



Selective Collection Of The Organic Waste In Tourist Areas



Project
funded by the
EUROPEAN UNION



Training Protocols for composting facility management

Task 4.4_2b

4.4. Elaboration training/communication contents for agents

WP4. DEFINITION OF THE GENERAL MANAGEMENT MODEL

Author: Ramon Plana, BCNecologia

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Version: Final version

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4.4_2b Training protocols for composting facility management

WP	4. Definition of the general management model
Coordinator	Beneficiary
Sub-Activity	4.4 Elaboration of training/communication materials content for the agents involved (guidelines, environmental communication materials, etc.)
Description of the tasks (FAF)	<ol style="list-style-type: none"> 1. Elaboration of a Guide gathering the results of the definition of the generic model and the evaluation parameters. 2. Technical elaboration of training materials with the local stakeholders. 3. Technical elaboration of common communication elements to be used in local communication and environmental education campaigns. 4. Elaboration of an-easy-to-use handbook for the staff in charge of the plants. 5. Other communication materials if necessary.
Action Plan Period	Final months of 2013 (initial planning, postponed as the final definition of the models were needed)
Name of the Output	4.4-2b Training protocols for composting facility management
Date of the delivery	First draft:15/10/2014, Final version: 30 November 2014
PP involved	Beneficiary and Ramon Plana (project technical expert)
Description of the Output	Preparation of training protocols addressed to composting facility managers in order to provide them with the instructions and main contents of the needed initial formation and practices for the operation starting and future running of the composting plant.
Objectives of the Output	<ul style="list-style-type: none"> -Providing all PP with information, indications and recommendations on training activities to define their own facility managers training program adapted to their biowaste management model and facility. -Complement the Output 4.4_1 on communication materials contents and Output 4.4_2a Training protocols for communication campaigns
Remarks	This report is complemented with the 4.4-1 Protocol with 3 typologies of contents for the stakeholders' communication packs, available on the website. This report is complemented with Output 4.4_2a Training protocols for communication campaigns
Communication/ Capitalization actions	<ul style="list-style-type: none"> -Available on SCOW website for all the public and for project members. -Distribution of the document and informative note to all the PP. -Distribution of the 4.4-2b output link and informative note to associates and other entities according to the SCOW Capitalization Plan.

1 Theoretical part of the training

1.1 Basic principles of the composting process

Persons attending	<ul style="list-style-type: none"> • Workers in the facility – manager – compost sellers
Teacher/coach	<ul style="list-style-type: none"> • Composting expert

- a. Definition and analyses of the composting process
- b. Biology of the process
- c. Main parameters of the process
 - i. Initial parameters
 - Mixture and porosity
 - Moisture
 - Particle size
 - pH
 - C/N rate
 - ii. Process parameters
 - Temperature
 - Oxygen consumption
 - CO₂ production
 - Moisture
 - pH
 - Density
- d. The final product – compost
 - i. Kinds – classifications
 - ii. Quality (agronomic, legal...)
 - iii. Maturity – stabilization
 - iv. Analytics – main chemical, physical and biological parameters
 - v. Uses and applications

Source of information	<ul style="list-style-type: none"> • 4.3_2 Guidelines on the definition of low cost, low tech high quality biowaste management models- SCOW model. • 4.4_3 Handbook for small scale composting facility management
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1.2 Composting systems

Persons attending

- Workers in the facility – manager

Teacher/coach

- Composting expert

- a. Theory on small scale facilities
- b. Open systems
- c. Semi-closed systems
- d. Closed systems
- e. More centralised/less centralised

Source of information

- **4.3_2 Guidelines on the definition of low cost, low tech high quality biowaste management models- SCOW model.**
- **4.4_3 Handbook for small scale composting facility management**
- **Bio-waste composting strategies. Management options for 6 composting schemes. 2013. ACR+.**

1.3 Parts/areas of a composting facility

Persons attending

- Workers in the facility – manager

Teacher/coach

- Composting expert

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- Reception
- Mixing
- Fermentation
- Maturation
- Sieving
- Storage
- Rainwater collection/storage
- Leachates collection/storage
- Electricity/water supply
- Shredding (bulking)
- Maintenance
- Laboratory
- Compost selling/distribution zone
- Office

Source of information

- **4.3_2 Guidelines on the definition of low cost, low tech high quality biowaste management models- SCOW model.**
- **4.4_3 Handbook for small scale composting facility management**

1.4 Machinery

Persons attending

- Workers in the facility – manager

Teacher/coach

- Composting expert, providers of the equipment

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- a. Basic description: equipment needed-uses, equipment models, own made equipment
- b. Maintenance (daily, monthly and annual)
- c. Cautions and basic considerations of the tasks and operations with machinery

Source of information

- 4.3_2 Guidelines on the definition of low cost, low tech high quality biowaste management models- SCOW model.
- 4.4_3 Handbook for small scale composting facility management

1.5 Tasks in the composting facility

Persons attending

- Workers in the facility – manager

Teacher/coach

- Composting expert

- a. Reception
- b. Mixing - proportions
- c. Fermentation stage
 - vi. Monitoring – diagnosis
 - vii. Turning / aeration /watering/coverning
- d. Maturation stage
 - viii. Monitoring - diagnosis
 - ix. Turning / aeration/watering/covering
- e. Sieving
- f. Shredding (bulking)
- g. Storage
 - x. Monitoring
 - xi. Bagging
- h. Rainwater storage and management - watering
- i. Leachates storage and management - watering
- j. Maintenance (machinery and installations)
- k. Recording monitoring parameters and indicators/material traceability

