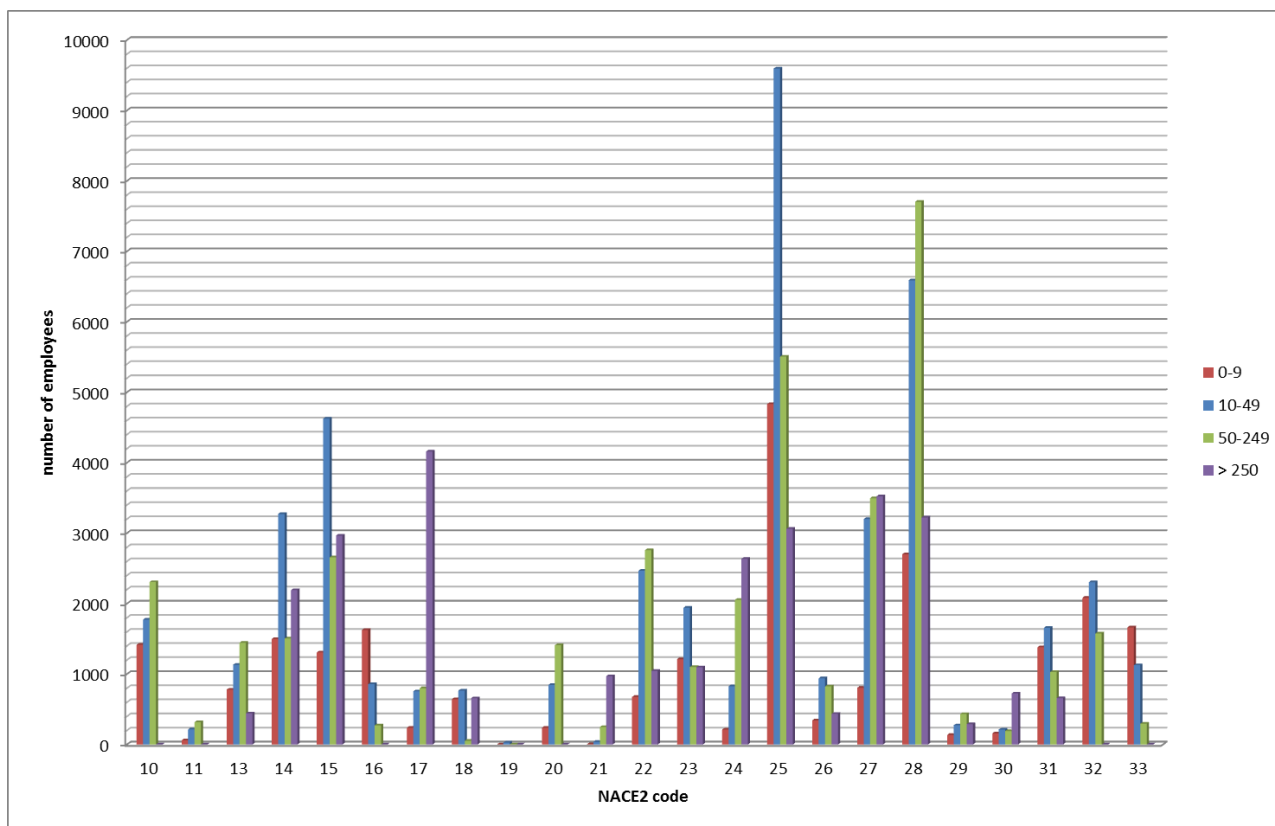


Figure 2 – Number of employees by employees size class in Vicenza province



Data type		number of active businesses					number of employees				
Employees size class		0-9	10-49	50-249	> 250	total	0-9	10-49	50-249	> 250	total
NACE2 code	NACE2 description										
10	Manufacture of food products	486	116	7	1	610	1835	2356	521	343	5055
11	Manufacture of beverages	18	9	1	..	28	42	177	66	..	285
13	Manufacture of textiles	243	59	6	..	308	745	1130	632	..	2507
14	Manufacture of wearing apparel	787	166	9	2	964	2440	2953	861	879	7133
15	Manufacture of leather and related products	249	86	11	..	346	776	1519	1176	..	3470
16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	568	68	3	..	639	1385	1091	282	..	2758
17	Manufacture of paper and paper products	55	27	9	1	92	208	669	839	328	2043
18	Printing and reproduction of recorded media	240	60	7	..	307	735	1074	730	..	2539
19	Manufacture of coke and refined petroleum products	1	..	..	..	1	7	..	..	..	7
20	Manufacture of chemicals and chemical products	57	30	10	..	97	216	719	1016	..	1951
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	1	2	2	1	6	1	32	214	550	796
22	Manufacture of rubber and plastic products	182	105	17	4	308	618	2110	1266	1265	5260
23	Manufacture of other non-metallic mineral products	197	49	10	2	258	565	893	810	1426	3694
24	Manufacture of basic metals	40	20	15	2	77	149	451	1486	1465	3550
25	Manufacture of fabricated metal products, except machinery and equipment	1132	374	40	5	1551	3718	6938	3621	2076	16352
26	Manufacture of computer, electronic and optical products	111	34	7	1	153	313	731	764	569	2378
27	Manufacture of electrical equipment	224	82	14	..	320	730	1587	1537	..	3854
28	Manufacture of machinery and equipment n.e.c.	448	281	57	14	800	1636	5549	5345	6784	19314
29	Manufacture of motor vehicles, trailers and semi-trailers	33	19	6	..	58	138	422	679	..	1240
30	Manufacture of other transport equipment	50	10	1	..	61	164	228	84	..	476
31	Manufacture of furniture	576	111	10	..	697	1768	1989	937	..	4694
32	Other manufacturing	522	44	13	2	581	1111	847	1220	3134	6312
33	Repair and installation of machinery and equipment	803	58	2	..	863	1688	1043	108	..	2840
	total	7023	1810	257	35	9125	20985	34508	24196	18818	98507

