



Nexus

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What is Nexus?



What is Nexus?

- Biomass energy testing site (20' × 30' greenhouse)
- Comprehensive three phase project to stimulate local industry and create revenue
- Phase I: proof of concept testing (BV and AD)
- *Phase II: implement the Nexus system (ongoing)*
- Phase III: technology transfer

Objectives

To build and test various inexpensive and efficient biomass heat storage and delivery systems for a greenhouse, Nexus in order to research and demonstrate how to improve local crop productivity for farmers in Appalachia. The low-cost heating systems will help resource-limited farmers to extend their growing season:

- 1) increasing the income of local farmers;*
- 2) enhancing the surrounding community's access to fresh local produce;*
- 3) conserving fossil-fuel; and*
- 4) reducing greenhouse gas emissions associated with greenhouse heating and transportation of non-local produce.*

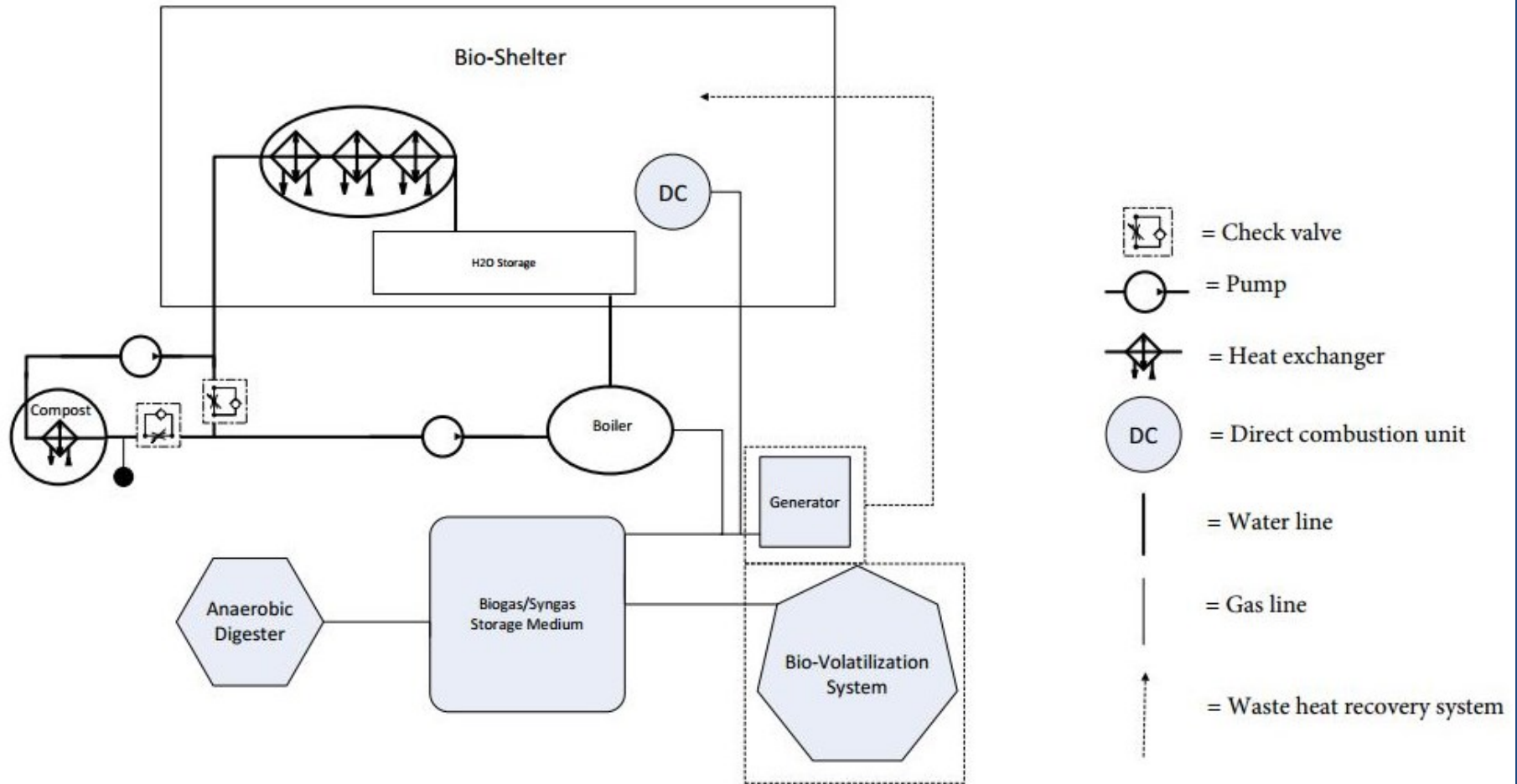
Scope

- Biomass conversion
- Agricultural improvement
- Energy management
- Water management
- Waste management
- Community enrichment
- Education by the Nexus example

