

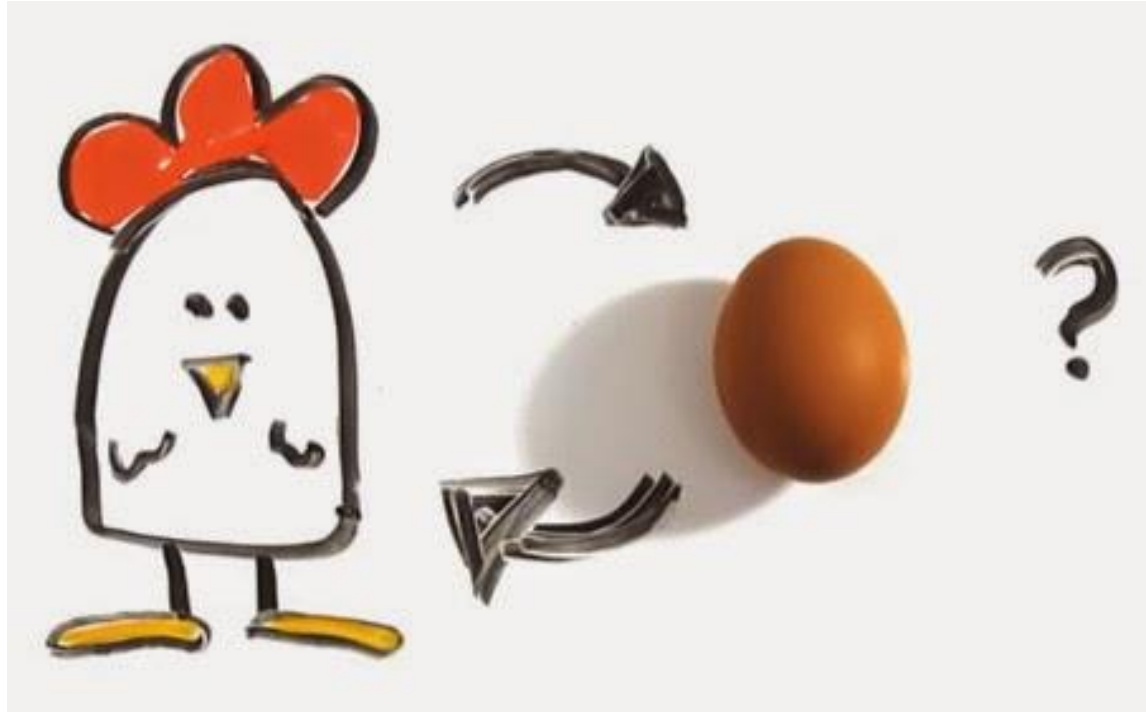
# Give competitors a helping hand or throw a spanner in the works?

