



LITHUANIAN  
RESEARCH CENTRE  
FOR AGRICULTURE  
AND FORESTRY

# Carbon accounting in harvested wood products: experience of Lithuania

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## **Introduction**

**Carbon sequestration and storage in the forest biomass has been recognised by the United Nations Framework Convention on Climate Change (UNFCCC) as a potential CO<sub>2</sub> abatement strategy.**

**For the first commitment period of the Kyoto Protocol (KP) (2008–2012), Parties were encouraged to monitor and report carbon stock changes in the forest biomass, but not in HWP.**

**However, after forest harvesting a significant amount of carbon is removed and might be stored in HWP, including building materials, furniture, paper, etc.**








**The Intergovernmental Panel on Climate Change provides guidelines for reporting countries on how to estimate carbon stocks and their changes in HWP.**

**The guidelines propose to use one out of three accounting methodological tiers (levels), named as Tier 1, 2 or 3, respectively, depending on the availability of country-specific activity data and methodologies.**

## Tier Levels

- In the **Tier 1** method, carbon in HWP is assumed to be oxidised at the year of forest harvest. Thus, this method makes a simplistic assumption of no carbon stock in HWP.
- The **Tier 2** method requires estimating the HWP carbon pool and its changes for the three default HWP categories, namely: **sawn wood, wood-based panels, paper and paperboard**. Country-specific information, factors and/or methodologies are not required as the method and data source are **proposed by the IPCC guidelines**.
- The **Tier 3** method foresees estimating the HWP carbon pool and its changes by using **country-specific half-life values and/or methodologies covering, at least three aforementioned categories of semi-finished HWP**.

## Reporting by different countries for the first commitment period of the KP

	 <i>Australia</i>	 <i>Canada</i>	 <i>Finland</i>	 <i>Latvia</i>	 <i>Portugal</i>	 <i>UK</i>	 <i>USA</i>
<i>Tier</i>	Tier 3	Tier 3	Tier 3	Tier 2	Tier 2	Tier 3	Tier 3
<i>Start year (data)</i>	1940	1990	1900	1900	1900	1990	1800
<i>Historical data source</i>	Department of National Development	<1991 FAO data for country-specific model "CBM-FHWP"	>1960 estimated. <1961 FAO data, National inventory	>1990 estimated. <1991 Central statistical bureau of Latvia, Latvian State forest service data	>1963 estimated. <1964 UNECE	National Inventory of Woodlands and Trees as input data for country-specific "CARBINE" model	1800 < data on softwood lumber for housing 1900 < data on other products USDA Forest Service and other sources for WOODCARB II model
<i>Half-life values</i>	Country-specific (research based)	IPCC default	Country-specific (national Inventory)	IPCC default	IPCC default	CARBINE model values (unknown)	County-specific (research based)

