GENEVA TIMBER AND FOREST DISCUSSION PAPERS

Outlook for the development of European forest resources

A study prepared for the European Forest Sector Outlook Study (EFSOS)

by

Mart-Jan Schelhaas, Jo Van Brusselen, Ari Pussinen, Emi Pesonen, Andreas Schuck, Gert-Jan Nabuurs, Volker Sasse

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Abstract

The current report provides the methodologies, data, scenarios, and results of the outlook on the European forest resources from 2000 to 2040. The aim of this forest resource study was to analyse the impacts on the European forest resources under the level of fellings needed to fulfil the derived roundwood demand according to two scenarios as provided by the market modelling project within the EFSOS framework. Thus fellings and removals presented in this study can not be identified with a wood supply forecast in economic terms.

The study includes the forest available for wood supply (FAWS) in the geographical Europe, i.e. from Ireland to the Urals, and from the northern tip of Lapland to the southern border of Turkey. The model outcomes are based on assumptions about the increase of FAWS as well as unchanged forest management regimes (e.g. rotation period, thinning intensity, afforestation), growth of stands ratios between felling and removals over the analysed period.

Although removals are assumed to rise significantly the results as presented sketch large and increasing forest resources in Europe. The growing stock increases under the baseline scenario from 51 billion m³ o.b. to 62 billion m³ o.b. in 2040, whereas the net annual increment stays stable at a level of 1.2 billion m³ o.b. The FAWS area is assumed to decrease from 335 million ha to 329 million ha by the year 2040, according to the base scenario. In the alternative scenario the forest area is expected to increase to 343 million ha.

The market model outcomes projected a fast increase in required fellings in the current outlook study. This demand for fellings on FAWS is foreseen to increase from 656 million m³ o.b. per year in 2000 to 822 million m³ o.b. per year in 2020 in the baseline scenario (973 million m³ o.b. per year in the alternative). This, together with an approach that dynamically simulates age class development, shows that annual availability of roundwood may be hampered after 2020. In the baseline scenario the actual fellings in 2036-2040 were 25 million m³ lower than the required fellings (2.5%), whereas in the alternative scenario the difference amounts to 136 million m³ per year (10.0%). In reality market mechanisms will take care of this difference, by adjusting prices, forestry management and especially trade, considering the legal restriction, which assure sustainable forestry management. These adjustments cannot be simulated with the current modelling system.
Acknowledgements

This outlook for the development of European forest resources was prepared in the framework of the European Forest Sector Outlook Studies (EFSOS) under the auspices of the Food and Agriculture Organisation (FAO, Rome) and the Economic Commission for Europe (ECE, Geneva).

Dr. Volker Sasse provided valuable input throughout the project and co-ordinated the study with the other parts of the EFSOS with a lot of exemplary discipline and determination.

The work was carried out at Alterra¹ (Wageningen) and the European Forest Institute² (Joensuu) by an enthusiastic team existing of ir. Mart-Jan Schelhaas¹, ir. Jo Van Brusselen², Ms. Emi Pesonen², Mr. Ari Pussinen², Dr. Gert-Jan Nabuurs¹ &² and Mr. Andreas Schuck².

It would not have been possible to complete this major task without the preparation of model input data by many of the EFSOS National Correspondents and their staff and colleagues, listed in Annex 2: National data correspondents of this report.

The following people have provided valuable feedback in the validation of the model outcomes: Prod. O.A. Atroshchenko (Belarus), Prof. Ivan Raev (Bulgaria), Mr. Hentzlik Vladimir (Czech Republic) Mr. Gérôme Pignard (France), Mr. Ilze Silamikele (Latvia), Mr. Ljupco Nestorovski (Macedonia, FYR), Mr. Stein Tomter (Norway), Dr. Roman Michalak (Poland), Mr. António Leite (Portugal), Mr. Nenad Petrovic (Serbia and Montenegro), Prof. Milan Hocevar (Slovenia), Mr. Edgar Kaufmann (Switzerland), Mr. Simon Gillam and Mr. Pat Snowdon (United Kingdom).

Many thanks to all!
UNECE/FAO TIMBER AND FOREST DISCUSSION PAPERS

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In the interests of economy, Discussion Papers are issued in the original language only, with only minor language editing and final layout by the secretariat. They are distributed automatically to nominated forestry libraries and information centres in member countries.

It is the intention to include this discussion paper on the Timber Committee website at: http://www.unece.org/trade/timber.

The Discussion Papers are available on request from the secretariat. Those interested in receiving the Discussion Papers on a continuing basis should contact the secretariat. Comments are most welcome and will be referred to the authors:

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Many thanks to all!


**Acronyms**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tr>
<td>CEEC</td>
<td>Central and Eastern European Countries</td>
</tr>
<tr>
<td>CIS</td>
<td>Commonwealth of Independent States</td>
</tr>
<tr>
<td>ECE</td>
<td>Economic Commission for Europe</td>
</tr>
<tr>
<td>EFI</td>
<td>European Forest Institute</td>
</tr>
<tr>
<td>EFISCEN</td>
<td>European Forest Information Scenario Model</td>
</tr>
<tr>
<td>EFSOS</td>
<td>European Forest Sector Outlook Studies</td>
</tr>
<tr>
<td>EFTA</td>
<td>European Free Trade Agency</td>
</tr>
<tr>
<td>ETTS</td>
<td>European Timber Trend Studies</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agricultural Organisation</td>
</tr>
<tr>
<td>FAWS</td>
<td>Forest available for wood supply</td>
</tr>
<tr>
<td>NAI</td>
<td>Net annual increment</td>
</tr>
<tr>
<td>SEDS</td>
<td>Single Entity Data Set</td>
</tr>
<tr>
<td>TBFRA</td>
<td>Temperate and Boreal Forest Resource Assessment</td>
</tr>
<tr>
<td>TC</td>
<td>UN-ECE/FAO Timber Committee</td>
</tr>
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<td>UN</td>
<td>United Nations</td>
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</tbody>
</table>

**Symbols and other abbreviations**

- cu.m. Cubic meter
- ha Hectare (100 by 100 metres)
- Kha Thousand hectares
- m³ Cubic meter
- o.b. Over bark
- u.b. Under bark
- y Year
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1 Introduction and aim

Under the auspices of the Food and Agriculture Organisation (FAO) and the Economic Commission for Europe (ECE) forestry sector analyses have been undertaken since 1952 under the title European Timber Trends Studies (ETTS). Up to now, outlook study reports have been published at roughly 10-year intervals. The last study (ETTS V) was published in 1996. Taking the increasing importance of social and environmental benefits from forests into consideration, the title of these activities was changed in 1999 to European Forest Sector Outlook Study (EFSOS).

The objectives of EFSOS are to analyse the development of the forest and forest industry sector, considering challenges and uncertainties of varying policies, market developments and the influence of exogenous factors. The aim is to assist policy and investment decision-making. The main target groups of EFSOS activities are policy makers, entrepreneurs, the academic community of the forest and forest products sector and the public as well. The first and main step into EFSOS activities is the preparation of a new outlook study in the mode of its successors (so to speak an ETTS VI report).

The EFSOS activities reflect the forest sector development at the national and European level, analysing the countries as far as possible in a consistent way, considering the European developments as a part of the global forest sector.

The geographic scope of the various EFSOS studies reflects the interests of the participating countries and their possibilities to provide necessary data as well as the importance of different countries for the development of timber production and trade in Europe. The EFSOS outlook study covers all European countries, including the European CIS (Russia, (European part only) Ukraine, Moldova and Belarus). Complementary policy studies may only cover case-study countries. In general the activities are strongly determined by the data, methodology and resources available.
The quantitative methodological approach of EFSOS considers the specific aspects of the long-term development and sustainable management of forest resources on the one hand and the dynamic influence of changes on timber markets and policy frames on the other hand. The applied model system consists of a forest resource model, describing the development of forest resources (current report), coupled off-line to a timber market model. The current report provides the methodologies, data, scenarios, and results of the outlook on the European forest resources from 2000 to 2040. The methodology used for the analysis of timber markets is described in a separate report (Kangas et al., In prep). The outlook on forest resources as done in ETTS-V (Pajuojä 1995) is improved in the current study by using the European Forest Information Scenario (EFISCEN) model (Pussinen et al. 2001, Nabuurs 2001). The aim of the current study is to analyse the impacts on the European forest resource of two scenarios of derived roundwood demand provided by the market model.
2 Methods, data and scenarios in the forest resource study

2.1 General approach

The general approach of the study is forward projections of the forest resource for 37 European countries under a specific required felling level as provided by the market model. For the market model and scenario assumptions built into the latter model, see Brooks et al. (1994) and Kangas et al. (In prep). The development of forest resources and actual supply according to the resource model is simulated based on: (i) the current state of the forests, (ii) the growth model, (iii) the assumptions on required felling level, and (iv) one set of management regimes. Further, changes in the policy framework are assumed, which will have an impact on the development of the forest area (Thoroe et al. In prep). Each of these aspects of the resource study is dealt with in the following sections 2.2 to 2.6. The modelling is based mainly on physical assumption, although the management regimes are based on long term economic experiences. They have been kept stable in the modelling process over the whole forecast period.

2.2 The EFISCEN model

For the forest resources part of the EFSOS study, the European Forest Information Scenario Model (EFISCEN) was used. EFISCEN is an area-based matrix model that is especially suitable for projections on a regional or a country level. The model simulates the development of the forest resources in terms of increment, growing stock, area, tree species and age class distribution in time steps of five years, for periods of usually 50-60 years. A detailed description of the EFISCEN model has been published in Pussinen et al. (2001) and Nabuurs (2001).

The model is a pure forest resource model, not taking into account economic principles, such as price elasticities and supply and demand. As an input, the model needs a required amount of fellings. The model quantifies the degree to which this required level can be met by the resource, given management constraints as defined by the user. In this study, required fellings are derived from Kangas et al. (In press). The model gives insight in the
future state of the forest resource under the assumptions of a certain scenario and can provide (indirect) indicators for sustainability, biodiversity, and the carbon balance.

**Single entity data sets (SEDS)**

The input forest inventory data are structured in units, called Single Entity Data Set (SEDS; Table 1), formerly called forest types (Nabuurs 2001). These are defined by country, region, owner, site class and tree species. The data of SEDS contain the following variables by age classes:

- Area (ha);
- Average growing stock (overbark, m³/ha);
- Net annual increment (overbark, m³/ha.y).

**The matrix model**

The state of the forest is depicted as an area distribution over a volume-age matrix (Figure 1). The matrix holds up to 60 age classes, each of 5 year width. The width of the volume classes can be defined separately for all SEDS, depending on the maximum attainable volume for that SEDS. The area per SEDS is divided over the age classes according to the input data. Per age class the area is distributed over the volume classes in a way that the average growing stock in that age class is equal to the input data. A separate matrix is set up for each SEDS of the inventory data.
Figure 1  The area matrix approach (Nilsson et al. 1992).

**Increment**

The simulation of net annual increment in the model is based on age-dependent growth functions that are calibrated on the inventory data. In case no inventory based increment data is provided, yield tables are used instead. In the matrices, growth is represented as a probability of the area to move to a higher volume class. Ageing of the forest is simulated by movement of the area to higher age classes. Throughout the projections the same growth functions are used, so no changes in growth are assumed, due to e.g. climate change or nitrogen deposition. Further it was assumed that natural mortality change will not occur in significant amounts.

**Regeneration, afforestation, deforestation**
Establishment of regeneration is simulated as the movement of area from the bare-forest-land class to the first volume and age class. The amount of area that is regenerated is expressed as a percentage of the area in the bare-forest-land class that will enter the matrix. This percentage expresses the intensity and success of regeneration and can be varied per country and tree species. Furthermore, it is possible to change tree species after clear-cutting. This latter option was not used in the current study.

It is also possible to take into account afforestation and deforestation. The user can add or remove area per tree species in each time step of the simulation. The new forest area is added to or removed from the bare-forest-land class of each SEDS of that tree species.

**Forest management**

Forest management is controlled at two levels in the model. First, a basic management in the form of thinning and final felling regimes is incorporated for each SEDS. These regimes are constant through time, so there is no dynamic owner behaviour, reacting on market conditions.

The thinning regimes are incorporated as the range of age classes at which a thinning can be carried out. Thinning is simulated by preventing area in a matrix cell from moving to a higher volume class; i.e. the maximum thinned volume for a cell equals maximum theoretical increment per hectare of that cell, multiplied with the actual area in the cell. Thinned forest area receives a ‘thinning status’ and cannot be thinned while having that status. These thinned areas receive a slightly increased chance to grow to the next higher volume class in the next time step; a small growth boost (Pussinen et al., 2001). After receiving this growth boost the cell loses its thinning status.

Final felling regimes per SEDS are incorporated as a probability that a final felling can in principle be carried out, depending on the actual age and volume class (Figure 2). The maximum amount of volume that can be harvested through final felling in a cell is defined by the probability that a final felling can be carried out, multiplied with the actual area in the cell and the actual standing volume in the cell. By aggregating the maximum thinning and felling volumes per cell over all SEDS, or a selection of SEDS (for example
for conifers and broadleaves separately), an absolute maximum possible felling level is derived per time step.

Figure 2 shows an example of a management regime for one SEDS. For all SEDS such a management regime is defined (adapted by climatic region in Europe), based on yield tables and/or information provided by the country correspondents.

Figure 2 Example of a management regime for one SEDS. The grey shaded area indicates the range where thinnings can be carried out, the numbers indicate the chance of a final felling in that particular cell.

Second, for each time step the required total volume of harvest (in this case coming from the market model, see also: 2.5 Linkages between the market model and EFISCEN) is specified for the whole country, divided over conifers, broadleaves and coppice. The required felling level is then compared to the maximum level as defined above by the management regimes and the actual state of the forest. If the maximum level is not exceeded, fellings are carried out in the cells, relative to their contribution to the maximum felling level. If the required felling level exceeds the maximum possible level, fellings are carried out at the maximum and the actual fellings will be lower than the required level.

2.3 Inventory data

The EFISCEN model uses as input results from national forest inventories. In 1996 a European wide dataset of national forest inventory results was gathered, excluding the
former USSR (Schelhaas 1999). In some cases an older dataset gathered by Nilsson et al. (1992) had to be used at that time. For the current study, a full update enquiry was sent in September/October 2001 to the TBFRA national correspondents. National correspondents were asked to supply new results, if available, and in concordance with the definitions of the latest forest resource assessment, the TBFRA 2000 (UN-ECE/FAO 2000). A special enquiry was elaborated in co-operation with the UN-ECE and sent to national correspondents in order to compile the data in the required structure (see Annexes).

From 21 countries a new dataset was received, for 11 countries the dataset of the 1996 enquiry was used (Figure 3). For Moldova and Serbia and Montenegro the TBFRA totals were used and disaggregated (UN-ECE/FAO 2000). For the European part of Russia the data as presented in Pisarenko et al. (2001) were used and disaggregated. For the latter this was based on detailed data that were available for the Leningrad and Arkhangelsk region. For Bosnia and Herzegovina and Greece no dataset was available and a simple balance approach was executed, based on TBFRA data. The latter method is a simple forward calculation with increment, fellings and mortality.

![Figure 3 Data update results. White: new 2002 data; light grey: 1996 data; dark grey: TBFRA disaggregation, or in case of the European part of Russia: disaggregation of data in Pisarenko et al. (2001).](image-url)
The full database reflects on average the state of the forests of 1994 and covers 329 million ha of forests, distinguished by 5479 SEDS. For each of these 5479 SEDS the area, growing stock, and increment was received for usually 12 age classes.

Table 1 gives an overview of the metadata gathered from the inventory data for all countries for which data was available. These forest inventory data were prepared for each SEDS as shown for one example country and SEDS in Box 1.
Table 1 Metadata of forest inventory for 37 European countries. For countries printed in bold, new data were received in the 2001/2002 update.

<table>
<thead>
<tr>
<th>No</th>
<th>Country</th>
<th>FAWS (1000 ha)</th>
<th>No of SEDS</th>
<th>Year of forest inventory</th>
<th>Number of administrative regions</th>
<th>Number of owner classes</th>
<th>Number of site classes (i.e. growth classes)</th>
<th>Number of tree species</th>
<th>Area covered ** (1000 ha)</th>
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<td>71</td>
</tr>
<tr>
<td>21</td>
<td>Macedonia; the former Yugoslav Republic of</td>
<td>745</td>
<td>8</td>
<td>?</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>653</td>
</tr>
<tr>
<td>22</td>
<td>Moldova</td>
<td>210</td>
<td>1</td>
<td>?</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>206</td>
</tr>
<tr>
<td>23</td>
<td>Netherlands</td>
<td>314</td>
<td>13</td>
<td>1995-1999</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>13</td>
<td>307</td>
</tr>
<tr>
<td>24</td>
<td>Norway</td>
<td>6,609</td>
<td>357</td>
<td>1996-2000</td>
<td>17</td>
<td>1</td>
<td>7</td>
<td>3</td>
<td>6,644</td>
</tr>
<tr>
<td>25</td>
<td>Poland</td>
<td>8,300</td>
<td>170</td>
<td>1993</td>
<td>17</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>6,019</td>
</tr>
<tr>
<td>26</td>
<td>Portugal</td>
<td>1,897</td>
<td>7</td>
<td>1997-1998</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>2,133</td>
</tr>
<tr>
<td>27</td>
<td>Romania</td>
<td>5,617</td>
<td>36</td>
<td>80's</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>6</td>
<td>6,211</td>
</tr>
<tr>
<td>28</td>
<td>Russia (Eur part)</td>
<td>174,000 *</td>
<td>112</td>
<td>90's</td>
<td>56</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>173,000</td>
</tr>
<tr>
<td>29</td>
<td>Serbia and Montenegro</td>
<td>2,378</td>
<td>40</td>
<td>1991</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>10</td>
<td>2,894</td>
</tr>
<tr>
<td>30</td>
<td>Slovak Republic</td>
<td>1,706</td>
<td>16</td>
<td>1994</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>8</td>
<td>1,909</td>
</tr>
<tr>
<td>31</td>
<td>Slovenia</td>
<td>1,035</td>
<td>6</td>
<td>2000</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1,152</td>
</tr>
<tr>
<td>32</td>
<td>Spain</td>
<td>10,479</td>
<td>850</td>
<td>1986-1995</td>
<td>50</td>
<td>1</td>
<td>1</td>
<td>17</td>
<td>13,905</td>
</tr>
<tr>
<td>33</td>
<td>Sweden</td>
<td>21,236</td>
<td>180</td>
<td>1996-2000</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>20,967</td>
</tr>
<tr>
<td>34</td>
<td>Switzerland</td>
<td>1,060</td>
<td>100</td>
<td>1994</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>1,140</td>
</tr>
<tr>
<td>35</td>
<td>Turkey</td>
<td>8,635</td>
<td>891</td>
<td>2001</td>
<td>27</td>
<td>3</td>
<td>1</td>
<td>11</td>
<td>8,024</td>
</tr>
<tr>
<td>36</td>
<td>Ukraine</td>
<td>5,999</td>
<td>36</td>
<td>1995</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>18</td>
<td>3,969</td>
</tr>
</tbody>
</table>
Box 1: Preparation of inventory data for the input to the EFISCEN model

The forest inventory data was provided by an institution in a country, which conducts the inventory of forests in that particular country. The inventory data was provided for 2 regions (e.g. North and South), 1 owner class (there was no need to distinguish different owner classes, such as private, state and companies, as there are no major differences between owner classes), 4 tree species and 8 site classes (fertility classes).

Number of Matrices: 2*1*4*8 = 64 SEDS

The data of one SEDS for a particular species, site class and region is presented below. The input to the EFISCEN consists of 64 such tables.

<table>
<thead>
<tr>
<th>REGION</th>
<th>xy</th>
</tr>
</thead>
<tbody>
<tr>
<td>OWNER CLASS</td>
<td>xy</td>
</tr>
<tr>
<td>SITECLASS</td>
<td>xy</td>
</tr>
<tr>
<td>SPECIES</td>
<td>xy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AGECLASS (y)</th>
<th>AREA (ha)</th>
<th>GROWING STOCK VOLUME (m³/ha)</th>
<th>NET ANNUAL INCREMENT, (m³/ha.y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-19</td>
<td>667718</td>
<td>14</td>
<td>1.63</td>
</tr>
<tr>
<td>20-39</td>
<td>410370</td>
<td>89</td>
<td>6.88</td>
</tr>
<tr>
<td>40-59</td>
<td>194522</td>
<td>158</td>
<td>7.33</td>
</tr>
<tr>
<td>60-79</td>
<td>258085</td>
<td>183</td>
<td>6.21</td>
</tr>
<tr>
<td>80-99</td>
<td>100000</td>
<td>200</td>
<td>5.32</td>
</tr>
<tr>
<td>100-119</td>
<td>167714</td>
<td>199</td>
<td>4.35</td>
</tr>
<tr>
<td>120-139</td>
<td>63182</td>
<td>180</td>
<td>3.34</td>
</tr>
<tr>
<td>140-159</td>
<td>20814</td>
<td>181</td>
<td>2.76</td>
</tr>
<tr>
<td>&gt;160</td>
<td>9015</td>
<td>226</td>
<td>2.55</td>
</tr>
</tbody>
</table>

The data that countries reported as a whole often covered an area in between the categories "forest land" and "forest land available for wood supply (FAWS)" as defined in the TBFRA 2000 report (Figure 4). EFISCEN is especially suitable of simulating managed forest, therefore we took the FAWS as starting point for the simulations. To achieve conformity, the data were scaled according to the ratio of reported area to TBFRA 2000 FAWS. By using this scaling method, it was assumed that the data that were received were representative for the total area of FAWS. In most cases the difference between the data received and the FAWS was small, so that the assumption made was not too crude. However, for some countries, like Poland and Ireland, data were only available for the state forests, representing only part of the total FAWS. In these
cases the assumption of representation clearly does not hold. This is therefore reflected by differences in total growing stock and increment after scaling, as compared to those in the TBFRA 2000 data. Although the assumption is not valid in these cases, this approach was still applied, as there was no other acceptable alternative available. Due to this scaling approach, some variables or ratios other than FAWS might differ from those in the TBFRA 2000, such as the ratio between conifers and broadleaves.

In case of Spain the inventory data were not grouped according to age classes, but according to diameter classes. In earlier projections, a separate model was used, based on transition times between diameter classes (Schelhaas, 1997). However, the outcomes of this modelling approach were not satisfying. Therefore, for the EFSOS simulations the diameter data over age classes were re-distributed using yield tables for Spain. The approach was the following: Per tree species, relevant yield tables were chosen. From

Figure 4 Ratio between the forest area that is included in the new database underlying the present study and ‘Forest available for wood supply’ according to UN-ECE(2000). Ireland, and Poland score rather low because data for the state owned forests only were received. Ukraine scores rather low, because data by age classes could not be derived for all state owned forests.
these yield tables, diameters, total volume per hectare and stem number are given at regular age intervals. By linear interpolation, ages, volume per hectare and stem number were determined for each diameter class, as given in the Spanish national inventory. By combining volume and stem number, an average tree volume per diameter class was obtained, for different site classes. These average stem volumes were then compared to the actual stem volume as given by the inventory. By visual interpretation, a distribution over site classes was sought in a way that the actual tree volume matched the average volume for that distribution. For all diameter classes the number of trees could then be distributed to site classes. From the average volume and increment per tree for that diameter class, the total volume and increment was calculated. From the yield table the density per hectare is known, which was used to derive the total area for the combination of that specific age and site class. The resulting data was then grouped according to regular age classes. Finally, the total resulting area was scaled to match with the area for that tree species according to the inventory.

In Spain and Portugal, part of the FAWS consist of fast growing plantations of Eucalyptus species. Due to their fast growth and very short rotations (5-10 years), EFISCEN is not able to simulate their growth dynamics very well, because of the time step of 5 years. In order to include these forests, EFISCEN was adapted to simulate them using one-year time steps. However, this will have serious implications for the accuracy, since accuracy is among others related to the amount of simulation steps.

2.4 Linkages between the market model and EFISCEN

The same methodology for projecting of demand, supply and trade as developed in ETTS V by Brooks et al. (1994) was applied in the current EFSOS study (Kangas et al., in press). This provided outlooks of consumption, trade and consumption per commodity until 2020. The market model converted national domestic production per commodity to the equivalent of required roundwood removals (underbark). This conversion takes into account roundwood trade, recovered paper and processing losses (residues), within the industry, and recycling. The baseline projection of the market model resulted in an
absolute total required removal underbark of 688 million m³/y in 2016 – 2020. Because projections with the EFISCEN model were made until 2040, the trends in required roundwood demand were extrapolated linearly from the period 2016-2020 up to 2040.

