LCA-IWM Report Summary

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Prognostic Model for Waste Generation (software tool) for Waste Management Planning

1. Results description

The Waste Prognostic Tool - a practical software tool for waste management planners with highly improved accuracy - is the core output of the results No. 23501 - Data on waste generation trends-, which represents the extensive and essential database which has been exclusively used for the development of the prognostic model for waste generation (Result No. 23502). The tool (respectively the underlying model) enables the estimation of future municipal solid waste generation (MSW) and composition by main fractions for cities on a high level of planning accuracy over a period of 10 or more years. Compared to existing models, the accuracy is outstanding high for estimations of total MSW generation (The median error for forecasts over 5 to 22 years lies at 0.6% per year), whereas estimations for MSW composition can be made only on much lower level of accuracy due to limited data availability. Only a small set of social and economic indicators is necessary for forecasts. Thus a good trade-off between accuracy and user-friendliness could be achieved. Quantitative effects of measures for waste prevention and increased separate collection are considered. Using this model, it is possible to plan waste management systems with appropriate capacity thus functioning efficiently in both economic and environmental terms.

2. Dissemination

Dissemination focuses on providing sustainable decision support for all parties involved in local/regional waste management planning: Local and regional authorities, institutes and consultancies as well as officials and decision makers. Within the project period, these groups were reached with different types of publications (see documentation): Scientific articles (8 finished, 2 in progress), oral presentations at conferences (6), popular scientific articles (2) and poster presentations (2). Together with these publications, the software tool including manual in the handbook (available in six languages) are made available at the website of this project (http://www.lca-iwm.net) in order to enable broad use of this tool.

3. Use potential

The Waste Prognostic Tool can be applied for the development of long-term waste management plans in European cities or regions with urban structure. It is especially interesting for regions with rapidly growing economies (consecutively also waste amounts) such as in Southern or Central-Eastern Countries. Decision support is needed as knowledge on how estimating future waste amounts is completely missing in the most cases. Waste forecasts are as a rule carried out without consideration of socio-economic changes.

4. Key innovative features

Key innovative features cover firstly the high predictive quality of the model concerning total MSW estimations, secondly
appropriate trade-off between usability/user-friendliness (small number of available indicators) and planning accuracy, thirdly the integrated implementation of municipal measures (waste prevention and separate collection) in waste prognosis methodology and fourthly the new way of integration of qualified waste forecasts in life cycle assessment-based modelling of waste management systems.

5. Current status

The development of the tool and its verification and improvement of practicability, the development and publication of the model description and manual and deliverables were completed. More than 10 publications were finished and were published or are, at this moment, in press. More publications as well as one related PhD-thesis are in preparation.

6. Use of the results

Results will primarily used in the form of the provided software tool by the targeted end-users that will use the decision support tool themselves or that will use them to consult municipalities or local/regional authorities. Additionally the results are planned to be used scientifically: Firstly it is planned to implement the method in Asian and Latin-American countries, secondly the tool will be applied by scientific partners in the field of waste management planning and thirdly the statistical model is planned to be further improved and refined in the framework of a PhD-thesis.

7. Expected benefits

Accurate forecast of waste generation is an indispensable step in waste management planning. The quantifiable benefit of a forecast with higher accuracy can only be measured ex-post, i.e. after the prognosis period that is unfortunately not possible. A growth forecast that is out by only 1% can lead to a deviation of more than 10% of the total waste generated over a planning period of 10 years. Under- or over-estimation thus has significant consequences in terms of additional investment and operating costs. Using the Waste Prognostic Tool in connection with well-funded forecasts of the used social and economic indicators is highly probable to lead to a more appropriate capacity planning. Aside from the factor costs, also other impacts deriving from facilities, e.g. environmental impacts are affected.

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