Managing hazardous wastes

Carbon sequestration

Carbon cycle 2.0

Biofuels life-cycle techno-economics

California hydraulic fracturing and nat. gas storage

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EARTH & ENVIRONMENTAL SCIENCES

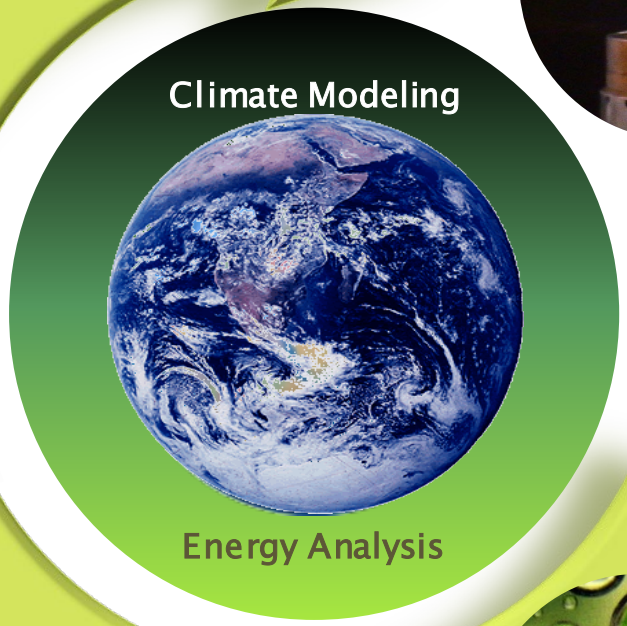
The Carbon Cycle 2.0 Initiative at Berkeley Lab

