

<p style="text-align: center;">TOWEFO (Toward Effluent Zero)</p> <p>EVALUATION OF THE EFFECT OF THE IPPC APPLICATION ON THE SUSTAINABLE WASTE MANAGEMENT IN TEXTILE INDUSTRIES</p>	IDENTIFICATION CODE: PA-112-003		DIS.: C0	PAG.: 1	OF PAG.: 144
	PARTNER: ENEA		WORKPACKAGE: WP12		
	EXTERNAL IDENTIFICATION CODE:				
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TITLE:
5ND MANAGEMENT REPORT

KEY WORDS

ANNOTATIONS:

3					
2					
1	7.11.2003	Revision integrating comments from partners	D. Mattioli		
0	28.10.03	Emission	D. Mattioli		

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SECTION 1: Management and resource usage summary, related to the reporting period

The TOWEFO Project comprises fourteen workpackages (WP). Each WP represents a main work field and is subdivided in job cards (work tasks). Each job card has been conceived as a well defined activity assigned to a single partner.

Each job card is identified by an alphanumeric code: the first four digits represent the work package, the following two digits represent the progressive number of the job card in the WP and the last one represents the partner in charge of the activity. The numbers associated to each partner are defined in the annex 1 of the contract (Description of Work).

The objectives of the period and the progress in the activities here presented reflect the detailed planning agreed during the kick-off meeting and based on the division of the workpackages in job cards.

A WP0 has been created to collect all the planning activities of the project, it was not in the work programme originally submitted to E.C.. All the management work needed at the beginning of the project has therefore been moved from WP12 to WP0.

OBJECTIVES OF THE REPORTING PERIOD

Workpackage 00 - Project Management (part 1)

WP00.03.1 Solving technical problems and updating the website.

Workpackage 01 – Qualitative survey on GEP application in the textile finishing industry

All the activities are concluded.

Workpackage 02 – Quantitative evaluation of GEP application. Case studies in the synthetic fibres and silk industries

The activities WP02.01.3 and WP02.02.3 are concluded.

WP02.03.3 Completion of the data collection and elaboration of process data

Workpackage 03 – Quantitative evaluation of GEP application. Case studies in the cotton industries

The activities WP03.01.8 and WP03.02.8 are concluded.

WP03.03.8 Completion of the data collection and elaboration of process data

Workpackage 04 – Water Pinch technology in textile finishing industries (silk, synthetic fibres and cotton)

The activities WP04.01.4, WP04.02.4, WP04.03.4 and WP04.04.4 are concluded.

WP04.05.4 Proceeding with the design of water reuse scheme and definition of necessary water quality

WP04.06.4 Proceeding with the preparation of the database of allowable inlet concentrations of textile processes

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WP04.07.4 Starting with the preparation of the guidelines for an optimal reduction of water usage and discharge

Workpackage 05 – Characterisation and design of wastewater

The activity WP05.01.5, WP05.02.5 and WP05.03.6 are concluded

WP05.04.5 Carrying out extra activities (with respect to the original schedule) concerning respirometric on-line tests

WP05.05.3 Carrying out tests for water reuse on the basis of the protocol agreed

WP05.06.8 Carrying out tests for water reuse on the basis of the protocol agreed

WP05.07.4 Starting the set up of the integrated methodology for water pinch and waste design

WP05.08.5 Starting the preparation of the protocol for wastewater design in terms of treatability and reusability

Workpackage 06 – Wastewater treatment

The activities WP06.01.1, WP06.02.5, WP06.03.1, WP06.04.1 and WP06.05.5 are concluded.

WP06.06.1 Proceeding with the tests to evaluate the aerobic treatability of final effluents

WP06.07.1 Finalising the treatment tests by membranes to produce permeates suitable for reusing

WP06.08.1 Proceeding with the results elaboration to obtain operational data to design treatments

WP06.09.1 Organising the workshop on wastewater design

WP06.10.1 Starting the preparation of the protocol for the evaluation of mixed finishing textile process wastewater

Workpackage 07 – Effluent characterisation

The activities WP07.01.6 and WP07.03.4 are concluded

WP07.02.6 Completing the monitoring and physical-chemical characterisation of textile industry effluents

WP07.04.4 Completing the eco-toxicological characterisation of textile industry effluents

WP07.05.4 Proceeding with the preparation of the protocol for eco-toxicological characterisation of the wastewater streams in the textile industry

WP07.06.6 Starting with the effluents characterisation in the selected industries

Workpackage 08 – Application of LCA to support optimisation processes

The activity WP08.01.1 is concluded.

