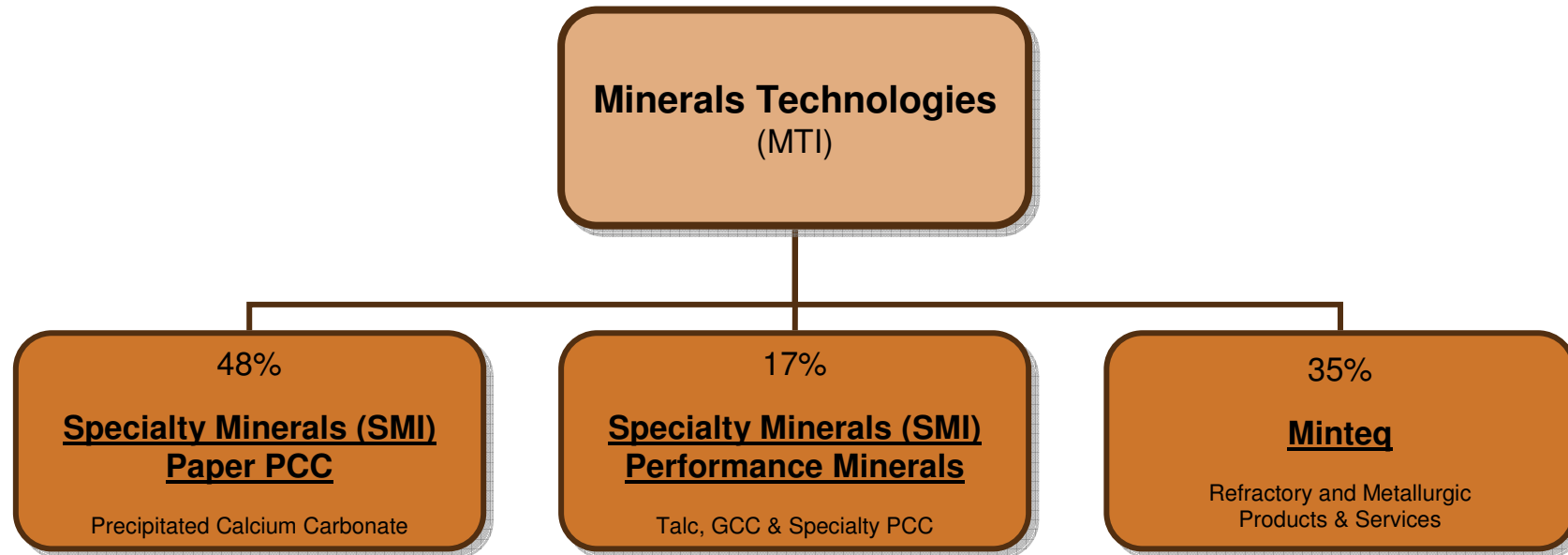


Reducing CO₂ emissions

24 October 2012

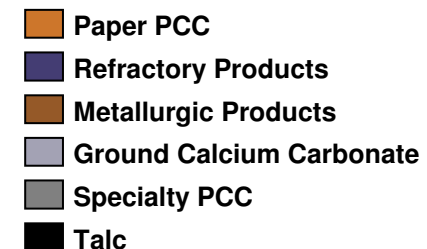
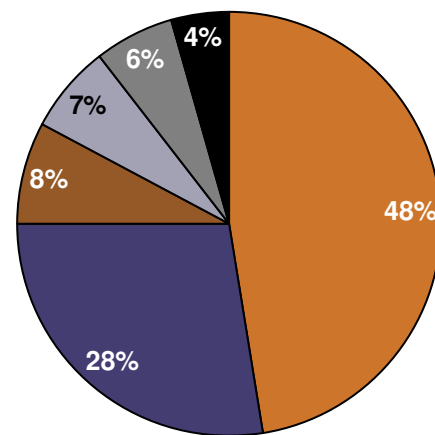
Ludo Schyvinck – Director Specialty Minerals