Table 2 – Manufacturing sector in Padova Province

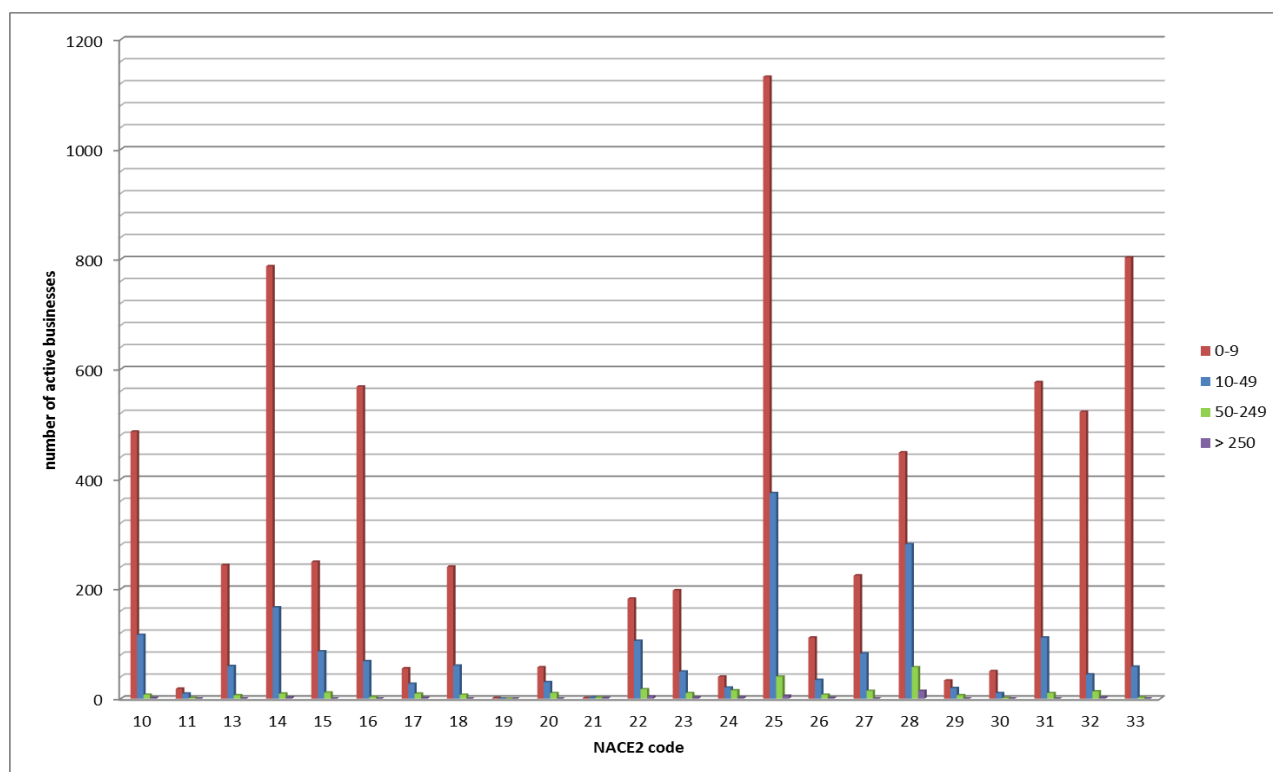
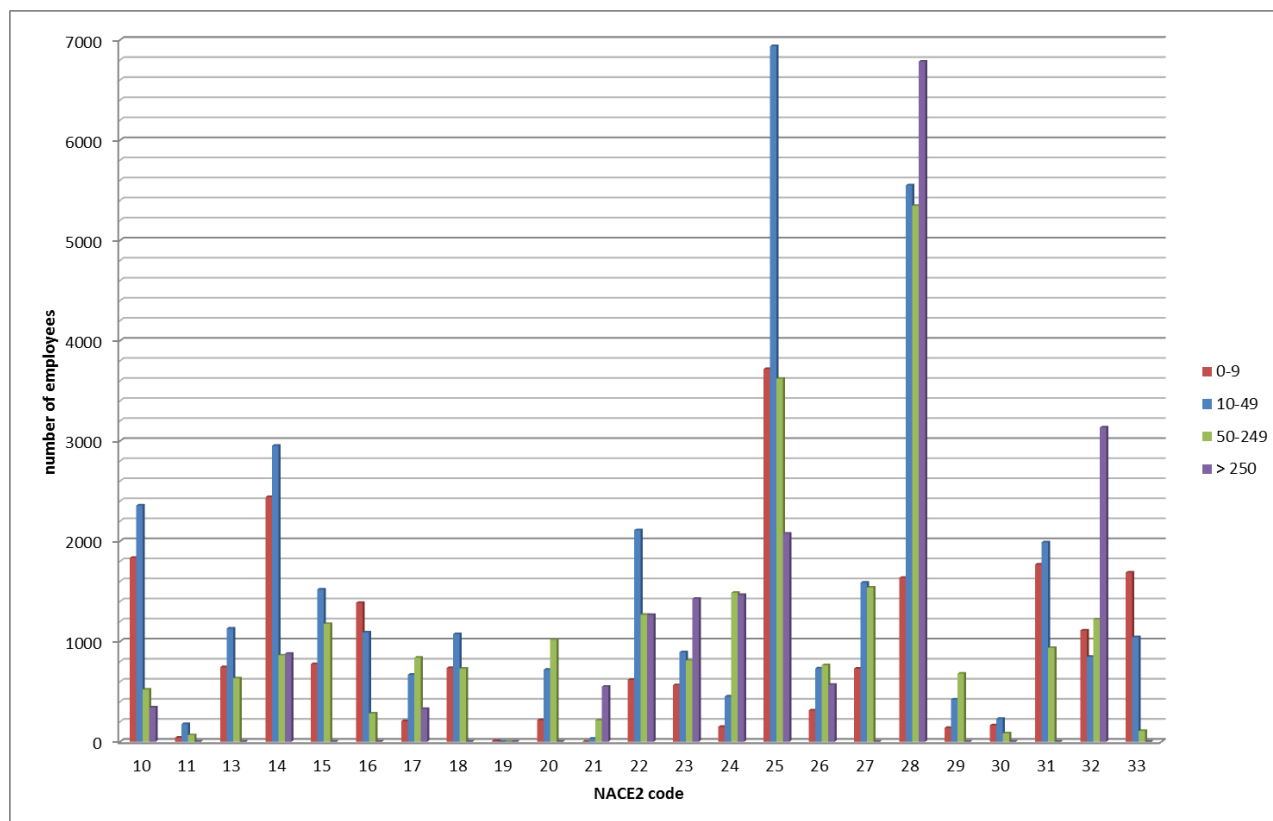


