U.S. DEPARTMENT OF ENERGY
Fossil Energy and Carbon Management

Bioenergy's Role in Soil Carbon Storage: FECM's Carbon Conversion Program Contribution

BETO's Workshop

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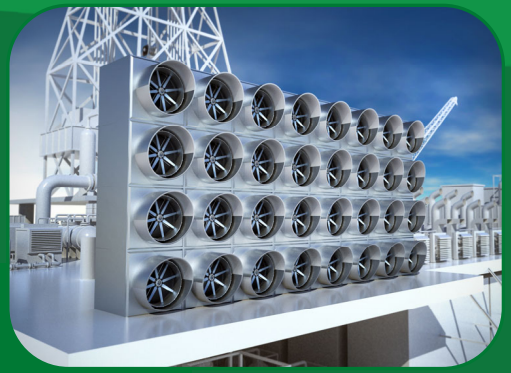
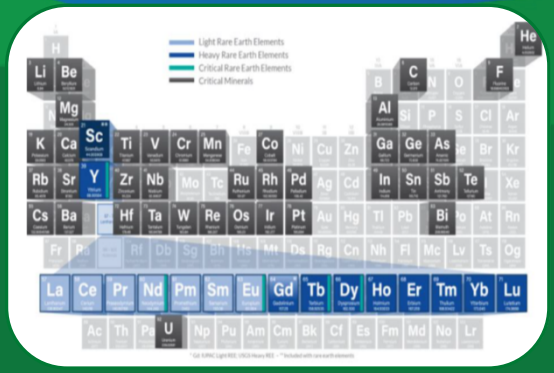
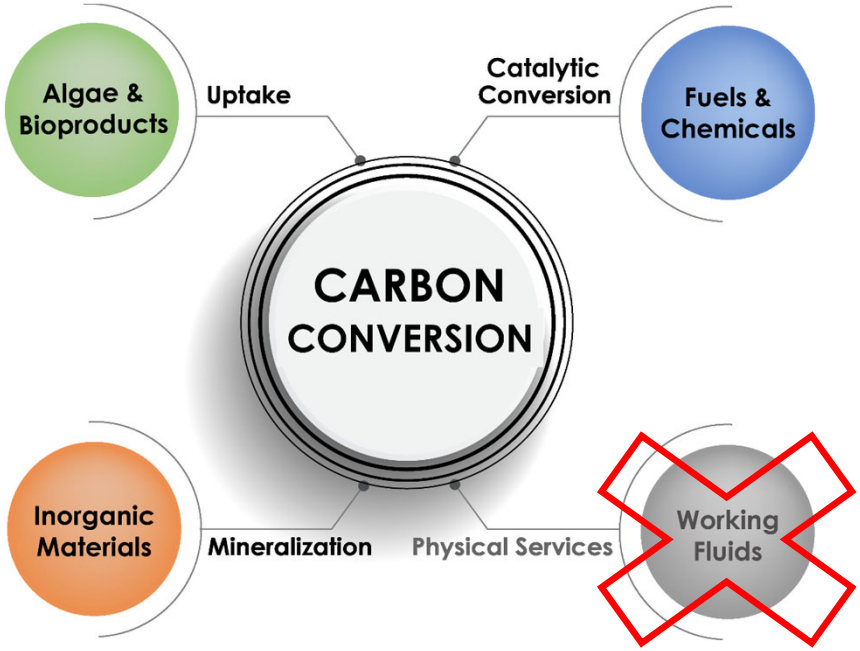
March 28-29, 2022