Minerals Technologies (MTI) – 3 Product Lines



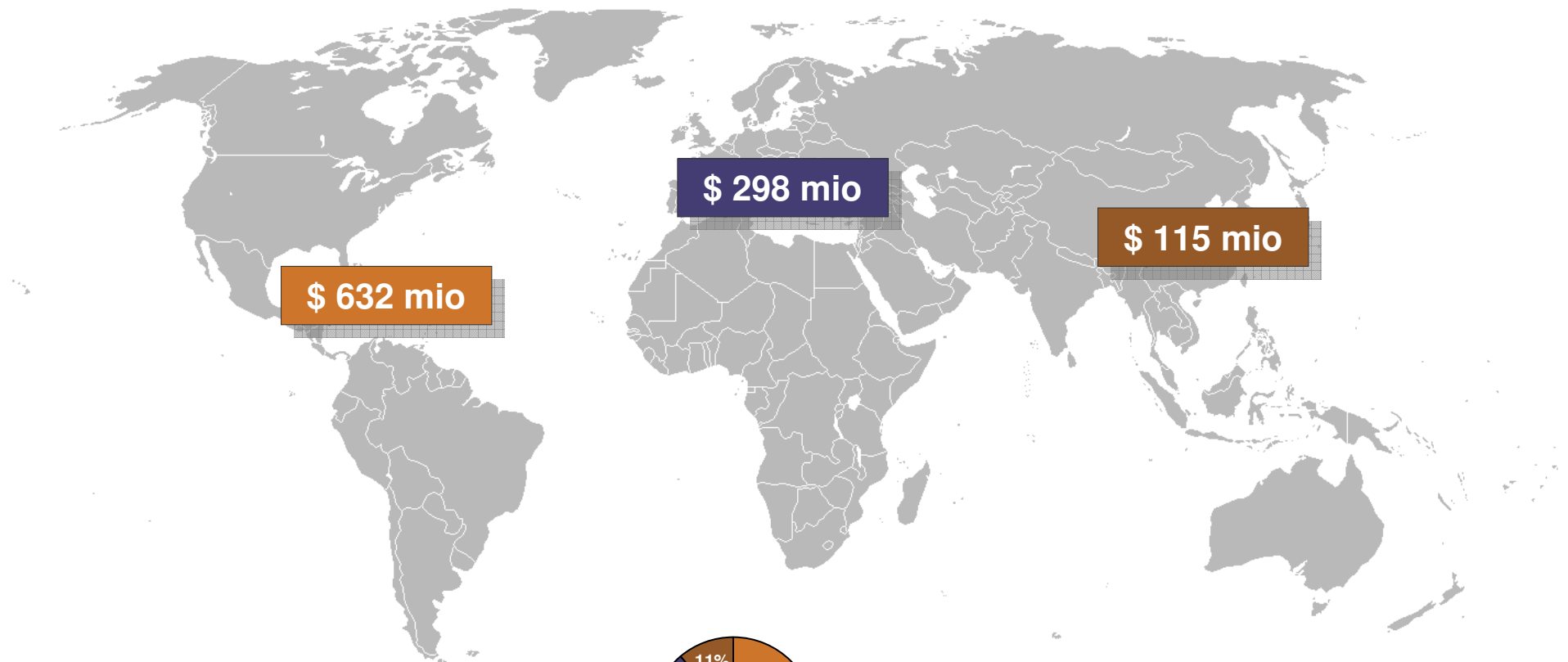
Minerals Technologies Inc.

- Publicly traded company
- New York Stock Exchange (MTX)
- 2011 sales: \$ 1 billion



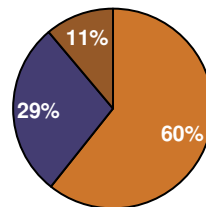
SMI CONFIDENTIAL

MTI sales per geographic area



Minerals Technologies Inc.

