

The New Zealand Institute for Plant & Food Research Limited

Plant & Food  
**RESEARCH**

RANGAHAU AHUMĀRA KAI



# Arable Feedstocks for Biogas

Mixed crop rotations for food, feed  
and energy production

**Prepared by:**  
Rocky Renquist

# Synergies with anaerobic digestion



- § Why the interest in AD by P&FR and FAR?
- § Bringing together the positives for 2 sectors
  
- § Pastoral: water quality; AD slurry bests manure slurry in terms of GHG; energy capture
  
- § Arable: value in residues (add value via pre-treatment); arable crops via AD give the most biofuel/ha/yr
  
- § Two-sector synergies

# European Experience



Germany has 4000 biogas plants, mostly on large maize farms.

The govt incentive was by having electricity companies pay a subsidised price for renewable electricity, so biogas is used to generate electricity which is fed into the grid.

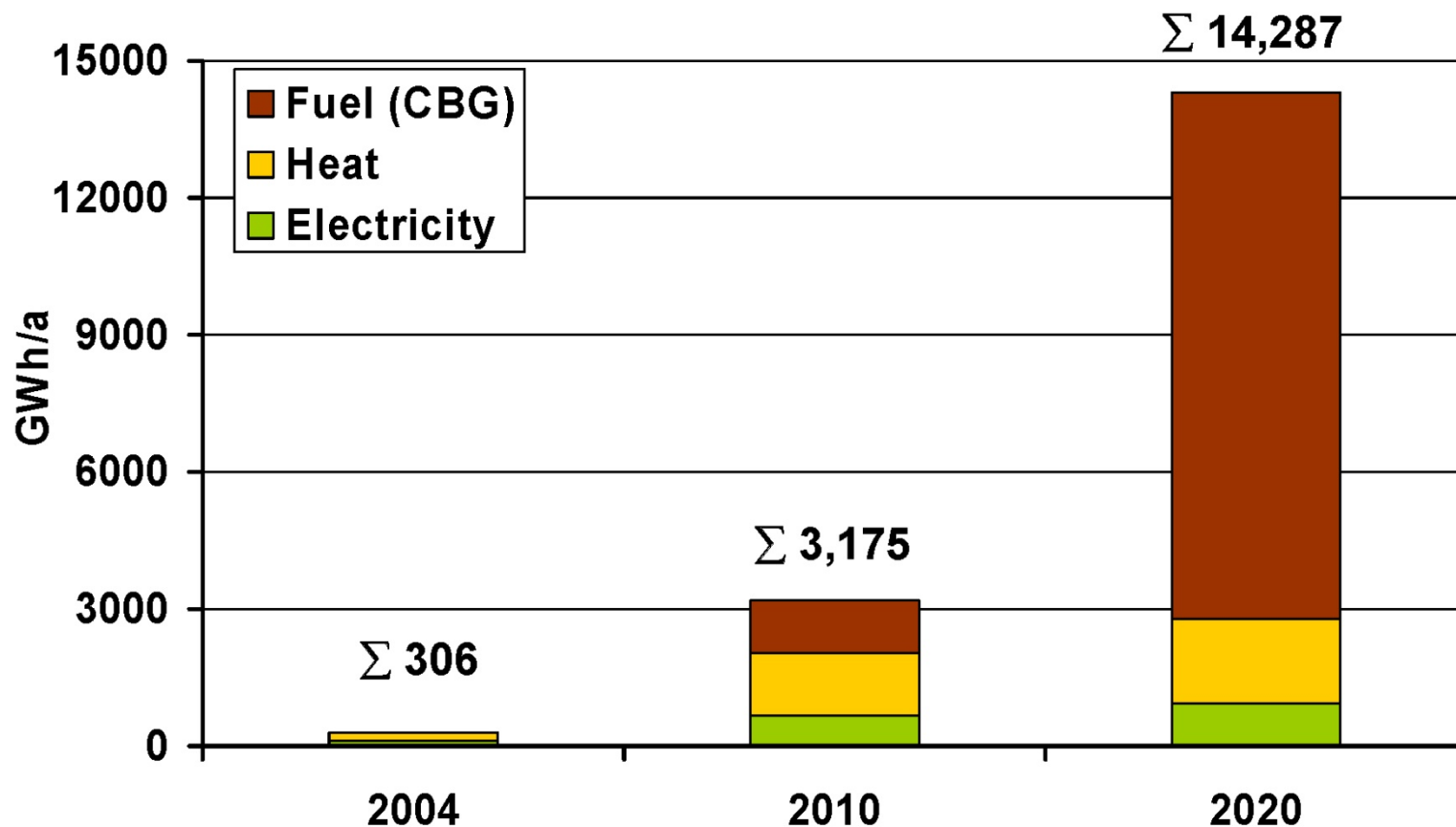
Austria has similar uptake and a well organised biogas industry. I have research collaborators there, so I will present their information.