Source of information

- **4.3_2 Guidelines on the definition of low cost, low tech high quality biowaste management models- SCOW model.**
- **4.4_3 Handbook for small scale composting facility management**
- **6.1_1 SCOW Online forms for facility monitoring (and instructions), Webgis**

1.6 Laboratory – basic analytics and others

Persons attending

- Workers in the facility – manager- compost sellers

Teacher/coach

- Composting expert, expert in lab analysis

- Sampling
- Total solids – moisture
- pH and conductivity
- Volatile solids – organic matter
- Density
- Maturity (*Rottegrade, Solvita*)
- Germination index
- Other: characterisation of the input material, visual qualitative parameters

Source of information

- 4.3_2 Guidelines on the definition of low cost, low tech high quality biowaste management models- SCOW model.
- 4.4_3 Handbook for small scale composting facility management
- 6.1_1 SCOW Online forms for facility monitoring (and instructions), Webgis

1.7 Compost marketing

Persons attending

- Workers in the facility – manager- compost sellers

Teacher/coach

- Composting expert, expert in agriculture/fertilisers

- a. Value of the product
- b. Presentation – packing
- c. Type of customer/consumer
- d. Marketing strategy
- e. Information of the product/application (doses, techniques, etc.)
- f. Labelling/Standards/Quality assurance systems
- g. Services provider to the customer

Source of information

- **4.3_2 Guidelines on the definition of low cost, low tech high quality biowaste management models- SCOW model.**
- **4.4_3 Handbook for small scale composting facility management**

2 Practical part of the training

2.1 Use and maintenance of the machinery

Persons attending

- Workers in the facility – manager

Teacher/ coach

- Composting expert, providers of the equipment

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- Front loader
- Mixer
- Turner
- Drum – electromechanical composter
- Sieve
- Shredder
- Forced aeration system
- Modular composters

Source of information

- **4.4_3 Handbook for small scale composting facility management**

2.2 Work protocols for the different tasks

Persons attending

- Workers in the facility – manager

Teacher/coach

- Composting expert

- a. Reception
- b. Mixing – Proportions of bulking/biowaste
- c. Formation of windrows/heaps
- d. Feeding the electromechanical composter
- e. Turnings – aeration frequency /Watering
- f. Movements of the materials between different areas
- g. Leachates management/storage
- h. Shredding
- i. Sieving
- j. Storage of the different materials/bagging
- k. Cleaning and general maintenance

Source of information

- **4.4_3 Handbook for small scale composting facility management**

2.3 Monitoring

Persons attending

- Workers in the facility – manager– compost sellers

Teacher/ coach

- Composting expert

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- a. Material traceability/batch management
- b. Measuring parameters (direct and indirect)
- c. Taking samples
- d. Basic analytics
- e. Material composition characterisation
- f. Visual qualitative parameters
- g. Evaluation of the process state
- h. Evaluation of the compost
- i. Facility result indicators

Source of information

- **4.4_3 Handbook for small scale composting facility management**
- **6.1_1 SCOW Online forms for facility monitoring (and instructions), Webgis**

2.4 Facility general management

Persons attending	<ul style="list-style-type: none"> Workers in the facility – manager
Teacher/coach	<ul style="list-style-type: none"> Composting expert

- a. Licenses and permits/administrative management
- b. Safety practices
 - i. Safe working practices
 - ii. Control hazardous substances exposure
 - iii. Consulting, informing and training operators
- c. Waste management

Source of information

- **4.4_3 Handbook for small scale composting facility management**
- **Document “Health & Safety at composting sites : a guide for site managers – 3rd Edition (2012)”**, from Association for Organics Recycling. For more details, please refer to this document <http://www.organics-recycling.org.uk/uploads/article453/Health%20%20Safety%20at%20Composting%20Sites%20Low-Res.pdf>

3 Inventory of documents on composting and facility management

- Amlinger, F. *et al.* 2009. The State of Art of Composting (A guideline in good practice). Edited by: Austrian Ministry for Agriculture and Forestry.
- CCME. 2005. Guidelines for Compost Quality. Canadian Council of Ministers of the Environment. Manitoba, Canada.
- Duckworth, G. 2005. The composting industry – Code of Practice. The Composting Association. England
- Gabbay, O. 2010 Assessment of the Avenor Pilot Community Composting Facility and its Adaptability in Other Accra Sub-Metro Areas
- Environment Agency (UK). 2001. Technical guidance on composting operations
- Huerta, O.; López, M. & Soliva, M. 2010. Proceso de compostaje: Caracterización de muestras. Ed: Diputacio de Barcelona, Co-lecciò Estudis - Serie Medi ambient 2, 432 pp.
- Zucconi, F. & De Bertoldi, M. 1987. Compost specifications for the production and characterization of compost from municipal waste”. A: de Bertoldi, M.; Ferranti, M.P.; L’Hermite, P.; Zucconi, F. (eds). “Compost: Production, Quality and Use”. *Elsevier Applied Science*. London. pp 30 - 50