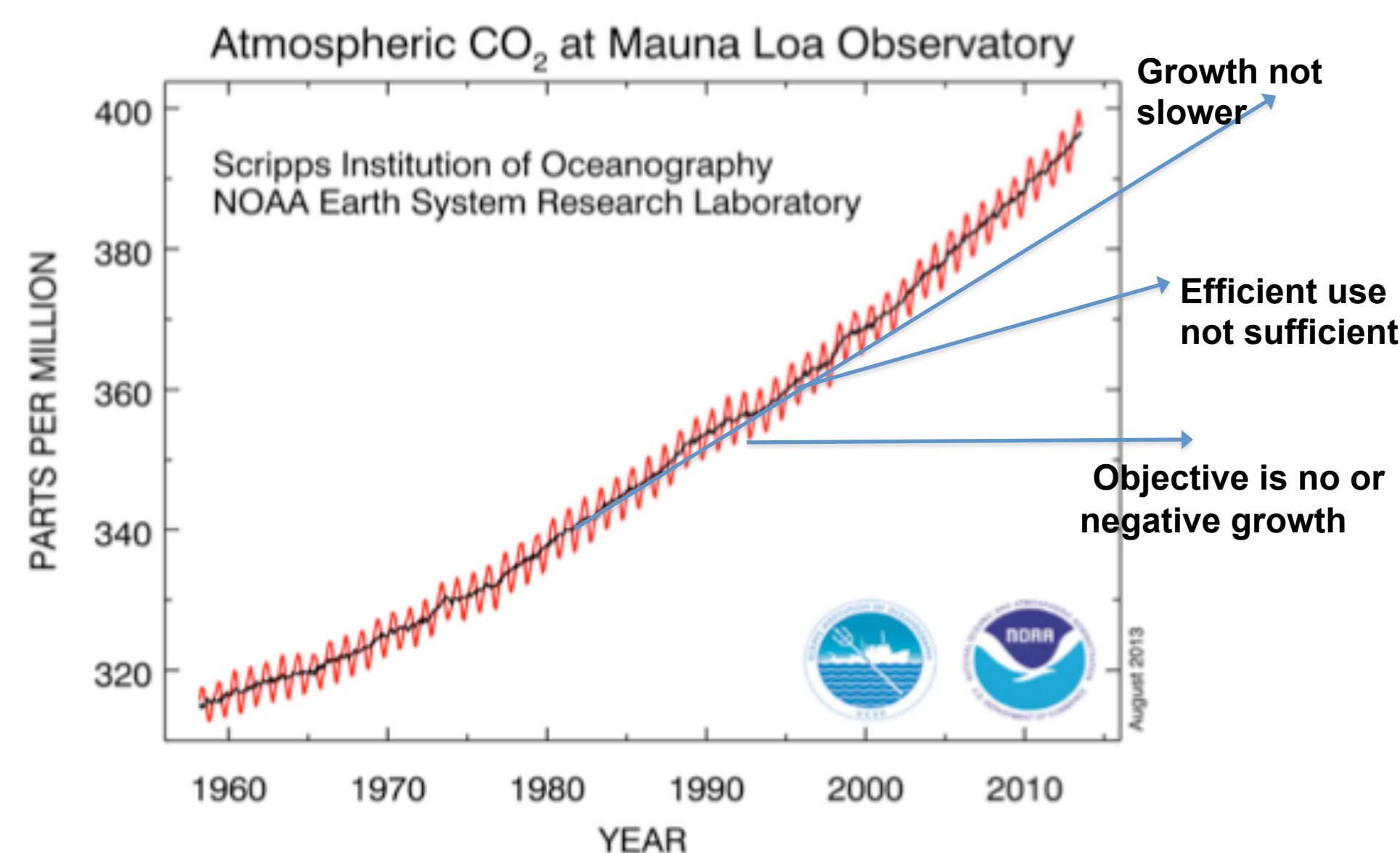


Carbon Policy Failures and the Opportunity for Better Uses of Wood:

If we have carbon negative technologies why aren't we using them?