An agent-based model simulating the  
development of a corn stover market

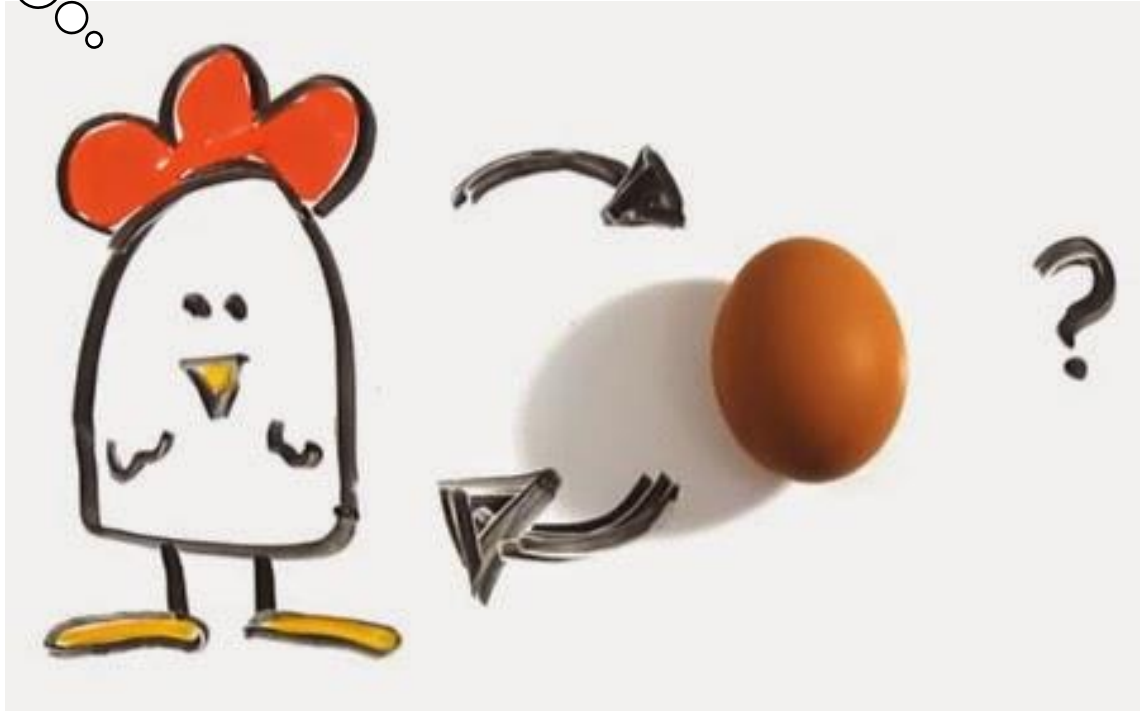
Anouk Mertens, Jef Van Meensel, Jeroen Buysse

*16<sup>th</sup> PhD Symposium Agricultural and Natural Resource Economics – Brussels – 29/04/2015*



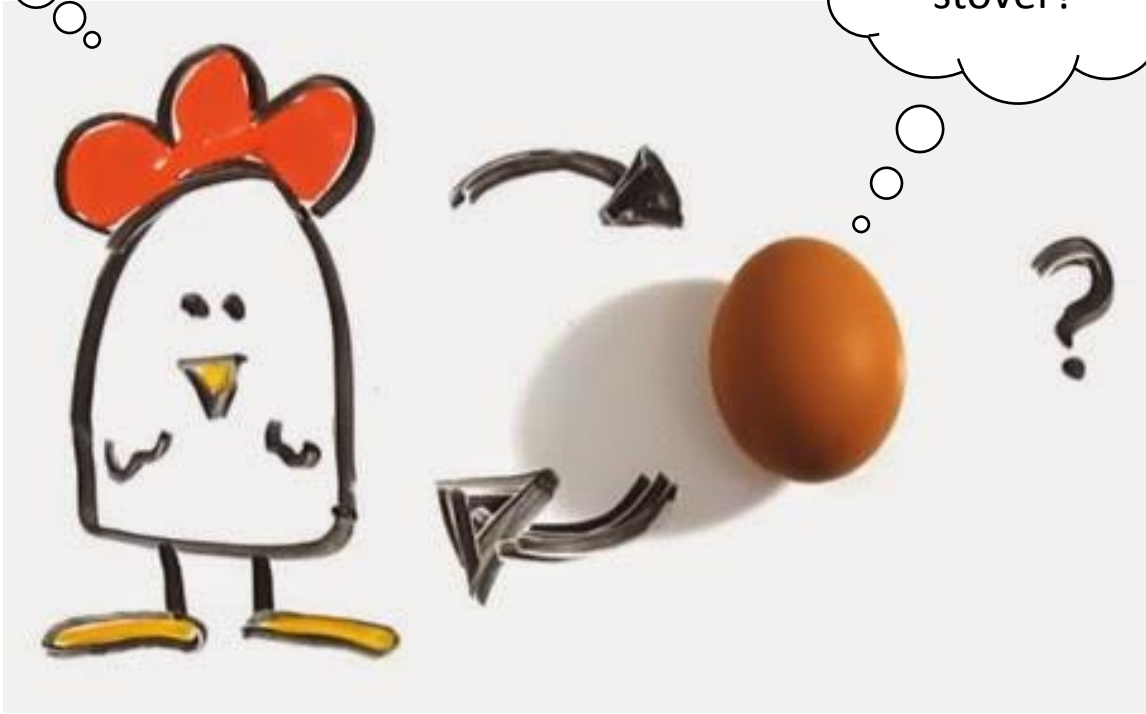


Enough stover?



