



“B2G” sustainable gas for industrial processes

June 2019

Leo Arpa



Mondi is a global leader in packaging and paper



26,000 employees



Over **100** operations across more than **30** countries



More than **100,000** solutions for our customers



2.4M hectares of forest managed



Group offices in Johannesburg, London and Vienna



Primary listing on the JSE Limited for Mondi Limited

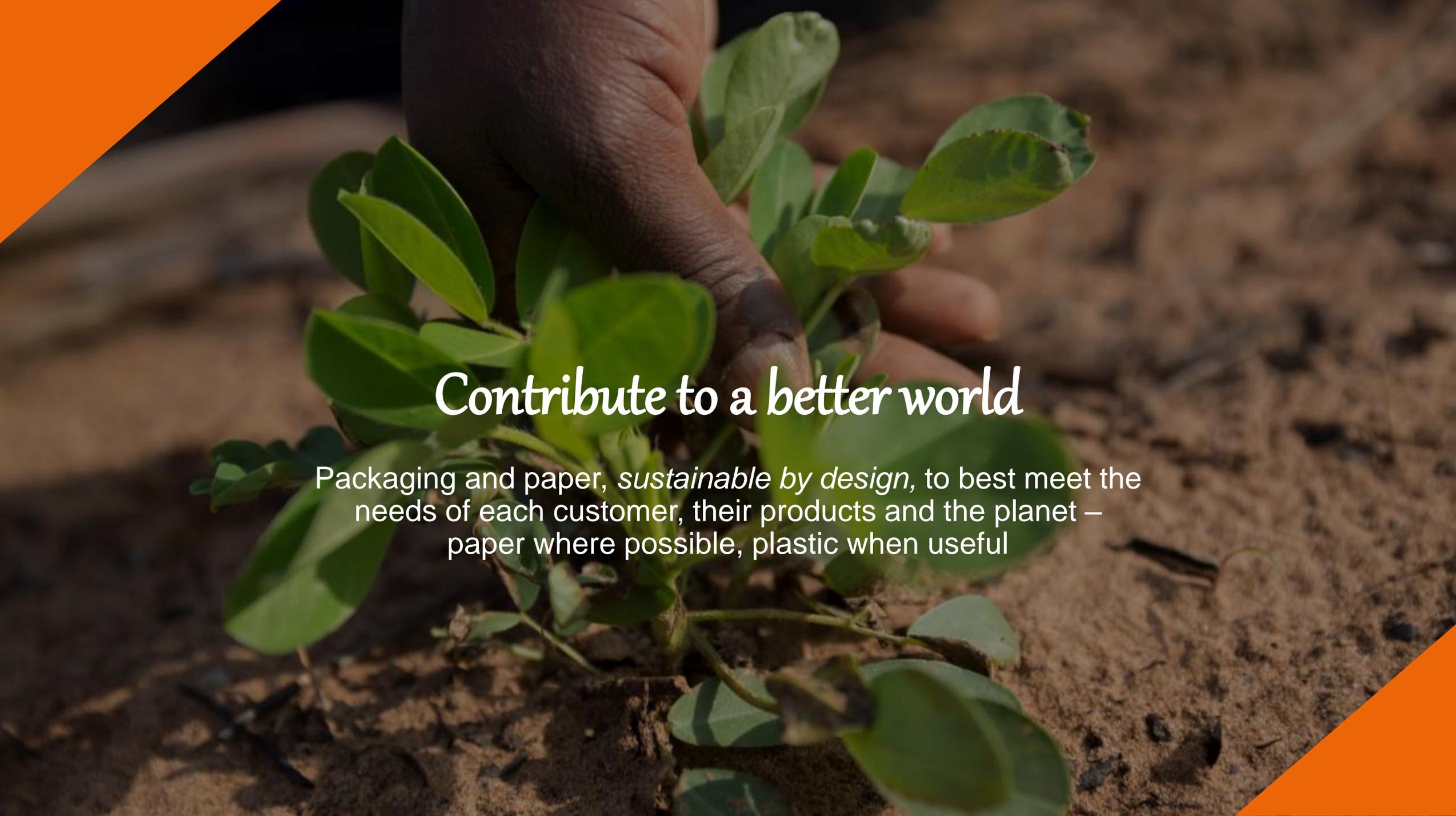


Premium listing on the London Stock Exchange for Mondi plc



FTSE4Good Index Series
JSE's Socially Responsible Investment Index





Contribute to a better world

Packaging and paper, *sustainable by design*, to best meet the needs of each customer, their products and the planet – paper where possible, plastic when useful

