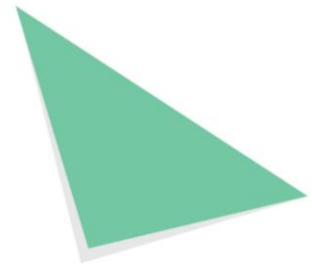


# Two Sides Facts



**The Myth: Making paper consumes a lot of energy.**

**The Fact: Yes, but most of it is renewable energy.**

Like all major manufacturing, papermaking is an energy-intensive endeavor. The most recent data from the U.S. Department of Energy, Energy Information Agency show that the paper industry is the country's third-largest industrial user of energy. However, nearly two-thirds of the energy used by U.S. pulp and paper mills is self-generated using renewable, carbon-neutral biomass in high-efficiency combined heat and power (CHP) systems. In fact, the U.S. paper and forest products industry produces and uses more renewable energy than all other industrial sectors combined.

---

*All cited facts are quoted directly from the source unless otherwise noted. Where indicated, Two Sides U.S. has summarized lengthy information, but links to original sources are provided in the footnotes. Information in brackets was added by Two Sides U.S. for clarification purposes.*

## What is biomass energy?

We have used biomass energy – the energy from plants and plant-derived materials – since people began burning wood to cook food and keep warm, and wood is still the largest biomass energy resource today. Biomass can be used for power production that would otherwise require fossil fuels. In such scenarios, biomass can provide an array of benefits, including the potential to greatly reduce greenhouse gas emissions [that contribute to global climate change].<sup>1</sup>

## What is the difference between biomass and fossil fuels?

- There is a vital difference between energy production from fossil fuels and from biomass. Burning fossil fuels releases carbon dioxide that has been locked up for millions of years [introducing “new” carbon to the atmosphere]. By contrast, burning biomass simply returns to the atmosphere the carbon dioxide that was absorbed as the trees grew and there is no net release of carbon dioxide if the cycle of growth and harvest is sustained.<sup>2</sup>

---

<sup>1</sup> [U.S. DOE.](#)

<sup>2</sup> [IEA Bioenergy Task 38, 2001](#)

# Two Sides Facts



- It is the new carbon from fossil fuels that is primarily responsible for the increases in atmospheric carbon dioxide that have occurred in the last 100 years.<sup>3</sup>

## Is biomass carbon neutral? What does this mean?

- Yes, biomass is carbon neutral and the concept is quite simple. The term carbon neutral contrasts the carbon found in biomass, which is recycled to the atmosphere, to carbon in fossil fuels, which undergoes a one-way transfer to the atmosphere from underground geologic reserves. Carbon neutrality is an inherent property of biomass reflecting the fact that the carbon residing inside it was only recently removed from the atmosphere, so returning it to the atmosphere has no net effect on atmospheric carbon dioxide.<sup>4</sup>
- (*Two Sides Summary*) For purposes of carbon accounting, carbon dioxide emissions from the combustion of biomass are reported as zero and for information purposes only.<sup>5</sup>

## Does the carbon neutrality of biomass depend on planting new trees?

- No. Biomass fuels contain carbon that was recently removed from the atmosphere, and this inherent property exists whether or not trees are regrown. Therefore, all biomass is carbon neutral. The overall benefits of biomass fuels depend on how efficiently we use it to displace fossil fuels. The benefits are reduced if biomass is used faster than it is regrown since this shrinks future supplies of carbon-neutral fuel and can reduce the amounts of carbon sequestered in the forest. Fortunately, it is widely understood that using biomass faster than it's replaced is neither responsible nor sustainable. Sustainable forest management practices, which are strongly supported by the paper industry, not only ensure growth of fiber to meet future needs, they also ensure attention to environmental and biodiversity objectives for the ecosystems in which we operate.<sup>6</sup>

## How does using biomass to generate energy affect greenhouse gas emissions?

- Forest biomass-derived energy could reduce global emissions by 400 million to 4.4 billion tons of carbon dioxide equivalents per year.<sup>7</sup>

