

# Biokol-produktion



Kolmila i Näske, ca 1920 (Foto A Wiberg)

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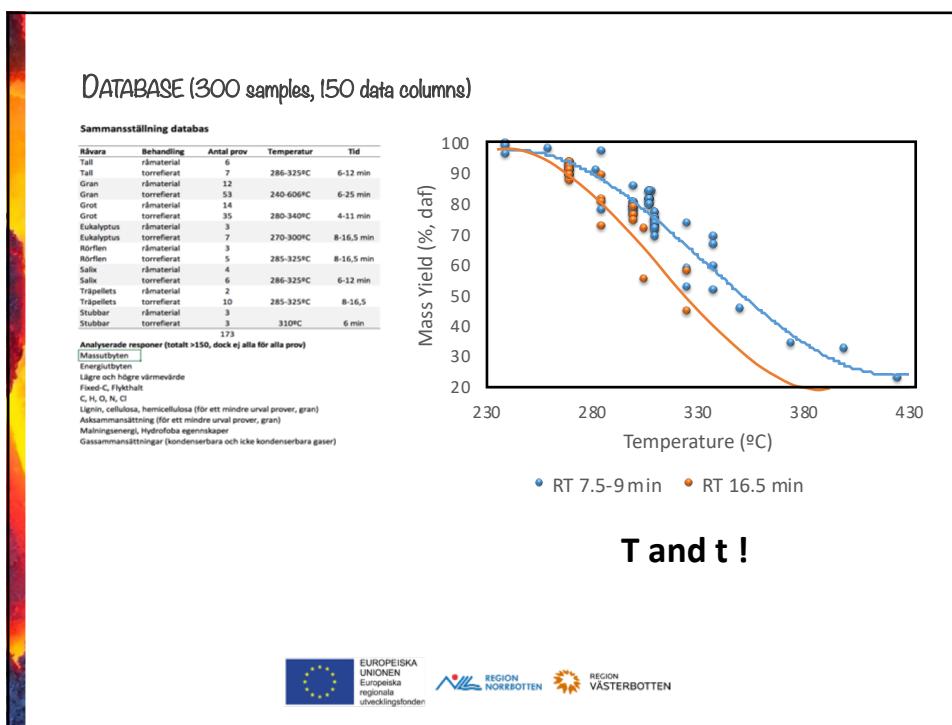
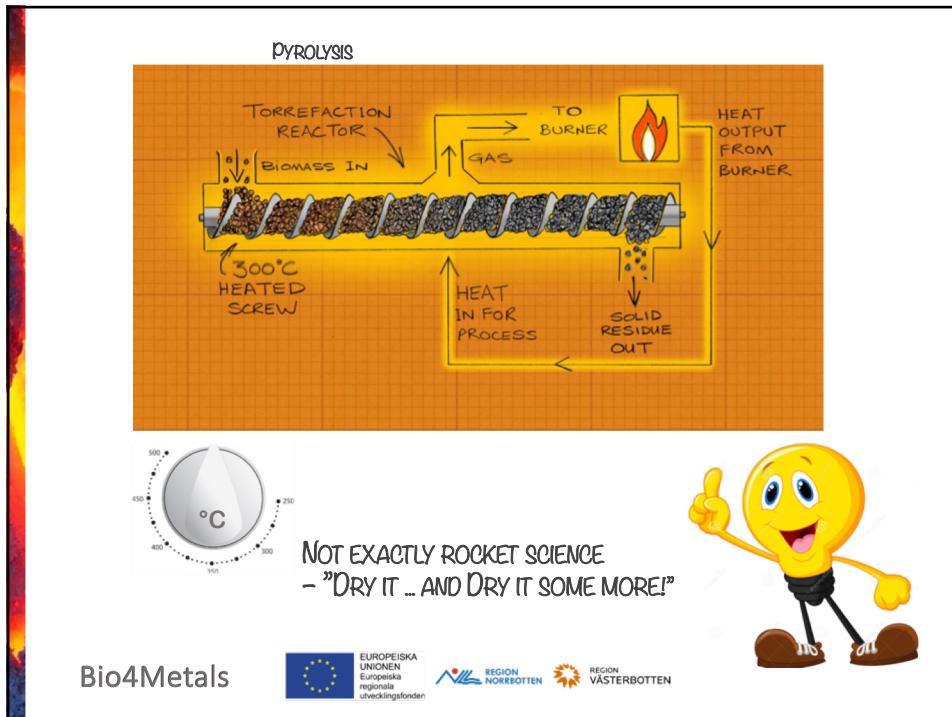