- 2011 sales: \$ 1 billion



Americas
Europe / Africa
Asia

SMI CONFIDENTI



Industrial Minerals Association Europe

IMA Europe represents the European producers of:

Calcium Carbonates (GCC/PCC), Dolomite, Andalusite, Bentonite, Borates, Diatomite, Feldspar, Kaolin, Lime, Mica, Plastic Clays, Sepiolite, Silica, Talc, Vermiculite

28 European Countries

i.e. 23 EU Member States

+ Croatia, Norway, Switzerland, Turkey and Ukraine

500 companies (685 mines & quarries, 750 plants)

42.500 employees

180 million tpa, EUR 10 billion

Two cases from the Industrial Minerals Industry:

1. CO₂ as a feedstock in a production process
⇒ Case of **PCC production**
2. Autogenous CO₂ sequestration
⇒ Case of **lime-based mortars**

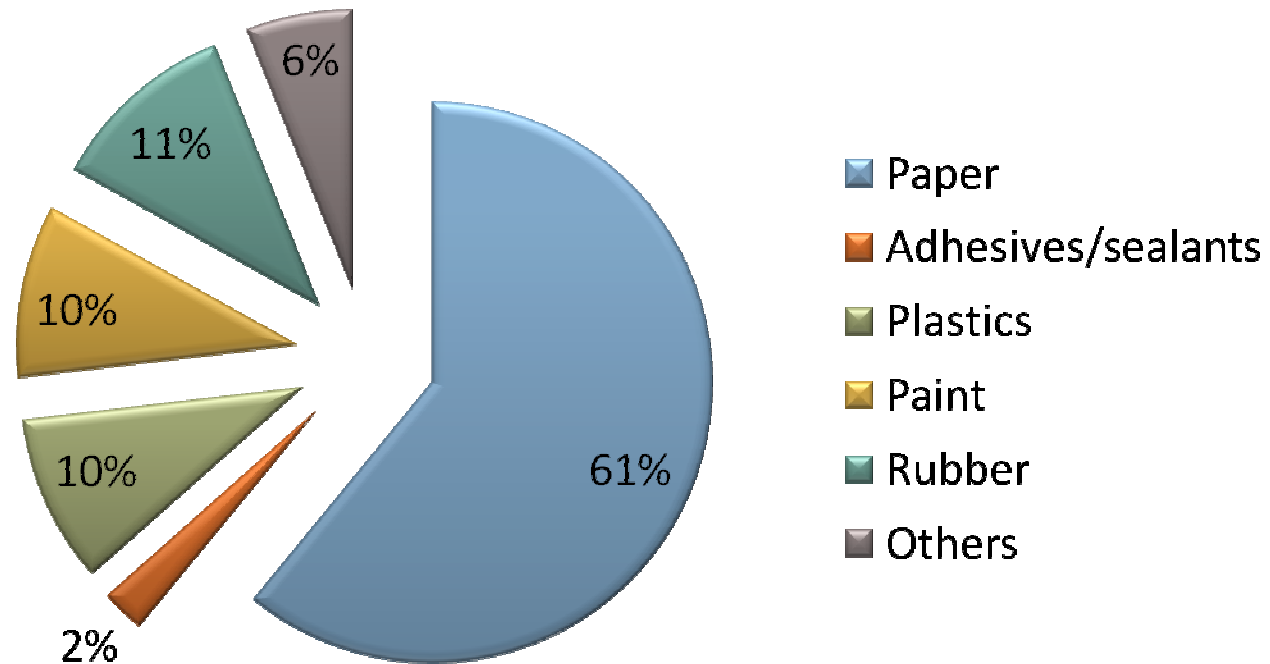
Precipitated Calcium Carbonate (PCC)

Total market in Europe:

- PCC: +/- 2.1 Mtonnes

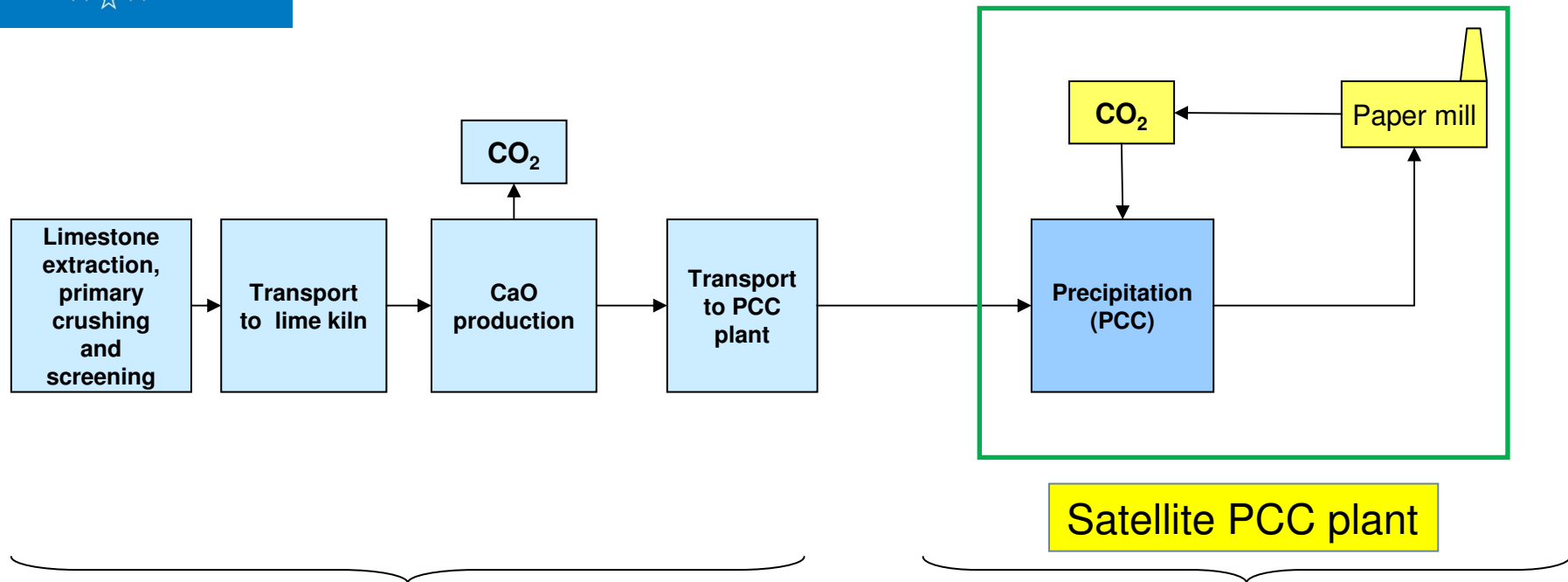


PCC is used in a wide variety of applications:



Source: Based on Roskil (2012): Ground and Precipitated Calcium Carbonate: Global Industry Markets and Outlook

