

Biomass Carbon Neutrality: Practical Contexts & Implications

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Outline

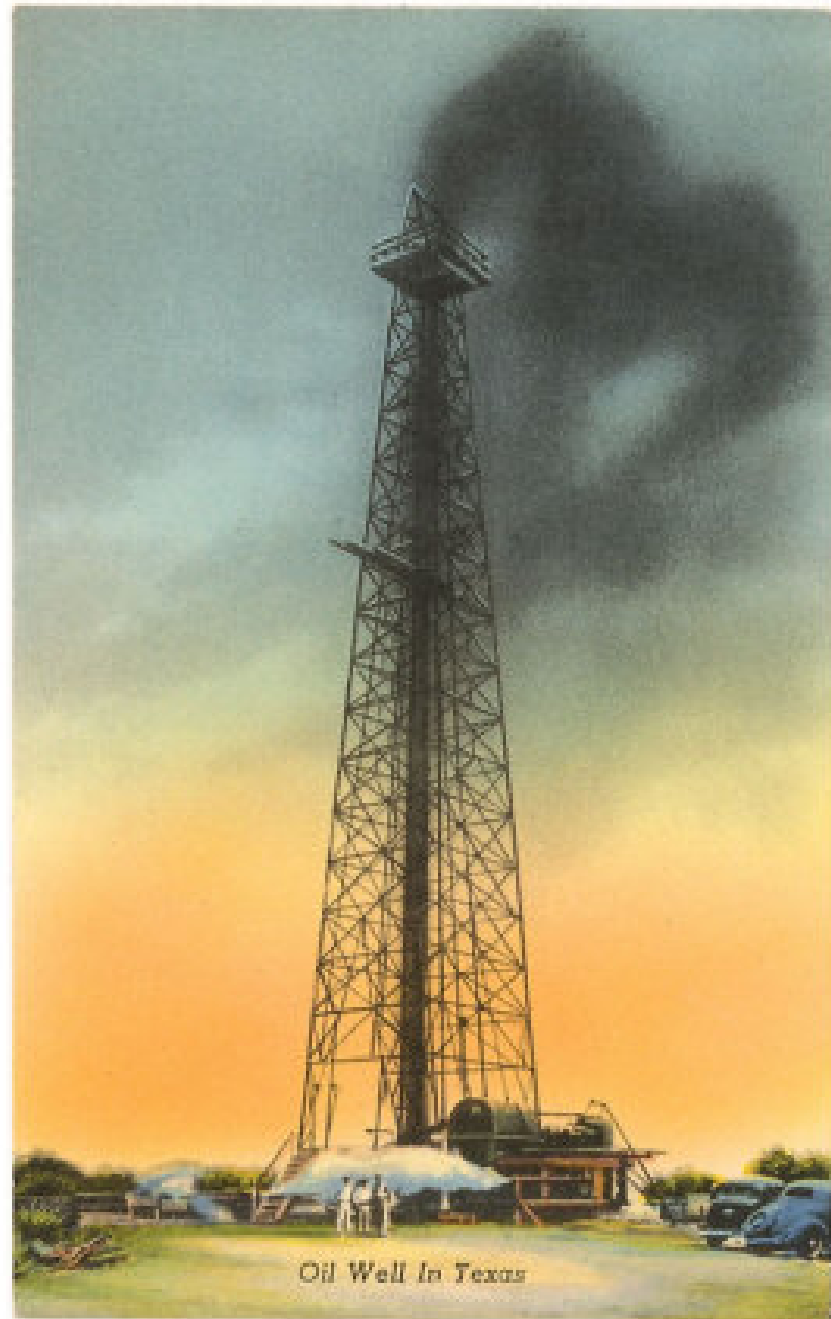
- Primer on Biomass Energy
- Practical Contexts
 - National Greenhouse Gas Reporting
 - Cap & Trade Programs
 - EPA Regulation of CO₂
- Practical Implications

For most of human history, ***renewables*** were predominant energy sources.

