BioSequestration Policy Pathways

A policy research and evaluation effort led by:

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Our Operating Framework

- **Climate change is real**, caused mostly by **combusting fossil fuels**
- **It's a crisis** –
  - Risk to our health, way of life, and economy
  - IPCC: we only have 10 years to cut net emissions in half.
- **The severity of the crisis depends on the net of:**

  \+ Ongoing GHGs emissions

  \- Atmospheric GHGs absorbed and stored on the planet ("sequestration")
- **Bio-sequestration can**
  - play a major role in meeting our net reductions
  - ~30% of gross emissions are being offset by naturally occurring biosequestration
  - Create a stable and growing financial boon for Rural America – "farming carbon"

Bio-Sequestration = form of Sequestration

- **Sequestration:**
  - Absorption of GHGs from the atmosphere, smokestack, or other source of air, and the storage of that absorbed carbon on the planet preferably as long as possible.

- **BioSequestration**:
  - The use of vegetation to absorb CO_2 from the atmosphere via photosynthesis, and then storage of that absorbed carbon on the planet, preferably as long as possible.

Forest, farms and prairies are where
Bio-sequestration occurs in the U.S.

Example: Biochar

Process
Wood scrap -->

- **Long term storage**
- **High surface area**

Soil amendment

- ↓ **irrigation & fertilizer needs**
- ↑ **farm profits**
- ↓ **fertilizer runoff**

Possible BioSequestration Pathways

1. **Regulations:**
   - All commercially forested lands must be replanted after harvest
   - Conversion of forested land and farmland limited/banned by law
   - Annual cover crops required by law, tillage limited/banned by law
2. **Voluntary subsidies:**
   - Pay farmers for voluntary sequestration, either absolute or beyond baseline
   - Balance with fees for removing natural resource sequestration, e.g. forests
3. **Carbon marketplaces:** e.g. Cap & Trade
   - a "Net Zero" declining cap on net emissions
   - sequestration credits that can be sold to emitters at prevailing prices

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3. **Carbon marketplaces:** e.g. Cap & Trade or Carbon Taxes
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Subsidy : Voluntary Grant Program

- **Examples**
  - **EQIP Loans** – Federal voluntary grants, environmental but not carbon priorities
  - **WA SB5947** - State example of carbon prioritized legislation, national model?
- **Benefits**
  - **Economic –** Bio-sequestration @ lower cost than alternatives, e.g. solar
  - **Legislative** – Aligns farmer and climate interests, increasing enactability
  - **Social –** Sets a constructive framework for discussions with rural community

Biosequestration credits in practice: CA

- **California's Cap, Trade & Invest Program (AB32)**
  - Declining cap on total emissions
  - Auctions on declining number of emission permits, price set by market
  - Covered entities can trade or purchase permits or acquire emission offsets
  - *Emission offsets* are approved as *protocols*
    - need to be both *additional* and *permanent*
    - qualified at applicant's expense via full life cycle analysis (LCA)
    - specific to technology, practice, location, feedstocks, etc.
    - growing library of protocols includes some sequestration practices
  - Good starting point for a baseline policy as already existing in statute

Biosequestration credits in practice: CA

- **Possible Improvements**
  - Pay for actual sequestration results rather than contracted behavior
  - Reframe system in net emission terms rather than gross emissions
  - Accept “durable” instead of “permanent” carbon storage.
  - Integrate fees for the destruction of natural CO_2 sequestration assets

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EXAMPLE

- No participation: No new benefit or cost
- Convert forests/farms to concrete: Purchaser pays for loss of future sequestration
- Increase sequestration vs baseline: Annual credit rather than long-term contracts

Measurement, Estimation & Verification

- **"MEV": critically important for any market mechanism**
  Basis for charging for damages & paying for benefits
- **State of carbon storage measurement systems**
  - *TOP-DOWN:* Satellites + artificial intelligence algorithms can evaluate an in impressive detail the quantity and type of carbon on an acre of land.
  - *BOTTOM-UP:* Physical measurements of trees and vegetation are common practices; Physical measurements of Soil Organic Matter can be used to estimate the quantity of carbon in topsoil.
- **CA's protocol approach**
  - Estimates future costs or benefits
  - Often requires long-term contracts, e.g. 50 or 100 years.

Improved MEV: Pay for Performance

- **Method:**
  - Recurring credits awarded for storing carbon above natural conditions
  - Can be annual credits, or credits assigned to longer time periods
- **Scientifically more complex, but more accurate & easier to administer**
  - Actual soil carbon content MEV more accurate than predicting future effects
  - Avoids array of potentially argumentative assumptions affecting future impact
  - No contracts that encumber property
  - No process/administrative loss developing and defending approved protocols

Prove how much carbon was on your land last year and receive a carbon credit check = *Carbon Farming*

Issues & Next Steps

- **Policy design**
  - Incremental vs baseline, absolute, or transition incremental → absolute
  - Tighten MEV policies to be simple, understandable, appealing, accurate
    - Propose project at University of Washington in 2020
  - Consider state-by-state vs national application
- **Alignment**
  - Build collaborative scientific consensus group
  - Engage farming community on policy design
  - Collaborate with California on any modifications from their practice