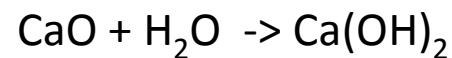
PCC production process: 2 models



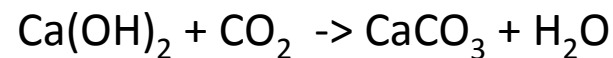
Lime production process



PCC production process

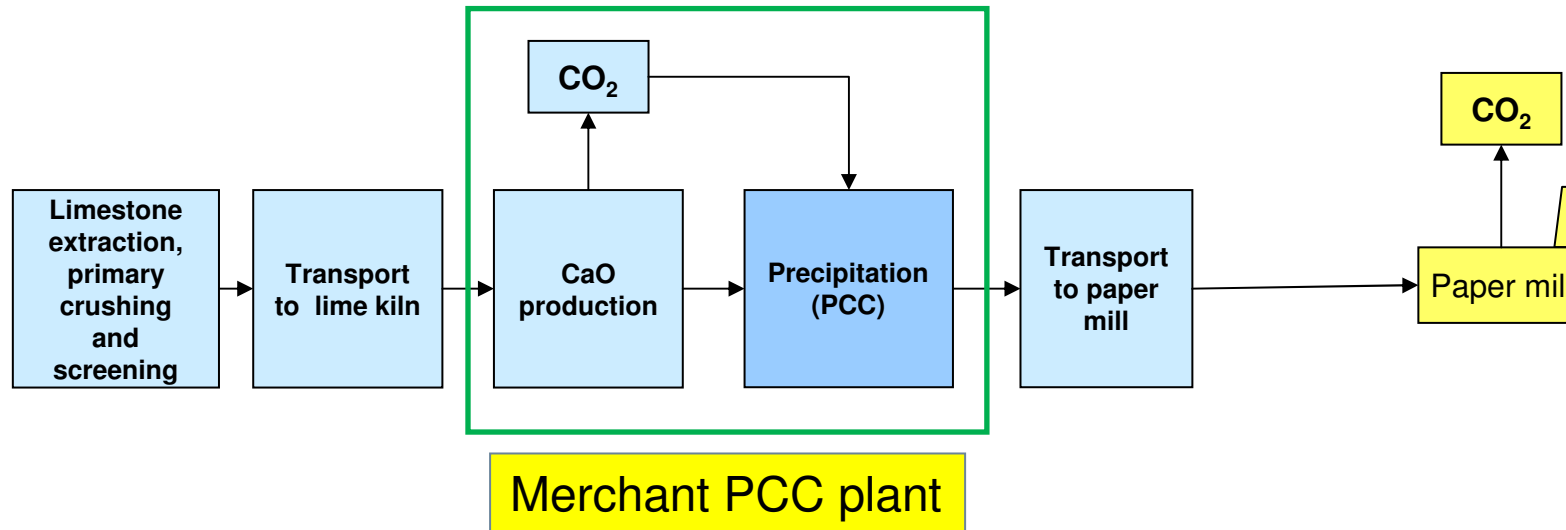


Burnt lime + water → Calcium hydroxide



Calcium hydroxide + Carbon Dioxide →
Calcium Carbonate

