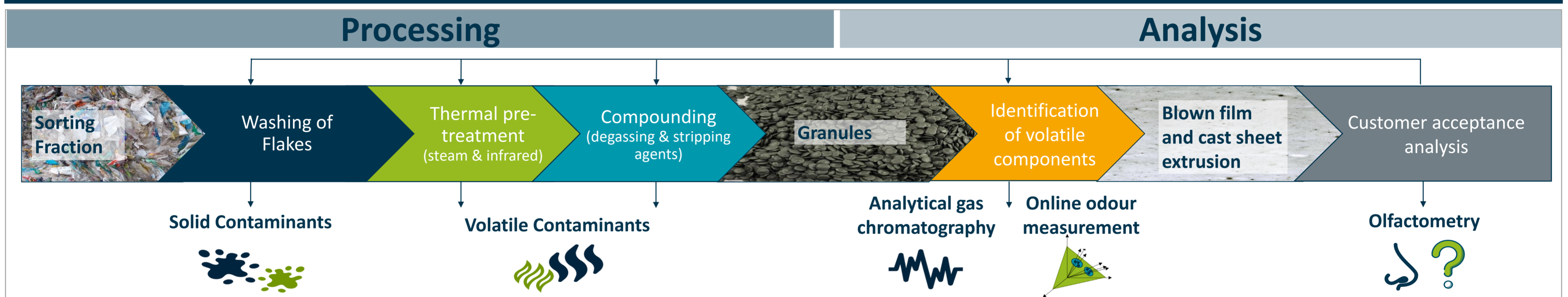


# Odour reduction as a key technology for the use of recycled post-consumer polyethylene

## Comprehensive approach to reducing odour along the value chain of recycled materials



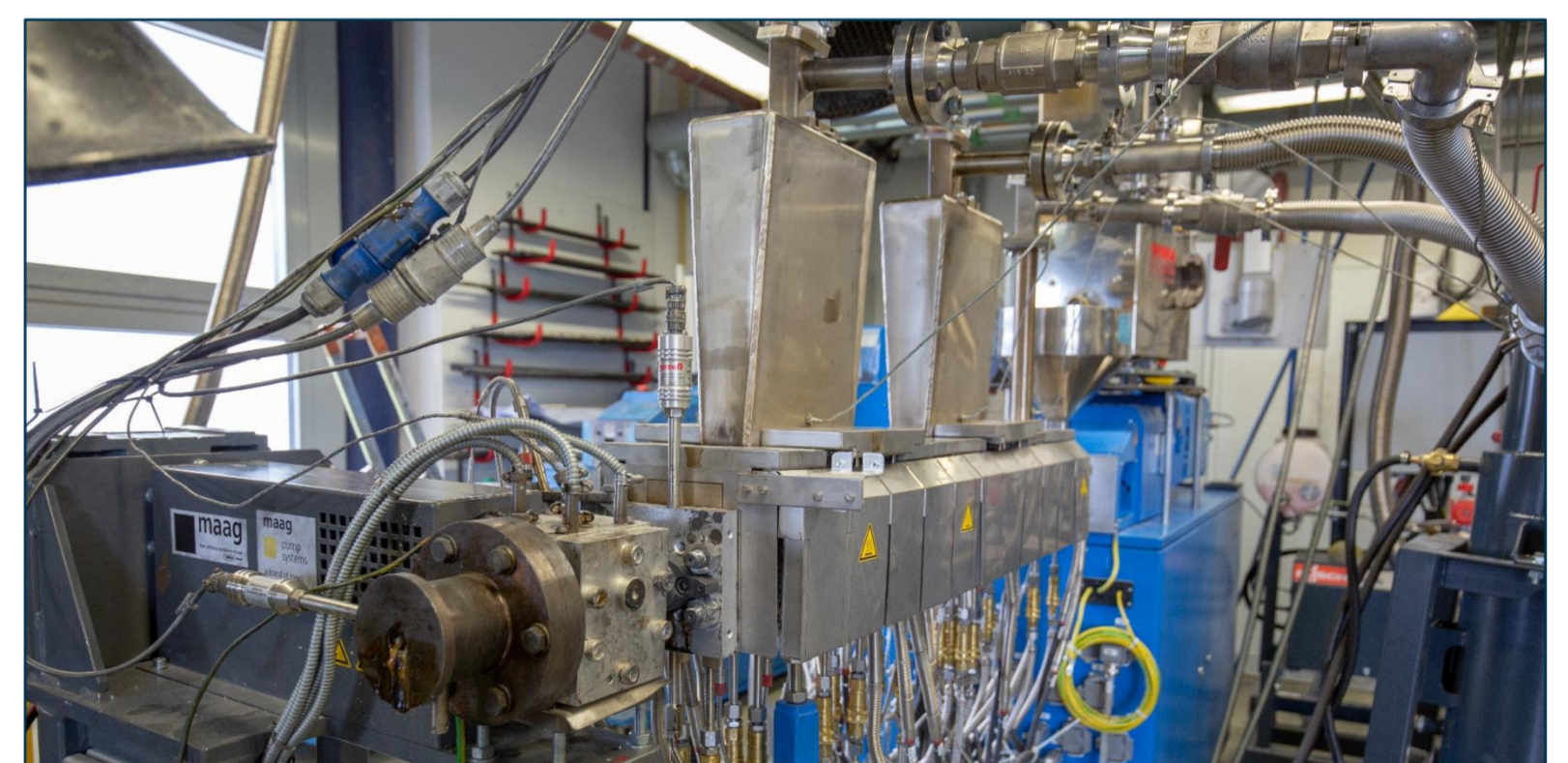
- The project considers the entire processing chain of the washed film flakes to new packaging films.
- To reduce volatiles thermal pre-treatment is carried out on the film flakes using an infrared dryer and steam treatment at an elevated temperature.
- In compounding, different degassing strategies are investigated by varying the process and degassing parameters and the use of stripping agents.
- The process parameters in blown and flat film production are also optimised to minimise odours.
- A customer acceptance analysis is carried out to assess the potential for increasing the use of recycle in packaging production after odour reduction.

