



Modelling framework for the forestry sector component of the Bioeconomy

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Introduction to JRC



What is the Joint Research Centre (JRC)?


The Joint Research Centre is the scientific and technical arm of the European Commission.

JRC aims at providing the scientific advice and technical know-how to support a wide range of EU policies.

As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.

The JRC plays a key role in the European Research Area and reinforces its multi-disciplinarity by networking extensively with leading scientific organizations in the Member States, Associated countries and worldwide.

Forest and the Bioeconomy


European Commission

The role of the forest sector in the Bioeconomy is to address

(1) **Environmental concerns**; combatting climate change & the depletion of fossil resources

(2) **Economic concerns** to maintain a competitive and innovative bio-based industry

(1)

Mitigation: Forests as well as *Harvested wood products* (HWP) store CO₂;


Adaptation: Change of tree species, rotation period length, etc., in response to climate change


Substitution: wood substitutes non-renewable & carbon-intensive *materials* & energy sources

(2)


Competition: Maintain and create growth and jobs in rural areas; diversify markets in bio-based products


Innovation: New ideas for improving management of renewable resources; "green growth"




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Forestry modelling and the Bioeconomy



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Need for a *fully integrated framework* combining *forest resources assessment* & *economic* modeling

- **Complete feedback** from the economic model to the forest model
- Expand forest resource modelling to **non even-aged** forest management
- Consider forest owner/manager **behavior**






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Forestry modelling and the Bioeconomy

FISE-Forest Bioeconomy Framework

1. an **economic** model of the (global) forest sector (*GFTM*)
2. a **forest** resource model (*EFDM*)
3. a forest owner **decision** module (*EVA*)
4. an **accounting tool** for comparing potential future supply & expected future demand of wood (*WRB*)


Forestry modelling and the Bioeconomy

1. The Global Forest Trade Model (GFTM)

Partial equilibrium model of the global forest sector: consumption, production & international trade of wood-based products & energy.

Output:

Projection of equilibrium prices and quantities produced, consumed, imported, and exported for each product and country.





2. The European Forestry Sector Model (EFDM)

- Area-based matrix model
- Relies on detailed **expert-based** and **national-level** input
- Mechanism to incorporate **natural disturbances** and **management choices**
- Developed to produce **harmonised forestry scenarios** across Europe
- **Free and open source**
- **MS** directly involved in testing prototypes

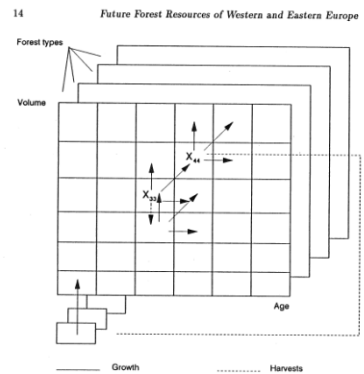


Figure 2.1. Transitions in the area-based model.

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3. Expected Value Asymmetries (EVA)