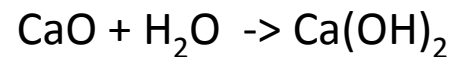
PCC production process: 2 models



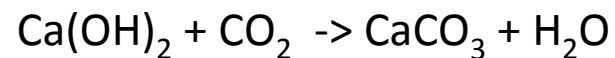
Lime production process



PCC production process



Burnt lime + water \rightarrow Calcium hydroxide



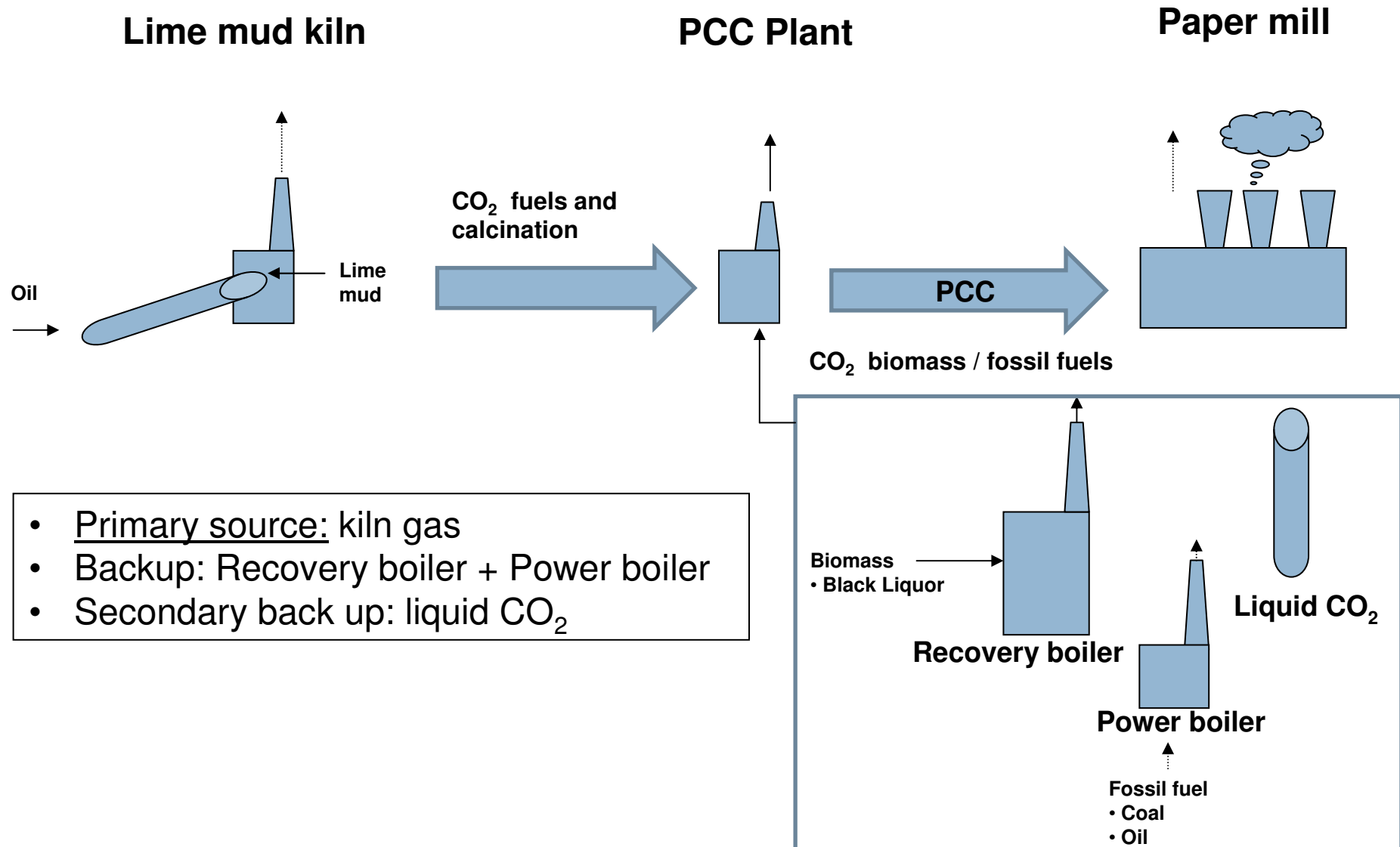
Calcium hydroxide + Carbon Dioxide \rightarrow
Calcium Carbonate



