



# Zero Energy Communities

*Leading the Way for Sustainable Development*



**BOSCH**

## Geo & PV Necessary to Achieve ZEB

- Ground Source Heat Pumps: Use the earth's **thermal properties** (ground source energy) , in conjunction with electricity, to provide **space conditioning** (heating and cooling) and **water heating** to commercial and residential facilities.
- Peak Load/Demand Reduction: Western Farmer's Cooperative program- participating homes saw the peak demand for their HVAC system drop by 38% or a reduction of **.55 kW per ton of installed capacity**
- Water Saving Ability: in a 150 room hotel in Florida, GHPs vs Water Cooled Chiller showed an **annual savings of 4,730,400 Gallons of Potable water**.



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## No ZEB Without Solar AND Geo

GSHP's are not limited by geography or geology. They can be installed in all 50 states



- GSHPs are the most efficient heating and cooling technology for residential and commercial buildings
- Energy saving between 25% -50% can be achieved
- Water savings potential of GSHP compared to cooling towers
- One ton (12,000 BTU/hr) of GSHP capacity over a 20 year operating cycle avoids 21 metric tons of CO2 emissions.
- New business models emerging to overcome the first cost hurdle



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# Geothermal Master Planned Communities

**Name**

**Serenbe, Georgia**

**Overview**



- New Urban village based on English hamlets
- High density clusters with green space and agriculture
- > 400 residents, retail, food services, hospitality



**Design**

**Building Technology –**

- Geothermal heating and cooling system
- Heat pump water heater
- Solar photovoltaic system
- Energy efficient home appliances
- Controls

**Success factors**

Private thermal service provider concept adopted by master developer



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# Geothermal Master Planned Communities

## Name

**Badger Mountain South, Richland, WA**

## Overview



- Master planned community.
- 1,500 acres
- 5,000 new homes planned
- major retail center, four sites for neighborhood schools
- over 400 acres of parks, trails and green spaces.
- 20 yr build out



## Design

### Building Technology –

- Geothermal HVAC
- PV ready
- EV Charging Stations
- Smart Home Security



## Success factors

- ORCA Energy Master Service Agreement
- Geothermal loop utility removes initial cost barrier for home owners.



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# Geothermal Master Planned Communities

## Name

Whisper Valley, Austin, Texas

## Overview



- 2,063-acre, mixed-use planned community
- 7,500 single and multi-family homes
- 2 million square feet of retail and office space.
- 15 year Build Out



## Design

- Zero Net energy Ready construction
- Geothermal community loop
- PV ready
- Energy efficient appliances

## Success factors

- EcoSmart Solution
  - develops and implements alternative energy structure programs in large-scale real estate projects.
  - Aggregation of technology, construction, communications and finance companies,

Whisper Valley  
AUSTIN, TEXAS



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# How We Can Help

- Bosch supports pro-ZEB policies and building codes at the Federal, State and local levels
- Serves as a partner and technical advisor to government, utility and private sector stakeholders
- Build Awareness and Educate:
  - Hosts Congressional staffer briefings to educate policymakers on how technologies work and identify their benefits
- Engagement:
  - Works with State Energy Offices to identify how geo and ZEB solutions can help support CPP compliance, emissions reductions, etc.



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# Thank you!

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