


First UK conference on Solid Recovered Fuels

Case studies of SRF production by Veolia in Europe


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SRF : a reality in Europe for several years





- Solid Recovered Fuel market developed at different paces in different European countries
- Case studies for
 - Italy
 - Germany
 - Norway






Criteria for SRF development in Germany

- 2005 → Implementation of “TASi” waste ordinance: landfill ban for non-pre-treated waste or waste containing more than 5% TOC
- Eastern Germany has no incinerators → MBT plants with SRF output
- Total SRF market estimation
 - 2008 → 4.000.000 tons (domestic and export)
 - 2011 → 8.000.000 tons
 - Cement kilns, power plants

VES Germany– SRF production

- Production from 13 sites
- Total input:
 - 940.000 tons/year
 - Commercial waste and packaging, some MSW
- Output:
 - 400.000 tons SRF → NCV 15 – 22 MJ/kg
 - 375.000 tons SRF “pre-product” → NCV 13 – 17 MJ/kg
 - Output/input ratio appr 75%



VES Germany– SRF production examples

- EVG Rostock**

 - Located to meet Eastern Europe and Scandinavian demands
 - Input 145.000 t MSW
 - Output 70.000 t SRF → NCV >13MJ/kg
 - Outlet: power plant


- Hamburg**

 - Input 180.000 t commercial and packaging waste
 - Output 80.000 t SRF → NCV >20MJ/kg
 - Outlet: cement kiln






EVG Rostock



EVG Rostock GmbH
 Ost-West-Straße 22
 18147 Rostock

Mechanical-Biological Treatment
 Plant capacity 145.000 t/a Input
 Year of construction 2006



RZH Hamburg



Veolia Umweltservice Nord-West GmbH	
NL Hamburg	
Werner-Siemens-Straße 20	
20097 Hamburg	
SRF production	
Plant capacity	180.000 t/a Input
Year of construction	2007



„Pre-product“ SRF, power plant quality



 „Fluff“ SRF– power plant quality





 „Fluff“ SRF– cement works quality





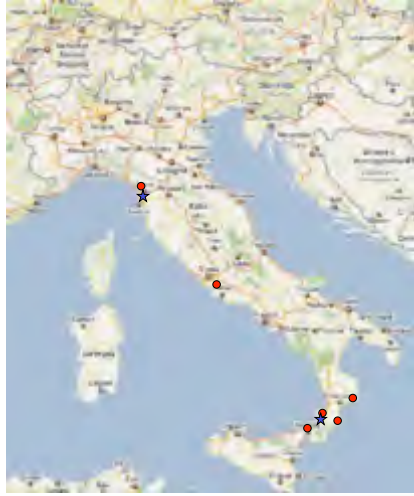
Criteria for SRF development in Italy

- Green certificates are awarded to “IAFR” approved facilities on the basis of the biodegradable fraction in SRF
- WTE facilities classified as IAFR (using renewable sources) or non-IAFR
- Green certificates are worth € 65/MWh for electricity production
- Former “CIP6” incentive (220 €/MWh) is not provided for new facilities
- Total market: 690.000 tons SRF burnt annually

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VES Italy – SRF production

- Production from 6 sites
- Input:
 - 560.000 tons
 - Mostly MSW and some commercial
- Output:
 - 180.000 tons/year SRF
 - Outlet: dedicated power plants
 - Output/input ratio appr 32%



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VES Italy – SRF production example The Versilia MSW treatment plant



WTE in Falascaia
Electric Energy produced
40.000 MWh/year



MBT in Pioppogatto
MSW treated →
140.000 t/year




The Versilia dedicated SRF thermal treatment plant


Tender documents obligated the competitors to use the fluidized bed technology, which needs a homogeneous fuel → “CDR”, Italian denomination of **SRF**


Input


- MSW → 136.000 t/y

Output

- FOS (Stabilized Organic Fraction) → 24.800 t/y
- SFR (Solid Recovered Fuel) → 56.500 t/y
- Residual (from mechanical treatment) → 37.200 t/y
- Evaporation → 14.000 t/y
- Other (Ferrous & non ferrous material) → 3.500 t/y








To landfill

To Falascaia WTE


To landfill



Reuse ?

Landfill ?

} Depending on market requests



Versilia SRF preparation (1)



MSW in storage pit



MSW shredded



Versilia SRF preparation (2)



First rotary screening




Second rotary screening





Finished SRF






Criteria for SRF development in Norway

- Societal acceptance of production plant in an urban environment (Oslo)
- Landfill ban expected as of 1 July 2009
- Total market
 - 2008 → 300.000 tons SRF
 - 2012 → 420.000 tons SRF
 - Cement kilns, district heating, CHP