Figure 3 – Enterprises by employees size class in Padova province



**Figure 4 – Number of employees by employees size class in Padova province**

### *Entrepreneurs and entrepreneurial spirit in Veneto*

The industrial districts of the Veneto region, with an industrial or artisan matrix, are the backbone of this system; born in the post-war period and developed until the seventies in a substantially homogeneous and autonomous way throughout the regional territory, above all thanks to the initiative and the desire to "set up on their own" typical of the Veneto. The products of these districts have always been appreciated in international markets for their quality and innovative contents.

Veneto is characterized by the presence of the following "industrial districts": mechanics, agro-food industry and printing and publishing in Verona; textiles in Treviso and Vicenza; food industry in Rovigo; glasses production in Cadore and Belluno; gold and jewellery in Vicenza, electrical appliances in Conegliano, furniture in Bassano del Grappa.

Specifically in ETRA area the relevant districts are: Goldsmith district in Province of Vicenza, art cabinet district of Bassano del Grappa, conditioning and refrigeration district of the Paduan area, artistic ceramics district of Nove and Bassano del Grappa.

Regional Innovative Networks (RIR) governed by Regional Law n. 13/2014 to support and boost the competitiveness of Veneto companies in the global market, are aggregations among companies and public and private entities, not necessarily linked to a specific geographical proximity. They are networks that go beyond the specific production area and become multi-



sectoral. They operate mostly on the research and innovation front, thanks also to partnership projects and collaborations with university institutions and other research facilities, both public and private. Being part of an innovative regional network therefore allows companies to access to the regional co-financing programs specifically provided by the new Industrial Plan of the Veneto Region, as well to national and international co-financing programs.

#### *Strategic bordering regions*

The region borders to the east with Friuli-Venezia Giulia and the Adriatic Sea (Gulf of Venice), to the north with Austria (Tyrol and Carinthia), to the north-west with Trentino-Alto Adige, to the west with Lombardy , to the south with the Emilia-Romagna region. Veneto is located in a strategic geographical position both for economy and innovation as for trade opportunities.



## 1.2. Circular Economy Awareness and Current Practices

*Please characterize your pilot area based on the factors included in Table 2 below! If feasible provide percentages for your aggregated pilot area's data.*

From the stakeholders forum held by ARPAV and ETRA in April 2018, the Italian pilot area is living a crucial point from the Circular Economy point of view. In fact, the professional associations that attended the meetings reported different feelings respect to CE. On one hand the economic fabric is unconsciously working according to CE principles above all where economic gains are evident and affordable with low starting investment. Because of this status quo, entrepreneurs do not seem to be interested to circular market novelties. On the other hand, the CE concepts scare SMEs, underlying relevant changes of the actual situation. In addition, while European bodies boost towards CE implementation, Italian legislation trips over schizophrenic decisions that weigh bureaucracy down and curb entrepreneurial initiative. Anyway, the general feedback is a good predisposition of stakeholders of all the economic sectors towards CE initiatives.

As a result of the ongoing consultation with the stakeholders, ARPAV and ETRA participated to the workshop on the issue "Circular Economy – the value of sustainability", organized by CONFINDUSTRIA Veneto, the most representative Italian association of medium and big enterprises. During this event it was possible to get a number of information about the status quo and the perception from the productive system about Circular Economy.