1. The Problem:

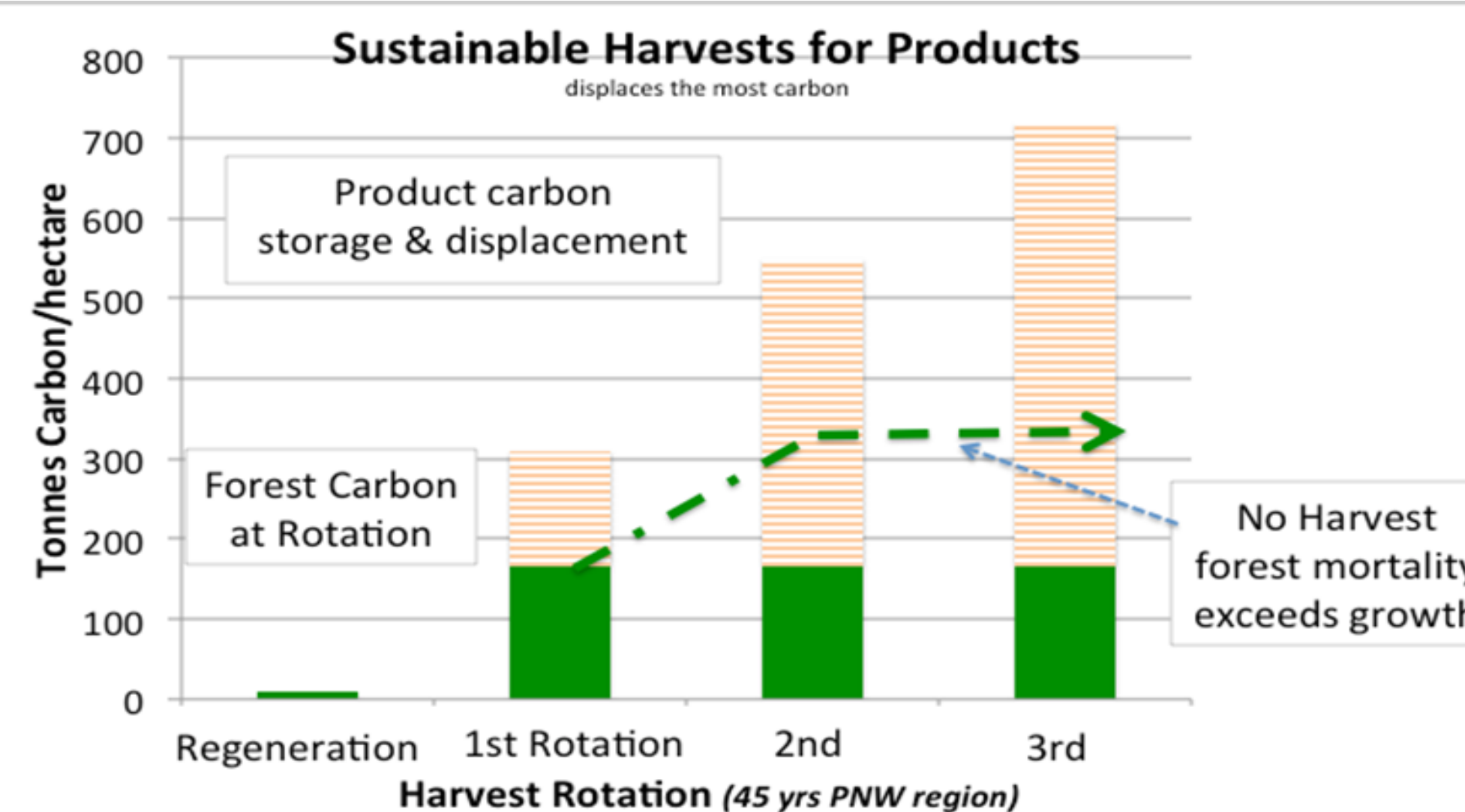
- CO2 is growing faster not slower!



- Efficient use of fossil fuels only delays the problem!
- The objective is to stop the growth!
- Carbon-negative technologies are needed to stop growth!