For implementation in the EFISCEN model, the national required removals (underbark) were converted to fellings (overbark), based on the ratio between Table 47: Annual fellings overbark and Table 50: Annual removals underbark of TBFRA 2000 (UNECE/FAO, 2000). The conversion factors thus applied, represents the average for conifers and broadleaves. It was assumed that this ratio will stay constant throughout the whole projection period. As shown in Table 2, part of the actual fellings take place outside the FAWS, on forest not available for wood supply, on other wooded land and on trees outside the forest. In many countries the contribution of such fellings to the total is substantial. For those countries where fellings outside FAWS amounted to more than 5% of the total, the required felling level was adapted to the shares as shown in Table 2. In this way it was assumed that the share of fellings outside FAWS will stay the same. The validity of this assumption depends on the reasons of fellings (calamity fellings or structural management) and can differ per country. In order to project the development of those categories, other models are needed. The resulting total fellings required on FAWS were then distributed over fellings of conifers and non-conifers relative to the TBFRA 2000 historic distribution. The distribution of the required fellings over thinnings and final cut was derived from national statistics and information from the national correspondents.
Table 2. Fellings on FNAWS, other wooded land and trees outside the forest

<table>
<thead>
<tr>
<th>Country</th>
<th>Total fellings</th>
<th>Fellings on FNAWS</th>
<th>Fellings on other wooded land</th>
<th>Fellings on trees outside the forest</th>
<th>Total fellings other than FAWS</th>
<th>Fellings on FAWS / total fellings (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>740</td>
<td>63</td>
<td>0</td>
<td>0</td>
<td>63</td>
<td>91.5</td>
</tr>
<tr>
<td>Austria</td>
<td>20041</td>
<td>300</td>
<td>150</td>
<td>70</td>
<td>520</td>
<td>97.4</td>
</tr>
<tr>
<td>Belarus</td>
<td>9550</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>99.0</td>
</tr>
<tr>
<td>Belgium</td>
<td>4400</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100.0</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulgaria</td>
<td>4851.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100.0</td>
</tr>
<tr>
<td>Croatia</td>
<td>4600</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100.0</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>16355</td>
<td>145</td>
<td>0</td>
<td>10</td>
<td>155</td>
<td>99.1</td>
</tr>
<tr>
<td>Denmark</td>
<td>2444</td>
<td>0</td>
<td>250</td>
<td>0</td>
<td>250</td>
<td>89.8</td>
</tr>
<tr>
<td>Estonia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>54300</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100.0</td>
</tr>
<tr>
<td>France</td>
<td>60174</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100.0</td>
</tr>
<tr>
<td>Germany</td>
<td>48584</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100.0</td>
</tr>
<tr>
<td>Greece</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>6449</td>
<td>170</td>
<td>0</td>
<td>400</td>
<td>570</td>
<td>91.2</td>
</tr>
<tr>
<td>Ireland</td>
<td>2330</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100.0</td>
</tr>
<tr>
<td>Italy</td>
<td>10101</td>
<td>0</td>
<td>0</td>
<td>1355</td>
<td>1355</td>
<td>86.6</td>
</tr>
<tr>
<td>Latvia</td>
<td>8150</td>
<td>1440</td>
<td>60</td>
<td>80</td>
<td>1580</td>
<td>80.6</td>
</tr>
<tr>
<td>Lithuania</td>
<td>5750</td>
<td>330</td>
<td>130</td>
<td>50</td>
<td>510</td>
<td>91.1</td>
</tr>
<tr>
<td>Luxembourg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Macedonia; the former Yugoslav Republic of
  Moldova; Republic of                    | 999            | 0                 | 0                             | 0                                    | 0                             | 100.0                                  |
| Netherlands                             | 2150           | 123               | 0                             | 589                                  | 712                           | 66.9                                   |
| Norway                                  | 11632          | 0                 | 0                             | 0                                    | 0                             | 100.0                                  |
| Poland                                  | 32212          | 1085              | 595                           | 0                                    | 1680                          | 94.8                                   |
| Portugal                                | 11500          | 300               | 300                           | 97.4                                 |                               |                                        |
| Romania                                 |                |                   |                               |                                      |                               |                                        |
| Russian Federation                      | 150200         | 24700             | 0                             | 0                                    | 24700                         | 83.6                                   |
| Serbia and Montenegro                   | 3476           | 372               | 0                             | 22                                   | 394                           | 88.7                                   |
| Slovak Republic                         | 7400           | 300               | 300                           | 95.9                                 |                               |                                        |
| Slovenia                                | 2300           | 0                 | 0                             | 0                                    | 0                             | 100.0                                  |
| Spain                                   | 15863          | 1611              | 3224                          | 4835                                 |                               | 69.5                                   |
| Sweden                                  | 67766          | 395               | 528                           | 728                                  | 1651                          | 97.6                                   |
| Switzerland                             | 7451           | 375               | 0                             | 375                                  |                               | 95.0                                   |
| Turkey                                  | 22150          | 226               | 4544                          | 0                                    | 4770                          | 78.5                                   |
| Ukraine                                 | 11600          | 2800              | 0                             | 300                                  | 3100                          | 73.3                                   |
| United Kingdom                          | 9500           | 0                 | 0                             | 0                                    | 0                             | 100.0                                  |
Thus a table as given in the example below (Table 3) with total national required fellings (million m³ o.b./y) is produced from the market model projections and used as a main source of input in the scenarios of resource model.

Table 3  Example: total national felling levels used as input in resource model (million m³ o.b./year)

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total felling conifers</td>
<td>30.1</td>
<td>32.7</td>
<td>34.3</td>
<td>35.7</td>
<td>37.1</td>
<td>38.5</td>
</tr>
<tr>
<td>Out of which thinning conifers</td>
<td>9.0</td>
<td>9.8</td>
<td>10.3</td>
<td>10.7</td>
<td>11.1</td>
<td>11.5</td>
</tr>
<tr>
<td>Total felling broadleaves</td>
<td>28.0</td>
<td>30.5</td>
<td>31.9</td>
<td>33.2</td>
<td>34.5</td>
<td>35.8</td>
</tr>
<tr>
<td>Out of which thinning broadleaves</td>
<td>8.4</td>
<td>9.1</td>
<td>9.6</td>
<td>10.0</td>
<td>10.3</td>
<td>10.6</td>
</tr>
</tbody>
</table>

The required felling level from Table 3 above is then combined in EFISCEN with the actual state of the forest and the management regimes to test if this amount of fellings is available. In case the required felling level is too high, EFISCEN will only “harvest” the maximum amount available for harvesting, based on the assumed management regimes and growth of forest stands. The management regimes include a priori setting, which avoid overcuttings, e.g. the rotation periods are predefined and can only vary with a certain probability. Also the thinning intensity is set in a way that clear cut in middle age stands are excluded.

In reality, economics will take care of the rest of the required felling amount. Wood price will increase and lead to additional net imports, but also optimisation of forest management regimes and new technologies. This could also lead to improvement in the ratio between felling and removals, as the current level of losses would be reduced. However, to simulate such mechanisms would require a feedback to the market model and possibly also adaptations in the EFISCEN modelling structure. In this study such feedback is not applied.

2.5 Scenario assumptions

Within this study, two scenarios were evaluated: (1) baseline scenario and (2) alternative scenario (basically a higher demand scenario, complemented by a increase of FAWS). Both scenarios are evaluated until 2040.
Scenario 1, baseline scenario. The main assumption of the baseline scenario is that currently visible trends will continue until 2040. The required felling level is derived from the baseline projection of the market model (Kangas et al. in press). Their baseline scenario is based on the same assumption. The required felling levels are tested on their achievability against management regimes that represent forest management in the eighties and nineties. Further, concerning forest area available for wood supply (FAWS), the trends of the nineties are continued as they are, based on historical TBFRA2000 data. However, in some cases the outcomes of this approach were unreliable. Thus in cases where FAWS area changes amounted to more than +/- 10% by 2040 compared to 2000, these were cut off to +/- 10. If national correspondents provided updates for changes in FAWS (Table 5), those were used instead.

For countries of the Commonwealth of Independent States (CIS), i.e. Belarus, the Republic of Moldova, the European part of Russia, and the Ukraine, the change was based on secretariat estimates (Table 4). This results in the change rates as shown in Table 5.

The reasons behind changes in FAWS are various. Increases of FAWS, as a few national correspondents have assumed, can be due to afforestation of marginal or abandoned agricultural fields (both active and passive) or investments in accessibility (for example road building). Decreases can originate from deforestation for various purposes, or forests set aside for reasons of protection. It is impossible to separate all these processes, and in addition they can also differ very much between individual countries. Therefore it is not possible to assess which types of forest are added to, or subtracted from the FAWS and therefore an even distribution over all types was applied.

Scenario 2, alternative scenario. The alternative scenario in the current study is based on the “economic integration and liberalisation scenario” scenario of Thoroe et al. (2002). The main assumption under this scenario is an increased use of the forest under a higher GDP development. Thus the alternative scenario modelled in the current study takes new developments in the policy framework into account, mainly inserted here as an additional increase in FAWS area. The total FAWS change is set to increase with 1 percent point.
more than the baseline for EU/EFTA countries and by 2 percent point more than the baseline for CEEC. If national correspondents provided updates for changes in FAWS for the alternative scenario (Table 6), those were used instead. This was the case for Belgium, Bulgaria, Czech Republic, Estonia, France, Norway, Portugal, Slovak Republic, Slovenia, Spain, Switzerland, Turkey and the United Kingdom (Tables 5 and 6). The FAWS change assumption for Spain is a combination of policy forecasts (increase of the forest area by 700,000 ha by the year 2030) and historical division of the total forest area in FAWS and non-FAWS (respectively 77.6% and 22.4%). For CIS, the FAWS changes are shown in Table 4.

Under the alternative scenario the management regimes were kept the same as under the base scenario. It was thus assumed that a higher GDP and higher demand will not lead to increased willingness to supply through e.g. shortened rotation lengths.
Table 3: Annual growth of derived roundwood demand for the base and alternative scenario (removals underbark) 2000 en 2020 as projected by the market model (Kangas et al., in press)

<table>
<thead>
<tr>
<th>Country</th>
<th>Annual growth</th>
<th>base scenario</th>
<th>alternative scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>1.1</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>1.4</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>Belarus</td>
<td>1.2</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>Belgium &amp; Luxembourg</td>
<td>0.7</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0.1</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Croatia</td>
<td>-0.7</td>
<td>-0.3</td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td>1.3</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>0.4</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Estonia</td>
<td>0.8</td>
<td>1.1</td>
<td></td>
</tr>
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Table 4. FAWS area change for the base and alternative scenario, by the year 2040 in percentage points of the year-2000 area

<table>
<thead>
<tr>
<th>Region</th>
<th>FAWS change for the baseline scenario</th>
<th>FAWS change for the alternative scenario: additional growth, change in percent points compared to baseline from 2000-2040</th>
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<tr>
<td></td>
<td>Change in percent from 2000-2040</td>
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<tr>
<td></td>
<td></td>
<td>Based on extrapolation of TBFRA2000 data</td>
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<tr>
<td></td>
<td></td>
<td>Additional growth **</td>
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<td></td>
<td></td>
<td>Shifts FAWS - other forests</td>
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<td></td>
<td></td>
<td>Afforestations</td>
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<td>Russia</td>
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</table>

(1) This group average is illustrative. The individual country trends have been extrapolated.

(2) This growth has been added to the FAWS change of the base scenario of all countries, except in the case where country correspondents had reported different expectations.
Table 5: Index of FAWS in 2040 in the scenarios. Changes in FAWS are applied gradually over time. Figures in bold are provided by country correspondents.

<table>
<thead>
<tr>
<th>Country group</th>
<th>Country</th>
<th>Baseline 2040</th>
<th>Alternative 2040</th>
</tr>
</thead>
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<tr>
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<td>Albania</td>
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</tr>
<tr>
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<td>Bosnia and Herzegovina</td>
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<td>102.00%</td>
</tr>
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<td><strong>140.00%</strong></td>
<td><strong>150.00%</strong></td>
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</table>

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Management regimes

The management regimes incorporated in both scenarios represent forest management and owner behaviour (clear cuttings, thinnings, afforestations etc.) represent the average of the eighties and nineties of the last century. The management regimes are based on information from EFSOS national correspondents and local yield tables. The model was run with the same management regime settings through all the forecast periods.

In the Nordic countries the northern parts of the countries have longer rotations by about 20 years for all tree species compared to southern parts. Conifers have average rotations of 80-100 years in the southern parts, and broadleaves 60-80. Thinnings are possible from an age of 20, until 120-140 years for conifers and until about 100 years for broadleaves.

In the sub-Atlantic region fast growing coniferous species have average rotation lengths of about 45-60 years, whereas slower growing coniferous species have average rotation lengths of 100-120 years. Fast growing coniferous species are thinned maybe once or twice only at ages of 20 – 30 years. Valuable hardwood species, such as oak and beech have rotation lengths of 120-140 years. Very fast growing softwoods like poplars have rotations of 20-40 years, with other species usually having rotations of 60-80 years, depending on their growth and according to yield tables. Thinnings are usually possible between 20 years and the average rotation length.

In Mediterranean countries, circumstances differ again. Stands have more often protection goals, and are often managed in regeneration (selective) type of management. Still some rotation cycle needs to be defined in EFISCEN (which is valid for many production type of stands). E.g. for Pinus pinaster a rotation of 45 to 50 years is applied in privately owned forests, while in State owned forests the rotation may be around 80 years. For Pinus halepensis (drier sites) and Pinus sylvestris rotations of 80 respectively 100 years are used. These are just summarising indications of how rotation lengths may differ. For each species these are assigned by age and volume classes (and sometimes further distinguished by owner class and site class). All together some 400 management regimes were defined.
2.6 Structure of model outcomes and country groupings

For the purpose of this study, aggregated country model results will be presented for the pan-European area and for three different regions. Europe and its regions are for the purpose of this study defined as follows:

- **Europe**
  
  Europe covers the countries that are included in one of the three following country groups.

- **European Union and European Free Trade Agreement countries (EU/EFTA)**
  
  Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom. At present no scenario model is set up for Greece. Secretariat estimates have been included in the country group and in the pan-European totals.

- **Central and Eastern European Countries (CEEC)**
  
  Albania, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia, Former Yugoslav Republic of Macedonia, Turkey, the Federation of Serbia and Montenegro. The Federation of Serbia and Montenegro was formed upon the adoption of a new constitution on February 4th, 2003. It comprises the territories of Serbia and Montenegro under the former Federal Republic of Yugoslavia. At present no scenario model is set up for Bosnia and Herzegovina. Secretariat estimates have been included in the country group and in the pan-European totals.

- **The Commonwealth of Independent States (CIS)**
  
  Belarus, European part of the Russian Federation, Ukraine and the Republic of Moldova

For some countries the initialisation inventory data represent the year 2000 or 2001. In these cases the calculations started from the period 2001-2005, and this consequently causes absence of output data for the period 1996-2000 for some CEEC and CIS countries. This is why the reports for these country groups contain extrapolated scenario data for the year 2000.
3 Results

2.7 Country group results and sheets

3.1.1 Europe

Europe has a FAWS area of 335 million ha. Broadleaved forest occupies an area of 131 million ha and coniferous forest 204 million ha. The FAWS area is in the base scenario expected to decrease to 329 million ha by the year 2040 (broadleaves: 130 million ha and coniferous: 199 million ha). In the alternative scenario the forest area is expected to increase to 343 million ha (broadleaves: 135 million ha and coniferous: 209 million ha).

The age-class distribution is shown in Figure 5. The youngest age-classes (until 60 years) show a considerably lower area in the base scenario by the year 2040 compared to the year 2000. The alternative scenario shows by the year 2040 a much larger area in the first age class (1-20 years) compared to the initial situation. This is caused by the additional afforestations under the alternative scenario and a higher regenerated area due to higher fellings. The age classes for maturing and mature forest (61-120 years) show a higher area by 2040 in both the base and alternative scenario. The area of forest older than 180 years increases slightly.

![Figure 5 Total FAWS area in Europe, per age class for the year 2000 (at the start of the simulation) and for the year 2040 according to the base and alternative scenario.](image_url)
The major steering factor in the development of the forest resources comes from the increase in the required felling level over time as projected by the demand model. Under the base scenario, required felling levels on FAWS are expected to increase from 656 million m$^3$ in 2000 to 822 million m$^3$ in 2020. There are no significant problems in finding this amount of fellings during the modelling process. The fellings never exceed the increment in the first two forecast decades, while a shortage appears after 2020. Nevertheless, the model indicates that total growing stock increases from 51 billion m$^3$ in the year 2000 (of which broadleaves 39% and conifers 61%) to 62 billion m$^3$ by the year 2040 (of which broadleaves 45% and conifers 55%). Per area, the growing stock increases from 152 m$^3$ per ha in the year 2000 to 189 m$^3$ per ha in the year 2040.

With regard to the required felling level, the alternative scenario shows a similar development as the baseline scenario. Until 2020, the required felling level is projected to increase to 973 million m$^3$. This amount can be found by the model. It should be noted that beyond 2030 fellings would start to exceed increment. This would cause the total growing stock to increase to 56 billion m$^3$ by the year 2030 and to decline to 55 billion m$^3$ by the year 2040 (of which broadleaves 48% and conifers 52%). Per area, the growing stock also stops increasing by the year 2030 at a level of 164 m$^3$ per ha and then decreases to 160 m$^3$ per ha by the year 2040.

Summarising, in both scenarios, a discrepancy between required felling level and actual fellings can be seen after about 2025. This is an indication that in certain areas of Europe wood may become more scarce, which would have implications for trade and owner behaviour.
3.1.2 The European Union and European Free Trade Agreement countries

The European Union (EU) and European Free Trade Agreement (EFTA) countries represent 31% of the forest area available for wood supply in this study. Under the base scenario, the overall historical increase of the forest area available for wood supply is assumed to continue. In the alternative scenario, the increase takes place at a slightly higher pace. In the base scenario, the area increases from about 103 million ha in the year 2000 to 106 million ha by the year 2040.

Figure 6 illustrates the age-class distribution of the forests available for wood supply in the EU/EFTA region. Compared to the situation in the year 2000, there will generally be more FAWS area in the age classes up to 100 years by the year 2040. The forest area will be lower in the age-classes over 100 years. This shift in age class distribution is caused by higher fellings in both scenarios, which take place according to the model assumptions, mainly in the forests over 100 years old. Due to extra afforestations in the alternative scenario the first age classes contain even more forests than under the baseline scenario.

The required felling level on FAWS under the baseline scenario is expected by the market model to increase from 356 million m$^3$ per year in the period 2001-2005 to 393 million m$^3$ per year in the period 2016-2020. Extrapolation until 2040 yields a required felling level of 445 million m$^3$. The model shows that it is not possible to increase the

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fellings accordingly after 2025. In the period 2036-2040 the difference amounts to 5 million m$^3$ on average per year. Despite the increase in demand, the growing stock continues its increase from 16 to almost 21 billion m$^3$ o.b. from the year 2000 until the year 2040. The growing stock per area goes for the base scenario up from 157 m$^3$ per ha in the year 2000 to 194 m$^3$ per ha in the year 2040. The net annual increment slightly decreases from 5.0 (2000) to 4.6 (2040) m$^3$ per ha, but the EU/EFTA countries together have the highest net annual increment, which accounts for 43% of the total increment of the pan European area throughout the whole simulation. During the whole 40-year forecast period, fellings never exceed the net annual increment in the baseline. The ratio of fellings over increment rises from 68% in 2000 to 89% by the year 2040.

The demand for fellings in the alternative scenario is higher than in the base scenario and increases to 445 million m$^3$ on average per year for the period 2016-2020, up to 568 million m$^3$ in 2036-2040. After 2020 this required amount cannot be found completely from domestic resource. The growing stock per area increases until 2020 to a level of 174 m$^3$ per ha and stays constant afterwards. This constant growing stock is caused by a ratio of fellings over net annual increment of about 100% after 2020.
3.1.3 The Central and Eastern European Countries

The Central and Eastern European Countries (CEEC) currently have an area of about 48 million ha of forest available for wood supply (FAWS), which represents 14% of the total FAWS area considered in this study. It is expected that the FAWS will increase by 1% or 504 thousand ha by the year 2040, according to the base scenario. According to the alternative scenario, the area increases by 3% or 1.4 million ha by the year 2040. The age-class distribution shows a large increase in the age class 1-20 by the year 2040 (Figure 7). There will be a very large decrease of the area in the age classes 41-60 according to both scenarios. The mature forest increases in the age-classes of over 80 years.

![Figure 7 Total FAWS area in CEEC, per age class for the year 2000 (at the start of the simulation) and for the year 2040 according to the base and alternative scenario.](image)

The required felling level in the base scenario is expected to increase from 150 million m$^3$ on average per year for the period 2001-2005 to 187 million m$^3$ on average per year for the period 2016-2020. For 2036-2040, a level of 229 million m$^3$ is extrapolated. After 2020, the required felling level cannot be met by the forest resource on a sustainable basis. In 2040 the actual felling level is 21 million m$^3$ lower than requested. The total growing stock rises from about 9.1 billion m$^3$ in the year 2000 to 10.1 billion m$^3$ in the year 2040. The average growing stock increases from 191 m$^3$ per ha in 2000 to a
maximum of 211 m³ per ha in 2040. In the base scenario the ratio of fellings to net annual increment increases from 59% in 2000 to 97% in 2040.

The demand in the alternative scenario is higher than in the base scenario and increases to 211 million m³ on average per year for the period 2016-2020 million m³ and up to 287 million m³ for the period 2036-2040. Again after 2020 the resource has problems to find the required amount of fellings, resulting in a ratio of fellings to net annual increment of 106% in 2040. The total growing stock increases to 9.5 billion m³ in the year 2020 and then decreases to 9.4 billion m³ by the year 2040. The average growing stock increases to 198 m³ per ha in 2020 and then drops to 192 m³ per ha in 2040. This decrease can be attributed to a higher pressure on the forest resources, combined with an increase of 3% of the FAWS area.
3.1.4 The Commonwealth of Independent States

The Commonwealth of Independent States (CIS) represents with 185 million ha 55% of all forest area available for wood supply of this study. The FAWS area of the CIS is expected to decrease by 5% in the base scenario, to 175 million ha by the year 2040. Under the alternative scenario, a 2% increase is expected, resulting in an area of 188 million ha by the year 2040. The age class distribution shows that the forest resources will continue to grow older (Figure 8) under both scenarios.

![Figure 8](image)

**Figure 8 Total FAWS area in CIS, per age class for the year 2000 (at the start of the simulation) and for the year 2040 according to the base and alternative scenario.**

Despite the large share of the overall area of FAWS that the CIS region represents, it only provides 23% of the total fellings of Europe at the beginning of the modelling period. However, its share increases gradually to 35% in the base scenario in 2040. In this scenario, the required felling level is expected to increase from 150 million $m^3$ on average per year for the period 2001-2005 to 243 million $m^3$ for the period 2016-2020. Extrapolation yields a required felling level of 342 million $m^3$ on average per year for the period 2036-2040. There are no problems in finding the required felling volumes until 2040. The growing stock increases from 25.8 billion $m^3$ (140 $m^3$ per ha) in the year 2000 to 32.4 billion $m^3$ (185 $m^3$ per ha) by the year 2040. Under the base scenario, the ratio of fellings over net annual increment increases from 33% in the year 2000 to 82% in the year 2040.

In the alternative scenario, the required felling level is expected to increase to 320 million $m^3$ on average per year for the period 2016-2020. For 2036-2040 a required felling level of 511 million $m^3$ is foreseen. After 2035 this sharp increase in required felling level cannot be met by the resource anymore, considering the assumptions described above.
For the period 2036-2040, the actual felling level is 18 million m³ lower than requested. Due to the high felling level, the utilisation rate reaches the level of 100% by the year 2035. After that the ratio increases to 105% by the year 2040. Consequently, the growing stock keeps rises until the year 2030 to a level of nearly 29.4 billion m³ (157 m³ per ha), and then decreases slightly to 29.3 billion m³ (156 m³ per ha) in 2040.

The total increment in the CIS countries amounts to 37% of the total increment in this study. This share is to increase slightly to 38% in 2040 under the baseline scenario, despite a high increase of the fellings. It may be expected that after 2040 the net annual increment will increase, due to the influence of the faster growing young coniferous forests.
3.2.1 The European Union and European Free Trade Agreement countries

**Austria** currently fells about 85% from its net annual increment. Under the base scenario this slowly develops to 101% in 2040, despite an increase in FAWS by that time of 140 thousand ha. Consequently, the growing stock increases to a maximum of 1076 million m$^3$ in 2030. In the alternative scenario, a maximum of 1038 million m$^3$ is reached in 2020, after which the growing stocks decreases. The figure below illustrates the sharp decrease in the volume rich forest area available for wood supply of age more than 100 years. This is balanced by an increase in the younger age classes, which however contain smaller volumes.

![Figure 9 Age class distribution for total FAWS in Austria for the year 2000 and for the year 2040 according the baseline and alternative scenario.](image)

**Belgium and Luxembourg** can continue to increase their fellings until the year 2020, to a maximum level of 6.3 million m$^3$ following the baseline assumptions. Already before 2010 however, the fellings exceed the increment, resulting in a decrease of the growing stock from 153 million m$^3$ (235 m$^3$/ha) in 2000 to 103 million m$^3$ (172 m$^3$/ha) in 2040. This decrease is proportional to the fall of forest area available for wood supply in the older age classes and increase in the younger age-classes. This is illustrated in the age-class distribution below.
Figure 10 Age class distribution for total FAWS in Belgium and Luxembourg for the year 2000 and for the year 2040 according to the baseline and alternative scenario.

Denmark has an utilisation ratio between 60% and 70% throughout the modelling period, in both the base and the alternative scenario. Consequently, the growing stock is expected to rise from 175 to over 300 m$^3$ per ha during the next 40 years. The total growing stock will almost double, from 77 million m$^3$ o.b. now to 140 million m$^3$ o.b. in 2040. The age-class distribution (Figure 11) shows that the area of forests of 21-60 years will have declined much by the year 2040 (178 thousand ha) as compared to the initial situation (244 thousand ha). The area of maturing forest (60-100) is much higher by 2040 than in the initial situation, which explains the fast increase of growing stock. The area of mature forest (over 100 years) decreases slightly.

Figure 11 Age class distribution for total FAWS in Denmark for the year 2000 and for the year 2040 according to the baseline and alternative scenario.
Finland currently has a utilisation rate of 89%, which is expected to increase under both scenarios. In the baseline scenario, fellings exceed the net annual increment after 2020 and for the alternative scenario already after 2005. This causes the growing stock under the baseline to firstly increase from 2 billion m$^3$ in 2000 to slightly over 2.1 in 2020 and then to decrease to 2 billion m$^3$ again. Under the alternative scenario the growing stock decreases from 2 billion m$^3$ to 1.3 billion m$^3$. This decrease corresponds to the decline of the forest of over 60 years old, especially according to the alternative scenario. As most of the volume is generally contained in the older forest, this explains the sharp decrease in growing stock by 2040. This is illustrated in the age-class distribution figure below.