## Project outline



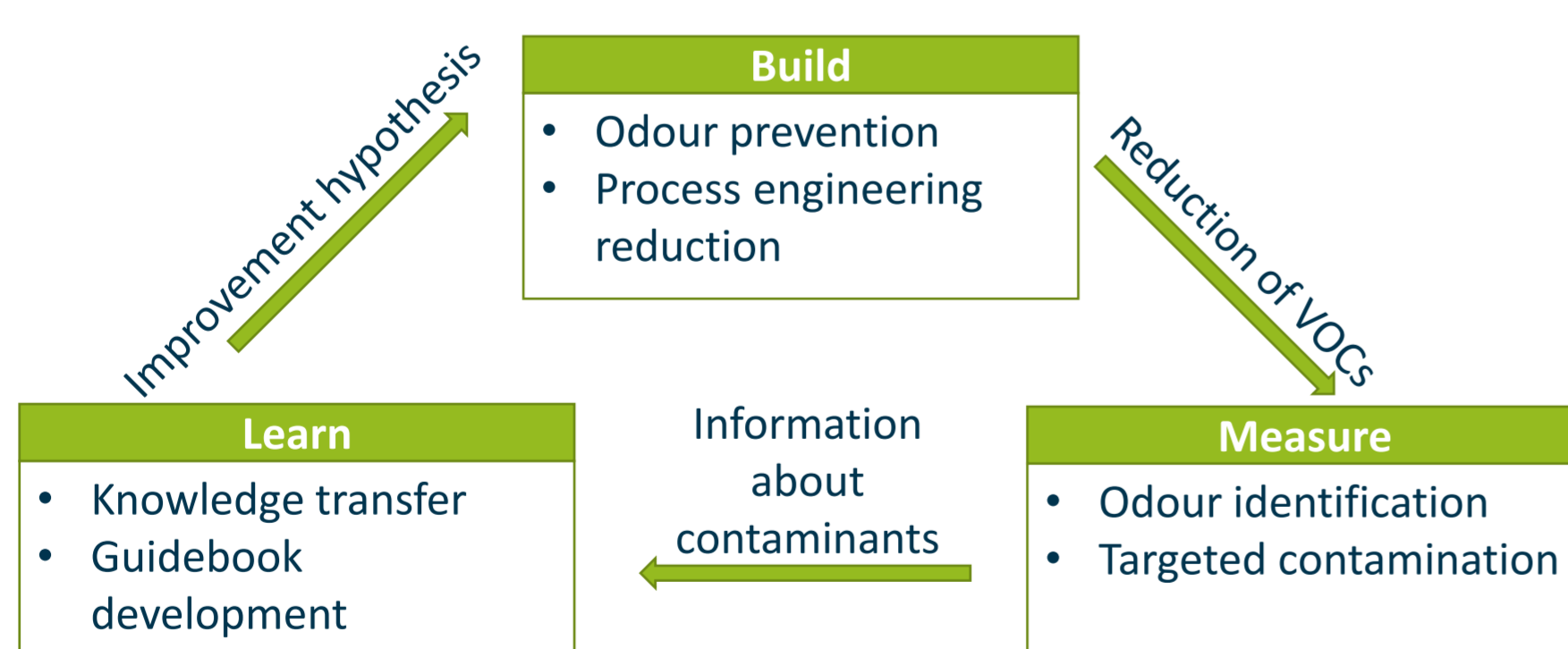
1. Decontamination by thermal pre-treatment and different degassing strategies in compounding
2. Production of odour free products such as granules and films
3. Optimisation of the printing inks regarding odour improvement

