

# LOCAL PLANS TO PRIORITIZE INTERVENTIONS

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DT1.4.2

Version 1  
07/2018

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## Municipalities where ETRA operates (ITALY)





## Introduction

The aim of the present document is to finalize the data collections and analysis built in DT1.3.2 (Report of the quantity of industrial waste in the CIRCE2020 industrial areas), DT1.3.3 (Report of the present destinations of industrial waste) and DT1.3.4 (M-scale analysis of the physical flows at local industrial system level). In a short way, this document summarizes the process that leads to pilot cases identification, from the recognition of waste production & destination to the physical flows maps. The present process to prioritize the interventions is also supported by a permanent consultation with the local stakeholders (administrations located in the pilot regions, trade and industrial associations, environmental authorities etc.) to come to a shared hierarchy of waste flows to optimize and/or to close (in DT1.1.3 and DT1.4.1).

## 1. Waste flows analysis

- *Short pilot area description (e.g. dimension, economic avocation)*

The 75 Municipalities served by ETRA are located in the Veneto region along the Brenta river for around 1.700 km<sup>2</sup>. The economic fabric is characterized by a major presence of SMEs, scattered in the pilot area. Considering both number of employees and number of units the most relevant sectors are: "Wholesale trade, except of motor vehicles and motorcycles", "Retail trade, except of motor vehicles and motorcycles", "Specialised construction activities", "Manufacture of fabricated metal products, except machinery and equipment". "Conditioning and refrigeration district" in the Paduan area and "artistic ceramics district" in Nove and Bassano del Grappa have been inserted in the regional Smart Specialization Strategy.

By quantity of industrial waste generated, the rank is different:

- 38 - Waste collection, treatment and disposal activities; materials recovery
- 25 - Manufacture of fabricated metal products, except machinery and equipment
- 17 - Manufacture of paper and paper products
- 37 - Sewerage

It is important to highlight how ETRA is the most relevant industrial waste producer, involved both in NACE 38 and 37. Considering the same aspect from a EWC perspective, from the Environmental Declaration Forms provided by local enterprises, the following figures result:

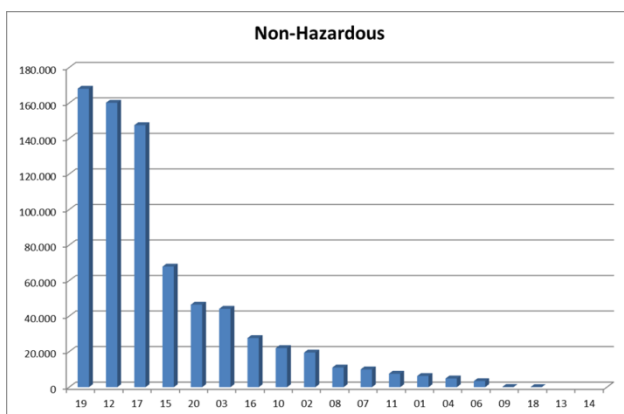


Figure 1 Total industrial non hazardous waste generation per EWC2 in ETRA area (tonnes/year), 2015

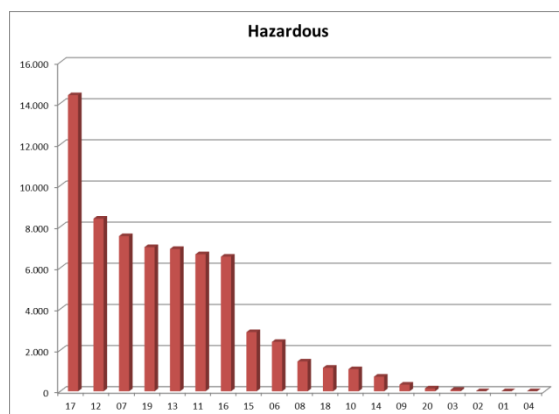


Figure 2 Total industrial hazardous waste generation per EWC2 in ETRA area (tonnes/year), 2015



- *Source/ quality of data (e.g. problems and concerns faced in data collection)*

Environmental Declaration Form represents the main source of data about waste. It cannot provide a complete overview because of legal exemption for certain activities. From estimations proposed by national and regional agencies the missed quantity are not relevant, but moving at local scale the methodological approach loses the robustness. Another relevant quantity of waste generated by non-domestic users is collected as urban-like waste within the municipal solid waste management system. The traceability of waste is not complete because the producers are obliged to declare the recipient but not the treatment operation of the single waste flow.