(the following 4 slides are courtesy of Thomas Amon in BOKU, a research unit in the University of Vienna; Austria)

from Amon, et.al. 2007



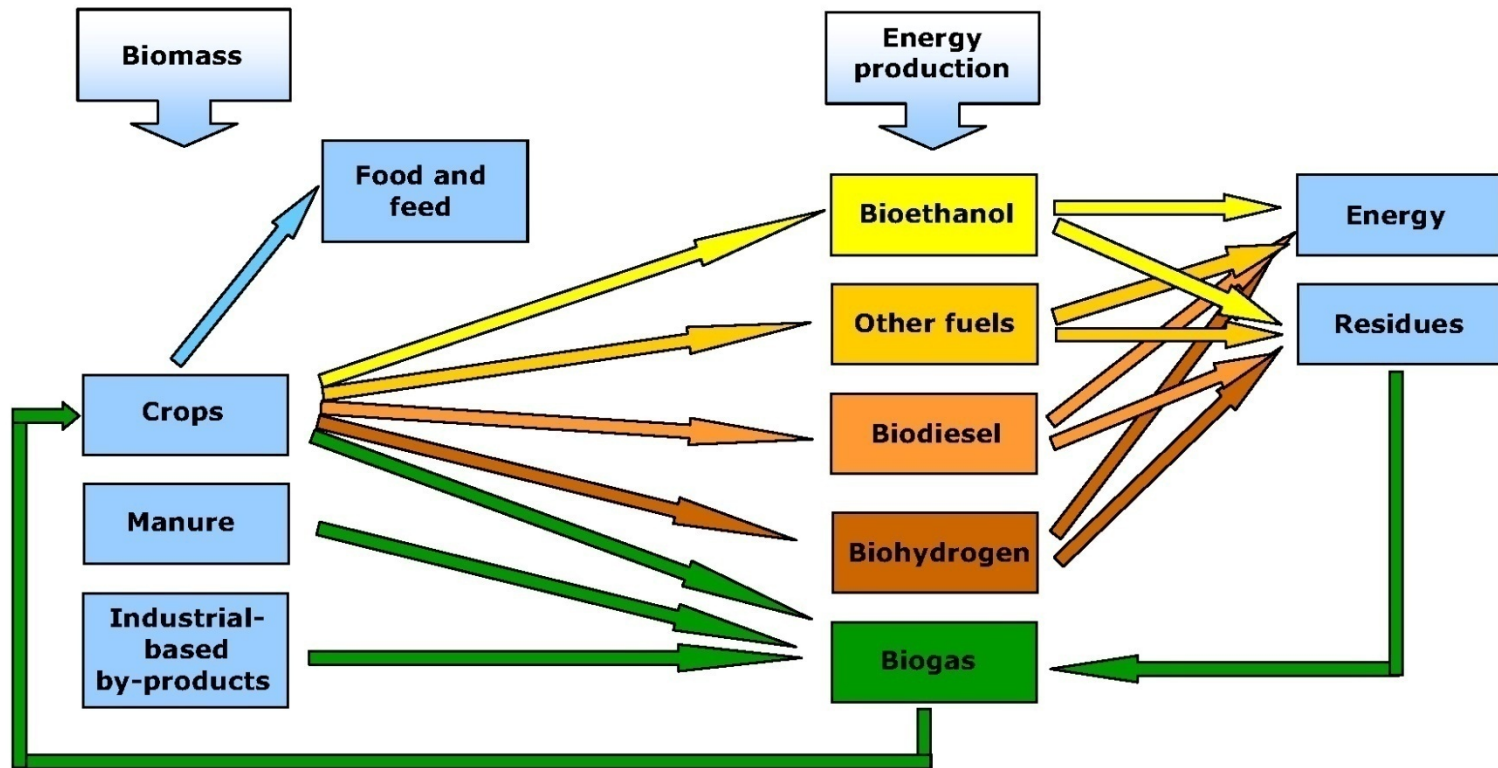
## Road map of biogas industry according to the Austrian biomass action plan



from Amon, et.al. 2007



## Fuel-oriented fully-integrated biorefinery system



from Amon, et.al. 2007



## Crop rotations

### Specialised

Crop rotation predominantly serves for:

