FutureMetrics LLC
8 Airport Road
Bethel, ME 04217, USA

"Alternative Facts" in the Recent Chatham House Paper[1]

William Strauss, PhD

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Providing misleading, inaccurate, and sometime outright fiction as facts could be called propaganda. With overtones of Orwell's novel *Nineteen Eighty-Four*, the term "alternative facts" has recently been coined. Either way, it is information that is biased and misleading that is used to promote a point of view. We have written critiques of other papers, by among others, the World Resources Institute and Climate Central, for writing biased, incomplete, and misleading publications that use alternative facts to promote an agenda that opposes a strategy that we have coined as a *rational and pragmatic off-ramp to a decarbonized future*[2].

Now we add the Chatham House paper to the list. The recently released paper by the Chatham House is a study that contains many inaccurate statements about the use of wood for energy. Those statements are presented as facts or as uncontested conclusions. This white paper will focus on the study's discussions that pertain to the sourcing of raw materials for industrial wood pellets.

We are not sure if the study's author is naïve about how the forest products industry operates or is purposefully presenting "alternative" facts. In either case, the result is a study that is one-sided and wrong in its conclusions.

The Renewable Energy Association (REA) of the UK has posted a critique of some of the inaccuracies in the Chatham House study[3]. This brief paper will focus on the discussions which form much of the foundation for the study's conclusions as to why using wood for energy is bad.

Throughout the study there is frequent reference to what the study claims is an important distinction regarding how trees are used after harvest. From their point of view, making lumber is okay, but using the wood to produce wood pellets for energy is not. The study also frequently states that the harvest of trees cuts short their ability to continue sequestering carbon.

[1] "Woody Biomass for Power and Heat: Impacts on the Global Climate"; HERE.
[2] The aforementioned critiques, the paper with that title, and all of FutureMetrics' white papers are freely downloadable from www.FutureMetrics.com.
[3] http://www.r-e-a.net/blog/misleading-statements-in-chatham-house-report-on-biomass-answered-23-02-2017

The following quote from the Chatham House paper embodies both of those concepts. The quote is part of paragraph in which the study is countering the logic in a paper published by William Strauss in 2011[4].

> "This argument implies that, once they have grown, what happens to trees later – whether they are left to grow further, or harvested and made into wood products, or harvested and burnt for energy – somehow makes no difference to carbon concentrations in the atmosphere. This is obviously not the case." (page 24)

That quote, which captures a logic presented in many other places in the Chatham House paper, presents a premise that is false and an "obvious" conclusion that is wrong. The rest of this paper will explain why we disagree with how the study has set up a dichotomy that does not represent reality in order to justify inaccurate conclusions about the carbon impacts of using wood for energy.

At the heart of the matter, it appears that the study does not understand how the forest products industry operates. In the US and Canada and many other countries, there are vast "working" forests whose purpose is to produce the raw materials for many industries. Those forests are valued assets to the landowners (tree farmers) and the buyers. Sawmills, pulp mills, and many other wood products mills, including pellet mills, depend on a continuous daily input of wood to produce products that are used in one way or another by just about everyone every day.

To enable and ensure a continuous supply of raw material, the quantity of the logs and chips coming into the mills cannot exceed the growth rate of the surrounding managed forest otherwise the mills, worth hundreds of millions of dollars, would have to close once they depleted the resource they depend on to operate. Sawmills, pulp mills, and pellet mills are sized to match the ability of the surrounding working forest to supply affordable wood every day for decades. Sawmill, pulp mill, and pellet mill business models require good forestry practices that yield a sustainable outcome. But beyond that, particularly for industrial wood pellets being exported from the US and Canada into the UK and other nations, there are rigorous certification schemes that demand auditing to prove that the forests are not being depleted and that the stock of carbon held in the forests is not being reduced.

The millions of hectares of working forests in north America that supply the forest products industries are like the millions of hectares of cropland in north America. The stewards of those lands are growing plants that are used for food and industry. Trees in these managed forests have much larger stems and take longer to grow than corn, wheat, sugarcane, or soybeans but they are nonetheless a crop.

[4] "How Manomet Got it Backwards" by William Strauss, PhD; http://futuremetrics.info/wp-content/uploads/2013/07/Manomet-Got-it-Backwards.pdf

The trees, whether grown on large plantations in the southeastern US or in the immense managed hardwood and softwood stands in the northern states and Canada, are being grown to be harvested. These forests are dynamic systems that are in many stages of growth. There are mature trees that are ready to harvest, areas of new growth, and many plots that are in stages of growth between seedlings and mature trees.

