

Southwest Energy Efficiency Project



Armory Park del Sol

An Energy Efficient Development

John Wesley Miller
John Wesley Miller Companies



www.johnwesleymillercompanies.com www.armoryparkdelsol.com

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Solar Energy Homes in Downtown Tucson ***An Award-Winning Community!***

- ❖ **AARP/NAHB Livable Communities Award 2007**
- ❖ **Governor Napolitano's *Arizona Innovation Award, 2007***
- ❖ **Tucson Mayor Bob Walkup's *Certificate of Appreciation & Recognition 2007***
- ❖ **Cottage Living Magazine, *Top 10 Cottage Neighborhoods, 2007***
- ❖ **Arizona Foothills Magazine, *Best Places to Live, 2007***
- ❖ **Metropolitan Pima Alliance *Common Ground Award, 2006***
- ❖ **Sonoran Institute *Livable Community Award, 2005***
- ❖ **NAHB *Builder of the Year Award Winner, 2005***
- ❖ **SAHBA *Builder of the Year, 2003***
- ❖ **City of Tucson's *Most Energy Efficient Builder, 2003***



Armory Park del Sol is located in downtown Tucson and derives its architectural inspiration from the surrounding nationally designated historic neighborhood of Armory Park.

Armory Park del Sol

Where Historic Meets High Tech



- **14 (13.8) acre subdivision**

- ❖ Purchased land in 1999
- ❖ Urban infill in downtown Tucson
- ❖ Single-family, solar homes
- ❖ 99 lots
- ❖ Construction began in 2000
- ❖ Same density as surrounding Armory Park neighborhood

- **Historic Armory Park/ Armory Park del Sol**

- ❖ Designs blend with area tradition
- ❖ Neighborhood has embraced project
- ❖ Local property values much higher



Armory Park del Sol

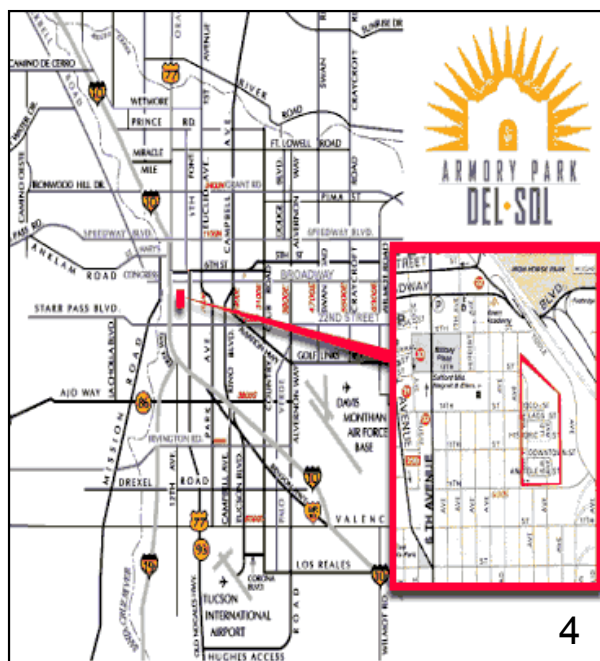


- **Urban in-fill**

- ❖ Former site of Southern Pacific RR executive homes
- ❖ Utilization of existing infrastructure

- **Downtown Tucson**

- ❖ Rio Nuevo Project- revitalizing downtown
- ❖ Walking distance to downtown, University of Arizona
- ❖ Walking distance to cultural activities, arts & music
 - Tucson Convention Center
 - Theatre, Symphony, concerts
 - Artist galleries
 - Museums



Armory Park del Sol



■ Single family homes

- ❖ New technology/construction methods blended with traditional southwestern exterior design
- ❖ Termite-proof metal framing
- ❖ Concrete construction – thermal mass regulates interior temperatures
- ❖ Significant energy savings



Armory Park del Sol



■ Award-winning energy efficiency construction

- ❖ Thermal mass wall – exterior insulation
- ❖ Insulation through slab edge
- ❖ Raised heel truss, R-38 ceiling
- ❖ Dual-pane, Low E & low solar heat gain windows
- ❖ Ducts in conditioned space
- ❖ Minimum 14 SEER heat pump
- ❖ HVAC system design using Manual J
- ❖ Optimized (reduced) duct runs
- ❖ Return air pathway from each room
- ❖ Passive ventilation system



Armory Park del Sol



■ Solar system

- ❖ 1.5 kW Photovoltaic (PV) system minimum
- ❖ Garage roof mount (parapet wall)
- ❖ Utility approved components & systems; annual utility inspection
- ❖ System meets TEP SunShare requirements (ACC approved)
- ❖ Compliance
 - IEEE
 - National Electric Code
 - TEP Service Requirements Book



A UniSource Energy Company



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Armory Park del Sol



■ Features

❖ Universal Design

- Step free homes and community
- Extra-wide hallways
- Three foot wide door openings
- Hard surface flooring
- Bathroom grab bars
- Roll-in and walk-in showers
- Dual shower heads with slide bar
- 6 foot wide sidewalks
- Extra-wide patio access gates

