

**IEA TASK 36
Workshop
Which future for the
SRF market?**



Experience in production and use of SRF

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Federambiente – Who we are

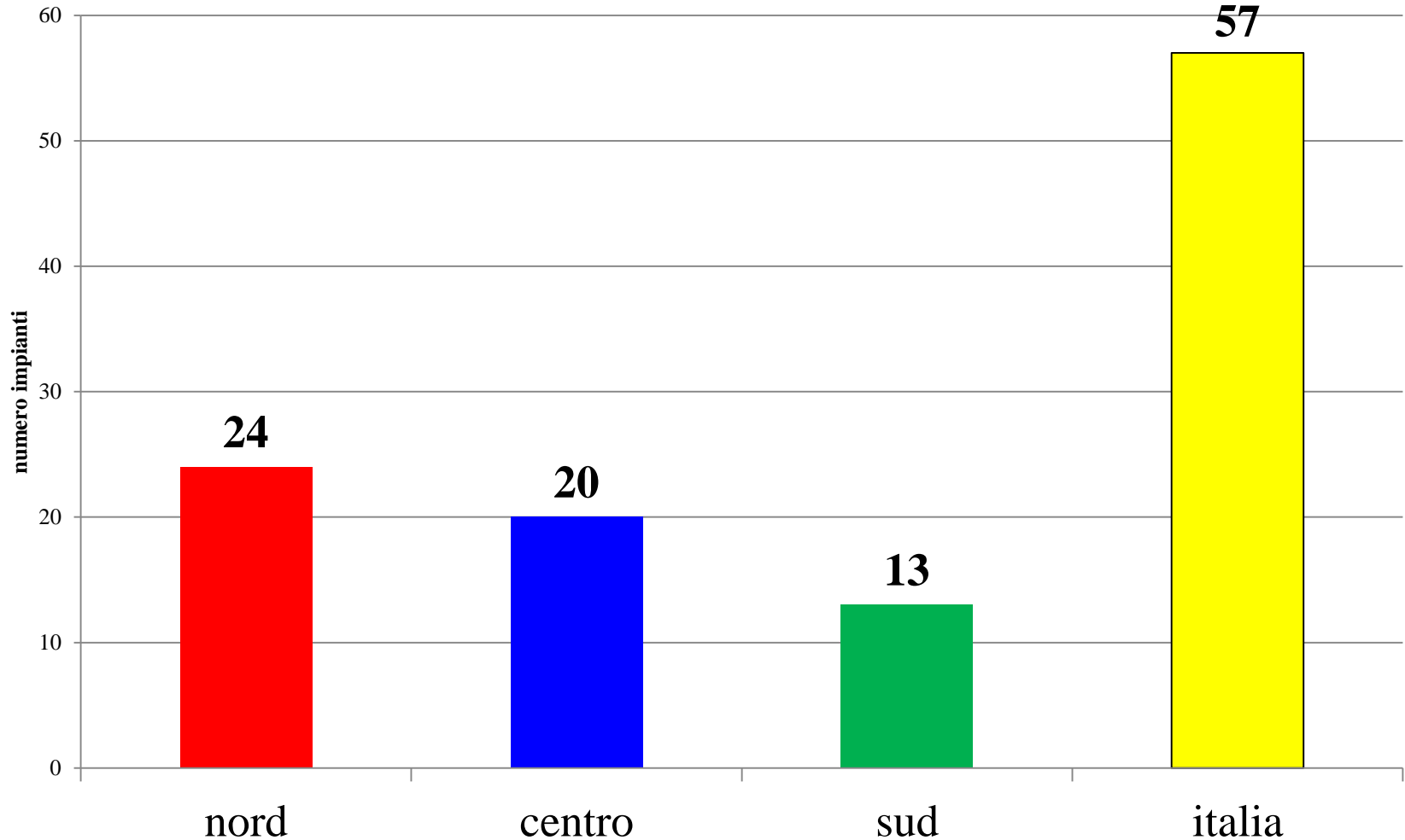
- The Italian Federation of Public Environmental Services
- Associates: more than 200 corporations, consortia, special companies, local authorities and other stakeholders in the environmental sector
- About 42,000 employees with federambiente national collective agreement
- Over 4,6 billions euros yearly turnover within the company system

Federambiente – Who we are

- About 22.5 million tons per year of waste collected
- About 37 million inhabitants and nearly 3,500 Municipalities served
- Within Federambiente system: most of national SRF (manly from MSW) production plants and MSW incineration plants