The purpose of tree farming is to supply wood fiber and its many by-products to industry.

The privately-owned forests in the US, which make up about 60% of all US forestland, most of which are managed to continuously produce the raw materials for making lumber, paper, pellets, and other products derived from wood, also hold billions of tons of carbon.

The landowners of those private forests and the workers that manage and harvest trees get paid for growing and producing wood fiber, not for sequestering carbon. However, the inherent sustainability of the resource that accrues from good forest management practices means that the aggregate carbon stock held in private forests are not being depleted.

Quite the contrary.

The first chart below shows the annual carbon sequestered in US forests. The larger the negative number, the more carbon that is being captured in US forests. US forest carbon sequestration has increased by 13.6% over the past 25 years.

The second chart shows the total carbon held in US privately owned forests by state and the percentage of US forests that are privately owned. Most privately owned forests are working forests growing trees for the forest products industries.

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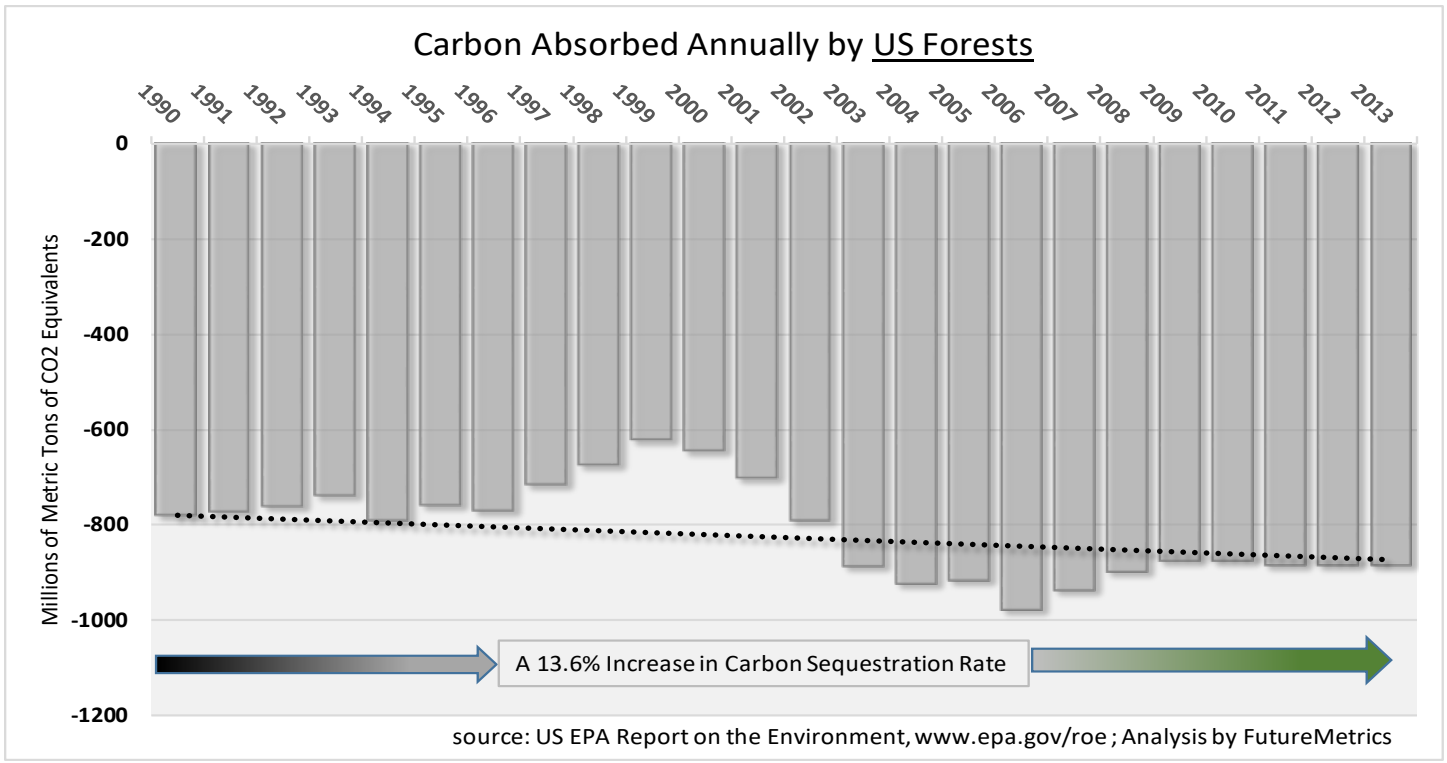
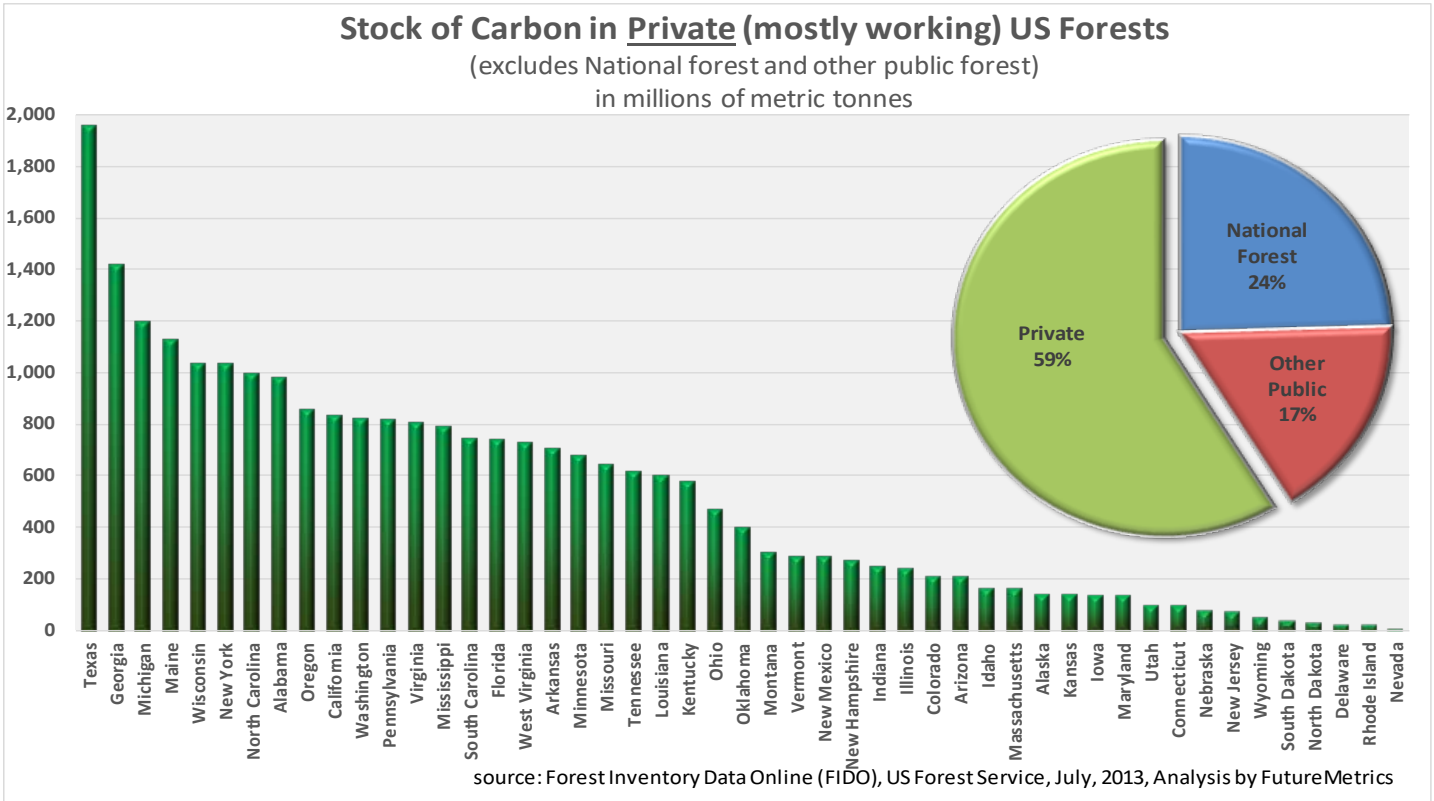


source: US EPA Report on the Environment, www.epa.gov/roe ; Analysis by FutureMetrics



source: Forest Inventory Data Online (FIDO), US Forest Service, July, 2013, Analysis by FutureMetrics

Contrary to the either-or implications by the Chatham House study regarding harvesting trees versus carbon sequestration, a steady supply of raw materials for the forest products industries, including pellet production, does not mean reducing carbon stocks.

But what if the landowners stopped tree harvesting altogether? Would the Chatham House counterfactual be true? Would carbon stocks grow?

First, the private owners of working forests are farmers that depend on the forest products industries for income. As long as there is a demand for lumber, paper, chemicals derived from wood fiber, and other end products made from wood, forests will be grown to be harvested.

Second, sustainable tree farming, i.e., continuously renewing forests, does not degrade the carbon sink function of working forests.

