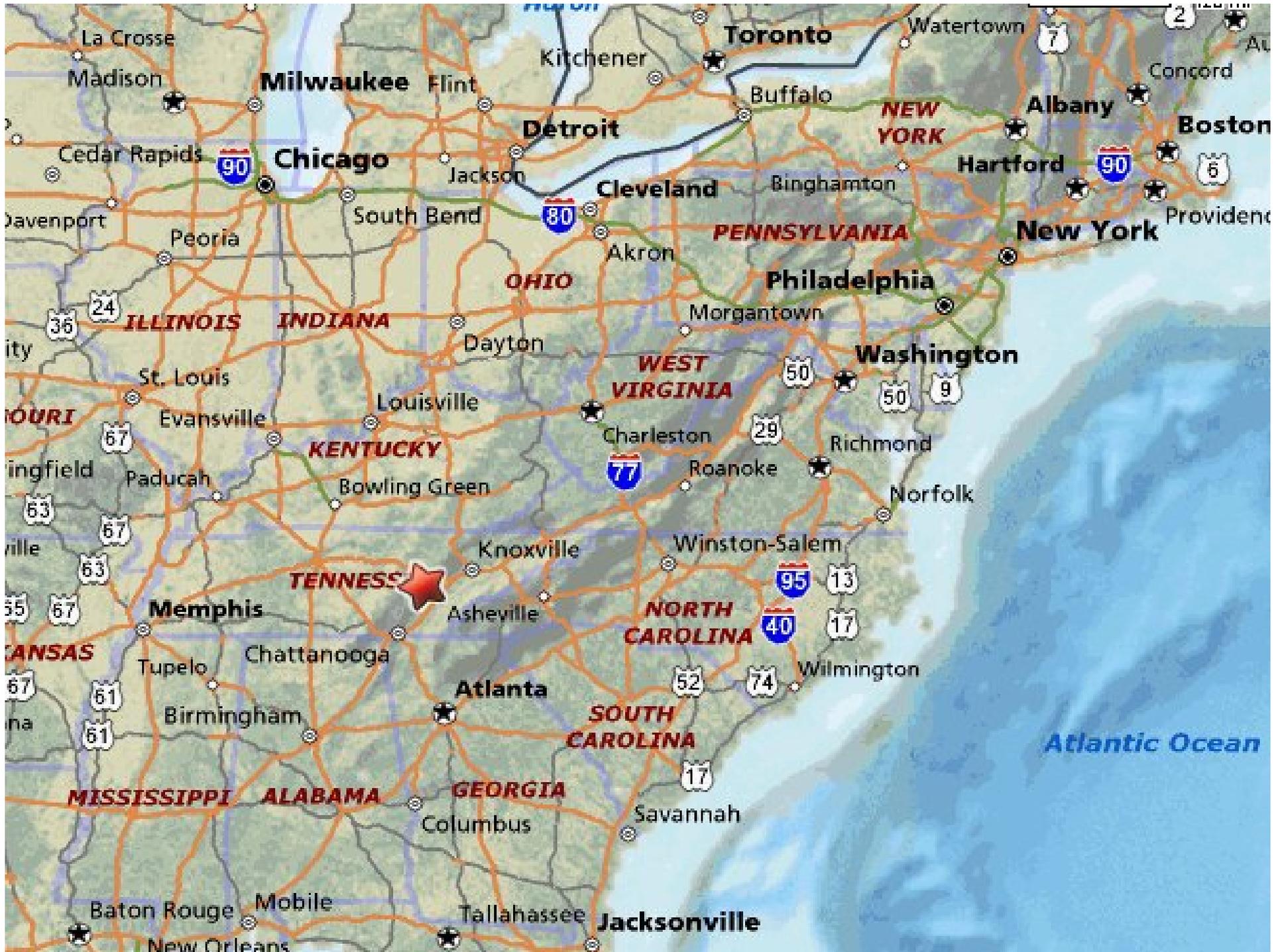




Walden Reserve

a Deep Green Community™

