



Wood supply – Simulation of the raw material allocation under varying economic conditions for the Austrian forest-based sector

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4th WoodEMA conference
June 8th - 10th 2011, Kozina, Slovenia



Objectives

- **Assumption of various economic scenarios**
- **Simulation of impacts on supply and allocation in Austria**

Method

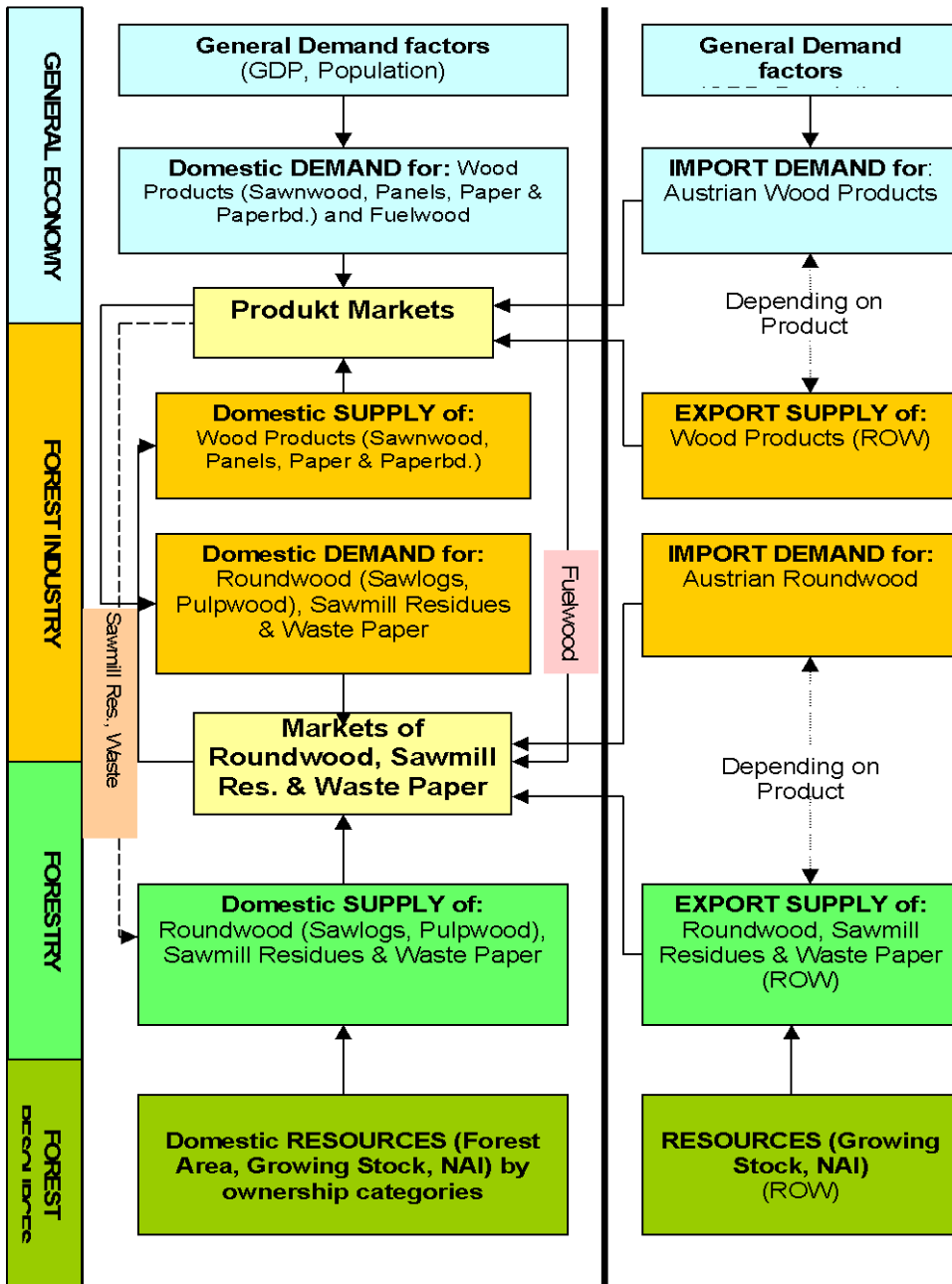
- **System Dynamics Simulation Model “FOHOW”**