For any forest, there are diminishing returns to carbon sequestration as trees in the forest age. The chart below shows a model of the carbon sequestered in a working forest with many separate plots at different stages of growth. For many years, the growth rates and carbon sequestration rates increase as the trees in each plot age. But all forests reach an inflection point and then an equilibrium at which the growth rate and the mortality rate equalize and the stock of carbon held in the forest stabilizes.

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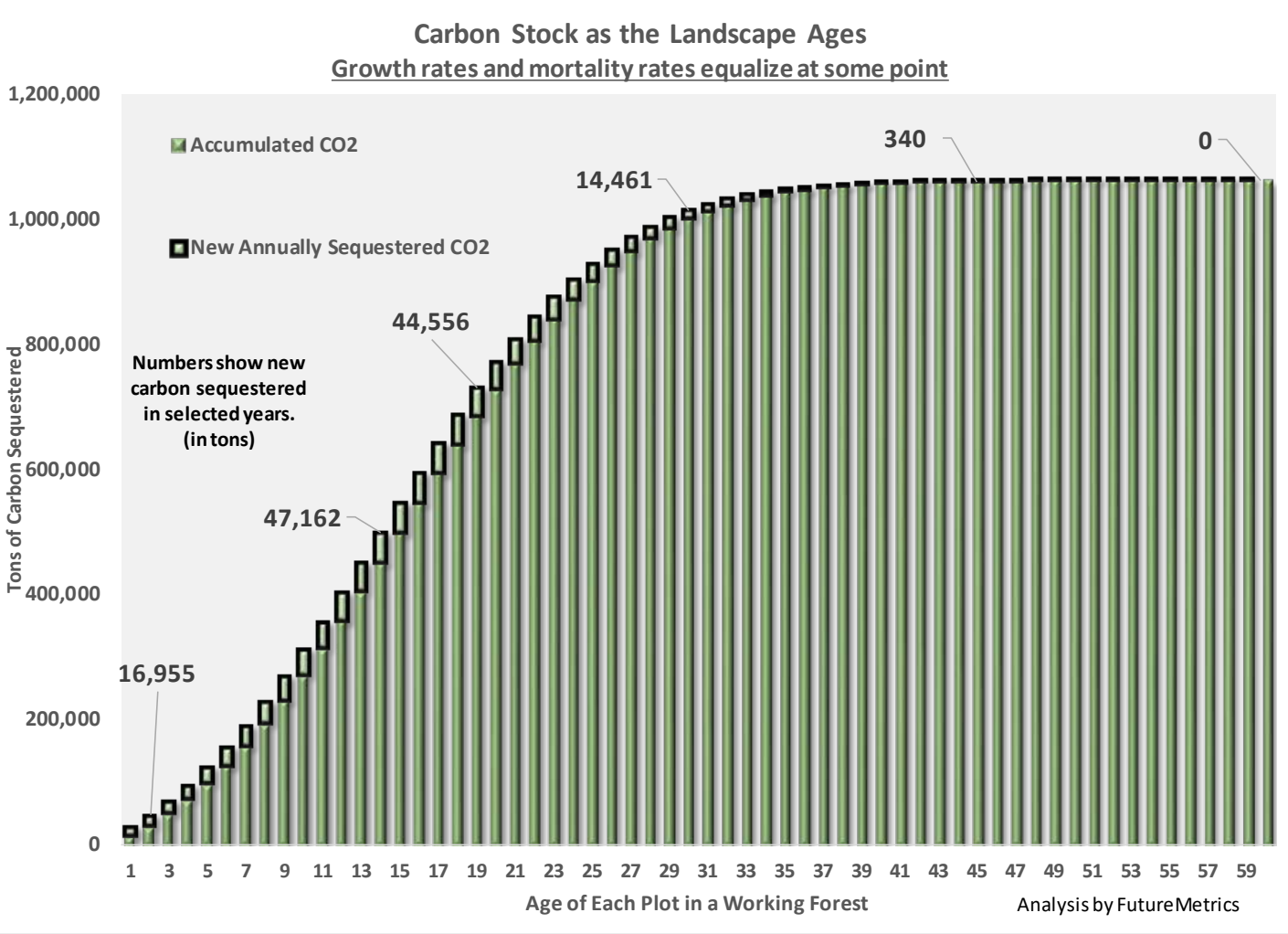

There is very little added carbon benefit after a plot in this model reaches about 35 years old.[5]

The model also illustrates why there is no net new carbon added to the atmosphere if the stock of new growth on the landscape equals the stock of the harvested plot (i.e., the harvest rate does not exceed the growth rate). Suppose the tree farmer has 35 plots across the landscape of her forest in different stages of growth. In the chart below, the carbon sequestered by each of the younger plots equals the carbon held by plot #35. So, if all of plot #35 were made into pellets (which as this paper shows below is highly unlikely) and the carbon was released from the combustion of the pellets made from that harvest, that carbon would be sequestered by plots #1 thought #34 over the next year.

