

Biomass production in sustainably managed landscapes

Ioannis Dimitriou
 SLU, Sweden
 IEA Bioenergy Task 43

IEA Bioenergy ExCo77 workshop Tuesday 17 May 2016, Rome – Italy
 Mobilizing sustainable bioenergy supply chains: opportunities for agriculture

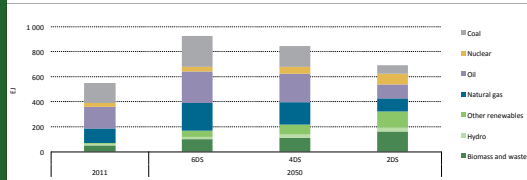


Swedish University of Agricultural Sciences

IEA Bioenergy

Bioenergy

- significant scope to make a greater contribution to secure and sustainable energy provision



Global modelling results - Total primary energy supply

IEA Energy Technology Perspectives 2014

Our Goal

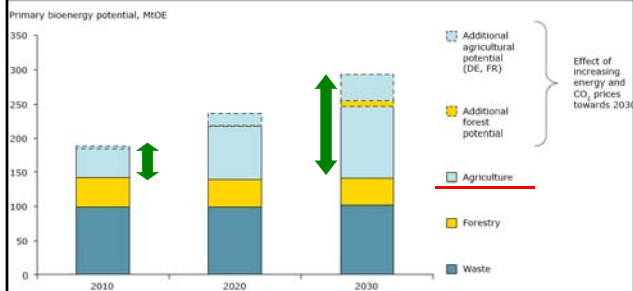
How to go from today's ca. 50 to ca. 150 EJ/yr in 2050?

IEA Bioenergy ExCo77 workshop Tuesday 17 May 2016, Rome – Italy
 Mobilizing sustainable bioenergy supply chains: opportunities for agriculture



Swedish University of Agricultural Sciences

Figure 1 Environmentally-compatible primary bioenergy potential in the EU



Source: EEA (European Environmental Agency) 2006.
 How much bioenergy can Europe produce without harming the environment?



Swedish University of Agricultural Sciences

Some background

- biomass production in agriculture (and forestry) will have to increase tremendously
- organic waste and by-products from agricultural (and forest) industries can make important contributions but will not suffice to meet anticipated levels
- dedicated biomass production systems for energy will be needed



Concerns raised

- potential disruption to food security
- raw material markets and rural livelihoods
- greenhouse gas (GHG) emissions
- ecological impacts associated with land use change
- displacement of small-scale farmers



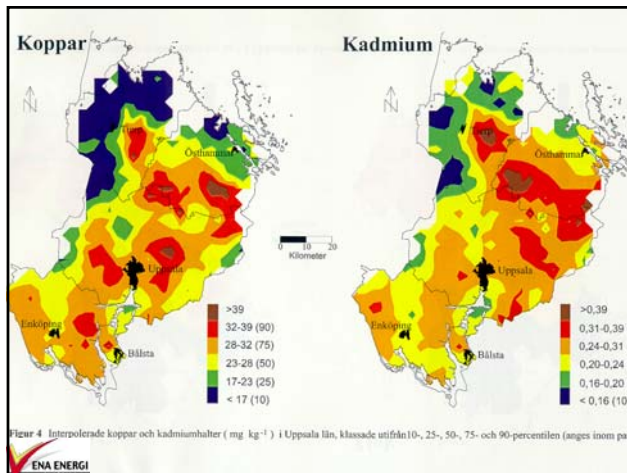
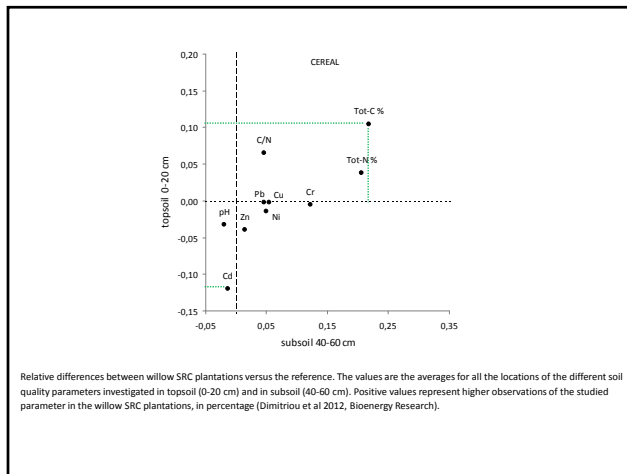
The Challenge