❖ Information age design

- Minimum 3 telecom ports
- Digital satellite service
- CAT5e wiring, pre-wired for fiber optics

❖ Security system

❖ Central vacuum



Armory Park del Sol



■ Utility collaboration

- ❖ Tucson Electric Power 5 year A/C guarantee
 - TEP inspects each home during construction
 - Guarantee qualifies Armory Park del Sol for reduced residential utility rates
 - Guarantees heating & cooling portion of annual bill
- ❖ State & federal tax credits
- ❖ Homeowner qualifies for TEP cash rebates
- ❖ Output offsets highest Time-of-Use rate
- ❖ TEP inspects solar electric system annually
- ❖ City permit fee credit up to \$1,000

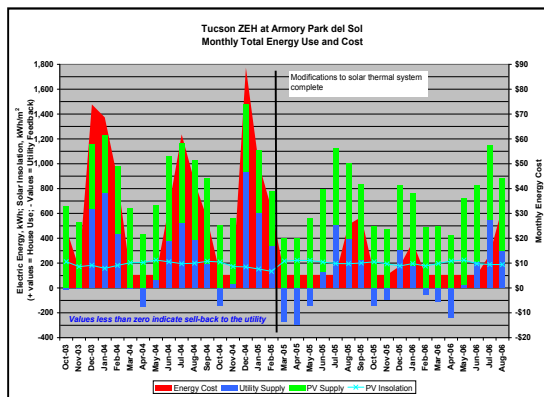


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■ Net Zero Energy Home 1

- ❖ Now averaging about \$10/mo for all household energy (including \$5.28 monthly base fee)
- ❖ Average 23 kWh/day Total Average Energy Use



■ Net Zero Energy Home 2 - Utility savings

- ❖ PV system cost benefit offsets utility-supplied energy



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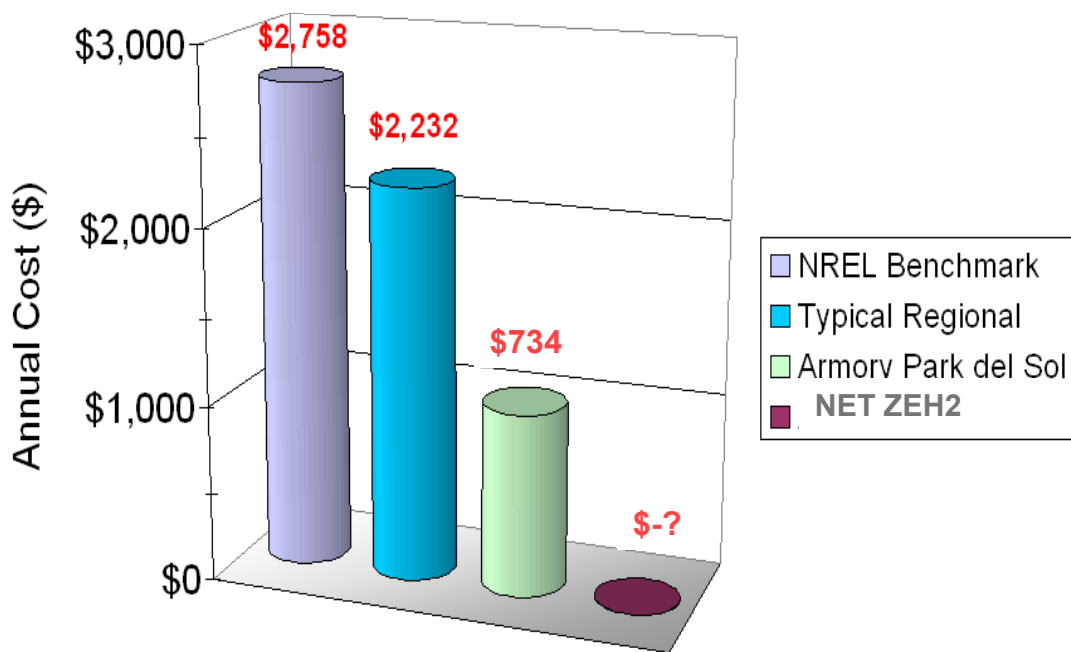


■ APdS Homes

- ❖ Average APdS home is predicted to use less than half the energy of a typical regional home
- ❖ Net ZEH2 is currently producing more energy than it is consuming

Annual Utility Cost Comparison *

Armory Park del Sol, Tucson, AZ



* with PV savings included

John Wesley Miller Companies



- **McLellan Building**

- ❖ Remodel of older, energy-inefficient building into a high tech, solar, green building
 - To be a part of downtown revitalization



- **NAHB Green Building Standards Consensus Committee**

- ❖ To develop and publish ANSI-approved standard on residential green building in collaboration with International Codes Committee (ICC)