[5] The growth rates and time to equilibrium vary greatly depending on geographical location, climate, species, management practices, and other variables. In some locations the time to equilibrium is shorter and in others longer than shown in this model.

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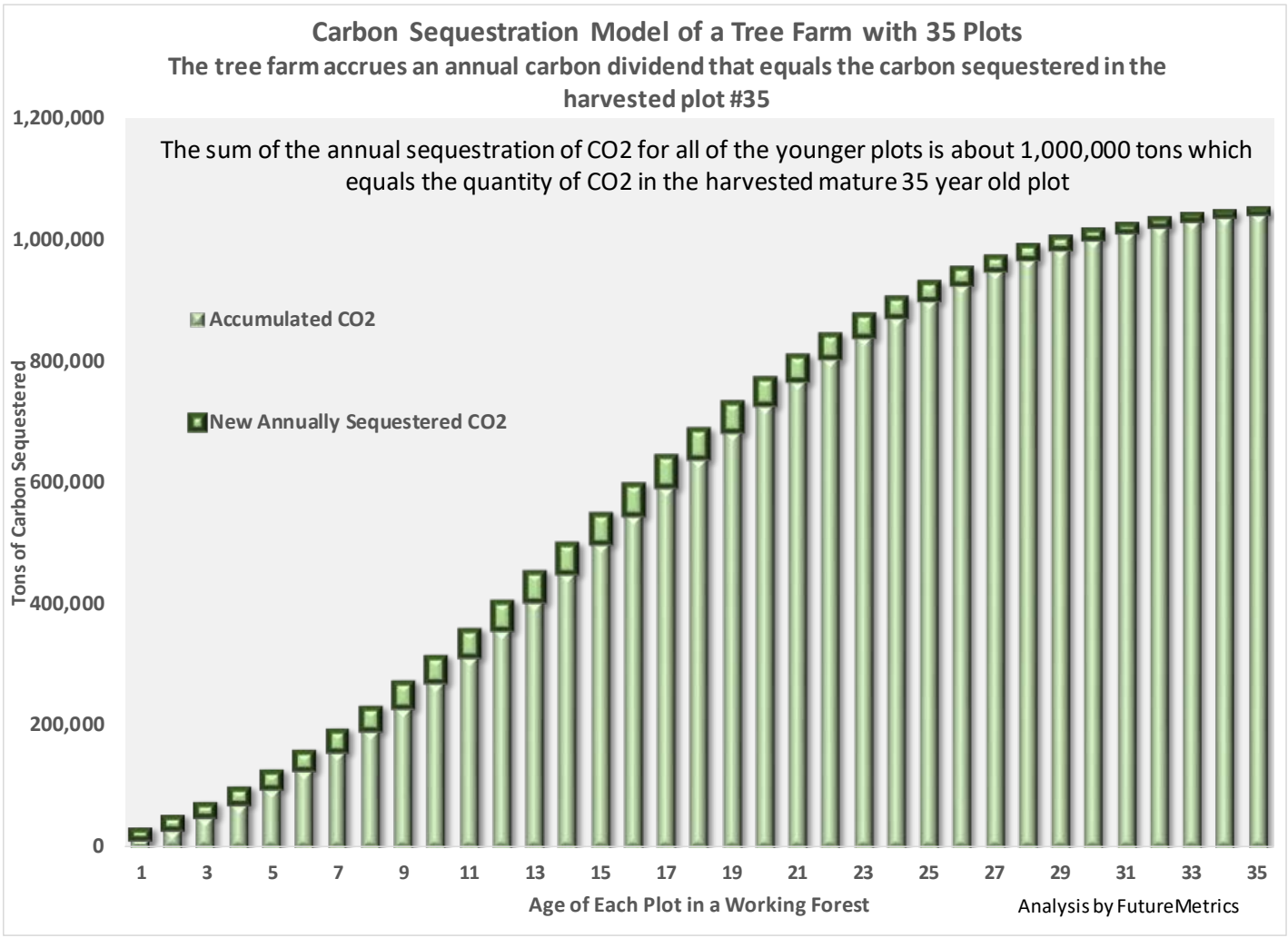
In the real world, the harvest, conversion to pellets, and combustion of those pellets is continuous throughout the year across many landscapes. The CO_2 released in combustion is absorbed contemporaneously by the new growth in the many younger plots that matches or exceeds the removals from mature plots.