Veneto is the second Region in Italy (UNIONCAMERE, 2016) by number of enterprises, 37.120, which made investments in green economy, technology and products, during the period 2010 - 2015. Almost 80% of the enterprises in Veneto Region is considered "green" and about 60% of them aim to reduce their environmental impacts starting from the eco-design. Scaling down to ETRA area, during the period 2010 - 2015, 7.210 enterprises in the Provinces of Vicenza invested in green economy (30% of the total number enterprises of the Province), and 7.110 enterprises in the Province of Padova (26% of the total number enterprises of the Province).

**Table 2: Circular Economy Awareness & Current Practices in the Pilot Area**

	<b>Pilot Area Aggregated Data</b> <i>(Please fill-in)</i>
1. What percentage of the respondents have heard of the circular economy / closed loop economy?	_____ %



	<b>Pilot Area Aggregated Data</b> (Please fill-in)
2. What percentage of the respondents are:  a) Purely in a linear system.  b) In a linear system with some elements of circularity within the manufacturing process.  c) In a linear system with some elements of circularity, occurring outside of the company facility ( <i>a waste material is sent to a recycling facility</i> )  d) In a linear system with some elements of circularity, occurring outside of the company facility ( <i>a waste material is sent to another facility as a secondary raw material</i> )  e) In a circular system.	a) _____ %  b) _____ %  c) _____ %  d) _____ %  e) _____ %
3. What percentage of the respondents apply eco-design directives?  Which of the following design features were applied? a) Reparability b) Upgradability c) Durability d) Recyclability of products	_____ %  a) _____ % b) _____ % c) _____ % d) _____ %
4. What percentage of the respondents make an effort to reduce packaging waste?  If yes, how? a) Use bio-degradable materials b) Smart Design for overall reduction of materials c) Use of easily recyclable packaging	_____ %  a) _____ % b) _____ % c) _____ %

### 1.3. Scope and Availability of Preliminary Modeling Data

Please characterize your pilot area based on the factors included in Table 3 below! If feasible provide percentages for your aggregated pilot area's data.

**Table 3: Scope and Availability of Preliminary Modeling Data**

	<b>Pilot Area Aggregated Data</b> (Please fill-in)
What percentage of companies provided information regarding their primary material in-flows?	_____ %
If information was not provided, what reason(s) were given for not	





	<b>Pilot Area Aggregated Data</b> (Please fill-in)
providing the information?  a) No reason given b) Too much hassle (not interested in cooperating) c) Confidentiality and/or Business secret d) Other	a) _____ % b) _____ % c) _____ % d) _____ %
What percentage of companies provided information regarding waste generation (out-flows)?  Of those that responded, generally speaking, how complete was the information? a) Complete b) Mostly complete c) Incomplete d) No information provided	_____ %  a) _____ % b) _____ % c) _____ % d) _____ %
If information regarding was not provided, generally speaking, can the information be obtained through public records?	YES / NO

## 1.4. Conclusions and Recommendations for Overcoming Barriers in Obtaining Data

*Please summarize your experiences with obtaining information from companies in your Pilot Area. Give recommendations for your pilot area, which can help in obtaining material flow data- for instance, overcoming confidentiality, etc.*



## 2. Assessment of market barriers analysis for the creation of an efficient model of industrial symbiosis

One of the most relevant market barrier is the distortion in product prices which don't take in account the negative externalities on environment given by manufacturing processes. In fact the most environmental impacting enterprises keep their fixed and variable costs at a lower level than the innovative ones, as they don't invest in green technology, thus leaving the final environmental costs to the collectivity.

Furthermore widespread market globalization create remarkable difficulties in applying the concept of reverse logistic, which presupposes the management and the backward movement of the products along the supply chain.



### 3.1. Local legislative environment

A detailed description of the legislative environment has been already done for the DT 1.2.3.

In this section is important to add a relevant update: the recent judgement of Supreme Administrative Court (n.1129-2018) stated that only national government can define the EoW criteria. Note that before this judgment it was possible for local government to define EoW criteria in waste treatment plant permit. This decision could create great obstacles in the prosecution of circular economy implementation in Italy.

Furthermore entrepreneurs and professional associations stress on the regulation lacks, referring to the necessity of updating the existing laws about EoW with the new waste streams, recovery technologies and products.