## Historical data

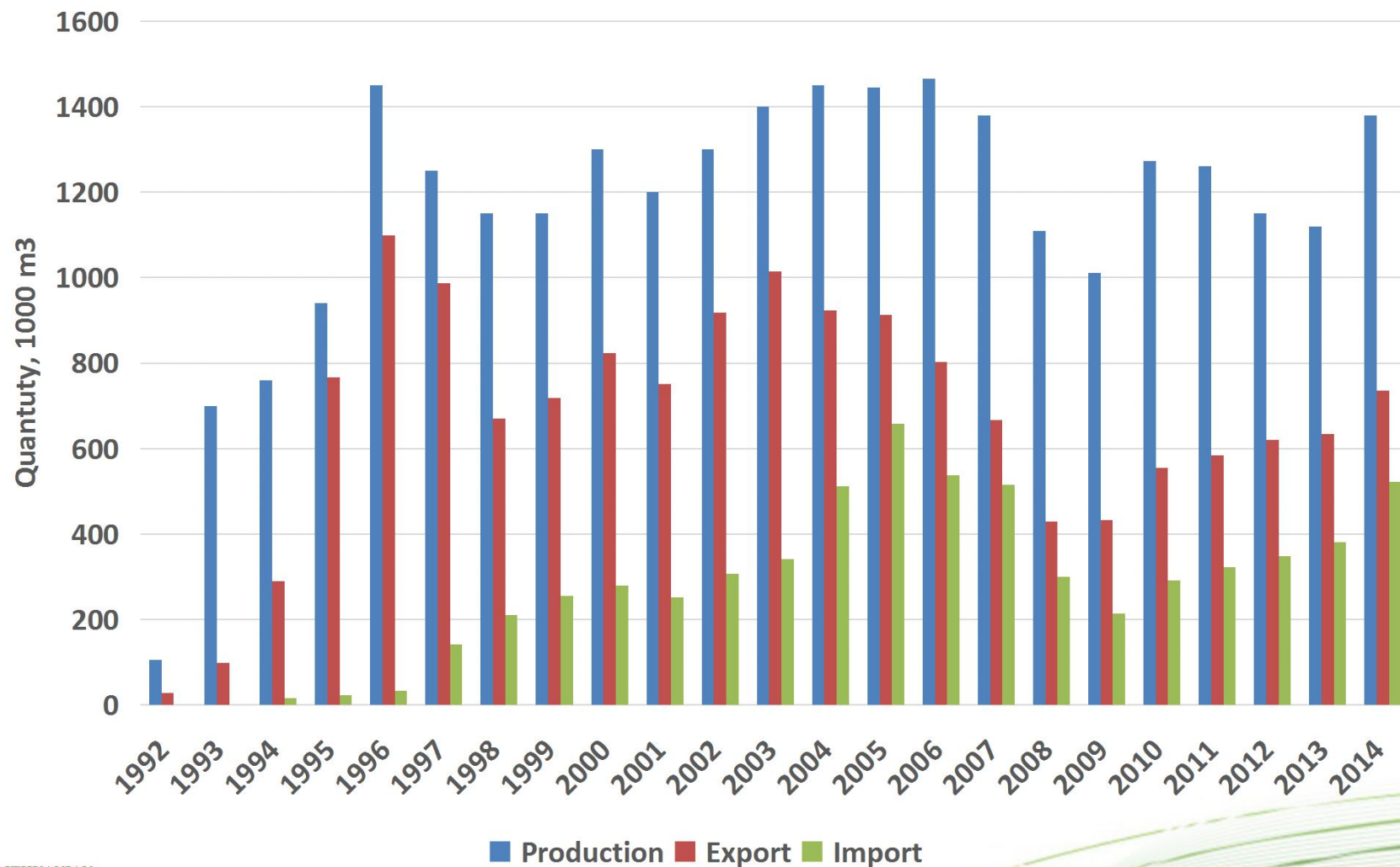
**In order to estimate carbon stock in HWP, three data sources with different time series were used:**

- **FAOSTAT data bases (1992-2015)**
- **literature (1960-1991)**
- **Data from Lithuanian statistics department (1940-1991)**

**The data from literature and national statistics were fragmented**  
**The data for the missing time series were interpolated**