![Image of age-class distribution for total FAWS in Finland for the year 2000 and for the year 2040 according the baseline and alternative scenario.](image)

In France the fellings amount to 74% of the increment in 2000. The required felling level increase moderately from 58 million m$^3$ in 2000 to 72 million m$^3$ in 2040, which causes no problems. The growing stock increases from 221 m$^3$/ha up to 235 m$^3$/ha in 2040 according to the base scenario. The utilisation rate reaches a maximum in 2040 of 84%. The alternative scenario is characterised by a more rapid though still moderate increase in the required felling level (83 million m$^3$ by 2040), with a much smaller increase in the FAWS area compared to the base scenario. The alternative scenario reaches a maximum utilisation rate of 97% in 2040.

Germany has an utilisation rate of 56% of the increment in the year 2000. Under the base scenario, FAWS increases by 8% and the fellings by 30%, to 66 million m$^3$ by the year 2040. The total growing stock goes up by 34% to 4.1 billion m$^3$ in 2040. The utilisation rate increases to 84% under the baseline scenario, but under the alternative
scenario it increases to over 100% of NAI after 2030. This can be attributed to higher fellings (36% higher fellings in alternative than in baseline for the year 2040) in combination with a slightly declining increment.

**Ireland**’s increasingly maturing forest resources will allow an increase of the utilisation rate from 44% in 2000 to 80% in the base scenario or to 100% in the alternative scenario by 2040. The assumed increases in FAWS were even more moderate than proposed in Ireland’s forest policy plans. The fellings increase by 72% to over 4 million m$^3$ by the year 2040 in the base scenario. By that time the growing stock has reached an apparent saturation level at 365 m$^3$ per ha.

**Italy** currently fells only 34% of its net annual increment on FAWS. The expected increase in required felling level, from 9.5 million m$^3$ in the year 2000 to 14 million (base scenario) or 20 million m$^3$ (alternative scenario) by the year 2040, can be met over the whole period 2000-2040. However, the net annual increment decreases over these 40 years by over 1 m$^3$ per ha (a decrease of more than 20%). As a result, the utilisation ratio under the alternative scenario increases to 85% by 2040.

**Luxembourg** is described together with Belgium under ‘Belgium and Luxembourg’.

**The Netherlands** FAWS area is projected to increase from 314 thousand ha in the year 2000 to 346 thousand ha in the year 2040. By then the growing stock per area will have gained by 86% (355 m$^3$ per ha) compared to the year 2000. The utilisation rate is expected to slowly increase from the current 41% according to both the base (by 52%) and the alternative scenario (by 56%).

**Norway** sees its growing stock increasing in the period 2000-2040 from 749 million m$^3$ to 1091 or 1015 million m$^3$, respectively according the baseline and the alternative scenario. The required felling level from the market model has been increased with 778 thousand m$^3$ in order to include fellings for household consumption. The utilisation rate increases from 48% (2000) to 72% and 89% (2040) respectively. The decrease of the overall net annual increment by 24% (or 5.7 million m$^3$) over the 40-year period can be explained by changes in the age class distribution. At the beginning of the simulation period, the age class distribution is dominated by relatively young and well growing
stands. These stands mature during the simulation, causing a lower net annual increment, as shown in Figure 13.

![Figure 13 Age class distribution for total FAWS in Norway for the year 2000 and for the year 2040 according the baseline and alternative scenario.](image)

The Portuguese country sheet presents the output including results for Eucalypt plantations. It shows a utilisation rate of 30% in 2000. According to the base scenario, the fellings can increase from 10.9 million m$^3$ in the year 2000 to 13.7 million m$^3$ in the year 2040. Meanwhile, the total growing stock goes up from 129 million m$^3$ in the year 2000 to 139 million m$^3$ in the year 2010, after which the growing stock decreases to 120 million m$^3$ by the year 2040. The Eucalypt plantations have an important effect on the overall balance of the Portuguese forest resources. Covering 33% of the Portuguese FAWS area, the increment of the plantations accounts for 64% of the total increment in the year 2000. Already in the year 2000, 34% of the total growing stock is located in Eucalypt plantations, this share is expected to rise to 42% by the year 2040 according the base scenario (33% according the alternative scenario). The share of fellings is 43% in the base scenario in the year 2000, which increases to 67% by the year 2040. In the alternative scenario this share increases to 67% for the year 2030, after which the share decreases to 63%.

Spain's growing stock will increase from 730 million m$^3$ in 2000 to 1175 million m$^3$ (base scenario) or 1118 million m$^3$ (alternative scenario) by 2040. The fellings increase from 12.6 million in 2000 to 18 million m$^3$ (base scenario) or 20.4 (alternative scenario) in 2040. Combined with a nearly constant net annual increment of about 26 million m$^3$,
the utilisation rate reaches a maximum level of 70% (base scenario) or 79% (alternative scenario).

**Sweden** is expected to decrease its FAWS area by 400 thousand ha by the year 2040 following the base scenario and by 200 thousand ha by the year 2040 following the alternative scenario. The required felling level of the base scenario can easily be followed, even allowing an increase of the total growing stock of 22% by 2040. The utilisation rate, however, reaches close to 100% then. The increased demand in the alternative scenario can only be followed until 2030 after which fellings drop. This drop causes the growing stock to recover again towards 2040.

**Switzerland** increases its FAWS area by almost 10% to 1166 thousand ha by 2040 according to the base scenario. The FAWS area develops under the alternative scenario according to the recommendations of the country correspondent and firstly increases until the year 2020, after which it decreases until 2030 to remain stable afterwards. The required felling level has been increased with 22% following the suggestion from the country correspondent to account for differences in calculation methods between the National Forest Inventory and the official statistics. The country will be able to increase its fellings by 34% to 9.6 million m³, or by 46% to 10.5 million m³ by the year 2040, respectively following the base and alternative scenario. The growing stock per ha will increase to 419 m³ per ha by the year 2040 under the base scenario and to 417 m³ per ha under the alternative scenario.

**The United Kingdom** is expected to increase its FAWS area in the base scenario with at least 40% by 2040 according the national correspondent. The alternative scenario has a FAWS area increase of 50% by 2040. The country is projected to increase its fellings by the year 2040 by 59% according to the base scenario or even by 90% according to the alternative scenario. The model shows that there are difficulties to meet the required fellings for the period 2005-2015, after which enough resources seem available. The total growing stock as well as the growing stock per hectare continue to rise during the whole period (by 84% and 32% respectively in the base scenario and by 73% and 15% respectively in the alternative scenario).
3.2.2 The Central and Eastern European Countries

**Albania** currently falls 27% of the increment of FAWS in recorded fellings. Even with a decrease in FAWS by 90 thousand ha and an increase of the fellings with 366 thousand m³ per year by 2040 in the base scenario, it reaches a utilisation rate of only 66%. Under the alternative scenario the utilisation rate increases to 81%.

**Bulgaria** has known a substantial decrease of the FAWS area in the 90s, due to the establishment of a system of national parks. No further increase is expected in the area of these parks. Following this expert communication, the historical downward trend from TBFRA 2000 was discontinued in the baseline scenario and was kept at a constant level. Bulgaria currently has a rather high utilisation rate of 76%. Under the base scenario the fellings are not expected to reach 100% of net annual increment by 2040. A constant FAWS area in combination with an increase in roundwood demand by 26% in the base scenario, will still allow for an increase of the total growing stock by 5%. In the alternative scenario, the FAWS area is expected to increase by 15% or 468 thousand ha by the year 2040. Under the alternative scenario, the utilisation rate goes just over 100%.

**Croatia** had a utilisation rate in 2000 of 62%. According to the base scenario it is projected to increase to 96% by 2040. The growing stock per area reaches a maximum value of 145 m³ per ha in 2030 and stays stable until 2040. The total annual increment drops by 0.9 million m³ per year by 2040. The alternative scenario has a 15% (3.2 million m³) higher required felling level by 2040 compared to the base scenario. Despite a higher increase of FAWS compared to the base scenario, the utilisation rate reaches 100% of net annual increment before 2035. The growing stock reaches a maximum of 141 m³ per ha by 2010, which decreases after 2020 to 137 m³ per ha in 2040. The reason that the growing stock per hectare decreases already earlier in time are the afforestations. The total annual increment decreases less than in the base scenario, by only 0.7 million m³ per year.

**Czech Republic** currently has a rather high utilisation rate of 76%. Due to a high increase in required felling level the fellings start to exceed the increment in 2015 and by 2030 the required felling level cannot be met anymore. Over the projection period, the net annual increment decreases from 9.6 to 8.5 m³ o.b. per ha. Due to the higher increase
in felling levels in the alternative scenario, problems start already after 2020. The growing stock starts to decline already before, when the utilisation rate crosses 100% of NAI in 2010. The non-linear evolution of the forest area available for wood supply is based on the country correspondent’s assumptions.

**Estonian** FAWS area development shows large differences between the scenarios. Whereas TBFRA projected an increase, the correspondent expected a decrease. This has a large impact on total NAI, and consequently also on utilisation rates and growing stock development. Estonia has a utilisation rate of 86% of NAI in the year 2000 and reaches according to the base scenario a rate of 100% of NAI by the year 2015. The growing stock decreases with 12% (48 million m³) and the total net annual increment with 17% (2 million m³) in the base scenario from 2000 to 2040. Due to a higher felling level under the alternative scenario, the 100% of NAI mark is reached already by the year 2005 and continues to increase until 2040. In the alternative scenario the growing stock decreases with 22% (91 million m³) and the total net annual increment decreases with 31% (3 million m³). Towards the end of the simulation, there is hardly any old forest left. Due to the high felling level, the area of young forests has increased considerably (see Figure 14).

![Figure 14 Age class distribution for total FAWS in Estonia for the year 2000 and for the year 2040 according the baseline and alternative scenario.](image)

**Hungary** shows an increase in FAWS under the baseline scenario of about 200 thousand hectare, which consists mainly of broadleaves (86%). The fellings increase from 6 million m³ in 2000 to 8.5 million m³ in 2040. There are no problems in finding these felling levels. The total growing stock increases from 317 million m³ currently to 385 million in 2040. Due to simultaneous afforestations the average growing stock increases
from 186 to 212 m$^3$ per ha in 2030 and stabilises afterwards. In 2040, the ratio of fellings over net annual increment amounts to 96%. The required felling level in the alternative scenario increases much faster, causing the felling level to exceed the increment level after 2030. Consequently, the total growing stock reaches it maximum in 2030 at 365 million m$^3$ and decreases afterwards to 358 million in 2040. Due to the afforestations, the average growing stock reaches a maximum in 2020 at 203 m$^3$ per ha and then decreases to 193 in 2040.

Latvia’s fellings on FAWS currently equals the net annual increment. Due to foreseen increases in required felling levels, the utilisation ratio is expected to increase far over 100%. In the baseline scenario, the utilisation rate increases to 144% in 2040. Under the alternative scenario, a maximum 162% is reached in 2030, after which it decreases to 133% due to a lack of resources.

Figure 15 shows the wipe-out of the old forests and the sharp increase in young forests due to the high required felling levels. Due to this high level of exploitation, the current total growing stock of 488 million m$^3$ decreases to 307 million in 2040 under the baseline and to 243 million under the alternative scenario.
**Lithuania** will encounter under the base scenario a utilisation rate of more than 100% after the year 2020. The total growing stock can increase under the baseline scenario from 343 million m³ in 2000 to 362 in 2020, after which it declines to 354 million m³ in 2040. Despite this decrease, there are no problems in finding the required felling level. Due to the faster increase in fellings under the alternative scenario, the fellings exceed the increment already in 2020 by 6% and by 29% in 2040. After 2015 the total growing stock decreases, to a level of 305 million m³ in 2040. This is a decrease of 21% as compared to the year 2000.

**FYR Macedonia** is projected to increase its utilisation rate from about 76% in the year 2000 to about 116% in 2040, following an increase of the fellings by 78% according to the base scenario. Under the alternative scenario the required felling level more than doubles by the year 2040. This causes the utilisation rate to cross the 100% level already by 2005.

**Poland**’s FAWS area was for the year 2000 scaled to 8.4 million ha following communication with the country correspondent. Also the baseline increase of the FAWS area by 18 thousand ha annually is based on expert assumptions. Under the forecasted increase of FAWS area and fellings, Poland is still expected to keep its utilisation rate under 90%. The utilisation rate goes from 61% in the year 2000 to 81% under the base scenario and 87% under the alternative scenario in the year 2040. This results in an increase of the growing stock from 213 m³ per ha in 2000 to 285 and 273 m³ per ha in 2040 under the respective scenarios.

**Romania** will be able to increase its fellings with 77% by the year 2040 under the base scenario. This will still allow an increase of the growing stock per ha, which levels off towards the end of the period. A utilisation rate of 85% is reached by the year 2040. The alternative scenario puts more pressure to the forest resources, because the fellings increase by 121% compared to the year 2000 figure. Here, the utilisation rate will reach almost 100% by the year 2040.

**Serbia and Montenegro** will see a rapid increase of its utilisation rate in the future. This is the combination of a decline in annual increment and an increase in required felling
level. The net annual increment decreases from 5.8 in the year 2000 to 2.6 million m³ in the year 2040, opposed to an increase by 69% of the fellings from 1.5 to 2.5 million m³ according to the base scenario. Under the baseline scenario, the utilisation rate will increase from the current 25% to 95% in 2040. Under the alternative scenario this will increase to 116%. After 2015 there are some problems in finding the required level of thinnings under both scenarios.

**Slovak Republic** will under the expected required felling level exceed a utilisation rate of 100% by the year 2015 under the base scenario, and already by the year 2010 under the alternative scenario. According to both scenarios the growing stock starts to decrease afterwards. In the alternative scenario the removals can continue to increase until the year 2030 to a level of about 15.5 million m³ (an increase with over 7 million m³ compared to the year 2000). After that the increasing required felling level cannot be met anymore.

**Slovenia** is projected to increase its utilisation rate over the projected 40 year period from 38% in 2000 to 66% in the year 2040 under the base scenario, and to 86% under the alternative scenario. The growing stock per area develops respectively from 316 m³ o.b. in the year 2000 to 416 m³ o.b. (base scenario) and 391 m³ o.b. (alternative scenario) in 2040.

**Turkey** utilises its forest resources at the beginning of the simulation at a utilisation rate of 63% of NAI. The forest resources can follow the slight increase of the required fellings under the base scenario only until the year 2030, and for the alternative scenario only until 2020. Both scenarios show a decrease of the growing stock: a decrease of 9% in the base scenario and of 22% in the alternative scenario.
3.2.3 The Commonwealth of Independent States

Belarus has a low harvesting intensity, with a utilisation rate in 2000 of 23% only. The FAWS area is expected to increase by 166 thousand ha and 284 thousand ha respectively according baseline and alternative scenario. A more than doubling of the required fellings brings the utilisation rate to 52% and 62% respectively by the year 2040.

The Republic of Moldova currently utilises its forest resources at a rate of less than 30% of NAI. By the year 2040 this will increase slightly to 37% under the increased required fellings of the base scenario and to 52% under the alternative scenario. This low utilisation rate allows the growing stock to increase from 144 m$^3$ per ha in the year 2000 to 273 and 261 m$^3$ per ha in the year 2040, respectively according the base and alternative scenario.

The European part of Russia (EUPR), with 56% of total forest resources in this study, is expected to triple its rate of utilisation of net annual increment under the base scenario, from 24% in 2000 to almost 85% in 2040. The data on forest area available for wood supply was based on information from Pisarenko et al. (2001). The required felling level as projected by the market model was derived for the whole of the Russian Federation. The share of required fellings for the European part of Russia was estimated at 60% of the total, based on EUPR’s share in removals of total Russia (Pisarenko et al., 2001). The required felling level was lowered with 16.4% to account for fellings outside FAWS. The expected rise in felling levels under the alternative scenario is too high for the forest resources available. After the year 2030 the total growing stock as well as the growing stock per hectare start to decrease. The utilisation rate increases to over 111% by 2040 under the alternative scenario. This increase is caused by a dramatic increase of the projected fellings, rather than due to a change in overall net annual increment. Also the non-European part of Russia would be developed.

Ukraine does not utilise its forest resources fully, with a utilisation rate for the year 2000 of only 15%. The simulation shows that the country will be able to easily follow tripling (base scenario) or even quadrupling (alternative scenario) of the current level of fellings. Such a high increase will still allow the growing stock to go up with about 120 m$^3$ per ha.
(from 229 m³ per ha in 2000 to 353 m³ per ha in 2040) in the baseline scenario and with 80 m³ per ha in the alternative scenario.
3 Main findings and discussion

The results as presented have sketched a large and increasing forest resource in Europe. The growing stock increases under the baseline from 51 billion m$^3$ o.b. in 2000 to 61 billion m$^3$ o.b. in 2040, whereas the net annual increment slightly declines from 1.199 to 1.211 billion m$^3$ o.b. in the year 2040. The market projections show that fellings can be increased to fulfil the demand for timber and other wood products. Most of the fellings increase that can be achieved occurs in the CIS countries with 145% increase in actual fellings. Much more limited were the felling increases in EU/EFTA countries and CEEC countries with respectively increases of 26 and 31%. In absolute terms the smallest increase in fellings was forecasted for CEEC countries: an extra 49.6 million m$^3$/y (compared to EU/EFTA: 95.6 million m$^3$/y in the period 2036-2040; and CIS: 249.7 million m$^3$/y in the period 2036-2040). This is remarkable given the attention that these countries usually receive when it comes to future supply of wood to the Western European market. This can largely be explained by the facts that the share of CEEC in the FAWS is only limited (14%) and current utilisation ratios are already quite high (66% on average). If the required felling levels really increase as fast as foreseen, then it seems that the fellings increases will mostly have to come from CIS countries.

Due to the large increase in demand, the ratio of fellings over net annual increment increased to over 100% in several countries, causing a decline in growing stock after 2020. In itself such a high utilisation rate does not mean that the forest management is not sustainable, but if these are continued over a long time, forest resources might be depleted, such as the examples of the Baltic states show.

The current study shows contrasting developments compared to ETTS V (Pajuöja, 1995). Indeed the evaluations by the national correspondents led to decrease of total FAWS area with 8.59 million ha over the period 2000 to 2040 in the base scenario, while Pajuöja foresaw a total increase of 7 million ha. Another difference is that the market model outcomes project a much faster increase in required fellings in the current outlook. The required felling level is foreseen to increase from 710 million m$^3$ o.b. per year in 2000 to 895 billion m$^3$ o.b. per year in 2020 in the baseline scenario. This means an increase of 26% in 20 years, whereas Pajuöja - based on all correspondent information - foresaw an increase of only 17% over the total time span from 1990 to 2040. This, together with an
approach that dynamically simulates age class development -and thus net annual increment as well- shows that annual availability of roundwood may be hampered after 2020. In the baseline scenario the actual fellings in 2036-2040 were 47 million m³ lower than the required fellings (4.7%), whereas in the alternative scenario the difference amounted 215 million m³ per year (14.3%). In reality market mechanisms will take care of this difference, by adjusting prices and trade according to the principles of supply and demand. These adjustments cannot be simulated with the current modelling system and therefore the system needs to be adapted to make reliable projections after 2020 under such high increases of required fellings. Further, we have assumed here that all fellings have to be found on forest available for wood supply, thus ignoring the fact that part of the actual fellings take place outside the FAWS.

The projected outcomes of the scenarios are determined by the fast increase of the required felling level, the current state of the forest and the management regimes as incorporated in the model. For assumptions behind the increase in consumption of commodities we refer to Kangas et al. (In press). Despite the fact that re-use of by products (i.e. processing efficiency) was taken into account in the market scenarios, a steady increase in required felling level of 1.3% per year over the first 20 years in the base scenario was projected. The management regimes have an important impact on the model outcomes as well. In some cases, growing stocks may still be increasing in a country, while the simulation shows that required fellings cannot be found (e.g. the baseline scenario for the CEEC country group). In these cases, the incorporation of fixed management regimes may not be optimal. Flexible adaptation of management constraints could be a large improvement to the model when it would come to modelling forest management schemes.
References


Annex 1: Definitions

**Alternative scenario** for the purpose of this study sets higher demands than in short-term historical trends of domestic roundwood demand. The short-to-long term historical trends of FAWS area change according to the historical data in TBFRA 2000. The FAWS change is either set to increase to an area 2% larger than the one in the baseline, or as indicated by the EFOS country correspondent for Belgium, Bulgaria, Czech Republic, Estonia, France, Norway, Portugal, Slovak Republic, Slovenia, Spain, Switzerland, Turkey and the United Kingdom. The FAWS change assumption for Spain is the combination of policy forecasts and historical division of the forest in FAWS and non-FAWS. For the European countries of the Commonwealth of Independent States (CIS) the FAWS area changes were based on secretariat estimates.

**Base scenario** for the purpose of this study includes domestic roundwood demand as modelled by the base and the short-to-long term historical trends of FAWS area change according to the historical data in TBFRA 2000.

**Broadleaved** trees are all trees classified botanically as Angiospermae. They are sometimes referred to as ‘non-coniferous’ or ‘hardwoods’ (UN-ECE/FAO, 2000). The largest part of this group concerns deciduous species in Europe.

**Central and Eastern European Countries (CEEC)** include for the purpose and scope of this study and due to data availability: Albania, Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Serbia and Montenegro, Slovak Republic, Slovenia, FYR of Macedonia, Turkey.

**Commonwealth of Independent States (CIS)** includes for the purpose and scope of this study and due to data availability: Belarus, European part of the Russian Federation, Ukraine, and Republic of Moldova.

**Coniferous** trees are all trees botanically classified as Gymnospermae. They are sometimes referred to as softwoods (UN-ECE/FAO, 2000).

**Coppice and coppice with standards** is forest composed of stool-shoots or root suckers with or without scattered trees (standards), which may of seedling or coppice origin (UN-ECE/FAO, 2000).

**Deciduous** refers to broadleaved trees that have the capability to drop their leaves during a particular season of the year that coincides with particular circumstances as e.g. severe drought, reduced light intensity and coldness. The trees regenerate their leaf cover in the season that has improved growing conditions, generally spring under the European climate.

**Demand** is here used as the domestic demand for roundwood unless otherwise mentioned. A demand model has forecast short-term historical trend of domestic demand for roundwood for the years 2010, 2020 and 2030. This linear change in demand has been extrapolated to the year 2040.

**EFISCEN (European Forest Information Scenario Model)** is the forest resource projection model of the European Forest Institute that was applied in this study.
European Forest Institute (EFI) is a non-governmental, independent research organisation that promotes, conducts and co-operates in research of forestry and forest products at the pan-European level; and makes the results of the research known to all interested Parties, notably in the areas of policy formulation and implementation, in order to promote the conservation and sustainable management of forests in Europe.

European Union and European Free Trade Agreement countries (EU/EFTA) includes for the purpose and scope of this study and due to data availability: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

Forest Available for Wood Supply (FAWS) includes forest where any legal, economic, or specific environmental restrictions do not have a significant impact on the supply of wood. The area includes: areas where, although there are no such restrictions, harvesting is not taking place, for example areas included in long-term utilisation plans or intentions (UN-ECE/FAO, 2000). The original forest resource inventory input data has been contributed to the project by EFI or EFSOS country correspondents. The FAWS area has been upscaled to match with TBFRA2000 data.

Fellings refer to the volume of wood from stems or stakes that is felled in the forest, either in thinnings or in final fellings. The unit is cubic meters (m³), over bark, unless stated otherwise.

Forest resources are the forest resources on Forest Available for Wood Supply (FAWS) according to the definition used in the TBFRA-2000, except in the case that it is explicitly indicated to be otherwise.

Growing stock refers to the volume of wood standing in the living trees as measured and reported by national and/or regional forest inventory according to the specific methodology.

Mature forest is forest that has reached the age suitable for implementation of a final felling. The forest is ecologically mature and the trees are able to produce seeds and to regenerate. This term is most suitable for even-aged forest. This is consistent with the EFISCEN model, which calculates in terms of homogenous even-aged forests.

Net Annual Increment is the average annual volume over the given reference period of gross increment minus that of natural losses on all trees as measured and reported by national and/or regional forest inventory according to the specific methodology.

Overmature forest is forest that has reached the final stage of its development and starts to decline. This results in a loss of potential timber value. This term is most suitable for even-aged forest. This is consistent with the EFISCEN model, which calculates in terms of homogenous even-aged forests.

Removals are the amount of the fellings that are removed from the forest. The difference between fellings and removals are the residuals that stay on-site in the forest. The unit is cubic meters (m³), usually under bark, unless stated otherwise.
**Rotation length** refers to the number of years between the establishment or regeneration of a forest tree unit or stand and its final cutting at a specified stage of maturity.

**Scenario** is a set of parameters that is used to constraint the development of the forest resources in the model for a number of periods. The parameters set the demand for the (intermediate and final) fellings in the different classes (broadleaf, coniferous, coppice), the ratio between removals and fellings, young forest coefficients and the area of afforestation or deforestation. Different forest categories, depending on ownership class and site class can be modelled with different scenarios.

**Supply** is the amount of forest resources in the meaning of removals that have been calculated by the EFISCEN model as an output from the forest, anticipating the demand specified in the model scenario file. Supply does not equal demand in case the model cannot allocate enough resources that could be removed given the pre-defined model constraints.

**Sustainable forest management** is for the purpose of this study considered as a forest management where the yearly removals from the forest do not exceed the yearly growth of the trees in the forest. The authors of this study understand the complexity of the forest ecosystem and that there are many more factors that contribute to the sustainable management of an ecosystem, e.g. the nutrient balance of the forest soil, conservation of biodiversity, etc.. These factors however cannot (yet) be taken into account in the EFISCEN model approach and are left out of consideration here.

**Utilisation rate** is for the purpose of this document defined as the ratio of fellings (m$^3$ o.b.) over net annual increment (m$^3$ o.b.).