Sustainable forestry practices, mandated by the sustainability criteria that qualifies wood pellets for use in UK power stations, assure that the biogenic carbon cycle continuously sequesters at least as much carbon as that which is released by the combustion of pellets. There is no such thing as a carbon debt if the stock of carbon held in the forest not reduced.

Further undermining the Chatham House study is another false premise. The study's author apparently does not understand that harvested trees have more than one purpose. For the most part (more on this

below) mature trees are not harvested just to make lumber or just to make wood pellets. The landowners, the foresters, and the loggers work together to maximize the value and productivity of the working forests.

The study is correct in stating that the preferred raw material for wood pellet production is sawmill residuals (sawdust, chips, and shavings). What was not that long ago a sawmill waste is now a valued feedstock for pellet production. In many locations sawmill residuals from structural lumber production are abundant and they supply much of the raw material needed to produce wood pellets. In other locations, there are insufficient sawmill residuals. In those locations, the pellet mills, just like the pulp mills, use the non-sawlog portions of the tree. Just as sawdust is a by-produce of sawmilling, pulp or pellet grade wood chips are a by-product of growing and harvesting trees for lumber production.

The highest value for tree farmers from a harvested tree is the sawlog. This is the lower portion of the tree that is large in diameter and free from defects that would preclude producing lumber. The upper portion of the harvested tree is either too low in diameter or is not straight and defect free, and therefore cannot be sawn into boards. That portion of the tree typically has been debarked and chipped for use in pulp and paper mills. The image below[6] illustrates how a typical harvested tree is used.

[6] From Forest to Market https://blog.forest2market.com/how-harvested-trees-are-used .

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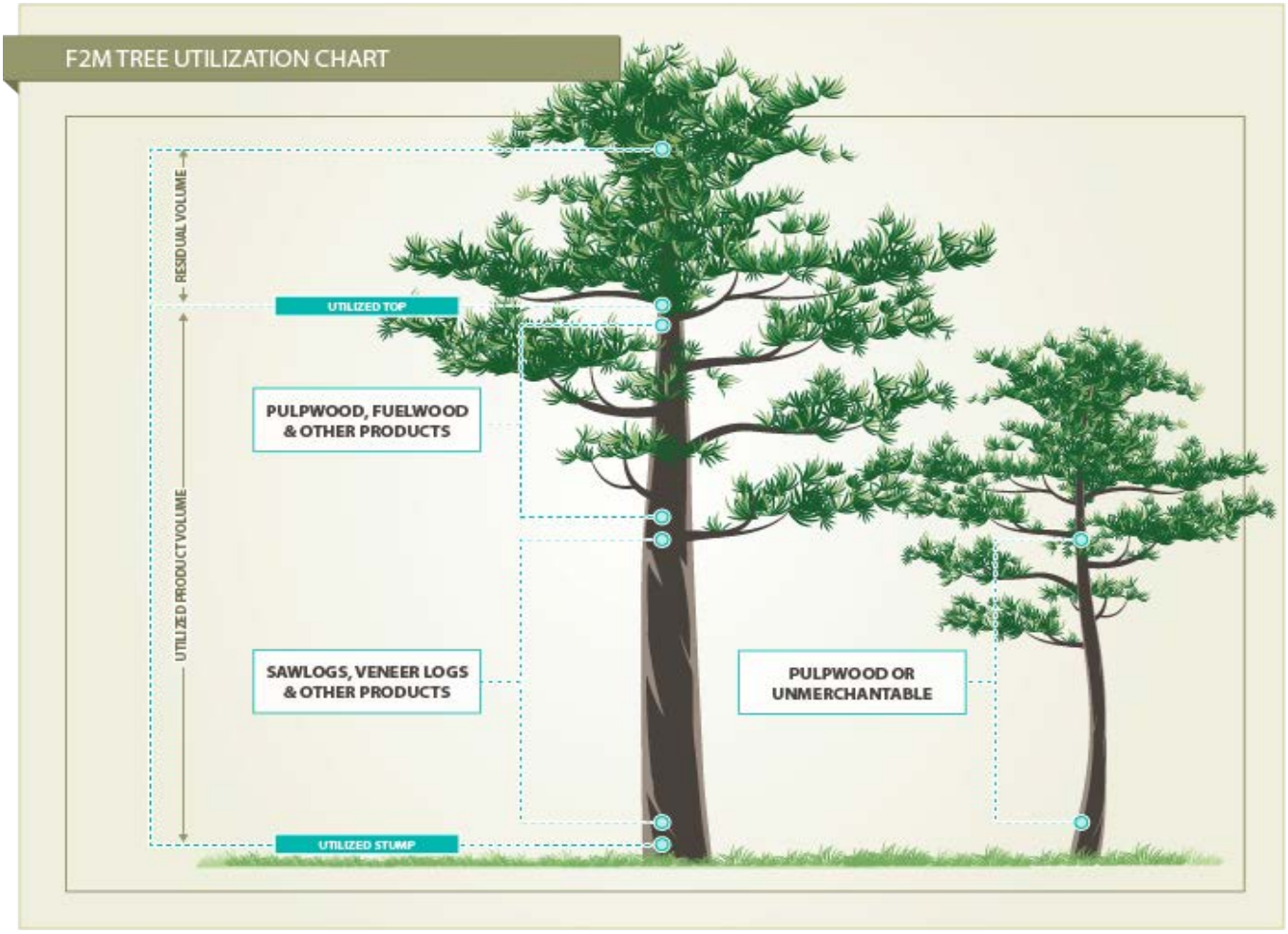