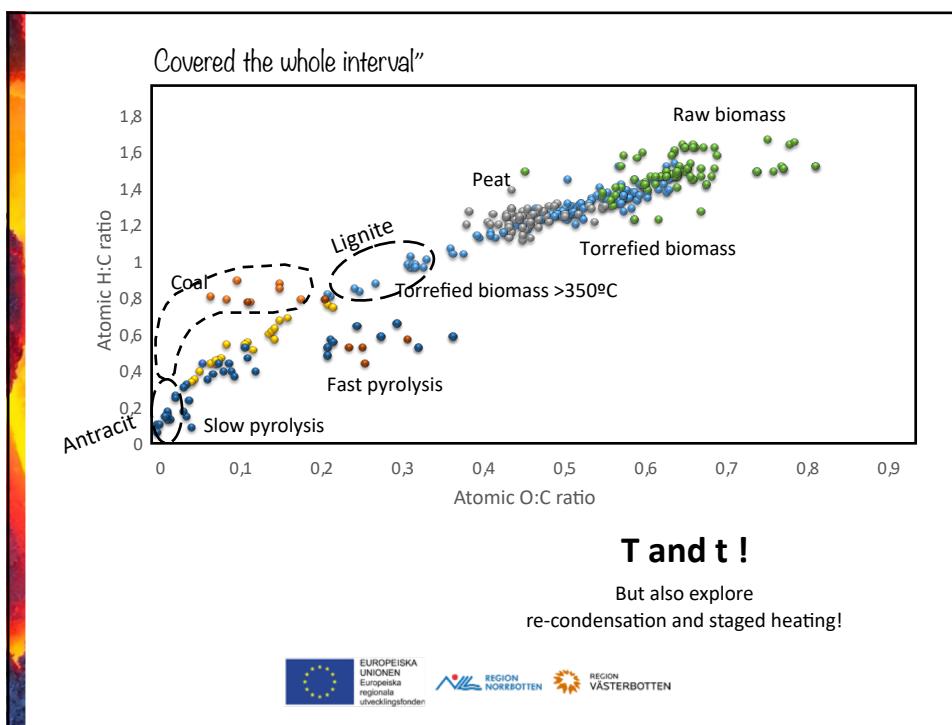
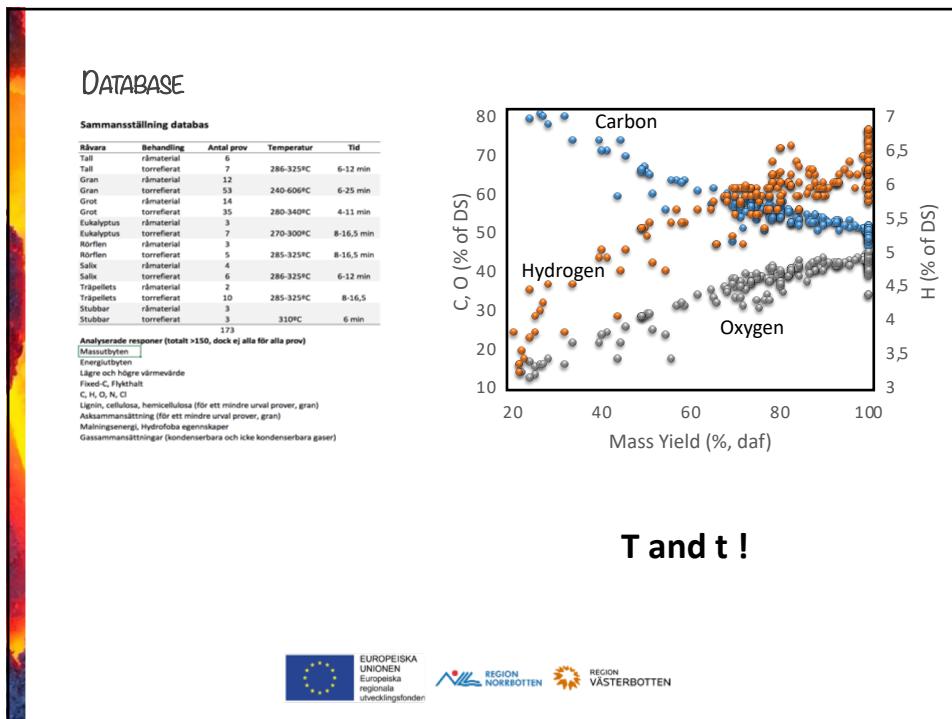
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