





NaRoLa

Analyzing Bioenergy and Land Use Competition in a Coupled Modelling System

The NaRoLa Project

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NaRoLa Questions Motivation **NaRoLa** Outlook

Outline

- Research questions
- Motivation
- The NaRoLa project
 - The Integrated Modelling System
 - First results
- Outlook

2/14










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Research Questions

- NaRoLa – Renewable Resources and Land Use: Integration of bioenergy into a sustainable energy strategy
- Using and extending established as well as newly developed economic and agricultural models
- Assess the role of bioenergy from an economic and agricultural science perspective
 - To what extent does bioenergy production create land use conflicts?
 - What is the impact on agricultural and food prices?
 - Which are potential repercussions for rural areas in Germany?
 - How do global markets react and interact?

3/14

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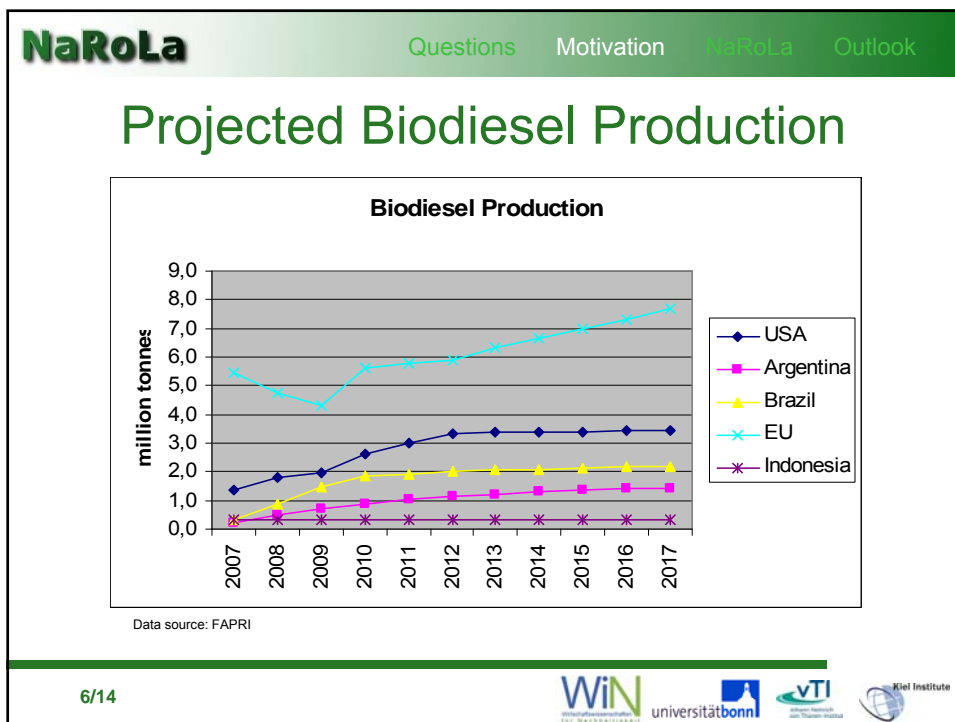
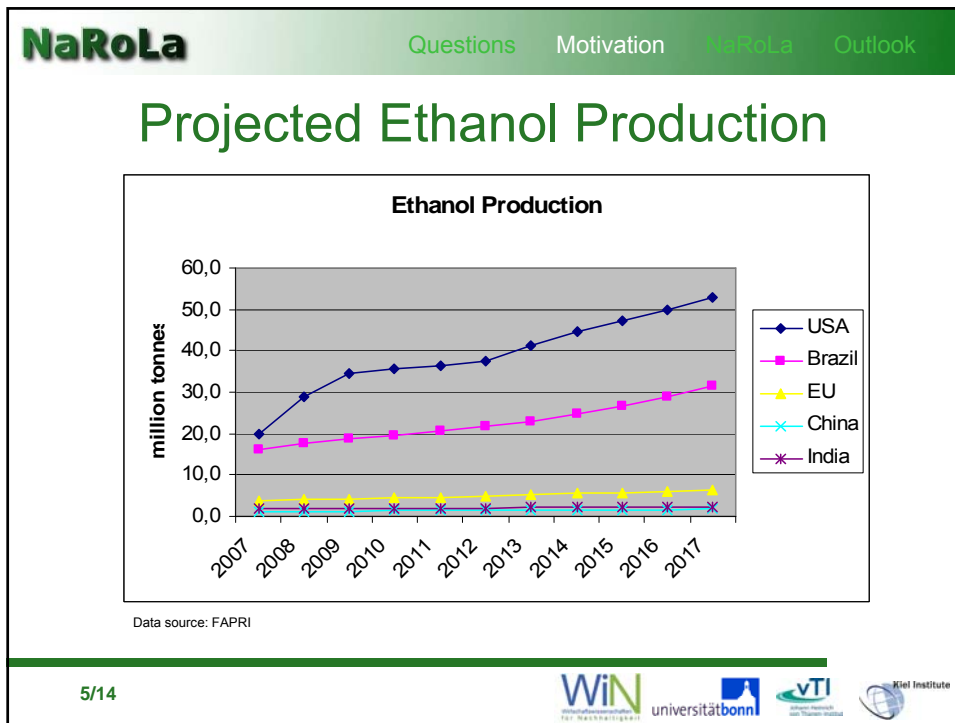
Motivation

