

Biobased systems in sustainability transitions

ExCo83 workshop, May 23 – 2019, Utrecht



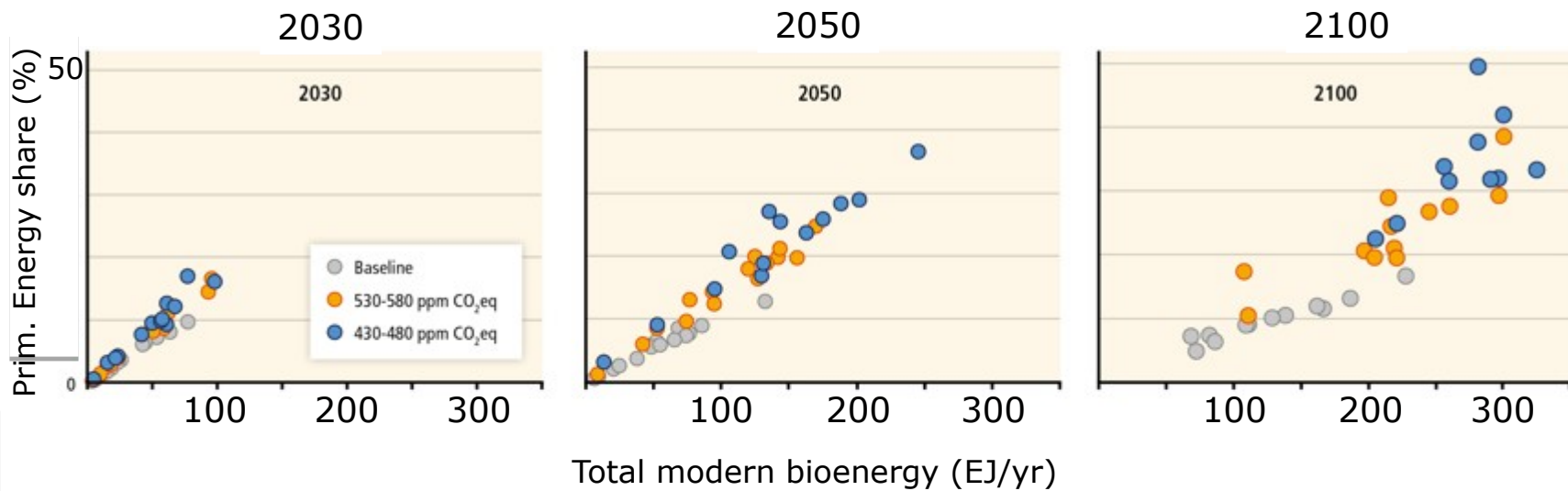
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Bioenergy & BECCS

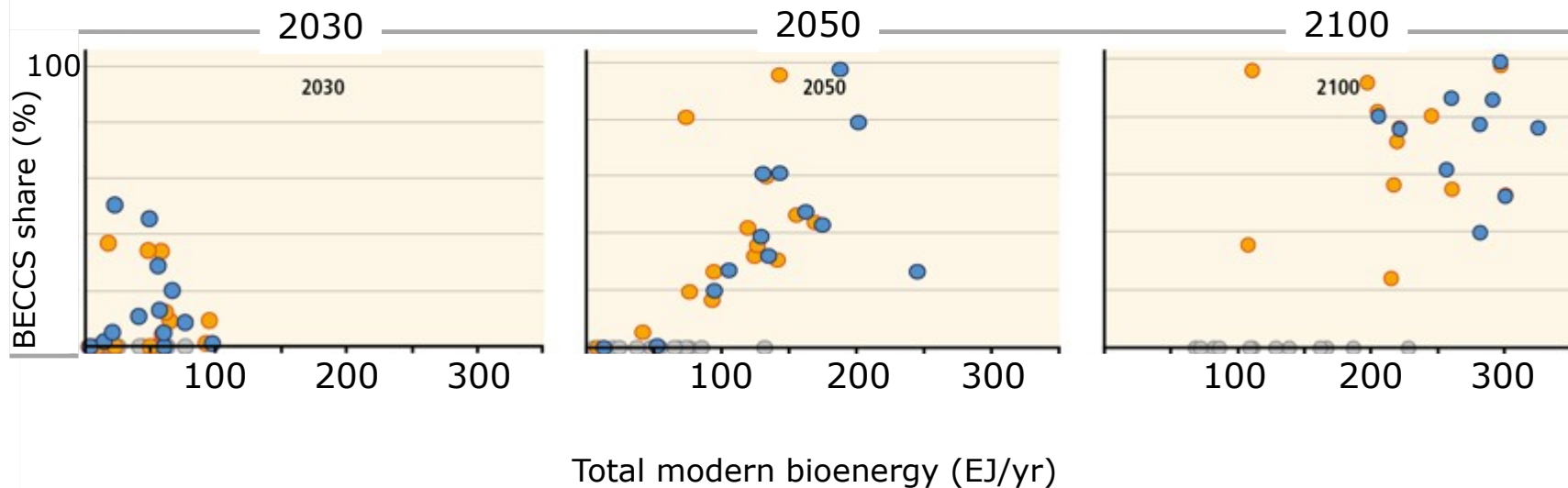
- Difficult to keep global warming well below 2°C without bioenergy and BECCS