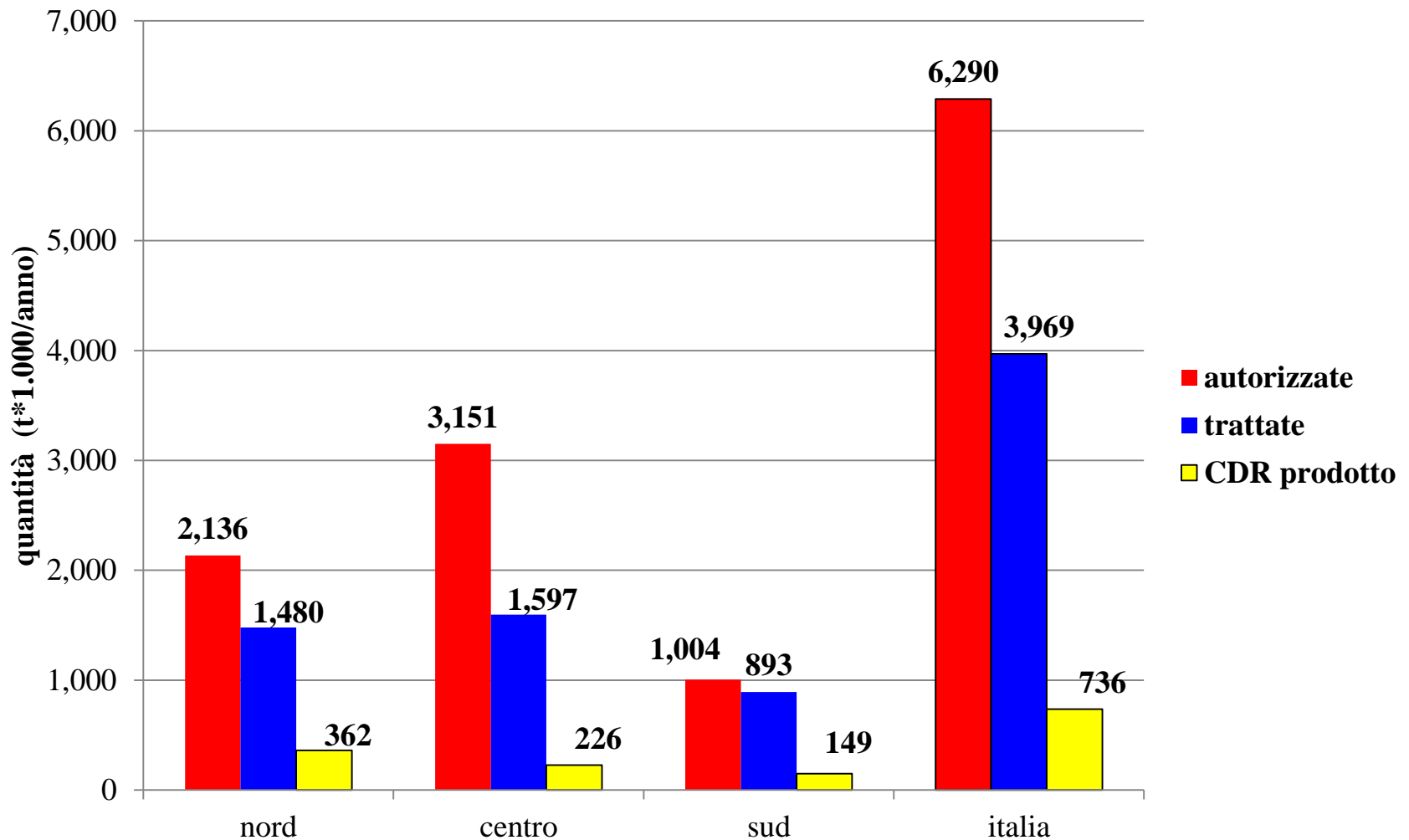
Operating SRF production plants in Italy, 2011

(Ispra, 2013)