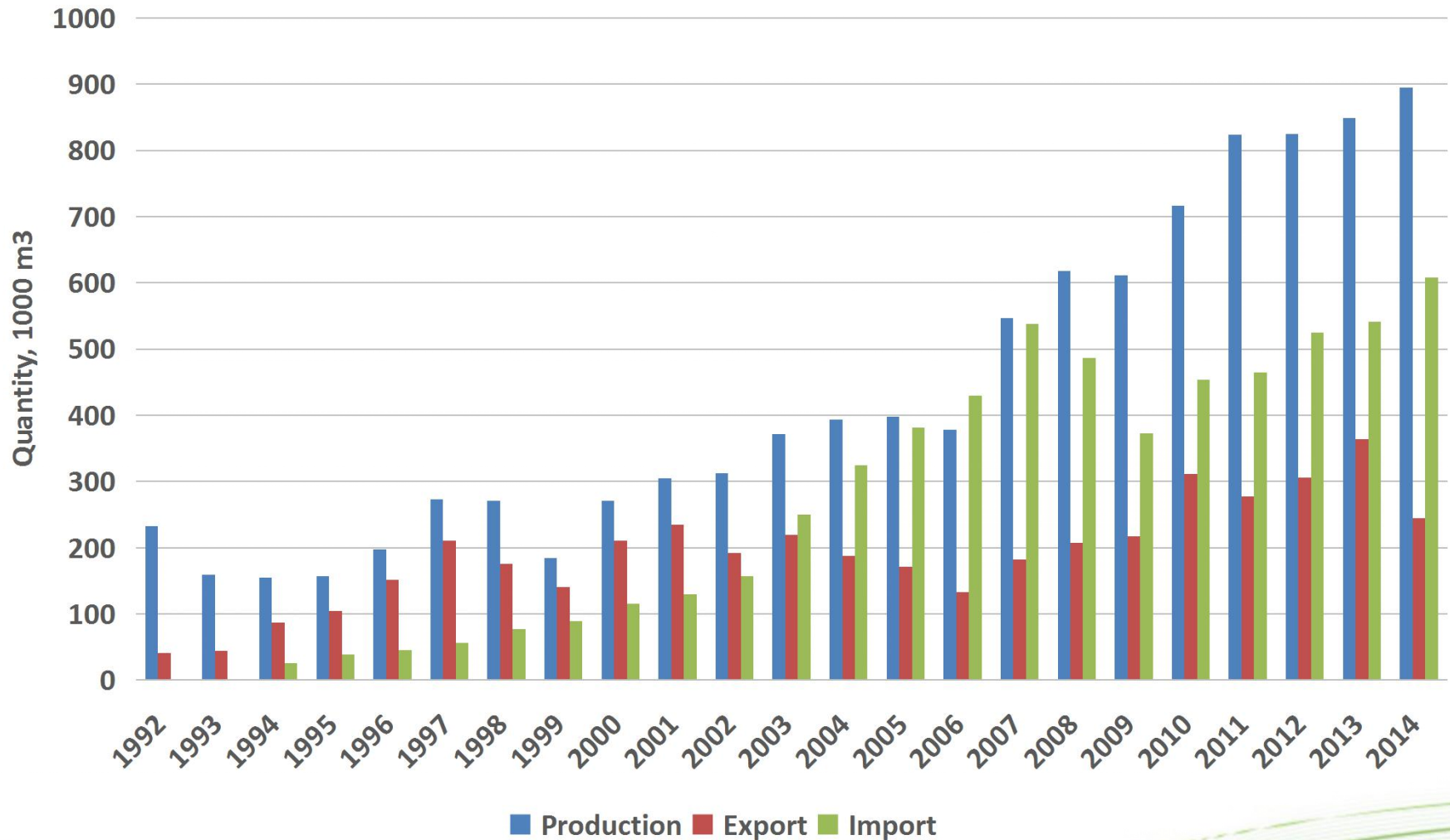
**The FAOSTAT data is considered to be reliable because they provide explicit information on production and trade of semi-finished HWP. However, FAOSTAT data for Lithuania are from 1992 only.**