WP08.02.1 Proceeding with the LCA inventory and application in the selected textile industries

WP08.04.1 Proceeding with the preparation of the database supporting the LCA software

Workpackage 09 – Development of an LCA software tool

The activities WP09.01.7 and WP09.02.7 are concluded.

WP09.03.7 Concluding the development of the LCA software tool

WP09.04.7 Starting with the assessment of alternative recycling options

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Workpackage 10 – Regulatory Policy

- WP10.01.1 Completing the collection of information on European Economic regulation experiences for industrial use of water resources
- WP10.02.1 Starting the study of some prototypical tariff structure for industrial water use
- WP10.03.1 Starting the economic and financial analysis of the European regulation
- WP10.04.1 Starting the benchmark analysis on sustainable tariff systems experimented in Europe
- WP10.05.1 Starting the simulation of different type of prototypical tariff system

Workpackage 11 – Multicriteria integrated GEP for textile finishing industry

- WP11.02.1 Starting with the organisation of the project final workshop

SCIENTIFIC/TECHNICAL PROGRESS MADE IN DIFFERENT WORK PACKAGES ACCORDING TO THE PLANNED TIME SCHEDULE

Workpackage 00 - Project Management (part 1)

Technical problems of the web-site were solved. A new web-site responsible person (Mr. Piergiacomo Pagano) was identified within ENEA. The website is now regularly maintained and updated.

Workpackage 01 – Qualitative survey on GEP application in the textile finishing industry

Activities concluded.

Workpackage 02 – Quantitative evaluation of GEP application. Case studies in the synthetic fibres and silk industries

- WP02.03.3 Collection and elaboration of process data was completed.

Workpackage 03 – Quantitative evaluation of GEP application. Case studies in the cotton industries

- WP03.03.8 Collection and elaboration of process data is almost complete.

Workpackage 04 – Water Pinch technology in textile finishing industries (silk, synthetic fibres and cotton)

- WP04.05.4 Design of water reuse scheme and definition of necessary water quality is proceeding
- WP04.06.4 Design of database of allowable inlet concentrations of textile processes is proceeding
- WP04.07.4 The preparation of the guidelines for an optimal reduction of water usage and discharge was started

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Workpackage 05 – Characterisation and design of wastewater

- WP05.04.5 Extra work on respirometric on-line tests is almost completed.
- WP05.05.3 Tests for water reuse were carried out and the report has to be finalised.
- WP05.06.8 Tests for water reuse were carried out and the report has to be finalised.
- WP05.07.4 The set up of the integrated methodology for water pinch and waste design was started
- WP05.08.5 The preparation of the protocol for wastewater design in terms of treatability and reusability was started

Workpackage 06 – Wastewater treatment

- WP06.06.1 Tests to evaluate the aerobic treatability of final effluents on real concentrates are almost concluded.
- WP06.07.1 Treatment tests by membranes to produce permeates suitable for reusing were finishing
- WP06.08.1 Operational data to design treatments are being obtained by elaboration of the tests results
- WP06.09.1 The Workshop on wastewater design was organised and held.
- WP06.10.1 The preparation of the protocol for the evaluation of mixed finishing textile process wastewater was started

Workpackage 07 – Effluent characterisation

- WP07.02.6 The monitoring and physical-chemical characterisation of textile industry effluents is concluded.
- WP07.04.4 The ecotoxicological characterisation of textile industry effluents is concluded
- WP07.05.4 The preparation of a Protocol for eco-toxicological characterisation of the wastewater streams in the textile industry is proceeding.
- WP07.06.6 The effluents characterisation in the selected industries has started

Workpackage 08 – Application of LCA to support optimisation processes

- WP08.02.1 The LCA inventory and application in the selected textile industries is almost completed in three companies and it is progressing in the remaining ones.
- WP08.04.1 The data collection for the Database supporting the LCA software is proceeding.