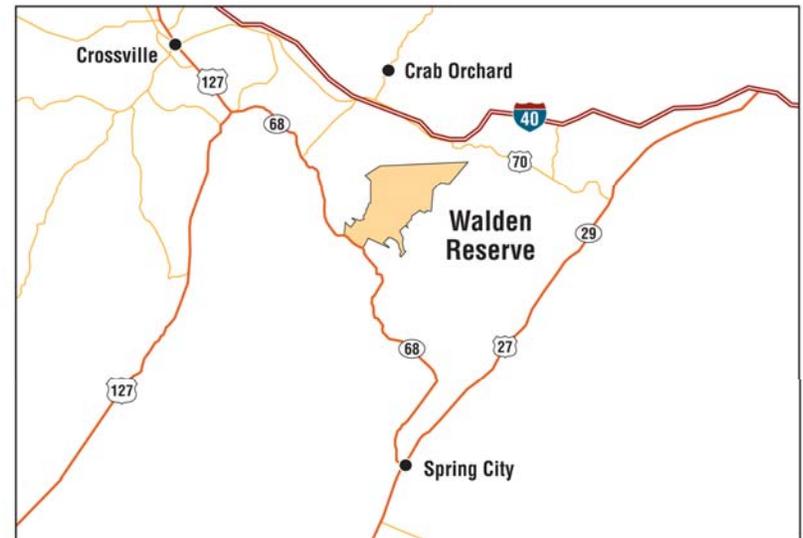
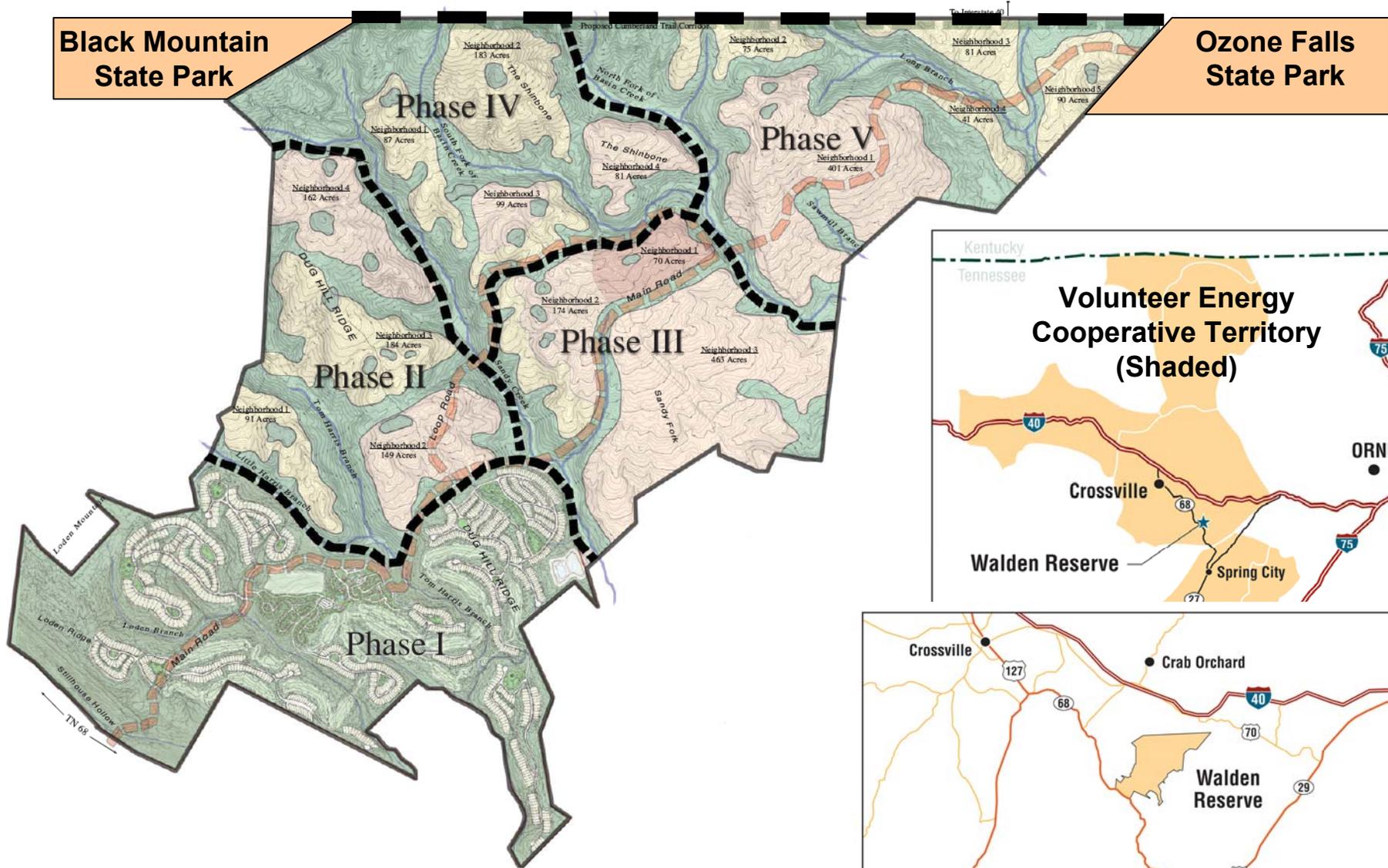




