

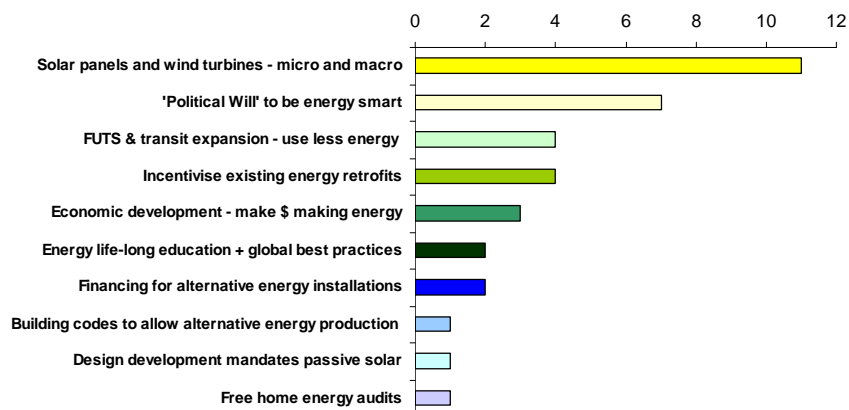
Citizen Advisory Committee 'Energy Element'

November 5, 2009

Energy Planning

Open House Comments: 8/12 (Sunnyside Farmers Market); 8/16 (City Hall Farmers Market); 8/26 (Fl. Valley Plan Open House - Coconino County offices); 8/29 (Doney Park Picnic in the Park); 9/12 (Kachina Village Picnic in the Park)
36 Comments

What is your vision of Energy production, consumption and conservation in Flagstaff?





Energy Planning - Sep. 24 Focus Group - SWOT

ENERGY	
Strengths	Weaknesses
City & County environmental services department – education / incentives.	City/County programs are residential based-need commercial opportunities
Solar Resource-capturing this – what is the potential capture and feasibility?	Solar Incentives? Policy for use?
APS is forward thinking-good partner; ACC is pushing in the right direction	Tax incentives- exist but could be improved
Expertise & infrastructure (capability) here For solar & wind efficiency	Political leadership- advocating energy efficiency & remodels
Favorable community culture & community leaders	Low capital funding available
Educational expertise- CCC & NAU	Rental properties are NOT interested in energy efficiency
Solar & Wind capabilities	FUSD Education (K-12)
Public Transit w/ alternative fuels	Biomass, Bio Gas & Geo-thermal - potential
Community Partnerships –SEDI/CITY/COUNTY/FS	Public transit can increase service
Opportunities	Threats
Solar Resource	Political inconsistency
FUSD educational resources K-12	Tax structure
Learning from global best practices	State laws that prevent municipalities from adopting
SWEEP- SW Energy Efficiency Program-Jeff Slagal	Inertia & political opposition at state & local level
Focus econ. Development on "green" businesses –harvesting energy from renewable	Environmental conservation – wildlife & view sheds
National Energy producers are interested in AZ solar	Special interest groups (AZ Builders) knock down legislation- political opposition – how to build bridges and buy-in?
Tribes & tribal land are interested & developing economic opportunity- have land; include energy conservation design in site plans	Need strong renewable transmission capabilities (infrastructure)

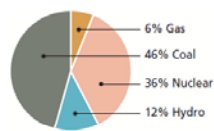
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Arizona Energy Atlas:

Arizona Renewable Energy Resources

Existing Generation Mix



Data source: Energy Information Administration 1999

Renewable Energy Policies

Arizona is often called the "solar capital" of the US. Despite the state's tremendous solar and other renewable resources, Arizona lags behind the rest of the region with only 9 MW of installed renewable energy facilities. However, thanks to the passage of a renewable portfolio standard designed to boost the development of renewables, especially solar, across the state, a number of new large-scale solar projects are now under construction. The RPS requires utilities to obtain nearly 1% of their power from renewables, half of which must be from solar.

Renewable Energy Installed Renewable Capacity¹

Resource Type	Installed Capacity
Wind	.04 MW
Solar (PV)	4 MW
Solar (Thermal)	.08 MW
Geothermal	0 MW
Biomass	5.3 MW
Total	9.4 MW


¹Source: RPS database, plus known installations

<http://www.energyatlas.org/>

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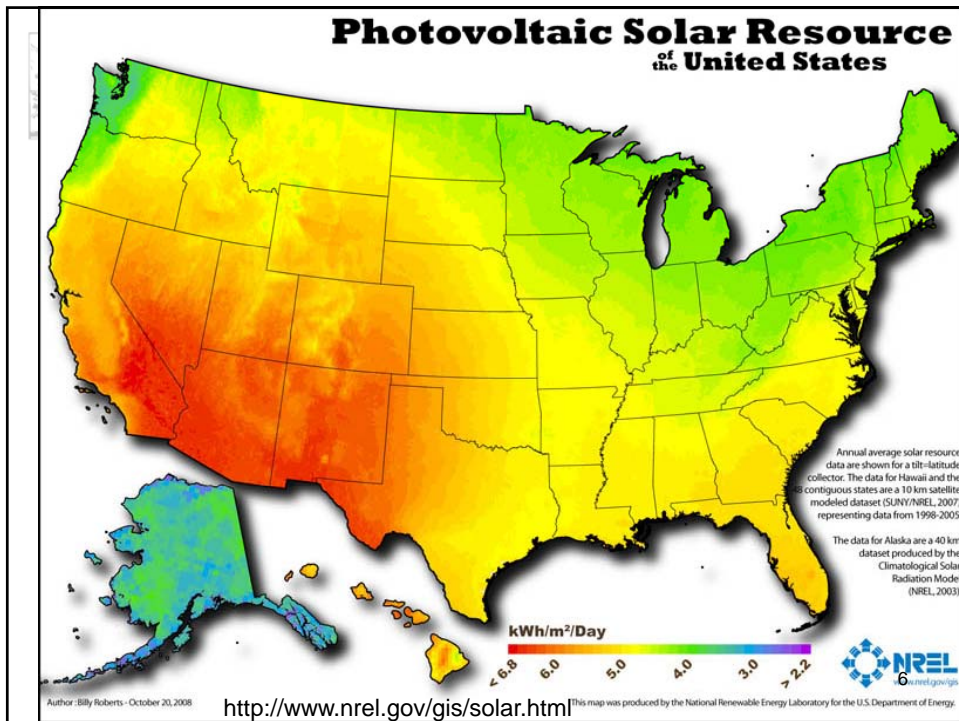
Efficiency