Workpackage 09 – Development of an LCA software tool

- WP09.03.7 The LCA software tool is on the server and can be tested online (<http://192.107.65.184/towefo/>)
- WP09.04.7 The assessment of alternative recycling options was started

Workpackage 10 – Regulatory Policy

- WP10.01.1 Collection of information on European Economic regulation experiences for industrial use of water resources is almost finished

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- WP10.02.1 The study of some prototypical tariff structure for industrial water use has started
 WP10.03.1 The economic and financial analysis of the European regulation has started
 WP10.04.1 The benchmark analysis on sustainable tariff systems experimented in Europe has started
 WP10.05.1 The simulation of different type of prototypical tariff system has started

Workpackage 11 – Multicriteria integrated GEP for textile finishing industry

- WP11.02.1 The organisation of the project final workshop started

MILESTONES AND DELIVERABLES OBTAINED

Deliverable list (grey shading indicates Workpackages)

No	Deliverable Title	Date planning	Date obtained
1	Manual for technical/economical evaluation of GEP data collection	6	6
2	Workshop (Wo) on the state-of-the-art qualitative survey	9	12
3	Report on the GEP survey	18	18
4	Material and resources data input of the synthetic fibres and silk industry	12	13
5	Report on quantitative evaluation of GEP in synthetic fibres and silk industries	24	30
6	Material and resources data input of the cotton industry	12	13
7	Report on quantitative evaluation of GEP in the cotton industry	24	30
8	Data source on relaxation possibilities of process inlet water quality	24	draft
9	Optimal water re-use procedures applicable in the synthetic/silk/cotton industry	30	
10	An on-line textile waste water characterisation technique	34	
11	A framework for the application of calorimetry in the characterisation of biological textile waste water treatment process	34	18
12	Unified Wo in collaboration between WP5 and WP6 on design of waste water for the textile and waste water industry	30	30
13	A protocol to determine the optimum composition of the waste water streams of the different process units	34	
14	Integrated methodology for Water Pinch and Waste Water Design	34	
15	Operational data to design treatment for increasing biodegradability, decreasing toxicity and for re-use and recycling water in textile finishing process	34	
16	Protocol for the evaluation of treatability of mixed finishing textile process waste water.	34	
17	Compendium of analytical methods for organic micropollutants	18	18
18	Protocols to characterise and screen for ecotoxicity in effluents of textile industry	30	30
19	Final report on effluent characterisation from selected textile refining industries	34	
20	Technical report on LCA application in the textile finishing industry	28	draft
21	Database on paper/magnetic support for decision support software	34	

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22	Peer review Wo on the LCA software tool	30	18
23	A software tool complete with a dedicated user's interface and related databases	34	
24	Report on economic regulations and best European practice experience	18	draft
25	Sustainable tariff systems for industrial water usage. A benchmarking analysis	28	
26	Wo on regulatory policy for the water management in the industrial sector	28	
27	Final report on the practical prototype for a water management regulatory policy in the textile finishing industry	34	
28	Wo "Integrated Waste Water Management in textile finishing industry"	34	
29	Final report " Evaluation of the effect of the IPPC application on the sustainable waste water management in textile industries"	36	
30	Management reports	Every 6	
31	Periodic reports	Every 12	
32	Internet Page	3	3
33	Technical publication in three languages	36	
34	CD ROM	36	