## Sawnwood production (FAOSTAT data bases )



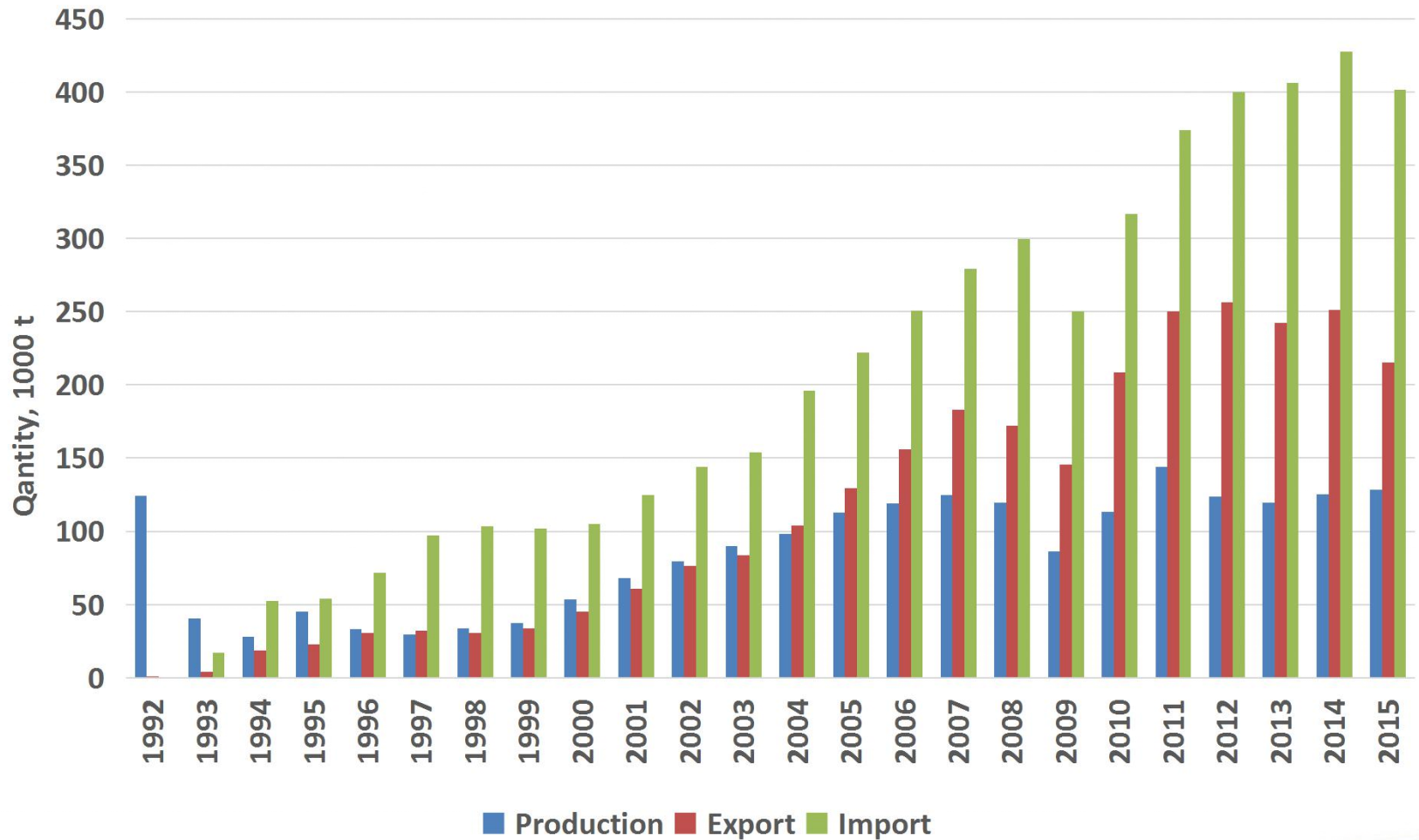


## Wood based panels (FAOSTAT data bases )

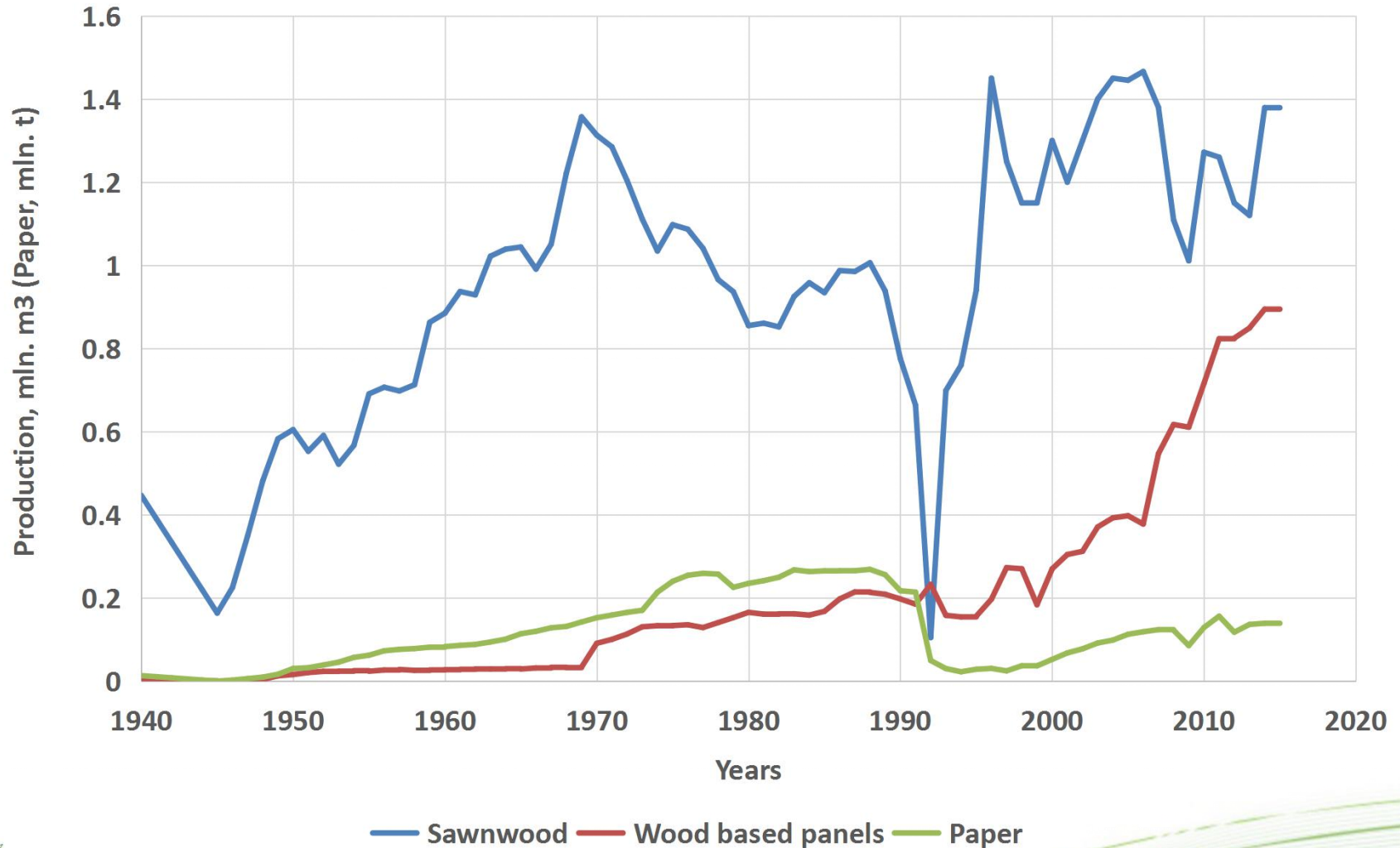




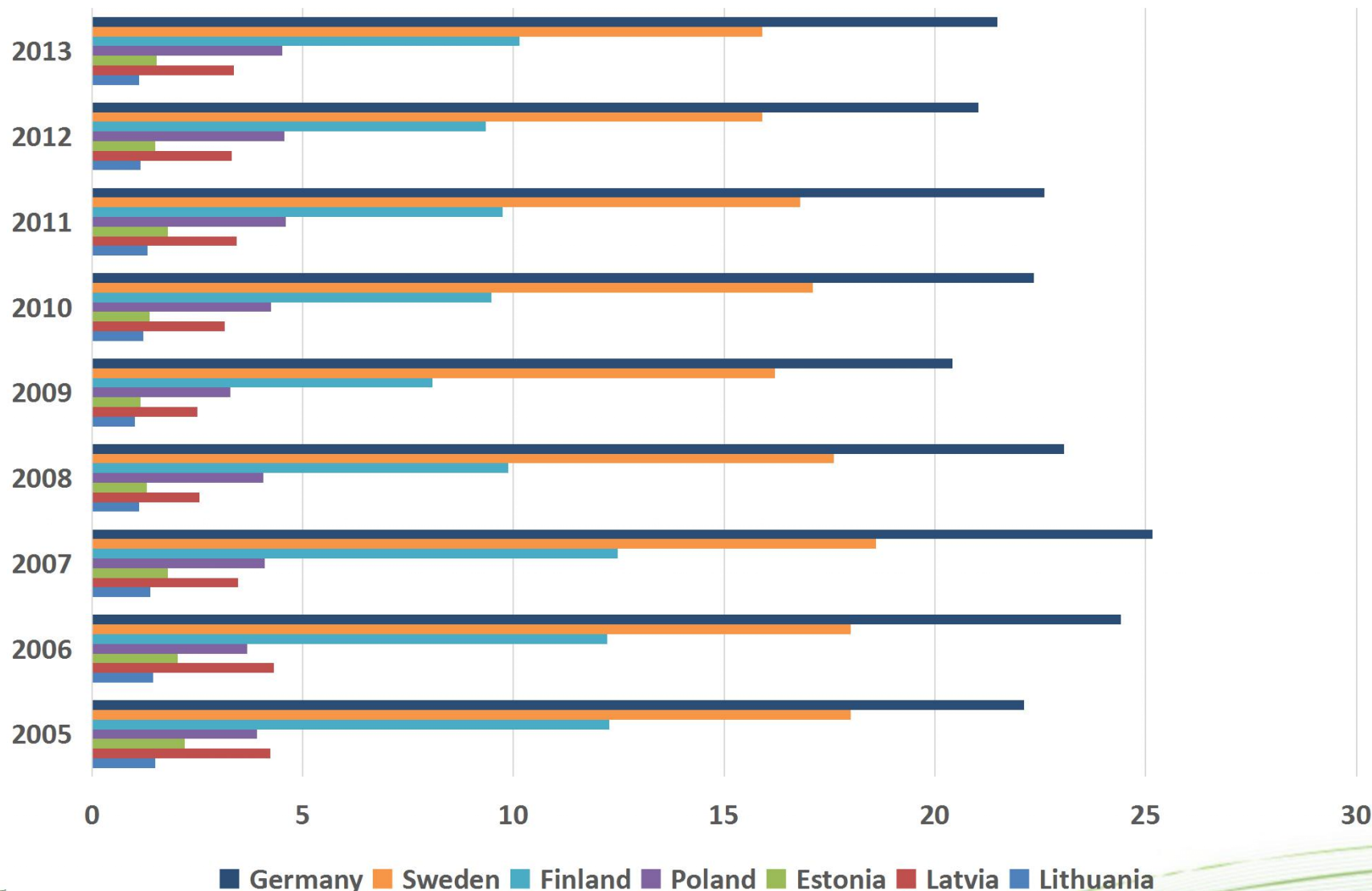
## Pulp and paper industry



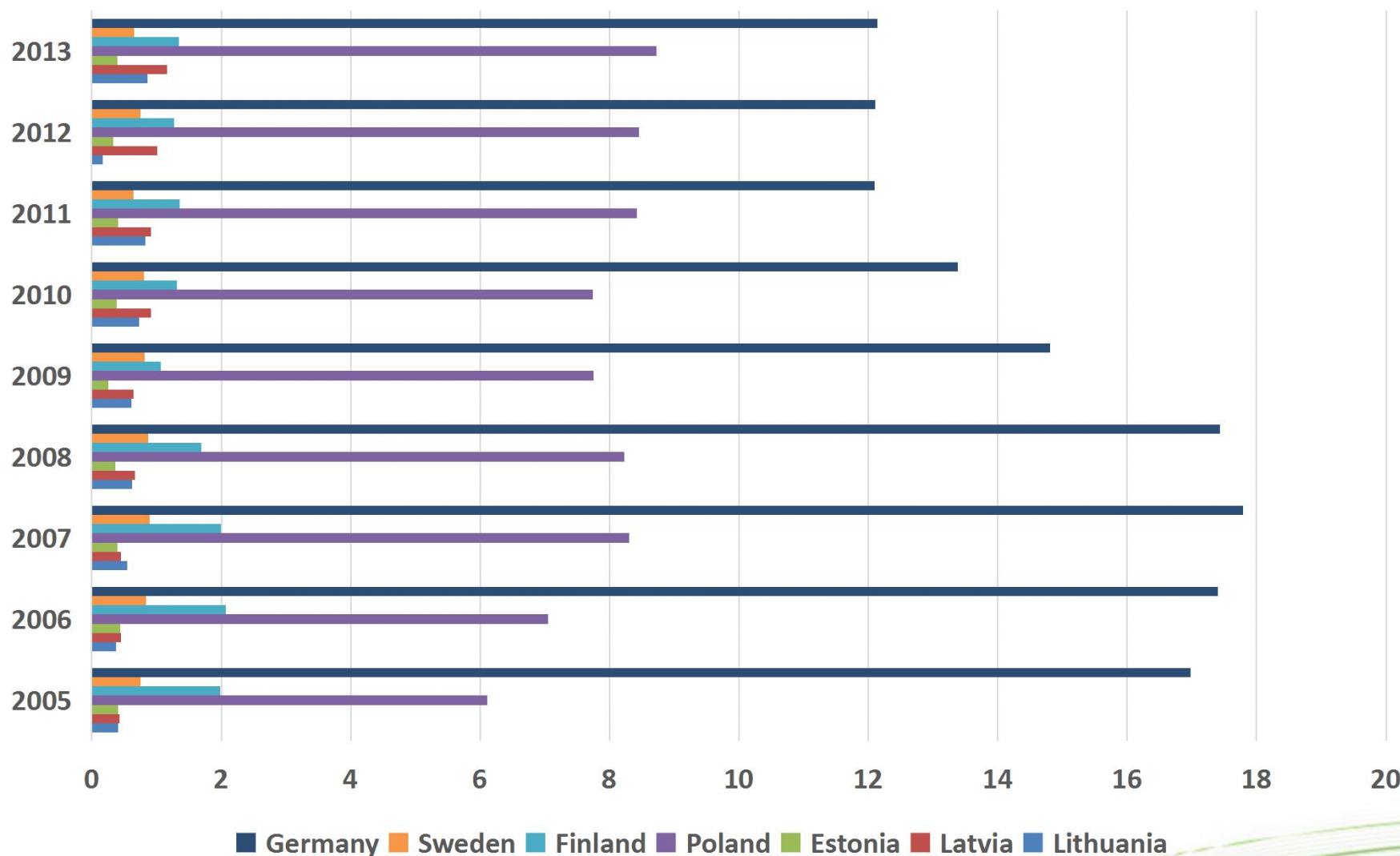
## Harvested wood products



## Production of Sawnwood, mln m<sup>3</sup>



## Production of Wood based panels, mln m<sup>3</sup>



## Methods

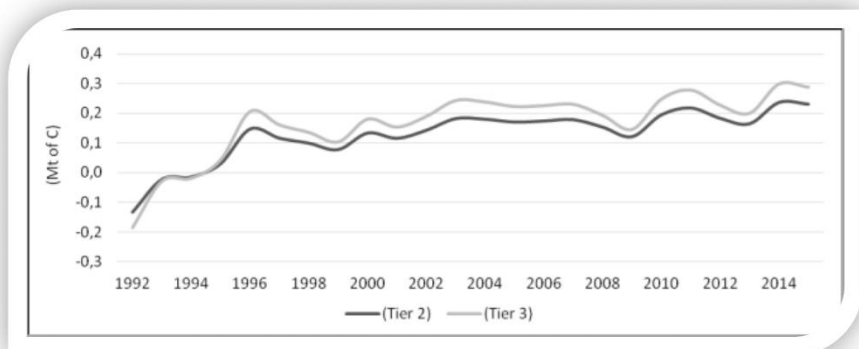