2. Carbon Negative Technologies (CNT) are needed:

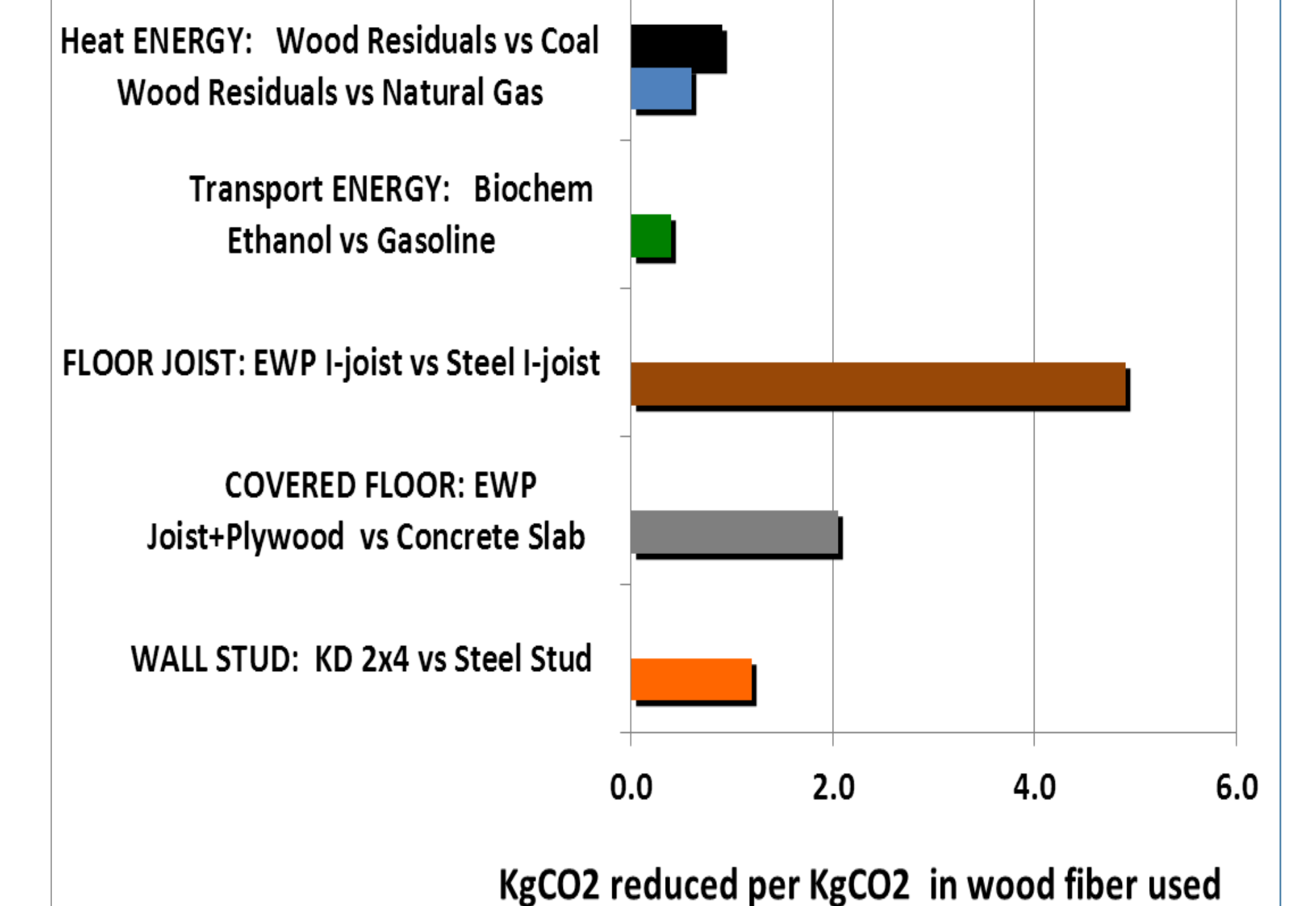
- We need to know--all inputs and outputs to identify CNT.
 - Life Cycle Inventories (LCI): All inputs and outputs.
 - LCI-analysis (LCA) comparisons of processes and uses for best impacts
- Data needs to compare different wood and non wood products and use impacts
 - We have USFS Forest-inventories
 - & CORRIM primary survey data on products by region
 - & NREL inventory data on primary non- renewable products
- Harvesting on rotations sustains forest carbon with sustained growth in product carbon & displacement



3. Why Policies are Failing:

- Subsidies for biofuel & renewable fuel standards that steal the feedstock from better uses.
- Promoting wood ethanol for airplanes – the lowest efficiency of all wood uses
- Paying to not harvest increasing forest carbon – increases emissions from fossil intensive substitutes.
- Efficiency is measured by reduced fossil use insted of greatest CO2 displacement per wood used.
- Ignoring the uses with the greatest displacement.
- Price (cost) of carbon emissions is not operational – no incentive to avoid emissions.