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Milestone list

N o	Milestone Title	Date planning	Date obtained
1	Submission of Manual for technical/economical evaluation of data collection	6	6
2	Submission of the report on the Workshop on the state-of-the-art qualitative survey	12	12
3	Submission of report on the GEP survey	18	18
4	Industry selection and textile process identification	12	12
5	Draft report and data delivery.	18	18
6	Report and data delivery	24	30
7	Industry selection and textile process identification	12	12
8	Draft report and data delivery.	18	18
9	Report and data delivery	24	30
10	Report on water pinch technology. Specific problems for the application in the textile industry	6	6
11	Definition of necessary water quality	18	18
12	Guidelines for an optimal reduction of water usage and discharge in the synthetic, silk and cotton industry	30	
13	Literature review on textile wastewater characterisation procedures	6	6
14	First results on respirometry characterisation	12	12
15	Respirometry and other techniques set up, integration of the measurement techniques	18	18
16	Set up microcalorimetry	24	18
17	Protocol for waste design	30	30
18	Selection of the textile treatment bench and pilot scale plant (0.5%)	3	3
19	Start-up of laboratory and pilot plants	6	6
20	Report on first experimental results	12	18
21	Draft report on operational data to design treatment for increasing biodegradability	24	24
22	Evaluation of treatability of mixed finishing textile process waste water	30	Draft
23	Literature review on micropollutants and toxic compounds in textile wastewater	6	18
24	Selection of compounds to be monitored for the different industries and setting up of analytical methods	12	12
25	Data evaluation and reporting	24	Draft
26	Reports on the data base for LCA applied to textile wastewater treatment	12	12
27	Issuing of deliverable: Technical report on LCA application in the selected textile finishing industry	28	Draft
28	Issuing of deliverable: Database on paper/magnetic support for decision support software	34	
29	LCA software specification	12	12
30	Enabling assessment of alternative recycling options for the textile industry from the environmental perspective	24	24
31	Collection of information on the European Economic regulation's experiences for water resources' industrial uses	12	12

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32	Theoretical and practical prototype of a new sustainable tariff structure in textile-industrial water using inclusive of environmental externalities	30	
33	Evaluation of data, information and methodologies set up in the WPs	33	
34	Collection, elaboration and integration of the contribution and remarks gathered in the Workshop	35	

DEVIATIONS FROM THE WORK PLAN OR / AND TIME SCHEDULE AND THEIR IMPACT TO THE PROJECT

WP1

All the activities are concluded. With reference to the WP01.10.2 Workshop on the state of the art involving end users and stakeholders a workshop restricted to the members of the project as requested by the contract was held respecting the timing scheduled. A workshop with the industrial representatives was held in Belgium. The organisation of a similar workshop involving the Italian Textile Association was finally evaluated as not opportune.

WP2 - WP3

The problems evidenced in the last management report, causing some delay in the activities, did not avoid the successful proceeding of the data collection which is complete for WP2 and more than 90% concluded for WP3.

WP4

The delay evidenced in the last management report were partly recovered by putting more resources in third year. More data is needed but VITO can continue until December with the available information and finalise the work as far as possible. In December the extra information needed (especially on treatment technologies) will be provided by ENEA, Centexbel, Lariana and LeAF in Deliverable 15. (see also the minutes of the Project Meeting). Meanwhile VITO will continue its activities on the Pinch analysis with the data available. The inputs necessary to the related activities in other workpackages have anyway been given so this will not affect the rest of the project.

WP5

The schedule will be respected.

WP6

After the delays reported in the last management report, WP6 activities are expected to be completed as scheduled.

WP7

The final objectives and timing of the WP7 will be reached.

WP8

There are some delay related to delays in WP2 and WP3. The final timing will be respected.

WP9

No delay.

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WP10

Activities are proceeding according to the schedule agreed between ENEA and its subcontractor Nomisma. No effects on other activities are expected because the Workpackage is independent.

WP11

No delays expected

CO-ORDINATION OF THE INFORMATION AMONG PARTNERS AND COMMUNICATION ACTIVITIES (E.G. ORGANISED MEETINGS. CONFERENCE ATTENDANCE. CO-OPERATION WITH OTHER PROJECTS/NETWORKS....)

