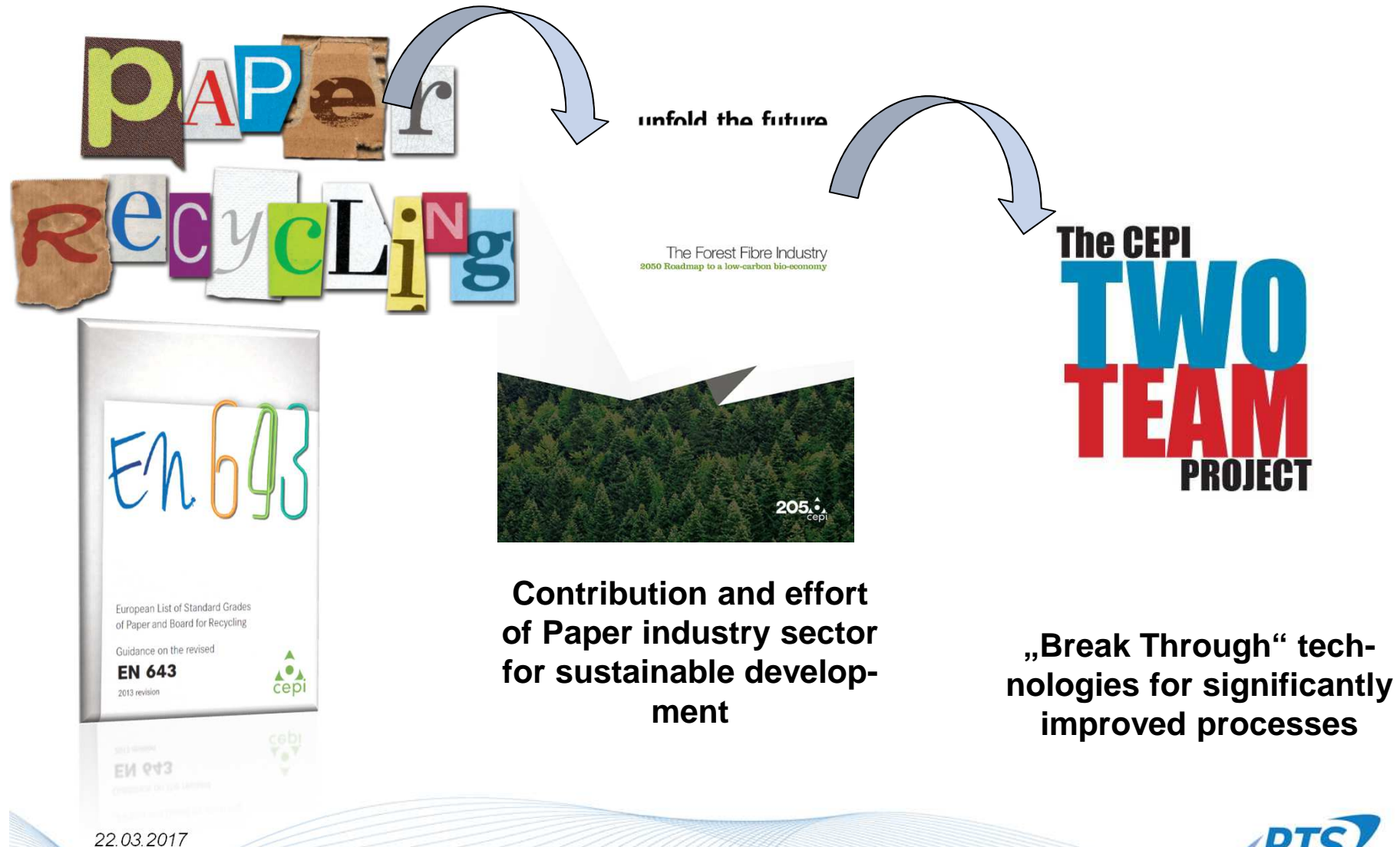


Finance for Innovation Workshop Brussels, March 23, 2017