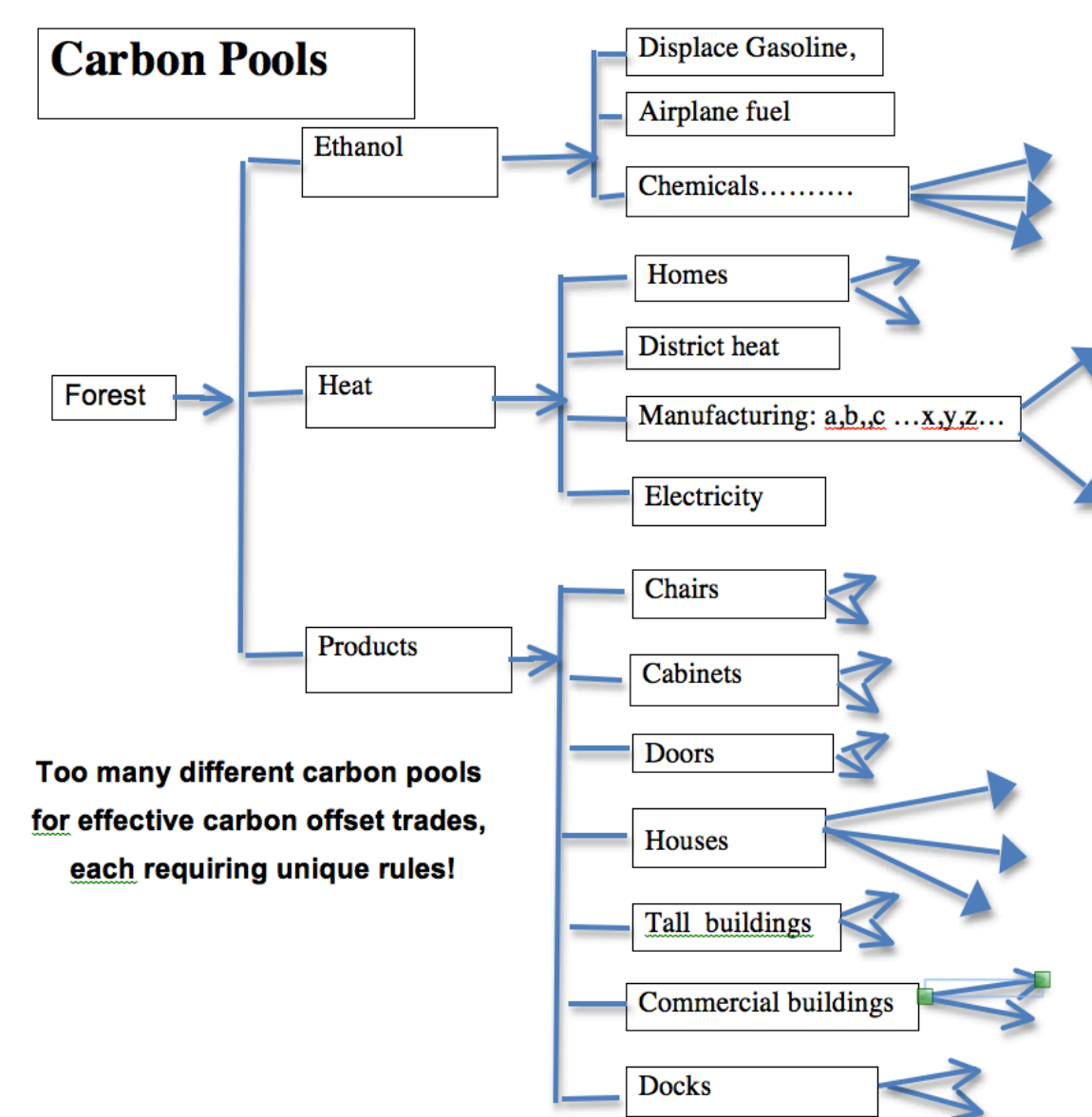
Carbon Emission Reductions by Displacing Non-Wood Products & Fuels



4. Policy Options: Cap & Trade vs Carbon Emission Taxes

- Cap & Trade requires accountable measures for trades.

