



Agricultural and Construction  
Equipment



# A Short term Approach to in-field Harvesting and Handing Bio-feedstocks

## CNH Biomass Activities - 2004/2010



Corn Cobs



Corn Stover



Dedicated Crops

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## Discussion Outline

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### SHORT TERM BIOMASS HARVESTING STRATEGY FOR A MAJOR OEM

- Who is Case New Holland (CNH)
- Key strategy to CNH's involvement for harvesting bio-feedstocks
- Equipment line up under test
- Bio-feedstocks being harvested
- Lessons learned
- Using the bio-fuels on the farm (in our equipment)
- The ultimate harvesting & handling solution





# Who CNH (Case New Holland) is...



# CASE IH Agricultural products



*The highest performance production tools*

*> 13 Product Lines  
> 220 Models*

Soil Preparation



Seeding & Planting



Spraying & Fertilizing



Haying



Harvesting



# New Holland Agricultural products



*The Specialist in Agriculture*

> 20 Product Lines  
> 300 Models



## Short Term Biomass Strategy

- NA, SA & Western Europe
- Key focus: Production & Harvesting with minimal changes (tuning) current product lines
  - In the field
  - ▶ Understand storage needs & transportation
    - From field to storage – w/cooperators
    - From storage to conversion facility – w/cooperators
  - ▶ Understand conversion needs such as moisture, cleanliness, particle size
    - Cellulosic conversion to liquids
    - Direct combustion
    - Gasification/Pyrolysis
    - Methane generation



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CASE IH & New Holland branded Crop establishment equipment  
Traditional crops plus switchgrass, energy sorghum etc

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CASE IH & New Holland branded production related equipment  
Watch for labeled pesticides for energy crops

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# CASE IH & New Holland branded Self Propelled Harvesting equipment



# Equipment for Dedicated Grasses/Straw/Stover/Sugarcane residue

- Preparation Eq.

- Mowers
- Rakes



- Large Square Balers



- Round Balers



- Material Handling

- Accumulators
- Bale Wagons



# CNH Single Pass Equipment (green material for biogas, wood chips)

- FR9000 with Direct Cut Header 570 FW for green grass/small grain crops used for methane gas generation in biogas installations – strong EU applications
- FR9000 with FB130 header for willow and Poplar energy crops, direct combustion & 2<sup>nd</sup> generation ethanol



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## Cob Collection Activities

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# CNH Single Pass Equipment (loose cobs)

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## CNH Single Pass Equipment (cobs & husks)

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## CNH Single Pass Equipment (cobs & husks)

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## CNH Single Pass Equipment (straw)

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# Cob & Stover Collection Activities

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# Energy Sorghum (Texas)



Cane / Energy Sorghum



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# Energy Sorghum activities – Baling & chopping

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# Sorghum / Sweet Sorghum (Florida)



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# Switchgrass Activities (Canada, Kentucky, Penn, Tenn,)

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# Miscanthus (Europe & US)





# Coppice woody crops (Europe & US)



Willow NY March 2009



Poplar OR March 2009



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# Lessons learned



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## Lessons learned

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## Lessons learned



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# Bio Fuel used on the Farm – Bio Diesel