Austria

REST of the WORLD
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Structure of “FOHOW”

Modules:

- General economy
- Forest industries
- Forestry
- Forest resources

2 regions

- Austria
- Rest of the World

approx. 1500 equations

5 Scenarios [1, 1a ,1b, 2, 3]

#1 Base scenario – business as usual

| Impact factor | Year | | | | | |
|------------------------------|-------|-------|-------|-------|-----------|-----------|
| | 2008 | 2009 | 2010 | 2011 | 2012-2015 | 2016-2020 |
| GDP Austria* | 2.2 | -3.9 | 2.0 | 1.9 | 2.5 | 2.1 |
| GDP OECD* | 0.4 | -3.4 | 2.2 | 2.2 | 2.5 | 2.0 |
| | 2008 | 2009 | 2010 | 2011 | 2015 | 2020 |
| Crude oil price \$/barrel ** | 99.57 | 60.12 | 72.42 | 76.25 | 105.33 | 132.33 |

*Annual real growth rates

Sources: *2008-2011 WIFO (2010); since 2012 OECD Baseline Scenario

**EIA (2010)



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#1a Base scenario variation – Reduction of coniferous roundwood imports

| Impact factor | Year | | | |
|---------------------------|------|------|------|------|
| | 2006 | 2015 | 2020 | 2025 |
| Coniferous sawlog imports | 5.8 | 4.0 | 2.5 | 1.0 |

#1b Base scenario variation – energy efficiency scenario

#2 Local economic crisis scenario

| Impact factor | Year | | | | | | | | |
|---------------|------|------|-------|-------|-------|------|------|-----------|-----------|
| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019-2020 | 2021-2025 |
| GDP Austria* | -7.0 | -9.7 | -12.5 | -15.0 | -11.0 | 0.02 | 0.2 | 2.1 | 1.9 |
| GDP OECD* | 2.5 | 2.5 | 2.5 | 2.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |

*Annual real growth rates

#3 Global economic crisis scenario

| Impact factor | Year | | | | | | | | |
|---------------|------|------|-------|-------|-------|------|------|-----------|-----------|
| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019-2020 | 2021-2025 |
| GDP Austria* | -7.0 | -9.7 | -12.5 | -15.0 | -11.0 | 0.02 | 0.2 | 2.1 | 1.9 |
| GDP OECD* | -7.0 | -9.7 | -12.5 | -15.0 | -11.0 | 0.02 | 0.2 | 2.0 | 2.0 |