---

<sup>3</sup> [IPCC, 2007.](#)

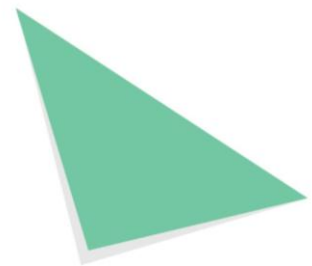
<sup>4</sup> [NCASI, 2007.](#)

<sup>5</sup> [IPCC, 2006.](#)

<sup>6</sup> [ibid, NCASI, 2007.](#)

<sup>7</sup> [UN FAO, 2010.](#)

# Two Sides Facts



## How much renewable energy does the U.S. pulp and paper industry use?

- U.S. pulp and paper mills are largely energy self-sufficient, and some mills supply excess energy to the electric utility grid. Some 65% of the energy needed to operate U.S. pulp and paper mills is generated from renewable fuels, primarily biomass. Since 1990, total energy use per ton of production has been reduced by 8.2 %, and purchased energy and fossil fuel use per ton of production was reduced 26%.<sup>8</sup>
- The forest products industry far exceeds all other industries in the use of renewable biomass energy and is a leader in cogenerating electricity. In 2005, the forest products industry produced more than four-fifths of the total biomass energy generated by all industrial sectors.<sup>9</sup>

## How efficient is energy production at U.S. pulp and paper mills?

- Virtually all U.S. pulp and paper mills that generate electricity on-site do so using combined heat and power technology, sometimes called cogeneration,<sup>10</sup> [which recycles exhaust steam for use as manufacturing process heat or space heating]. CHP systems are highly efficient (up to 75% efficiency compared to 45% for traditional fossil-fuel power plants) and, because they require less fuel to produce the same amount of energy, have lower emissions than separate heat and power generation.<sup>11</sup> [without cogeneration exhaust steam goes to waste]

## What effect does paper manufacturing have on greenhouse gas emissions and climate change?

- The print and paper industry accounts for only 1.1% of global carbon dioxide emissions.<sup>12</sup>
- Because forest products [including paper] can require little or no fossil fuels for production and store carbon throughout their useful life, they can have inherent climate change advantages over all other materials with which they compete, provided they are produced in a sustainable manner.<sup>13</sup>
- The biomass emissions from papermaking are part of the natural carbon balance and do not add to atmospheric concentrations of carbon dioxide, unlike emissions from fossil fuel. The forests that provide that biomass support key climate change mitigation technologies and practices currently commercially available including, afforestation; reforestation; forest management; reduced deforestation; harvested wood product management; use of forestry products for bioenergy to replace fossil fuel use; tree species

---

<sup>8</sup> [AF&PA, 2010.](#)

<sup>9</sup> [Agenda 20/20 Technology Alliance, 2010](#)

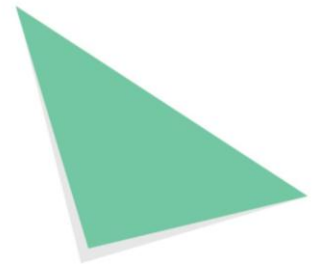
<sup>10</sup> [ibid, AF&PA.](#)

<sup>11</sup> [U.S. EPA, 2008.](#)

<sup>12</sup> [WRI, 2005.](#)

<sup>13</sup> [WRI, Trees in the Greenhouse, 2008.](#)

# Two Sides Facts



improvement to increase biomass productivity and carbon sequestration; improved remote sensing technologies for analysis of vegetation/soil carbon sequestration potential and mapping land-use change <sup>14</sup>

- U.S. pulp and paper mills are largely energy self-sufficient, and some mills supply excess energy to the electric utility grid. Some 65% of the energy needed to operate U.S. pulp and paper mills is generated from renewable fuels [mostly biomass].