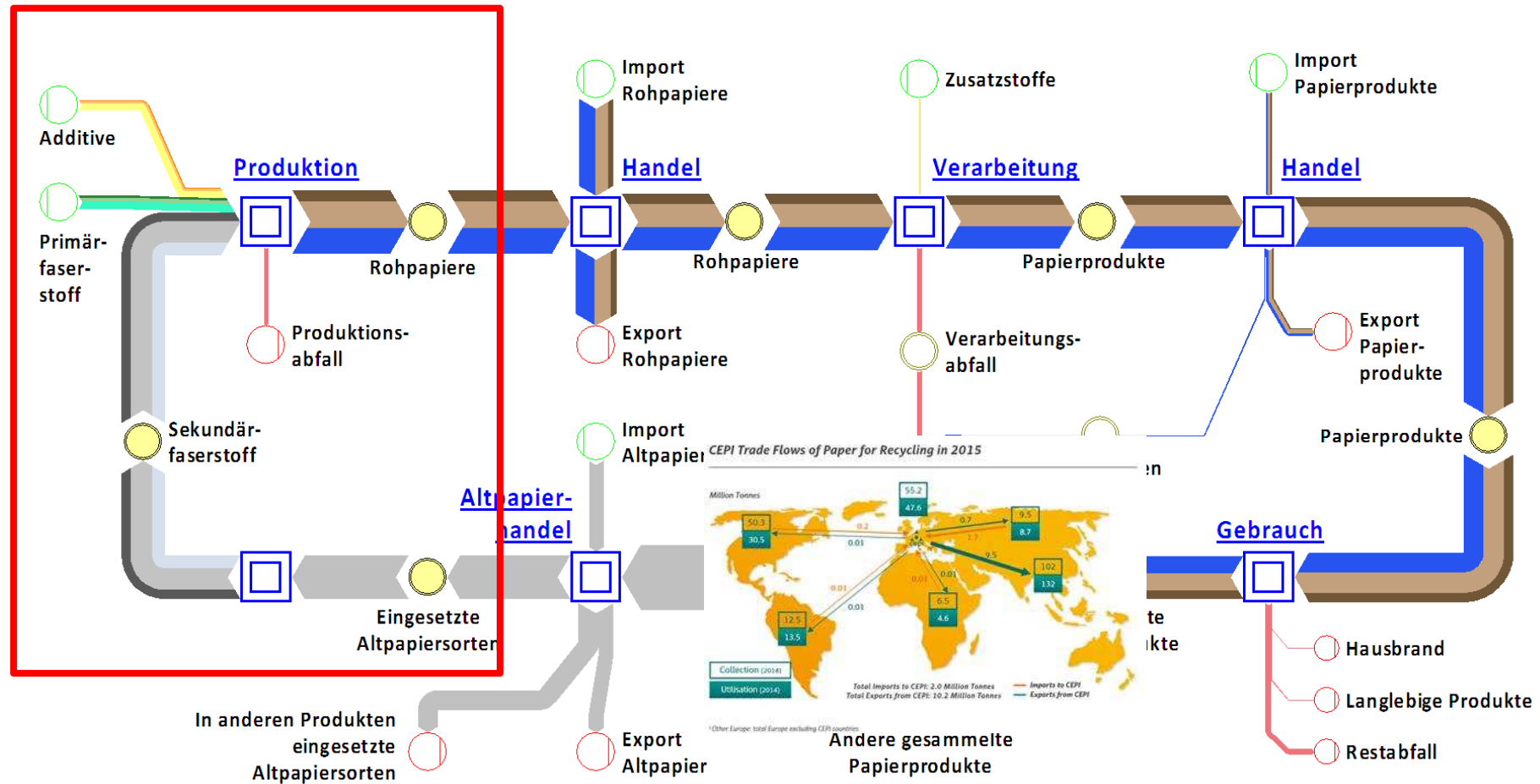
Circular Economy by new Recycling of paper