- how to integrate new bioenergy feedstock production systems into agricultural landscapes in ways that promote environmental, social and economic sustainability of the agricultural production

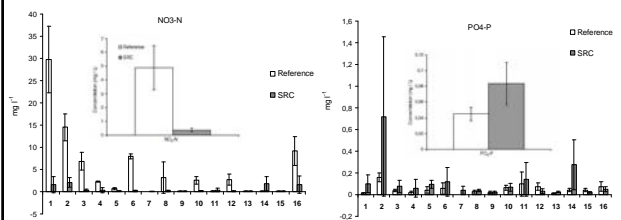


So, will we succeed in this?





Nutrient leaching



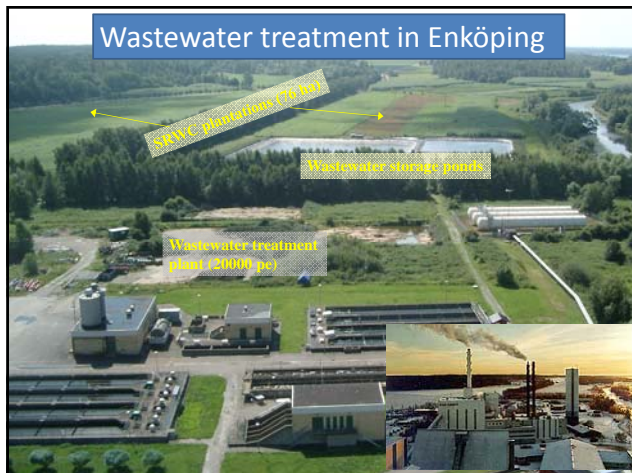
Means, averages and standard errors of NO₃-N and PO₄-P concentrations in the groundwater of willow short rotation coppice (SRC) plantations and reference fields (Dimitriou et al, 2012 - Bioenergy Research)



Riparian buffer zones and bioenergy production



Wastewater treatment in Enköping

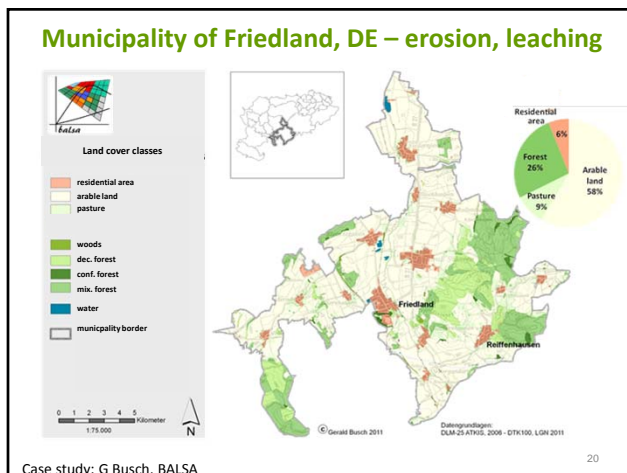
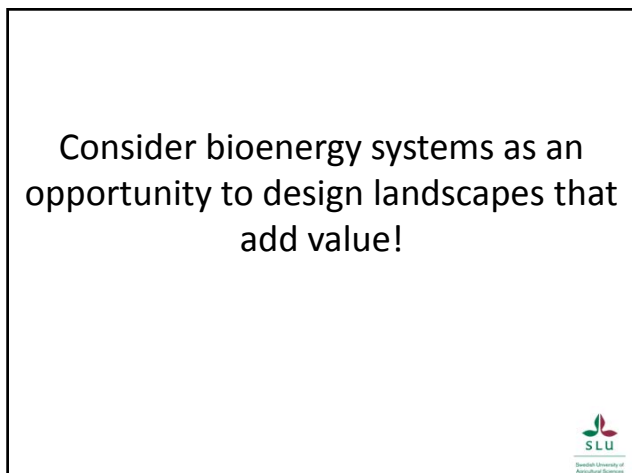
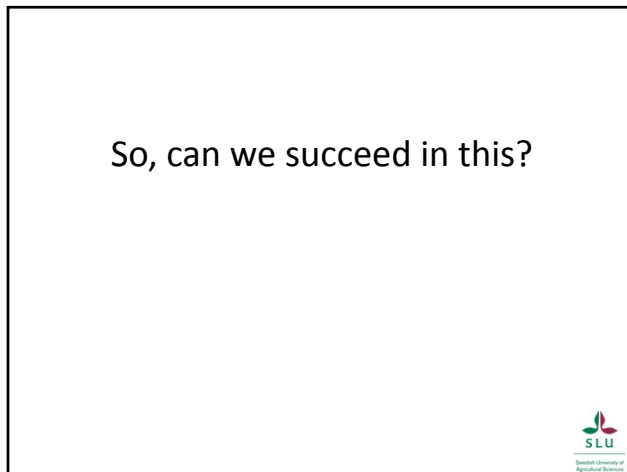
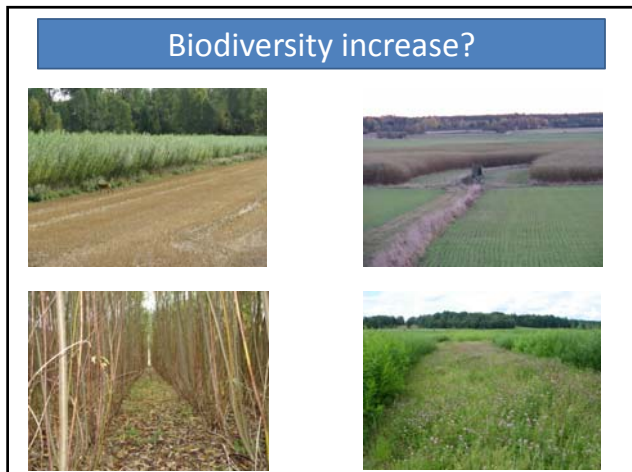


