



# **Palopuro agroecological symbiosis**

**Local sustainable food and farming pilot based on  
anaerobic digestion of residues for energy and  
recyclable nutrients**

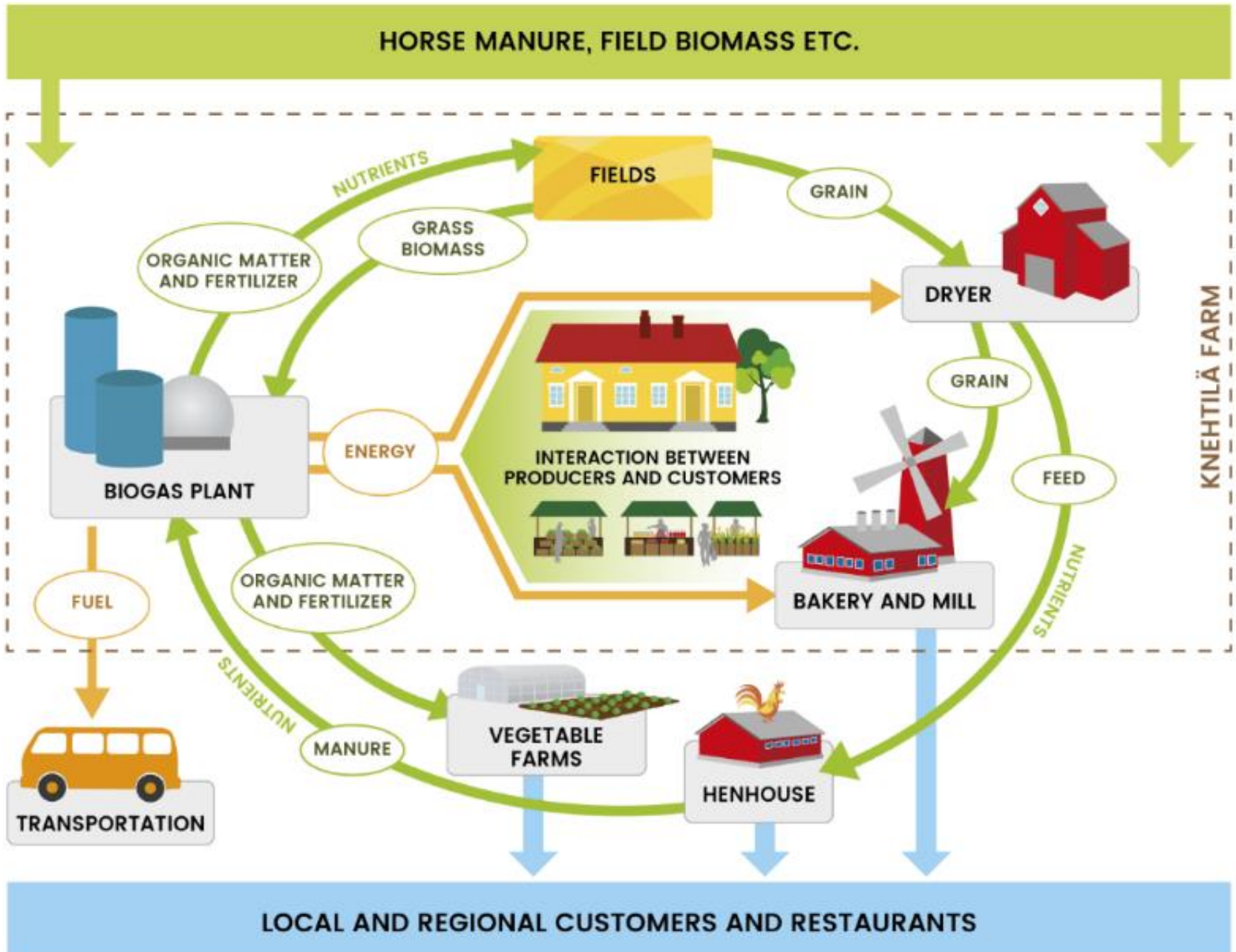
**The sixth Nordic Biogas Conference (NBC)**

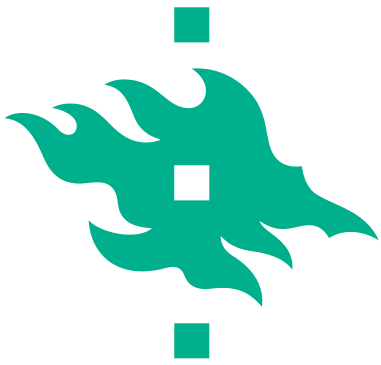
Viking Grace, 8 September 2016

An aerial photograph of a farm complex. The central focus is a large, multi-story barn with a complex roof structure. To its right is a smaller, two-story house. In the foreground, there is a long, low, dark-colored structure, possibly a greenhouse or covered walkway. The farm is surrounded by fields and a dense forest in the background. The text "Agroecological symbiosis?" is overlaid in the center of the image.

