



Study on the calculation of recycling efficiencies and implementation of export article (Art. 15) of the Batteries Directive 2006/66/EC

Best Available Techniques and Minimum Treatment Requirements

Workshop Brussels, 20 January 2009

Consortium **ESWI**
Expert Team to **S**upport **W**aste **I**mplementation



Information sources BAT (1): BREFs

- BREF 1: Reference Document on Best Available Techniques in the **Non Ferrous Metals** Industries, December 2001 [EIPPCB 2001] (new draft November 2008)
- BREF 2: Reference Document on Best Available Techniques on **Emissions from Storage**, July 2006 [EIPPCB 2006a]
- BREF 3: Reference Document on Best Available Techniques for the **Waste Treatment** Industries, August 2006 [EIPPCB 2006b]

No dedicated BREF for battery recycling



Information sources BAT (2): Technical documents

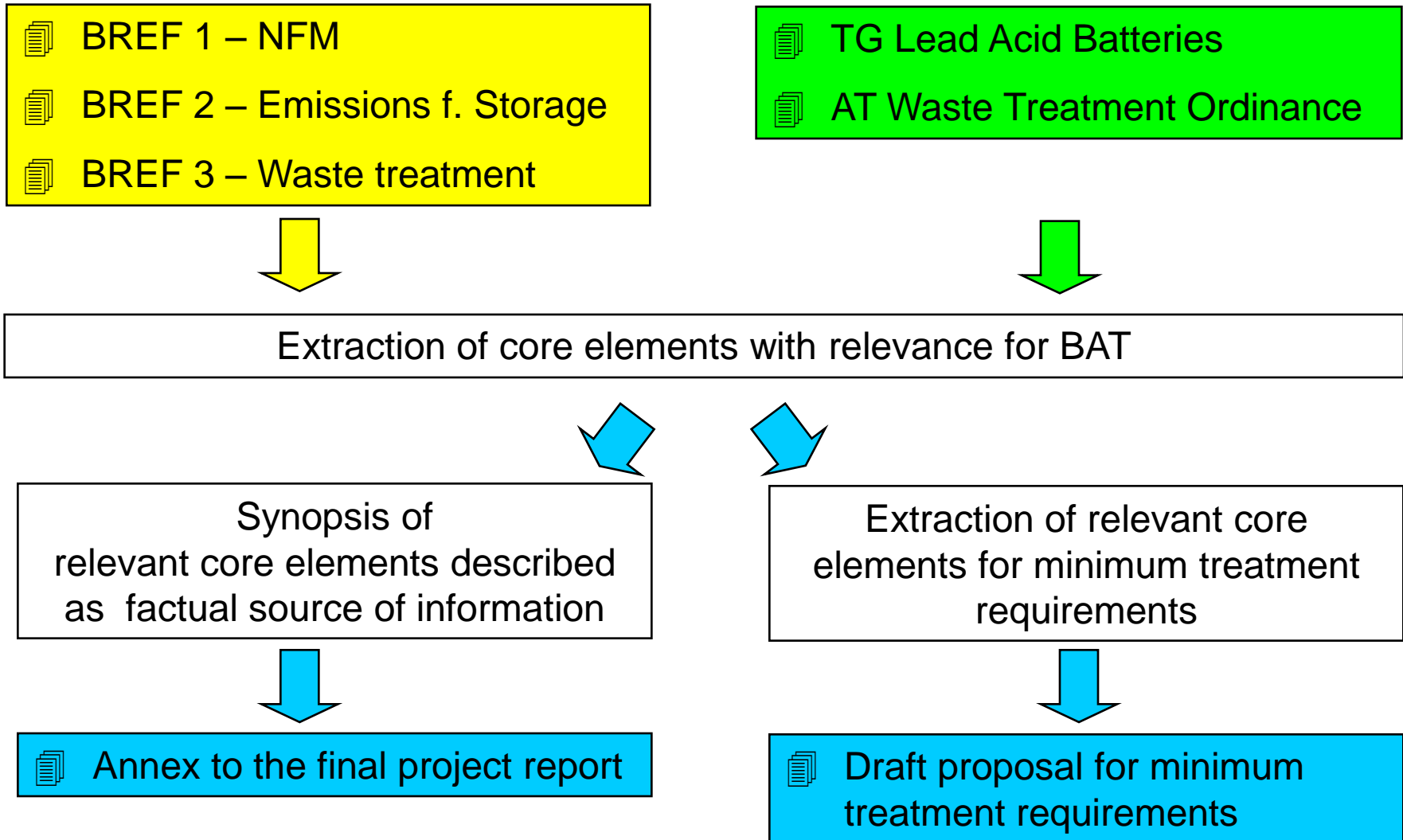
Search for further **relevant documents** containing specific requirements or techniques*

Two relevant documents have been identified:

- Technical Guideline on the Environmentally Sound management of Waste Lead Acid Batteries [SBC 2003]
- Austrian ordinance Management on Waste Treatment Obligations [MinEnv AT 2004]