Data from single enterprises are difficult to obtain because of the cultural scare of the authority and the preference to solve within the industry gate possible problems, instead of discuss with external entities.

- *Overview of the main treatment operation of industrial waste*

Since the problems of data quality just discussed, only a regional perspective is available for overall industrial waste management. This is presented in the following figures:

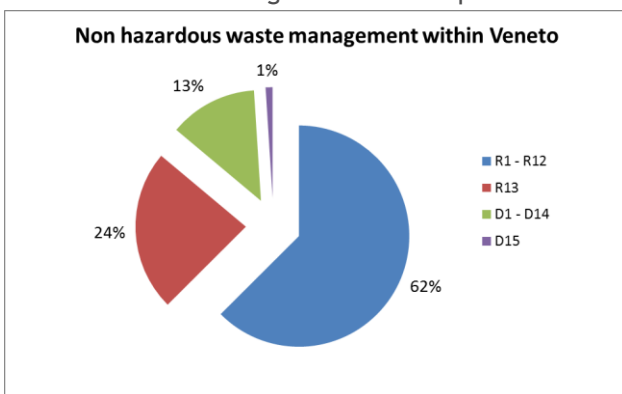


Figure 3 Treatment operations according to EDF, reporting data for Veneto in 2015 - non hazardous waste

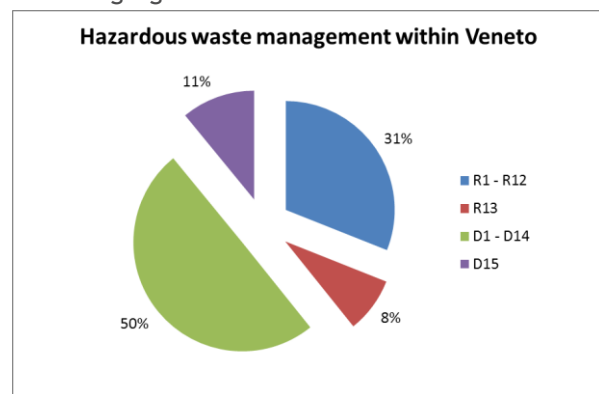


Figure 4 Treatment operations according to EDF, reporting data for Veneto in 2015 -hazardous waste

Some specific EWC have been selected in a first analysis following these criteria: 1) relevant for quantity (> 90% of the overall amount generated); 2) relevant for the EU Action Plan. An additional follow-up on those EWC has been conducted in order to appreciate a scaled situation.

- *Main geographical destination and availability of treatment facilities in the pilot area*

The analysis of available databases shows a prevalent destination for waste generated within the pilot area; the main geographical destinations are represented in the following pie-charts

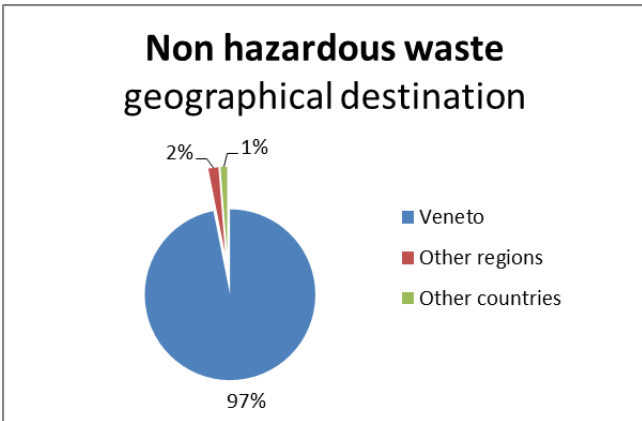


Figure 5 Geographical destination of industrial non-hazardous waste generated within ETRA area (source: EDF - 2015)

