Cellulose carbamate from a new process

Possibilities and challanges in industrial scale

Hans Grundberg

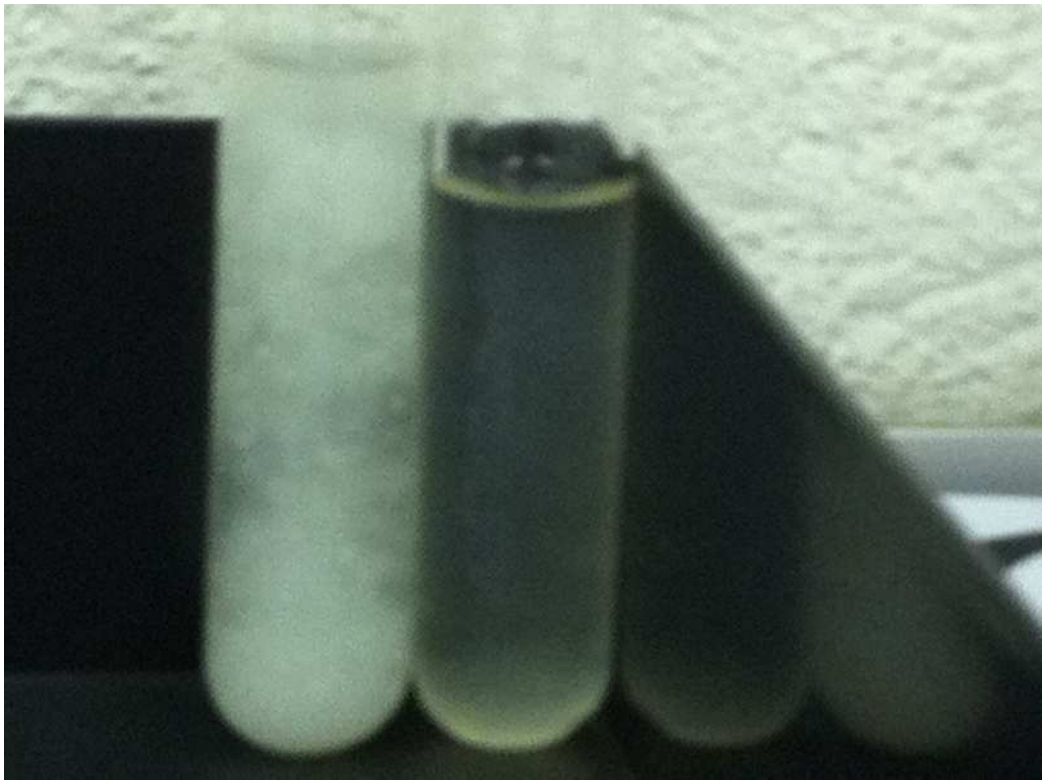
Domsjö Fabriker

Aim of the project

- Evaluate the possibilities to produce a regenerated cellulose fibre without the use of hazardous carbon disulfide with a simplified cellulose carbamate process.