Efficiency

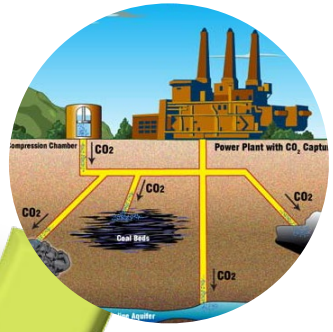
Developing World

Solar PV

Energy Storage

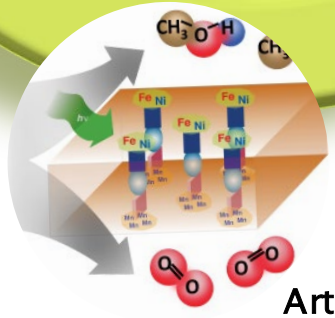


Combustion



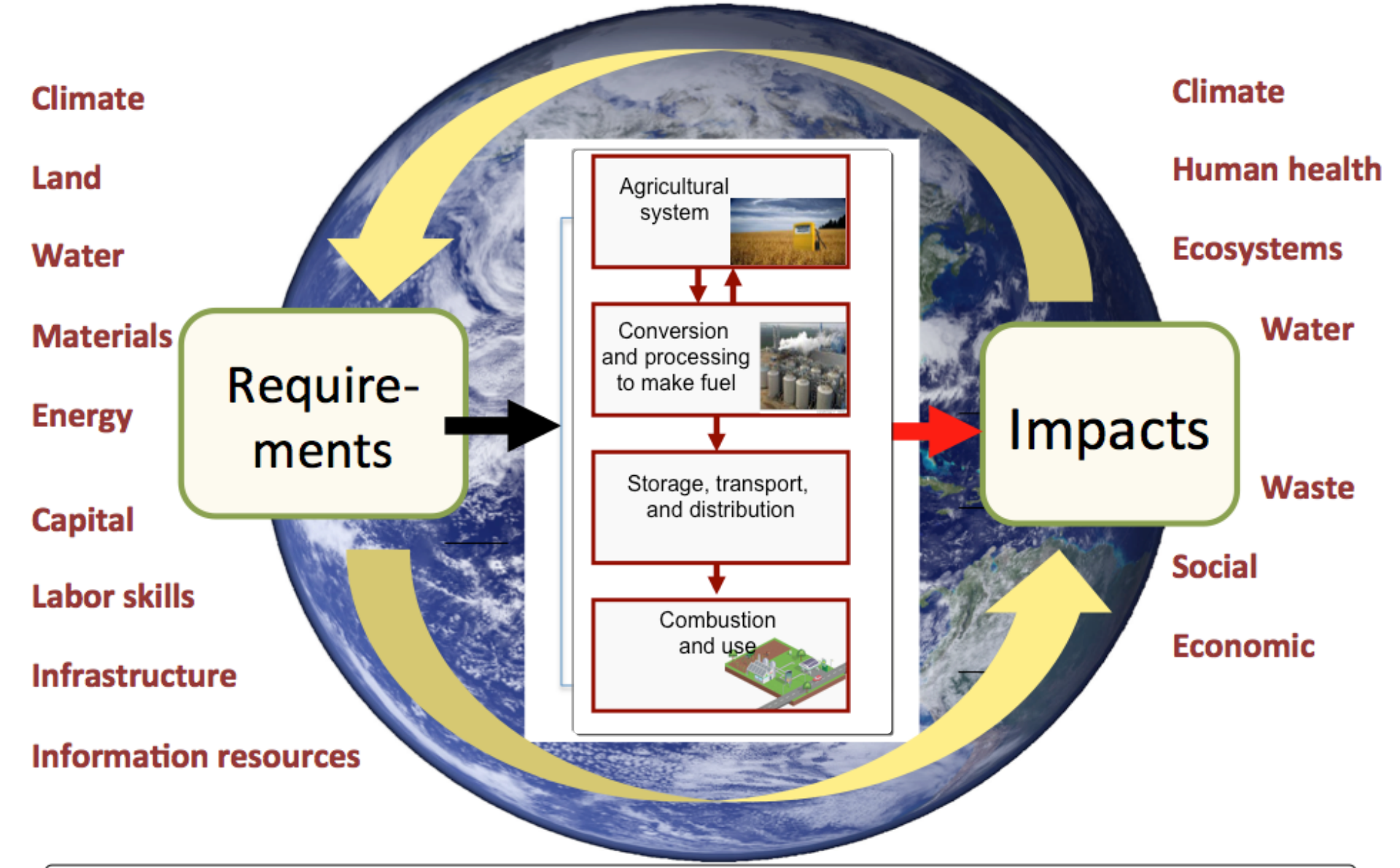
Carbon Capture & Storage

Biofuels



Artificial Photosynthesis

Requirements and Impacts from the life cycle of a technology



Spatial considerations: Local Regional National Global

Temporal considerations: Short-term (5-10 yr) Mid-term (10-25 yr) Long-term (>25 yr)

Performance Metrics: costs, climate change, health impacts, security, reliability

Sources

- Sunlight
- Biomass
- Wind
- Uranium
- Coal
- Gas
- Oil

Energy capture and production

Energy Carriers

Energy distribution storage and transformation

Delivered energy-based services

- Lighting
- Comfort
- Mobility
- Process heat
- Industrial energy
- Food
- Water
- Communications

Requirements

- Land
- Resources
- Energy
- Knowledge

Efficiency of distribution, storage, transformation and use

Confronting Climate Change: Systems View

Economy

Decarbonization

Mitigation

Emissions

Carbon Removal

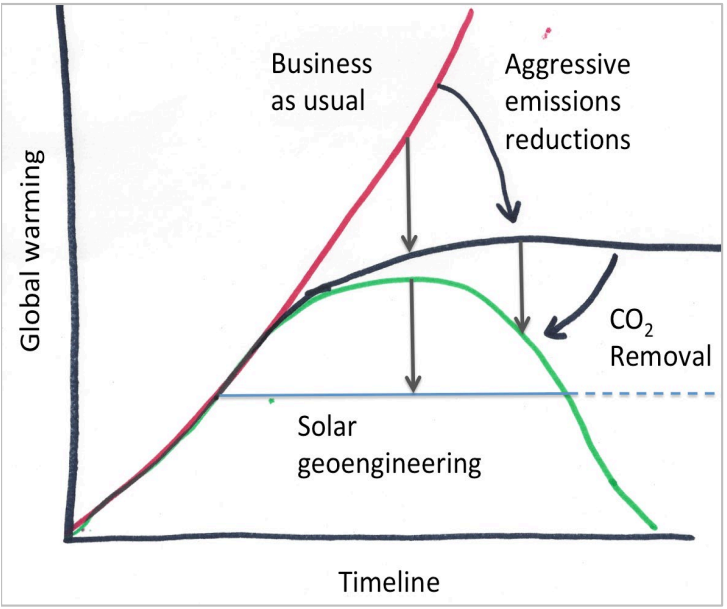
Concentrations

Solar Geo-engineering

Adaptation

Climate Change

Impacts



Source: Honegger et al. (2018) 10.13140/RG.2.2.11930.75208.