**Young forest coefficients** are a measure of the effectiveness of regeneration. From the area which is in the bare-forest-land class, this share is entering the lowest age- and volume class and will thus be considered as being planted or naturally regenerated and has reached the average volume of the lowest volume class.
### Annex 2: National data correspondents

<table>
<thead>
<tr>
<th>Country</th>
<th>Correspondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>Dr. Eng. Bashkim Mal Lushaj</td>
</tr>
<tr>
<td>Austria</td>
<td>Dr. Klemens Schadauer</td>
</tr>
<tr>
<td>Belarus</td>
<td>Mr. Mikhail V. Kuzmenkov</td>
</tr>
</tbody>
</table>
| Belgium                      | Wallony: Prof. Dr. J. Rondeux & Dr. Hebert  
                                | Flanders: ir. Bart Roelandt           |
| Bosnia and Herzegovina       | Ms. Sabanka Rado                       |
| Bulgaria                     | Mr. Stefan Mirchev                     |
| Croatia                      | Mr. Goran Kovac                        |
| Czech Republic               | Dr. Miloš Kraus                        |
| Denmark                      | Dr. Kim Dralle                         |
| Estonia                      | Mr. Ulo Viilup                         |
| Finland                      | Prof. Erkki Tomppo                     |
| France                       | Dr. G. Pignard                         |
| Germany                      | Mr. Peter Lohner                       |
| Greece                       | Dr. I Meliadis                         |
| Hungary                      | Dr. Peter Csoka                        |
| Ireland                      | Cormack Judge                          |
| Italy                        | Dr. Franco Cozza                       |
| Latvia                       | Sanda Zauere                           |
| Lithuania                    | Dr. Edmundas Petraukas                 |
| Luxembourg                   | Mr. Marc Wagner                        |
| Macedonia, frm YugRep        | Mr. Luktscho Nesterovski               |
| Moldova                      | -                                      |
| Netherlands                  | ir. H. Schoonderwoerd                  |
| Norway                       | Mr. S.M. Tomter                        |
| Poland                       | Mr. Roman Michalak                     |
| Portugal                     | Mr. Antonio Leite                      |
| Romania                      | Mr. Claudiu Zaharescu                  |
| Russia                       | Mr. Valentin V. Strakhov & Dr. Pisarenko |
| Slovak Republic              | Mr. Ivan Luptak                        |
| Slovenia                     | Dr. Hocevar                            |
| Spain                        | Dr. J.A. Villanueva                    |
| Sweden                       | Dr. U. Söderberg                       |
| Switzerland                  | Dr. U.-B. Brändli                      |
| Ukraine                      | Mr. V. F Romanovsky & Dr. I. Buksha     |
| Turkey                       | Mr. Ulvius                             |
| United Kingdom               | Mr. Simon Gillam                       |
| Serbia and Montenegro        | Mr. Milan Medarevic                    |
Annex 3: Questionnaire

Dear country correspondent,

In the past decades the Timber Committee at the UN-ECE in Geneva has made various outlook studies for the development of the European Forest sector. Considering the recent fast developments in forestry and the forest sector (e.g. opening up of Eastern Europe, bioenergy discussions, nature oriented forest management) it was decided to produce a new outlook study by the end of 2002. This is part of the EFSOS programme. See for more information on EFSOS http://www.unece.org/trade/timber/efsos

For the projection of the forest resource in Europe the EFSOS specialists and national correspondents suggested applying the European Forest Information Scenario Model (EFISCEN) and to contract the European Forest Institute in Joensuu, Finland. The objective of the EFISCEN model in the framework of EFSOS is to investigate a certain roundwood demand against the sustainability of forest management, simulating the development of the forest resources of European countries over an outlook horizon of 50 years. To successfully implement this task, the currently available European Forest Resource Database that underlies the EFISCEN model will need to be updated and expanded.

In 1996, the EFISCEN team had contacted [national inventory specialist name] directly in order to build a European Forest Resource Database. He/she informed and supplied the EFISCEN team with [your latest country data or you informed us of the reliability/accuracy of the old dataset which we had received earlier from the IIASA’s Forest Study (some details of what we received these old data are included here to this letter on floppy disc ) ]. (http://www.efi.fi/projects/eefi) Several projects have been implemented, or are presently underway with these data.

Further in 1997/98 UN ECE/FAO collected the Temperate and Boreal Forest Resource Assessment data. A big effort was made in common definitions on various forest parameters. Now this data presents a comprehensive and consistent overview on forest resources in the region. (www.unece.org/trade/timber/fra) The results are approved by the countries and have an official status. At the same time the structure of this data set is not detailed enough to serve as input data for EFISCEN.

The goal of the current inquiry is to update the EFISCEN dataset based on your latest National Forest Inventory. To run EFISCEN, the main parameters (age, area, growing stock, increment) need to be structured by tree species, owner ship classes, site classes and regions

The attached questionnaire explains the requested information.

In the case of further questions please contact:

European Forest Institute
Andreas Schuck
Torikatu 34
Fin 80100 Joensuu, Finland.
Tel + 358.13.2520227
Fax + 358.13.124393
Andreas.schuck@efi.fi

We would ask you to please send the actual data before 15 September to Andreas Schuck at EFI.

We would appreciate in the meantime an immediate response to this letter (by email or phone), informing us on your possibilities to provide the data.

We would like to thank you very much in advance.

Yours sincerely,

Dr. Volker Sasse  Mr. Kit Prins
Questionnaire

For the collection of forest inventory data as input to the
European Forest Information Scenario Model

1. Introduction

Firstly, we are looking for data representing your national forest area. Please indicate your
• area of forest available for wood supply ….. 1000 ha, and
• your area of forest not available for wood supply …..1000 ha.

We are now looking for detailed data representing your national ‘forest available for wood supply’ on
• area (ha),
• growing stock volume (m3 ha –1 overbark),
• net annual increment (m3 ha –1 y-1 overbark)
cross structured by
• regions,
• ownership classes,
• site classes,
• tree species, and
• age classes

At the end of this questionnaire you find some requests for general information.

An example of the data required (one of such a set of data we call a SEDS: Single Entity Data Set):

REGION=1
OWNER=1
SITE CLASS = 1
SPECIES= 1 (PINE, Pinus sylvestris)

<table>
<thead>
<tr>
<th>AGE</th>
<th>AREA Ha</th>
<th>GROWING STOCK m3/ha</th>
<th>INCREMENT m3/ha/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>110151</td>
<td>20</td>
<td>2.37</td>
</tr>
<tr>
<td>30</td>
<td>74586</td>
<td>107</td>
<td>7.23</td>
</tr>
<tr>
<td>50</td>
<td>66139</td>
<td>197</td>
<td>7.96</td>
</tr>
<tr>
<td>70</td>
<td>74203</td>
<td>240</td>
<td>7.3</td>
</tr>
<tr>
<td>90</td>
<td>66980</td>
<td>256</td>
<td>6.34</td>
</tr>
<tr>
<td>110</td>
<td>27967</td>
<td>269</td>
<td>5.53</td>
</tr>
<tr>
<td>130</td>
<td>4800</td>
<td>212</td>
<td>3.53</td>
</tr>
<tr>
<td>150</td>
<td>3180</td>
<td>240</td>
<td>2.92</td>
</tr>
<tr>
<td>160</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Structure of SEDS

SEDS are to be distinguished in a detailed way for your national forest available for wood supply, but the number of SEDS you distinguish depends on your data availability.

![Diagram of SEDS hierarchy]

Figure 1. Example of hierarchy of distinguishing SEDS. In this case it was assumed that in each level, two types can be distinguished. For the FAWS area you would have 16 SEDS.

The structure of the data you provide determines the smallest unit for which results are available. In order to produce best results for modelling, the data should be compiled as detailed as possible (see figure). Of course some data tables may contain no data as, for example if there is no tree species “Aspen” on a “poor site”, the table will be empty.
3 Explanatory Notes

3.1. Parameters

Area
area per age class, ha

Growing stock
mean stemwood volume of the age class, m³/ha overbark

Increment
net current annual increment (CAI) of the age class, m³/ha/year overbark

please indicate in your reply the definition you applied.

3.2. SEDS Indices

Region
For more detailed georeferenced presentation of forest resources, a structure by regions would be highly needed and appreciated. The region could represent administrative units e.g. provinces or counties.

For your country …NUTS level was provided in 1996, we would appreciate

Owner classes
Distinguish owners by appropriate groups valid for your country. A short description of the individual ownership classes should be provided.

Site classes
Distinguish site classes by appropriate groups that are valid/in-use for your country. A short description of the site classes should be provided.

Tree species(groups)
The main tree species should be distinguished. The remaining tree species may be provided individually but can also be added to a species groups, e.g. other broadleaves, other coniferous. Where appropriate the scientific names of all species in that group should be given in order to allow clear distinction.

Age classes and clearcut areas
Age classes are preferably to be given by 5 years classes. If this is not possible by 10, or 20 year classes. Also the number of age classes may vary between tables depending on the forest structure.
Clearcut areas can usually not be assigned to a specific SEDS, and should therefore be provided separately as one number for each combination of distinguished region and owner.

Organising the data
The organisation of data we leave to your choice: whether an excel sheet with tables as organised in the included old data set, or whether as a more proper database format (e.g. MS Access).

4  Additional information

4.1  Changes in tree species distribution for the region/country

Indicate in relative terms what you expect as tree species composition changes in your country for the time span 2000-2050.

Example for a country where only three species were distinguished.

<table>
<thead>
<tr>
<th>Tree species group</th>
<th>2000 (from inventory)</th>
<th>2050 (your expectation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10%</td>
<td>25%</td>
</tr>
<tr>
<td>2</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>3</td>
<td>30%</td>
<td>35%</td>
</tr>
</tbody>
</table>

4.2  Changes in total ‘Forest area available for wood supply’

Indicate in relative terms what you expect as area change in your country for the time span 2000-2050. (this may also include loss of FAWS due to establishment of e.g. forest reserves)

<table>
<thead>
<tr>
<th>Year</th>
<th>Index 2000 = 100%</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000 (from inventory)</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>2010 (your expectation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020 (your expectation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2030 (your expectation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2040 (your expectation)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.3. Management regimes

Rotation length (clear cutting regimes)

Specify commonly used average rotation lengths per tree species in your country.

Example for a country where only three species were distinguished.

<table>
<thead>
<tr>
<th>Tree species group</th>
<th>Rotation length (year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
Thinning regimes

Specify commonly used thinning regimes per tree species in your country.

Example for a country where only three species were distinguished.

<table>
<thead>
<tr>
<th>Tree species group</th>
<th>Age of earliest thinning</th>
<th>Periodicity (e.g. every 5, 10, etc. years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Share in total national fellings coming from thinnings

Example for a country where only three species were distinguished.

<table>
<thead>
<tr>
<th>Tree species group</th>
<th>Share from thinnings</th>
<th>Share from clear cuts</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coniferous</td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Deciduous</td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

4.4. Background information

Year of forestry inventory

Please indicate the period to which the data refer

New developments in forest inventory activities

Will new inventories be completed in the near future and when will the data become available.

4. Forest area

The data should cover the total forest area of a country/region (FAWS and FNAWS). If not, the gaps should be explained. The gaps in forest area should be made available by the regions that have been specified.
## Annex 4: Country Profile Sheets

### Europe Base scenario

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>335,243</td>
<td>333,624</td>
<td>331,826</td>
<td>330,004</td>
<td>328,644</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>203,641</td>
<td>202,443</td>
<td>201,189</td>
<td>199,937</td>
<td>199,000</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>121,602</td>
<td>131,181</td>
<td>130,636</td>
<td>130,067</td>
<td>129,645</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>50,845,431</td>
<td>54,833,302</td>
<td>58,250,009</td>
<td>60,688,335</td>
<td>62,223,946</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>36,901,855</td>
<td>32,468,589</td>
<td>33,676,376</td>
<td>34,181,175</td>
<td>34,055,840</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>13,943,576</td>
<td>22,364,713</td>
<td>24,573,634</td>
<td>26,507,159</td>
<td>28,168,106</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,199,171</td>
<td>1,200,510</td>
<td>1,205,073</td>
<td>1,206,664</td>
<td>1,199,768</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>750,188</td>
<td>758,166</td>
<td>765,084</td>
<td>776,779</td>
<td>783,378</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>448,983</td>
<td>442,344</td>
<td>439,989</td>
<td>429,885</td>
<td>416,390</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>644,863</td>
<td>771,026</td>
<td>886,889</td>
<td>984,943</td>
<td>1,070,097</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>491,617</td>
<td>572,023</td>
<td>662,626</td>
<td>741,220</td>
<td>810,801</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>173,246</td>
<td>199,003</td>
<td>224,262</td>
<td>243,723</td>
<td>259,296</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>497,101</td>
<td>576,538</td>
<td>663,210</td>
<td>736,574</td>
<td>800,300</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>367,409</td>
<td>427,566</td>
<td>495,336</td>
<td>554,128</td>
<td>606,184</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>129,691</td>
<td>149,972</td>
<td>167,874</td>
<td>182,446</td>
<td>194,116</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>352,930</td>
<td>409,964</td>
<td>472,447</td>
<td>525,826</td>
<td>571,235</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>258,478</td>
<td>300,855</td>
<td>349,085</td>
<td>390,945</td>
<td>428,498</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>94,452</td>
<td>109,098</td>
<td>123,362</td>
<td>134,881</td>
<td>142,737</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>144,171</td>
<td>166,584</td>
<td>190,763</td>
<td>210,747</td>
<td>229,065</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>108,932</td>
<td>126,710</td>
<td>146,250</td>
<td>163,182</td>
<td>177,686</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>35,239</td>
<td>39,874</td>
<td>44,513</td>
<td>47,565</td>
<td>51,379</td>
</tr>
</tbody>
</table>

### Ratios

- Growing stock per Area                 cu.m. o.b. / ha  152  164  176  184  189
- Net annual increment per growing stock  cu.m. o.b. / cu.m. o.b.  2.4%  2.2%  2.1%  2.0%  1.9%
- Fellings per Net annual increment      cu.m. o.b. / cu.m. o.b.  55%  64%  74%  82%  89%
- Removals per Area                      cu.m. u.b. / ha / y.  1.5  1.7  2.0  2.2  2.4

### Graphs

#### Growing stock, total

- Base scenario
- Alternative scenario

#### Net annual increment, total

- Base scenario
- Alternative scenario
### EU and EFTA Base scenario

<table>
<thead>
<tr>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest resource parameters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>102,995</td>
<td>103,854</td>
<td>104,534</td>
<td>105,190</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>64,615</td>
<td>64,892</td>
<td>65,114</td>
<td>65,336</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>38,380</td>
<td>38,962</td>
<td>39,420</td>
<td>39,655</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>16,160,908</td>
<td>17,912,671</td>
<td>19,089,295</td>
<td>19,947,212</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>10,534,176</td>
<td>11,568,172</td>
<td>12,272,897</td>
<td>12,755,623</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>5,656,732</td>
<td>6,343,499</td>
<td>6,816,297</td>
<td>7,191,369</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>515,614</td>
<td>508,094</td>
<td>504,692</td>
<td>494,995</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>352,046</td>
<td>354,414</td>
<td>356,193</td>
<td>351,933</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>163,568</td>
<td>153,680</td>
<td>148,499</td>
<td>143,062</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>348,640</td>
<td>365,914</td>
<td>392,726</td>
<td>416,255</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>258,680</td>
<td>269,539</td>
<td>280,550</td>
<td>307,884</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>89,562</td>
<td>95,942</td>
<td>101,710</td>
<td>107,880</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>260,291</td>
<td>273,188</td>
<td>293,206</td>
<td>310,773</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>193,157</td>
<td>201,266</td>
<td>216,959</td>
<td>229,689</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>67,134</td>
<td>71,922</td>
<td>76,247</td>
<td>80,675</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>189,629</td>
<td>199,305</td>
<td>214,370</td>
<td>227,745</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>139,233</td>
<td>145,279</td>
<td>157,156</td>
<td>166,975</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>50,396</td>
<td>54,026</td>
<td>57,215</td>
<td>60,769</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>70,662</td>
<td>73,883</td>
<td>78,836</td>
<td>83,028</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>53,924</td>
<td>55,987</td>
<td>59,803</td>
<td>62,923</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>16,738</td>
<td>17,896</td>
<td>19,033</td>
<td>20,106</td>
</tr>
</tbody>
</table>

### Ratios

<table>
<thead>
<tr>
<th></th>
<th>cu.m. o.b. / ha</th>
<th>157</th>
<th>172</th>
<th>183</th>
<th>190</th>
<th>194</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growing stock per Area</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
<td>3.2%</td>
<td>2.8%</td>
<td>2.6%</td>
<td>2.5%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Net annual increment per growing stock</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
<td>68%</td>
<td>72%</td>
<td>78%</td>
<td>84%</td>
<td>89%</td>
</tr>
<tr>
<td>Fellings per Net annual increment</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
<td>2.5</td>
<td>2.6</td>
<td>2.8</td>
<td>3.0</td>
<td>3.1</td>
</tr>
</tbody>
</table>

---

**Diagram:**
- FAWS (1000 ha)
- Growing stock, total (1000 cu.m. o.b.)

---

**Note:** The data and diagrams represent forest resource parameters and ratios over the years 2000 to 2040, illustrating the base scenario and its variations.
### Austria

#### Base scenario

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>3,354</td>
<td>3,398</td>
<td>3,433</td>
<td>3,468</td>
<td>3,494</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>2,541</td>
<td>2,574</td>
<td>2,601</td>
<td>2,627</td>
<td>2,647</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>813</td>
<td>824</td>
<td>832</td>
<td>841</td>
<td>847</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>99,111</td>
<td>1,035,871</td>
<td>1,068,221</td>
<td>1,075,512</td>
<td>1,068,773</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>821,284</td>
<td>855,295</td>
<td>871,771</td>
<td>869,620</td>
<td>857,793</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>170,628</td>
<td>180,522</td>
<td>194,450</td>
<td>205,893</td>
<td>210,920</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>32,422</td>
<td>31,550</td>
<td>33,039</td>
<td>31,745</td>
<td>33,143</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>26,504</td>
<td>25,987</td>
<td>27,269</td>
<td>26,075</td>
<td>27,371</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>5,918</td>
<td>5,563</td>
<td>5,770</td>
<td>5,670</td>
<td>5,772</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>26,645</td>
<td>28,854</td>
<td>29,912</td>
<td>31,795</td>
<td>33,584</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>22,019</td>
<td>24,030</td>
<td>25,729</td>
<td>27,031</td>
<td>28,275</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>4,626</td>
<td>4,824</td>
<td>4,183</td>
<td>4,764</td>
<td>5,309</td>
</tr>
<tr>
<td>Removels, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>18,476</td>
<td>20,007</td>
<td>20,741</td>
<td>22,047</td>
<td>23,287</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>15,268</td>
<td>16,663</td>
<td>17,840</td>
<td>18,744</td>
<td>19,606</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,208</td>
<td>3,345</td>
<td>2,901</td>
<td>3,303</td>
<td>3,681</td>
</tr>
<tr>
<td>Removels, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>15,705</td>
<td>16,986</td>
<td>17,515</td>
<td>18,653</td>
<td>19,736</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>12,978</td>
<td>14,163</td>
<td>15,164</td>
<td>15,932</td>
<td>16,665</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,726</td>
<td>2,823</td>
<td>2,351</td>
<td>2,721</td>
<td>3,071</td>
</tr>
<tr>
<td>Removels, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,771</td>
<td>3,021</td>
<td>3,226</td>
<td>3,394</td>
<td>3,551</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,290</td>
<td>2,499</td>
<td>2,676</td>
<td>2,812</td>
<td>2,941</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>481</td>
<td>522</td>
<td>550</td>
<td>582</td>
<td>610</td>
</tr>
</tbody>
</table>

#### Ratios

- Growing stock per Area  
  cu. m. o.b. / ha  
  296  305  311  310  306
- Net annual increment per growing stock  
  cu. m. o.b. / cu. m. o.b.  
  3.3%  3.0%  3.1%  3.0%  3.1%
- Net annual increment per ha  
  cu. m. o.b. / ha / y.  
  9.7  9.3  9.6  9.2  9.5
- Fellings per Net annual increment  
  cu. m. o.b. / cu. m. o.b.  
  82%  91%  91%  100%  101%
- Removals per Area  
  cu. m. u.b. / ha / y.  
  5.5  5.9  6.0  6.4  6.7

### Graphs

- [Graph of FAWS (1000 ha)]
- [Graph of Growing stock, total (1000 cu.m. o.b.)]
Belgium-Luxembourg  

### Forest resource parameters

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area of forest available for wood supply</strong></td>
<td>1000 ha</td>
<td>651</td>
<td>635</td>
<td>621</td>
<td>608</td>
<td>598</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>311</td>
<td>303</td>
<td>297</td>
<td>291</td>
<td>286</td>
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<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>340</td>
<td>331</td>
<td>325</td>
<td>318</td>
<td>312</td>
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<tr>
<td><strong>Growing stock, total</strong></td>
<td>1000 cu.m. o.b.</td>
<td>153,058</td>
<td>150,305</td>
<td>135,402</td>
<td>115,055</td>
<td>102,732</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>88,881</td>
<td>85,457</td>
<td>74,331</td>
<td>57,490</td>
<td>46,500</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>64,177</td>
<td>64,848</td>
<td>61,071</td>
<td>57,565</td>
<td>56,232</td>
</tr>
<tr>
<td><strong>Net annual increment, total</strong></td>
<td>1000 cu.m. o.b. / y.</td>
<td>6,558</td>
<td>5,032</td>
<td>4,613</td>
<td>4,084</td>
<td>4,007</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>4,075</td>
<td>3,461</td>
<td>3,114</td>
<td>2,690</td>
<td>2,675</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,483</td>
<td>1,571</td>
<td>1,499</td>
<td>1,394</td>
<td>1,332</td>
</tr>
<tr>
<td><strong>Fellings, total</strong></td>
<td>1000 cu.m. o.b. / y.</td>
<td>4,570</td>
<td>5,918</td>
<td>6,302</td>
<td>6,159</td>
<td>4,808</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>3,272</td>
<td>4,165</td>
<td>4,381</td>
<td>4,483</td>
<td>3,340</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,298</td>
<td>1,753</td>
<td>1,921</td>
<td>1,677</td>
<td>1,469</td>
</tr>
<tr>
<td><strong>Removals, total</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,947</td>
<td>5,111</td>
<td>5,442</td>
<td>5,319</td>
<td>4,152</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,826</td>
<td>3,597</td>
<td>3,784</td>
<td>3,872</td>
<td>2,884</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,121</td>
<td>1,514</td>
<td>1,659</td>
<td>1,448</td>
<td>1,268</td>
</tr>
<tr>
<td><strong>Removals, total from final fellings</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,763</td>
<td>3,597</td>
<td>4,092</td>
<td>4,080</td>
<td>2,960</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,978</td>
<td>2,358</td>
<td>2,935</td>
<td>3,120</td>
<td>2,153</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>795</td>
<td>1,059</td>
<td>1,157</td>
<td>960</td>
<td>807</td>
</tr>
<tr>
<td><strong>Removals, total from thinnings</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,184</td>
<td>1,514</td>
<td>1,351</td>
<td>1,239</td>
<td>1,192</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>848</td>
<td>1,059</td>
<td>848</td>
<td>751</td>
<td>731</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>336</td>
<td>455</td>
<td>502</td>
<td>488</td>
<td>461</td>
</tr>
</tbody>
</table>

### Ratios

- **Growing stock per Area**  
  cu.m. o.b. / ha  
  235 237 218 189 172

- **Net annual increment per growing stock**  
  cu.m. o.b. / cu.m. o.b.  
  4.3% 3.3% 3.4% 3.5% 3.9%

- **Net annual increment per ha**  
  cu.m. o.b. / ha / y.  
  10.1 7.9 7.4 6.7 6.7

- **Fellings per Net annual increment**  
  cu.m. o.b. / cu.m. o.b.  
  70% 116% 137% 151% 120%

- **Removals per Area**  
  cu.m. u.b. / ha / y.  
  6.1 8.1 8.8 8.7 6.9
Denmark

Base scenario

<table>
<thead>
<tr>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>142</td>
<td>144</td>
<td>146</td>
<td>146</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>76,976</td>
<td>97,897</td>
<td>113,730</td>
<td>128,199</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>45,146</td>
<td>62,005</td>
<td>74,716</td>
<td>86,493</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>31,830</td>
<td>35,891</td>
<td>39,014</td>
<td>41,706</td>
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<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>3,898</td>
<td>4,277</td>
<td>4,216</td>
<td>4,032</td>
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<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,803</td>
<td>3,090</td>
<td>3,039</td>
<td>2,917</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,094</td>
<td>1,186</td>
<td>1,177</td>
<td>1,155</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,418</td>
<td>2,644</td>
<td>2,652</td>
<td>2,632</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,618</td>
<td>1,772</td>
<td>1,784</td>
<td>1,771</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>800</td>
<td>872</td>
<td>868</td>
<td>860</td>
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<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,374</td>
<td>2,596</td>
<td>2,603</td>
<td>2,584</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,588</td>
<td>1,740</td>
<td>1,751</td>
<td>1,739</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>785</td>
<td>856</td>
<td>852</td>
<td>844</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,702</td>
<td>1,853</td>
<td>1,870</td>
<td>1,875</td>
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<tr>
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<td>1000 cu.m. u.b. / y.</td>
<td>1,191</td>
<td>1,297</td>
<td>1,309</td>
<td>1,312</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>511</td>
<td>556</td>
<td>561</td>
<td>562</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>672</td>
<td>743</td>
<td>733</td>
<td>709</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>397</td>
<td>443</td>
<td>442</td>
<td>427</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>275</td>
<td>300</td>
<td>291</td>
<td>282</td>
</tr>
</tbody>
</table>

Ratios

- Growing stock per Area cu.m. o.b. / ha 175 219 252 281 305
- Net annual increment per growing stock cu.m. o.b. / cu.m. o.b. 5.1% 4.4% 3.7% 3.1% 2.7%
- Net annual increment per ha cu.m. o.b. / ha / y. 8.9 9.6 9.3 8.8 8.2
- Fellings per Net annual increment cu.m. o.b. / cu.m. o.b. 62% 62% 63% 65% 69%
- Removals per Area cu.m. u.b. / ha / y. 5.4 5.8 5.8 5.7 5.5
## Finland Base scenario