Legislative Decree n. 152/2006 art. 185 paragraph 1 letter f, created a problem of interpretation about the correct management of mowing and pruning. The specifications introduced were inconsistent with UE legislation, and in order to avoid to avoid the infringement procedure (EU Pilot 9180/2017/ENVI) Italian Environment Ministry gave an explanation confirming that those materials, when produced by gardeners in public or private areas, must be considered as waste. Nevertheless the issue is still opened and need to get a formal legislative response.

*Please fill out the table below based on your knowledge of your Pilot Area.*

**Table 4: Characteristics of Legislative Environment**



SECTOR <i>(eg. Waste, Use of specific recycled materials, Energy efficiency, Wastewater, Air emissions, Green taxes/refunds)</i>	LAW REFERENCE	TITLE OF LEGISLATION	RELEVANCY TO CIRCULAR ECONOMY	DOES THE LEGISLATION ENCOURAGE A CIRCULAR ECONOMY? (YES / NO)	DOES THE LEGISLATION CREATE A BARRIER TO A CIRCULAR ECONOMY? (YES / NO)

## 3.2. Assessment of Market factors

### 3.2.1. Absence or Presence of Waste Types

*Do you have information on the presence of certain – reusable/recyclable – wastes which can be used as secondary raw material in the pilot area? If yes, please describe.*

*Do you have information on the absence of certain secondary raw materials that are in demand in the pilot area? If yes, please describe.*

Grounded in the peculiar “Venetian” culture, the management of waste in Veneto is recognized as a best practice also at European level. Recycling and recovery rates are clear facts in the region. Anyway some open tasks should be faced in order to be compliant with European guidelines and principles on circular economy. For example some valuable materials recovered from waste still pass the regional and national borders towards different countries.

### 3.2.2. Demand for Critical Raw Materials

*Is there a shortage of certain critical raw materials in your Pilot Area? If yes, please describe.*

### 3.2.3. Motivating Factors and Cooperation

*Please characterize your pilot area based on the factors included in Table 5 below! If feasible provide percentages for your aggregated pilot area's data.*

The feedback from local stakeholders is that their willingness to cooperate is directly linked to an economic profitability. This could be generated both by cost savings or by future gains. In case of positive business models for the studied pilot actions business can envisage also initial investment. Therefore, the decision support tools (LCA-PEF, LCC) can be exploited as leverage to motivate future active stakeholders.

**Table 5: Motivating Factors and Cooperation in the Pilot Area**

	Pilot Area Aggregated Data (Please fill-in)
1. What percentage of the respondents would benefit from the following: a) Reduced waste management cost b) Income from selling waste as a secondary raw material c) Obtaining raw materials (especially limitedly available materials) at a lower cost d) Minimizing costs related to green taxes e) Receiving state allowances/refunds related to circularity/sustainability f) Marketing benefits from green operation (eco-labeling)	a) _____ % b) _____ % c) _____ % d) _____ % e) _____ % f) _____ %



<p>2. Assessment of Cooperation</p> <p>a) What percentage of the respondents would cooperate in a multi-company (industrial area wide) circular economy scheme</p> <p>b) What percentage of the respondents would be willing to sell or use a secondary raw material?</p> <p>c) What percentage of the respondents would be willing to sell or use waste heat or water?</p> <p>d) What percentage of the respondents feel that it would be feasible to find a cooperation partner(s) to work together toward closing material loops?</p>	<p>a) _____ %</p> <p>b) _____ %</p> <p>c) _____ %</p> <p>d) _____ %</p>
<p>3. What percentage of the respondents feel that questions of confidentiality and potential business secrets would make the sharing of information difficult?</p>	<p>_____ %</p>

### 3.2.4. Availability of Infrastructure

*Discuss what types of infrastructure are available in the vicinity of the pilot area that can be used for waste management. For example is there a recycling facility, or a waste sorting facility, or a re-manufacturing facility, or a facility that facilitates reuse nearby?*

Table 3 shows the available plants in ETRA area and in Veneto region; it reveals a complex system of waste management plants available in the area where ETRA operates; this high number of active businesses allows to treat within the regional borders the majority of waste generated in ETRA area (80% of non-hazardous waste and 66% of hazardous waste).