The View of Walden Reserve From Black Mountain State Park (Neighbor to West)



Walden Reserve Will Gift An Easement to Close a 4 Mile Gap in the Cumberland Trail





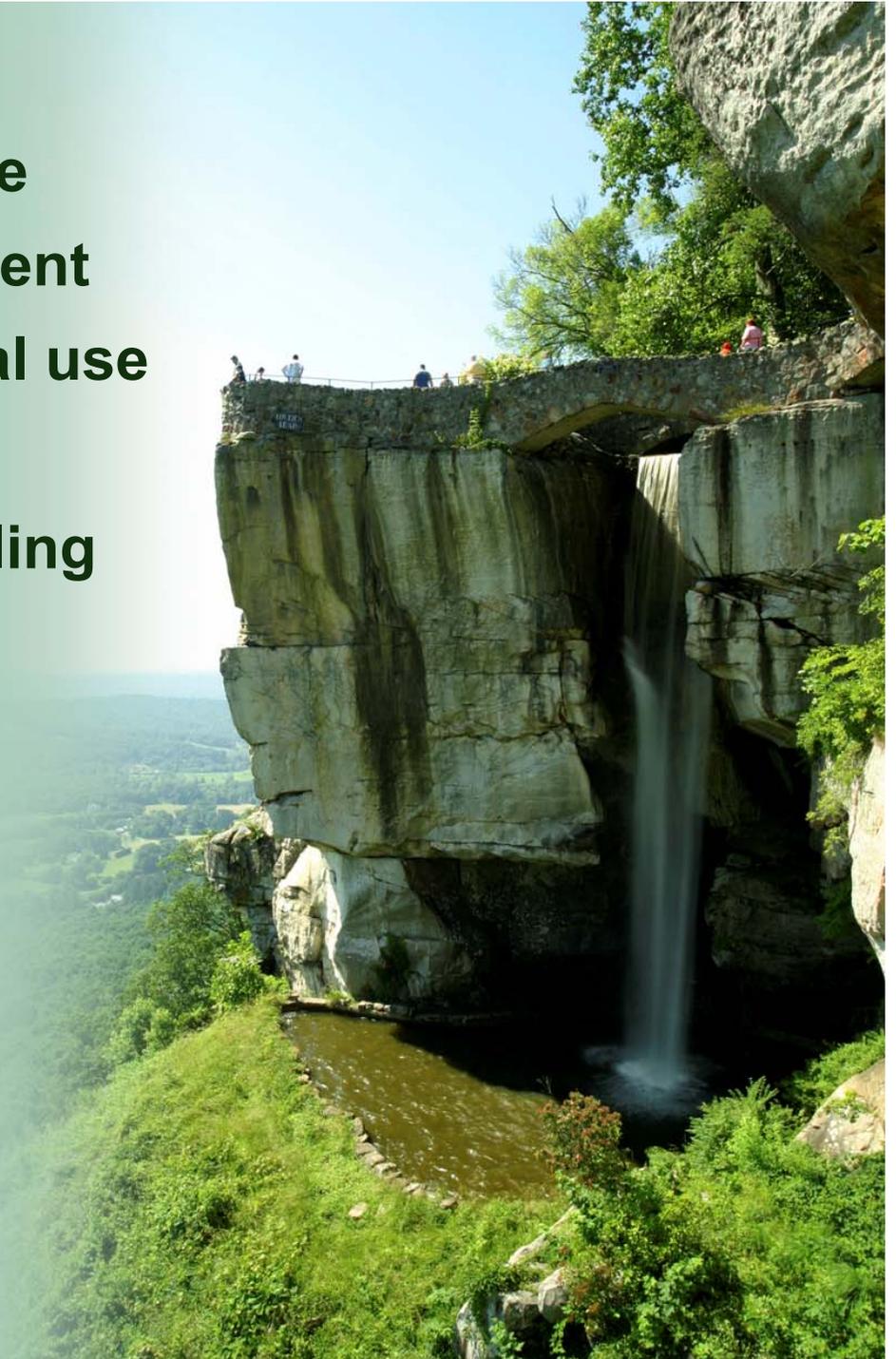








- Energy supply independence
- Zero discharge water treatment
- Sustainable building material use
- Energy efficient building
- Storm water retention/recycling
- Sustainable water supply
- Micro-climate management
- 75% green space
- Carbon sequestering
- Green ways
- Fire-wise development
- Audubon certification



Walden Reserve Phase I



Relevant Phase I Goal
– Zero peak period load

Relevant All-Phase Goals
– Zero peak period load
– Zero energy
– Carbon Neutral

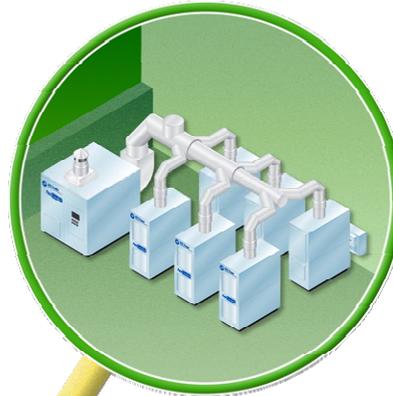
Audubon Cert. Golf Course	175 acres
Village	65 acres
Roads	35 acres
Forest/Ponds/Meadows/Trails	482 acres
Housing Pods	810 acres
	<hr/>
	1,567 acres



Phase 1 Goal: Zero Contribution to Peak Period Loads

Dispatchable renewable power

- Combined heat & power (CHP)
- Mini-district system for Village
- Wood waste to biofuel



Central solar field(s)

- Pine beetle infestation areas
- Study all options (deploy best)



Transportation (not shown)

- Fleet of EVs for within community
- Grid-docking at homes & Village
- Transition to PHEVs

Community utility not-for-profit

- Funds all upgrades from business-as-usual
- Community-level net metering and DG metering
- Supervisory Control and Data Acquisition (SCADA)
- Advanced Metering Infrastructure (AMI)
- Enterprise Management

Housing & Village Buildings

- Near zero-energy (but affordable)
- Demand-responsive (but affordable)
- Preserve tree canopy (cooling)