### Forest resource parameters

<table>
<thead>
<tr>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest area for wood supply (1000 ha)</td>
<td>1000 ha</td>
<td>20,551</td>
<td>19,951</td>
<td>19,470</td>
<td>18,990</td>
</tr>
<tr>
<td>- Coniferous</td>
<td>1000 ha</td>
<td>16,478</td>
<td>15,894</td>
<td>15,606</td>
<td>15,218</td>
</tr>
<tr>
<td>- Broadleaved</td>
<td>1000 ha</td>
<td>4,073</td>
<td>3,957</td>
<td>3,865</td>
<td>3,772</td>
</tr>
<tr>
<td>Growing stock, total (1000 cu.m. o.b.)</td>
<td>1000 cu.m. o.b.</td>
<td>1,998,773</td>
<td>2,096,606</td>
<td>2,128,332</td>
<td>2,091,649</td>
</tr>
<tr>
<td>- Coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>1,637,923</td>
<td>1,719,301</td>
<td>1,750,190</td>
<td>1,728,788</td>
</tr>
<tr>
<td>- Broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>360,850</td>
<td>377,305</td>
<td>378,141</td>
<td>362,862</td>
</tr>
<tr>
<td>Net annual increment, total (1000 cu.m. o.b.)</td>
<td>1000 cu.m. o.b. / y.</td>
<td>77,107</td>
<td>73,002</td>
<td>72,046</td>
<td>71,524</td>
</tr>
<tr>
<td>- Coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>61,793</td>
<td>58,776</td>
<td>58,366</td>
<td>58,134</td>
</tr>
<tr>
<td>- Broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>15,314</td>
<td>14,226</td>
<td>13,680</td>
<td>13,390</td>
</tr>
<tr>
<td>Felling, total (1000 cu.m. o.b.)</td>
<td>1000 cu.m. o.b. / y.</td>
<td>68,816</td>
<td>65,321</td>
<td>70,726</td>
<td>76,681</td>
</tr>
<tr>
<td>- Coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>55,120</td>
<td>52,324</td>
<td>56,657</td>
<td>61,428</td>
</tr>
<tr>
<td>- Broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>13,695</td>
<td>12,997</td>
<td>14,068</td>
<td>15,254</td>
</tr>
<tr>
<td>Removals, total (1000 cu.m. u.b.)</td>
<td>1000 cu.m. u.b. / y.</td>
<td>53,861</td>
<td>51,126</td>
<td>55,356</td>
<td>60,018</td>
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<tr>
<td>- Coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>43,142</td>
<td>40,954</td>
<td>44,345</td>
<td>48,079</td>
</tr>
<tr>
<td>- Broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>10,719</td>
<td>10,173</td>
<td>11,011</td>
<td>11,939</td>
</tr>
<tr>
<td>Removals, total from final fellings (1000 cu.m. u.b.)</td>
<td>1000 cu.m. u.b. / y.</td>
<td>38,232</td>
<td>36,293</td>
<td>39,299</td>
<td>42,607</td>
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<tr>
<td>- Coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>30,199</td>
<td>28,667</td>
<td>31,042</td>
<td>33,655</td>
</tr>
<tr>
<td>- Broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>8,032</td>
<td>7,626</td>
<td>8,257</td>
<td>8,952</td>
</tr>
<tr>
<td>Removals, total from thinnings (1000 cu.m. u.b.)</td>
<td>1000 cu.m. u.b. / y.</td>
<td>15,630</td>
<td>14,833</td>
<td>16,057</td>
<td>17,410</td>
</tr>
<tr>
<td>- Coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>12,943</td>
<td>12,286</td>
<td>13,304</td>
<td>14,424</td>
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<td>- Broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,687</td>
<td>2,547</td>
<td>2,754</td>
<td>2,986</td>
</tr>
</tbody>
</table>

### Ratios

- Growing stock per Area (cu.m. o.b. / ha) | 97 | 105 | 109 | 110 | 107 |
- Net annual increment per growing stock (3.9% 3.5% 3.4% 3.4% 3.6%)
- Net annual increment per ha (3.8% 3.7% 3.7% 3.8% 3.8%)
- Felling per Net annual increment (89% 89% 98% 107% 116%)
- Removals per Area (2.6 2.6 2.8 3.2 3.5)

## Graphs

**Graph 1:** Forest area available for wood supply

**Graph 2:** Growing stock total

**Graph 3:** Net annual increment per year

**Graph 4:** Felling total per year

**Graph 5:** Removals total per year
France

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>14,497</td>
<td>14,949</td>
<td>15,310</td>
<td>15,672</td>
<td>15,942</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>5,221</td>
<td>5,384</td>
<td>5,514</td>
<td>5,644</td>
<td>5,742</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>9,276</td>
<td>9,565</td>
<td>9,796</td>
<td>10,027</td>
<td>10,201</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>3,198,928</td>
<td>3,332,959</td>
<td>3,462,032</td>
<td>3,606,002</td>
<td>3,746,610</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>1,229,569</td>
<td>1,263,028</td>
<td>1,307,358</td>
<td>1,361,357</td>
<td>1,414,730</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>1,969,358</td>
<td>2,069,931</td>
<td>2,154,674</td>
<td>2,244,645</td>
<td>2,331,880</td>
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<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>78,847</td>
<td>75,448</td>
<td>78,857</td>
<td>82,593</td>
<td>84,827</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>35,712</td>
<td>36,852</td>
<td>38,350</td>
<td>40,327</td>
<td>41,627</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>43,135</td>
<td>38,596</td>
<td>40,507</td>
<td>42,266</td>
<td>43,200</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>58,224</td>
<td>62,498</td>
<td>65,579</td>
<td>68,031</td>
<td>70,926</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>30,166</td>
<td>32,147</td>
<td>33,670</td>
<td>34,826</td>
<td>36,458</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>28,058</td>
<td>30,351</td>
<td>31,909</td>
<td>33,206</td>
<td>34,468</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>39,322</td>
<td>42,208</td>
<td>44,289</td>
<td>45,946</td>
<td>47,901</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>20,373</td>
<td>21,711</td>
<td>22,739</td>
<td>23,520</td>
<td>24,622</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>18,949</td>
<td>19,498</td>
<td>21,550</td>
<td>22,426</td>
<td>23,278</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>27,487</td>
<td>29,758</td>
<td>31,288</td>
<td>32,562</td>
<td>33,814</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>14,243</td>
<td>15,419</td>
<td>16,212</td>
<td>16,873</td>
<td>17,521</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>13,244</td>
<td>14,338</td>
<td>15,076</td>
<td>15,690</td>
<td>16,293</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>11,835</td>
<td>12,451</td>
<td>13,001</td>
<td>13,383</td>
<td>14,087</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>6,130</td>
<td>6,291</td>
<td>6,527</td>
<td>6,647</td>
<td>7,101</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>5,705</td>
<td>5,159</td>
<td>6,475</td>
<td>6,736</td>
<td>6,885</td>
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<tr>
<td>Ratios</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Growing stock per Area</td>
<td>cu.m. o.b. / ha</td>
<td>221</td>
<td>223</td>
<td>226</td>
<td>230</td>
<td>235</td>
</tr>
<tr>
<td>- Net annual increment per growing stock</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
<td>2.5%</td>
<td>2.3%</td>
<td>2.3%</td>
<td>2.3%</td>
<td>2.3%</td>
</tr>
<tr>
<td>- Net annual increment per ha</td>
<td>cu.m. o.b. / ha / y.</td>
<td>5.4</td>
<td>5.0</td>
<td>5.2</td>
<td>5.3</td>
<td>5.3</td>
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<tr>
<td>- Fellings per Net annual increment</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
<td>74%</td>
<td>83%</td>
<td>83%</td>
<td>82%</td>
<td>84%</td>
</tr>
<tr>
<td>- Removals per Area</td>
<td>cu.m. u.b. / ha / y.</td>
<td>2.7</td>
<td>2.8</td>
<td>2.9</td>
<td>2.9</td>
<td>3.0</td>
</tr>
</tbody>
</table>

![Graph 1](image1.png)

![Graph 2](image2.png)
### Germany: Base scenario

#### Forest resource parameters

<table>
<thead>
<tr>
<th>Unit</th>
<th>Year 2000</th>
<th>Year 2010</th>
<th>Year 2020</th>
<th>Year 2030</th>
<th>Year 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply (1000 ha)</td>
<td>10,143</td>
<td>10,403</td>
<td>10,612</td>
<td>10,820</td>
<td>10,976</td>
</tr>
<tr>
<td>- coniferous (1000 ha)</td>
<td>6,664</td>
<td>6,835</td>
<td>6,972</td>
<td>7,109</td>
<td>7,212</td>
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<tr>
<td>- broadleaved (1000 ha)</td>
<td>3,479</td>
<td>3,568</td>
<td>3,639</td>
<td>3,711</td>
<td>3,764</td>
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<tr>
<td>Growing stock, total (1000 cu.m. o.b.)</td>
<td>3,107,870</td>
<td>3,539,144</td>
<td>3,813,819</td>
<td>4,014,021</td>
<td>4,151,575</td>
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<tr>
<td>- coniferous (1000 cu.m. o.b.)</td>
<td>2,165,665</td>
<td>2,480,549</td>
<td>2,683,619</td>
<td>2,831,574</td>
<td>2,933,039</td>
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<tr>
<td>- broadleaved (1000 cu.m. o.b.)</td>
<td>942,005</td>
<td>1,058,596</td>
<td>1,130,200</td>
<td>1,182,446</td>
<td>1,218,536</td>
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<tr>
<td>Net annual increment, total (1000 cu.m. o.b. / y.)</td>
<td>90,102</td>
<td>86,788</td>
<td>84,054</td>
<td>80,671</td>
<td>78,006</td>
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<tr>
<td>- coniferous (1000 cu.m. o.b. / y.)</td>
<td>67,108</td>
<td>65,380</td>
<td>63,692</td>
<td>61,245</td>
<td>59,353</td>
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<tr>
<td>- broadleaved (1000 cu.m. o.b. / y.)</td>
<td>22,994</td>
<td>21,407</td>
<td>20,362</td>
<td>19,426</td>
<td>18,653</td>
</tr>
<tr>
<td>Felling, total (1000 cu.m. o.b. / y.)</td>
<td>50,326</td>
<td>54,243</td>
<td>58,524</td>
<td>62,221</td>
<td>65,808</td>
</tr>
<tr>
<td>- coniferous (1000 cu.m. o.b. / y.)</td>
<td>38,512</td>
<td>41,510</td>
<td>44,786</td>
<td>47,615</td>
<td>50,360</td>
</tr>
<tr>
<td>- broadleaved (1000 cu.m. o.b. / y.)</td>
<td>11,814</td>
<td>12,733</td>
<td>13,738</td>
<td>14,606</td>
<td>15,448</td>
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<tr>
<td>Removals, total (1000 cu.m. u.b. / y.)</td>
<td>38,343</td>
<td>41,328</td>
<td>44,589</td>
<td>47,406</td>
<td>50,139</td>
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<td>- coniferous (1000 cu.m. u.b. / y.)</td>
<td>29,342</td>
<td>31,626</td>
<td>34,122</td>
<td>36,278</td>
<td>38,369</td>
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<tr>
<td>- broadleaved (1000 cu.m. u.b. / y.)</td>
<td>9,001</td>
<td>9,702</td>
<td>10,467</td>
<td>11,128</td>
<td>11,770</td>
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<tr>
<td>Removals, total from final fellings (1000 cu.m. u.b. / y.)</td>
<td>27,290</td>
<td>29,414</td>
<td>31,736</td>
<td>33,741</td>
<td>35,686</td>
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<tr>
<td>- coniferous (1000 cu.m. u.b. / y.)</td>
<td>20,539</td>
<td>22,138</td>
<td>23,885</td>
<td>25,394</td>
<td>26,858</td>
</tr>
<tr>
<td>- broadleaved (1000 cu.m. u.b. / y.)</td>
<td>6,751</td>
<td>7,276</td>
<td>7,850</td>
<td>8,346</td>
<td>8,827</td>
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<tr>
<td>Removals, total from thinning (1000 cu.m. u.b. / y.)</td>
<td>11,053</td>
<td>11,913</td>
<td>12,853</td>
<td>13,665</td>
<td>14,453</td>
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<tr>
<td>- coniferous (1000 cu.m. u.b. / y.)</td>
<td>8,803</td>
<td>9,488</td>
<td>10,237</td>
<td>10,883</td>
<td>11,511</td>
</tr>
<tr>
<td>- broadleaved (1000 cu.m. u.b. / y.)</td>
<td>2,250</td>
<td>2,425</td>
<td>2,617</td>
<td>2,782</td>
<td>2,943</td>
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</table>

#### Ratios

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Unit</th>
<th>Year 2000</th>
<th>Year 2010</th>
<th>Year 2020</th>
<th>Year 2030</th>
<th>Year 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growing stock per Area (cu.m. o.b. / ha)</td>
<td>306</td>
<td>340</td>
<td>359</td>
<td>371</td>
<td>378</td>
<td></td>
</tr>
<tr>
<td>Net annual increment per growing stock (2.9%)</td>
<td>2.5%</td>
<td>2.2%</td>
<td>2.0%</td>
<td>1.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net annual increment per ha (8.9)</td>
<td>8.3</td>
<td>7.9</td>
<td>7.5</td>
<td>7.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fellings per Net annual increment (56%)</td>
<td>63%</td>
<td>70%</td>
<td>77%</td>
<td>84%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removals per Area (3.8)</td>
<td>4.0</td>
<td>4.2</td>
<td>4.4</td>
<td>4.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Ireland

#### Base scenario

<table>
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<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>581</td>
<td>600</td>
<td>615</td>
<td>630</td>
<td>642</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>581</td>
<td>600</td>
<td>615</td>
<td>630</td>
<td>642</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>94,670</td>
<td>146,351</td>
<td>186,806</td>
<td>217,671</td>
<td>234,120</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>94,670</td>
<td>146,351</td>
<td>186,806</td>
<td>217,671</td>
<td>234,120</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>5,942</td>
<td>7,393</td>
<td>7,528</td>
<td>6,882</td>
<td>5,752</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>5,942</td>
<td>7,393</td>
<td>7,528</td>
<td>6,882</td>
<td>5,752</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,625</td>
<td>3,063</td>
<td>3,669</td>
<td>4,079</td>
<td>4,520</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,625</td>
<td>3,063</td>
<td>3,669</td>
<td>4,079</td>
<td>4,520</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,363</td>
<td>2,757</td>
<td>3,302</td>
<td>3,671</td>
<td>4,068</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,363</td>
<td>2,757</td>
<td>3,302</td>
<td>3,671</td>
<td>4,068</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,796</td>
<td>2,095</td>
<td>2,504</td>
<td>2,963</td>
<td>3,427</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,796</td>
<td>2,095</td>
<td>2,504</td>
<td>2,963</td>
<td>3,427</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>567</td>
<td>662</td>
<td>798</td>
<td>708</td>
<td>641</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>567</td>
<td>662</td>
<td>798</td>
<td>708</td>
<td>641</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Ratios

- Growing stock per Area  
  cu.m. o.b. / ha  
  163  244  304  345  365
- Net annual increment per growing stock  
  cu.m. o.b. / cu.m. o.b.  
  6.3%  5.1%  4.0%  3.2%  2.5%
- Net annual increment per ha  
  cu.m. o.b. / ha / y.  
  10.2  12.3  12.2  10.9  9.0
- Fellings per Net annual increment  
  cu.m. o.b. / cu.m. o.b.  
  44%  41%  49%  59%  79%
- Removals per Area  
  cu.m. u.b. / ha / y.  
  4.1  4.6  5.4  5.8  6.3
### Italy Base scenario

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>6,015</td>
<td>6,041</td>
<td>6,062</td>
<td>6,083</td>
<td>6,099</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>949</td>
<td>954</td>
<td>957</td>
<td>960</td>
<td>963</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>5,066</td>
<td>5,088</td>
<td>5,105</td>
<td>5,123</td>
<td>5,136</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>1,194,445</td>
<td>1,411,430</td>
<td>1,550,026</td>
<td>1,660,500</td>
<td>1,745,204</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>321,162</td>
<td>383,709</td>
<td>428,621</td>
<td>469,273</td>
<td>503,011</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>873,263</td>
<td>1,027,722</td>
<td>1,121,405</td>
<td>1,191,227</td>
<td>1,242,194</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>28,330</td>
<td>27,397</td>
<td>25,167</td>
<td>23,622</td>
<td>22,075</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>6,779</td>
<td>7,247</td>
<td>6,889</td>
<td>6,702</td>
<td>6,166</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>21,551</td>
<td>20,150</td>
<td>18,278</td>
<td>16,920</td>
<td>15,909</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>9,503</td>
<td>10,939</td>
<td>12,144</td>
<td>13,228</td>
<td>14,298</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,982</td>
<td>2,281</td>
<td>2,533</td>
<td>2,759</td>
<td>2,982</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>7,521</td>
<td>8,658</td>
<td>9,612</td>
<td>10,469</td>
<td>11,316</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>8,663</td>
<td>9,972</td>
<td>11,071</td>
<td>12,059</td>
<td>13,034</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,807</td>
<td>2,080</td>
<td>2,309</td>
<td>2,515</td>
<td>2,718</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>6,856</td>
<td>7,892</td>
<td>8,762</td>
<td>9,544</td>
<td>10,316</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>7,813</td>
<td>8,993</td>
<td>9,984</td>
<td>10,875</td>
<td>11,754</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,265</td>
<td>1,456</td>
<td>1,616</td>
<td>1,760</td>
<td>1,903</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>6,548</td>
<td>7,537</td>
<td>8,368</td>
<td>9,115</td>
<td>9,852</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>851</td>
<td>979</td>
<td>1,087</td>
<td>1,184</td>
<td>1,280</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>542</td>
<td>624</td>
<td>693</td>
<td>755</td>
<td>815</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>308</td>
<td>355</td>
<td>394</td>
<td>429</td>
<td>464</td>
</tr>
<tr>
<td>Ratios</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Growing stock per Area</td>
<td>cu.m. o.b. / ha</td>
<td>199</td>
<td>234</td>
<td>256</td>
<td>273</td>
<td>286</td>
</tr>
<tr>
<td>- Net annual increment per growing stock</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
<td>2.4%</td>
<td>1.9%</td>
<td>1.6%</td>
<td>1.4%</td>
<td>1.3%</td>
</tr>
<tr>
<td>- Annual increment per Area</td>
<td>cu.m. o.b. / ha / y.</td>
<td>4.7</td>
<td>4.5</td>
<td>4.2</td>
<td>3.9</td>
<td>3.6</td>
</tr>
<tr>
<td>- Removals per Area</td>
<td>cu.m. u.b. / ha / y.</td>
<td>1.4</td>
<td>1.7</td>
<td>1.8</td>
<td>2.0</td>
<td>2.1</td>
</tr>
</tbody>
</table>
The graphs depict the comparison of the growing stock per area (cubic meters oven dry per hectare) and removals total (1000 cubic meters oven dry) between the base scenario and the alternative scenario for the years 2000 to 2040. The baseline scenario shows a steady increase in growing stock, while the alternative scenario shows a more gradual increase. The removals total, on the other hand, shows a slightly higher increase in the alternative scenario compared to the base scenario.

The falling NAI (Notttig Erao Almog) percentage also shows a steady increase in both scenarios, with the alternative scenario having a slightly higher percentage than the base scenario.
The Netherlands

Base scenario

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>314</td>
<td>324</td>
<td>332</td>
<td>340</td>
<td>346</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>172</td>
<td>178</td>
<td>182</td>
<td>186</td>
<td>189</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>142</td>
<td>146</td>
<td>150</td>
<td>154</td>
<td>156</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>66,161</td>
<td>83,871</td>
<td>97,855</td>
<td>110,816</td>
<td>122,789</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>37,690</td>
<td>46,248</td>
<td>52,727</td>
<td>58,541</td>
<td>63,894</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>28,471</td>
<td>37,623</td>
<td>45,128</td>
<td>52,274</td>
<td>58,895</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,480</td>
<td>2,518</td>
<td>2,591</td>
<td>2,519</td>
<td>2,445</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,354</td>
<td>1,414</td>
<td>1,428</td>
<td>1,392</td>
<td>1,356</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,126</td>
<td>1,104</td>
<td>1,163</td>
<td>1,127</td>
<td>1,089</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,016</td>
<td>1,114</td>
<td>1,203</td>
<td>1,254</td>
<td>1,263</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>671</td>
<td>736</td>
<td>794</td>
<td>828</td>
<td>821</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>345</td>
<td>378</td>
<td>408</td>
<td>426</td>
<td>442</td>
</tr>
<tr>
<td>Removels, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>702</td>
<td>770</td>
<td>831</td>
<td>867</td>
<td>873</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>464</td>
<td>590</td>
<td>549</td>
<td>572</td>
<td>568</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>238</td>
<td>261</td>
<td>282</td>
<td>294</td>
<td>305</td>
</tr>
<tr>
<td>Removels, from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>281</td>
<td>308</td>
<td>333</td>
<td>347</td>
<td>360</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>186</td>
<td>204</td>
<td>220</td>
<td>229</td>
<td>238</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>95</td>
<td>104</td>
<td>113</td>
<td>118</td>
<td>122</td>
</tr>
<tr>
<td>Removels, from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>421</td>
<td>462</td>
<td>499</td>
<td>519</td>
<td>513</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>278</td>
<td>305</td>
<td>329</td>
<td>343</td>
<td>330</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>143</td>
<td>157</td>
<td>169</td>
<td>177</td>
<td>183</td>
</tr>
</tbody>
</table>

Ratios
- Growing stock per Area cu.m. o.b. / ha 211 259 295 326 355
- Net annual increment per growing stock cu.m. o.b. / cu.m. o.b. 3.7% 3.0% 2.6% 2.3% 2.0%
- Net annual increment per ha cu.m. o.b. / ha / y. 7.9 7.8 7.8 7.4 7.1
- Fellings per Net annual increment cu.m. o.b. / cu.m. o.b. 41% 44% 46% 50% 52%
- Removals per Area cu.m. u.b. / ha / y. 2.2 2.4 2.5 2.6 2.5
### Norway

#### Base scenario

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>6,611</td>
<td>6,711</td>
<td>6,791</td>
<td>6,871</td>
<td>6,931</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>5,024</td>
<td>5,100</td>
<td>5,160</td>
<td>5,221</td>
<td>5,267</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>1,587</td>
<td>1,611</td>
<td>1,631</td>
<td>1,650</td>
<td>1,664</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>749,229</td>
<td>881,060</td>
<td>988,187</td>
<td>1,038,121</td>
<td>1,091,927</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>633,991</td>
<td>742,247</td>
<td>811,731</td>
<td>864,892</td>
<td>902,458</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>115,238</td>
<td>138,813</td>
<td>156,456</td>
<td>173,229</td>
<td>189,469</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>23,410</td>
<td>21,482</td>
<td>20,195</td>
<td>18,905</td>
<td>17,747</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>20,045</td>
<td>18,308</td>
<td>17,081</td>
<td>15,820</td>
<td>14,668</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>3,365</td>
<td>3,174</td>
<td>3,114</td>
<td>3,085</td>
<td>3,079</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>11,060</td>
<td>11,484</td>
<td>11,916</td>
<td>12,334</td>
<td>12,749</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>9,785</td>
<td>10,160</td>
<td>10,543</td>
<td>10,912</td>
<td>11,279</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,275</td>
<td>1,324</td>
<td>1,374</td>
<td>1,422</td>
<td>1,470</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>8,881</td>
<td>9,221</td>
<td>9,568</td>
<td>9,904</td>
<td>10,237</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>7,857</td>
<td>8,158</td>
<td>8,465</td>
<td>8,762</td>
<td>9,057</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,024</td>
<td>1,063</td>
<td>1,103</td>
<td>1,142</td>
<td>1,180</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>7,993</td>
<td>8,299</td>
<td>8,611</td>
<td>8,913</td>
<td>9,213</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>7,071</td>
<td>7,342</td>
<td>7,619</td>
<td>7,886</td>
<td>8,151</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>921</td>
<td>957</td>
<td>993</td>
<td>1,028</td>
<td>1,062</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>888</td>
<td>922</td>
<td>957</td>
<td>990</td>
<td>1,024</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>786</td>
<td>816</td>
<td>846</td>
<td>876</td>
<td>906</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>102</td>
<td>106</td>
<td>110</td>
<td>114</td>
<td>118</td>
</tr>
</tbody>
</table>

### Ratios

- **Growing stock per Area**
  - cu.m. o.b. / ha: 113, 131, 143, 151, 158
- **Net annual increment per growing stock**
  - cu.m. o.b. / cu.m. o.b.: 3.1%, 2.4%, 2.1%, 1.8%, 1.6%
- **Net annual increment per ha**
  - cu.m. o.b. / ha / y.: 3.5, 3.2, 3.0, 2.8, 2.6
- **Fellings per Net annual increment**
  - cu.m. o.b. / cu.m. o.b.: 47%, 53%, 59%, 65%, 72%
- **Removals per Area**
  - cu.m. u.b. / ha / y.: 1.3, 1.4, 1.4, 1.4, 1.5
### Portugal