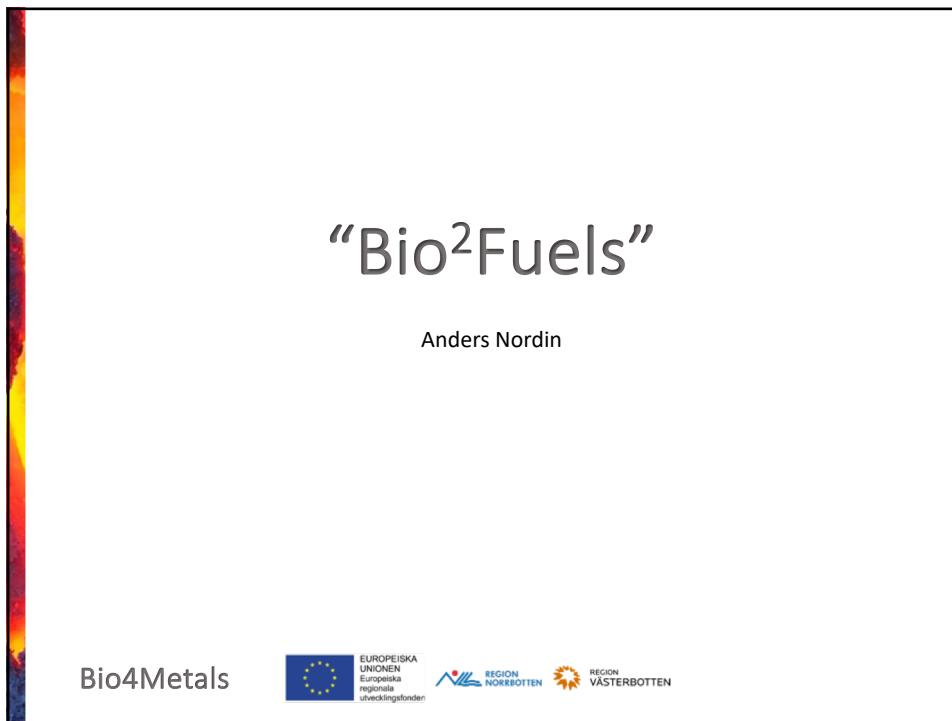
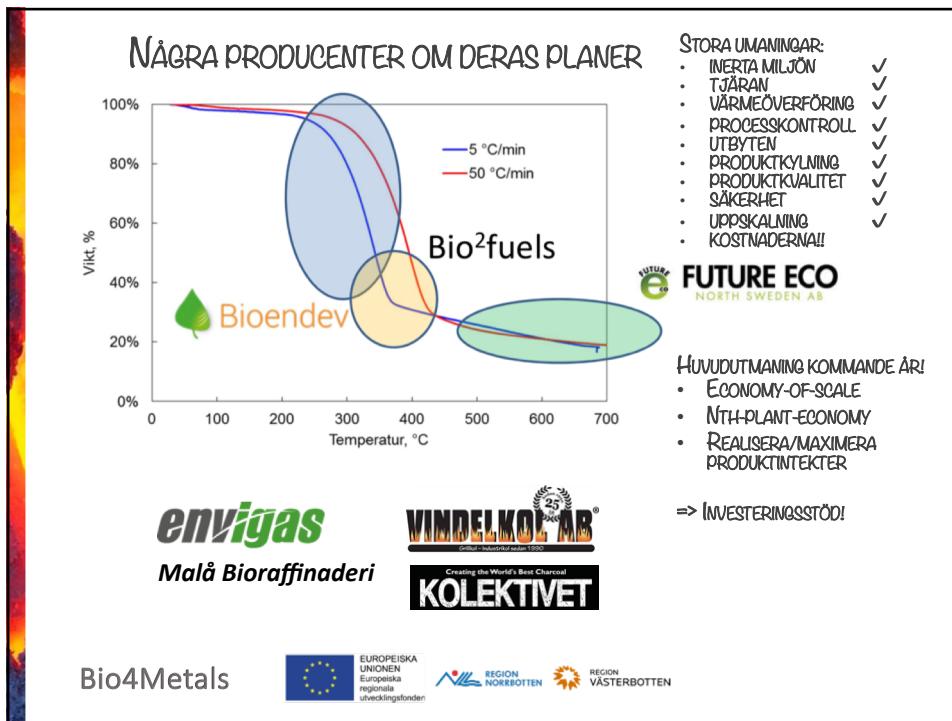