Technologies Being Considered



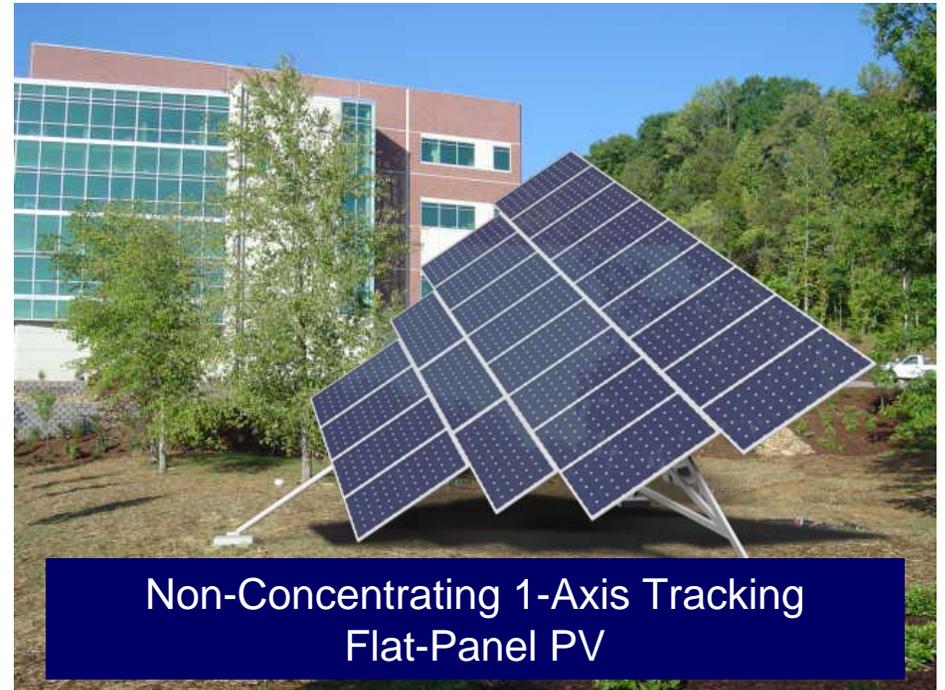
Various Concentrating 2-Axis Tracking PV



Concentrating 2-Axis Tracking Solar Stirling Engine



Packaged Cooling, Heating & Power From Biofuel



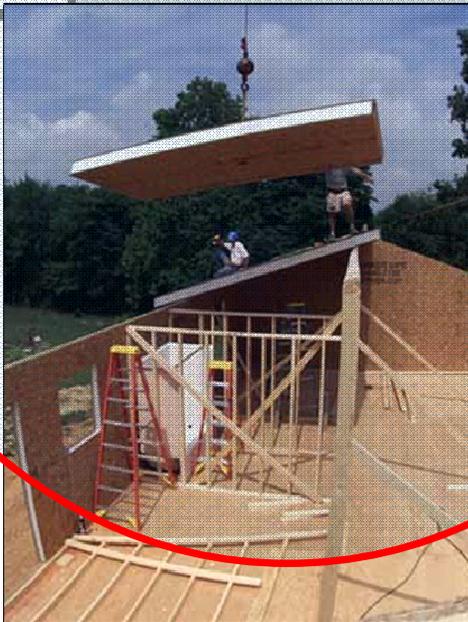
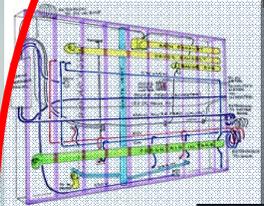
Non-Concentrating 1-Axis Tracking Flat-Panel PV

Walden Reserve Wants Guaranteed Performance of Envelopes and Behind-the-Scenes Energy Services

ZEHcore Interior Utility Wall



Reduces cost, enables energy-saving integration that could never be done reliably on-site, including management of miscellaneous electric loads



Structural Insulated Panels
(1% share)



Which style of construction can you envision at Walden Reserve?

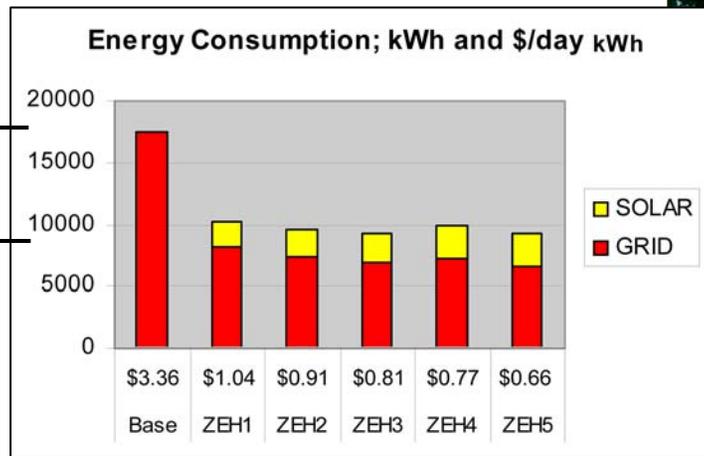


Manufactured
(10% share)