Since 1990, total energy use per ton of production at U.S. pulp and paper mills has been reduced by 8.2 %, and purchased energy and fossil fuel use per ton of production was reduced 26%. <sup>15</sup>

- The forest products industry far exceeds all other industries in the use of renewable biomass energy and is a leader in cogenerating electricity. In 2005, the forest products industry produced more than four-fifths of the total biomass energy generated by all industrial sectors. <sup>16</sup>
- Virtually all U.S. pulp and paper mills that generate electricity on-site do so using combined heat and power technology, sometimes called cogeneration, <sup>17</sup> [which recycles exhaust steam for use as manufacturing process heat or space heating]. CHP systems are highly efficient (up to 75% efficiency compared to 45% for traditional fossil-fuel powered systems) and have lower emissions than separate heat and power generation. <sup>18</sup>
- At U.S. pulp and paper mills, the combined direct and indirect greenhouse gas emissions intensity rate (emissions per ton of production) for 2008 was 14.1% lower than in 2000. <sup>19</sup>
- In the long term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual sustained yield of timber, fiber or energy from the forest, will generate the largest sustained [climate change] mitigation benefit. <sup>20</sup>
- At a global level, the greenhouse gas emissions from the forest products industry value chain are largely offset by sequestration in forests and forest products. <sup>21</sup>

---

<sup>14</sup> [Ibid, IPCC.](#)

<sup>15</sup> [AF&PA, 2010](#)

<sup>16</sup> [Agenda 20/20 Technology Alliance, 2010.](#)

<sup>17</sup> [ibid, AF&PA.](#)

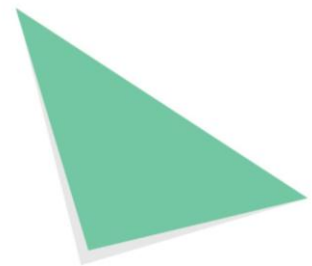
<sup>18</sup> [U.S. EPA, 2008.](#)

<sup>19</sup> [ibid, AF&PA.](#)

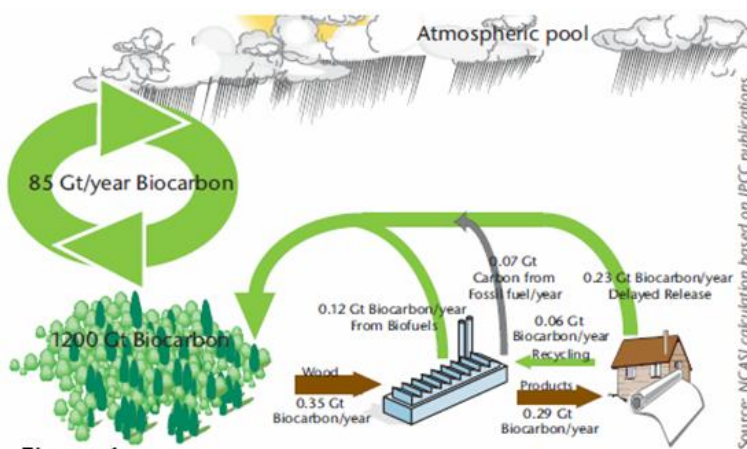
<sup>20</sup> [ibid, IPCC.](#)

<sup>21</sup> [WBCSD and NCASI, 2005.](#)

# Two Sides Facts



- The carbon removed from the forest by the paper and forest products industry represents only about 0.5% of the carbon that is recycled between the forest and the atmosphere annually, and less than 0.03% of the carbon stored in the world's forests. (Figure 1)<sup>22</sup>



- While carbon is stored in forest products like paper, it remains out of the atmosphere. Forest products store more than 3 billion tons of carbon globally.<sup>23</sup> The net sequestration of carbon stored in forest products is estimated to be the equivalent of 540 million tons of carbon dioxide per year.<sup>24</sup>

<sup>22</sup> [ibid, WBCSD and NCASI.](#)

<sup>23</sup> [UNFCCC, 2003.](#)

<sup>24</sup> [NCASI, 2007.](#)