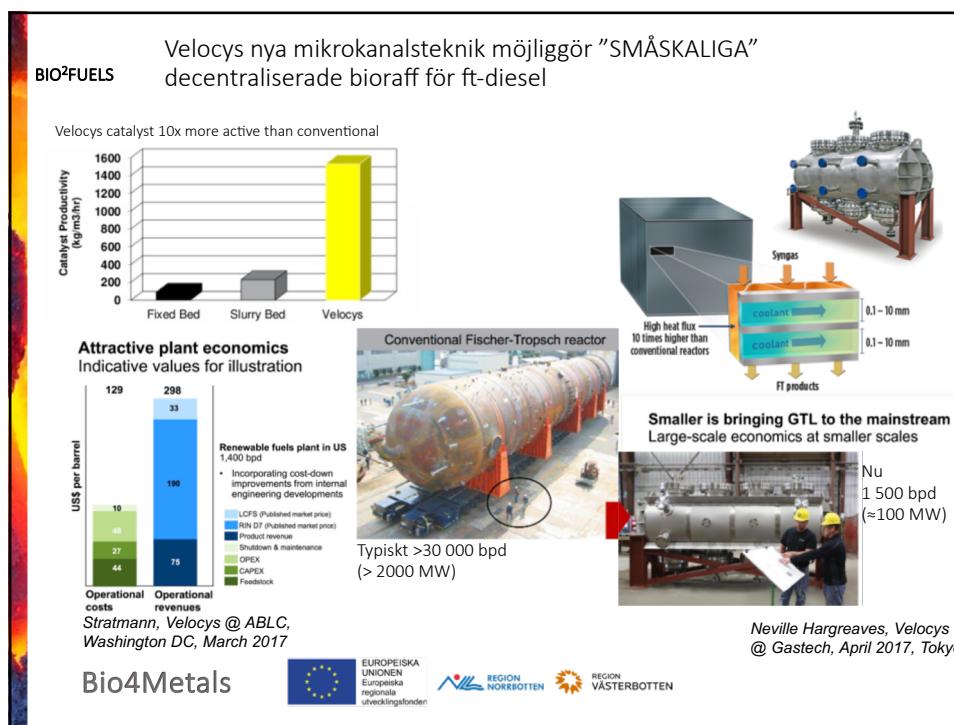
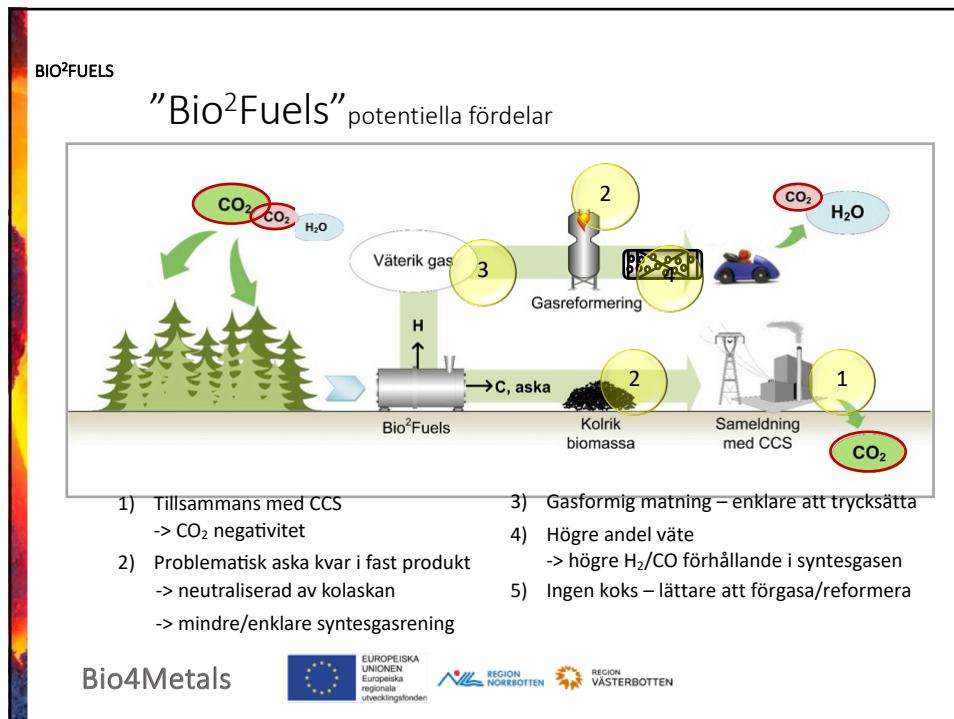
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