Mondi Sustainable Development Report 2018 headlines



Safety

11% reduction in total recordable case rate since 2015
'Think twice' – safety campaign **brings safety home to our employees**
1,315 people have completed first-line managers safety training since 2015



Training and development

30+ hours average training per employee in 2018



Diversity & inclusion roadmap launched in 2018

27% women in our Executive Committee and its direct reports
25% women on our Boards



Climate change and energy

14.5% reduction in total specific **CO₂e emissions** in our mills against our 2014 baseline
64% fuel consumed in our mills from renewable biomass-based sources
100% electricity self-sufficiency in our mills
WWF Climate Savers programme membership in 2018



Socio-economic assessment toolbox (SEAT) at Frantschach

79% of our mills and forestry operations assessed to date



FSC™- or PEFC™-certified wood

71%



Our vision

Contributing to a better world

Mondi Leadership Forum, Berlin 2018



Collaborating with partners



€7.9m invested in community initiatives in 2018



Not everything goes to plan ... but transparency is key

Our performance in some key indicators deteriorated due to unforeseen challenges. As a result, compared to our 2015 baseline:

Specific **waste to landfill** increased **+1.3%**

Specific **COD emissions** increased **+6.1%**

Specific **contact water** from our mills decreased **-2.0%**

„B2G“ sustainable power for industrial processes



- In line with Mondri's commitment to act also on SDG 7, 9 and 13, next to other commitments, Mondri R&D Paper is working together with its scientific and industrial partners, on the development of a novel process technology which aims to convert bark or other residues into a gas for powering industrial processes on CO₂ neutral basis.

7 AFFORDABLE AND
CLEAN ENERGY



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE

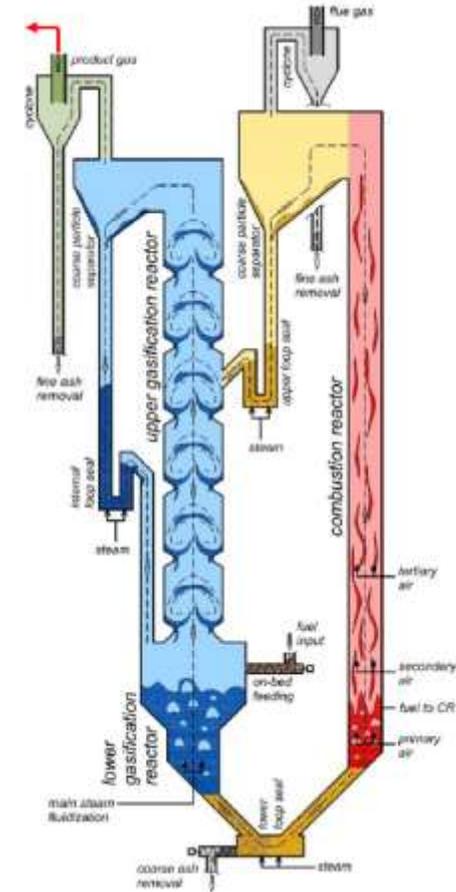


13 CLIMATE
ACTION



B2G key elements and TRL

- Key elements:
 - Process for the production of mid caloric gas from bark residues with NPE below suitable trashhold
 - Integration of the technology in existing closed cycle production infrastructure of a pulp biorefinery
 - Novel process which allows to increase caloric value of the gas to suitable level
- TRL of the proposed process after currently performed project (until 2020)
 - TRL of the entire process is app. at level 7
 - Feed stock preparation and product cleaning are app. at TRL 8
 - The converting process is app. at TRL 8
 - The process for removal of NPE from the product gas is app. at TRL 7
 - The process for increasing the caloric value of the product gas is app. at TRL 7
 - The integration into the closed cycle production ranges from TRL 7-8



