Circular Economy

Raw material consumption target
Circular Economy

CO₂ emissions target

![Graph showing CO₂ emissions target versus Human Development Index](image)
Circular Economy
History of LC Paper

- **1881**: LC Paper was born in 1881.
- **1993**
  - CHP First cogeneration plant 6.5 MW Motor
- **1999**
  - CHP New Gas engine 6 MW-Motor
  - New MG paper machine 3.3 m.500 m/min
- **2009**
  - New PM3 CHP heating system
- **2010**
  - Stop first cogeneration engine 6,5 MW
- **2012**
  - New 132 kV parc transformer
  - New gas engine 6 MW. total cogeneration plant 12 MW
- **2014**
  - Rebuild PM2 MG-CHP heating system+SYD
- **2017**
  - New Biomass Boiler
- **2019**
  - New 3 MW Photovoltaic park
- **2021**
  - New Sludge dryer

Circular Economy

Jornades Descarbonització i Indústria

History of LC Paper

Circular Economy
Flow of LC Paper

- Waste paper treatment
  - Cogeneration 6 MW
  - MP2. Paper machine MG
  - MP3. Tissue machine
    - Pulp treatment
    - Biomass boiler
    - Store
    - Converting
  - Store
Circular Economy

Recovery Flow

Heat recovery and Combined Heat and Power at LC Paper

Gas Engine

Gas: 14000.0 kW

Transformer

Electricity: 6000.0 kW

Boiler 17 bar

Boiler 17 bar

Air-air R2

Boiler 0.5 bar

Grid: 2430.0 kW

Boiler 0.5 bar

Air-air R3: 1055.0 kW

Air-air R3: 1055.0 kW

Heating machine room

Paper Machine

High Pressure Shower: 1134.0 kW

Heating room paper machine: 1288.0 kW

Heating room converting: 1042.0 kW

Hot water shower

Equivalent Electrical Performance = 86.5%
Evolution of consumption

Specific energy consumption on weight and surface

- Standard:
  - kWh/t: 0.096
  - kWh/m^2: 3000

- Process Reengineering:
  - kWh/t: 0.067
  - kWh/m^2: 2100

- Product Reengineering:
  - kWh/t: 0.051
  - kWh/m^2: 1700

- New Process Reengineering:
  - kWh/t: 0.039
  - kWh/m^2: 1300

- Converting, Biomass & green electricity:
  - kWh/t: 0.029
  - kWh/m^2: 1100

Circular Economy
• Toilet paper is made on 2, 3, 4 or 5 sheets. Total grammage is 16.5 x 2 = 33 to 16.5 x 5 = 82.5 g/m².
• The energy consumption for 16.5 g/m² is 3 kWh/kg.
• The energy consumption of OnePly® 28 g/m² is 1.7 kWh/kg.
• To change from 2 x 16.6 to 1 x 28 g/m² saves 15% fibers, chemicals and 52% of energy.
Circular Economy

Decrease in rolls usage thanks to last-longing rolls

- Buying paper by meters, not by rolls.
- A Megaroll contains 40 m., a OnePly® roll 80 m. We call it Gigaroll.
- A Megaroll clean 8 days/person; a Gigaroll clean 16 days/person.
- A jumbo OnePly® roll cleans 60 days/person
Circular Economy

Consumption and CO₂ emissions

![Energy consumption versus CO₂ MP2](image)

- **Energy kWh/t**
  - Standard: 3000 kWh/t
  - Process Reengineering: 2100 kWh/t
  - Product Reengineering: 1700 kWh/t
  - New Process Reengineering: 1300 kWh/t
  - Converting, Biomass & green electricity: 1100 kWh/t

- **CO₂ eq/t**
  - Standard: 808 CO₂ eq/t
  - Process Reengineering: 666 CO₂ eq/t
  - Product Reengineering: 487 CO₂ eq/t
  - New Process Reengineering: 298 CO₂ eq/t
  - Converting, Biomass & green electricity: 0 CO₂ eq/t
Circular Economy

New packaging concept
Circular Economy

New unbleached product
New wipe hydroalcohol 100% paper