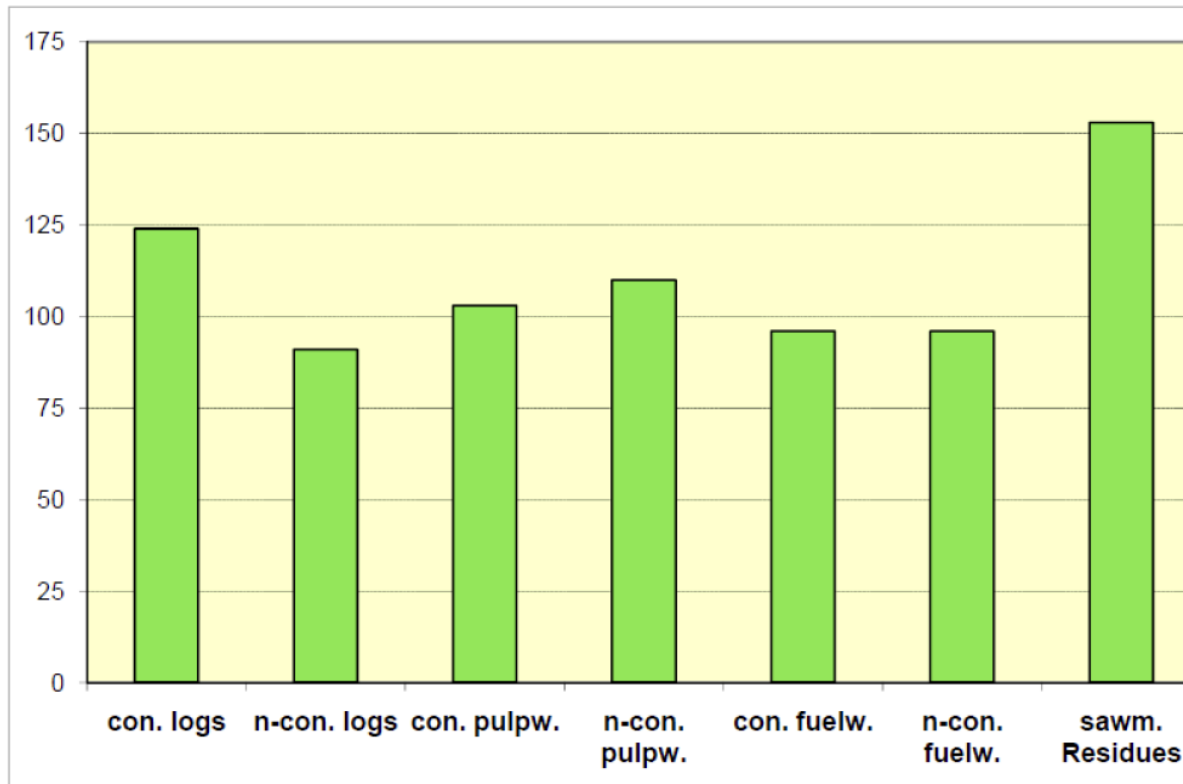
*Annual real growth rates

Results

#1 Baseline scenario – business as usual



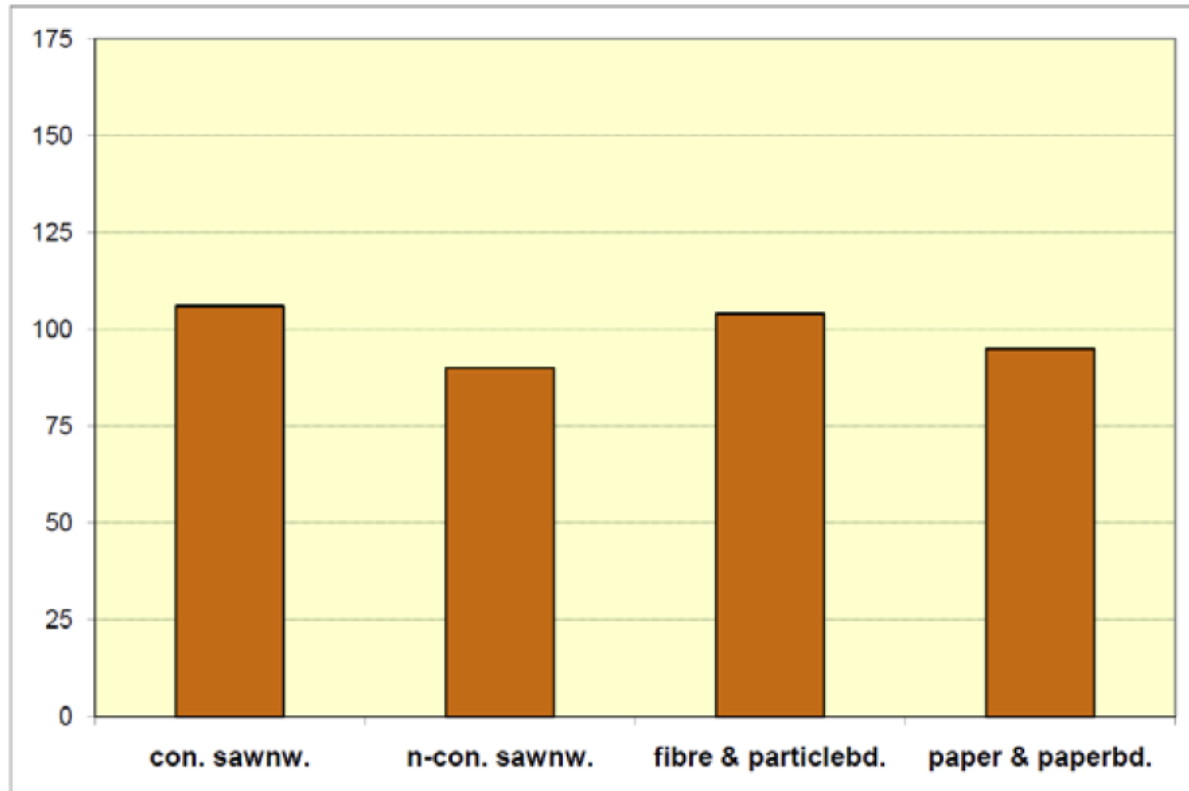
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Real price indexes 2025 (2006 = 100) of roundwood assortments