- Biomass, Water, Wind, Solar, Geothermal



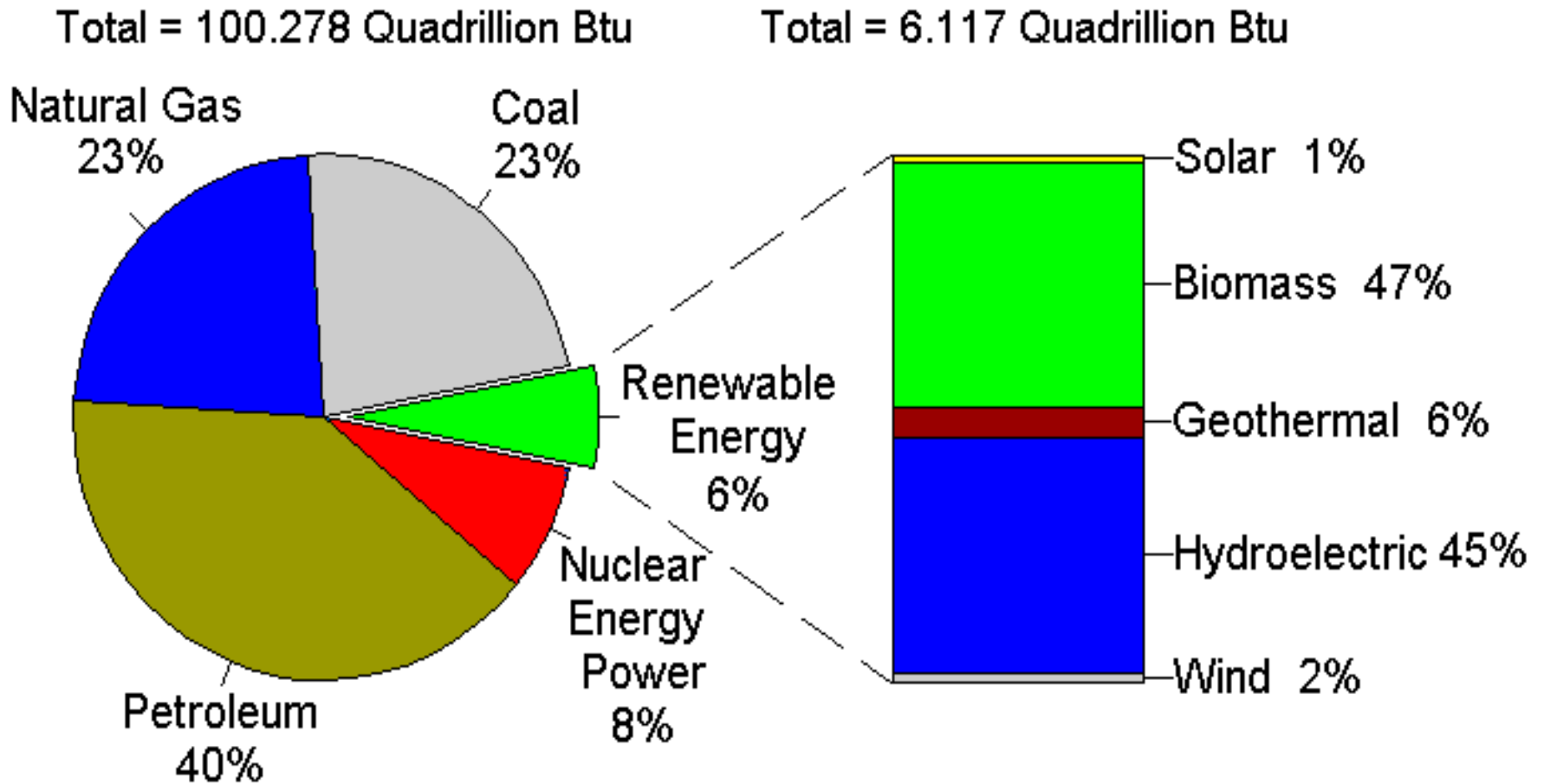
Energy market shares of renewables declined sharply during 19th and 20th centuries while total energy production grew rapidly.