- **Integrated assessment**
 - Combining economic and agricultural models
 - Linking global and local dimension
- **Global perspective**
 - Focus on Germany alone too narrow
 - International agricultural market developments have local repercussions
 - Need for a global economic model

4/14












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The NaRoLa Models

- DART (IfW):
 - A multi-region, multi-sector computable general equilibrium model
 - Extended by technologies that produce biogas, biodiesel and ethanol using diverse energy crops
 - Countries/regions are linked via trade so that national as well as international feedback effects of increased bioenergy production can be analyzed
 - Global perspective
- RAUMIS (vTI):
 - Detailed representation of the German agricultural sector
 - Generates supply functions for various crops on a regional level (NUTSIII)
 - Analyzes the impact of alternative policies on agricultural land use, production, input use and income
 - Regional perspective within Germany

7/14










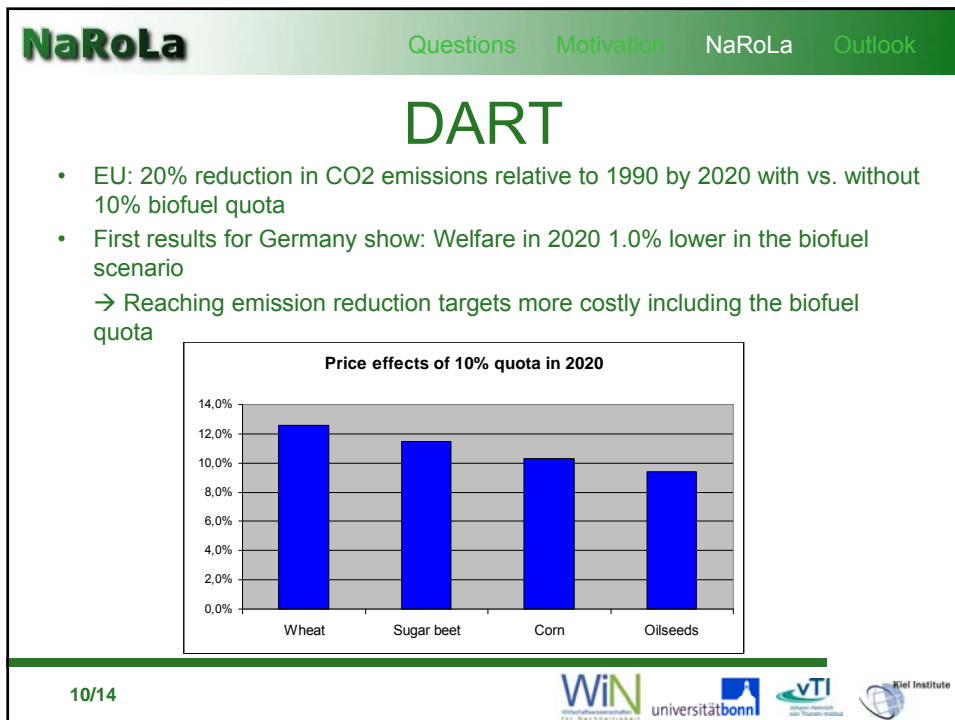
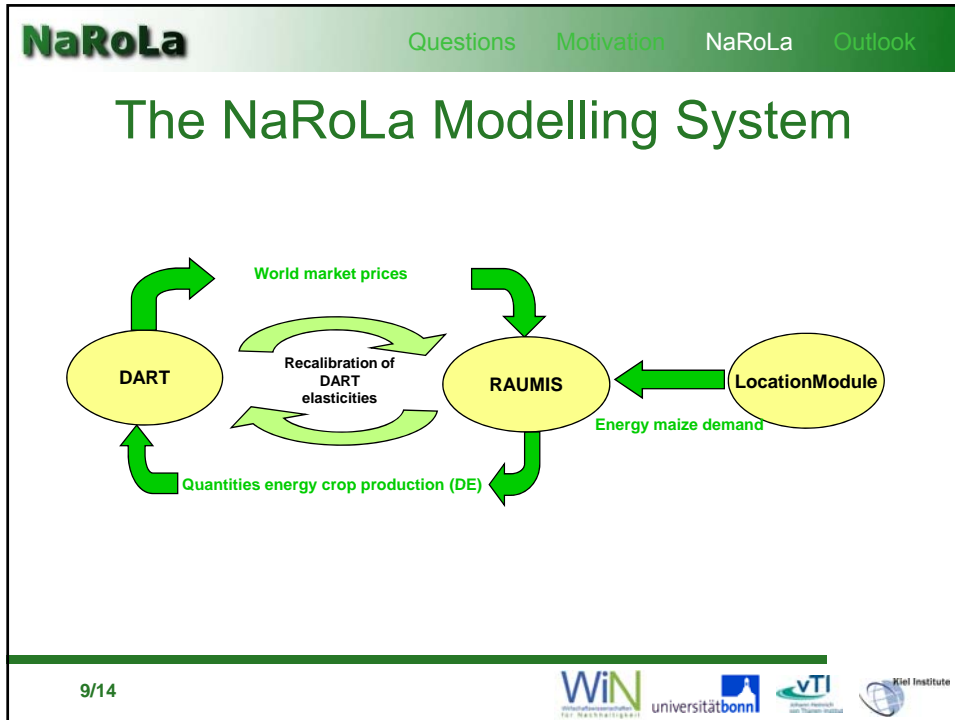
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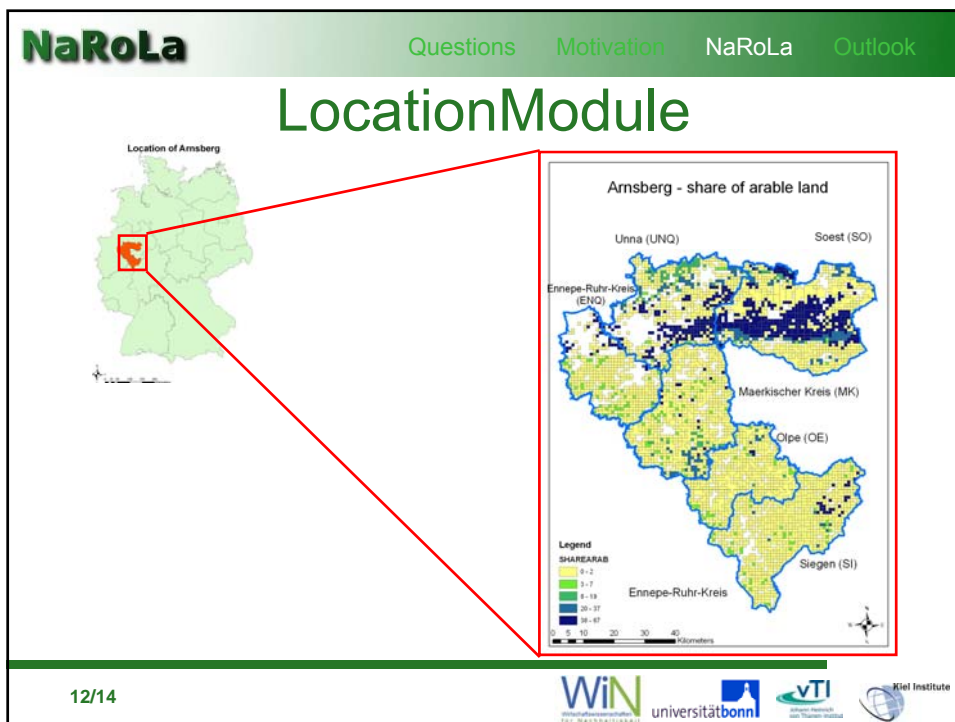
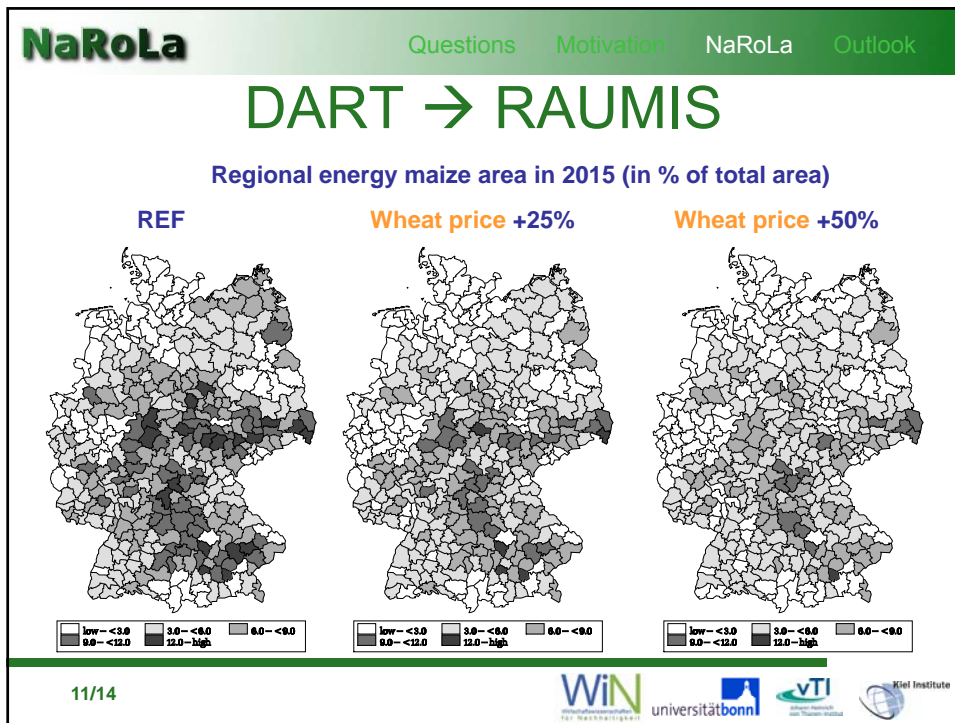
The NaRoLa Models

- LocationModule (Uni Bonn):
 - Newly developed for NaRoLa
 - Decision tool for the location of biogas plants (based on energy maize)
 - Location decision influenced by renewable energy policies (EEG), infrastructure, transport costs, availability of crop supply
 - Generates a demand function for energy maize that is fed back into RAUMIS
 - Regional perspective within Germany

8/14









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Outlook

- Phase 1 completed: Extending and developing the models
- Phase 2: Simulations:
 - First results confirm that emission reduction targets can be met more cost effectively without the use of bioenergy
 - Feedback effects on world agricultural markets expected
 - The role of certification: Will EU biofuel imports count for quota?
- Phase 3: Policy recommendations

13/14

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Future results → www.narola.ifw-kiel.de

Thank you for your attention!

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14/14

