





 **chempolis**[®]
Sustainable Results







3G Technology for Production of Non-Food Cellulosic Bioethanol

Inauguration ceremony, the 4th of May 2010
Pasi Rousu, CTO of Chempolis Oy

Business Idea

Deliver 3G **formico**[®] biorefineries, which make Sustainable Results using **Non-Wood** and **Non-Food** biomasses

3G Biorefinery vs. Petroleum refinery

3G Biorefinery integrates biomass conversion processes and equipment to produce fibres, multiple fuels, power, heat and chemicals from biomass

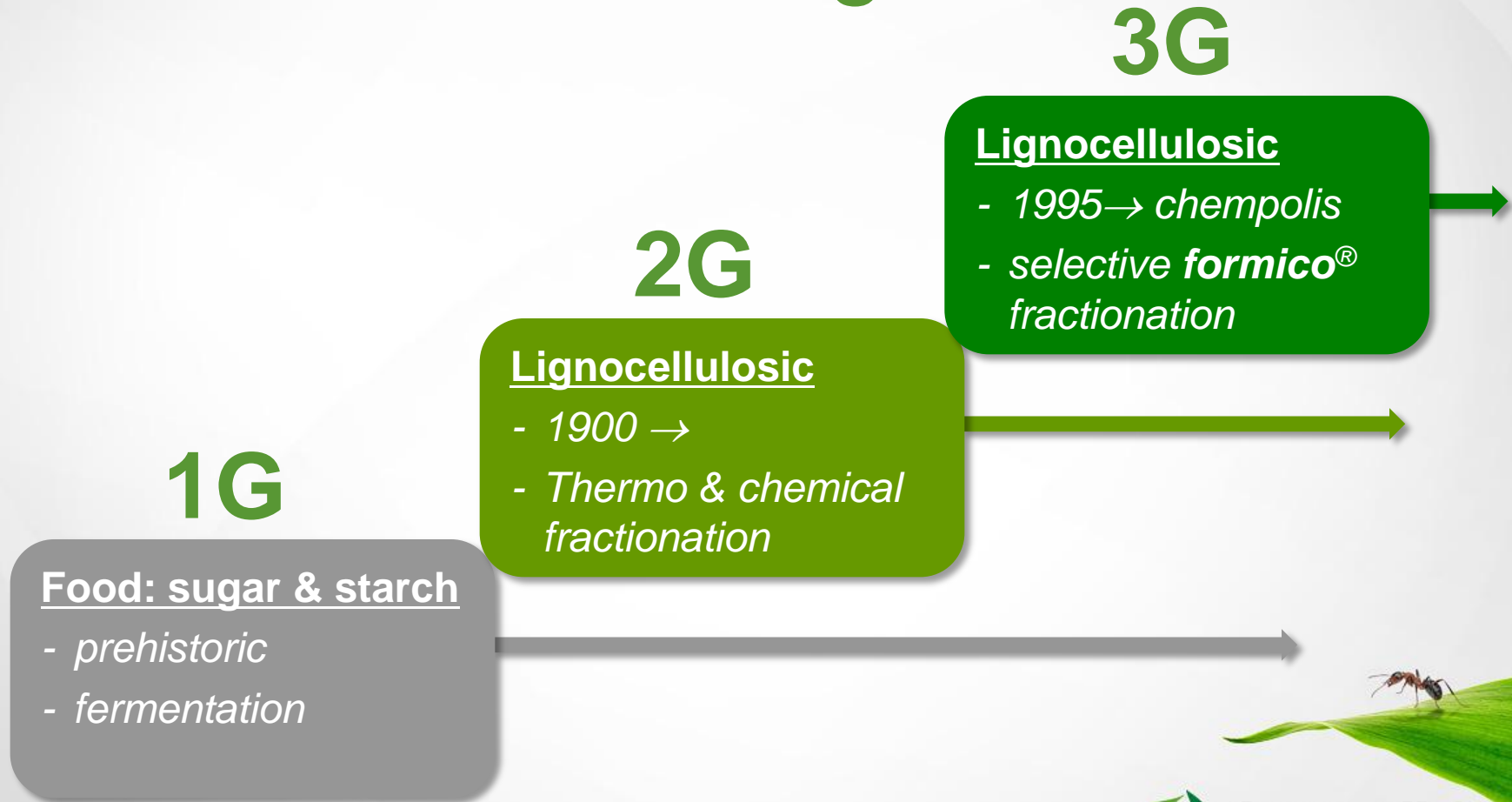
Biorefinery concept is analogous to today's **petroleum refinery**, which produce multiple fuels and products from petroleum