Enough stover?

Market for stover?



# Feedstock risk for investors

BEP: Large feedstock risk



Large volumes

No alternative feedstock

# Feedstock risk for investors

BEP: Large feedstock risk



Large volumes  
No alternative feedstock

AD: Smaller feedstock risk



Small volumes  
Alternative feedstock

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Small volumes  
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Promote competition?




Give competitors a helping hand  
or  
throw a spanner in the works?

# Can competition reduce the feedstock risk for a BEP?

 Agent-based model

 Scenario analysis

 Evaluation of the research question

# Can competition reduce the feedstock risk for a BEP?



Agent-based model



What is agent-based modelling?

Overview of the agent-based model



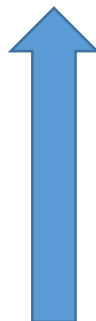
Scenario analysis

# ABM is modelling individual decisions at micro-level in order to observe market properties at macro-level

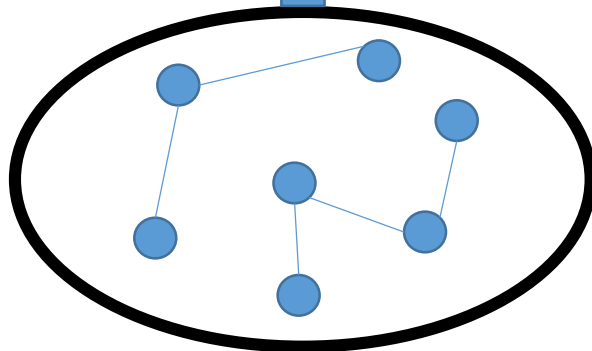
Macro-level



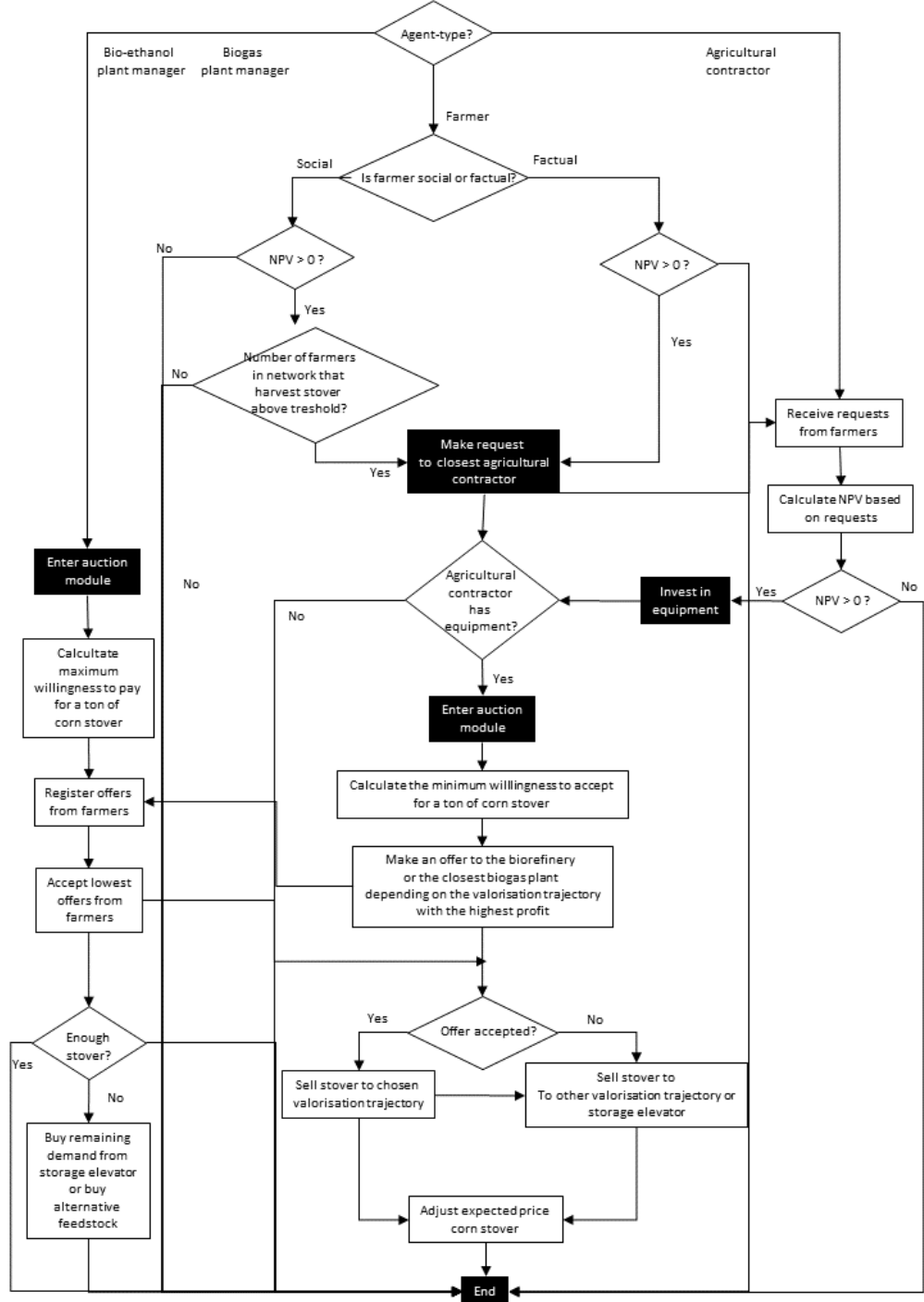
- Emergent phenomenon



Micro-level



- Many agents
- Interactions
- Behavioural rules




# Can competition reduce the feedstock risk for a BEP?

■ Agent-based model

■ Scenario analysis

Overview of the scenarios  
Results

A thin black line starts from the bottom of the 'Scenario analysis' text, extends horizontally to the right, and then turns vertically upwards to point towards the 'Overview of the scenarios Results' text.