Best bang for buck

 <p>CERTIFIED</p>	<p>World's Best Window Co. Millennium 2000+ Vinyl-Cased Wood Frame Double Glazing - Argon Fill - Low E Product Type: Vertical Slider</p>	
	<p>ENERGY PERFORMANCE RATINGS</p>	
	<p>U-Factor (U.S./I-P) A 0.35</p>	<p>Solar Heat Gain Coefficient B 0.32</p>
	<p>Visible Transmittance C 0.51</p>	<p>Air Leakage (U.S./I-P) D 0.2</p>
	<p>Condensation Resistance E 51</p>	
<p><small>Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining window product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. Consult manufacturer's literature for other product performance information. www.wbc.com</small></p>		



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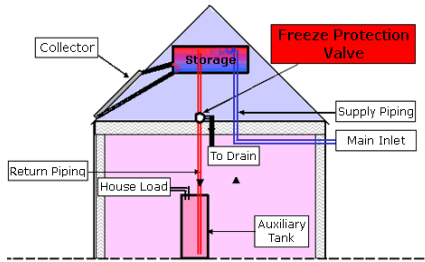


Thermal Energy

Solar Thermal



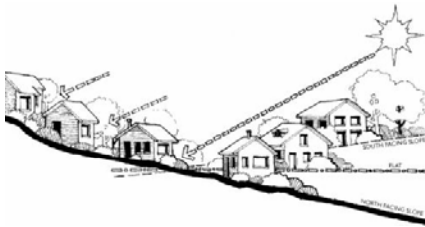
Piping in the House



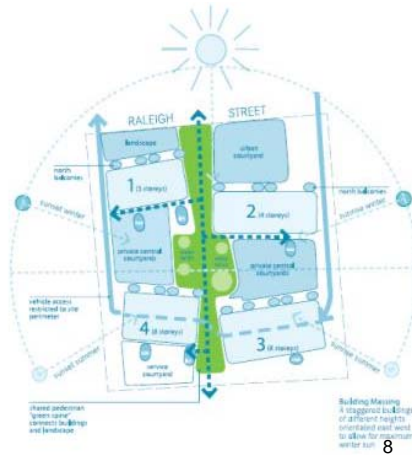
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Orientation

Catch the Sun



Versus park the car



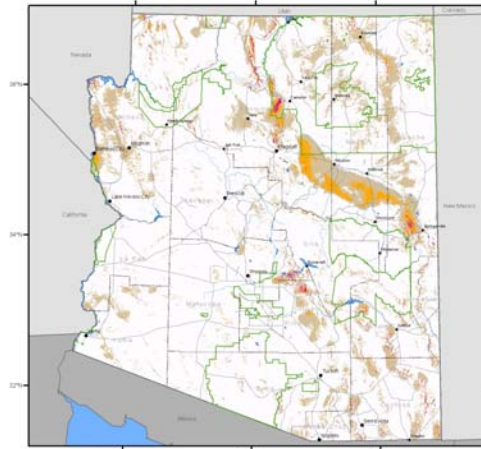
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FLAGSTAFF
REGIONAL
PLAN 2012

Wind Power

State of Arizona Average Annual Wind Resource 164 ft (50m)



Created by: Grant Brummetts
Date of Creation: 7/6/2005
For more information contact:
Dr. Earl Duque
Earl.Duque@asu.edu

Projection:
UTM, Zone 12, WGS84
Spatial Resolution of
Wind Resource Data: 200m

Sustainable
Energy Solutions
www.ses.nau.edu



Wind Power Classification

Wind Power Class	Wind Power Density (W/m ²)	Wind Speed (mph)
1 Poor	0 - 200	0.0 - 12.9
2 Marginal	200 - 300	13.3 - 14.1
3 Fair	300 - 400	14.5 - 15.7
4 Good	400 - 500	16.1 - 16.6
5 Excellent	500 - 600	16.8 - 17.9
6 Outstanding	600 - 900	17.9 - 19.7
7 Superb	> 900	> 19.7

Legend

- County Boundary
- Indian Reservation
- Rivers and Water Bodies
- Major Roads



AMWS m/s	Annual MWh	Daily kWh
4	1.9	5.3
5	3.8	10.5
6	5.4	14.8
7	6.7	18.4
8	7.7	21
9	8.9	24

Note: The annual electricity consumption of a medium size home is in the region of 4 to 6 MWh. This is equivalent to a daily consumption of 11 to 16 kWh.



Michael McElmury
Arizona Public Service (APS)
Programs & service update:
(insert presentation here)



Nicole Woodman
City of Flagstaff
Programs & service update:
(insert presentation here)



Amanda Acheson
Coconino County
Programs & service update:
(insert presentation here)

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Rebecca Sayers
SEDI
Programs & service update:
(insert presentation here)

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Friends of Flagstaff's Future suggested policies:

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CAC Discussion:

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