



**State of Forest Carbon in British Columbia  
February 2017**

# Ministry of **Forests, Lands and Natural Resource Operations**



British Columbia has vast forests we can use to help fight climate change. Due to trees' ability to absorb and store carbon as they grow, B.C.'s forests can affect atmospheric concentrations of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases (GHGs) that are causing the climate to change. The following information provides timely updates of the forest and forest product carbon indicators in B.C.

Below is a list of acronym and terminology explanations that will help you through this document:

CO<sub>2</sub> – carbon dioxide

CO<sub>2</sub>e – carbon dioxide equivalent – refers to the internationally recognized measure of global warming potential that a particular mixture of gas would have over a specific time period if it was carbon dioxide

GHGs – greenhouse gases

T –Tonnes

Mt – megatonnes (one million tonnes)

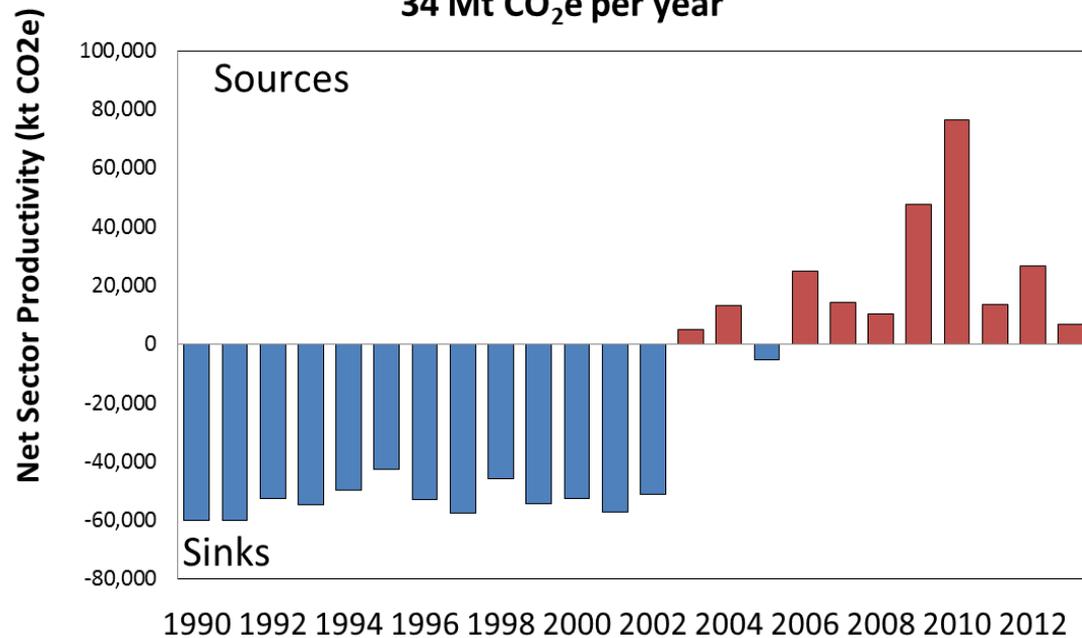
Kt – kilotonnes (one thousand tonnes)

m<sup>2</sup> – square metres



## Greenhouse gas sinks and emissions from forests.

Net forest sinks and sources. 2009-2013 average of  
34 Mt CO<sub>2</sub>e per year