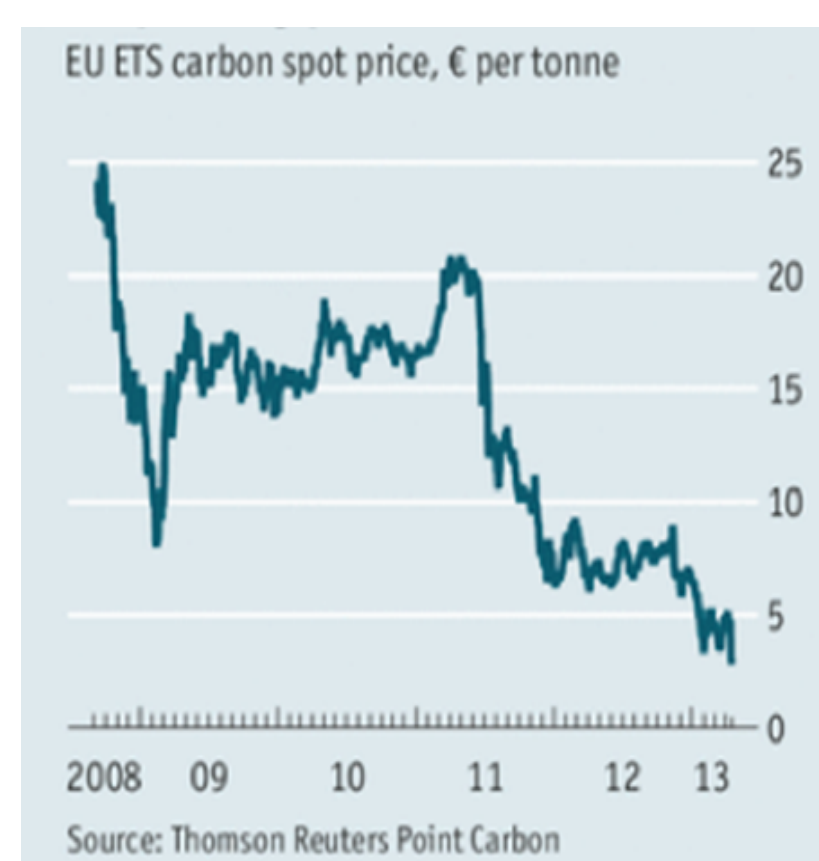
- It worked for sulfur dioxide when few measures & trades were needed.
- There are thousands of interactive carbon pools.
- Every product and stage of processing alters carbon.
- Impossible to write rules to include so many different uses,
- or measure the impacts.



Cap & Trade is not working! --- What are the options?

- EU Cap and Carbon Exchange: price of carbon trades **is unstable**.
- Low accountability on the impact of carbon trading.
- Success requires the cost of carbon to be proportional to emissions such as a carbon emissions tax.
- The income lost from a tax can be neutralized by rebating the revenue to consumers and producers to offset any loss in growth.