Food vs. Non-Food biomass

Food biomasses are for human eating like corn, wheat, sugarcane, palm oil

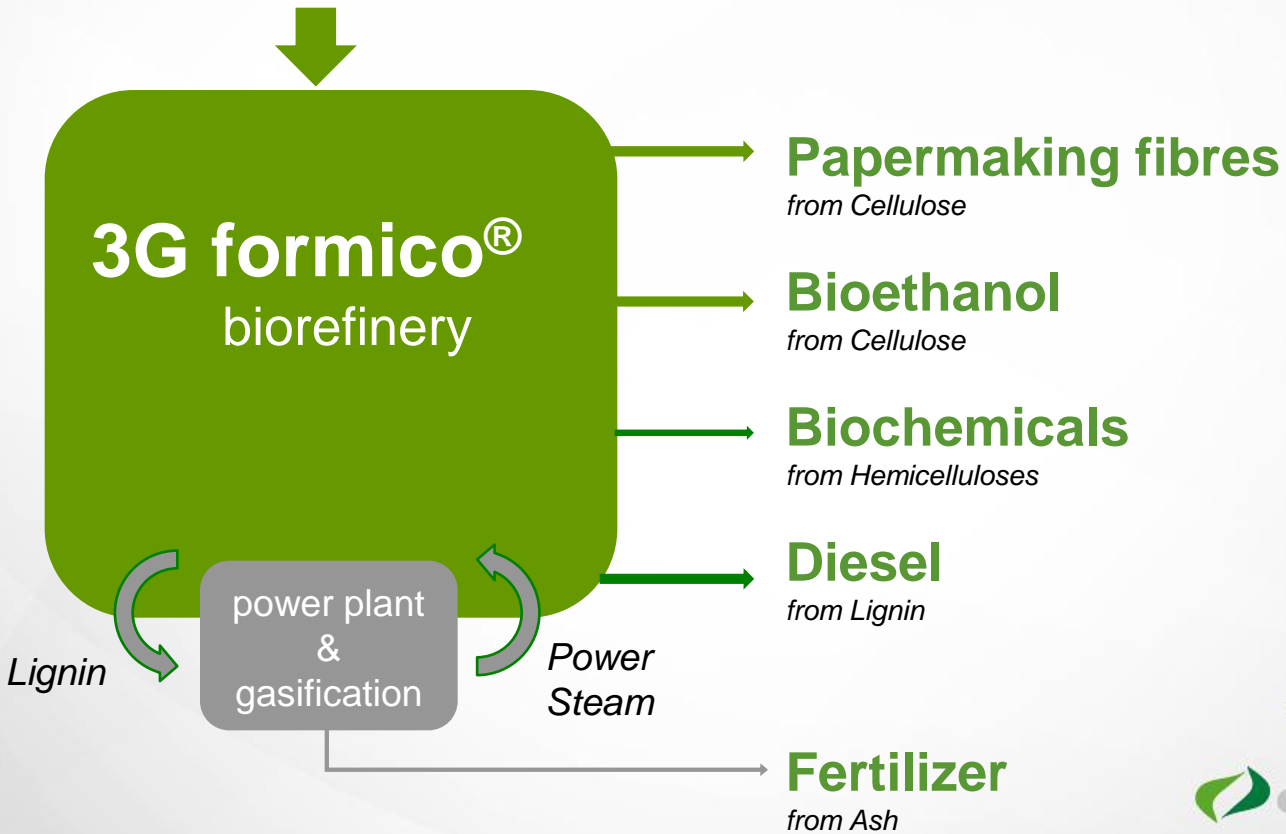
Non-Food biomasses are mostly residues from food production: straw, stalk, bagasse, grasses, empty fruit bunches etc