The image also shows a smaller tree on the right side. That is from the thinnings that occur once or twice over the growth period of the mature trees. Imagine trying to grow food crops without managing how many stems per acre are planted. If the plants are too crowded together, productivity would be very low. That same logic applies to working forests. Selective thinning improves the growth rate and health of the remaining trees. The stands are thinned to allow the remaining trees to grow straight and tall in order to maximize the production of sawlog quality timber. The thinnings typically have stems that are too small in diameter and/or are not straight enough for sawlogs; but they are suitable for producing wood chips for the pulp and paper industry or for wood pellets.

There is no “black or white” mutually exclusive decision making to either use the wood for lumber or for pellets. The same tree provides both.

The Chatham House study’s thesis that there are two distinct alternatives for the use of harvested trees is wrong. Recognizing that error in their logic, that leads us to conclude that if they are okay with harvesting

wood to make lumber, they should be okay with using the upper portion of the tree and the thinnings for making pellets.

Some pellet plants under specific circumstances, if there is no higher and better use for the wood, use whole logs from mature trees to make pellets. The Chatham House study mentions the Vyborgskaya pellet mill in Russia (page 22) and implies that there is a false labeling of the wood as "waste". The study lumps Enviva, the largest wood pellet producer in the US, into the same accusation (page 21). If the reader only depends on the information in the report, he or she would have the impression that these pellet mills are sourcing wood that could have been used for lumber production, or worse, are using wood that was harvested with no regard for the health of the forests. The study presents incomplete information that allows the reader to make incorrect conclusions.

The procurement of wood must be put into the context of the forest products industry in the region and on the suitability of the logs used in that pellet mill for other purposes.

About 80% of the whole logs going into the Vyborgskaya plant are aspen[7]. Aspen is a relatively soft nonconiferous tree that is not suitable for structural lumber and thus has very limited demand for sawmilling. The UN report titled "The Russian Federation Forest Outlook to 2030[8]" states the following:

> "…over 200 million cubic metres of nonconiferous species can be annually harvested without damage to the country's forests. Due to low demand for non-coniferous species, however, the process of ageing of small-leaved deciduous forests is underway in a number of regions, thus increasing decay and mortality. Forest mortality takes place with consequent decrease in growth and deterioration of forest health conditions. A critical situation is developing with aspen forests: over-mature stock is subject to rot and loss of essential wood qualities." (page 6)

Using aspen for pellet production is helping to improve the health and future productivity of the forest and is providing a paying market for an otherwise unwanted species.

Regarding Enviva, several peer reviewed studies by Dr. Dennis Hazel and other co-authors from the University of North Carolina[9], studying areas from which Enviva pellet plants procure wood, have shown that the wood procurement practices used by Enviva in those areas referenced in the Chatham House study provide a valued end use to otherwise non-merchantable trees[10]. The studies show that providing a market for otherwise non-merchantable wood allows private forests that have deteriorated into non-merchantable