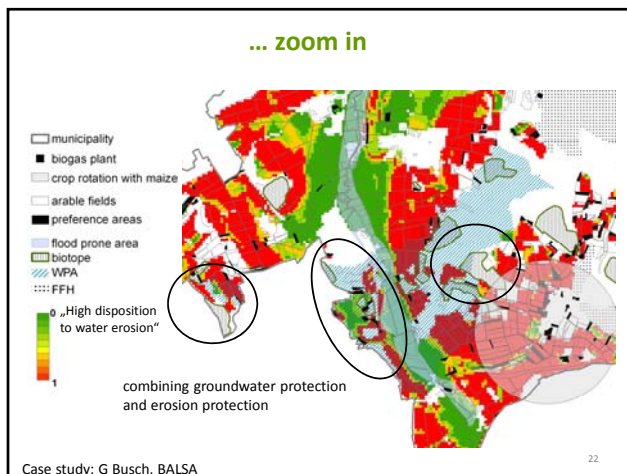
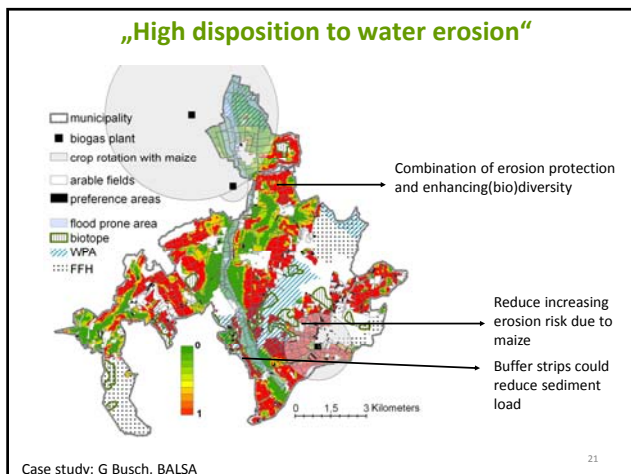
Soil salinization management



Oil Mallee, Australia – Picture: John McGrath

Trees and shrubs can be used to address soil salinity by reducing groundwater recharge, either by using water in the root zone and reducing 'leakage' to deeper aquifers; or by reducing saline or potentially saline groundwater levels (make them deeper beneath the ground surface) through roots directly accessing the water table and increasing discharge.





Consider bioenergy systems as an opportunity to design landscapes that add value...

... and use/develop participatory approaches to include stakeholders/decision makers!