Stick-Built
(89% share)

To Achieve Goal, WR Must Push Beyond the 50% Saver Houses Already Proven by ORNL

50%
Savers



And make them appealing



WR Will Make WR-Owned Facilities Available to Serve as a Test Bed for New Products

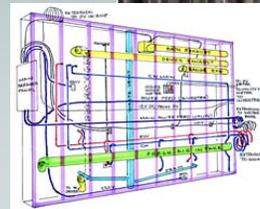
Heat Pump Water Heater



50% saver for the electric water heating mass market.

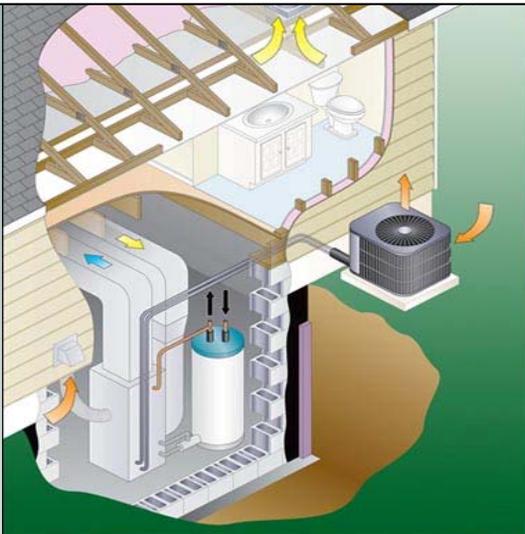
Product coming with a brand name known worldwide.

ZEHcor Interior Utility Wall



Reduces cost, saves energy, and enables integration of appliance suites, management of misc. electric loads.
Product available from TBD.

Air-Source Version

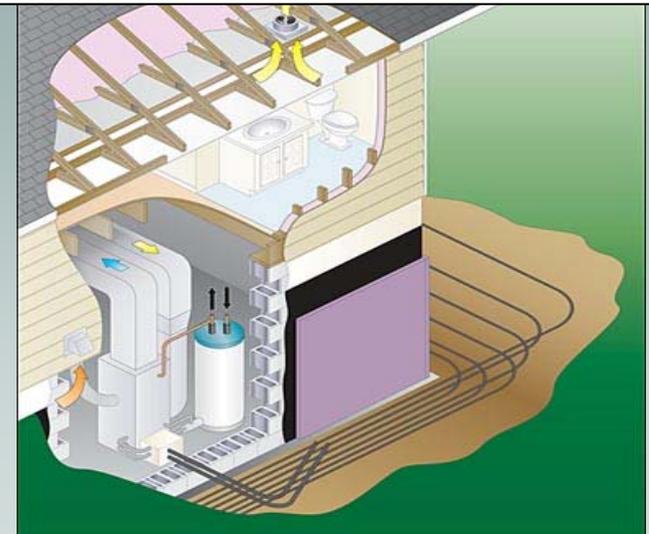


Integrated Heat Pump (IHP)

50% saver across multiple end-uses (H, C, WH, demand dehumidification) in all-electric homes.

Products expected with brand names known nationwide.