#### Base scenario

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>1,897</td>
<td>1,952</td>
<td>2,000</td>
<td>2,047</td>
<td>2,087</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>914</td>
<td>942</td>
<td>965</td>
<td>988</td>
<td>1,005</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>983</td>
<td>1,010</td>
<td>1,035</td>
<td>1,059</td>
<td>1,082</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>126,936</td>
<td>139,034</td>
<td>135,016</td>
<td>126,954</td>
<td>119,596</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>75,463</td>
<td>74,901</td>
<td>68,708</td>
<td>62,429</td>
<td>59,948</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>53,473</td>
<td>64,133</td>
<td>66,308</td>
<td>64,525</td>
<td>59,648</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>13,018</td>
<td>12,456</td>
<td>12,523</td>
<td>12,801</td>
<td>13,171</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>4,468</td>
<td>4,127</td>
<td>4,121</td>
<td>4,139</td>
<td>4,166</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>8,550</td>
<td>8,329</td>
<td>8,403</td>
<td>8,663</td>
<td>9,006</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>10,883</td>
<td>12,111</td>
<td>13,049</td>
<td>13,620</td>
<td>13,708</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>6,059</td>
<td>4,471</td>
<td>4,780</td>
<td>4,754</td>
<td>4,221</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>4,825</td>
<td>7,641</td>
<td>8,270</td>
<td>8,865</td>
<td>9,487</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>8,843</td>
<td>9,840</td>
<td>10,603</td>
<td>11,066</td>
<td>11,138</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>4,923</td>
<td>3,632</td>
<td>3,884</td>
<td>3,863</td>
<td>3,430</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,920</td>
<td>6,208</td>
<td>6,719</td>
<td>7,203</td>
<td>7,708</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>7,566</td>
<td>8,912</td>
<td>9,603</td>
<td>10,032</td>
<td>10,042</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,646</td>
<td>2,704</td>
<td>2,884</td>
<td>2,829</td>
<td>2,334</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,920</td>
<td>6,208</td>
<td>6,719</td>
<td>7,203</td>
<td>7,708</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,276</td>
<td>929</td>
<td>1,000</td>
<td>1,034</td>
<td>1,096</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,276</td>
<td>929</td>
<td>1,000</td>
<td>1,034</td>
<td>1,096</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Ratios

- Growing stock per Area (cu.m. o.b. / ha) | 68 | 71 | 68 | 62 | 57 |
- Net annual increment per growing stock (cu.m. o.b. / cu.m. o.b.) | 10.1% | 9.0% | 9.3% | 10.1% | 11.0% |
- Net annual increment per Area (cu.m. o.b. / ha / y.) | 6.9 | 6.4 | 6.3 | 6.3 | 6.3 |
- Fellings per Net annual increment (cu.m. o.b. / cu.m. o.b.) | 84% | 97% | 104% | 108% | 104% |
- Removals per Area (cu.m. u.b. / ha / y.) | 4.7 | 5.0 | 5.3 | 5.4 | 5.3 |

#### Diagrams

- **Growing stock, total (1000 cu.m. o.b.)**
  - Base scenario
  - Alternative scenario

- **Fellings, total (1000 cu.m. o.b. / y.)**
  - Base scenario
  - Alternative scenario
### Spain: Base scenario

#### Forest resource parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>10,447</td>
<td>10,756</td>
<td>11,003</td>
<td>11,249</td>
<td>11,434</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>4,913</td>
<td>5,065</td>
<td>5,186</td>
<td>5,307</td>
<td>5,398</td>
</tr>
<tr>
<td>- eucalypt plantations</td>
<td>1000 ha</td>
<td>447</td>
<td>447</td>
<td>447</td>
<td>447</td>
<td>447</td>
</tr>
<tr>
<td>- broadleaved without eucalypt plantations</td>
<td>1000 ha</td>
<td>5,088</td>
<td>5,245</td>
<td>5,370</td>
<td>5,496</td>
<td>5,590</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>5,534</td>
<td>5,691</td>
<td>5,817</td>
<td>5,942</td>
<td>6,036</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>730,578</td>
<td>890,481</td>
<td>1,003,616</td>
<td>1,097,138</td>
<td>1,175,290</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>495,240</td>
<td>616,121</td>
<td>707,882</td>
<td>790,507</td>
<td>863,164</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>235,338</td>
<td>274,360</td>
<td>295,733</td>
<td>306,631</td>
<td>312,126</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>26,886</td>
<td>26,684</td>
<td>26,035</td>
<td>25,582</td>
<td>25,469</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>18,228</td>
<td>18,841</td>
<td>19,032</td>
<td>19,000</td>
<td>18,813</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>8,658</td>
<td>7,843</td>
<td>7,003</td>
<td>6,583</td>
<td>6,657</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>12,579</td>
<td>14,215</td>
<td>15,391</td>
<td>16,654</td>
<td>17,952</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>8,176</td>
<td>9,271</td>
<td>10,103</td>
<td>10,948</td>
<td>11,803</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>4,403</td>
<td>4,943</td>
<td>5,288</td>
<td>5,706</td>
<td>6,149</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>10,311</td>
<td>11,651</td>
<td>12,615</td>
<td>13,651</td>
<td>14,715</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>6,702</td>
<td>7,600</td>
<td>8,281</td>
<td>8,974</td>
<td>9,675</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,609</td>
<td>4,052</td>
<td>4,334</td>
<td>4,677</td>
<td>5,040</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>7,733</td>
<td>8,739</td>
<td>9,530</td>
<td>10,328</td>
<td>11,136</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>5,026</td>
<td>5,700</td>
<td>6,211</td>
<td>6,730</td>
<td>7,256</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,706</td>
<td>3,039</td>
<td>3,319</td>
<td>3,598</td>
<td>3,880</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,578</td>
<td>2,912</td>
<td>3,086</td>
<td>3,323</td>
<td>3,579</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,676</td>
<td>1,900</td>
<td>2,070</td>
<td>2,243</td>
<td>2,419</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>902</td>
<td>1,013</td>
<td>1,015</td>
<td>1,080</td>
<td>1,160</td>
</tr>
</tbody>
</table>

#### Ratios

- **Growing stock per Area** (cu.m. o.b. / ha): 70, 83, 91, 98, 103
- **Net annual increment per growing stock** (cu.m. o.b. / cu.m. o.b.): 3.7%, 3.0%, 2.6%, 2.3%, 2.2%
- **Net annual increment per ha** (cu.m. o.b. / ha / y.): 2.6, 2.5, 2.4, 2.3, 2.2
- **Fellings per Net annual ha** (cu.m. o.b. / cu.m. o.b.): 47%, 53%, 59%, 65%, 70%
- **Removals per Area** (cu.m. u.b. / ha / y.): 1.0, 1.1, 1.1, 1.1, 1.3

---

**Diagram 1:** FAWF (1000 ha) over years 2000-2040 for Base and Alternative scenarios.

**Diagram 2:** Growing stock, total (1000 cu.m. o.b.) over years 2000-2040 for Base and Alternative scenarios.
### Switzerland

#### Base scenario

**Forest resource parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>1,060</td>
<td>1,093</td>
<td>1,120</td>
<td>1,146</td>
<td>1,166</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>742</td>
<td>765</td>
<td>784</td>
<td>802</td>
<td>816</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>318</td>
<td>328</td>
<td>336</td>
<td>344</td>
<td>350</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>392,836</td>
<td>427,561</td>
<td>450,930</td>
<td>472,502</td>
<td>488,053</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>305,399</td>
<td>330,463</td>
<td>347,936</td>
<td>365,677</td>
<td>378,787</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>87,437</td>
<td>97,098</td>
<td>102,995</td>
<td>106,824</td>
<td>109,266</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>10,078</td>
<td>10,713</td>
<td>11,125</td>
<td>11,071</td>
<td>11,025</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>7,255</td>
<td>7,758</td>
<td>8,071</td>
<td>7,969</td>
<td>7,887</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,823</td>
<td>2,955</td>
<td>3,054</td>
<td>3,103</td>
<td>3,139</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>7,146</td>
<td>8,098</td>
<td>8,808</td>
<td>9,061</td>
<td>9,590</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>5,172</td>
<td>5,861</td>
<td>6,296</td>
<td>6,287</td>
<td>6,693</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,974</td>
<td>2,237</td>
<td>2,513</td>
<td>2,774</td>
<td>2,897</td>
</tr>
<tr>
<td>Remova s, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>5,223</td>
<td>5,919</td>
<td>6,438</td>
<td>6,623</td>
<td>7,009</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,780</td>
<td>4,284</td>
<td>4,602</td>
<td>4,595</td>
<td>4,892</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,443</td>
<td>1,635</td>
<td>1,837</td>
<td>2,028</td>
<td>2,117</td>
</tr>
<tr>
<td>Remov a ls, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,134</td>
<td>3,550</td>
<td>3,987</td>
<td>4,359</td>
<td>4,719</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,268</td>
<td>2,569</td>
<td>2,885</td>
<td>3,154</td>
<td>3,415</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>866</td>
<td>981</td>
<td>1,101</td>
<td>1,204</td>
<td>1,304</td>
</tr>
<tr>
<td>Remov a ls, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,089</td>
<td>2,368</td>
<td>2,451</td>
<td>2,264</td>
<td>2,290</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,512</td>
<td>1,714</td>
<td>1,716</td>
<td>1,441</td>
<td>1,477</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>577</td>
<td>654</td>
<td>735</td>
<td>823</td>
<td>813</td>
</tr>
<tr>
<td>Ratios</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Growing stock per Area</td>
<td>cu.m. o.b. / ha</td>
<td>371</td>
<td>391</td>
<td>403</td>
<td>412</td>
<td>419</td>
</tr>
<tr>
<td>- Net annual increment per growing stock</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
<td>2.6%</td>
<td>2.5%</td>
<td>2.5%</td>
<td>2.3%</td>
<td>2.3%</td>
</tr>
<tr>
<td>- Net annual increment per ha</td>
<td>cu.m. o.b. / ha / y.</td>
<td>9.5</td>
<td>9.8</td>
<td>9.9</td>
<td>9.7</td>
<td>9.5</td>
</tr>
<tr>
<td>- Fellings per Net annual increment</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
<td>71%</td>
<td>76%</td>
<td>78%</td>
<td>82%</td>
<td>87%</td>
</tr>
<tr>
<td>- Removals per Area</td>
<td>cu.m. u.b. / ha / y.</td>
<td>4.9</td>
<td>5.4</td>
<td>5.7</td>
<td>5.8</td>
<td>6.0</td>
</tr>
</tbody>
</table>

---

![Graph showing FAWS (1000 ha) over time for Base scenario and Alternative scenario.](image1)

![Graph showing Growing stock total (1000 cu.m. o.b.) over time for Base scenario and Alternative scenario.](image2)
### United Kingdom of Great Britain and Northern Ireland

#### Base scenario

<table>
<thead>
<tr>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Forest resource parameters</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>2,108</td>
<td>2,371</td>
<td>2,582</td>
<td>2,793</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>1,455</td>
<td>1,637</td>
<td>1,782</td>
<td>1,928</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>653</td>
<td>734</td>
<td>800</td>
<td>865</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>374,980</td>
<td>478,576</td>
<td>580,385</td>
<td>628,313</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>248,206</td>
<td>322,112</td>
<td>380,332</td>
<td>424,865</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>126,774</td>
<td>156,464</td>
<td>180,052</td>
<td>203,448</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>17,061</td>
<td>20,068</td>
<td>21,228</td>
<td>21,489</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>13,138</td>
<td>16,147</td>
<td>17,145</td>
<td>17,272</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>3,923</td>
<td>3,922</td>
<td>4,082</td>
<td>4,217</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>10,135</td>
<td>10,961</td>
<td>13,539</td>
<td>14,935</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>8,855</td>
<td>9,401</td>
<td>11,812</td>
<td>13,049</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,280</td>
<td>1,560</td>
<td>1,727</td>
<td>1,886</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>7,788</td>
<td>8,423</td>
<td>10,404</td>
<td>11,476</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>6,804</td>
<td>7,224</td>
<td>9,076</td>
<td>10,027</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>984</td>
<td>1,199</td>
<td>1,327</td>
<td>1,449</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>5,452</td>
<td>5,597</td>
<td>7,248</td>
<td>8,030</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>4,763</td>
<td>4,758</td>
<td>6,319</td>
<td>7,016</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>689</td>
<td>839</td>
<td>929</td>
<td>1,014</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,336</td>
<td>2,826</td>
<td>3,156</td>
<td>3,446</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,041</td>
<td>2,466</td>
<td>2,758</td>
<td>3,011</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>295</td>
<td>360</td>
<td>398</td>
<td>435</td>
</tr>
</tbody>
</table>

#### Ratios

- Growing stock per Area  (cu.m. o.b. / ha)  178 202 217 225 234
- Net annual increment per growing stock  (cu.m. o.b. / cu.m. o.b.)  4.5% 4.2% 3.8% 3.4% 3.2%
- Net annual increment per ha  (cu.m. o.b. / ha / y.)  8.1 8.5 8.2 7.7 7.6
- Fellings per Net annual increment  (cu.m. o.b. / cu.m. o.b.)  59% 55% 64% 69% 72%
- Removals per Area  (cu.m. u.b. / ha / y.)  3.7 3.6 4.0 4.1 4.2
### Central and Eastern European Base scenario

| Countries |  
| --- | ---  
| **Unit 2000 2010 2020 2030 2040** |  
| **Forest resource parameters** |  
| **Area of forest available for wood supply** |  
| 1000 ha | 47,533 | 47,667 | 47,801 | 47,936 | 48,037 |  
| - coniferous | 1000 ha | 24,598 | 24,747 | 24,895 | 25,044 | 25,156 |  
| - broadleaved | 1000 ha | 22,935 | 22,920 | 22,906 | 22,920 | 22,892 |  
| **Growing stock, total** |  
| 1000 cu.m. o.b. | 9,064,296 | 9,465,420 | 9,870,518 | 10,045,311 | 10,120,571 |  
| - coniferous | 1000 cu.m. o.b. | 5,164,966 | 5,417,047 | 5,671,352 | 5,791,583 | 5,837,165 |  
| - broadleaved | 1000 cu.m. o.b. | 3,899,330 | 4,048,372 | 4,199,166 | 4,253,728 | 4,283,406 |  
| **Net annual increment, total** |  
| 1000 cu.m. o.b. / y. | 238,292 | 230,791 | 222,396 | 218,730 | 215,915 |  
| - coniferous | 1000 cu.m. o.b. / y. | 143,738 | 140,354 | 136,499 | 136,164 | 135,153 |  
| - broadleaved | 1000 cu.m. o.b. / y. | 94,553 | 90,437 | 85,897 | 82,566 | 80,762 |  
| **Fellings, total** |  
| 1000 cu.m. o.b. / y. | 144,308 | 167,208 | 190,260 | 204,916 | 210,321 |  
| - coniferous | 1000 cu.m. o.b. / y. | 87,864 | 101,601 | 115,377 | 125,899 | 131,430 |  
| - broadleaved | 1000 cu.m. o.b. / y. | 56,445 | 65,607 | 74,882 | 78,927 | 80,762 |  
| **Removals, total** |  
| 1000 cu.m. u.b. / y. | 107,795 | 124,900 | 142,119 | 153,067 | 157,104 |  
| - coniferous | 1000 cu.m. u.b. / y. | 65,632 | 75,893 | 86,184 | 94,111 | 98,175 |  
| - broadleaved | 1000 cu.m. u.b. / y. | 42,163 | 49,007 | 55,935 | 58,956 | 58,929 |  
| **Removals, total from final fellings** |  
| 1000 cu.m. u.b. / y. | 72,312 | 84,834 | 97,436 | 105,849 | 108,157 |  
| - coniferous | 1000 cu.m. u.b. / y. | 42,861 | 49,845 | 56,650 | 62,271 | 65,573 |  
| - broadleaved | 1000 cu.m. u.b. / y. | 29,451 | 34,989 | 40,586 | 43,578 | 42,584 |  
| **Removals, total from thinnings** |  
| 1000 cu.m. u.b. / y. | 35,482 | 40,066 | 44,683 | 47,218 | 48,948 |  
| - coniferous | 1000 cu.m. u.b. / y. | 22,771 | 26,048 | 29,334 | 31,839 | 32,602 |  
| - broadleaved | 1000 cu.m. u.b. / y. | 12,711 | 14,017 | 15,349 | 15,379 | 16,346 |  
| **Ratios** |  
| - Growing stock per Area cu.m. o.b. / ha | 191 | 199 | 206 | 210 | 211 |  
| - Net annual increment per growing stock cu.m. o.b. / cu.m. o.b. | 2.6% | 2.4% | 2.3% | 2.2% | 2.1% |  
| - Net annual increment per Area cu.m. o.b. / ha / y. | 2.3 | 2.6 | 3.0 | 3.2 | 3.3 |  
| - Fellings per Net annual increment cu.m. o.b. / cu.m. o.b. | 59% | 72% | 86% | 94% | 97% |  
| - Removals per Area cu.m. u.b. / ha / y. | 2.3 | 2.6 | 3.0 | 3.2 | 3.3 |  

---

**Graphs:**
- **Forest area (1000 ha):**
- **Growing stock, total (1000 cu.m. o.b.):**

---

**Tables:**
- **Area of forest available for wood supply**
- **Growing stock, total**
- **Net annual increment, total**
- **Fellings, total**
- **Removals, total**
- **Removals, total from final fellings**
- **Removals, total from thinnings**
- **Ratios**

---

**Graphs:**
- **Forest area (1000 ha):**
- **Growing stock, total (1000 cu.m. o.b.):**

---

**Tables:**
- **Area of forest available for wood supply**
- **Growing stock, total**
- **Net annual increment, total**
- **Fellings, total**
- **Removals, total**
- **Removals, total from final fellings**
- **Removals, total from thinnings**
- **Ratios**
## Forest resource parameters

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area of forest available for wood supply</strong></td>
<td>1000 ha</td>
<td>898</td>
<td>870</td>
<td>848</td>
<td>825</td>
<td>808</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>165</td>
<td>160</td>
<td>155</td>
<td>151</td>
<td>148</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>734</td>
<td>711</td>
<td>692</td>
<td>674</td>
<td>660</td>
</tr>
<tr>
<td><strong>Growing stock, total</strong></td>
<td>1000 cu.m. o.b.</td>
<td>77,879</td>
<td>91,587</td>
<td>99,674</td>
<td>106,139</td>
<td>110,832</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>15,762</td>
<td>18,045</td>
<td>19,641</td>
<td>20,954</td>
<td>21,956</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1002 cu.m. o.b.</td>
<td>62,117</td>
<td>73,542</td>
<td>80,033</td>
<td>85,185</td>
<td>88,876</td>
</tr>
<tr>
<td><strong>Net annual increment, total</strong></td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,768</td>
<td>1,491</td>
<td>1,452</td>
<td>1,355</td>
<td>1,312</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>308</td>
<td>288</td>
<td>286</td>
<td>279</td>
<td>270</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,460</td>
<td>1,203</td>
<td>1,166</td>
<td>1,076</td>
<td>1,043</td>
</tr>
<tr>
<td><strong>Fellings, total</strong></td>
<td>1000 cu.m. o.b. / y.</td>
<td>477</td>
<td>545</td>
<td>662</td>
<td>769</td>
<td>871</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>97</td>
<td>110</td>
<td>134</td>
<td>156</td>
<td>176</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>379</td>
<td>434</td>
<td>528</td>
<td>613</td>
<td>695</td>
</tr>
<tr>
<td><strong>Removals, total</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>398</td>
<td>455</td>
<td>553</td>
<td>643</td>
<td>728</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>81</td>
<td>92</td>
<td>112</td>
<td>130</td>
<td>147</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>317</td>
<td>363</td>
<td>441</td>
<td>513</td>
<td>581</td>
</tr>
<tr>
<td><strong>Removals, total from final fellings</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>287</td>
<td>329</td>
<td>399</td>
<td>464</td>
<td>527</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>55</td>
<td>62</td>
<td>75</td>
<td>87</td>
<td>99</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>232</td>
<td>267</td>
<td>324</td>
<td>377</td>
<td>428</td>
</tr>
<tr>
<td><strong>Removals, total from thinnings</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>112</td>
<td>127</td>
<td>154</td>
<td>179</td>
<td>201</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>27</td>
<td>30</td>
<td>37</td>
<td>43</td>
<td>48</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>85</td>
<td>96</td>
<td>117</td>
<td>136</td>
<td>153</td>
</tr>
</tbody>
</table>

### Ratios

- **Growing stock per Area** cu.m. o.b. / ha 87 105 118 129 137
- **Net annual increment per growing stock** cu.m. o.b. / cu.m. o.b. 2.3% 1.6% 1.5% 1.3% 1.2%
- **Net annual increment per ha** cu.m. o.b. / ha / y. 2.0 1.7 1.7 1.6 1.6
- **Fellings per Net annual increment** cu.m. o.b. / cu.m. o.b. 27% 37% 46% 57% 66%
- **Removals per Area** cu.m. u.b. / ha / y. 0.4 0.5 0.7 0.8 0.9

---

![Base scenario and Alternative scenario plots](image-url)
### Bulgaria

#### Base scenario

<table>
<thead>
<tr>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Forest resource parameters</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>3,121</td>
<td>3,121</td>
<td>3,121</td>
<td>3,121</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>954</td>
<td>954</td>
<td>954</td>
<td>954</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>2,167</td>
<td>2,167</td>
<td>2,167</td>
<td>2,167</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>404,671</td>
<td>411,902</td>
<td>419,134</td>
<td>423,210</td>
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<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>168,029</td>
<td>173,944</td>
<td>179,858</td>
<td>184,389</td>
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<tr>
<td>- broadleaved</td>
<td>1002 cu.m. o.b.</td>
<td>236,641</td>
<td>237,958</td>
<td>239,276</td>
<td>238,921</td>
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<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>6,876</td>
<td>6,831</td>
<td>6,787</td>
<td>6,655</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>3,224</td>
<td>3,229</td>
<td>3,234</td>
<td>3,153</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>3,651</td>
<td>3,603</td>
<td>3,554</td>
<td>3,503</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>5,244</td>
<td>5,702</td>
<td>6,160</td>
<td>6,331</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,277</td>
<td>2,475</td>
<td>2,674</td>
<td>2,748</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,968</td>
<td>3,227</td>
<td>3,486</td>
<td>3,563</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,608</td>
<td>3,923</td>
<td>4,238</td>
<td>4,356</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,566</td>
<td>1,703</td>
<td>1,840</td>
<td>1,891</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,042</td>
<td>2,220</td>
<td>2,398</td>
<td>2,465</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,623</td>
<td>2,852</td>
<td>3,081</td>
<td>3,166</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,096</td>
<td>1,192</td>
<td>1,288</td>
<td>1,324</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,526</td>
<td>1,660</td>
<td>1,793</td>
<td>1,843</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>985</td>
<td>1,071</td>
<td>1,157</td>
<td>1,189</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>470</td>
<td>511</td>
<td>552</td>
<td>567</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>515</td>
<td>560</td>
<td>605</td>
<td>622</td>
</tr>
</tbody>
</table>

**Ratios**

- Growing stock per Area cu.m. o.b. / ha | 130 | 132 | 134 | 136 | 136 |
- Net annual increment per growing stock cu.m. o.b. / cu.m. o.b. | 1.7% | 1.7% | 1.6% | 1.6% | 1.5% |
- Net annual increment per ha cu.m. o.b. / ha / y. | 2.2% | 2.2% | 2.2% | 2.1% | 2.1% |
- Fellings per Net annual increment cu.m. o.b. / cu.m. o.b. | 76% | 83% | 91% | 95% | 101% |
- Removals per Area cu.m. u.b. / ha / y. | 1.2% | 1.3% | 1.4% | 1.4% | 1.4% |

### Diagrams

1. **FAWS (1000 ha)**
   - Base scenario
   - Alternative scenario

2. **Growing stock, total (1000 cu.m. o.b.)**
   - Base scenario
   - Alternative scenario
<table>
<thead>
<tr>
<th>Croatia</th>
<th>Base scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Forest resource parameters</strong></td>
<td><strong>Unit</strong></td>
</tr>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>Felling, total</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>Removals, total from thinning</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
</tbody>
</table>

**Ratios**
- Growing stock per Area: cu.m. o.b. / ha
- Net annual increment per growing stock: cu.m. o.b. / cu.m. o.b.
- Net annual increment per ha: cu.m. o.b. / ha / y.
- Felling per Net annual increment: cu.m. o.b. / cu.m. o.b.
- Removals per Area: cu.m. u.b. / ha / y.

