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Key Questions:

- Can the development of other ecosystem services help support the development of the biomass and biofuel industry?
- Can stacking of benefits make a difference for the ability to scale up the biomass industry?
- What role do law and policy drivers have in supporting various types of incentives?

Legal Uncertainty = Challenge for Biofuel Industry

Industry pieces are in place but where are the results? Policy changes = uncertainty

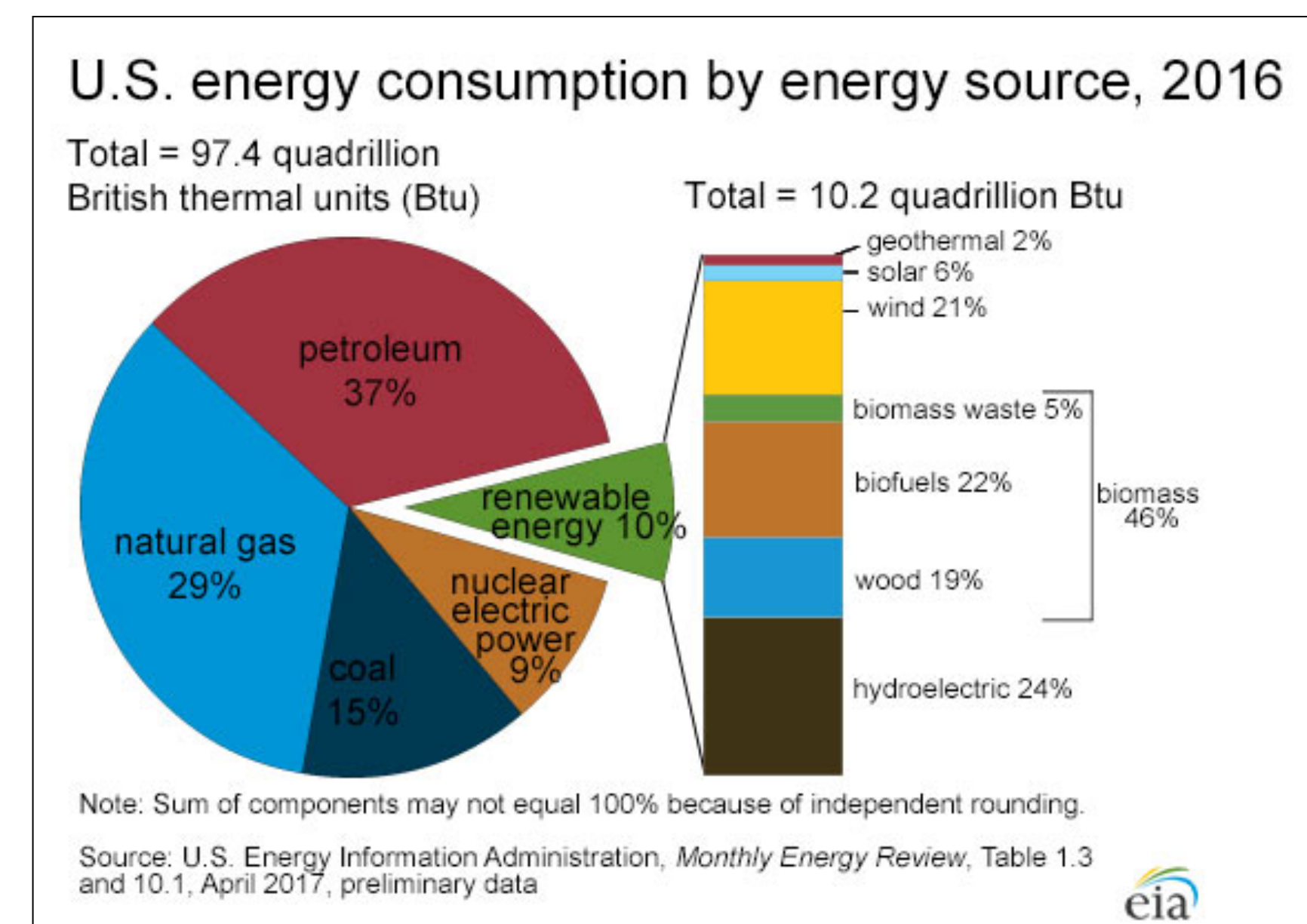
Questions raised about the likelihood of:

- predictable development?
- commercialization?

