

## Black Birds

Combined thermochemical and catalytic processing adapted for the production of high-value products and energy from lignin

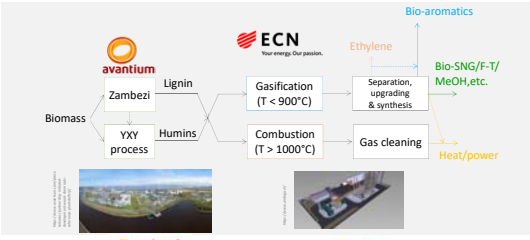
TEBE117010

Geertruidenberg, 15<sup>th</sup> March 2018 / G. Aranda Almansa (ECN)

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Circular Congres:  
Agrifood, chemie en energie samen naar een circulaire economie

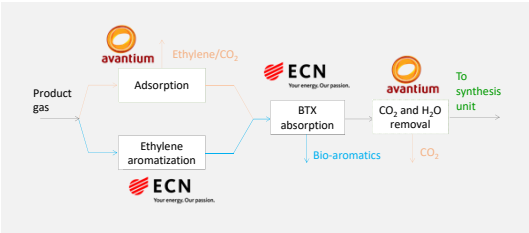
## The "Birds" concept (I)



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## The "Birds" concept (II)



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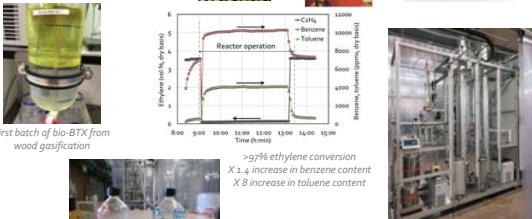
## Our plan

- Production and thermochemical valorization of Zambezi lignin.
- Optimization of ethylene aromatization and chemical absorption/adsorption.
- Upscaling of the technologies (1 Nm<sup>3</sup>/h feed gas).
- Application of the bio-BTX product → polymers.
- Close collaboration with end users:
  - Logistics: how to incorporate small streams of bio-BTX in production systems and in the market.
  - Quality of bio-BTX product: impurity levels.
- Synergies: AMBIGO pilot plant, Biorizon network, Zambezi process.

**ambigo** **Biorizon** **Zambezi** **RWE** **TKI-BBE**

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## A sound basis



First batch of bio-BTX from wood gasification

>97% ethylene conversion  
X 1.4 increase in benzene content  
X 8 increase in toluene content

>> Bio-BTX from wood- and sewage sludge product gas, > 97% recovery, 2017

Bio-BTX scrubber unit + automated product separation (1 Nm<sup>3</sup>/h feed)

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## The impact of our project

Stakeholder	Impact
2 <sup>nd</sup> -gen biorefinery processes	New markets for side-streams
Biomass gasification plants (including green gas)	Increase of plant revenues Decrease of production cost
Catalyst companies	Expand market portfolio
End users bio-BTX	Greening product portfolio Reduction of CO <sub>2</sub> emissions
Dutch government	CO <sub>2</sub> targets and implementation of bio-based economy

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## Take-home messages



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- Low-T gasification: potential source for high-value chemicals → towards the **thermochemical biorefinery**.
- Low-value biomass + co-production = lower production cost of bio-SNG.
- Good market perspectives.
- Sound project approach.
- Close involvement of end-users in advisory role.
- Strong consortium – synergies with strategic projects and networks.
- Solid basis: upscaling, then we are ready for demonstration!

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Thanks for your attention!

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