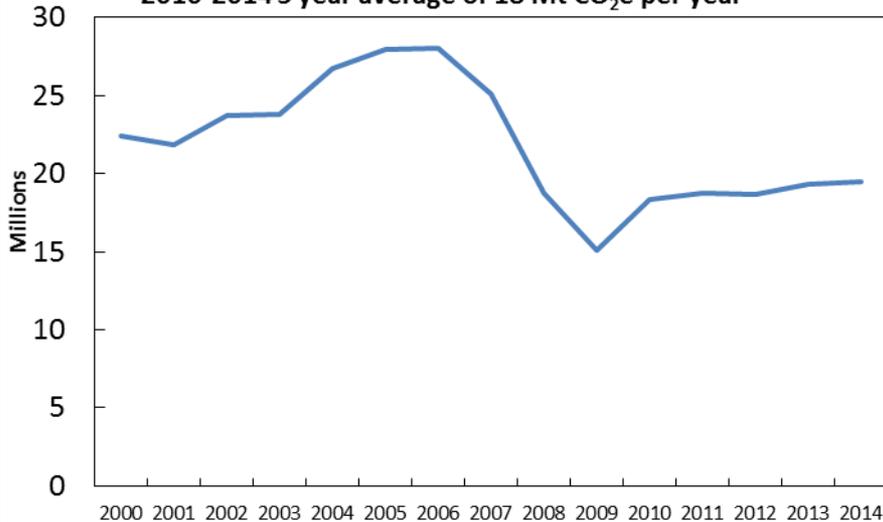
The switch from sink to source was caused by the mountain pine beetle, harvest uplift, and large fire years in the last decade.

For more information go to:  
<http://www2.gov.bc.ca/gov/content/environment/climate-change/reports-data/provincial-ghg-inventory-report-bc-s-pir>



## Annual transfer of carbon from forests to long-lived wood products

Long-lived wood products Mt CO<sub>2</sub>e based on Mill Survey  
2010-2014 5 year average of 18 Mt CO<sub>2</sub>e per year



Harvested wood is made into many products, including ones that cause immediate carbon emissions, such as bioenergy, those that have a short lifespan such as paper, and those that have lifespans of decades such as lumber and plywood. Those long-lived products store the CO<sub>2</sub> absorbed by the tree as cellulose and lignin.

For more information go to:

<https://cbmjournals.springeropen.com/articles/10.1186/1750-0680-7-8>

Data derived from:

<http://www2.gov.bc.ca/gov/content/industry/forestry/competitive-forest-industry/forest-industry-economics/fibre-mill-information>



## Forest Carbon Offsets in BC, 2015

Through the Carbon Neutral Government program, B.C. invests in forestry-related greenhouse gas emissions offset projects.

- In 2015, the B.C. government purchased 499,537 tonnes of CO<sub>2</sub>e in forest and forest products offsets. Total cost was \$5,826,480.
- For more information go to: <http://www2.gov.bc.ca/assets/gov/environment/climate-change/reports-and-data/cng/cng-yir-2015-final5.pdf>



## Carbon stored in wood buildings

The table below shows the amount of carbon stored in wood buildings as a result of the Building Code change for mid-rise, wood-frame residential construction.

This documents the approximate carbon benefit of new five- and six-storey, light-frame, wood buildings compared to if they had been made from concrete, for the years of 2009-2015. The avoided emissions estimates range from 31,500 - 150,000 tonnes CO<sub>2</sub>e.

Usable floor area	Avoided emissions	Carbon storage in wood	Gross benefit of code change	Gross benefit per m <sup>2</sup>	Number of buildings	Gross benefit per average building
(m <sup>2</sup> )	(t CO <sub>2</sub> e)	(t CO <sub>2</sub> e)	(t CO <sub>2</sub> e)	(t CO <sub>2</sub> e /m <sup>2</sup> )		(t CO <sub>2</sub> e / building)
<b>654,560</b>	91,639	102,966	194,605	0.2527	145	1,342

The data was derived from FPIinnovations and Construction Market Data Group. **For more information go to:**  
<http://www2.gov.bc.ca/gov/content/industry/construction-industry/building-codes-standards/forms-resources/historical-reports>

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**Key facts from “Climate mitigation potential of British Columbian forests:  
Growing carbon sinks” (November 2013)**

**B.C.’s 55 million hectares of forests, contain 6-7 billion tonnes of carbon  
in above-ground biomass.**

**Carbon is stored in standing live and dead trees, roots, soils, non-tree  
plants, and dead wood and litter on the forest floor. Data are from 2007.  
Source: Stinson et al. 2010.**

**Full report available here:**

**[https://www.for.gov.bc.ca/het/climate/carbon/ClimateMitigationPotentialof  
BritishColumbianForests.pdf](https://www.for.gov.bc.ca/het/climate/carbon/ClimateMitigationPotentialofBritishColumbianForests.pdf)**