EU ETS: Emissions Trading System

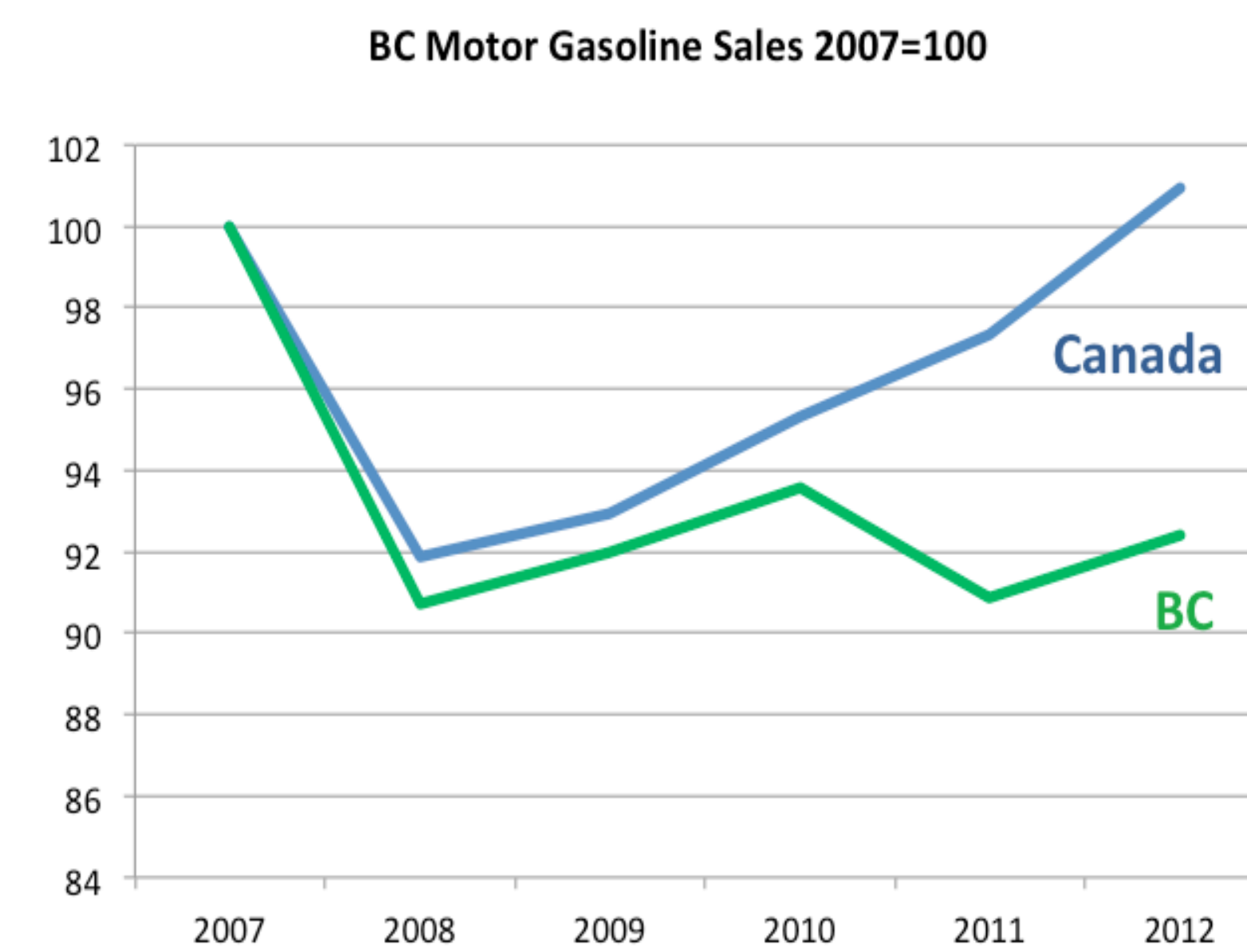


5. The BC carbon tax: Is it working?

Table 1: Per Capita Consumption of Petroleum Fuels Subject to BC Carbon Tax (% Change)

	2008/09	2009/10	2010/11	2011/12	2008-12	Total
British Columbia	-	5.4%	-3.6%	-2.4%	-7.1%	-17.4%
Rest Of Canada	-3.4%	-0.7%	3.9%	1.7%	1.5%	
Difference	-2.1%	-3.0%	-6.3%	-8.8%	-18.8%	

- In 5 years BC Carbon tax reached \$30/ton CO2
- Per Capita Fossil Emissions reduced by 18% vs all Canada
- Economic growth 1% above all Canada
- Reducing emissions but not growth is working



6. Wood opportunities when there is a price/cost for fossil emissions

- Price advantage for wood uses proportional to CO2 displacement
- Will pay to use all wastes like forest residuals and demolition material
 - Innovative reprocessing and recycling
- More intensive and sustainable forest management
 - More and/or better wood
- Motivation to innovate in product and building design
- EWP advances & better use of less than prime quality wood

Such as:



Tallest wood building: 14 floor modular construction



Displacing steel with wood a CNT

The Bottom Line: Policies that ignore the cost of carbon emissions fail to reduce carbon emissions and do not motivate innovations that will result in better uses of wood and greater displacement of fossil emissions.

By: Bruce Lippke, Professor Emeritus, U. of Washington; Elaine Oneil, U. of Washington and Executive Director CORRIM; and Holly Fretwell, Research Fellow PERC and Faculty Montana S.U.