![Graphs showing changes in forest resource parameters over time](image-url)
### Czech Republic

#### Base scenario

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area of forest available for wood supply</strong></td>
<td>ha</td>
<td>1000</td>
<td>2561</td>
<td>2574</td>
<td>2587</td>
<td>2600</td>
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<tr>
<td>- coniferous</td>
<td>ha</td>
<td>1000</td>
<td>1,983</td>
<td>1,993</td>
<td>2,003</td>
<td>2,013</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>ha</td>
<td>1000</td>
<td>578</td>
<td>581</td>
<td>594</td>
<td>587</td>
</tr>
<tr>
<td><strong>Growing stock, total</strong></td>
<td>cu.m.o.b.</td>
<td>1000</td>
<td>782,306</td>
<td>801,654</td>
<td>791,309</td>
<td>760,115</td>
</tr>
<tr>
<td>- coniferous</td>
<td>cu.m.o.b.</td>
<td>1000</td>
<td>636,058</td>
<td>637,481</td>
<td>606,949</td>
<td>558,781</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>cu.m.o.b.</td>
<td>1000</td>
<td>146,248</td>
<td>164,173</td>
<td>184,360</td>
<td>201,334</td>
</tr>
<tr>
<td><strong>Net annual increment, total</strong></td>
<td>cu.m.o.b.</td>
<td>1000</td>
<td>24,612</td>
<td>23,768</td>
<td>22,211</td>
<td>21,912</td>
</tr>
<tr>
<td>- coniferous</td>
<td>cu.m.o.b.</td>
<td>1000</td>
<td>20,170</td>
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<td>18,115</td>
<td>17,925</td>
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<td>cu.m.o.b.</td>
<td>1000</td>
<td>4,442</td>
<td>4,279</td>
<td>4,096</td>
<td>3,987</td>
</tr>
<tr>
<td><strong>Fellings, total</strong></td>
<td>cu.m.o.b. / y.</td>
<td>1000</td>
<td>18,711</td>
<td>21,518</td>
<td>24,325</td>
<td>25,087</td>
</tr>
<tr>
<td>- coniferous</td>
<td>cu.m.o.b. / y.</td>
<td>1000</td>
<td>17,053</td>
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<td>22,742</td>
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<tr>
<td>- broadleaved</td>
<td>cu.m.o.b. / y.</td>
<td>1000</td>
<td>1,658</td>
<td>1,923</td>
<td>2,189</td>
<td>2,345</td>
</tr>
<tr>
<td><strong>Removals, total</strong></td>
<td>cu.m. u.b. / y.</td>
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<td>16,278</td>
<td>18,402</td>
<td>18,978</td>
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<td>cu.m. u.b. / y.</td>
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<td>12,901</td>
<td>14,823</td>
<td>16,746</td>
<td>17,204</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>cu.m. u.b. / y.</td>
<td>1000</td>
<td>1,254</td>
<td>1,455</td>
<td>1,656</td>
<td>1,774</td>
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<tr>
<td><strong>Removals, total from final fellings</strong></td>
<td>cu.m. u.b. / y.</td>
<td>1000</td>
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<td>12,204</td>
<td>13,759</td>
<td>14,012</td>
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<td>- coniferous</td>
<td>cu.m. u.b. / y.</td>
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<td>9,708</td>
<td>11,112</td>
<td>12,517</td>
<td>12,682</td>
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<td>cu.m. u.b. / y.</td>
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<td>941</td>
<td>1,091</td>
<td>1,242</td>
<td>1,330</td>
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<tr>
<td><strong>Removals, total from thinnings</strong></td>
<td>cu.m. u.b. / y.</td>
<td>1000</td>
<td>3,507</td>
<td>4,075</td>
<td>4,643</td>
<td>4,966</td>
</tr>
<tr>
<td>- coniferous</td>
<td>cu.m. u.b. / y.</td>
<td>1000</td>
<td>3,193</td>
<td>3,711</td>
<td>4,229</td>
<td>4,523</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>cu.m. u.b. / y.</td>
<td>1000</td>
<td>313</td>
<td>364</td>
<td>414</td>
<td>443</td>
</tr>
<tr>
<td><strong>Removals, total from final fellings</strong></td>
<td>cu.m. u.b. / y.</td>
<td>1000</td>
<td>3,507</td>
<td>4,075</td>
<td>4,643</td>
<td>4,966</td>
</tr>
<tr>
<td>- coniferous</td>
<td>cu.m. u.b. / y.</td>
<td>1000</td>
<td>3,193</td>
<td>3,711</td>
<td>4,229</td>
<td>4,523</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>cu.m. u.b. / y.</td>
<td>1000</td>
<td>313</td>
<td>364</td>
<td>414</td>
<td>443</td>
</tr>
<tr>
<td><strong>Removals, total from thinnings</strong></td>
<td>cu.m. u.b. / y.</td>
<td>1000</td>
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<td>4,075</td>
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<td>4,966</td>
</tr>
<tr>
<td>- coniferous</td>
<td>cu.m. u.b. / y.</td>
<td>1000</td>
<td>3,193</td>
<td>3,711</td>
<td>4,229</td>
<td>4,523</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>cu.m. u.b. / y.</td>
<td>1000</td>
<td>313</td>
<td>364</td>
<td>414</td>
<td>443</td>
</tr>
</tbody>
</table>

#### Ratios

- **Growing stock per Area**
  - cu.m. o.b. / ha: 305 / 311 / 306 / 292 / 282
- **Net annual increment per growing stock**
  - cu.m. o.b. / cu.m. o.b.: 3.1% / 3.0% / 2.8% / 2.9% / 3.0%
- **Net annual increment per ha**
  - cu.m. o.b. / ha / y: 9.6 / 9.2 / 8.6 / 8.4 / 8.5
- **Fellings per Net annual increment**
  - cu.m. o.b. / cu.m. o.b.: 76% / 91% / 110% / 114% / 108%
- **Removals per Area**
  - cu.m. u.b. / ha / y: 5.5 / 6.3 / 7.1 / 7.3 / 7.0

---

**Diagram 1:**
- **FAWS (1000 ha)**
  - **Base scenario**
  - **Alternative scenario**

**Diagram 2:**
- **Growing stock, total (1000 cu.m. o.b.)**
  - **Base scenario**
  - **Alternative scenario**
### Estonia

#### Base scenario

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>1,919</td>
<td>1,966</td>
<td>2,014</td>
<td>2,062</td>
<td>2,097</td>
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<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>961</td>
<td>984</td>
<td>1,008</td>
<td>1,032</td>
<td>1,050</td>
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<tr>
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<td>1000 ha</td>
<td>958</td>
<td>992</td>
<td>1,006</td>
<td>1,029</td>
<td>1,047</td>
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<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>412,448</td>
<td>407,254</td>
<td>402,059</td>
<td>385,847</td>
<td>364,041</td>
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<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>213,138</td>
<td>187,636</td>
<td>162,135</td>
<td>130,877</td>
<td>97,974</td>
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<tr>
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<td>1000 cu.m. o.b.</td>
<td>199,311</td>
<td>219,617</td>
<td>239,924</td>
<td>254,970</td>
<td>266,067</td>
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<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>10,887</td>
<td>10,343</td>
<td>9,798</td>
<td>9,335</td>
<td>9,010</td>
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<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>5,457</td>
<td>5,360</td>
<td>5,263</td>
<td>5,150</td>
<td>5,035</td>
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<tr>
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<td>1000 cu.m. o.b. / y.</td>
<td>5,430</td>
<td>4,982</td>
<td>4,535</td>
<td>4,184</td>
<td>3,975</td>
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<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>9,328</td>
<td>9,970</td>
<td>10,612</td>
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<td>11,130</td>
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<tr>
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<td>1000 cu.m. o.b. / y.</td>
<td>6,995</td>
<td>7,478</td>
<td>7,960</td>
<td>8,411</td>
<td>8,182</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
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<td>2,493</td>
<td>2,651</td>
<td>2,800</td>
<td>2,948</td>
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<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>7,403</td>
<td>7,913</td>
<td>8,422</td>
<td>8,898</td>
<td>8,833</td>
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<td>1000 cu.m. u.b. / y.</td>
<td>5,551</td>
<td>5,935</td>
<td>6,318</td>
<td>6,675</td>
<td>6,493</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,852</td>
<td>1,978</td>
<td>2,104</td>
<td>2,222</td>
<td>2,340</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>5,556</td>
<td>5,935</td>
<td>6,313</td>
<td>6,663</td>
<td>6,650</td>
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<td>1000 cu.m. u.b. / y.</td>
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<td>4,451</td>
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<td>1000 cu.m. u.b. / y.</td>
<td>1,389</td>
<td>1,484</td>
<td>1,578</td>
<td>1,667</td>
<td>1,755</td>
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<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
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<td>2,234</td>
<td>2,183</td>
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<td>1000 cu.m. u.b. / y.</td>
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<td>1,484</td>
<td>1,583</td>
<td>1,679</td>
<td>1,598</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>463</td>
<td>495</td>
<td>526</td>
<td>556</td>
<td>585</td>
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</tbody>
</table>

#### Ratios

- Growing stock per Area
  - cu.m. o.b. / ha: 215, 207, 200, 187, 174

- Net annual increment per growing stock
  - cu.m. o.b. / cu.m. o.b.: 2.6%, 2.5%, 2.4%, 2.4%, 2.5%

- Net annual increment per ha
  - cu.m. o.b. / ha / y.: 5.7, 5.3, 4.9, 4.5, 4.3

- Fellings per Net annual increment
  - cu.m. o.b. / cu.m. o.b.: 96%, 96%, 108%, 120%, 124%

- Removals per Area
  - cu.m. u.b. / ha / y.: 3.9, 4.0, 4.2, 4.3, 4.2

---

#### Graphs

1. **Growing stock, total**
   - Base scenario
   - Alternative scenario

2. **Fellings, total**
   - Base scenario
   - Alternative scenario

---

<table>
<thead>
<tr>
<th>Year</th>
<th>FAWS (1000 ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>300,000</td>
</tr>
<tr>
<td>2010</td>
<td>320,000</td>
</tr>
<tr>
<td>2020</td>
<td>340,000</td>
</tr>
<tr>
<td>2030</td>
<td>360,000</td>
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<tr>
<td>2040</td>
<td>380,000</td>
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</table>
**Hungary**

### Forest resource parameters

<table>
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<tr>
<th></th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
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</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>1,703</td>
<td>1,739</td>
<td>1,768</td>
<td>1,797</td>
<td>1,819</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>1,467</td>
<td>1,498</td>
<td>1,523</td>
<td>1,546</td>
<td>1,567</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>316,645</td>
<td>352,171</td>
<td>370,225</td>
<td>380,603</td>
<td>385,388</td>
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<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>268,076</td>
<td>298,127</td>
<td>313,458</td>
<td>322,474</td>
<td>327,164</td>
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<td>9,333</td>
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<td>8,805</td>
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<tr>
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<td>5,887</td>
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<td>6,985</td>
<td>7,341</td>
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<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
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<td>6,439</td>
<td>6,767</td>
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<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>636</td>
<td>717</td>
<td>801</td>
<td>851</td>
<td>894</td>
</tr>
<tr>
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<td>4,179</td>
<td>4,709</td>
<td>5,263</td>
<td>5,588</td>
<td>5,873</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,579</td>
<td>4,034</td>
<td>4,508</td>
<td>4,786</td>
<td>5,031</td>
</tr>
<tr>
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<td>1000 cu.m. u.b. / y.</td>
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<td>502</td>
<td>561</td>
<td>596</td>
<td>626</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,134</td>
<td>3,532</td>
<td>3,947</td>
<td>4,191</td>
<td>4,405</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,236</td>
<td>1,392</td>
<td>1,556</td>
<td>1,652</td>
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<td>1000 cu.m. u.b. / y.</td>
<td>191</td>
<td>215</td>
<td>240</td>
<td>255</td>
<td>268</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,045</td>
<td>1,177</td>
<td>1,316</td>
<td>1,397</td>
<td>1,468</td>
</tr>
<tr>
<td>Ratios</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Growing stock per Area</td>
<td>cu.m. o.b. / ha</td>
<td>186</td>
<td>203</td>
<td>209</td>
<td>212</td>
<td>212</td>
</tr>
<tr>
<td>- Net annual increment per growing stock</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
<td>3.1%</td>
<td>2.6%</td>
<td>2.5%</td>
<td>2.3%</td>
<td>2.3%</td>
</tr>
<tr>
<td>- Net annual increment per ha</td>
<td>cu.m. o.b. / ha / y.</td>
<td>5.7</td>
<td>5.4</td>
<td>5.2</td>
<td>5.0</td>
<td>4.8</td>
</tr>
<tr>
<td>- Fellings per Net annual increment</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
<td>62%</td>
<td>73%</td>
<td>83%</td>
<td>90%</td>
<td>96%</td>
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<tr>
<td>- Removals per Area</td>
<td>cu.m. u.b. / ha / y.</td>
<td>2.8</td>
<td>3.1</td>
<td>3.4</td>
<td>3.6</td>
<td>3.7</td>
</tr>
</tbody>
</table>
Latvia

**Base scenario**

<table>
<thead>
<tr>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
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<tbody>
<tr>
<td>Forest resource parameters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>2,424</td>
<td>2,489</td>
<td>2,554</td>
<td>2,619</td>
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<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>1,393</td>
<td>1,430</td>
<td>1,467</td>
<td>1,504</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>1,032</td>
<td>1,059</td>
<td>1,087</td>
<td>1,114</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>487,693</td>
<td>454,881</td>
<td>422,070</td>
<td>371,749</td>
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<tr>
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<td>1000 cu.m. o.b.</td>
<td>286,618</td>
<td>271,305</td>
<td>255,992</td>
<td>233,452</td>
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<tr>
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<td>1000 cu.m. o.b.</td>
<td>201,075</td>
<td>183,577</td>
<td>166,078</td>
<td>138,297</td>
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<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>14,019</td>
<td>14,197</td>
<td>14,376</td>
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<td>1000 cu.m. o.b. / y.</td>
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<td>9,040</td>
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<td>1000 cu.m. o.b. / y.</td>
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<td>5,869</td>
<td>5,456</td>
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<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>14,186</td>
<td>16,133</td>
<td>18,080</td>
<td>19,725</td>
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<td>1000 cu.m. o.b. / y.</td>
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<td>9,246</td>
<td>10,642</td>
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<td>1000 cu.m. o.b. / y.</td>
<td>6,335</td>
<td>6,887</td>
<td>7,438</td>
<td>8,206</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>10,321</td>
<td>11,737</td>
<td>13,154</td>
<td>14,351</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>5,712</td>
<td>6,727</td>
<td>7,742</td>
<td>8,381</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>4,609</td>
<td>5,010</td>
<td>5,412</td>
<td>5,970</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>7,222</td>
<td>8,809</td>
<td>10,396</td>
<td>11,719</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>4,138</td>
<td>5,048</td>
<td>5,957</td>
<td>6,715</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,084</td>
<td>3,761</td>
<td>4,439</td>
<td>5,004</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,099</td>
<td>2,928</td>
<td>2,758</td>
<td>2,632</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,573</td>
<td>1,679</td>
<td>1,785</td>
<td>1,666</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,525</td>
<td>1,249</td>
<td>973</td>
<td>966</td>
</tr>
<tr>
<td>Ratios</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Growing stock per Area</td>
<td>cu.m. o.b. / ha</td>
<td>201</td>
<td>183</td>
<td>165</td>
<td>142</td>
</tr>
<tr>
<td>- Net annual increment per growing stock</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
<td>2.9%</td>
<td>3.1%</td>
<td>3.4%</td>
<td>3.8%</td>
</tr>
<tr>
<td>- Net annual increment per ha</td>
<td>cu.m. o.b. / ha / y.</td>
<td>5.8</td>
<td>5.7</td>
<td>5.6</td>
<td>5.4</td>
</tr>
<tr>
<td>- Fellings per Net annual increment</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
<td>101%</td>
<td>114%</td>
<td>126%</td>
<td>139%</td>
</tr>
<tr>
<td>- Removals per Area</td>
<td>cu.m. u.b. / ha / y.</td>
<td>4.3</td>
<td>4.7</td>
<td>5.2</td>
<td>5.5</td>
</tr>
</tbody>
</table>

---

**Graphs:**

1. Forest area available for wood supply over years 2000 to 2040.
2. Growing stock total over years 2000 to 2040.
**Lithuania**

**Base scenario**

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>1,679</td>
<td>1,712</td>
<td>1,745</td>
<td>1,779</td>
<td>1,804</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>1,007</td>
<td>1,027</td>
<td>1,047</td>
<td>1,067</td>
<td>1,082</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>672</td>
<td>685</td>
<td>698</td>
<td>712</td>
<td>722</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>343,215</td>
<td>352,578</td>
<td>361,942</td>
<td>361,227</td>
<td>354,282</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>223,389</td>
<td>226,703</td>
<td>230,017</td>
<td>227,420</td>
<td>220,661</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>119,826</td>
<td>125,875</td>
<td>131,925</td>
<td>133,807</td>
<td>133,622</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>9,764</td>
<td>9,442</td>
<td>9,120</td>
<td>9,093</td>
<td>9,280</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>6,009</td>
<td>5,840</td>
<td>5,671</td>
<td>5,710</td>
<td>5,806</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>3,756</td>
<td>3,602</td>
<td>3,449</td>
<td>3,383</td>
<td>3,474</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>6,129</td>
<td>7,326</td>
<td>8,524</td>
<td>9,349</td>
<td>10,111</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>3,988</td>
<td>4,768</td>
<td>5,547</td>
<td>6,084</td>
<td>6,580</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,140</td>
<td>2,559</td>
<td>2,977</td>
<td>3,265</td>
<td>3,531</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>4,632</td>
<td>5,537</td>
<td>6,442</td>
<td>7,065</td>
<td>7,641</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,014</td>
<td>3,603</td>
<td>4,192</td>
<td>4,598</td>
<td>4,973</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,618</td>
<td>1,934</td>
<td>2,250</td>
<td>2,468</td>
<td>2,668</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,474</td>
<td>4,153</td>
<td>4,831</td>
<td>5,299</td>
<td>5,731</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,261</td>
<td>2,702</td>
<td>3,144</td>
<td>3,448</td>
<td>3,730</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,213</td>
<td>1,450</td>
<td>1,687</td>
<td>1,851</td>
<td>2,001</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,158</td>
<td>1,384</td>
<td>1,610</td>
<td>1,766</td>
<td>1,910</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>754</td>
<td>901</td>
<td>1,048</td>
<td>1,149</td>
<td>1,243</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>404</td>
<td>483</td>
<td>562</td>
<td>617</td>
<td>667</td>
</tr>
</tbody>
</table>

**Ratios**

- Growing stock per Area (cu.m. o.b. / ha) | 204 | 206 | 207 | 203 | 196
- Net annual increment per growing stock (cu.m. o.b. / cu.m. o.b.) | 2.8% | 2.7% | 2.5% | 2.5% | 2.6%
- Net annual increment per ha (cu.m. o.b. / ha / y.) | 5.8 | 5.5 | 5.2 | 5.1 | 5.1
- Fellings per Net annual increment (cu.m. o.b. / cu.m. o.b.) | 63% | 78% | 93% | 103% | 109%
- Removals per Area (cu.m. u.b. / ha / y.) | 2.8 | 3.2 | 3.7 | 4.0 | 4.2
### FYR Macedonia

#### Base scenario

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>745</td>
<td>745</td>
<td>745</td>
<td>745</td>
<td>745</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>33</td>
<td>33</td>
<td>33</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>712</td>
<td>712</td>
<td>712</td>
<td>712</td>
<td>712</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>60,674</td>
<td>61,980</td>
<td>61,140</td>
<td>59,621</td>
<td>57,321</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>2,152</td>
<td>2,285</td>
<td>2,358</td>
<td>2,632</td>
<td>2,652</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>58,522</td>
<td>59,695</td>
<td>58,782</td>
<td>56,989</td>
<td>54,669</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,417</td>
<td>1,327</td>
<td>1,388</td>
<td>1,517</td>
<td>1,655</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>64</td>
<td>68</td>
<td>70</td>
<td>71</td>
<td>71</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,353</td>
<td>1,259</td>
<td>1,318</td>
<td>1,446</td>
<td>1,584</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,076</td>
<td>1,301</td>
<td>1,502</td>
<td>1,681</td>
<td>1,915</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>50</td>
<td>60</td>
<td>60</td>
<td>42</td>
<td>80</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,027</td>
<td>1,241</td>
<td>1,442</td>
<td>1,639</td>
<td>1,835</td>
</tr>
<tr>
<td>Removels, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,185</td>
<td>1,433</td>
<td>1,654</td>
<td>1,851</td>
<td>2,108</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>55</td>
<td>66</td>
<td>66</td>
<td>46</td>
<td>88</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,130</td>
<td>1,367</td>
<td>1,587</td>
<td>1,804</td>
<td>2,021</td>
</tr>
<tr>
<td>Removels, total from fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,111</td>
<td>1,344</td>
<td>1,550</td>
<td>1,733</td>
<td>1,976</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>38</td>
<td>46</td>
<td>43</td>
<td>20</td>
<td>58</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,073</td>
<td>1,297</td>
<td>1,507</td>
<td>1,713</td>
<td>1,918</td>
</tr>
<tr>
<td>Removels, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>74</td>
<td>89</td>
<td>104</td>
<td>118</td>
<td>132</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>17</td>
<td>20</td>
<td>23</td>
<td>26</td>
<td>29</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>57</td>
<td>69</td>
<td>81</td>
<td>92</td>
<td>102</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ratios</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Growing stock per Area</td>
<td>cu.m. o.b. / ha</td>
</tr>
<tr>
<td>- Net annual increment per growing stock</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
</tr>
<tr>
<td>- Net annual increment per ha</td>
<td>cu.m. o.b. / ha / y.</td>
</tr>
<tr>
<td>- Fellings per Net annual increment</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
</tr>
<tr>
<td>- Removals per Area</td>
<td>cu.m. u.b. / ha / y.</td>
</tr>
</tbody>
</table>

---

**Graphs:**
- **Base scenario vs. Alternative scenario**
  - FAWS (1000 ha)
  - Growing stock, total (1000 cu.m. o.b.)
### Poland

#### Base scenario

<table>
<thead>
<tr>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Forest resource parameters</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>8,397</td>
<td>8,600</td>
<td>8,762</td>
<td>8,925</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>6,497</td>
<td>6,653</td>
<td>6,777</td>
<td>6,902</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>1,901</td>
<td>1,948</td>
<td>1,985</td>
<td>2,022</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>1,792,424</td>
<td>2,067,684</td>
<td>2,274,619</td>
<td>2,448,160</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>1,408,463</td>
<td>1,648,182</td>
<td>1,828,204</td>
<td>1,982,312</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>383,962</td>
<td>419,502</td>
<td>446,415</td>
<td>465,848</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>53,727</td>
<td>58,872</td>
<td>60,395</td>
<td>60,626</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>43,462</td>
<td>47,167</td>
<td>48,187</td>
<td>48,350</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>10,264</td>
<td>11,705</td>
<td>12,207</td>
<td>12,276</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>33,118</td>
<td>37,022</td>
<td>40,299</td>
<td>44,255</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>25,203</td>
<td>28,174</td>
<td>30,669</td>
<td>33,472</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>7,915</td>
<td>8,848</td>
<td>9,630</td>
<td>10,563</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>23,073</td>
<td>25,793</td>
<td>28,075</td>
<td>30,831</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>17,558</td>
<td>19,628</td>
<td>21,366</td>
<td>23,472</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>5,514</td>
<td>6,164</td>
<td>6,709</td>
<td>7,359</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>11,536</td>
<td>12,896</td>
<td>14,035</td>
<td>15,409</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>8,779</td>
<td>9,814</td>
<td>10,681</td>
<td>11,726</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,757</td>
<td>3,082</td>
<td>3,354</td>
<td>3,683</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>11,536</td>
<td>12,896</td>
<td>14,041</td>
<td>15,422</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>8,779</td>
<td>9,814</td>
<td>10,686</td>
<td>11,746</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,757</td>
<td>3,082</td>
<td>3,355</td>
<td>3,676</td>
</tr>
<tr>
<td><strong>Ratios</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Growing stock per Area</td>
<td>cu.m. o.b. / ha</td>
<td>213</td>
<td>240</td>
<td>260</td>
<td>274</td>
</tr>
<tr>
<td>- Net annual increment per growing stock</td>
<td>cu.m. o.b. / cu.m. o.b.</td>
<td>3.0%</td>
<td>2.8%</td>
<td>2.7%</td>
<td>2.5%</td>
</tr>
<tr>
<td>- Fellings per Net annual increment</td>
<td>cu.m. o.b. / ha / y.</td>
<td>6.4</td>
<td>6.8</td>
<td>6.9</td>
<td>6.8</td>
</tr>
<tr>
<td>- Removals per Area</td>
<td>cu.m. u.b. / ha / y.</td>
<td>2.7</td>
<td>3.0</td>
<td>3.2</td>
<td>3.5</td>
</tr>
</tbody>
</table>

![Graph 1](image1.png)

![Graph 2](image2.png)
### Romania

#### Forest resource parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Base scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit</strong></td>
<td><strong>2000</strong></td>
</tr>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
</tbody>
</table>

#### Ratios

- Growing stock per Area (cu.m. o.b. / ha) 273, 331, 366, 393, 411
- Net annual increment per growing stock (cu.m. o.b. / cu.m. o.b.) 2.5%, 2.0%, 1.7%, 1.5%, 1.4%
- Net annual increment per ha (cu.m. o.b. / ha) 6.9, 6.8, 6.1, 6.1, 5.8
- Fellings per Net annual increment (cu.m. o.b. / cu.m. o.b.) 36%, 47%, 63%, 75%, 85%
- Removals per Area (cu.m. u.b. / ha / y.) 2.2, 2.8, 3.5, 4.0, 4.4

![Graph 1](image1.png)

- Base scenario
- Alternative scenario

![Graph 2](image2.png)

- Base scenario
- Alternative scenario
Slovak Republic

Base scenario

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area of forest available for wood supply</strong></td>
<td>1000 ha</td>
<td>1,707</td>
<td>1,716</td>
<td>1,724</td>
<td>1,731</td>
<td>1,737</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>715</td>
<td>719</td>
<td>722</td>
<td>726</td>
<td>728</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>991</td>
<td>997</td>
<td>1,001</td>
<td>1,006</td>
<td>1,009</td>
</tr>
</tbody>
</table>

- **Growing stock, total**
  - 1000 cu.m. o.b. | 386,974 | 408,258 | 402,844 | 385,253 | 361,316 |
  - coniferous | 185,146 | 187,018 | 176,133 | 159,015 | 141,196 |
  - broadleaved | 201,829 | 221,240 | 226,710 | 226,238 | 220,120 |

- **Net annual increment, total**
  - 1000 cu.m. o.b. / y. | 11,759 | 11,423 | 11,331 | 11,754 | 12,099 |
  - coniferous | 6,009 | 5,931 | 5,960 | 6,309 | 6,581 |
  - broadleaved | 5,750 | 5,492 | 5,371 | 5,445 | 5,518 |

- **Fellings, total**
  - 1000 cu.m. o.b. / y. | 8,172 | 10,457 | 12,239 | 13,812 | 14,396 |
  - coniferous | 4,834 | 6,186 | 7,242 | 8,177 | 8,125 |
  - broadleaved | 3,338 | 4,271 | 4,997 | 5,634 | 6,272 |

- **Removals, total**
  - 1000 cu.m. u.b. / y. | 5,640 | 7,217 | 8,447 | 9,532 | 9,935 |
  - coniferous | 3,336 | 4,269 | 4,998 | 5,643 | 5,607 |
  - broadleaved | 2,304 | 2,948 | 3,449 | 3,889 | 4,328 |

- **Removals, total from final fellings**
  - 1000 cu.m. u.b. / y. | 3,948 | 5,052 | 5,911 | 6,664 | 6,961 |
  - coniferous | 2,335 | 2,988 | 3,496 | 3,942 | 3,931 |
  - broadleaved | 1,613 | 2,063 | 2,414 | 2,722 | 3,030 |

- **Removals, total from thinnings**
  - 1000 cu.m. u.b. / y. | 1,692 | 2,165 | 2,536 | 2,868 | 2,975 |
  - coniferous | 1,001 | 1,281 | 1,501 | 1,702 | 1,676 |
  - broadleaved | 691 | 884 | 1,035 | 1,167 | 1,298 |