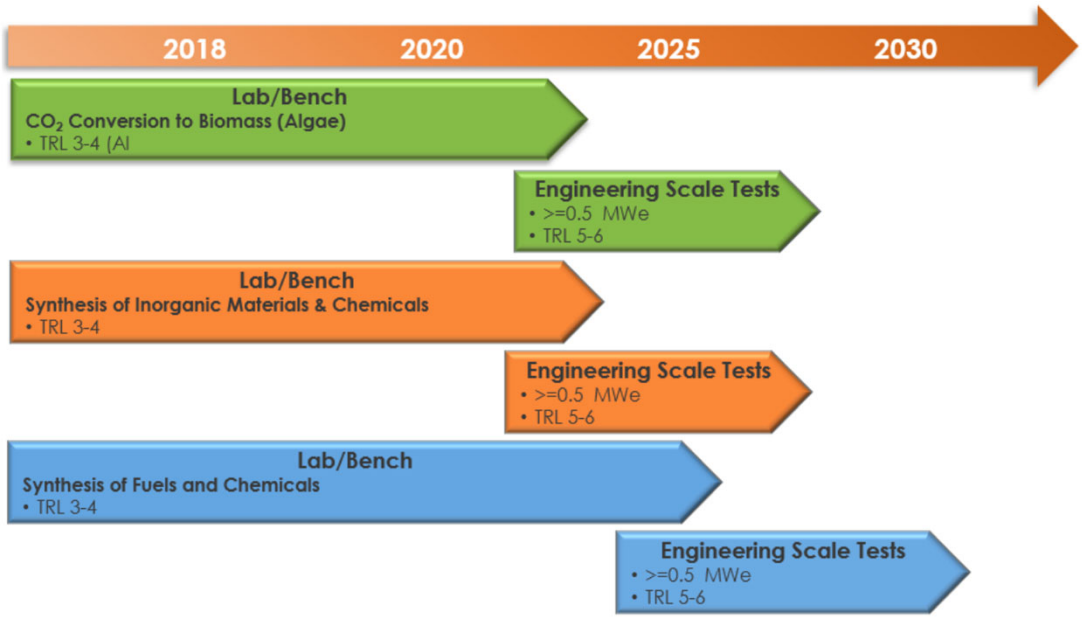




Carbon Conversion Program Overview



Focus of other programs



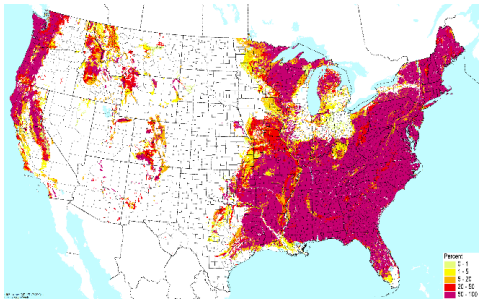
Conversion Program's research on soil carbon storage

- **Small Business Innovation Research (SBIR)**
  - **CO_2 Use to Enhance Biochar for Soils or Agricultural Carbon Products**
    - Altex Technologies Corporation, San Jose, CA; 135 Nicholson Lane, San Jose CA, 95134 1359
      - ***Enhanced Biochar for Soil Reclamation Co-Produced by a Drop-In Biofuels Process***
    - Novoreach Technologies LLC, Midland, MI; 210 Arrow Cv, Midland, MI 48642-3183
      - ***Novel Biochar Composite Materials for Carbon Capture and Soil Improvement***
- **Biochar and benefits**

