

The challenge to combine soil improvement needs with a digestion based Waste Management Strategy in Portugal

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European Compost Network ECN
 International Workshop with Exhibition & Study Tour
 The Future for Anaerobic Digestion of Organic Waste in Europe
 16th-17th of Jan. 2008, Nuremberg/Nürnberg, Germany
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Summary

- Introduction MSW management
- Organic waste treatment plants
- Soil problematic
- Soil improvement challenge with digestate
- Conclusions

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Introduction MSW management

- 10 millions inhabitants produce 4.5 millions tonnes of MSW (2005)
- 1.24 kg/inh. per day MSW
- Waste management in Portugal
 - 31 waste management systems
 - 29 continental
 - 2 archipelagos (Azores and Madeira regions)

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Organic waste treatment plants

+ Azores archipelago ○
 + Madeira archipelago ●

● Biological treatment plants existing
 ○ Biological treatment plants predicted

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Organic waste treatment plants

- Source Separated
 - Existing plants

Plant	Treatment	Organic waste capacity (ton)	Starting date
1 (Lipor)	C	60 000	2004
2 (Valorsul)	AD	60 000	2006
3 (Algar: 2 plants)	C	10 000	2002
Madeira archipelago (Valorambiente)	C	23 000	2005

Source: PERSU II, 2007; EGF, 2007

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Organic waste treatment plants

- Mix MSW
 - Existing plants

Plant	Treatment	Organic waste capacity (ton)	Starting date
1 (Amave)	MBT/C	53 000	2001
2 (Planalto Beirão)	MBT/AD	20 000	2008?
3 (Cova da Beira)	MBT/C	20 000	2001
4 (Tratolixo)	MBT/C	60 000	2001
5 (Amarsul)	MBT/C	20 000	1993

Source: PERSU II, 2007; EGF, 2007

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Organic waste treatment plants

- **Source Separated**
 - Future plants

Plant	Treatment	Organic waste capacity (ton)	Starting date
1 (Braval + Resulima + Valorminho)	AD	20 000	2011

Source: PERSU II, 2007; EGF, 2007

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Organic waste treatment plants

- **Mix MSW**
 - Future plants

Plant	Treatment	Organic waste capacity (ton)	Starting date
1 (Saldouros)	MBT/AD	20 000	2009
2 (Ersuc: 2 plants)	MBT/AD	200 000	2009
3 (Valorlis+Resioeste)	MBT/AD	30 000	2009

Source: PERSU II, 2007; EGF, 2007

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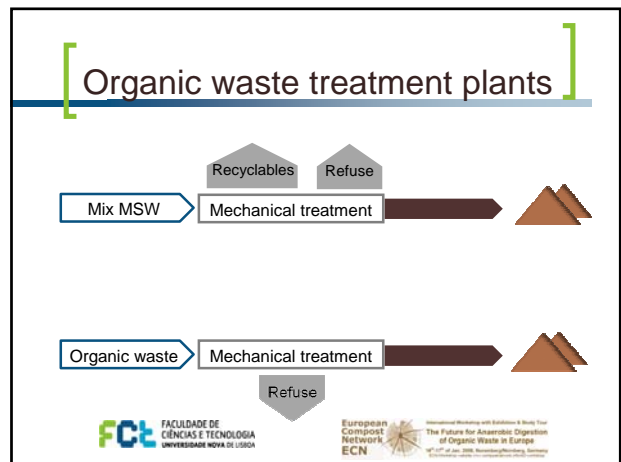
Organic waste treatment plants

- **Mix MSW + Source Separated**
 - Future plants
 - 2 compost qualities

Plant	Treatment	Organic waste capacity (ton)	Starting date
1 (Resat+Robat+Resdouro+AMVDN)	MBT/C	20 000: 10 000 source separ. 10 000 mix MSW	2011
2 (Valnor+Raia Pinhal)	MBT/C	20 000: 10 000 source separ. 10 000 mix MSW	2008