# We did simulations for three scenarios

## No competition scenario

- Only BEP in the market
- Entry at start of simulations

## Competition scenario:

- Both BEP and AD in the market
- Entry at start of simulations

## Late entry BEP scenario

- Both BEP and AD in the market
- Entry BEP 5 years after start of simulations

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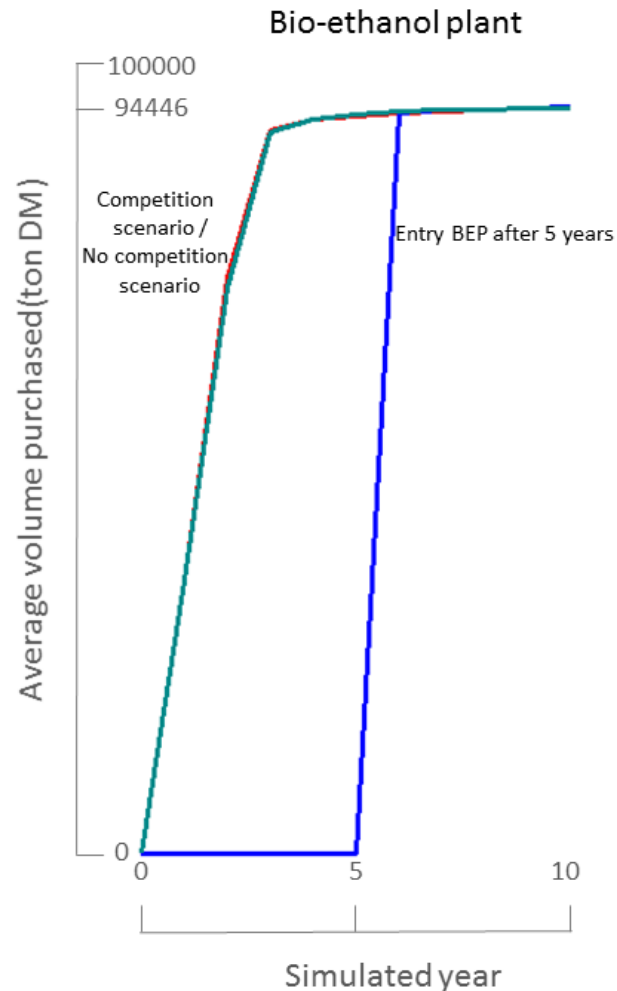
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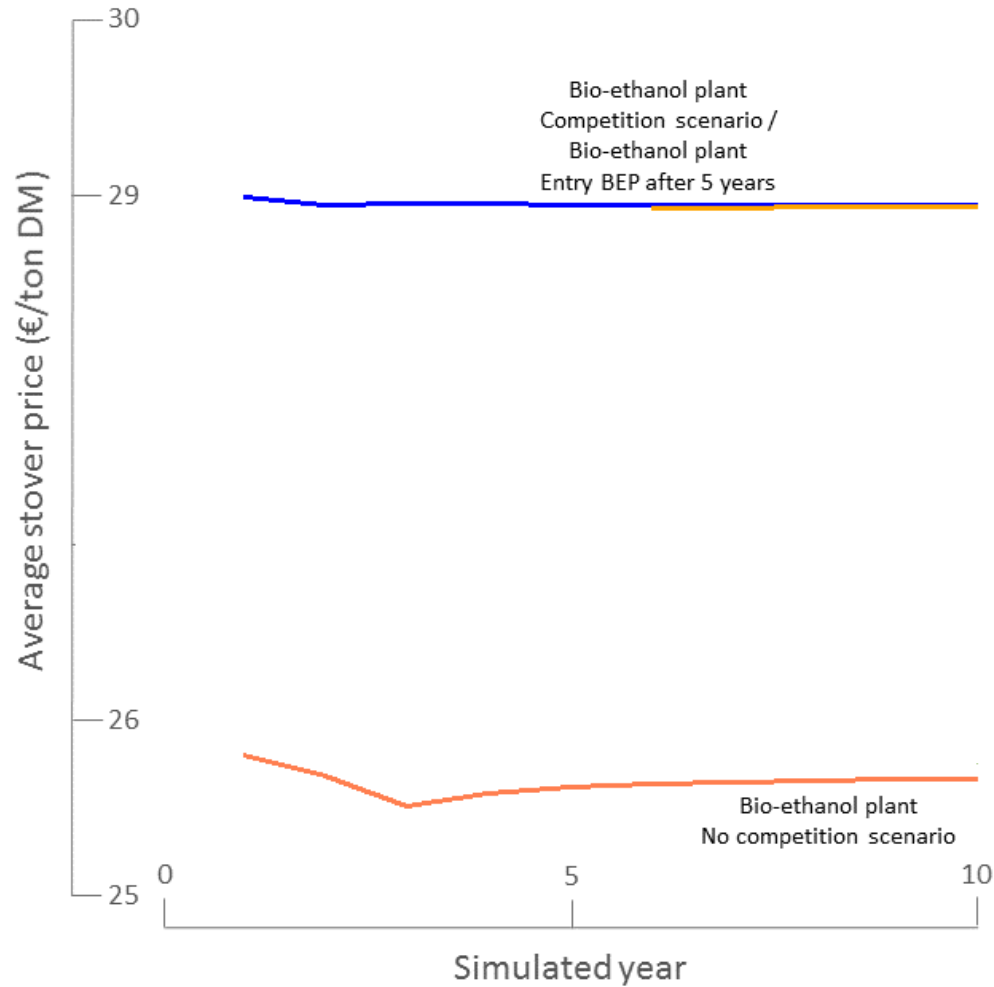
## Late entry BEP scenario

- Both BEP and AD in the market
- Entry BEP 5 years after start of simulations

When the BEP manager enters the market after 5 years, he can immediately purchase 94% of its maximum capacity