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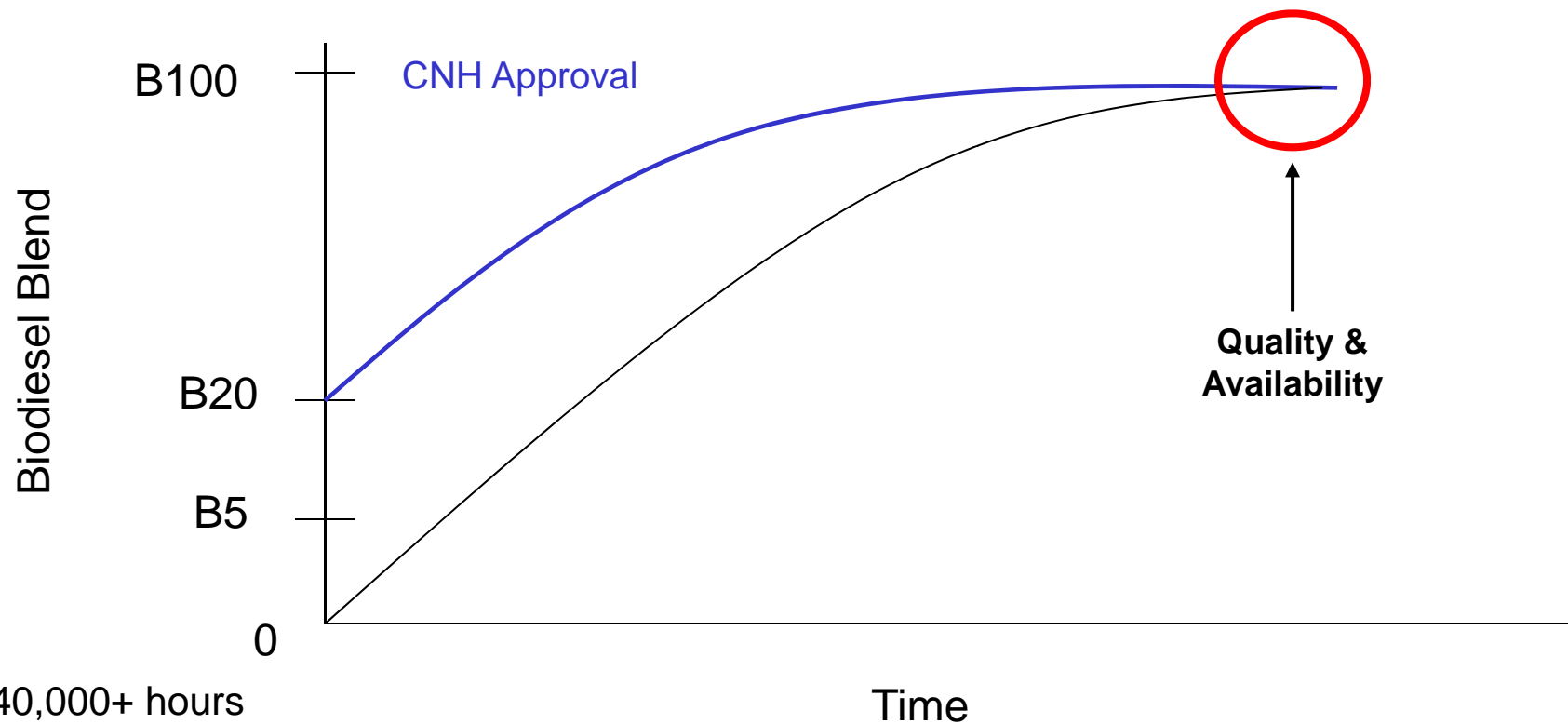
# Bio Fuel used on the Farm – Bio Diesel

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## Bio Fuel used on the Farm – Bio Diesel