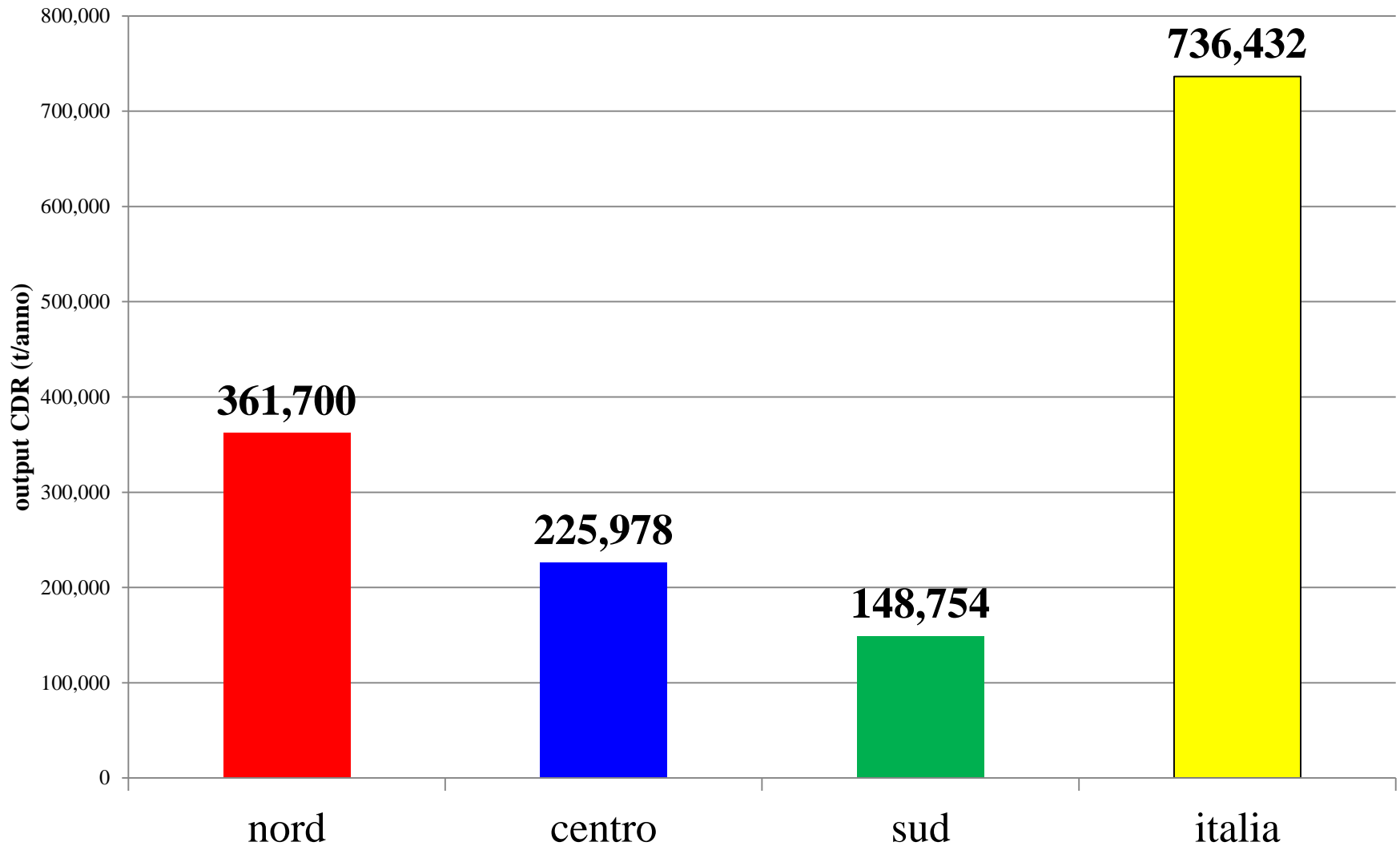
SRF PRODUCTION PLANTS IN ITALY

Capacity, treated amount of waste, amount of SRF produced, 2009
(Ispra, 2011)