**In order to estimate the national carbon stock in Lithuania, we applied two different methods:**

- **the IPCC Tier 2 method (activity data from statistics or literature and default half-life values)**
- **the material flow analysis which is compatible with the IPCC Tier 3 method (country-specific activity data, country-specific half-life values and country-specific HWP groups)**
- **We compared the obtained results applying two different methods**

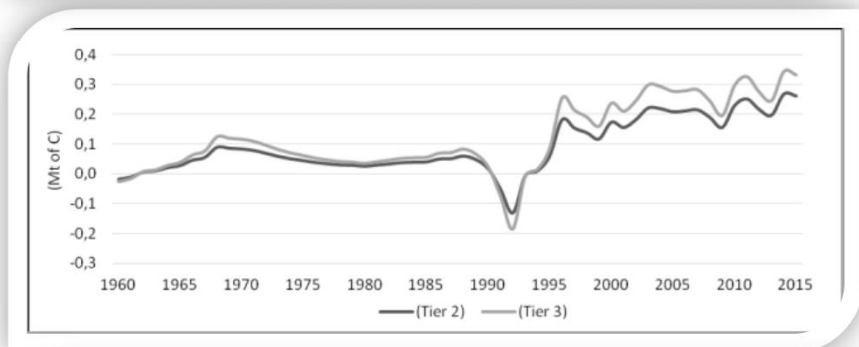
## **Country-specific and default half-life values for semi-finished HWP used for estimating carbon stock under Tier 3 method**

<b>HWP category</b>	<b>Source</b>	<b>Half-life (years)</b>	<b>Carbon inflow proportion (year 2013)</b>
<b>Wood-based panels</b>	IPCC default	25	46
<b>Sawn wood long-life</b>	IPCC default	35	43
<b>Sawn wood short-life (for EURO pallets)</b>	Estimates, the present study	3	8