***CNH is ready as quality and availability of biodiesel blends is acceptable and consistent!***



- 40,000+ hours
- fleet of 70 engines
- using B100

# Bio Fuel used on the Farm – Biogas (methane)



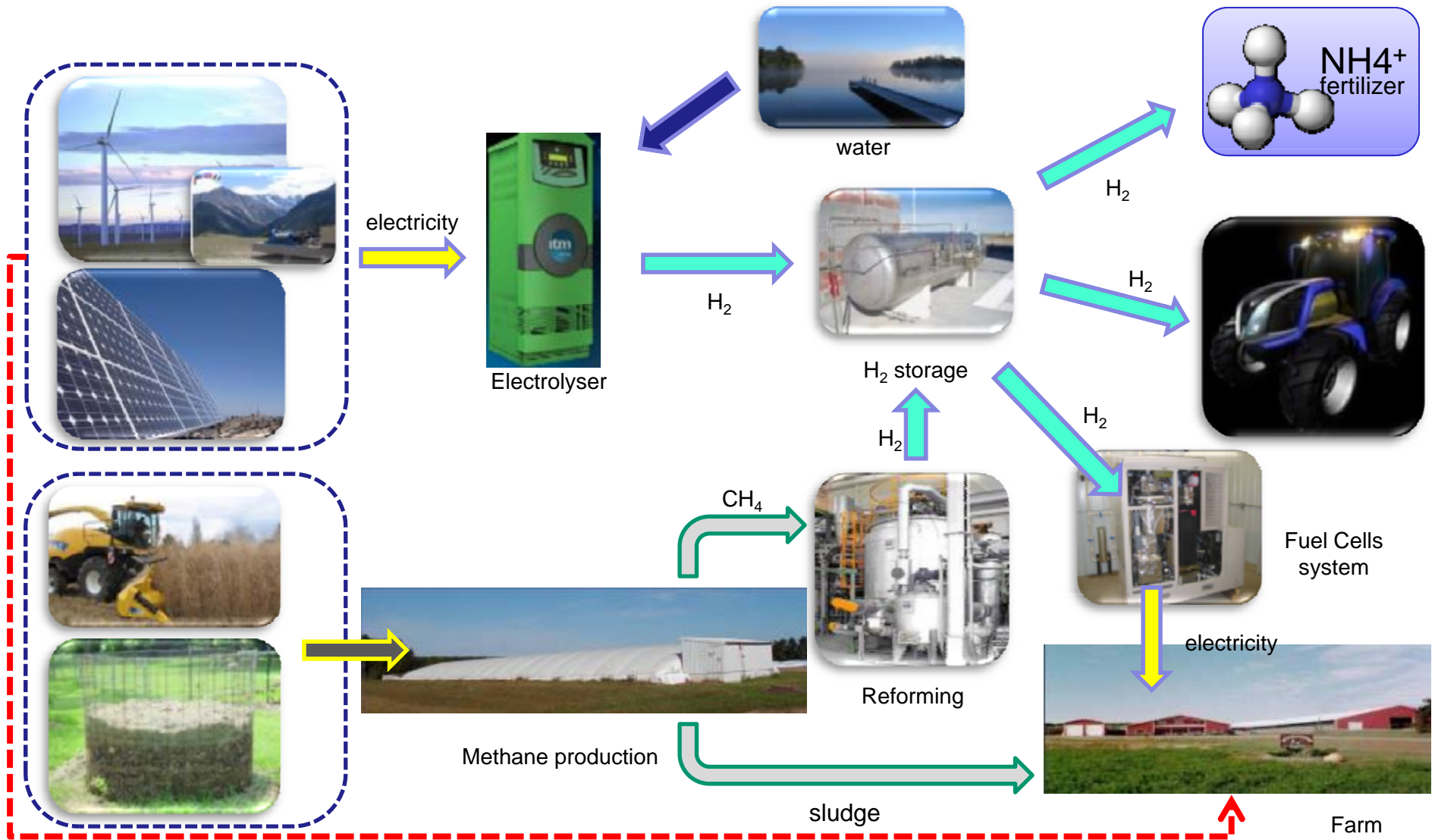
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# Hydrogen Fuel Cell Tractor

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# Bio Fuel used on the Farm



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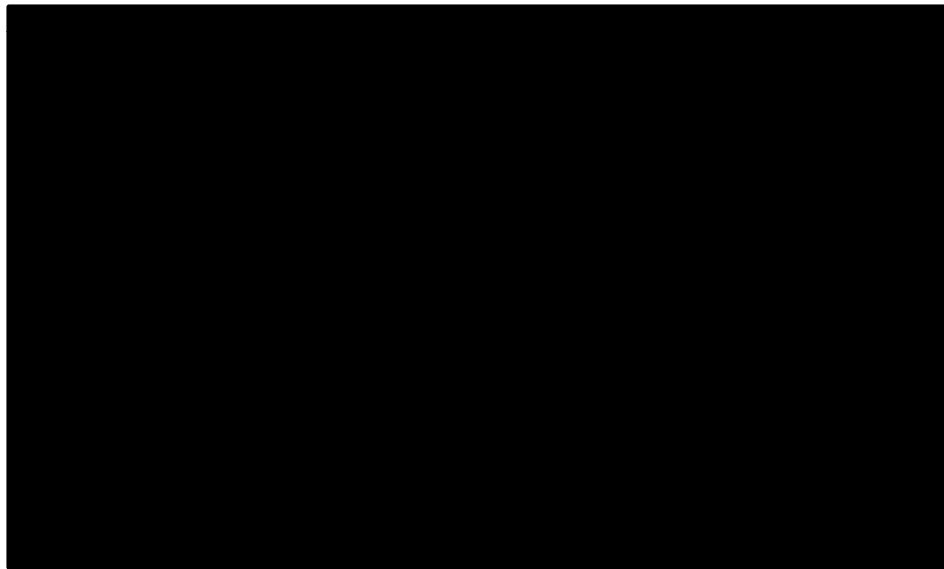


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## CNH Biomass Activities - 2004/2010

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**The ultimate harvesting & handling solution**





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## CNH Biomass Activities - 2004/2010

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### What is the ultimate conversion systems requirement?

- Able to utilize wide variety of feedstocks or very focused on specific feedstock or component?
- Just in time delivery and able to handle wet and/or dry feedstock?
- Any pre-treatment required – cleaning, sorting, size reduction?