Today, there is a resurgence of interest in renewables.

- Energy Security
- Climate Change
- Agriculture Policy

The Role of Renewable Energy Consumption in the Nation's Energy Supply, 2006



US Biomass Energy Consumption in 2006 (Trillion BTUs)

Wood Energy	2,114	65%
Ethanol Motor Fuel	448	14%
All Other	521	21%
Total Biomass	3,277	100%

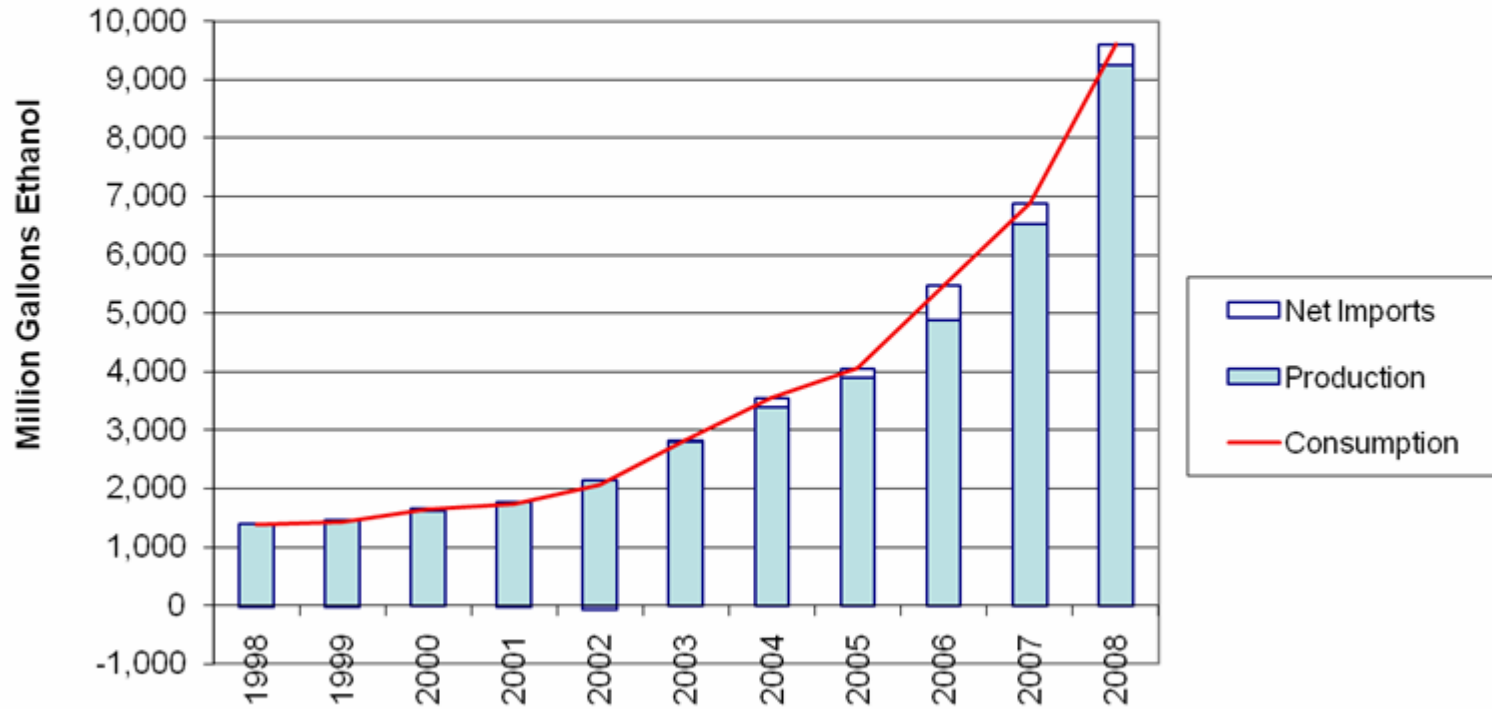
US Wood Energy Consumption in 2006 (Trillion BTUs)

Industrial	1,469	70%
Residential	390	18%
Electric Power	190	9%
Commercial	65	3%
Motor Fuel	0	0
Total	2,114	100%

Key Recent Development

- Growing concern about unintended consequences of using food crops to produce biofuels.
- Focus of US biomass energy policy has started to shift away from corn-ethanol toward “ligno-cellulosic” feedstocks.