## Compounding



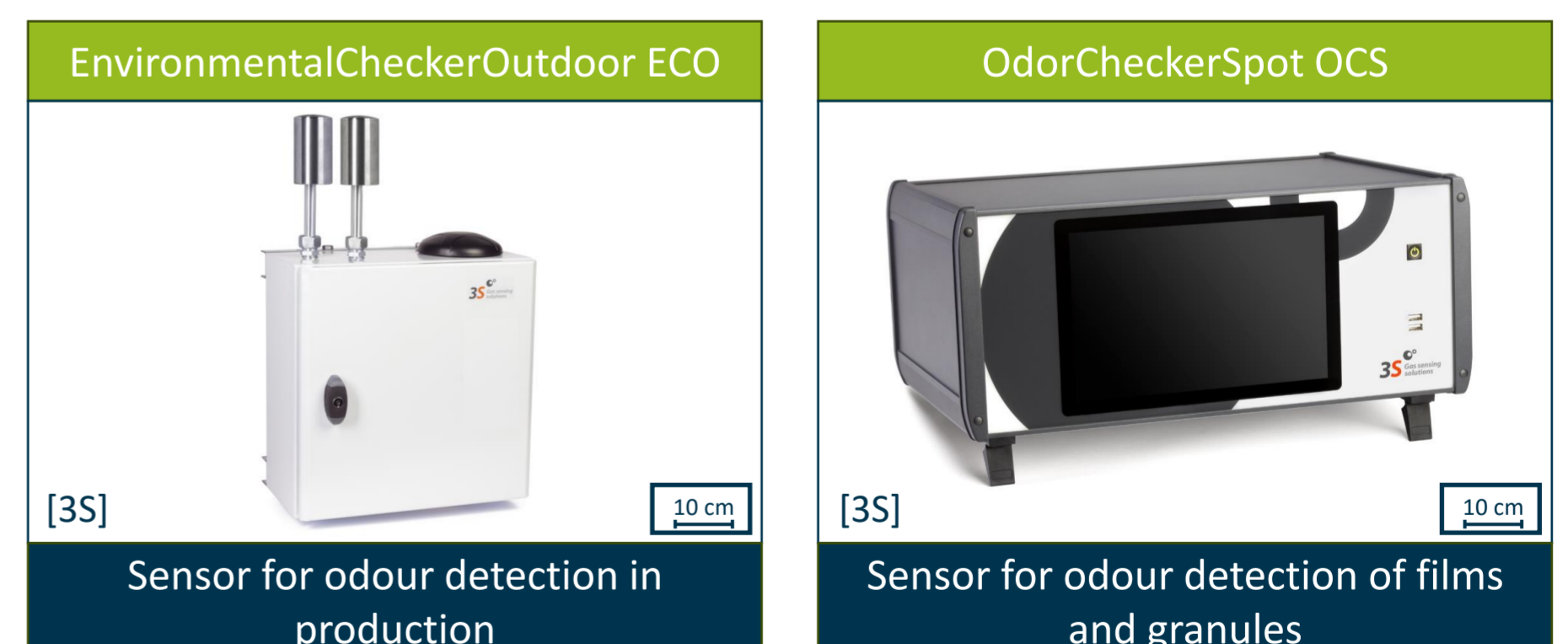
- The odour reduction is investigated through different degassing strategies, screw designs, compounding parameters, stripping agents, and additives
- Optimised conditions will be up-scaled to investigate the odour pollution and reduction under real conditions

## Iterative BML approach



- The process follows an iterative build-measure-learn cycle repeatedly two times to reduce the odour
- Tests in the *build* section are evaluated in the *measure* section. The *learn* section validates the improvement hypothesis using acquired knowledge.

## Analysis of the odour and odour-causing substances



- The odour is analysed using mobile gas sensors
- A GC-MS analysis is used to identify the odour-causing substances so that they can be avoided in primary packaging production.
- The information about odour causing substances are stored in a database.