Pyrolysis = *thermal decomposition of organic material in an inert atmosphere*

Biochar

Enhanced biochar applied to where it is needed



Benefits: soil ameliorate, e.g.,

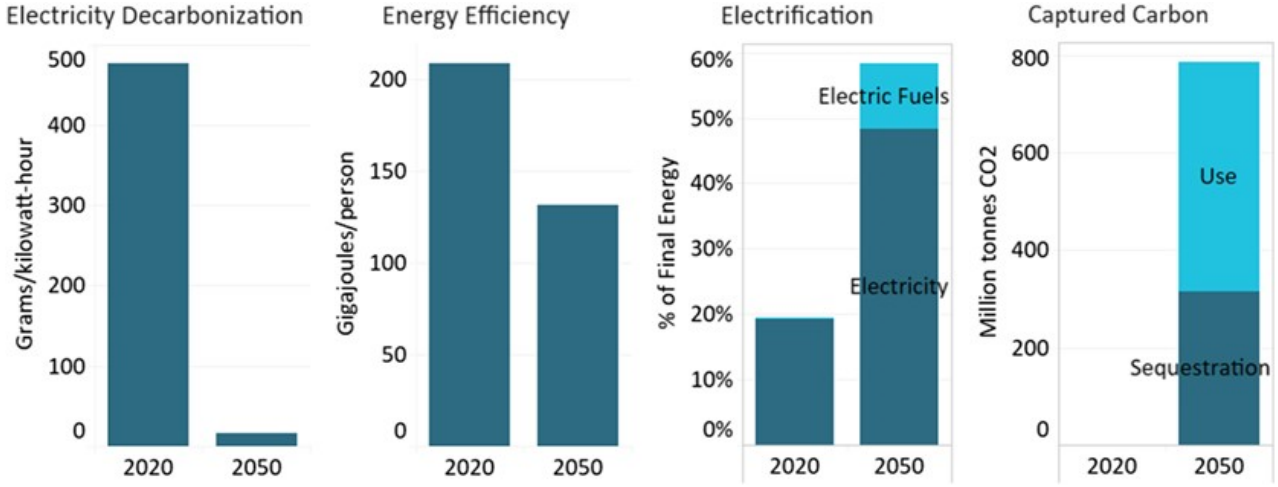
- **improving soil pH**
- **Enhancing microbial activity**
- **Retaining nutrients**

Source: Seifert H, Scheffknecht G. Thermal Waste Treatment: Basic Thermal Waste Treatment Processes. Lecture: LSF-No.: 48601. Institute of Combustion and Power Plant Technology (IFK), Pfaffenwaldring 23, Stuttgart Germany; 2014-2014

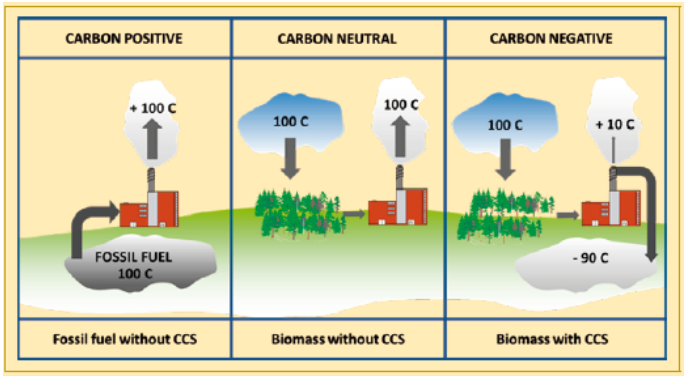
Source: Greg J. Schmidt, Misako Nishino, John Kartesz; The Biota of North America Program, North American Vascular Flora: Specialty Maps- Soil Types. [January 12, 2021]; Available from: http://www.bonap.org/2008_Soil/SoilTypesRelatedMaps.html;

Benefit of biochar for soil carbon storage

Reaching net-zero emissions



Source: Williams, J. H., Jones, R. A., Haley, B., Kwok, G., Hargreaves, J., Farbes, J., & Torn, M. S. (2021). Carbon-neutral pathways for the United States. AGU Advances, 2, e2020AV000284. [April 13, 2021]; Available from: https:// doi.org/10.1029/2020AV000284



Source: IEA Bioenergy. IEA Bioenergy Annual Report 2017. IEA BIOENERGY EXCO 2018 02. [March 13, 2020]; Available from: https://www.ieabioenergy.com/wp-content/uploads/2018/04/IEA-Bioenergy-Annual-Report-2017-R1.pdf.

Sequestering carbon via biochar: -enhancing soil carbon pool

-eco-friendly product in the market

-Create economical value-added products from CO_2 conversion

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Questions?