Companion Systems

- Bio-volatilization (BV)
- Anaerobic digestion (AD)
- Compost heating
- Solar thermal
- Thermal storage
- Solar PV
- Wind power
- Automated controlling system
- CNG making
- Aquaponics
- Hydroponics
- Greenhouse energy audit assessment tool
- Soil enrichment (biochar)
- Water collection
- Water filtration
- Food production
- Workshops

Nexus System



Bio-volatilization (BV)



(Proof of concept testing)

Bio-volatilization (BV)



(Constructed in Nexus)

Biochar



- Soil amendment
- Increased water retention
- Reduced nutrient leeching
- Carbon sequestration
- Water filtration
- Air filtration

Py-oil



- Refine into fuel
- Provides useful pharmaceutical ingredients
- Treat lumber
- Natural pesticide and herbicide
- Natural “liquid smoke” flavoring

Anaerobic Digestion (AD)



Solar PV



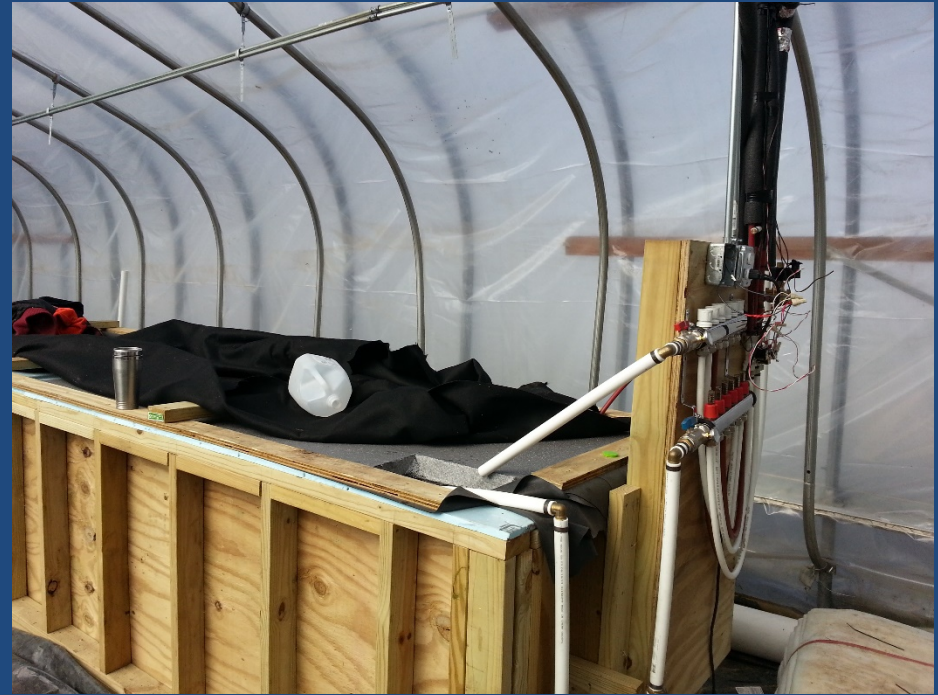