U.S. Production, Consumption, and Trade* of Fuel Ethanol



Biomass Carbon Neutrality

- Practical Contexts:
 - National Greenhouse Gas Reporting
 - Cap & Trade Programs
 - EPA Regulation of CO₂
- In these contexts:
 - BCN often means that a CO₂ emission factor of zero is used for biomass fuels ***at point of combustion.***
 - Emissions associated with producing biomass fuels are measured where they occur.

National GHG Reporting

- Two main components
 - (1) Emissions
 - (2) Changes in Carbon Stocks
- CO₂ emissions associated with biomass combustion / oxidation captured in (2).
 - To avoid double counting, a CO₂ emission factor of zero is used for biomass fuels ***at point of combustion.***

Cap & Trade Programs

- BCN is used in cap & trade programs to:
 - encourage use of biomass fuels in place of fossil fuels.
 - maintain consistency with National GHG Reporting.
- Some stakeholders have expressed concerns that BCN in this context can lead to land use change / over use of biomass.

EPA Regulation of CO₂

- BCN is being discussed in context of EPA's plan to regulate CO₂ as a pollutant under the Clean Air Act. Discussion topics include:
 - Legal basis for distinguishing between fossil and biomass sources of CO₂.
 - Concerns about over use of biomass.
 - Concerns that regulating CO₂ from biomass would encourage switching from biomass fuels to fossil fuels.