Results

#1 Baseline scenario – business as usual



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Real price indexes 2025 (2006 = 100) of wood products

Results

#1ab Baseline scenario variations

Shortage of sawmill residues due to

- reduction of coniferous sawlog imports and
- increased use of sawmill residues for energy purposes

compensated by

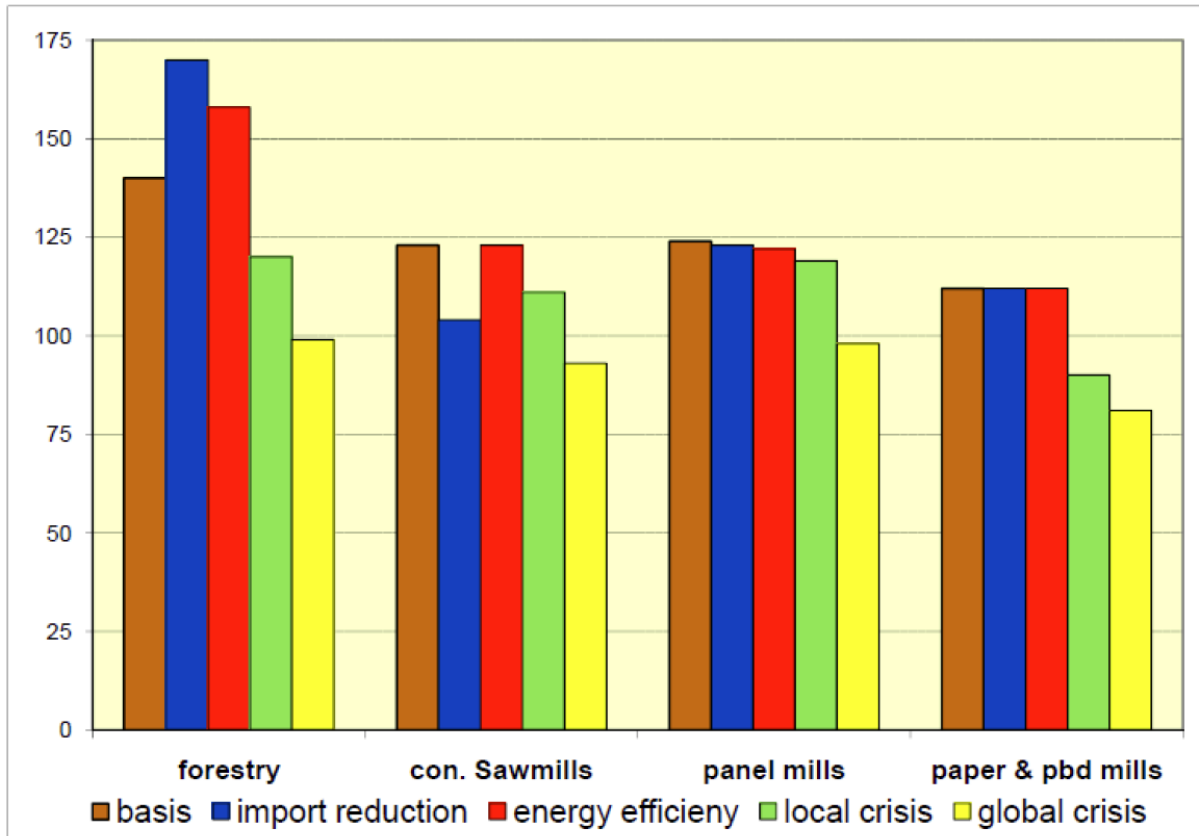
- intensified removals from domestic forests
- slight increase by pulpwood imports
- increased processing of waste paper