# BEP stover prices rise significantly in case of competition with AD



# Can competition reduce the feedstock risk for a BEP?

 Agent-based model

 Scenario analysis

 Evaluation of the research question

# Give competitors a helping hand or throw a spanner in the works?

## Spanner in the works:

- Significant price increase

## Helping hand:

- Decrease of feedstock risk



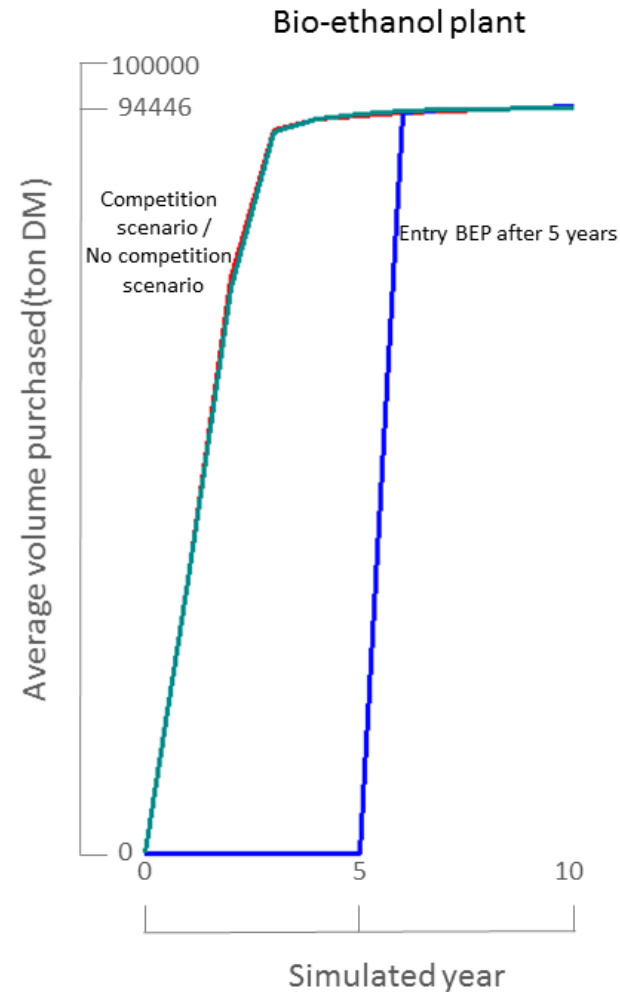
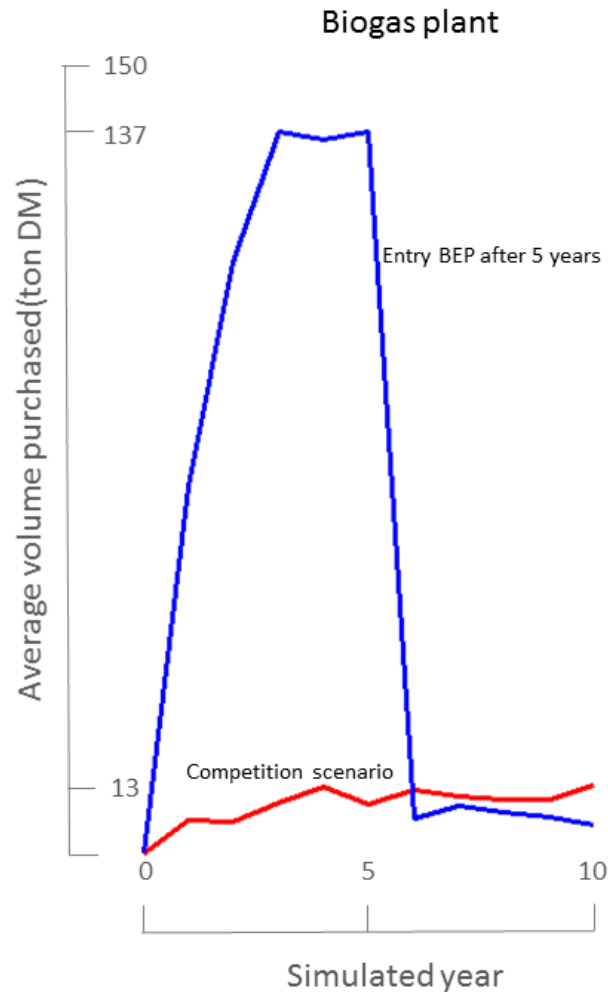
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# BEP stover prices rise significantly in case of competition with biogas plants