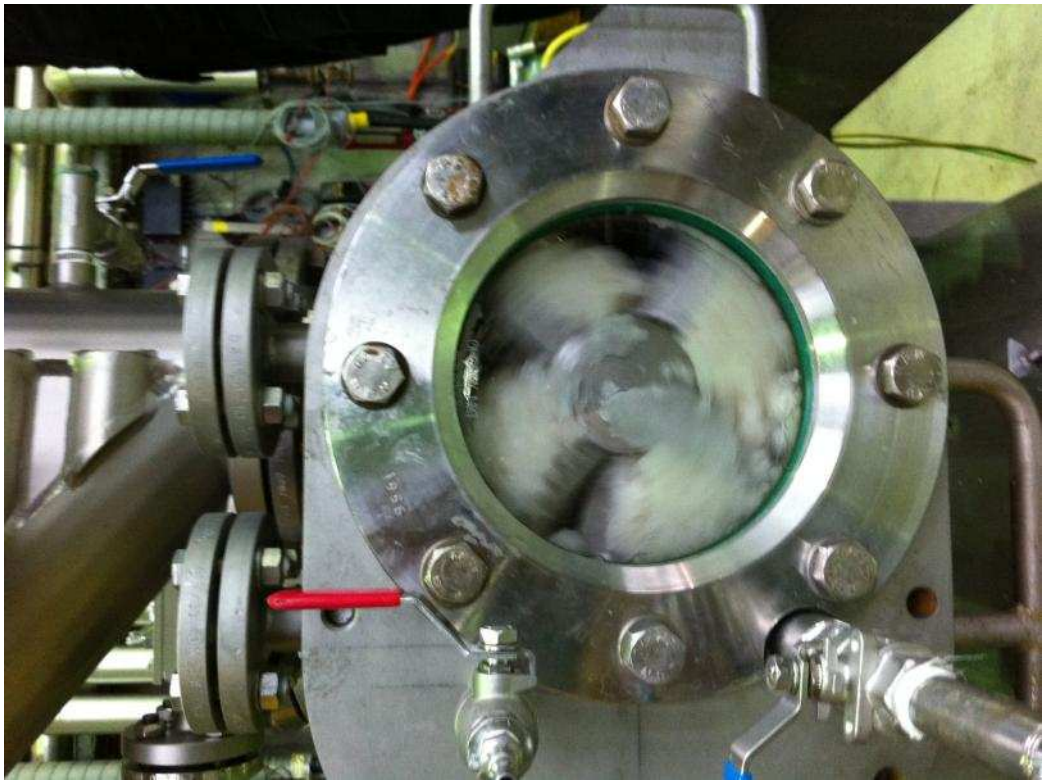
Summary of results from pilot trials

- Cellulose derivative soluble in alkali



Summary of results from pilot trials

- Cellulose derivative soluble in alkali
- No activation of the cellulose was needed



Summary of results from pilot trials

- Cellulose derivative soluble in alkali
- No activation of the cellulose was needed
- Higher degree of substitution although lower charge of urea

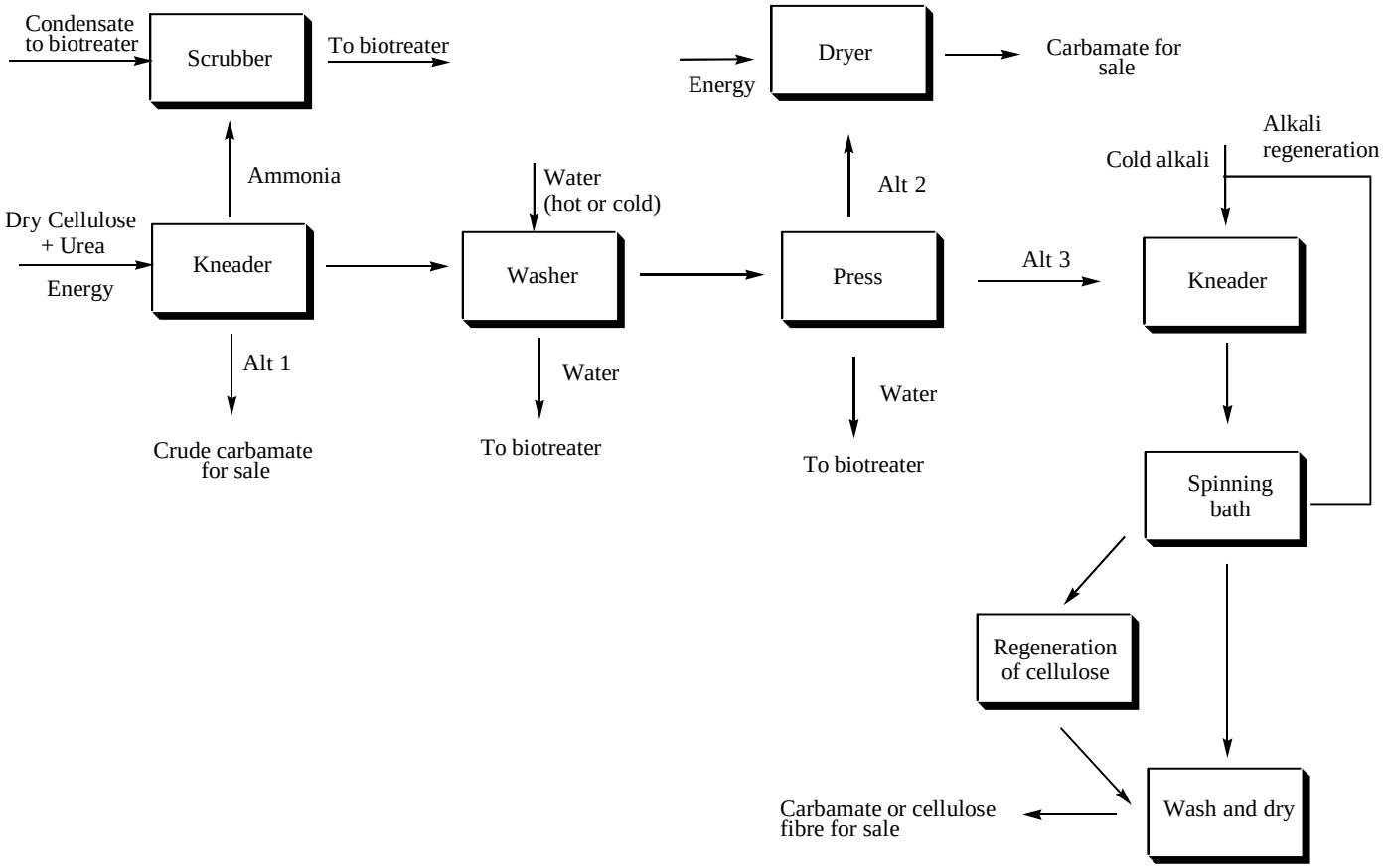
Summary of results from pilot trials

- Cellulose derivative soluble in alkali
- No activation of the cellulose was needed
- Higher degree of substitution although lower charge of urea
- Differences between wet and dry cellulose
  - High energy consumption in reaching reaction temperature
  - However, might be better product