<b>Cross laminated timber (CLT)</b>	Estimates, the present study	45	3
<b>Paper (applied for historical flows until 1999, when wood pulp was manufactured in the country) Currently, pulp from domestic wood is not produced in Lithuania. Paper products are manufactured only from imported pulp</b>	IPCC default	2	0

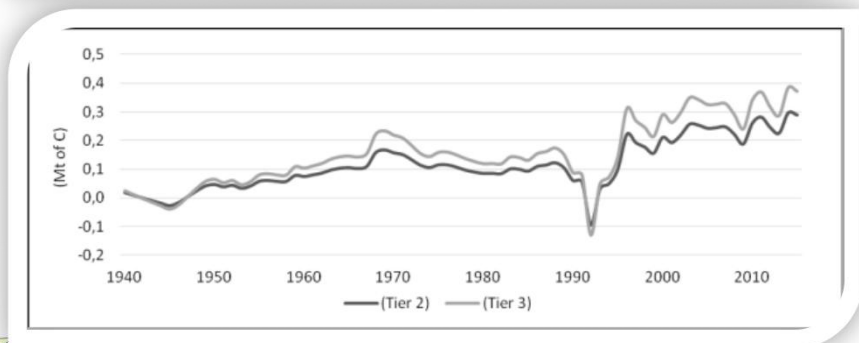
## Historical carbon stock changes by applying the IPCC Tier 2 and Tier 3 methods