Reduced coniferous sawlog imports

- severe negative impact on the sawmilling industry. In contrast,
- sawmilling industry profits from increased demand for energy purposes (sawmill residues)

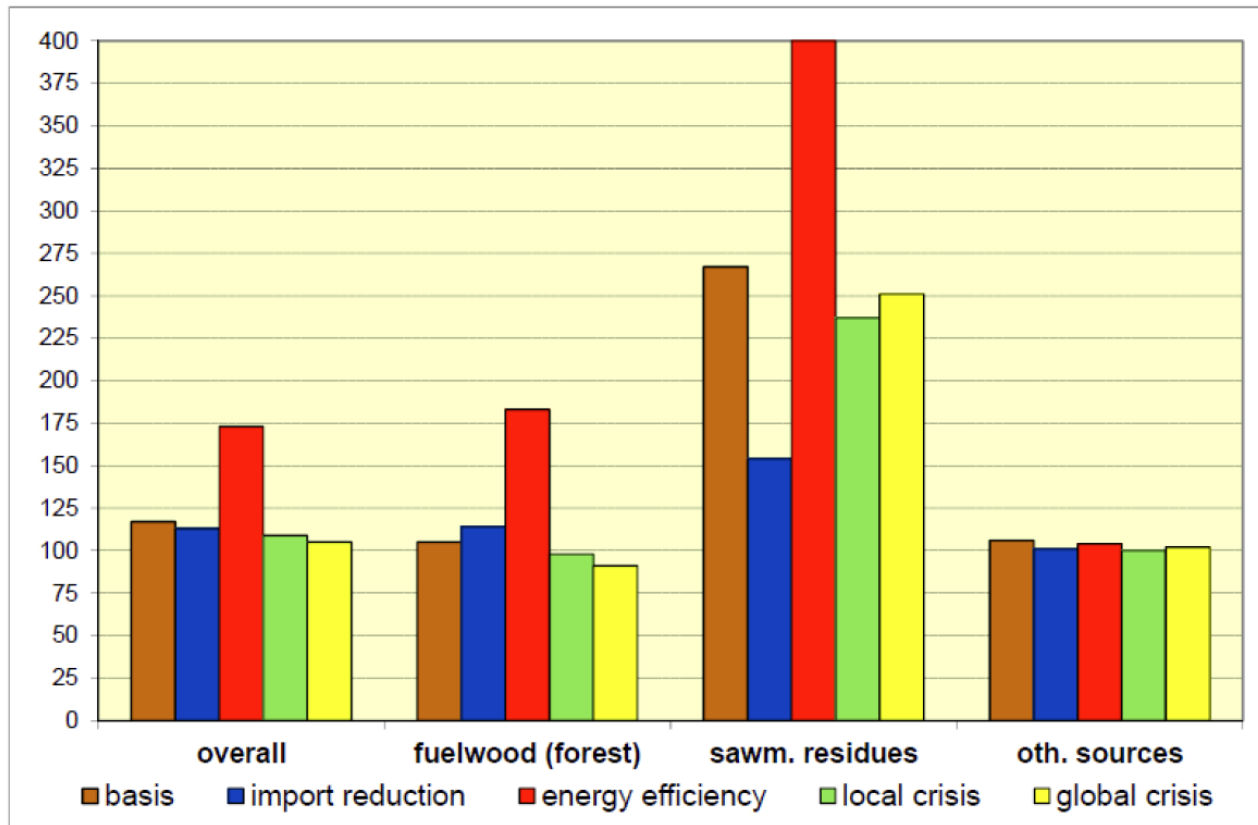


Results of Economic crises scenarios [#2, #3]



Real turnover Indexes 2025 (2006 = 100) forestry and forest-based industries

Results of Economic crises scenarios [#2, #3]



Indexes 2025 (2006 = 100)

woody biomass consumption for energy purposes



Summing up

- **scarcity of raw material (wood)**
- **harvests and roundwood prices will increase**
- **sawmills suffer from reduced log imports**
- **sawmills benefit from rising sawmill residues prices**
- **paper industry affected most by economic downturns**
- **even local crisis reduces availability of wood for energy**



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