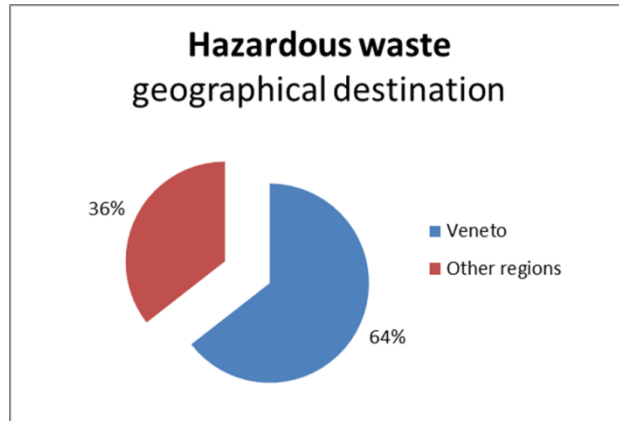


Figure 6 Geographical destination of industrial hazardous waste generated within ETRA area (source: EDF - 2015)

The availability of treatment facilities within regional boundaries can explain the high percentages of waste treated at local scale; data in following table reveal the development of recycling and treatment activities on which the economic system can pose bases for further improvements.

Table 1 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
<b>Total</b>	<b>1529</b>	<b>196</b>

## 2. Most promising waste flows

- *The criteria leading the choice*

Meetings with local stakeholders (above all trade association and related suggested companies) have been crucial to set the list of promising waste flows. The actors' willingness to collaborate is central in the project prosecution; therefore hints on flows with possible improvements have been supported and received. Other promising flows exit from the ETRA's experience, since it plays a central role in the waste management sector of the pilot area.



Figure 7 Stakeholder meeting #1: Padua province trade associations meet CIRCE2020 (ETRA headquarter in Vigonza, 11/04/2018)



Figure 8 Stakeholder meeting #2: Vicenza province trade associations meet CIRCE2020 (ETRA headquarter in Bassano, 17/04/2018)

The most promising waste flows are:

- **mulching sheets** (and in general activities optimizing waste management in the agricultural sector): introduction of bio-based material to replace plastic products; seminars and education about innovative material and dairy waste management;
- **landfill leachate**: on site leachate treatment generates ammonium sulphate (fertilizer) and can reduce the amount of liquor destined to wastewater treatment plant;
- **Green Public Procurement**: starting from a status quo analysis, the aim is to support the Public Administration in conceive public tenders with environmental criteria through specific training sessions; moreover, to set up a monitoring procedure, also transferrable to other European region;
- **packaging waste from non-domestic users**: in order to increase the overall recycling rate in the pilot area, specific actions to increase the quality of separate collection of packaging waste from non-domestic users are envisaged;
- **Salty (chlorine enriched) sludge from leather treatment**: the envisaged action allows the enterprise to become independent to manage the waste flow consisting in a sludge (EWC 020201) characterised by high concentration of chlorine that impedes its treatment on most of the wastewater treatment plant;
- **Biogas from AD (upgrading to biomethane)**: the original energy recovery from urban kitchen waste will shift to material recovery (biomethane is a sustainable fuel and the process is classified



as material recovery) and it is going to be used as a fuel for waste collection vehicles, thus closing the loop of kitchen waste management in the ETRA area.