Several collaborations have been set up and are currently running in order to better finalise the activities of the project. The most relevant are the following:

A workshop on waste design (WD) was held in Paris on October 1st 2003 in collaboration between WP5 (Characterisation and design of wastewater) and WP6 (Wastewater treatment). The aim of the workshop was the discussion on how the WD, that is already partly integrated in the overall methodology to be set up within the project TOWEFO, can fully be applied in the textile industry and in similar industrial sectors. In order to collect ideas and integrate different points of view, the cooperation with invited experts was required (Hans Henrik Knudsen, Institute for Product Development, Denmark and partner in the INNOWASH project; Mogens Henze, Technical University of Denmark, Denmark; Wolfgang Rauch, Innsbruck University, Austria). During the workshop clearly emerged the necessity of a big research effort to really assess all the issues connected to the waste design in the textile industry and an idea of research project was laid out. A detailed report of the workshop is the Deliverable 12 of the project.

The activities related to the membrane treatment of the effluents for reclamation, the anaerobic pre-treatment, the assessment of the reusability in textile processes and the toxicity evaluation of the concentrates produced have been discussed during the Group Meeting held on September the 30th whose minutes are included in the Minutes of the Project Meeting.

For the finalisation of the WP6 deliverables ENEA, LeAF, Centexbel and Lariana have planned an extra Group Meeting in Brussels at Centexbel offices on 19th of December 2003 (see also the minutes of the Project Meeting).

For the LCA finalisation (implementation of reuse scenarios), a meeting will be held in Bologna, at the ENEA centre, on the 16th of January 2004. ENEA, Ecobilan and VITO representatives will be present.

The Final Workshop organisation has started. It will be open to the public, especially the end users of the results (i.e. industrial representatives). A workshop on the regulatory policy will be held jointly. The Final Workshop will take place on the 27th of February 2004 in Ispra, if possible, otherwise in Bologna with the following draft programme:

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TOWEFO Final Wo - Draft Programme

- ? Background on the European textile industry, IPPC + BAT, GEP application (Referenced to deliverable 1 and 3) – 30 minutes – IPTS M. Aguado
- ? The demands and the expectations of the industrial sector – 30 minutes –Italian Textile Association
- ? Feasibility of reuse of water in Industry: Focus on the possibility of reuse of water within the industry – tools (monitoring, treatment technologies, ecotox characterisation) and results, (D10–D19) –. 60 minutes – ENEA D. Mattioli, LeAF H. Spanjers, IES Robert L. VITO H. Witters
- ? Process & Environmental data collection in the Textile industry – PIDACS, Process description, goals related to the data collection (water pinch, water reuse, LCA), (D4 -D7) – 20 minutes – Lariana G. Bergna and Centexbel I. De Vreese.
- ? Evaluation of the reusability: How to assess the reusability of water – practical tools, methods. (D15). – 30 minutes – Lariana G. Bergna and Centexbel I. De Vreese.

LUNCH BREAK

- ? Optimisation using Pinch Analysis, definition of scenarios & decision when they are direct. (D8, D9, D14) – 45 minutes VITO W. Schiettecatte
- ? Decision making (comparison of scenarios when they are balanced) using LCA (D20 & D23). – 45 minutes – ENEA M. Tarantini & Ecobilan P. Osset.
- ? Proposal of Improvements of Regulations Using the results of economic analysis, – 30 minutes ENEA B. Antonioli.
- ? What is design in the Textile Industry: different levels, optimal data (D12 D14 D15). Elements of the workshop held on the 1st of October. benefits for industry. – 30 minutes ENEA D. Mattioli & H. Spanjers
- ? Conclusion – Implementation of results, final outputs of the current project. Results available and useful for companies. Dissemination of results. – 20 minutes D. Mattioli

People to be invited: Textile association and members (through the Italian Textile Association and Euratex, European Commission. Partners in European projects on similar issues, PATANTEX members, Leather and Paper European Associations, UNEP also (LCA initiative) Guido Sonnemann. Eco-Label on textiles coordinator. EPE (European Partners on Environment – coordinator of the project on textile).

Ways of dissemination: Invitation by leaflet, publication on project website, publication on the PATANTEX website, E.C. publications. Sector Journals.

DIFFICULTIES ENCOUNTERED AT MANAGEMENT AND CO-ORDINATION LEVEL AND PROPOSED / APPLIED SOLUTIONS.

No difficulties to be reported after the solution of the web site problems.