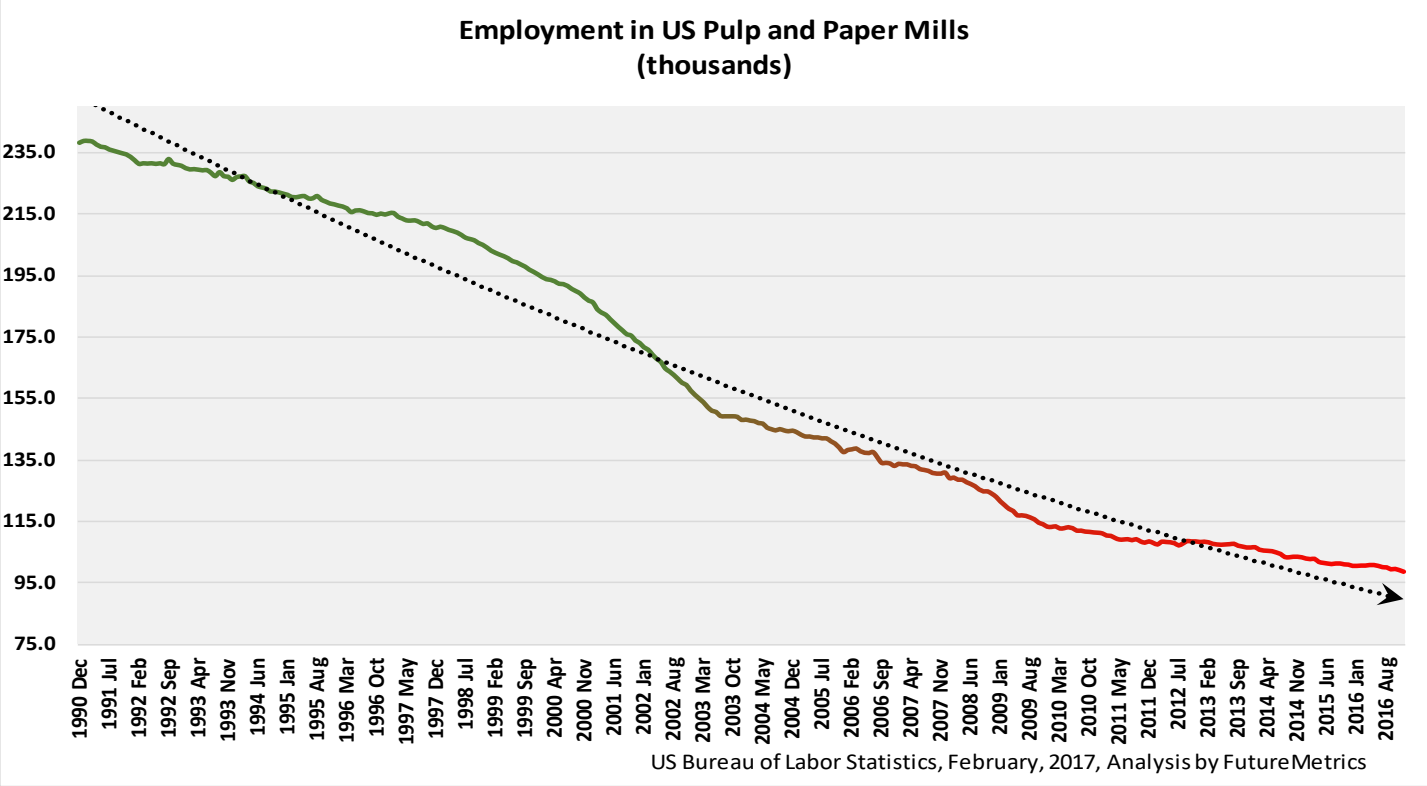
[7] Data supplied by Ekman and Company.
[8] See the UN Food and Agriculture Organization (FAO) Report HERE.
[9] See a list of publications HERE.
[10] Enviva has also implemented a "track and trace" system allowing full transparency on raw material sourcing. Full description HERE.

states to be managed into plots that will sustainably yield valued timber in the future for their owners and provide better habitat for wildlife. The Chatham House study does not tell that side of the story.

There is certainly a place for independent and critical oversight of the industrial wood pellet sector. There are some areas of the world where industrial wood pellets are produced from questionable feedstocks. There are some end users of industrial wood pellets that are less than rigorous in certifying the credentials of the producers. But the US and Canada are not one of those places in the world, and the UK's end users do engage in rigorous certification (as do those in most other jurisdictions). The Chatham House study is misguided in its focus.

Finally, the forest products industry is evolving. As the demand for paper for printing declines, the opportunity for pellet mills to use the raw materials that would have otherwise gone to pulp and paper mills that produced print media increases. In just one US state, Maine, there have been six pulp mill closures in the past two and a half years. Those pulp mills used more than 2 million tons per year of biomass that could be made into pellets[11]. The pellet industry will replace much of what is being lost.

That is an alternative future that does not depend on alternative facts.



[11] Data from the Maine Forest Service.