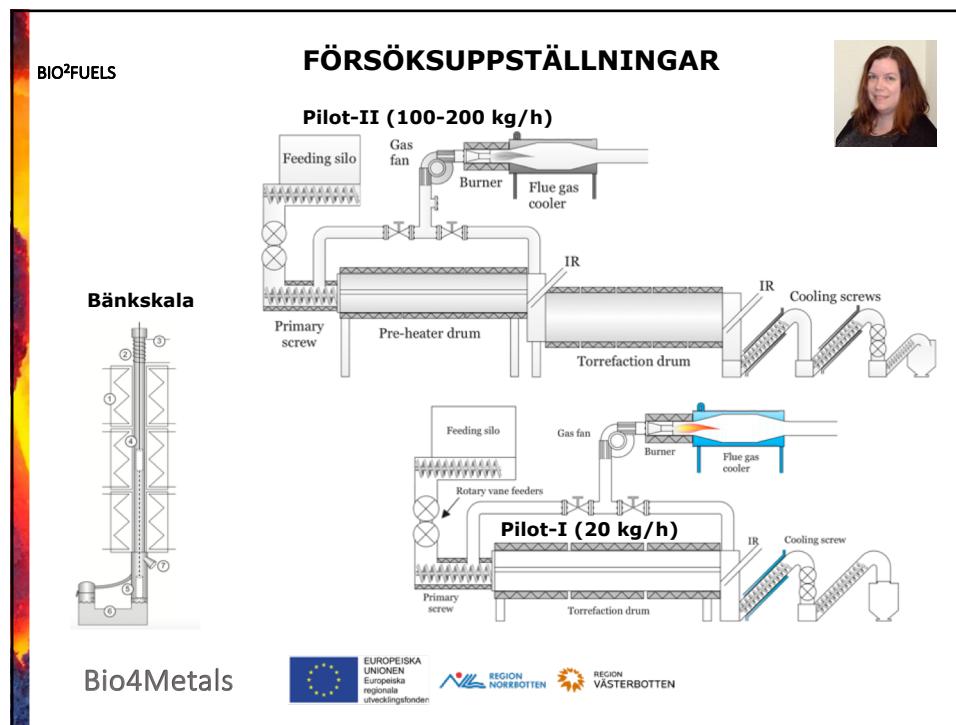
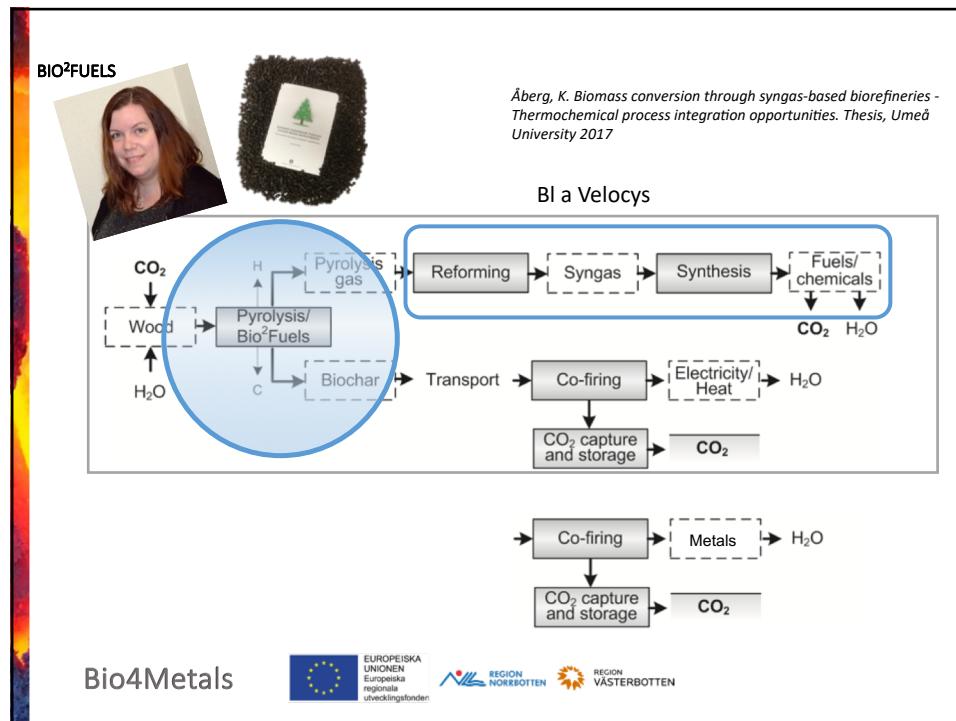