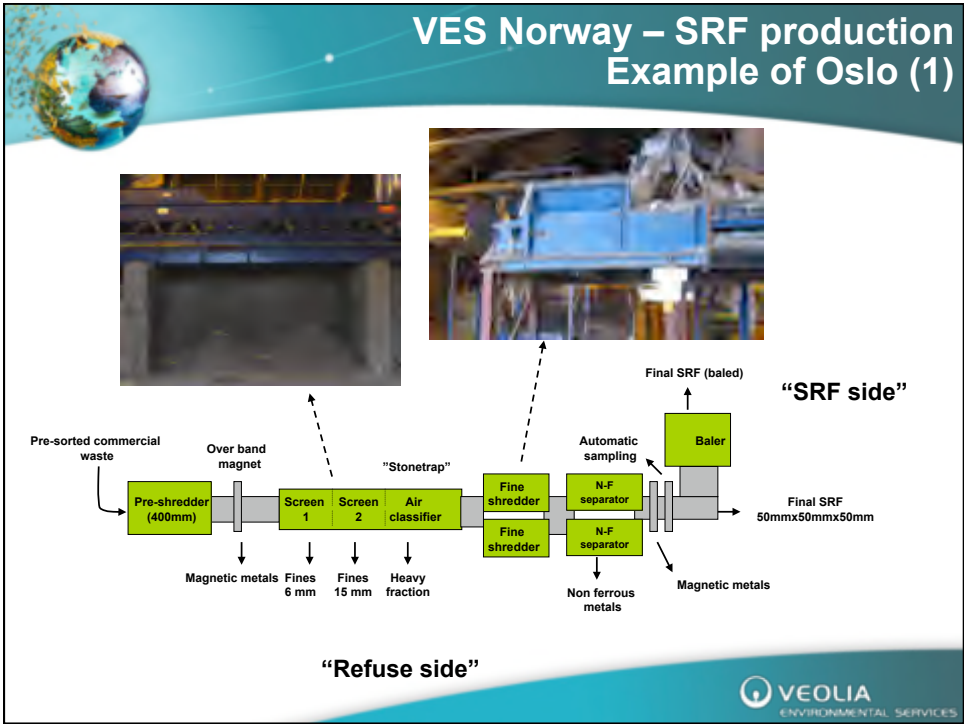
VES Norway – SRF production

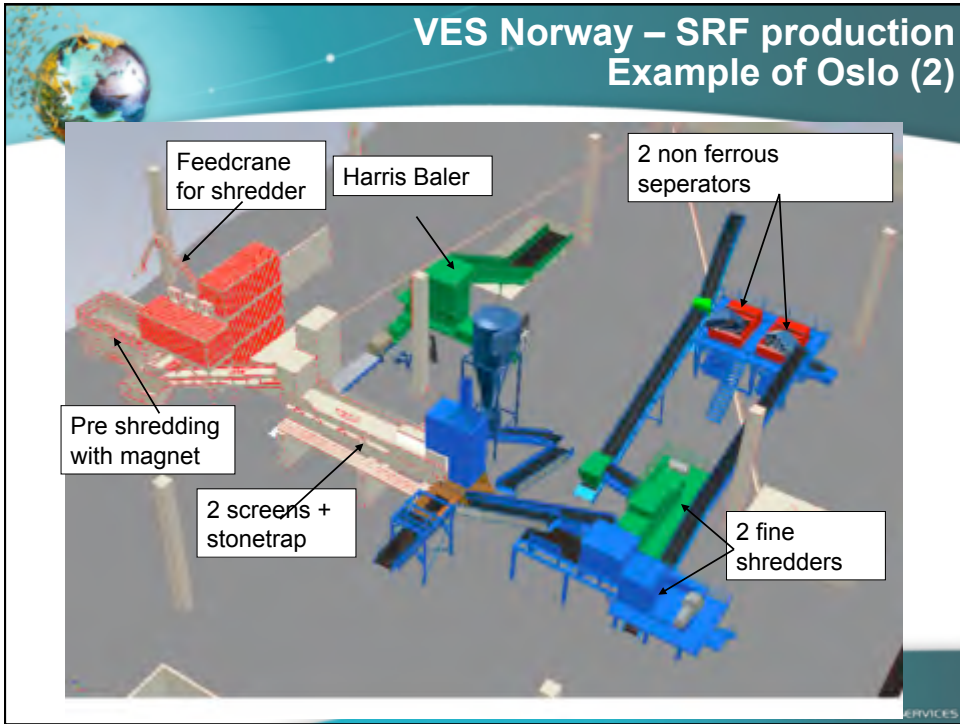
- Production from 3 sites
- Input:
 - 240.000 tons
 - Commercial waste and MSW
- Output:
 - 140.000 tons SRF -- NCV 12 – 15 MJ/kg
 - 60.000 tons SRF pre-product -- NCV 10 – 13 MJ/kg
 - Output/input ratio appr 80%



VES Norway – production & outlet

- Oslo**
 - Input 78.000 t commercial waste
 - Output 47.000 t SRF
- Tonsberg**
 - Input 70.000 t commercial and MSW
 - Output 43.000 t SRF
 - Output 20.000 t Pre Product
- Larvik**
 - Input 70.000 t commercial and MSW
 - Output 40.000 t SRF
 - Output 20.000 t Pre Product








VES Norway – SRF production Example of Oslo (4)



The image shows a large industrial facility with a high ceiling and complex machinery. A prominent blue vertical structure is in the center, surrounded by various pipes, walkways, and other industrial equipment. The floor is polished and reflects the overhead lights.


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Example of quality management for SRF preparation


- Implementation of an ISO 9001:2000 derived QMS, based on future CEN standards
- Based on operator experience for pre-sorting of unsuitable materials (very important!)
- On-site laboratory with adapted sampling and sample reduction procedure
- Additional chemical and physical properties analysis carried out externally

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VES operated SRF plants in Europe

- SRF production from VES operated plants in Europe:
 - Over 1 million tons in 2007 Germany, Italy, Norway
 - Over 1,1 million tons in 2008
- NCV range from 10 MJ/kg to 25 MJ/kg
- Output/input ratio range 30 % to 90 %



CONCLUSION

- Case studies for Veolia operated SRF plants shows a great diversity :
 - Waste sources and outlets
 - National / local context
 - Requested SRF specification and quality
 - Equipment and facility type and size
- Customized solutions are implemented to meet this great diversity, for all types of MSW, commercial or industrial waste

