### Theme:
Zeogyp-Board – Retrofitting existing plants for low cost production of high performances building boards

### Ausgangssituation/Problemstellung
The project aims at novel solutions to the problem of over one hundred gypsum-board production plants whose extension or retrofitting in view of improving capacity and/or production is either uneconomical or impossible due to lack of required space. Such lines are often no longer in operation or are at the end of their life-cycle and are targeted by the project results for conversion in order to produce low-cost gypsum-fibre boards that will include zeolites.

### Forschungsziel/Forschungsergebnis
A new process will be developed and implemented for cost effective production of a new generation of high performance gypsum-fibre boards (ZEOGYP-BOARD) making more skilled use of conventional gypsum board production lines with low capital investment. Old gypsum boards will be used together with cellulose-fibres, fibrous clay residue (FCR) from wastepaper and zeolites to achieve undistorted setting-behaviour of gypsum and to improve the strength and porosity of the board core resulting to higher surface hardness and lower application time and cost.

Up-to-date results have indicated that the production of new fibreboard(s) combining gypsum, fibres und zeolites is achievable. There are potentially two different types of products that can be developed within the project. The first type of products will include gypsum, FCR and probably zeolites. Both types of new product(s) are still under development and need optimisation. In addition, a new wet process has been proposed and is being developed for the production of fibreboards with zeolites. The principle of the wet process developed by Grenzebach-BSH, is operational but needs optimisation and proof of its financial viability.

The quality features of an old newspaper grade typical of Southern Europe were determined by PTS in terms of its physical properties after dry and wet defibration. The properties of the paperboard part of old gypsum boards were identified. The PTS work focused on the pulping behavior and fibre properties for all recovered papers in the test. Old wet-pulped newspapers were studied for refining-induced changes in its fibre morphology and strength properties. The use of alternative fibres, e.g. kraft pulp, corrugated board, synthetic fibres and wood flour were investigated together with KNAUF.WGW. The extensive results were the basis for the trials directed at the productio n of Fibre Reinforced Gypsum Board. Beyond literature surveys regarding the practical use of Zeolites as ion exchangers, further laboratory trials were carried out. In the Report of PTS (Studies into the use of modified minerals for the removal of anionic trash) it was shown that zeolites are suitable for the elimination of multi-valent cations and for the removal of detrimental substances present in the waste paper based pulp. The zeolites (or similar minerals) have to be modified cationically.

### Anwendung/Wirtschaftliche Bedeutung
Similar products have limited market share due to high production costs despite improved properties. The retrofitting approach prolongs the life cycle of existing plants and maintains sustainable growth of the sector. It solves problems related with landfilling leading to zero waste production and reduces raw gypsum requirements. It responds to consumers’ needs.

### Bearbeitungszeitraum:
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### Bemerkungen
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