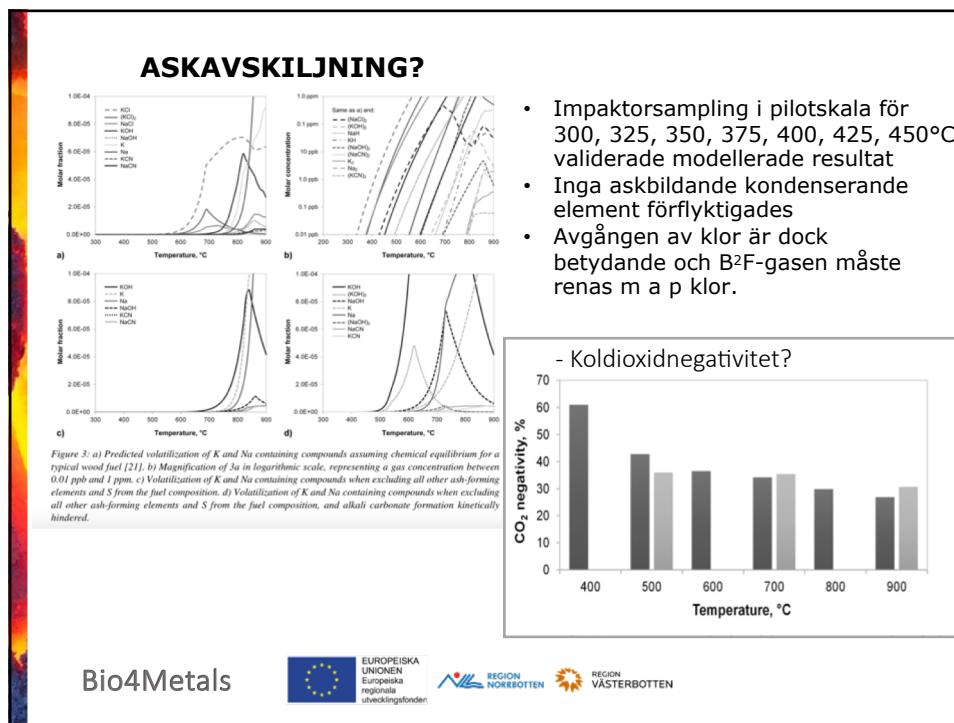
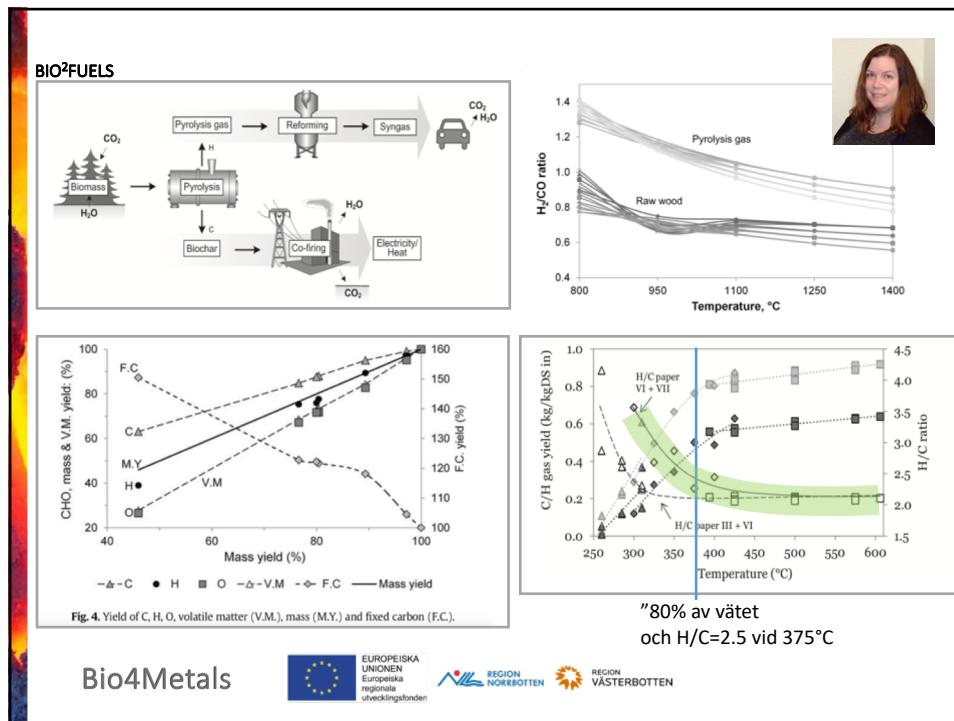