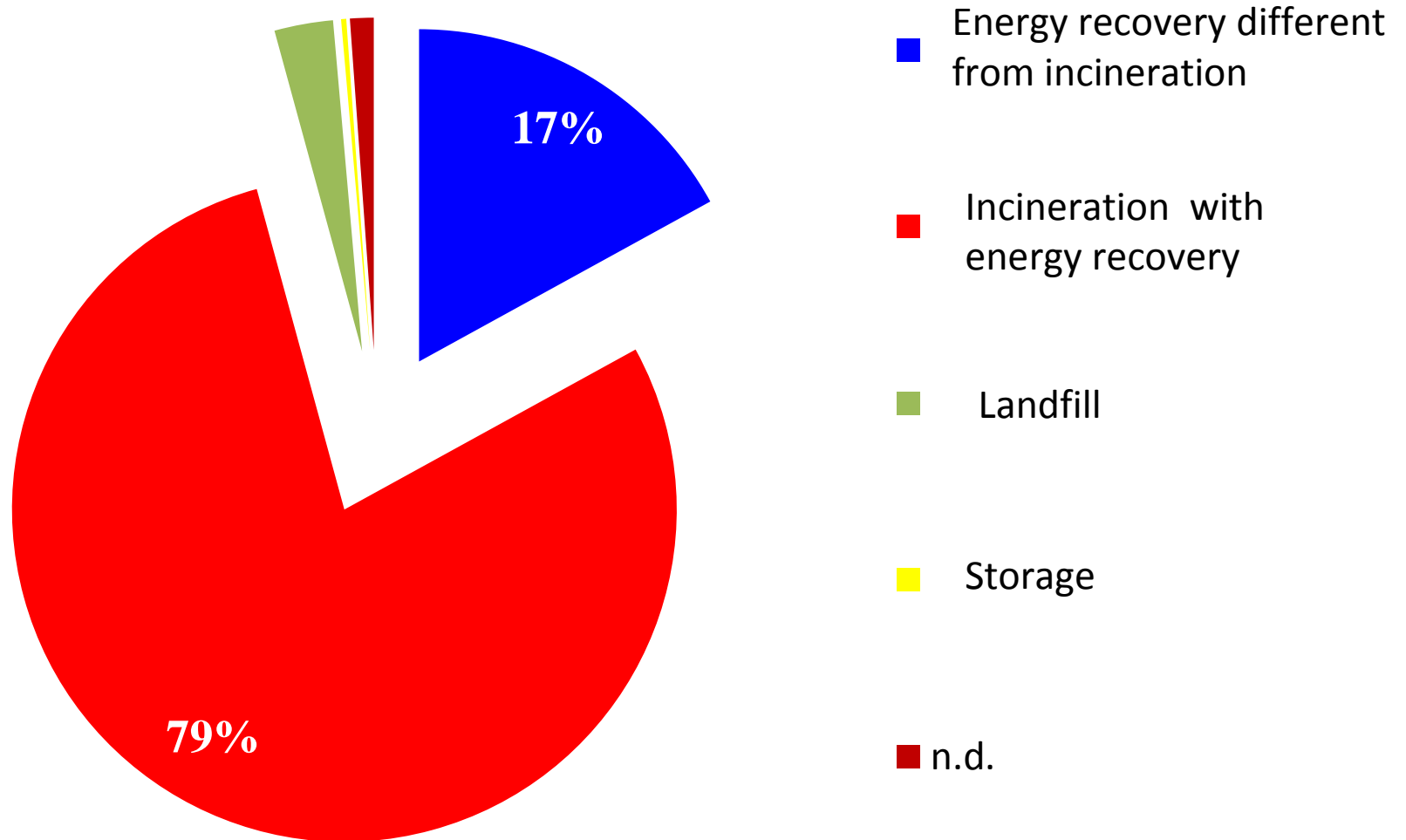
AMOUNT OF SRF PRODUCED IN ITALY, 2009

(Ispra, 2011)



SRF DESTINATION IN ITALY, 2009

(Ispra, 2011)



SRF production and use in Herambiente

The case of Herambiente spa

3 plants use SRF (Ravenna, Faenza, Pozzilli)