Evolution of biorefining technologies



3G formico[®] biorefinery

Non-Food and Non-Wood
biomass



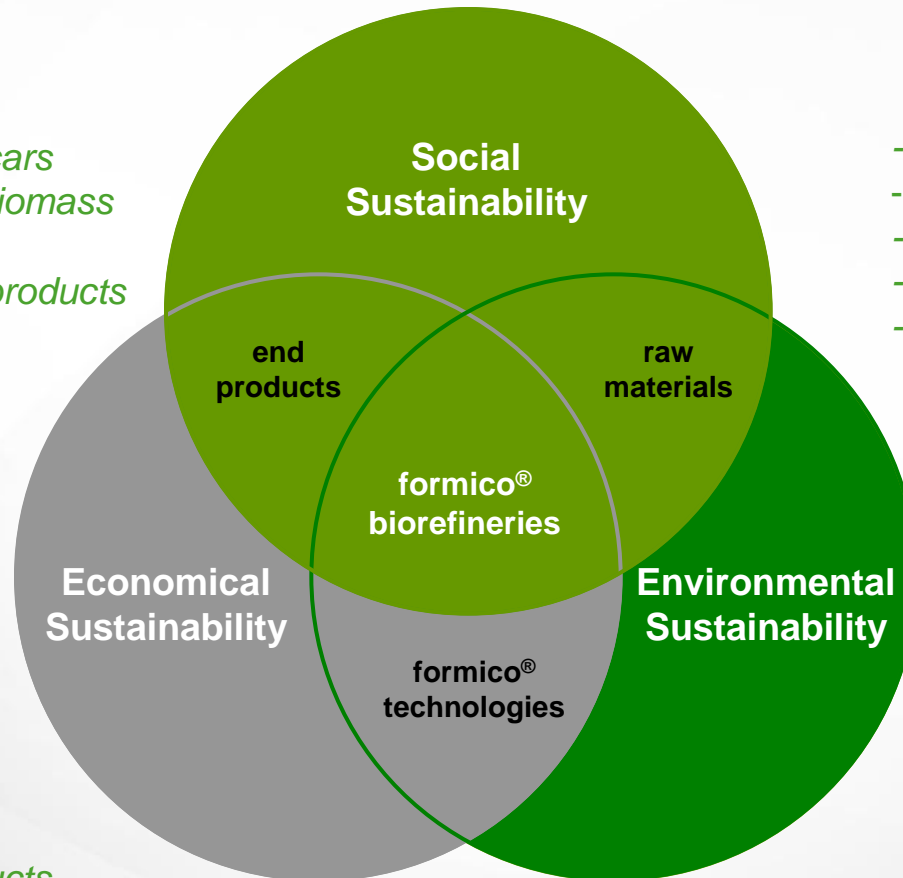
Business Opportunities

Local production and supply of bio-products using local cellulosic Non-Food residue biomasses in locally supplied **formico**[®] biorefineries

Chempolis

Sustainable Results

- food for people not for cars
- farming and supply of biomass
- production
- distribution and use of products



- use of residue biomass
- preservation of forests
- reduction of CO₂ emissions
- preservation of water resources
- minimal discharges

- highly profitable
- low operating cost
- low investment costs
- many high quality products

formicobio™ is superior solution for Non-Food ethanol

- **SELECTIVE fractionation** of biomass to cellulose, hemicellulose, lignin and ash
 - Generates 40 % more sales value
 - Energy self-sufficiency and no need of fossil fuels
 - No pollution; full recovery of chemicals and water
- Hydrolysis of **clean open structure cellulose** fibre is easy and 50 % less enzymes are needed
- Fermentation of **pure glucose** is easy

Chempolis deliveries

Services

Deliveries

- ⦿ (Pre)feasibility studies
- ⦿ Pre-engineering work
- ⦿ Laboratory tests (small scale)
- ⦿ Biorefinery tests (large scale)
- ⦿ Paper machine trials
- ⦿ Plant optimization
- ⦿ Training
- ⦿ Productivity improvement

EPC

Deliveries

- ⦿ E(ngineering) management
- ⦿ P(rocurement) management
- ⦿ C(ommissioning)
- ⦿ Or turn Key-projects

formico[®]
systems

Deliveries

- ⦿ **formico[®]** -systems are unit processes, which are characterized by reliability, safety, high operational efficiency and low energy consumption

 **formicocont[™]**
control system

 **formicodeli[™]**
delignification system

 **formicopure[™]**
purification system

formico[®]
technologies

Deliveries

- ⦿ **formico[®]** -licences for process technologies, which are characterized by high raw material and energy efficiency and low water consumption.

 **formicofib[™]**
non-wood fibre

 **formicobio[™]**
non-food bioethanol

 **formicochem[™]**
biochemicals

 **chempolis[®]**

Sustainable Results

Summary

- **3G formico[®]** technology is the solution
 - Food for people not for 1G
 - High conversion of products gives 40 % higher sales revenues than 2G with lower operation costs
 - Energy self-sufficient low carbon technology
 - Effluent free with minimal water use
- Social, Environmental & Economical sustainability

Chempolis Ltd.

Chempolis Oy

Chempolis Biorefining Park
Lääketehtaan tie 1
FI-90650 OULU, FINLAND
Tel. +358 (0)10 387 6666
Fax. +358 (0)10 387 6668



Chempolis Biorefining Technology (Shanghai) Co.,Ltd.



690 Bibo Road, Zhangjiang Hi-Tech Park Shanghai
201203, P.R. China

科伯利生物技术(上海)有限公司
碧波路690号, 2号楼, 401-14室,
上海市张江高科技园区

电话: +86 21 6104 2236
传真: +86 21 6104 1410



 **chempolis®**
Sustainable Results



 **formicochem**[™]
biochemicals



 **chempolis**[®]
Sustainable Results



 **formicofib™**
non-wood fibre



 **chempolis®**
Sustainable Results

The contents of Chempolis World Wide Web pages are Copyright © Chempolis 2010. Reproduction, copying, transfer, distribution or storage of part or all of the contents of Chempolis WWW service in any form including but not limited to framing, creating any derivative works based on this service or any part of it, incorporation into other websites, electronic retrieval systems or publications without the prior written permission of Chempolis Ltd. is prohibited.