Source: IPCC AR5

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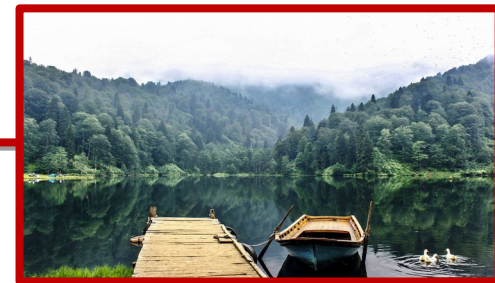
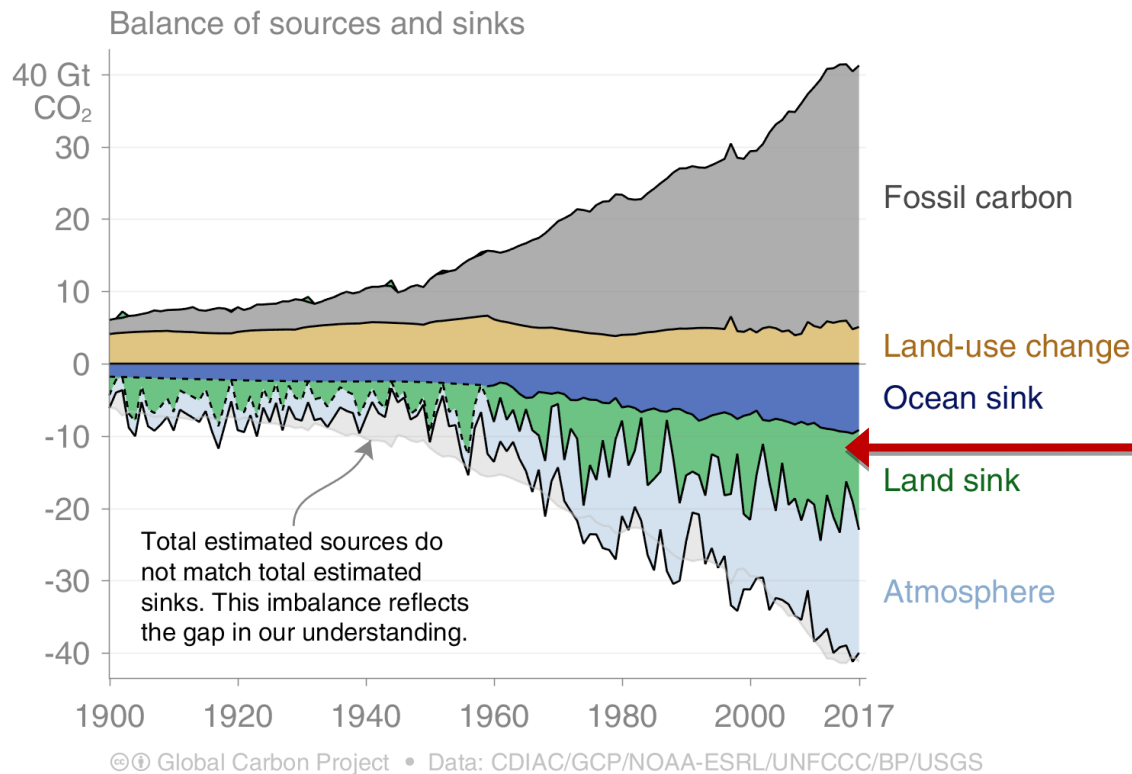
Other biobased options

- SR-1.5: Transformative systems change in *ALL SECTORS*
- UN-Environment: Almost half of the urban infrastructure that will be needed in year 2050 has not yet been built



Biomass supply and C storage

- Limited mitigation benefit if biomass supply causes large losses of carbon from the biosphere



Not just a carbon store

Why Task 45?