2 plants are SRF users

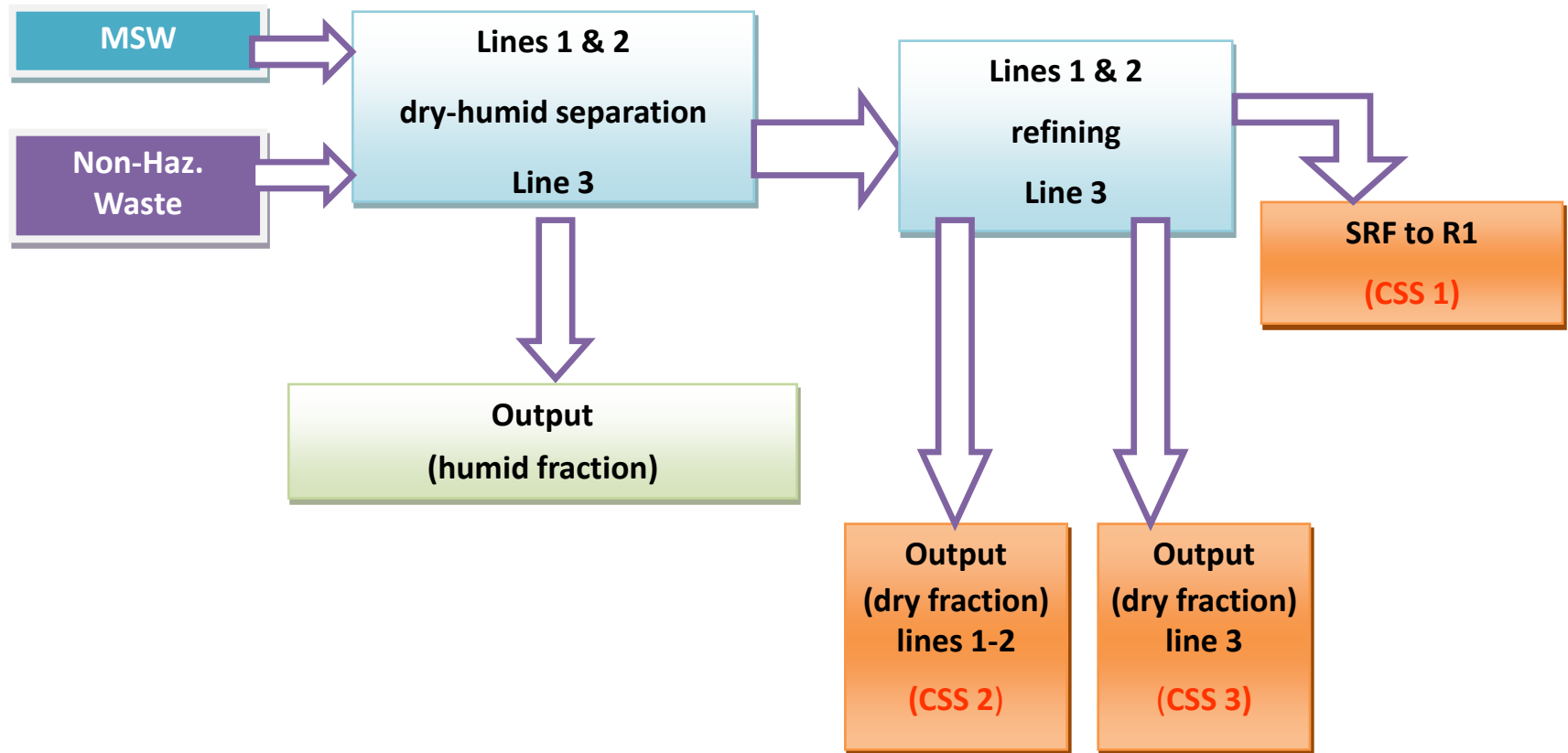
- **Faenza (RA): biomass (waste) and SRF**
- **Pozzilli (IS): only SRF**

1 plant is both producer and user of SRF (Ravenna)



Characterisation and classification

Ravenna



Characterisation and classification

For the plant located in Ravenna, during the procedure for the release of the IPPC permit, a specific analytical campaign has been carried out (end 2012 – march 2013).

Main references: UNI EN 15359, UNI EN 15442

+ Raccomandazione CTI n. 8

+ Raccomandazione CTI n. 11

Technical document developed by CTI Working Group 903 “Energia dai rifiuti” and the guidelines CTI 11, CTI 8.

In the analytical campaign the output streams (CSS1/CSS2/CSS3) from lines 1,2 and 3 have been sampled and analysed.

Results – Classification CSS1/CSS2/CSS3

CSS 1 is classified: NCV:4, Cl:3, Hg:1 → 4.3.1

CSS 2 is classified: NCV:5, Cl:3, Hg:1 → 5.3.1

CSS 3 is classified: NCV:4, Cl:2, Hg:1 → 4.2.1

Characterisation and classification

Stream	Description	NCV class	Cl class	Hg class
CSS1	SRF, former "RDF"	4	3	1
CSS2	Output lines 1,2	5	3	1
CSS3	Output line 3	4	2	1

Standard EN 15359

Classification Property	Statistical measure	Unit	Classes				
			1	2	3	4	5
Net Calorific Value	Mean	MJ/kg (ar)	≥ 25	≥ 20	≥ 15	≥ 10	≥ 3
Chlorine	Mean	% (dry basis)	≤ 0,2	≤ 0,6	≤ 1,0	≤ 1,5	≤ 3
Mercury	Median	mg/MJ (ar)	≤ 0,02	≤ 0,03	≤ 0,08	≤ 0,15	≤ 0,50
	80 th percentile	mg/MJ (ar)	≤ 0,04	≤ 0,06	≤ 0,16	≤ 0,30	≤ 1,00