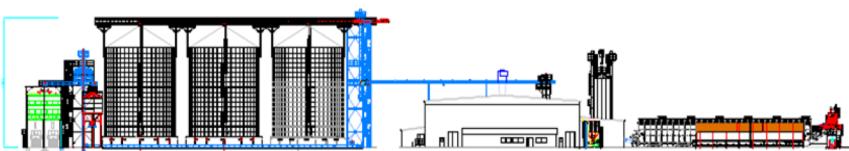








## WP5 TECHNOECONOMIC ANALYSIS (FOR BE-TORREFACTION AND B2F)



<ul style="list-style-type: none"> <li>• TECHNICAL REVIEW</li> <li>• COMILATION OF SMART SOLUTIONS</li> <li>• COMILATION OF CHALLENGES</li> <li>• SWOT-ANALYSIS</li> </ul>	<ul style="list-style-type: none"> <li>• REVIEW OF PREVIOUS DATA/STUDIES</li> <li>• SITE EVALUATION/DEVELOPMENT</li> <li>• RAW MATERIAL ANALYSIS FOR TWO SITES</li> <li>• CAPEX &amp; OPEX ESTIMATION</li> <li>• MODEL DEVELOPMENT           <ul style="list-style-type: none"> <li>• MASS &amp; ENERGY</li> <li>• PLANT ECONOMY</li> </ul> </li> <li>• LIVING DOCUMENT ... (RESULTS)</li> </ul>
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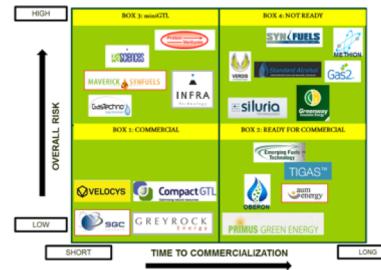
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## From the Technical Review

<b>Torrefaction</b>	<b>Bio2Fuels</b>
<ul style="list-style-type: none"> <li>• Know-how, IPR all there</li> <li>• Why still no commercial plant suppliers out there?! Few on going (France, Portugal, US...)</li> <li>• Demo in commercial scale needed asap!</li> </ul>	<ul style="list-style-type: none"> <li>• Basic idea's work in pilot scale</li> <li>• Still evaluation &amp; development needed (pressurization, oxygen, reforming, system)</li> <li>• Micro-GTL commercially ready:</li> </ul>