- “Acceleration is urgently needed to ramp up the contribution of bioenergy...”
- ...develop and implement internationally recognized sustainability governance systems that cover all bioproducts and which support sustainable best practices and stimulate innovation “



Task 45 work areas

- Metrics, methods, and tools for assessing climate change and sustainability effects of bioenergy
- Sustainability stakeholders and implementation approaches (governance)

Points of departure:

- Bioenergy systems are commonly components in value chains or production processes that also produce other biobased products (including food, feed and fiber)
- A wide range of factors together determine ecosystem's biodiversity, productivity, regeneration capacity, vitality and potential to fulfil relevant ecological, economic and social functions.

Governing sustainability in biomass supply chains

- Develops over time to fit market dynamics, adapts to new knowledge and to new concerns or priorities
- Based on a holistic perspective that recognizes a multitude of societal objectives
- Promotes options that contribute positively to the implementation of 2030 Agenda & the SDGs



Received 15 March 2016 | Accepted 29 August 2016
DOI: 10.1111/gbed.12268

WILEY **BIOENERGY**

ORIGINAL RESEARCH

How is biodiversity protection influencing the potential for bioenergy feedstock production on grasslands?

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Abstract
Sustainable feedstock supply is a critical issue for the bioenergy sector. One concern is that feedstock production will impact biodiversity. We analyse how this concern is addressed in assessments of biomass supply potentials and in selected governance systems in the EU and Brazil, including the EU Renewable Energy Directive (RED), the EU Common Agricultural Policy (CAP), and the Brazilian Forest Act. The analysis focuses on grasslands and includes estimates of the amount of grassland area (and corresponding biomass production volume) that would be excluded from cultivation in specific biodiversity protection scenarios. The reviewed assessments used a variety of approaches to identify and exclude bioenergy grasslands as unsuitable for bioenergy. Biomass exclusion was integrated with other nature protection considerations, quantification of excluded grassland areas was often not possible. The RED complements and strengthens the CAP in terms of biodiversity protection. Following the RED assessment (39% of EU grassland) (54% of US grassland) about 16–28% of natural and semi-natural grassland, respectively, may be considered highly biodiversity in EU/US. The estimated biomass production potential on these areas corresponds to some 1.4 and 1.5 Gt DGE/year for natural and semi-natural grassland, respectively (depending on area availability and management intensity). However, the RED is not a protection or exclusion mechanism for biodiversity. However, the RED is not a protection or exclusion mechanism for biodiversity. However, the RED is not a protection or exclusion mechanism for biodiversity.

Keywords
biodiversity, bioenergy, feedstock, grassland, land use, sustainability

Funding Information
Swedish Environmental Protection Agency, Grant/Award Number: 2012:070; IEA Bioenergy

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© 2016 The Authors. GCB Bioenergy. Published by John Wiley & Sons, Ltd.
GCB Bioenergy, 2016, 8, 1–12

Received 6 November 2015 | Revised 2 February 2016 | Accepted 10 March 2016
DOI: 10.1111/gbed.12268

WILEY **BIOENERGY**

ADVANCED REVIEW

Positive water linkages of producing short rotation poplars and willows for bioenergy and phytotechnologies

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Abstract
The production of short rotation woody crops (SRWCs) such as poplars and willows is a promising component of global bioenergy and phytotechnologies portfolios. In addition to the provision of biomass feedstocks and pollution remediation, these trees and shrubs have been sustainably grown to conserve or utilize water in a variety of applications. Growing these woody plants for multiple uses supports many of the United Nations' Sustainable Development Goals (SDGs), especially 'Clean Water and Sanitation' (SDG6) and 'Affordable and Clean Energy' (SDG7). As a result, focusing on ecosystem services such as freshwater and biomass has become an important aspect of deploying these production systems across variable landscapes. The current review consists of an introduction of ecosystem services and the SDGs, as well as SRWCs and their applications. The middle section of the review contains case studies highlighting the positive water linkages of producing short rotation poplars and willows for bioenergy and phytotechnologies. The review concludes with a section that outlines the common themes that are consistent among the case studies to address options for integrating new bioenergy feedstock production systems into rural and urban landscapes to promote environmental, social and economic sustainability.

Keywords
bioenergy, ecosystem services, phytotechnologies, short rotation woody crops, water management

This article is categorized under:
Bioenergy > Economics and Policy
Bioenergy > Climate and Environment

KEY WORDS
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Lignocellulosic Crops in Agricultural Landscapes
Production systems for biomass and other environmental benefits – examples, incentives, and barriers



GLOBAL LAND OUTLOOK WORKING PAPER

ENERGY AND LAND USE

IEA Bioenergy
IEA Bioenergy, Task 43, 2016-05

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Copy editing by: Mogge Peters-Flores.

September 2017

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United Nations
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February 2016

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Examples of Positive Bioenergy and Water Relationships



GBEP
Global Bioenergy Partnership

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