Table 3 Number of treatment plants active in Veneto (according to ARPAV report on industrial waste) and in ETRA area

	Veneto region	ETRA area
Material recovery (R2-R12)	1152	150
Energy recovery (R1)	67	3
Preliminary treatments (D8, D9, D13, D14)	95	10
Incineration (D10)	6	-



Landfill (D1)	58	4
Only storage (R13, D15)	151	29
Total	1529	196

### 3.3. Conclusions and recommendations

*Please give relevant recommendations for your pilot area, which can help in overcoming market barriers. For instance, suggested legislative changes, the creation of waste management infrastructure, etc.*

There are several actions that could help in overcoming market barriers, starting from the legislative uncertainties about the timing for obtaining a new permit for a waste management facility; the bureaucracy of the authorization procedure is also a relevant barrier. Furthermore the legislative framework of the permit procedure can vary substantially from a Region to another.

At a national level specific EoW regulation is almost scarce and need to be updated to the new features and needs of the market and of the productive fabric. For instance, we refer to the changed raw material demand, the new technologies available, and new products on the market.



## 4. Assessment of availability industrial & waste management information

### 4.1. Accessibility of waste generation /management information

Access to waste management info and data has several problems due so that the correct reconstruction of waste streams often results incomplete or not possible at all.

The huge production of waste deriving from waste treatment leads to an overestimation of the quantity actually generated in the pilot area, since secondary waste, by its intrinsic nature, constitutes at least a partial duplication of primary production.

A further distortive effect on the evaluation of the actual waste production in the pilot area is determined by the fact that it is not possible to distinguish whether the secondary waste is attributable to primary waste generated in the pilot area from the one coming from external areas.

The official source of information about waste management is the collection of Environmental Declaration Forms (EDF) yearly compiled by waste producers and treatment plants. However a complete evaluation of waste streams is not realizable as EDFs compiled by producers don't detail the treatment operation (disposal/recovery) to which the waste is subjected.

The identification of the treatment operation becomes even harder when destination plant is located outside Veneto or abroad due to almost total lack of detailed information.

EDF leads to problems of data interpretation as there are discrepancies between production and destination DBs mainly caused by balances of waste stocks in the previous and the current year and balance of waste self-produced and managed in treatment plants.

Official data from EDFs account a further limit to a complete access to information about waste streams: a series of producer are excluded by law from compiling EDF.

Referring to paragraph 3 of the art. 189 of the legislative decree n.152 / 2006, only the entities and enterprises producing hazardous waste and those producing non-hazardous waste are required to submit the annual declaration, as per article 184<sup>1</sup>, paragraph 3, letters c), d) and g) of the mentioned decree with more than 10 employees. As a result, for supermarkets and stores as well as for small traders, there's no obligation to compile EDF which leads to an outstanding underestimation of packaging waste streams.

Other categories of waste producers are exempt from compiling EDF, referring to article 69, paragraph 1 of Law 28 December 2015, n. 221: the agricultural enterprises referred to in Article

---

<sup>1</sup> Article 184, paragraph 3 of Legislative Decree no. 152/2006: "[...] c) industrial processing waste; d) waste from craftsmanship; [...] g) waste deriving from the recovery and disposal of waste, sludge produced by drinking water and other water treatment plants, by waste water purification plants and fume reduction plants".





2135 of the Civil Code, as well as the subjects carrying out activities falling within the ATECO codes 96.02.01, 96.02.02 and 96.09.02 which produce hazardous waste, including those with EWC 180103 \*, related to needles, syringes and sharp objects used, can transport their own waste, for a maximum quantity up to 30 kg per day, to a plant that carries out authorized disposal operations.

Furthermore waste assimilated to municipal waste coming from non-domestic users is not taken in account by EDFs and currently there are no standardize methods that quantify the amount of industrial waste classified as assimilated to municipal waste.