* Literature and internet search and check of national execution measures communicated by the Member States concerning the Batteries Directive. (status according to Eurlex from 13.11.2008)

Use of information on BAT for the project report





Information on actually applied processes in the Community

- BAT for dedicated processes is not defined.
 - Limited number of **dedicated processes** in the battery recycling industry in the EU (valid permit; compliance with EU waste legislation; compliance with EU health and safety legislation). Flow charts and short textual description of the treatment and recycling process steps the output fractions and their fate will be part of the project report.
- Valuable expert information source on actually applied technologies in dedicated processes for battery recycling in addition to defined BAT



 Further Annex to the final project report



Draft proposal for minimum treatment requirements (1)

According to article 12.2 of the Batteries Directive treatment shall meet specific treatment minimum requirements (Annex III Part A)

- Treatment shall include removal of all fluids and acids
- Treatment and storage at treatment facilities shall take place in sites with
 - impermeable surfaces and
 - suitable weatherproof covering or in
 - suitable containers

No details in the Directive

→ Objective: proposal to describe minimum treatment requirements in detail



Draft proposal for minimum treatment requirements (2)

“Removal of all fluids and acids, their collection and treatment”:

- ◆ Batteries should be drained and prepared for recycling by adequately trained and personally protected workers
- ◆ In operational areas a ground cover has to be utilised that may retain any leakage and direct it to a collecting container from where it can be removed.
- ◆ Surfaces of operational areas, drainage systems and other subsurface structures should be maintained, including applying measures to prevent or quickly clear away leaks and spillages.
- ◆ Electrolyte should be directed to appropriate treatment (recycling/recovery or appropriate waste treatment)
- ◆ Recycling/recovery of electrolyte should be done if appropriate; direct discharge of neutralised and/or untreated electrolyte should be avoided.
- ◆ When applying a neutralisation process customary measurement methods have to be used
- ◆ Neutralised waste water [of a neutralisation] process has to be stored separately
- ◆ A final inspection of the neutralised waste water [of a neutralisation process] after a sufficient storage time has elapsed has to be performed

- ◆ = „only relevant for battery waste possible containing liquids“
(note: possible impurities and contamination with other battery types to be considered)



Draft proposal for minimum treatment requirements (3)

“Impermeable surfaces and suitable weatherproof covering” (1)

- Storage of waste batteries at treatment and recycling facilities must take place in a proper building or covered place with the following minimum requirements:
 - ◆ - Impermeable and acid and/or lye resistant floor depending on the electrolyte used
 - ◆ - Efficient water collection system which directs spilled liquids towards the effluent or electrolyte treatment plant
- Storage in a proper building or under cover must also be applied to any container that is pending sampling and emptying.
- Storage may be carried out without cover if the stored waste batteries and containers are not affected by ambient conditions (e.g. sunlight, temperature, water)
- Covered areas need to have adequate provision for ventilation.
- The availability and access to storage areas for containers holding substances that are known to be sensitive to heat, light and water, under cover and protected from heat and direct sunlight has to be maintained.

◆ = only relevant for battery waste possibly containing liquids



Draft proposal for minimum treatment requirements (3)

“Impermeable surfaces and suitable weatherproof covering” (2)

- ◆ For storing quantities of more than 2500 litres or kilograms dangerous substances a storage building and/or an outdoor storage area covered with a roof has to be applied according to the BREF on Emissions from Storage
- ◆ For storing quantities of less than 2500 litres or kilograms dangerous substances, at least a storage cell has to be applied according to the BREF on Emissions from Storage

◆ = only relevant for battery waste possibly containing liquids



Draft proposal for minimum treatment requirements (4)

“suitable containers” (1)

- ◆ During collection waste batteries must be stored inside acid and/or lye resistant containers – depending on the electrolyte used - that may simply be sealed and that may ideally be used as the transport container as well minimizing the risk of an accidental spillage.
- ◆ Waste batteries must be transported inside shock resistant, sealed and acid and/or lye resistant containers depending on the electrolyte used.
- ◆ Storage must take place in leakproof containers that are acid and/or lye resistant depending on the electrolyte used.
- The use of re-usable packaging (drums, containers, IBCs, palletes, etc.) is to be maximised.
- Containers in a good working state have to be re-used. In other cases, they are to be sent for appropriate treatment.

◆ = only relevant for battery waste possibly containing liquids



Draft proposal for minimum treatment requirements (5)

Additional proposals

- Treatment and recycling of waste batteries should only be carried out in installations with a corresponding permit according to the IPPC directive
- Containers used for transport must comply with international obligations for transport (ADR regulations)
- The capacity to retain leakage must at least be equal to the amount stored
- Surfaces in operational areas should be resistant to chemicals and fire
- Clear labelling of containers with the nature of the waste and the relevant danger symbols
- Collection and transport of automotive waste batteries should only be carried out by certified waste management companies