- production of biomass for biogas use



### Integrated

Crop rotation serves for :

- production of food and feed
- production of raw materials for industry, organic fertilisers etc. **and** energy (biogas; RME)
- Sustainable use of versatile man-made landscape

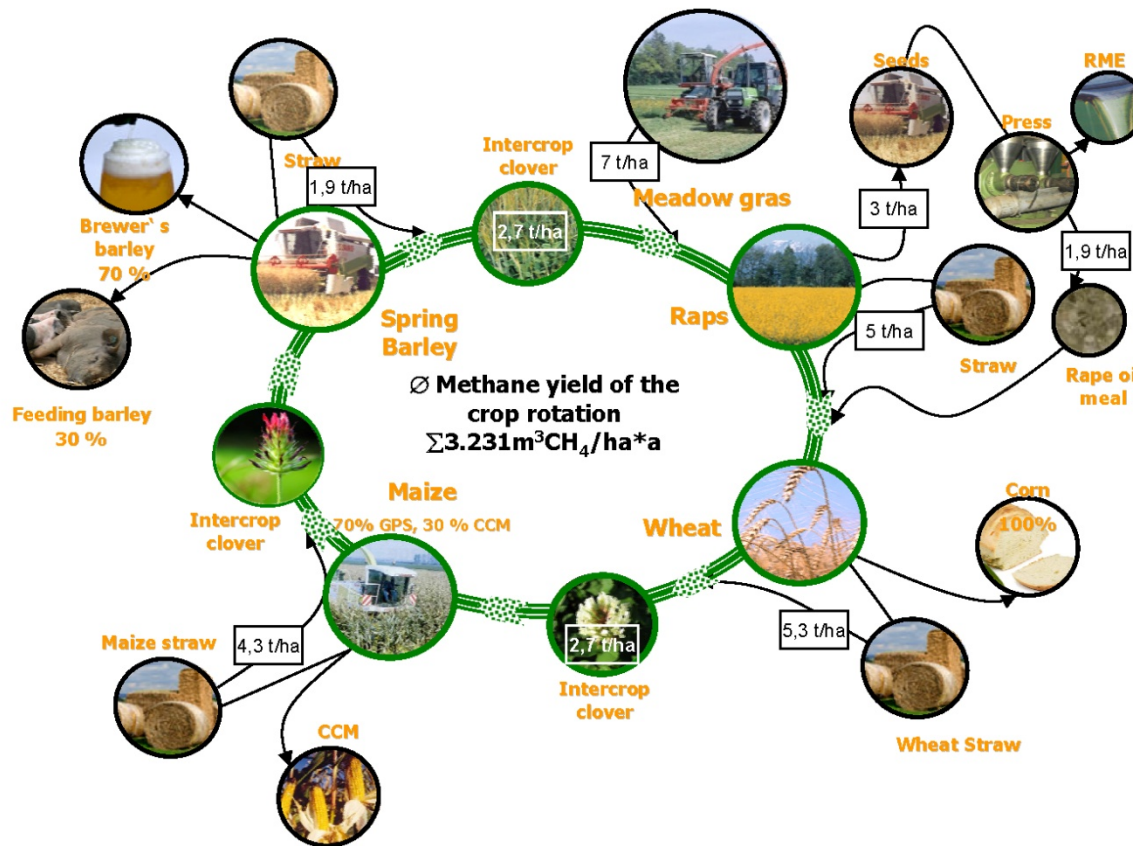


**Which system is more efficient ?**

from Amon, et.al. 2007



# Biogas production from integrated biorefinery complexes and sustainable crop rotations



The New Zealand Institute for Plant & Food Research Limited

Plant & Food  
**RESEARCH**

RANGAHAU AHUMĀRA KAI



[www.plantandfood.com](http://www.plantandfood.com)