Characterisation and classification

	Prescription	Used methodology
Definition of lot	<p>For sampling purposes, the lot's weight shall not exceed 1.500 t; lots with heavier weight must be properly divided</p>	<p>The size of the lot was determined on a temporal basis (1 week) and it measured about 400 t</p>
Sampling procedure	<p>Different possibilities, with a decreasing order of representativeness:</p> <ul style="list-style-type: none">- Sampling from a material flow- Sampling from vehicle- Sampling from a static lot	<p>The sampling plan from a material flow (from a moving conveyor) was chosen, in continuity with the previous procedures used with the "CDR"</p>

Characterisation and classification

	Prescription	Used methodology
Number of increments	The minimum number of increments (for the preparation of the sample from the lot) is 24, independently from the lot size	For each lot a minimum number of 25 increments was determined
Minimum size of sample	For the determination of the minimum size of the sample, the formula D.2 of EN 15442 is applied (which takes into account several factors)	The minimum size of the sample is 20 kg (comparison tables from CTI Guideline n.11 were used as reference)
Minimum size of increments	The minimum number of increments can vary, according the heterogeneity of SRF: from 24 (homogeneous materials) to 30 (heterogeneous materials)	The minimum size of increment is 0,8 kg (comparison tables from CTI Guideline n.11 were used as reference)

Characterisation and classification

	Prescription	Used methodology
Actual size of increment and sample	See tables (refer to standard 15442)	Same scheme previously adopted for “old” SRF sampling
Selection and distribution of increments on the lot	For each lot, the sampling is stratified (as described in standard EN 15442); the portions of the single increment are taken at regular time intervals.	3 increments per day were prepared for each of the different SRFs tested

Characterisation and classification

In the case of a plant operating for more than a year, it is possible to use the existing data for the characterisation of the lots according the UNI standard 9903-1 (lots of 5 weeks of production).

The historical data on the 3 output flows of the plant were elaborated and classified according EN 15359.

According to this database, the “old” RDF produced in the plant of Ravenna complies with the SRF classification (EN 15359) and could be classified as SRF, with NCV class 2, Cl class 3, Hg class 2.

The net calorific value ranges from 13,900 to 22.700 kJ/kg, showing high values in the central months of the year.

Characterisation and classification

On the basis of the historical data of the Ravenna plant, the output flows from lines 2 and 3 are classifiable as SRF with NCV class 4, Cl class 2, Hg, class 1.

This material shows different properties respect the “old” RDF, in terms of a lower quality as fuel but a better environmental impact thanks to a lower mercury content.

The humid fraction output shows a classification according EN 15359 similar to the dry fraction. Obviously the NCV ranks at lower values, but still quite comparable to materials such as biomass, wood, sawdust and some gases from chemical processes.

Few issues:

- Problems in conservation of the samples in the plant
- Differencies respect the theoretical classification of SRF:
 - Lower class for NCV
 - Higher class for Hg

Main considerations

Federambiente associates the main actors of SRF chain (SRF production plants and MSW incineration plants)

Most SRF produced today is recovered as energy in incineration plants

The potential of SRF and EoW-SRF market is significant, but it is not actually exploited

Cement sector shows great interest both for waste SRF and EoW-SRF, but today there are nearly no cases of cement kiln licensed to use SRF or EoW-SRF

To be verified the cement industry capability to comply with waste incineration emission limits

Need to create a direct relationship between producer and user of EoW-SRF

Main considerations

Complex authorization procedures and unclear legislation in this regard

Problem about local consent. Even when classified as EoW it is recognized as waste by oppositions

SRF is still object of wide and harsh political discussion (e.g. Mozione Camera dei Deputati 22/10/13)

Difficulties in producing EoW-SRF only from MSW (in particular in complying with NCV values)

Difficulty in matching supply and demand

Conclusions

In compliance with EU Waste hierarchy, any waste recovery strategy is preferable to landfill

Recovery operations of SRF (waste or EoW) shall be subject to the same requirements as regards environmental and health protection

In territorial planning the choice of SRF production must not underestimate the availability of plants for SRF recovery. Waste cycle doesn't close with SRF production (both waste and EoW)