**Ratios**

- Growing stock per Area  cu.m. o.b. / ha | 227 | 238 | 234 | 223 | 208
- Net annual increment per growing stock  cu.m. o.b. / cu.m. o.b. | 3.0% | 2.8% | 2.8% | 3.1% | 3.3%
- Net annual increment per ha  cu.m. o.b. / ha / y. | 6.9 | 6.7 | 6.6 | 6.8 | 7.0
- Fellings per Net annual increment  cu.m. o.b. / cu.m. o.b. | 69% | 92% | 108% | 118% | 119%
- Removals per Area  cu.m. u.b. / ha / y. | 3.3 | 4.2 | 4.9 | 5.5 | 5.7
### Slovenia
#### Base scenario

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>1,041</td>
<td>1,059</td>
<td>1,074</td>
<td>1,089</td>
<td>1,100</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>573</td>
<td>581</td>
<td>588</td>
<td>594</td>
<td>599</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>467</td>
<td>478</td>
<td>496</td>
<td>494</td>
<td>500</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>328,372</td>
<td>373,761</td>
<td>405,043</td>
<td>432,987</td>
<td>457,847</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>205,492</td>
<td>231,416</td>
<td>248,324</td>
<td>262,866</td>
<td>273,376</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>122,879</td>
<td>142,346</td>
<td>156,719</td>
<td>170,121</td>
<td>182,471</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>6,818</td>
<td>6,794</td>
<td>6,865</td>
<td>6,931</td>
<td>6,995</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>4,173</td>
<td>4,121</td>
<td>4,117</td>
<td>4,151</td>
<td>4,191</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,645</td>
<td>2,673</td>
<td>2,748</td>
<td>2,780</td>
<td>2,805</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,621</td>
<td>3,350</td>
<td>3,829</td>
<td>4,215</td>
<td>4,600</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,709</td>
<td>2,185</td>
<td>2,497</td>
<td>2,749</td>
<td>3,000</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>912</td>
<td>1,165</td>
<td>1,332</td>
<td>1,466</td>
<td>1,600</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,279</td>
<td>2,913</td>
<td>3,330</td>
<td>3,665</td>
<td>4,000</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,486</td>
<td>1,900</td>
<td>2,172</td>
<td>2,390</td>
<td>2,609</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>793</td>
<td>1,013</td>
<td>1,158</td>
<td>1,275</td>
<td>1,391</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,527</td>
<td>1,952</td>
<td>2,231</td>
<td>2,455</td>
<td>2,680</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>996</td>
<td>1,273</td>
<td>1,455</td>
<td>1,601</td>
<td>1,748</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>531</td>
<td>679</td>
<td>776</td>
<td>854</td>
<td>932</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>752</td>
<td>961</td>
<td>1,099</td>
<td>1,209</td>
<td>1,320</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>491</td>
<td>627</td>
<td>717</td>
<td>789</td>
<td>861</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>262</td>
<td>334</td>
<td>382</td>
<td>421</td>
<td>459</td>
</tr>
</tbody>
</table>

#### Ratios

- Growing stock per Area cu.m. o.b. / ha 316 353 377 398 416
- Net annual increment per growing stock cu.m. o.b. / cu.m. o.b. 2.1% 1.8% 1.7% 1.6% 1.5%
- Net annual increment per ha cu.m. o.b. / ha / y. 6.6 6.4 6.4 6.4 6.4
- Fellings per Net annual increment cu.m. o.b. / cu.m. o.b. 38% 49% 56% 61% 66%
- Removals per Area cu.m. u.b. / ha / y. 2.2 2.8 3.1 3.4 3.6

---

**Graphs:**

- FAWS (1000 ha) over the years 2000 to 2040 showing two scenarios: Base scenario and Alternative scenario.
- Growing stock total (1000 cu.m. o.b.) over the years 2000 to 2040 with the same two scenarios.
Turkey

**Base scenario**

### Forest resource parameters

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area of forest available for wood supply</strong></td>
<td>1000 ha</td>
<td>8,627</td>
<td>8,587</td>
<td>8,547</td>
<td>8,507</td>
<td>8,477</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>6,820</td>
<td>6,788</td>
<td>6,757</td>
<td>6,725</td>
<td>6,701</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>1,807</td>
<td>1,798</td>
<td>1,790</td>
<td>1,782</td>
<td>1,775</td>
</tr>
<tr>
<td><strong>Growing stock, total</strong></td>
<td>1000 cu.m. o.b.</td>
<td>1,174,669</td>
<td>1,161,529</td>
<td>1,148,389</td>
<td>1,105,271</td>
<td>1,069,912</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>864,606</td>
<td>916,421</td>
<td>968,235</td>
<td>980,183</td>
<td>977,064</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>310,063</td>
<td>245,108</td>
<td>180,153</td>
<td>115,088</td>
<td>92,848</td>
</tr>
<tr>
<td><strong>Net annual increment, total</strong></td>
<td>1000 cu.m. o.b. / y.</td>
<td>29,007</td>
<td>27,372</td>
<td>25,737</td>
<td>23,815</td>
<td>22,648</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>23,210</td>
<td>21,624</td>
<td>20,439</td>
<td>19,335</td>
<td>18,831</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>5,797</td>
<td>5,548</td>
<td>5,298</td>
<td>4,481</td>
<td>3,817</td>
</tr>
<tr>
<td><strong>Fellings, total</strong></td>
<td>1000 cu.m. o.b. / y.</td>
<td>18,229</td>
<td>23,471</td>
<td>28,713</td>
<td>29,101</td>
<td>24,683</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>10,290</td>
<td>13,293</td>
<td>16,297</td>
<td>18,900</td>
<td>19,435</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>7,939</td>
<td>10,178</td>
<td>12,417</td>
<td>10,201</td>
<td>5,248</td>
</tr>
<tr>
<td><strong>Removals, total</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>14,743</td>
<td>18,982</td>
<td>23,222</td>
<td>23,536</td>
<td>19,962</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>8,322</td>
<td>10,751</td>
<td>13,180</td>
<td>15,285</td>
<td>15,718</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>6,421</td>
<td>8,232</td>
<td>10,042</td>
<td>8,250</td>
<td>4,244</td>
</tr>
<tr>
<td><strong>Removals, total from final fellings</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>10,367</td>
<td>13,376</td>
<td>16,386</td>
<td>17,513</td>
<td>15,350</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>5,581</td>
<td>7,203</td>
<td>8,825</td>
<td>10,502</td>
<td>12,179</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>4,786</td>
<td>6,174</td>
<td>7,561</td>
<td>7,011</td>
<td>3,170</td>
</tr>
<tr>
<td><strong>Removals, total from thinnings</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>4,375</td>
<td>5,606</td>
<td>6,837</td>
<td>6,023</td>
<td>4,613</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,741</td>
<td>3,548</td>
<td>4,355</td>
<td>4,784</td>
<td>3,539</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,534</td>
<td>2,058</td>
<td>2,462</td>
<td>2,140</td>
<td>1,074</td>
</tr>
</tbody>
</table>

**Ratios**

- **Growing stock per Area**
  cu.m. o.b. / ha | 136  | 135  | 134  | 129  | 126  |
- **Net annual increment per growing stock**
  cu.m. o.b. / cu.m. o.b. | 2.5% | 2.4% | 2.2% | 2.2% | 2.1% |
- **Net annual increment per ha**
  cu.m. o.b. / ha / y. | 3.4  | 3.2  | 3.0  | 2.8  | 2.7  |
- **Fellings per Net annual increment**
  cu.m. o.b. / cu.m. o.b. | 63%  | 86%  | 112% | 122% | 109% |
- **Removals per Area**
  cu.m. u.b. / ha / y. | 1.7  | 2.2  | 2.7  | 2.8  | 2.4  |
### Serbia and Montenegro

#### Base scenario

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area of forest available for wood supply</strong></td>
<td>1000 ha</td>
<td>2,356</td>
<td>2,286</td>
<td>2,230</td>
<td>2,174</td>
<td>2,132</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>185</td>
<td>180</td>
<td>175</td>
<td>171</td>
<td>168</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>2,171</td>
<td>2,106</td>
<td>2,055</td>
<td>2,003</td>
<td>1,964</td>
</tr>
<tr>
<td><strong>Growing stock, total</strong></td>
<td>1000 cu.m. o.b.</td>
<td>273,178</td>
<td>312,743</td>
<td>330,556</td>
<td>339,133</td>
<td>341,644</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>25,571</td>
<td>27,063</td>
<td>27,443</td>
<td>27,122</td>
<td>26,313</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>247,607</td>
<td>285,680</td>
<td>303,113</td>
<td>312,011</td>
<td>315,331</td>
</tr>
<tr>
<td><strong>Net annual increment, total</strong></td>
<td>1000 cu.m. o.b. / y.</td>
<td>5,833</td>
<td>4,487</td>
<td>3,476</td>
<td>2,919</td>
<td>2,601</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>380</td>
<td>402</td>
<td>388</td>
<td>379</td>
<td>384</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>5,454</td>
<td>4,086</td>
<td>3,087</td>
<td>2,539</td>
<td>2,217</td>
</tr>
<tr>
<td><strong>Fellings, total</strong></td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,475</td>
<td>1,819</td>
<td>1,970</td>
<td>2,240</td>
<td>2,483</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>236</td>
<td>299</td>
<td>371</td>
<td>425</td>
<td>476</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,239</td>
<td>1,521</td>
<td>1,599</td>
<td>1,815</td>
<td>2,007</td>
</tr>
<tr>
<td><strong>Removals, total</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,182</td>
<td>1,458</td>
<td>1,579</td>
<td>1,796</td>
<td>1,990</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>189</td>
<td>239</td>
<td>297</td>
<td>341</td>
<td>382</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>993</td>
<td>1,219</td>
<td>1,282</td>
<td>1,455</td>
<td>1,608</td>
</tr>
<tr>
<td><strong>Removals, total from final fellings</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>827</td>
<td>1,047</td>
<td>1,301</td>
<td>1,492</td>
<td>1,670</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>132</td>
<td>168</td>
<td>208</td>
<td>239</td>
<td>267</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>695</td>
<td>879</td>
<td>1,093</td>
<td>1,253</td>
<td>1,403</td>
</tr>
<tr>
<td><strong>Removals, total from thinnings</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>355</td>
<td>411</td>
<td>278</td>
<td>304</td>
<td>320</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>57</td>
<td>72</td>
<td>89</td>
<td>102</td>
<td>114</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>298</td>
<td>339</td>
<td>189</td>
<td>202</td>
<td>205</td>
</tr>
</tbody>
</table>

#### Ratios

- **Growing stock per Area**
  cu.m. o.b. / ha | 116 | 137 | 148 | 156 | 160
- **Net annual increment per growing stock**
  cu.m. o.b. / cu.m. o.b. | 2.1% | 1.4% | 1.1% | 0.9% | 0.8%
- **Net annual increment per ha**
  cu.m. o.b. / ha / y. | 2.5 | 2.0 | 1.6 | 1.3 | 1.2
- **Fellings per Net annual increment**
  cu.m. o.b. / cu.m. o.b. | 25% | 41% | 57% | 77% | 95%
- **Removals per Area**
  cu.m. u.b. / ha / y. | 0.5 | 0.6 | 0.7 | 0.8 | 0.9

---

![Graphs showing forest resource parameters over time](image-url)
<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Base scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>Unit 2000 2010 2020 2030 2040</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
</tr>
</tbody>
</table>

**Ratios**
- Growing stock per Area cu.m. o.b. / ha 140 153 167 178 185
- Net annual increment per growing stock cu.m. o.b. / cu.m. o.b. 1.7% 1.8% 1.5% 1.4% 1.3%
- Net annual increment per Area cu.m. o.b. / ha / y. 2.4 2.4 2.5 2.5 2.5
- Fellings per Net annual increment cu.m. o.b. / cu.m. o.b. 33% 45% 57% 69% 82%
- Removals per Area cu.m. u.b. / ha / y. 0.6 0.8 1.1 1.3 1.5
# Belarus Base scenario

**Forest resource parameters**

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
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</thead>
<tbody>
<tr>
<td><strong>Area of forest available for wood supply</strong></td>
<td>1000 ha</td>
<td>5,978</td>
<td>6,023</td>
<td>6,067</td>
<td>6,111</td>
<td>6,144</td>
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<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>3,740</td>
<td>3,768</td>
<td>3,795</td>
<td>3,823</td>
<td>3,844</td>
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<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>2,238</td>
<td>2,255</td>
<td>2,272</td>
<td>2,298</td>
<td>2,301</td>
</tr>
<tr>
<td><strong>Growing stock, total</strong></td>
<td>1000 cu.m. o.b.</td>
<td>1,148,682</td>
<td>1,374,934</td>
<td>1,601,185</td>
<td>1,791,136</td>
<td>1,935,706</td>
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<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>781,673</td>
<td>930,257</td>
<td>1,078,842</td>
<td>1,204,468</td>
<td>1,297,893</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>367,009</td>
<td>444,676</td>
<td>522,343</td>
<td>586,669</td>
<td>637,814</td>
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<tr>
<td><strong>Net annual increment, total</strong></td>
<td>1000 cu.m. o.b. / y.</td>
<td>37,269</td>
<td>35,368</td>
<td>33,467</td>
<td>30,987</td>
<td>27,733</td>
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<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>24,384</td>
<td>23,360</td>
<td>22,336</td>
<td>20,702</td>
<td>18,335</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>12,885</td>
<td>12,008</td>
<td>11,131</td>
<td>10,285</td>
<td>9,398</td>
</tr>
<tr>
<td><strong>Fellings, total</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>6,640</td>
<td>7,758</td>
<td>8,875</td>
<td>9,961</td>
<td>11,049</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>4,519</td>
<td>5,280</td>
<td>6,041</td>
<td>6,780</td>
<td>7,521</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,121</td>
<td>2,478</td>
<td>2,834</td>
<td>3,181</td>
<td>3,529</td>
</tr>
<tr>
<td><strong>Removals, total</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,860</td>
<td>1,939</td>
<td>2,219</td>
<td>2,490</td>
<td>2,762</td>
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<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,130</td>
<td>1,320</td>
<td>1,510</td>
<td>1,695</td>
<td>1,880</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>530</td>
<td>619</td>
<td>709</td>
<td>795</td>
<td>882</td>
</tr>
<tr>
<td><strong>Removals, total from final fellings</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>6,980</td>
<td>8,186</td>
<td>9,382</td>
<td>10,578</td>
<td>11,774</td>
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<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>4,389</td>
<td>5,260</td>
<td>6,132</td>
<td>6,990</td>
<td>7,848</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,591</td>
<td>3,026</td>
<td>3,250</td>
<td>3,588</td>
<td>4,126</td>
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<tr>
<td><strong>Removals, total from thinnings</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>570</td>
<td>639</td>
<td>713</td>
<td>787</td>
<td>862</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>360</td>
<td>419</td>
<td>483</td>
<td>547</td>
<td>611</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>210</td>
<td>220</td>
<td>230</td>
<td>237</td>
<td>241</td>
</tr>
</tbody>
</table>

**Ratios**

- Growing stock per Area
  - cu.m. o.b. / ha: 192/228/264/293/315
- Net annual increment per growing stock
  - cu.m. o.b. / cu.m. o.b.: 3.2%/2.6%/2.1%/1.7%/1.4%
- Net annual increment per ha
  - cu.m. o.b. / ha / y.: 6.2/5.9/5.5/5.1/4.5
- Fellings per Net annual increment
  - cu.m. o.b. / cu.m. o.b.: 23%/29%/35%/42%/52%
- Removals per Area
  - cu.m. u.b. / ha / y.: 1.1/1.3/1.5/1.6/1.8

![Graph showing forest resource parameters](image-url)
<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
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</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>211</td>
<td>212</td>
<td>213</td>
<td>214</td>
<td>215</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>211</td>
<td>212</td>
<td>213</td>
<td>214</td>
<td>215</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>30,306</td>
<td>38,884</td>
<td>45,988</td>
<td>52,644</td>
<td>58,803</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>30,306</td>
<td>38,884</td>
<td>45,988</td>
<td>52,644</td>
<td>58,803</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,019</td>
<td>977</td>
<td>1,038</td>
<td>991</td>
<td>954</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>1,019</td>
<td>977</td>
<td>1,038</td>
<td>991</td>
<td>954</td>
</tr>
<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>279</td>
<td>300</td>
<td>323</td>
<td>339</td>
<td>354</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>279</td>
<td>300</td>
<td>323</td>
<td>339</td>
<td>354</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>159</td>
<td>171</td>
<td>184</td>
<td>193</td>
<td>202</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>159</td>
<td>171</td>
<td>184</td>
<td>193</td>
<td>202</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>119</td>
<td>128</td>
<td>138</td>
<td>145</td>
<td>151</td>
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<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>119</td>
<td>128</td>
<td>138</td>
<td>145</td>
<td>151</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>40</td>
<td>43</td>
<td>46</td>
<td>48</td>
<td>50</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>40</td>
<td>43</td>
<td>46</td>
<td>48</td>
<td>50</td>
</tr>
</tbody>
</table>

**Ratios**

- Growing stock per Area  
  cu.m. o.b. / ha | 144   | 183   | 216   | 246   | 273   |
- Net annual increment per growing stock  
  cu.m. o.b. / cu.m. o.b. | 3.4%  | 2.5%  | 2.3%  | 1.9%  | 1.6%  |
- Net annual increment per ha  
  cu.m. o.b. / ha / y. | 4.8   | 4.6   | 4.9   | 4.6   | 4.4   |
- Fellings per Net annual increment  
  cu.m. o.b. / cu.m. o.b. | 27%   | 31%   | 31%   | 34%   | 37%   |
- Removals per Area  
  cu.m. u.b. / ha / y. | 0.8   | 0.8   | 0.9   | 0.9   | 0.9   |
### European part of Russia

#### Base scenario

<table>
<thead>
<tr>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of forest available for wood supply</td>
<td>1000 ha</td>
<td>173,193</td>
<td>169,945</td>
<td>167,348</td>
<td>164,750</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>108,105</td>
<td>106,078</td>
<td>104,457</td>
<td>102,836</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>65,088</td>
<td>63,867</td>
<td>62,891</td>
<td>61,915</td>
</tr>
<tr>
<td>Growing stock, total</td>
<td>1000 cu.m. o.b.</td>
<td>22,147,252</td>
<td>24,921,152</td>
<td>26,526,036</td>
<td>27,703,869</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>13,145,568</td>
<td>14,092,442</td>
<td>14,347,155</td>
<td>14,283,858</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>9,001,684</td>
<td>10,828,709</td>
<td>12,178,861</td>
<td>13,420,011</td>
</tr>
<tr>
<td>Net annual increment, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>416,206</td>
<td>378,416</td>
<td>383,927</td>
<td>387,106</td>
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<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>228,102</td>
<td>214,277</td>
<td>218,637</td>
<td>228,295</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>188,105</td>
<td>164,139</td>
<td>165,089</td>
<td>158,811</td>
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<tr>
<td>Fellings, total</td>
<td>1000 cu.m. o.b. / y.</td>
<td>98,744</td>
<td>182,642</td>
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<td>280,589</td>
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<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>85,354</td>
<td>157,877</td>
<td>202,314</td>
<td>242,570</td>
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<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>13,390</td>
<td>24,765</td>
<td>31,733</td>
<td>38,019</td>
</tr>
<tr>
<td>Removals, total</td>
<td>1000 cu.m. u.b. / y.</td>
<td>68,137</td>
<td>126,030</td>
<td>161,501</td>
<td>193,618</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>58,898</td>
<td>108,941</td>
<td>139,605</td>
<td>167,383</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>9,240</td>
<td>17,089</td>
<td>21,897</td>
<td>26,235</td>
</tr>
<tr>
<td>Removals, total from final fellings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>47,697</td>
<td>88,221</td>
<td>113,052</td>
<td>135,548</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>41,229</td>
<td>76,259</td>
<td>97,723</td>
<td>117,168</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>6,468</td>
<td>11,962</td>
<td>15,329</td>
<td>18,380</td>
</tr>
<tr>
<td>Removals, total from thinnings</td>
<td>1000 cu.m. u.b. / y.</td>
<td>20,440</td>
<td>37,809</td>
<td>48,449</td>
<td>58,070</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>17,669</td>
<td>32,682</td>
<td>41,882</td>
<td>50,216</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,771</td>
<td>5,127</td>
<td>6,568</td>
<td>7,855</td>
</tr>
</tbody>
</table>

#### Ratios

- Growing stock per Area (cu.m. o.b. / ha) | 128 | 147 | 159 | 168 | 174 |
- Net annual increment per growing stock (cu.m. o.b. / cu.m. o.b.) | 1.9% | 1.5% | 1.4% | 1.4% | 1.3% |
- Fellings per Net annual increment (cu.m. o.b. / cu.m. o.b.) | 2.4 | 2.2 | 2.3 | 2.3 | 2.4 |
- Removals per Area (cu.m. u.b. / ha / y.) | 0.4 | 0.7 | 1.0 | 1.2 | 1.4 |

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**Graphs:**

1. **FAWS (1000 ha)**
   - 2000: 162,000
   - 2010: 164,000
   - 2020: 166,000
   - 2030: 168,000
   - 2040: 170,000

2. **Growing stock, total (1000 cu.m. o.b.)**
   - 2000: 20,000,000
   - 2010: 22,000,000
   - 2020: 23,000,000
   - 2030: 24,000,000
   - 2040: 25,000,000
### Ukraine

#### Base scenario

<table>
<thead>
<tr>
<th>Forest resource parameters</th>
<th>Unit</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area of forest available for wood supply</strong></td>
<td>1000 ha</td>
<td>5,875</td>
<td>5,816</td>
<td>5,757</td>
<td>5,698</td>
<td>5,654</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 ha</td>
<td>2,988</td>
<td>2,958</td>
<td>2,929</td>
<td>2,899</td>
<td>2,876</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 ha</td>
<td>2,886</td>
<td>2,858</td>
<td>2,829</td>
<td>2,800</td>
<td>2,778</td>
</tr>
<tr>
<td><strong>Growing stock, total</strong></td>
<td>1000 cu.m. o.b.</td>
<td>1,347,411</td>
<td>1,539,144</td>
<td>1,730,878</td>
<td>1,882,781</td>
<td>1,993,657</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b.</td>
<td>771,470</td>
<td>894,635</td>
<td>1,017,800</td>
<td>1,116,937</td>
<td>1,190,705</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b.</td>
<td>575,941</td>
<td>644,509</td>
<td>713,078</td>
<td>765,844</td>
<td>802,952</td>
</tr>
<tr>
<td><strong>Net annual increment, total</strong></td>
<td>1000 cu.m. o.b. / y.</td>
<td>30,717</td>
<td>28,964</td>
<td>27,212</td>
<td>25,185</td>
<td>22,997</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>18,764</td>
<td>17,692</td>
<td>16,619</td>
<td>15,246</td>
<td>13,719</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>11,953</td>
<td>11,273</td>
<td>10,593</td>
<td>9,939</td>
<td>9,278</td>
</tr>
<tr>
<td><strong>Fellings, total</strong></td>
<td>1000 cu.m. o.b. / y.</td>
<td>4,594</td>
<td>6,804</td>
<td>9,014</td>
<td>11,004</td>
<td>12,997</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,482</td>
<td>3,676</td>
<td>4,870</td>
<td>5,945</td>
<td>7,001</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. o.b. / y.</td>
<td>2,112</td>
<td>3,128</td>
<td>4,144</td>
<td>5,059</td>
<td>5,958</td>
</tr>
<tr>
<td><strong>Removals, total</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>3,169</td>
<td>4,693</td>
<td>6,217</td>
<td>7,589</td>
<td>8,937</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,712</td>
<td>2,535</td>
<td>3,359</td>
<td>4,100</td>
<td>4,828</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,457</td>
<td>2,157</td>
<td>2,858</td>
<td>3,489</td>
<td>4,109</td>
</tr>
<tr>
<td><strong>Removals, total from final fellings</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>2,449</td>
<td>3,627</td>
<td>4,806</td>
<td>5,866</td>
<td>6,908</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,284</td>
<td>1,901</td>
<td>2,519</td>
<td>3,075</td>
<td>3,621</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>1,165</td>
<td>1,726</td>
<td>2,286</td>
<td>2,791</td>
<td>3,287</td>
</tr>
<tr>
<td><strong>Removals, total from thinnings</strong></td>
<td>1000 cu.m. u.b. / y.</td>
<td>719</td>
<td>1,065</td>
<td>1,411</td>
<td>1,723</td>
<td>2,029</td>
</tr>
<tr>
<td>- coniferous</td>
<td>1000 cu.m. u.b. / y.</td>
<td>428</td>
<td>634</td>
<td>840</td>
<td>1,025</td>
<td>1,207</td>
</tr>
<tr>
<td>- broadleaved</td>
<td>1000 cu.m. u.b. / y.</td>
<td>291</td>
<td>432</td>
<td>572</td>
<td>698</td>
<td>822</td>
</tr>
</tbody>
</table>

#### Ratios

- **Growing stock per Area**
  - cu.m. o.b. / ha: 229, 265, 301, 330, 353
- **Net annual increment per growing stock**
  - cu.m. o.b. / cu.m. o.b.: 2.3%, 1.9%, 1.6%, 1.3%, 1.2%
- **Net annual increment per ha**
  - cu.m. o.b. / ha / y.: 5.2, 5.0, 4.7, 4.4, 4.1
- **Fellings per Net annual increment**
  - cu.m. o.b. / cu.m. o.b.: 15%, 23%, 33%, 44%, 56%
- **Removals per Area**
  - cu.m. u.b. / ha / y.: 0.5, 0.8, 1.1, 1.3, 1.6

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**Graphs:**
- Ukraine Forestry: Area of Forest Available for Wood Supply over the years 2000 to 2040.
- Ukraine Forestry: Growing Stock Total over the years 2000 to 2040.