Specialty MINERALS

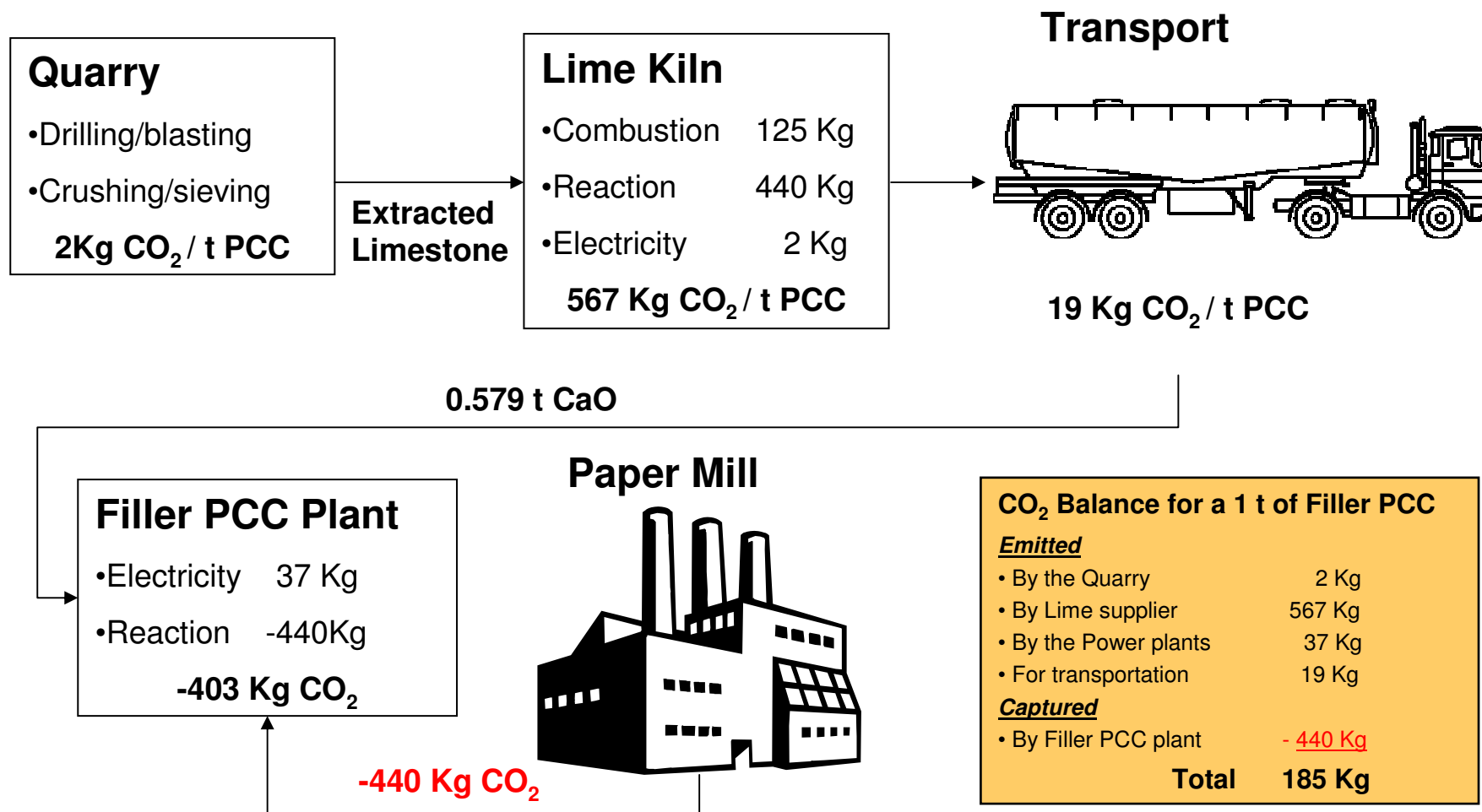


On Site PCC Manufacturing



CO₂ emissions for filler PCC production process

An example of emissions per tonne of FILLER PCC



- On site PCC manufacturing reduces the CO₂ emissions :
 - A PCC plant with 100.000 tons capacity absorbs 44.000 tons of CO₂ at the host mill
 - => Total absorption CO₂ in European PCC production: **880.000 tons**
- Where a Carbon Emission Trading Scheme is in place (for ex Europe), this creates a carbon credit that is trade-able: 44.000 tons CO₂
- Satellite uses electricity from host mill, mostly generated by using Biomass (Renewable Energy Source)

- There is a need to look more at the total value chain:
- Opportunities arising from:
 - Efficient (re-)use of carbon
 - Recycling of raw materials including minerals
 - Further integration of processes

- How can this kind of CO₂ reduction and storage be recognized and stimulated?

- ETS Monitoring and Reporting Regulation (21 June 2012):

- ⇒ **Art. 49:** Transferred CO₂ for CCS applications

- ⇒ But: **Recital 13:** “*Those conditions should not, nevertheless, exclude the possibility of future innovations.*”

- ⇒ What procedure to follow for having applications for CO₂ use and storage recognised – in order to get a similar treatment as CCS ?

Autogenous CO₂ sequestration

Case of lime-based mortars:



⇒ The European Lime Association (EuLA) estimates that 70%-90% of CO₂ emitted during the calcination of the limestone is sequestered again by the lime based mortar in the short term

⇒ Estimated total potential of 416.500t CO₂/year in EU-27

⇒ EuLA is further investigating

⇒ Results can be shared with DG Climate Action once available.



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IMA Europe's membership includes:

- Calcium Carbonate Association (CCA)
- European Lime Association (EuLA)