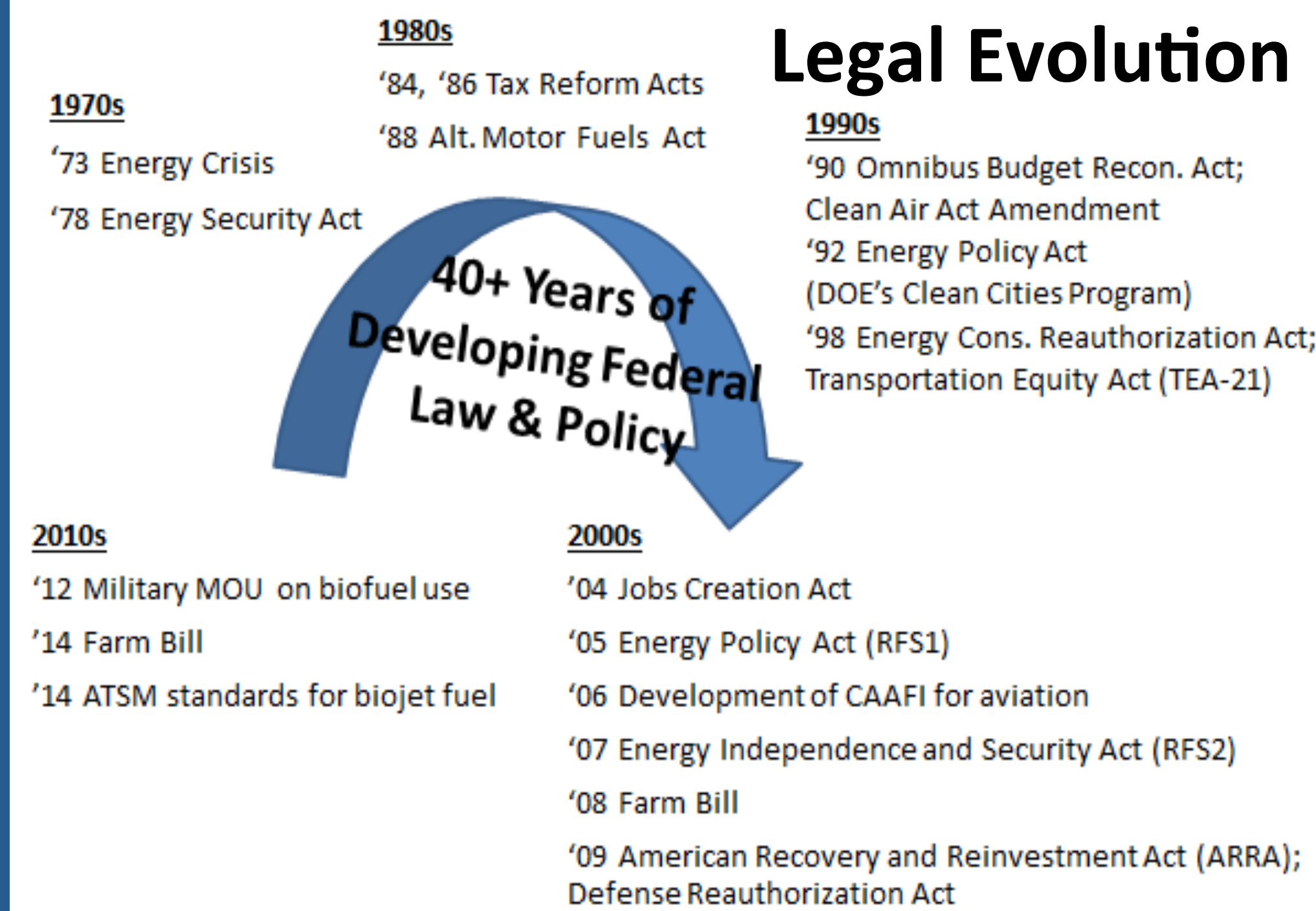
Law & policy incentives in the middle of changing dynamics:

- Decline of ground transportation sector motor gasoline consumption since 2007
- Coal, oil and other liquids on decline.

Opportunities from other sectors?



Legal Evolution



Opportunity =

Biomass Production + Other Policy Goals?

- Biomass production can be utilized by states and producers to achieve other environmental policy goals, such as improving local and downstream water quality and helping with flood mitigation.
- Installation of Best Management Practices (BMPs), aimed at achieving water quality improvement, mitigating flooding, and increasing biomass production can go hand-in-hand.
- Riparian buffers are the strips of trees and shrubs along waterways that help filter out pollutants before they enter the water.
- Multi-functional riparian buffers serve to improve water quality, and can be used by producers as a valuable production area to grow and harvest biomass.

Water Quality Law & Policy

Federal:

- Clean Water Act – regulates the discharge of pollutants into waters of the U.S. and establishes water quality standards for surface waters. Requires States to implement BMPs to improve water quality.
- Chesapeake Bay TMDL – a “pollution diet” that limits the amount of Nitrogen, Phosphorus and Sediment that may enter the Chesapeake Bay and its tributaries. It requires states to set out a plan for how they will achieve their allocated pollution reduction targets.

Pennsylvania:

- Clean Streams Law – requires all farms in the state to address sediment and nutrient discharges into waters of the state. Requires BMPs to be implemented where discharges of nutrients may occur