Source: PERSU II, 2007; EGF, 2007

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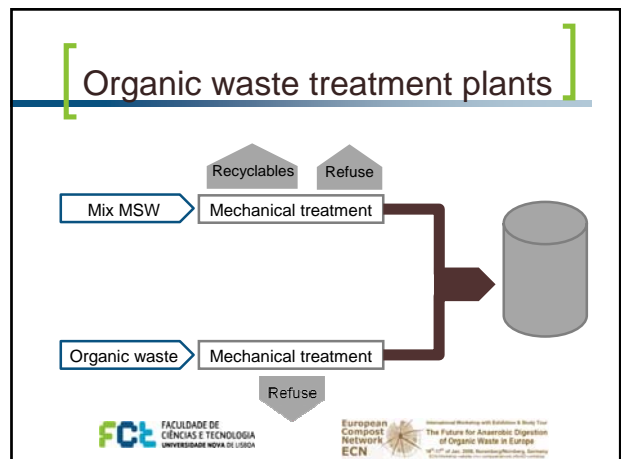
Organic waste treatment plants

- **Mix MSW + Source Separated**
 - Future plants
 - 1 compost quality

Plant	Treatment	Organic waste capacity (ton)	Starting date
1 (Amarsul)	MBT/AD	60 000: 20 000 source separ. 40 000 mix MSW	2009
2 (Algar)	MBT/AD	20 000: 10 000 source separ. 10 000 mix MSW	2009

Source: PERSU II, 2007; EGF, 2007

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Organic waste treatment plants

- Unknown
 - Future plants

Plant	Treatment	Organic waste capacity (ton)	Startin g date
1 (Resíduos do Nordeste)	?/AD	10 000	2011
2 (Ambiaousa)	?/AD	20 000	2009
3 (Resilurbe+Resitejo)	?/AD	20 000	2009
4 (Tratolixo)	?/AD	125 000	2009
5 (Gesamb+Amalga+ Amagra+Amcal)	?/C	30 000	2011
Azores archipelago (Sigra)	?/?	58 000	2011

Source: PERSU II, 2007; EGF, 2007

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Organic waste treatment plants

Input material	Organic waste capacity (ton)	Biological treatment plants
Source separated	193 000	6 composting + 2 anaerobic digestion
Mix MSW+source separated	80 000	2 anaerobic digestion
Mix MSW	443 000	6 composting+ 5 anaerobic digestion
Unknown	263 000	1 composting + 4 anaerobic digestion + 1 unknown

	Composting	Anaerobic digestion
Treatment capacity (%)	34	66
Treatment plants (number)	11	13

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Soil problematic

TOPSOIL ORGANIC CARBON CONTENT

LEGEND: Water, Soil aptitude (Medium to high (> 2%), Low (< 2%)

http://eu-soils.jrc.it

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Soil problematic

Actual soil erosion risk

Legend: Low, Moderate, High, Cuts, Bare soils, Urban areas, No data, Outside data coverage

http://dataservice.eea.europa.eu/dataservice/metadatails.asp?id=194

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Soil improvement challenge with digestate – Opportunities

- Improve source separation
 - the "modular" design of the new plants (that allow us to face with the future developments of source separation, compost standards)
- Improve digestate quality
 - Composting after anaerobic digestion
 - Appropriate bulking agents (lignin/wood) to raise humic substances (Smidt, 2007)

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Soil improvement challenge with digestate – Threats

Lack of lignin/wood
 ↓
 Input material for 15 new forest biomass power plants
 ↓
 Lack of fuel material

● Power capacity > 10 MVA
 ● Power capacity < 6 MVA
 ● Biological treatment plants existing
 ● Biological treatment plants predicted

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Conclusions

The challenge in the near future...
Source separated organic waste
+
Composting

↓

Soil improvement ← Humification technology → Carbon sequestration

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Thank you!

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