Solar Thermal



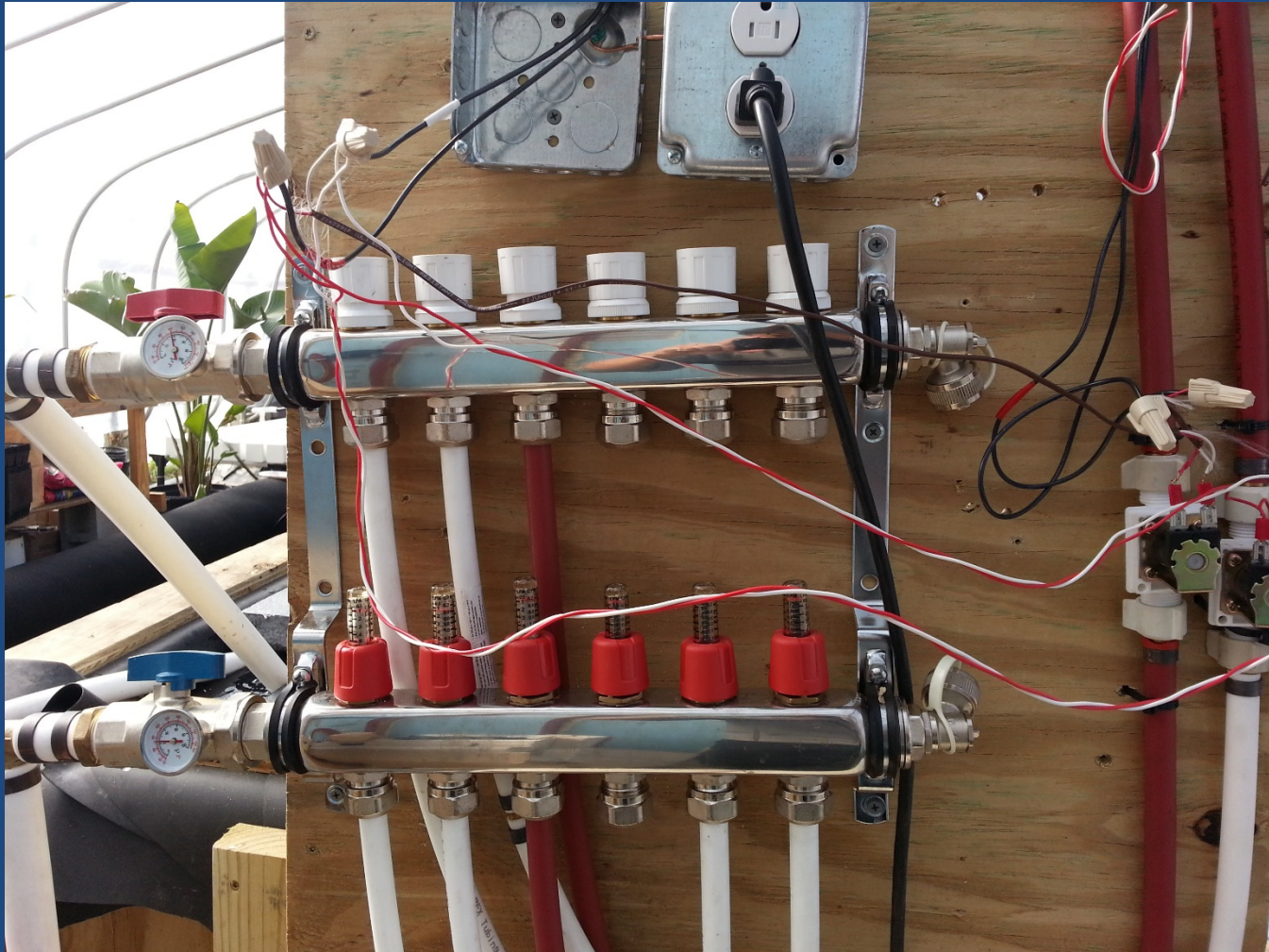
Wind Power



Thermal Storage



Automated Controlling System



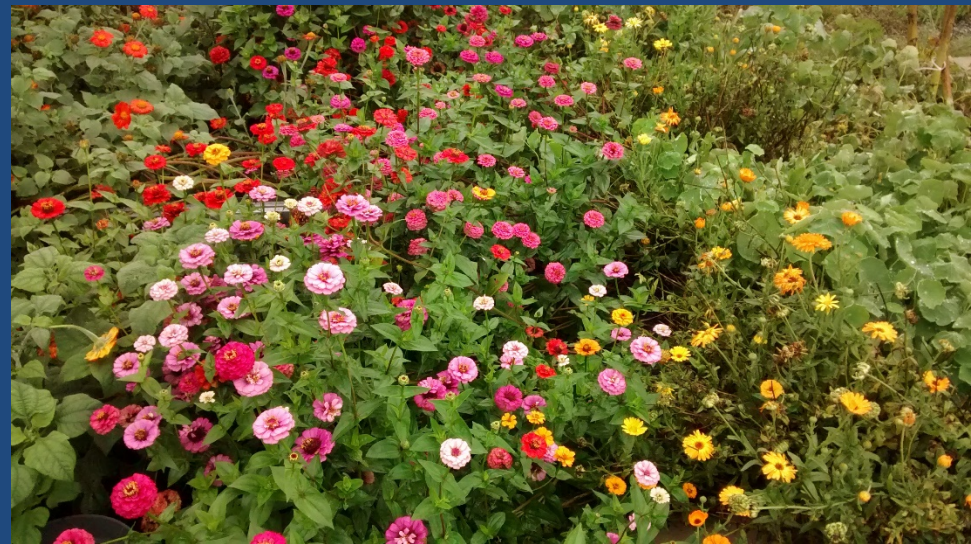
Hydroponics



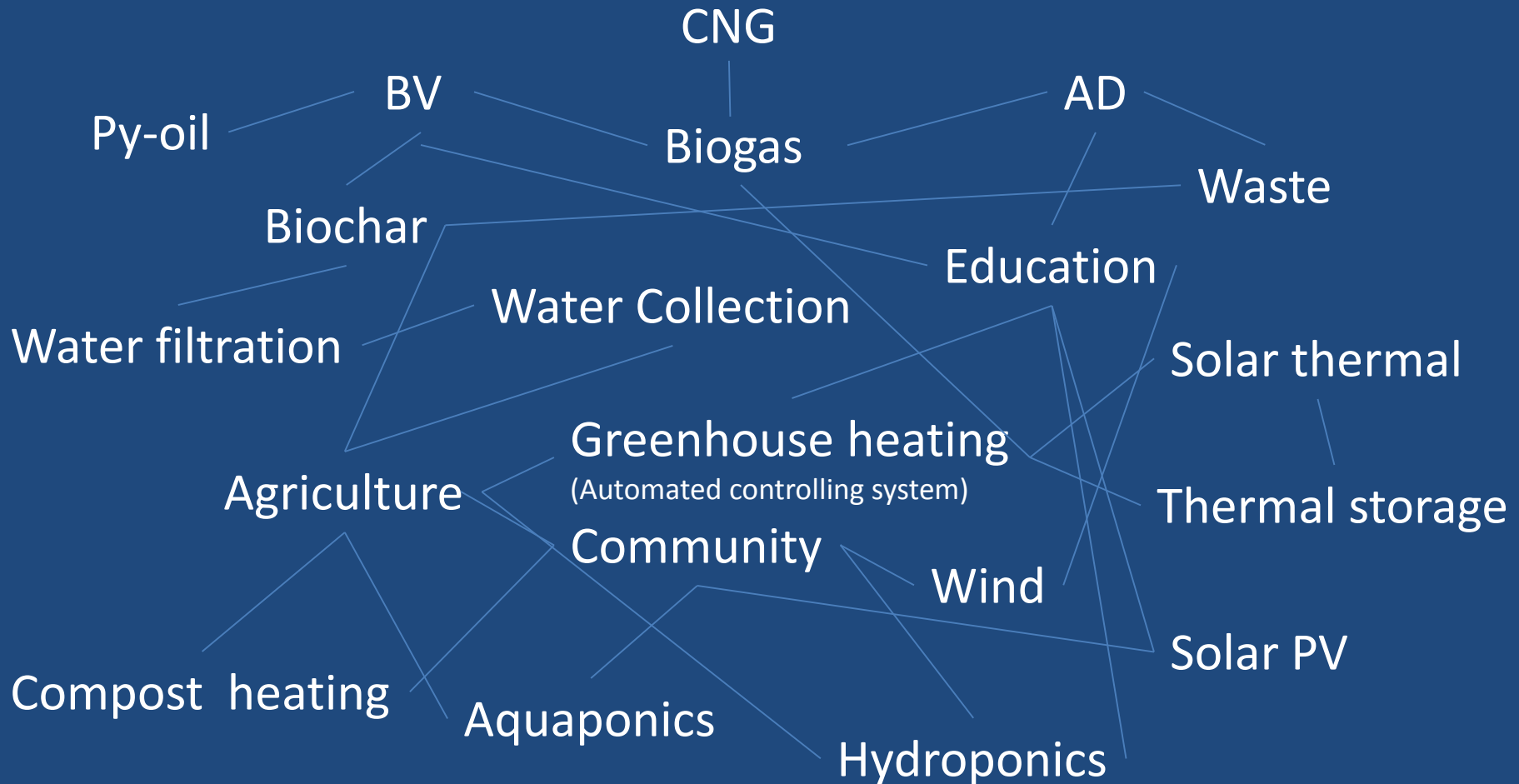
Compost Heating



Plant Growing



Nexus System



URL → <http://ok.tec.appstate.edu/biomass>

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Thank you

Gracias

謝謝

Danke

спасибо

ありがとう

감사합니다