Frank Miletzky, PTS, Germany

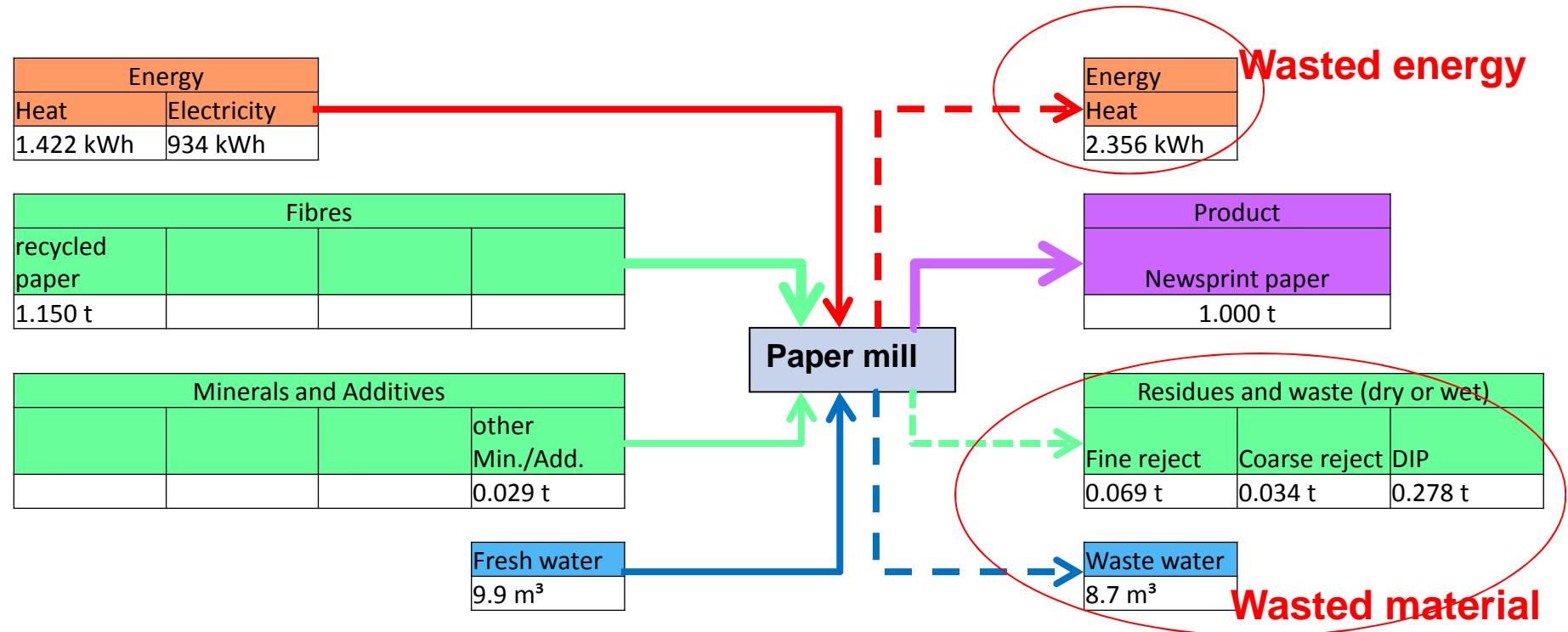
The strategic approach of the paper sector in Europe



The fragmented paper loop



Mass & Energy Input/Output of a Newsprint paper mill

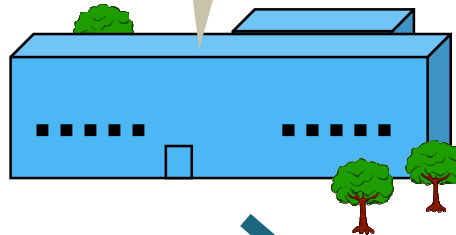


- Wasting about 20 % of the input material plus wasting energy gives serious concern in terms of sustainability
- Revenue from commodity product Newsprint paper has to pay all cost for losses and treatment of residues
- Appr. 40 % of total investment dedicated to handle complexity

Urban refinery – one key element of Circular Bioeconomy

- ⚙ New refining, cleaning & fractionation technologies
- ⚙ Utilization of all components (NO WASTE)
- ⚙ Elimination of contaminants
- ⚙ Cross-system data management & control (I4.0)

Standard PfR and ...
Paper composites
Urban collection close
to mill
(Urban Symbiosis)
Local commercial
wastes
(Industrial Symbiosis)



RCF pulp types:

- Use-oriented
(e.g. \pm ash \pm lignin \pm kraft)
- Well-defined,
guaranteed quality
- Certified for conformity

NO! By-products but dedicated
Recycling and Biorefinery of all
components including energy

Urban Refinery – Benefits for paper sector

- ✓ More added-value from Paper for Recycling
- ✓ Integrated process – instead of fragmented machining
- ✓ Paper mills: Focus on core business, less capital bound, less energy invest
- ✓ Energetic and economic optimum through
 - Best-suited technologies in a reasonable scale
 - Cross-process control
 - Added value from all products and energy integration
 - Best use of fibres available & new fibre sources
- ✓ Boosting a Europe-wide circular economy

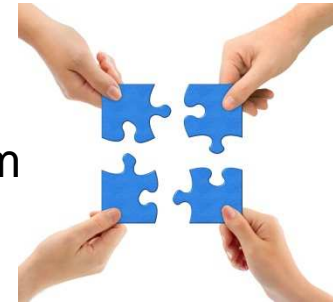


Urban Refinery

Major steps forward

- ✓ **Business Model**

Main driver, participants, possible joint benefits from the system
I4.0 aspects; Licencability & regulatory aspects (systems engineering, waste regulations a.o.)



- ✓ **Technology plan**

Assembling economic feasible technological steps from mature and innovative solutions; Pilot Plant construction & operation

- ✓ **Certification system**

develop & establish a certification approach for well defined quality and conformity

Urban Refinery

Major steps forward

- ✓ Business Model
1 year / 1 m€ major part from public funding
- ✓ Technology plan
3...4 years / 2 m€ + 15 m€ for Pilot plant, PPP
- ✓ Certification system
1 year / 1 m€, PPP



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Thank you for your attention!

22.03.2017