Summary of results from pilot trials

- Cellulose derivative soluble in alkali
- No activation of the cellulose was needed
- Higher degree of substitution although lower charge of urea
- Differences between wet and dry cellulose
  - High energy consumption in reaching reaction temperature
  - However, might be better product
- Film making possible

Potential block scheme for an industrial process



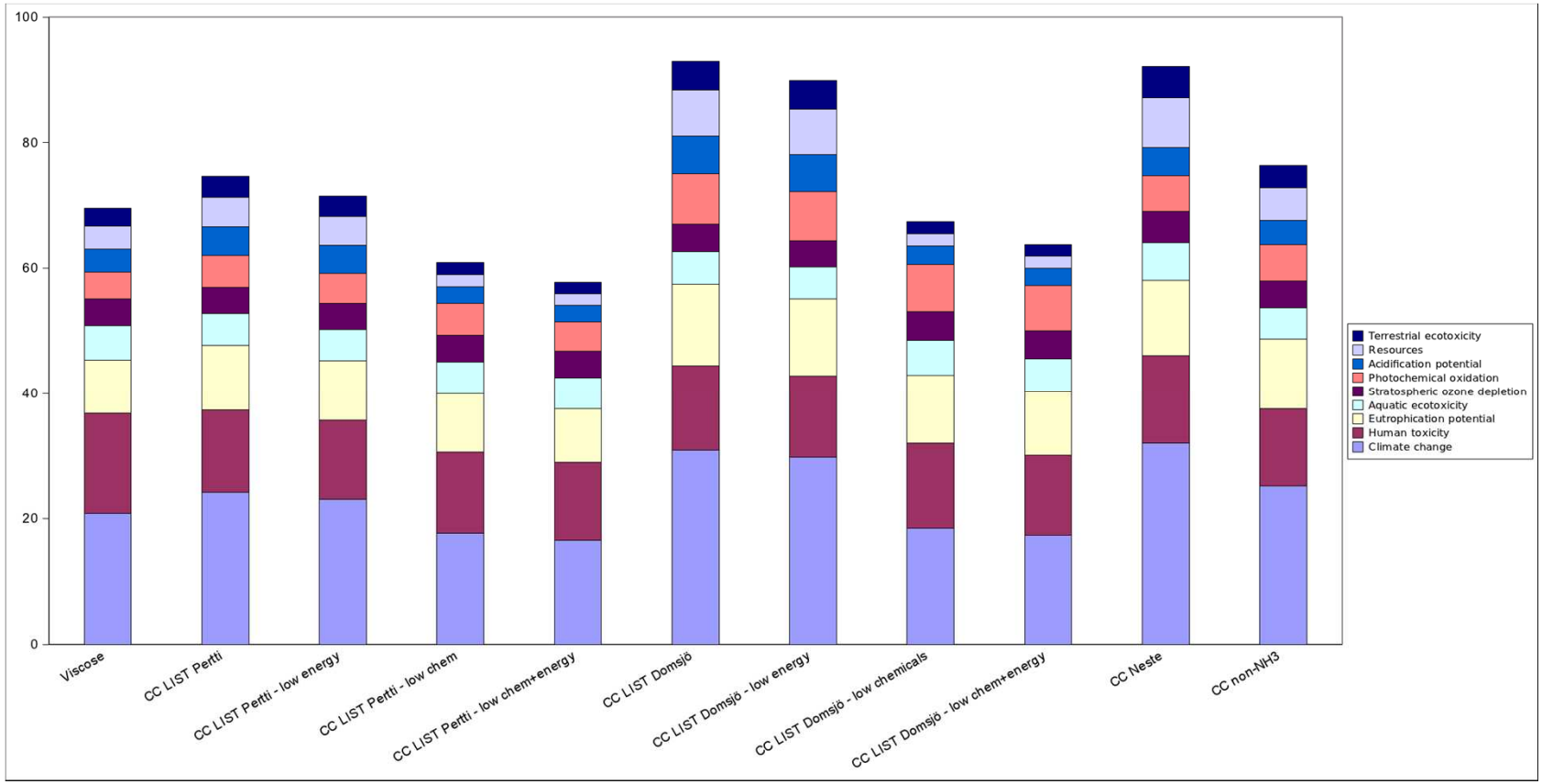
2011-11-06

ADITYA BIRLA
Domsjö

Cost evaluation

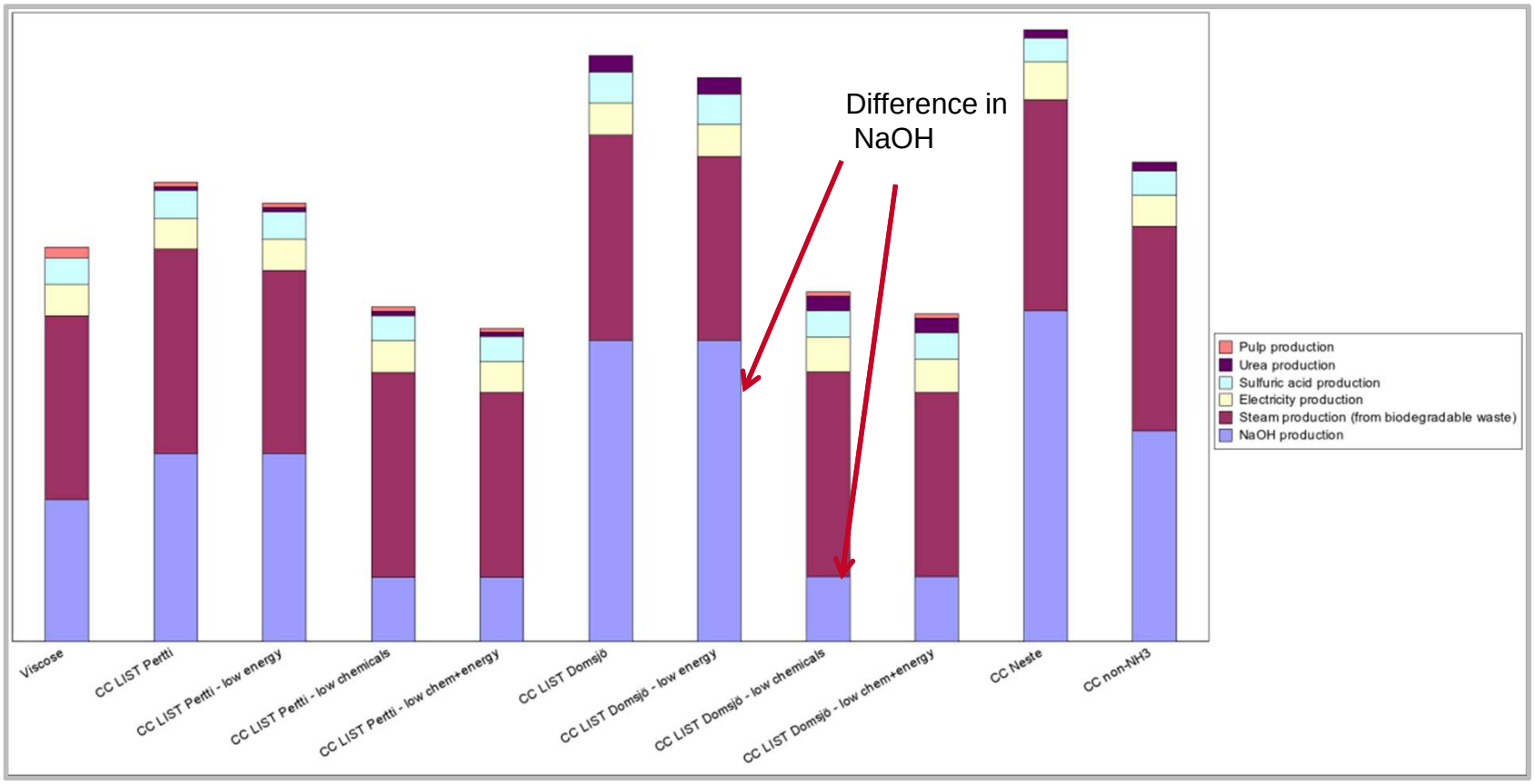
- Energy costs highly dependent on steam consumption for drying, governing where production should be
- Reduction of NaOH consumption necessary
- More trials needed to determine specific energy consumption

LCA



Single score results for the process alternatives and scenarios

LCA



Breakdown into contributing processes of the climate change impact category

Conclusions

- The carbamate process is a potential process for replacement of the viscose process, where infra structure at existing viscose mills could be utilized
- Simple production method with possibility to use only renewables
- Integration to fiber production beneficial
- Further research needed in order to solve alkali consumption in regeneration