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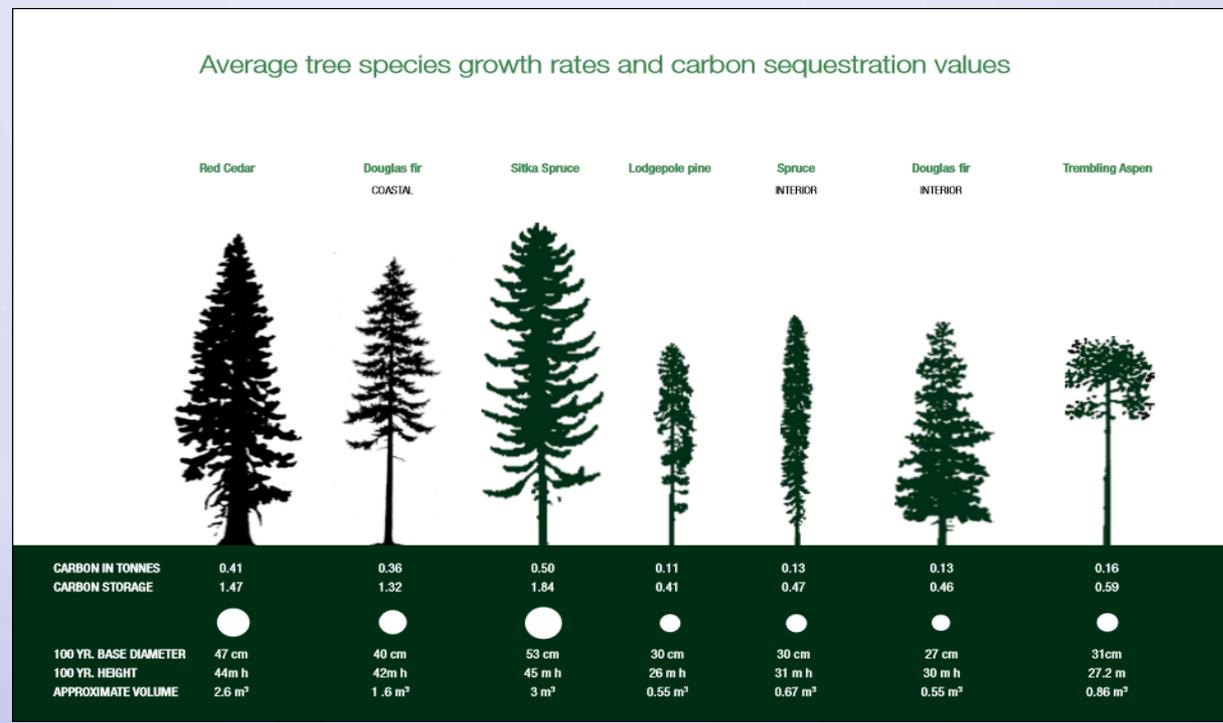


## Key facts from “BC forest carbon offset investment opportunities”

Read the full report at:

[https://www.for.gov.bc.ca/ftp/HET/external/!publish/Web/climate/carbon\\_investment\\_opportunities\\_info\\_book.pdf](https://www.for.gov.bc.ca/ftp/HET/external/!publish/Web/climate/carbon_investment_opportunities_info_book.pdf)\*

\*references in this report to Pacific Carbon Trust, should now be changed to the Climate Investment Branch of the B.C. Climate Action Secretariat.





## Longevity of wood products

The table below describes a range of lifespans for wood fibre used in different products, showing the half-life of harvested wood used.

The half-life represents the point where 50% of the material has been disposed. This means, 50% of the wood in family homes is still in use 90 years after construction and 50% has been removed through demolition or renovation.

For more information go to: <https://cbmjournals.springeropen.com/articles/10.1186/1750-0680-7-8>

Harvested Wood Product	Half-life
Single family homes	90
Multi-family homes and commercial buildings	75
Residential upkeep and moveable homes	30
Furniture & other manufactured products	38
Shipping	2
Paper	2.5