Climate benefits from „B2G“ and how to make it happen



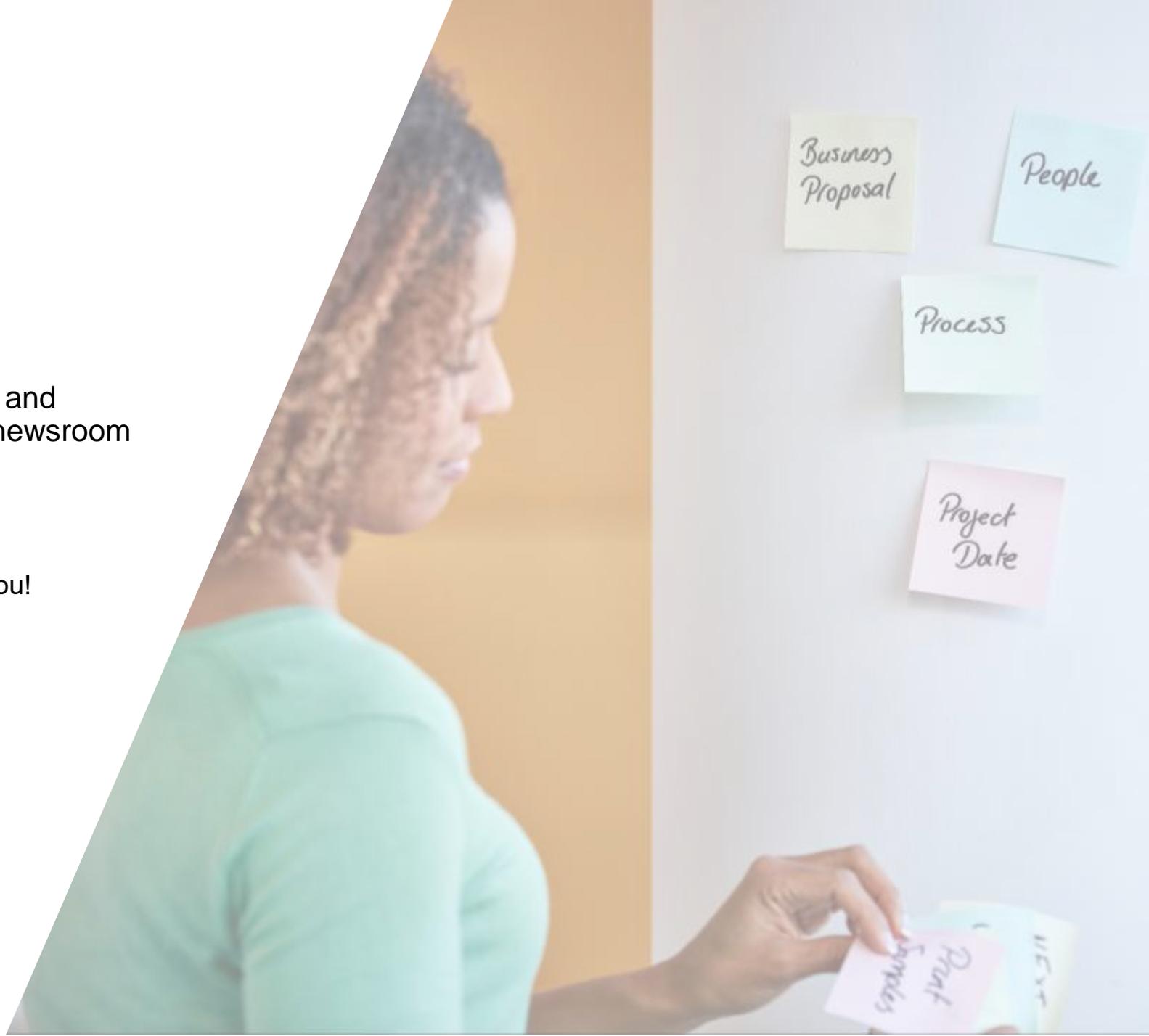
- Reduction of CO₂ from fossil fuel to zero for all petroleum gas replaced by the gas from bark
- Lime kilns (and flash dryers) are today some of the remaining sources of CO₂ emissions from fossil fuels in a modern pulp mill. A small to medium sized pulp mill which could be the first of its kind installation for this technology has a daily production of app. 1000 tons of pulp.
- By implementing „B2G“ process such mill could save about 30.000 tons of fossil CO₂ emissions per year
- Like other new technologies substantial technical and financial hurdles have to be overcome:
 - Technical hurdles shall be overcome during the currently executed pilot project in 2019 and 2020.
 - Financial hurdles for the first of its kind installation and integration in an existing 24/7 operating pulp mill need to be overcome in the anticipated project.



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