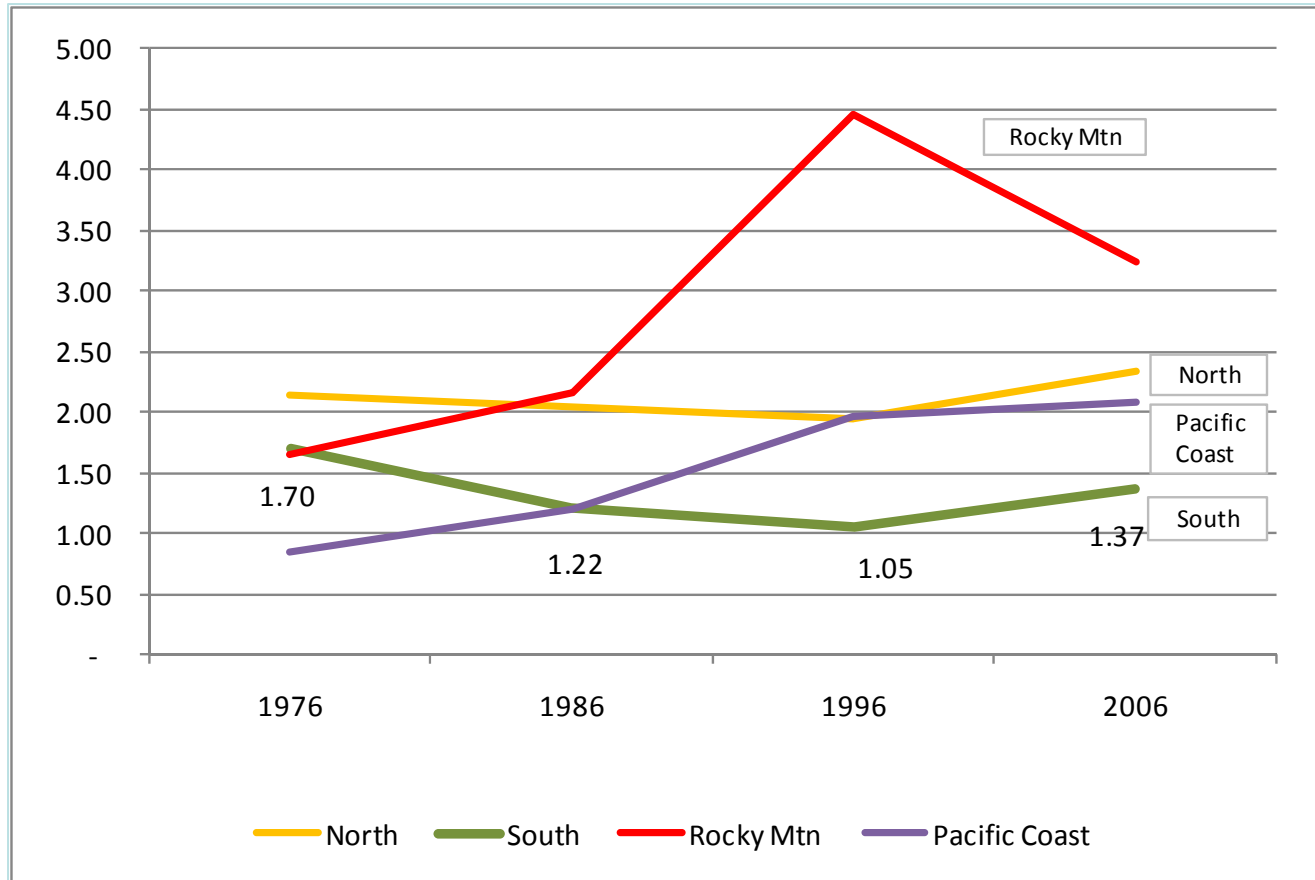
Practical Implications

- US forest sector is world leader in biomass energy production and use.
- BCN is an integral part of National GHG Reporting.
- In cap & trade programs, BCN provides an incentive to use biomass fuels in place of fossil fuels.
- EPA is considering whether / how to adopt BCN in context of plan to regulate CO₂ under CAA.

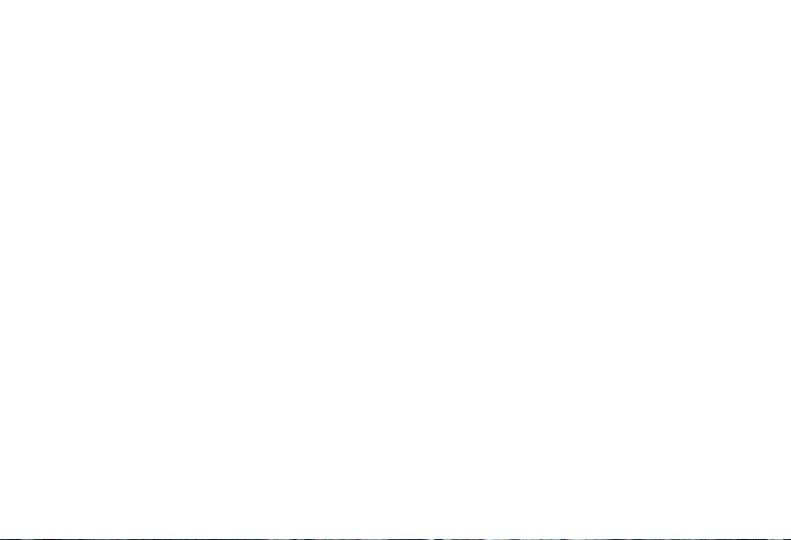
Practical Implications

- Some stakeholders have expressed concerns that BCN (in context of climate policy) encourages land use change / over use of biomass.
- Eliminating BCN could encourage use of fossil fuels in place of biomass fuels.

Growth/Removal Ratio By Region



- Growth-removal ratio is calculated based on annual growth on timberland divided by annual removal as of reported years. No specific data for growth and removal in between reported years.



Questions?