**These estimates are based on available FAO data (1992-2015)**



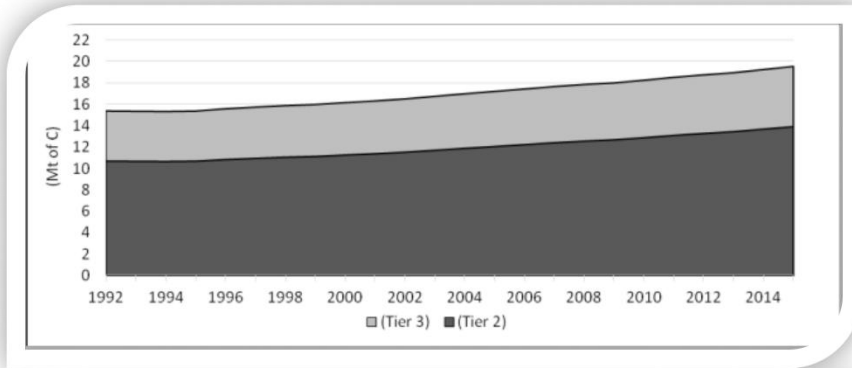
**These estimates are based on available literature data (1960-1991) and FAO data (1992-2015)**



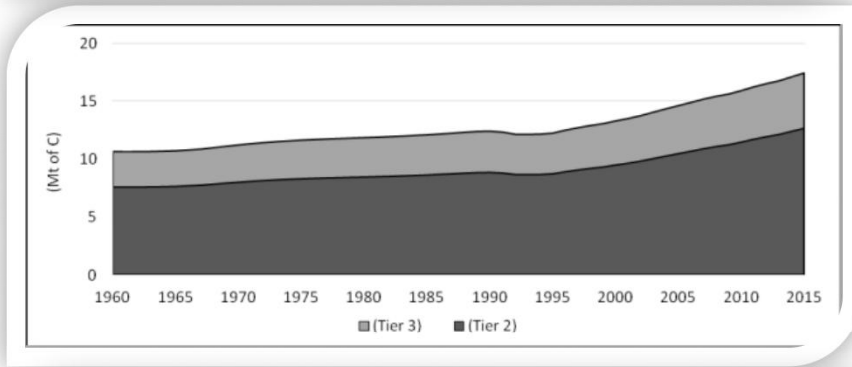
**These estimates are based on data obtained from national statistics (1940-1991) and FAO data (1992-2015)**



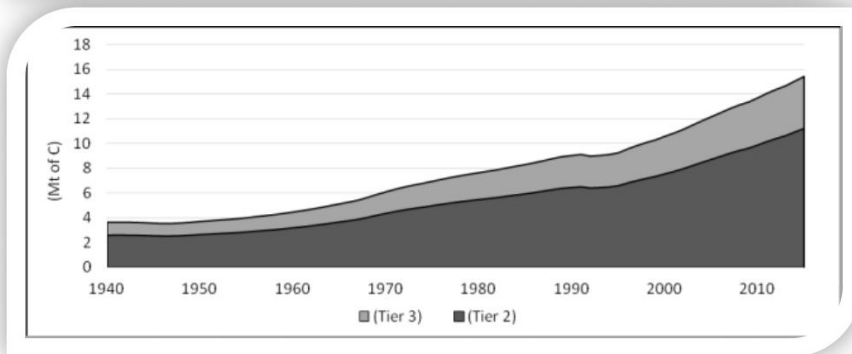
## Total carbon stocks in HWP under the IPCC Tier 2 and Tier 3 methods



**These estimates are based on available  
FAO data (1992-2015)**



**These estimates are based on  
available literature data (1960-1991)  
and FAO data (1992-2015)**



**These estimates are based on data  
obtained from national statistics  
(1940-1991) and FAO data (1992-  
2015)**

## **National carbon loss due to export of industrial roundwood**

**Lithuania is a net exporting country of industrial roundwood**

**In the last years (2010-2014), the export of industrial roundwood accounted to almost 1.7 million m<sup>3</sup> on average. This corresponds to 33 % of domestic production of industrial roundwood (LSY, 2015)**

**It is evident that huge amount of domestic carbon is exported together with industrial roundwood**

**At the moment there are no proposed methodologies and data that could estimate carbon flows and life times of HWP that are associated with exported wood**

# Thank you

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