# Agroecological symbiosis?

# Palopuro Agroecological Symbiosis

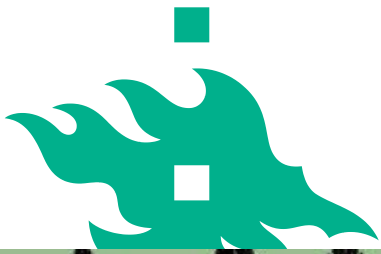


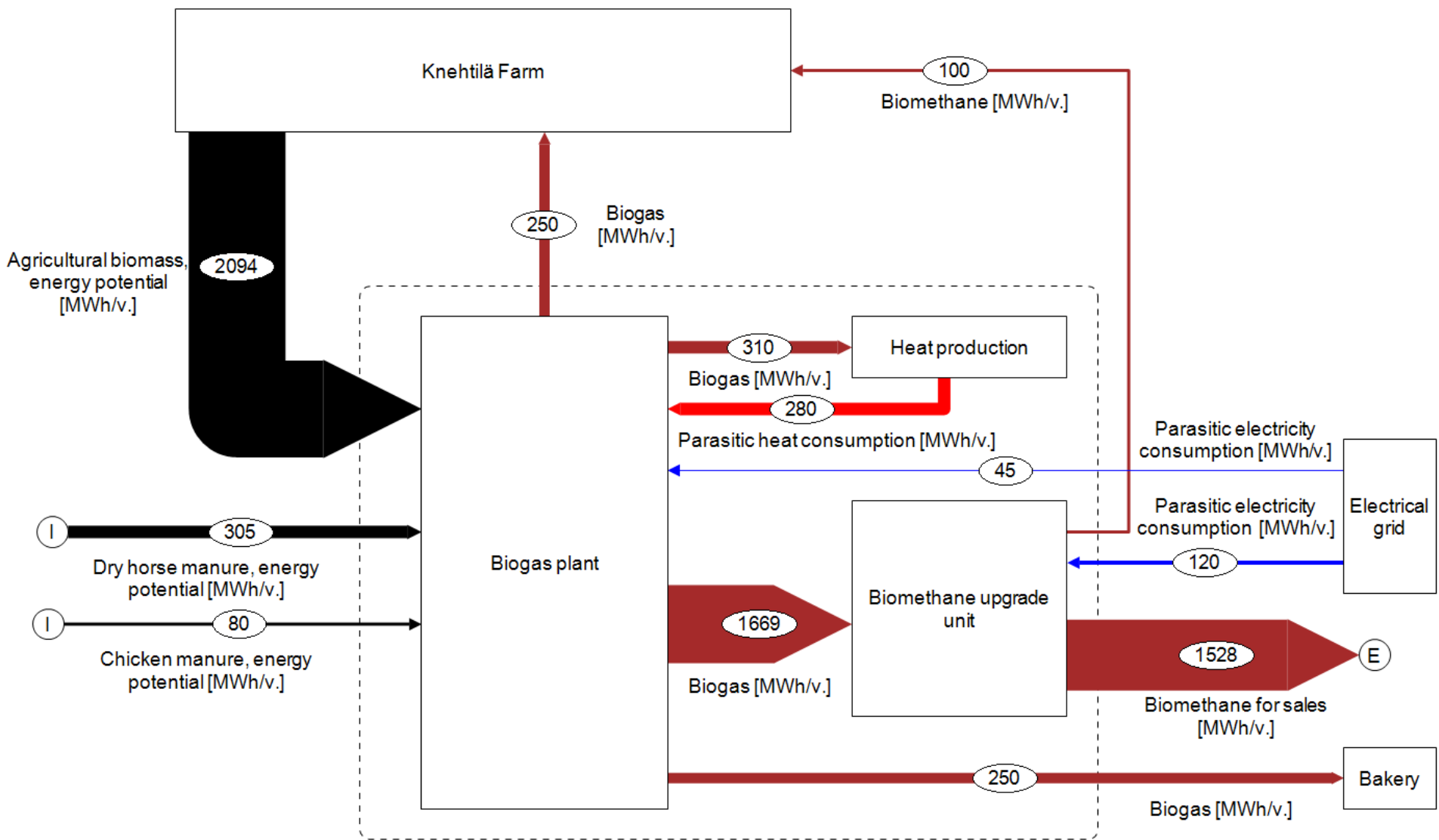


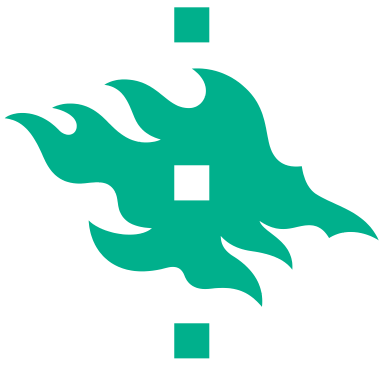
# Palopuro Pilot project

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- Dry digestion (high dry matter content in feeds)
  - Green manure leys, fallows 2 350 tn
  - Horse manure 1 000 tn
  - Chicken manure 80 tn
- Renewable energy used in baking, grain drying and for sale to 130 passenger cars
- Organic fertilizer for 130-150 ha
- All the biomasses locally available



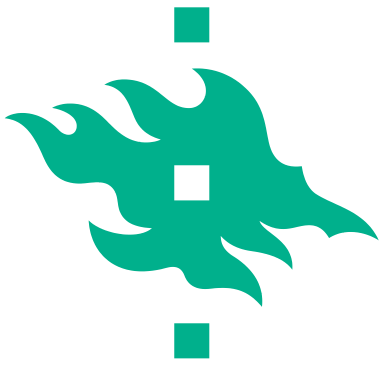




# Business model for the biogas production

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- Based on cooperation
  - Regional energy company
  - Local stakeholders
  - Biogas plant manufacturer
- Implementation in other places/regions

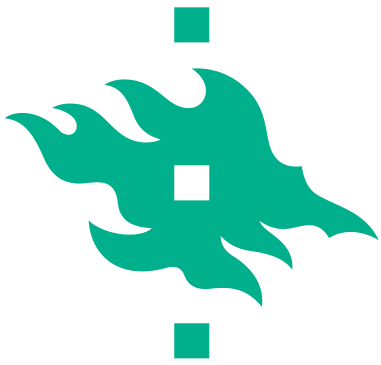


# Why farm scale biogas production?

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- In Finland 200 000 – 300 000 ha grassland not in food production
  - Possibility to biological N-fixation (good yields without fertilizers)
  - Also the smaller biomasses can be used
- Low utilisation of horse manure
- More business opportunities in countryside
- Increase in social resources and countryside viability