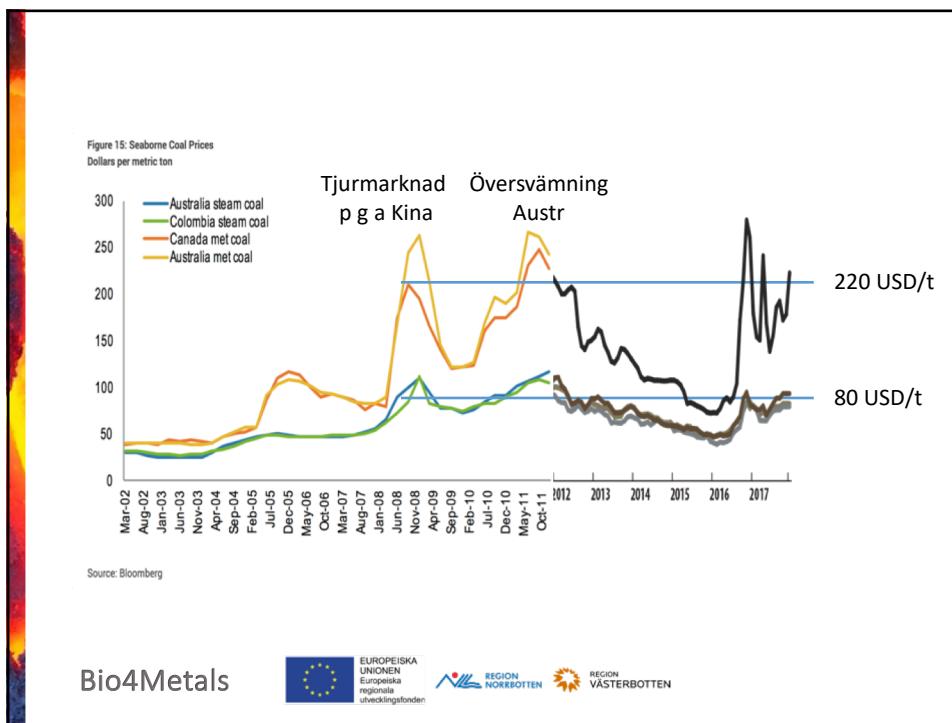
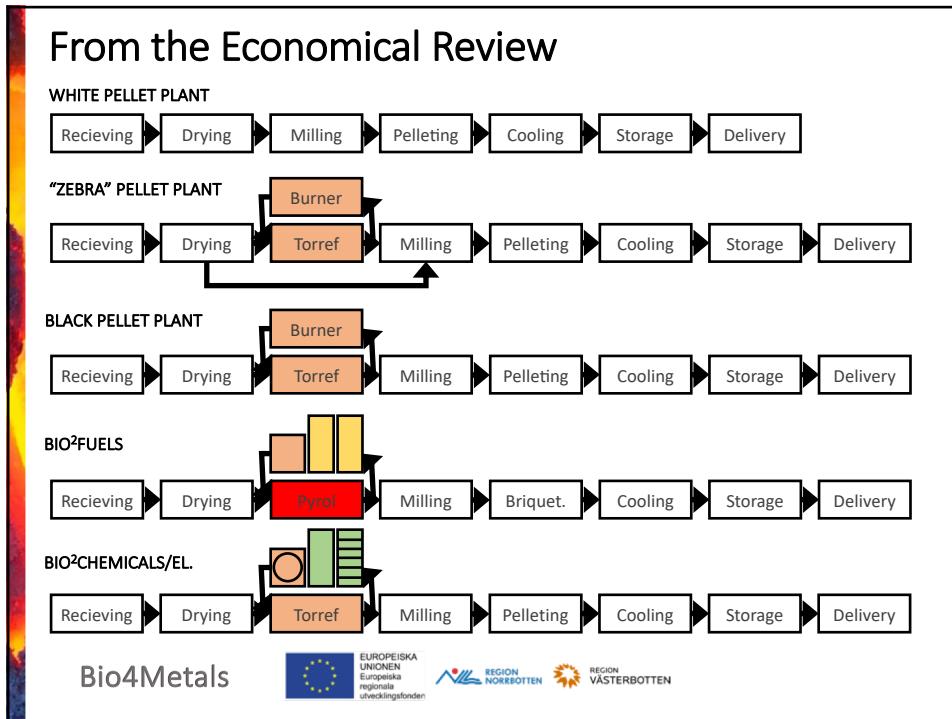
**UTMANINGAR:**

	✓	✓	✓!	✓	✓!	✓	✓!	✓!	!!!
• INERTA MILJÖN	✓								
• TJÄRAN	✓								
• VÄRMEÖVERFÖRING	✓!								
• PROCESSKONTROLL	✓								
• UTBYTEN	✓!								
• PRODUKTKYLNING	✓								
• PRODUKTQUALITET	✓								
• SÄKERHET	✓!								
• UPPSKALNING	✓								
• KOSTNADERNA	!!!								



Assessment by Fleisch, T. 2015 World Bank Group 101578

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## FROM THE RESULTS

### RESULTS BIOENDEV EVALUATION    RESULTS BIO2FUELS EVALUATION

- Technology**

- Process control ✓
- Tar control ✓
- Product cooling ✓
- Pelleting ✓
- Up-scaling ✓
- Cost-reduction !

- Economy**

- Small margins, but
- Appealing economy
- Raw material/product price  
most influential variables!

- Process**

- General process-concept ✓
- C negativity ✓
- H enrichment ✓
- Ash separation (theor.) ✓
- Ash separation (exp.) ✓

- System, economy**

- |                        |                |
|------------------------|----------------|
| ○ Thermal reforming    | Not possible   |
| ○ Cat. steam reforming | Seems to work  |
| ○ Economic analysis    | To costly      |
| ○ Technical solutions  | Potentially OK |

Quick learning curve desired  
because of the small margins!

Higher product price/CO<sub>2</sub>-cost!

More interesting with initial  
electricity, and subsequent  
potential green chemicals!