- **Promotion of recycling aggregates:** even if technical aspects have been already studied and validated, regulatory and legislative barriers keep the market; CIRCE staff will give support at an institutional level, in order to overcome these constraints.
- **Optimization of water management in a plant producing pharmaceutical glassware:** new management solutions of water used in several processes within the production site can be envisaged in order to decrease the resource consumption or the flow discharged in the sewage system
- *Focus on long-term Etra activities:*

Based on data analysis, Etra is the major producer of industrial waste within the pilot area (see DT1.3.2). In particular, EWC 191212 (other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 191211) and EWC 190805 (sludges from treatment of urban waste water) have shown great improvement potentials:

- 191212 is generated from waste treatment plants and contains residues of processes; because of uneven composition and other technical features the prevalent destinations are landfill or incineration plants. The efforts planned by Etra for the future aim at waste prevention. R&D department are studying plan revamping in different sites, substituting treatment technologies with a circular closed-loop approach.
- 190805 mainly exits from the 35 different wastewater treatment plants managed by Etra within the pilot area; this waste flow is in the spotlight due to recent normative updates (new limits on substances and new parameters to be analysed) that could lead the current system to collapse. New co-generation plants are envisaged as possible solutions in order to recover power and heat. Heat will be exploited to reduce the water content and consequently the waste amount. This solution, after the consolidation of the new regulation system, would allow to internally manage the total amount of sludge according to a chain-based approach. In this context, ongoing and planned drying and composting tests will help to face this new challenge.

The changes will require a medium-long time frame and results will not be achieved within CIRCE2020; therefore the previous EWCs are not in the “most promising” list, even if they show important potential and Etra is working alongside on them.



### 3. The role of stakeholders

SMEs and large enterprises represent the main stakeholder for CIRCE2020 due to their direct involvement in the project, focused on industrial waste. Considering the number of active businesses in the pilot area (around 26.000 units), the adopted strategy consisted into three steps (key numbers in brackets):

- 1) Stakeholder forums with trade associations presenting innovative approach and related actions, inviting participants to transmit the contents to related associates (2 forums - 35 invitations - 7 participants)
- 2) Bilateral meeting with participating trade associations in order to deeper peculiar problems and to collect suggested companies (5 meetings - 7 participants - 27 suggested companies)
- 3) Bilateral meetings with single company to know best practices of circular economy already implemented, problems and obstacles encountered in the path towards CE productive model, potential innovative actions on which collaborate (8 meetings - 3 promising flows).
- 4) Forum with representatives of Universities of Veneto Region to share CIRCE2020 targets and identified promising flows in order to create a network for present and future collaboration, to share best practices, experiences over circular economy and to envisage interesting waste flows (2 meetings, 13 participants, 3 Universities).

ARPAV and ETRA directly contacted Veneto Green Cluster, the Regional Innovative Network (Rete Innovativa Regionale - RIR - in Italian) which belongs to the S3 priority “Smart Manufacturing”, to consolidate a trust relationship for future collaboration.

Thanks to ETRA active role in waste management sector in pilot area, other 3 companies have been reached out to solve specific problems, but not relevant effects follow the first contact.

Municipalities and provincial entities have been contacted too. The presentation of CIRCE2020 project, as big opportunity to boost CE business model, has preceded the invitation to get involved in the activities of the circular economy forum born within CIRCE2020 project.

On 13th September 2018 a bilateral meeting with Veneto Region S3 Manager was organised. During the event held in Venice, CIRCE2020 project was presented and the envisaged promising flows were introduced. Every flow was concerned with a specific S3 priority as described in the following table, and got the endorsement from the local S3 Manager.

Promotion of biodegradable and compostable mulching sheet	<i>Smart Agrifood</i>
Ammonium sulphate production from landfill leachate	
Salty (chlorine enriched) sludge treatment for recovery from a leather treatment plant	<i>Smart Manufacturing</i>
Biogas upgrading to biomethane in a AD plant	
Optimization of water management in a plant producing pharmaceutical glassware	
Promotion of recycled aggregates	
Promotion of GPP	<i>Sustainable Living</i>
Upgrade of packaging waste management from non-domestic users	

As a final result of the consultation process, the interaction with the stakeholders was crucial to identify the most promising flows and the related pilot actions which are going to be implemented within



CIRCE2020 project. In fact the willingness to collaborate from the single companies and the endorsement received from Universities and the S3 manager could lead to a balanced choice of the relevant flow to be considered with the aim of improve their circularity.