Water Quality Mandates = Opportunity

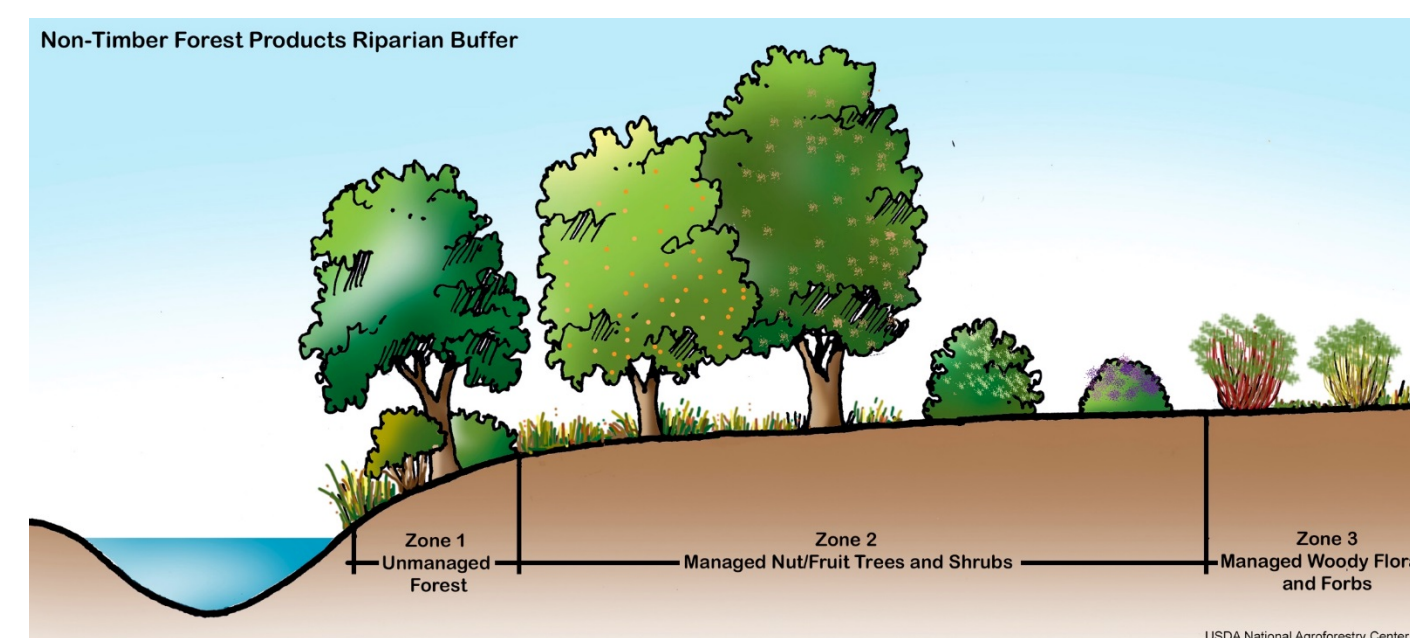
- As a part of the Chesapeake Bay TMDL, each state is required to implement BMPs in order to meet their pollutant discharge reduction targets.
- For example, under the Bay TMDL, Pennsylvania is required to reduce its Nitrogen discharge by 29.53 million tons, and its Phosphorus discharge by 1.21 million tons.
- To reach its required nutrient reductions, Pennsylvania has a goal of planting 205,698 acres of riparian buffers by 2025. As of 2015, Pennsylvania had planted a total of 64,847 acres of riparian buffers.



Imagine Multi-Functional Riparian Buffers

Typically consist of 3 zones:

- Zone 1: unmanaged forest from the stream edge to 15 feet inland, made up of native trees and shrubs. No Harvesting.
- Zone 2: from the edge of Zone 1 extending an additional 20 feet inland. Fruit and nut trees and shrubs. Non-mechanical harvesting only.
- Zone 3: from edge of Zone 2 extending an additional 50-100 feet inland. Woody florals and forbs, including biomass crops. Harvesting allowed.



Multi-functional Riparian Buffers: a Boon for Water Quality, Flood Mitigation, and the Biomass Industry

- Multi-functional riparian buffers provide both water quality benefits and incentivize the installation of riparian buffers and the production of biomass in these riparian areas. In some cases, this would require policy changes to allow for harvesting in the extended riparian buffer zone.
- Typically, the extended riparian areas of agricultural fields are the least productive, most flood-prone, and can even cost producers money to keep in production of traditional agricultural crops.
- FEMA-recommended flood mitigation techniques include the use of natural systems protection, such as installing and restoring wetlands and riparian buffers.

Pennsylvania Riparian Buffer Policy

- PA DEP issued Riparian Forest Buffer Guidance in 2010. Not a regulation in itself, but supplements other requirements and can be applied in the state's regulatory, voluntary and grant programs.
- Recommends a buffer width of 100', with no harvesting in the 50' closest to the water, and only minimal “sustainable” harvesting within 100'.
- Policy changes to the harvesting limitations would encourage the installation of multi-functional riparian buffers and the production of biomass in the extended buffer zone.

Pennsylvania Riparian Buffer Incentive Programs

Program	Harvesting Allowed?	Program Aim
CREP	No	Conservation
REAP	No	Tax Credit
Growing Greener	Possibly in Extended Buffer	Farm Preservation
PENNVEST CWSFR	Yes	Loan Program
EQIP & CBWI	No	Water Quality
RCPP	No	Conservation

What's Next?

- How can policy changes encourage and allow for biomass production in sub-optimal production areas (riparian buffers, flood plains, etc.), to help states meet other environmental policy goals?
- Assessment is needed of the short-term and long-term policy impacts.
- How can policy address current and future production impediments – price, supply chain, investment?

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