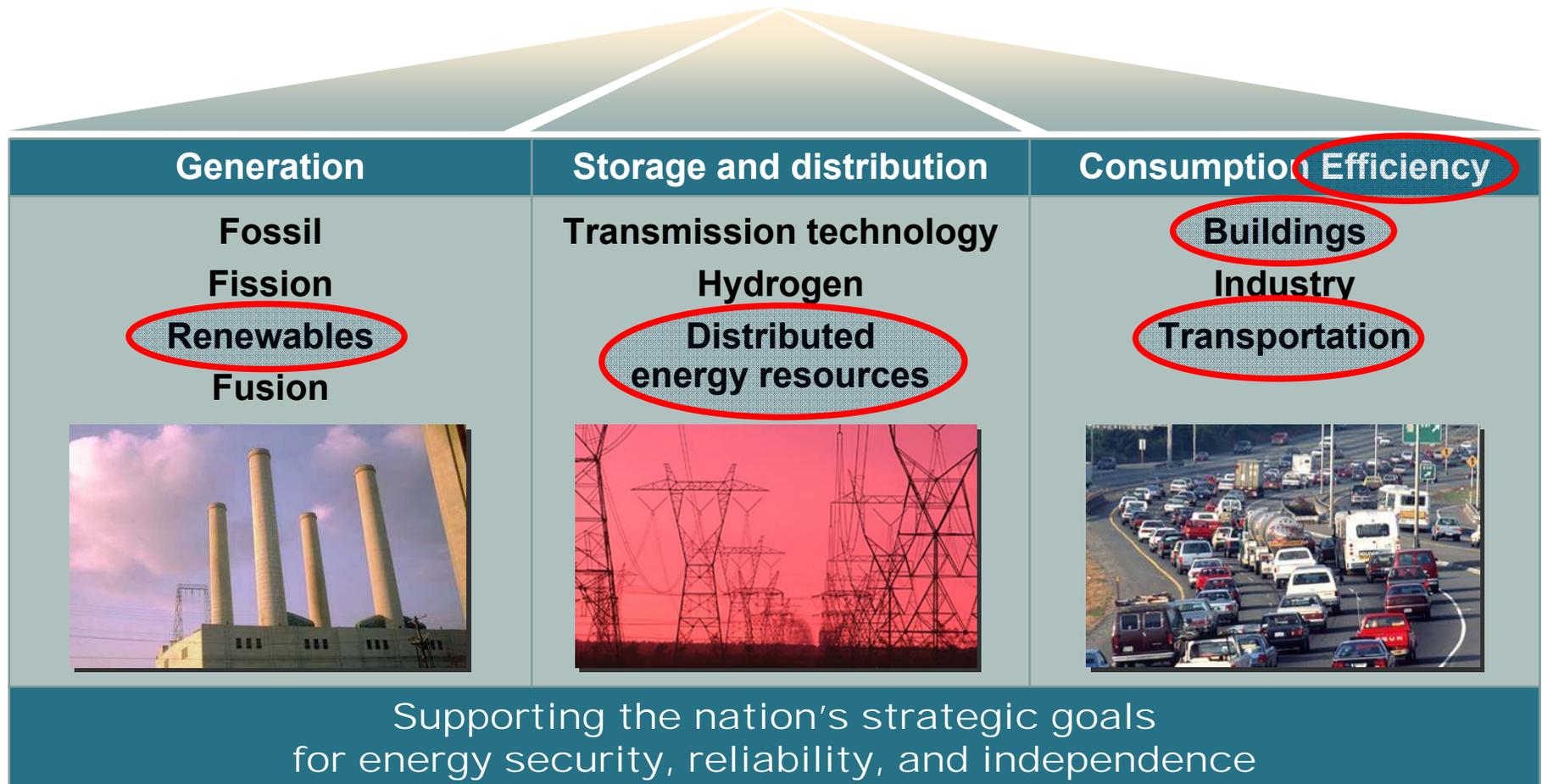
Ground-Source Version



Edging Toward Sustainable Communities

- **What Walden Reserve can do**
 - Test-bed: staff housing and the Village (WR-owned)
 - Seed market: entire build-out (community of 20,000 people)
- **What leadership-class manufacturers can do**
 - HPWH, IHP, ZEHcore interior utility wall, SIPs, appliance suites, whole-house demand-response, AMI, SCADA, CHP, DG, solar, EVs, vehicle docks, PEHVs, etc.
- **What ORNL can do**
 - New technology, manufacturing partners, expertise, interdisciplinary power to pull it all together
- **It is still early, but partnership with ORNL seems to be working**
 - Feb 07 1st contact, Mar 07 1st meeting, Apr 07 signed MOU, Jul 07 manufacturers begin lining up, Aug 07 1st joint proposal submitted

ORNL interdisciplinary power and industry connections to help pull it all together



For More Information

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865-576-8620



- Latest 'ORNL Review' has ZEH focus
<http://www.ornl.gov/info/ornlreview/>