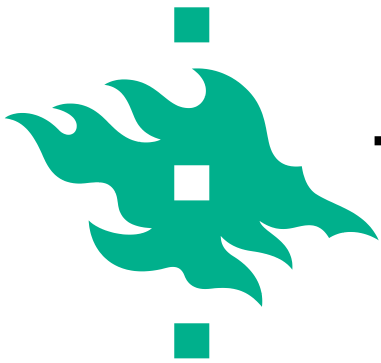




# Why farm scale biogas production?

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- Agronomical benefits
  - Enhance the productivity in organic farming
  - Reduced need of mineral fertilizers in conventional farms
  - Grasses in crop rotation → better soil quality
    - Better soil quality
    - Carbon sequestration
- New source of income from energy sales
- Other environmental reasons



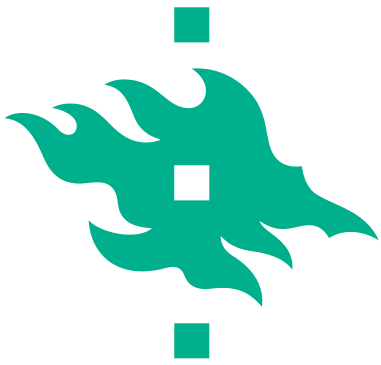
# The challenges

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- High investment costs and risks
- Feasibility of Rural Development Programme
- The volatility in energy and fertilizer prices
- Transportation policies



**Palopuro agroecological  
symbiosis project**



# Palopuro acroecological symbiosis project

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- The projects runs for 2015-2016
- Responsible partner: University of Helsinki
- Project partner: Natural Resources Institute Finland
- Funded by the Ministry of Environment (RAKI-projects)
- Project coordinator: Kari Koppelmäki  
(kari.koppelmaki@helsinki.fi)
- <http://blogs.helsinki.fi/palopuronsymbioosi>

**Kiitos  
(Thank you!)**



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LUONNONVARAKESKUS