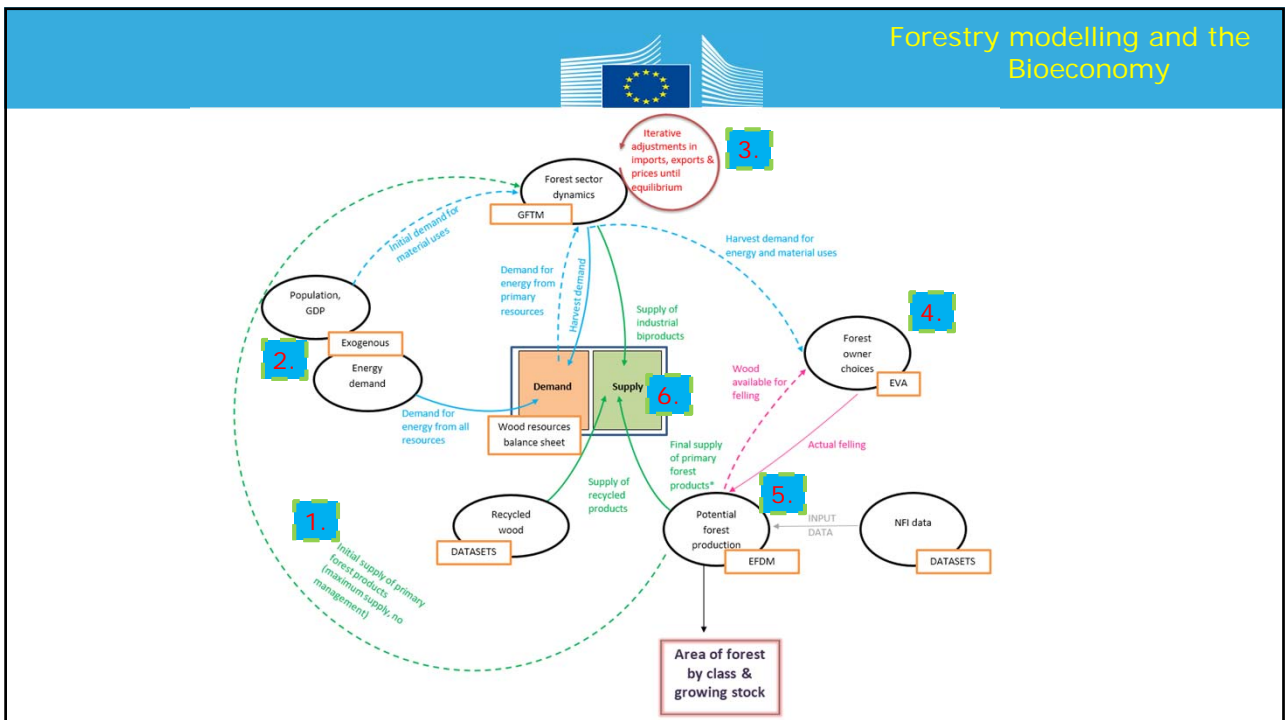
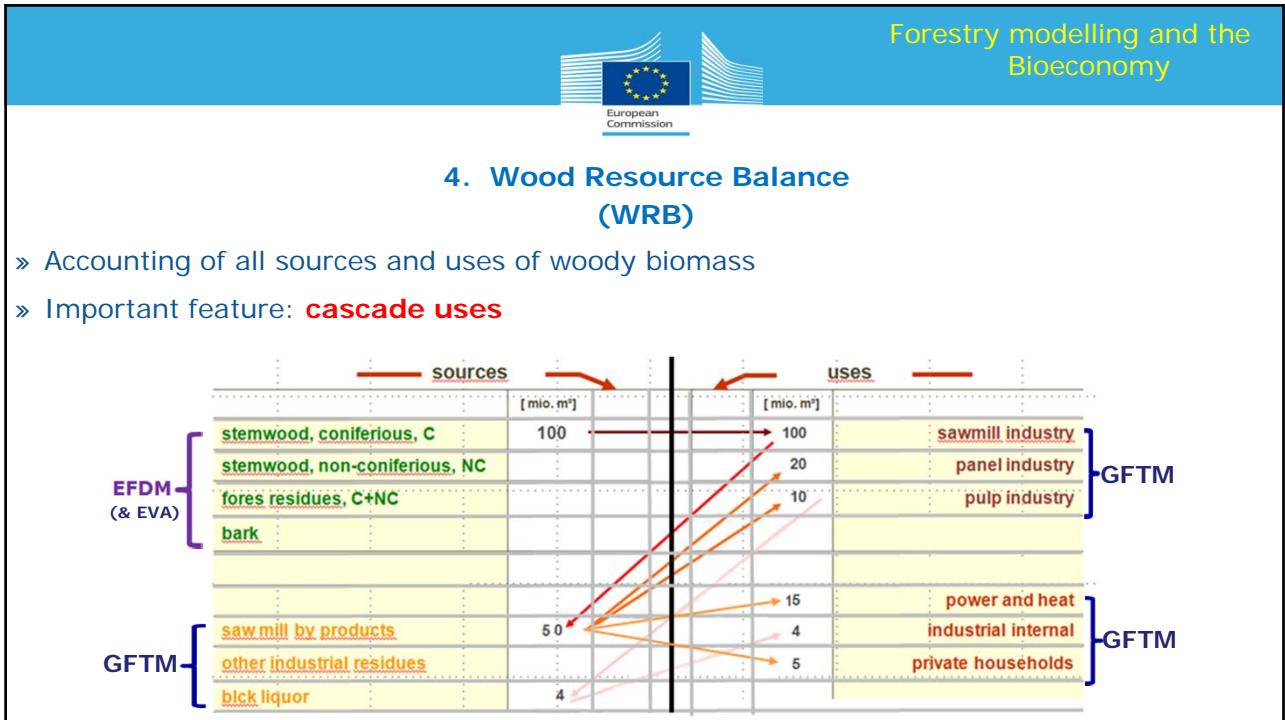
- Policy impacts on forest owners/managers by modifying their **expectations** about the future (demand, prices), so that harvesting decision are taken using *updated expectations*.
- This idea can be nicely modeled using **signals** from economic information theory.



Signals:

- allow the policy to be perceived as “good” or “bad” in the forest owner perspective;
- allow the policy’s effects to be perceived as long lasting and/or time contingent;
- express the degree of confidence of the forest owner.

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Questions / Comments?

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