<sup>1</sup> Article 184, paragraph 3 of Legislative Decree no. 152/2006: "[...] c) industrial processing waste; d) waste from craftsmanship; [...] g) waste deriving from the recovery and disposal of waste, sludge produced by drinking water and other water treatment plants, by waste water purification plants and fume reduction plants".

*Please fill out the table below based on your knowledge of your Pilot Area.*

**Table 6: Availability of Waste Generation Information**

ORGANIZATION / DESCRIPTION	WHERE IS THE INFORMATION ACCESSIBLE? (Link, data request forms)	TYPE OF DATA AVAILABLE	DOES THE DATABASE ENCOURAGE WASTE EXCHANGE? YES/NO
Unioncamere	<a href="http://www.elencosottoprodotti.it/">http://www.elencosottoprodotti.it/</a>	Producers and users of by-products can inscribe in the platform	National level
Sfridoo	<a href="https://www.sfridoo.com/">https://www.sfridoo.com/</a>	Web platform to purchase production residues	National level
Urban Mine Platform by WEEE Forum	<a href="http://www.urbanmineplatform.eu/">http://www.urbanmineplatform.eu/</a>	Inventory of WEEE flows	European level
Commerce Chambers	At national level: <a href="http://www.isprambiente.gov.it/en/publications/reports/report-on-non-municipal-waste?set_language=en">http://www.isprambiente.gov.it/en/publications/reports/report-on-non-municipal-waste?set_language=en</a> At regional level	Waste production and waste management of non municipal waste. Data are aggregate	Not roundly, but a picture of "state of art" of waste management can support the development of waste streams exchange



ORGANIZATION / DESCRIPTION	WHERE IS THE INFORMATION ACCESSIBLE? (Link, data request forms)	TYPE OF DATA AVAILABLE	DOES THE DATABASE ENCOURAGE WASTE EXCHANGE?  YES/NO
	(Veneto Region): <a href="http://www.arpa.veneto.it/temi-ambientali/rifiuti">http://www.arpa.veneto.it/temi-ambientali/rifiuti</a>		

## 4.2. Recommendations for information exchange

*Please give recommendations that are relevant for your pilot area, which can help in improving information exchange between waste generator, waste management companies, and companies looking to purchase waste to use as secondary raw materials.*



## 5. Assessment of limits to access mature cleanup techs

### 5.1. Mapping waste management technologies in the environment of the selected pilot area

*Please provide a list of local practices or technologies which are available for reuse, recycling, or remanufacturing waste in your pilot area.*

There are no particular obstacles to access management technologies. The regional fabric is quite complete in terms of waste management infrastructure (see §2.2.4 of this report). This condition allows to treat within the regional borders 80% of non-dangerous industrial waste generated in ETRA pilot area (ARPAV, 2016). The same percentage applied to hazardous flows decreases till 66% because of peculiarities required to treat those waste categories.

### 5.2. Gap analysis of waste recycling /management technologies

*Please fill out the table below based on your knowledge of your Pilot Area.*

**Table 7: Availability of Waste Management Practices/Technologies**

WASTE FLOWS	AVAILABLE PRACTICE(S)/TECHNOLOGY(S)		GAP ANALYSIS		
	Name of the Practice/Technology	Description of the Practice/Technology	DOES NOT EXIST	EXISTS but LACKING CAPACITY or LOCALLY NOT AVAILABLE	EXISTS and AVAILABLE FOR USE
Plastics					
Critical Raw Materials (eg. metals, minerals)					
Construction Waste					
Food Waste					
Biomass (eg. wood, paper, biofuels)					
+ Other Top 3 waste flows being relevant in your Pilot Area					



### 5.3. Recommendations to improve availability of waste management technologies in the environment of the pilot area

*Please give recommendations that are relevant for your pilot area, which can improve the availability of waste management technologies - for example financial support of start-ups, etc.*

## 6. References

*Please list your references below. For example if you used publically available information, or a published article, please list the source below.*

- [1] GreenItaly Report 2017 [www.unioncamere.gov.it/download/7071.html](http://www.unioncamere.gov.it/download/7071.html)
- [2] ...
- [3] ...