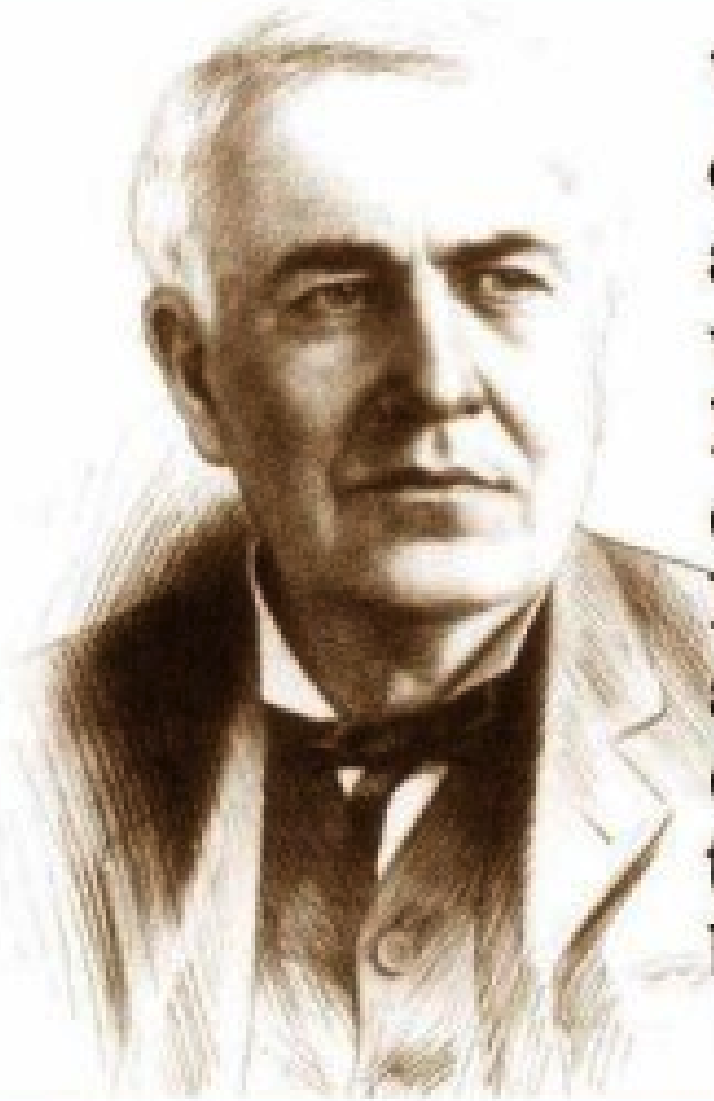
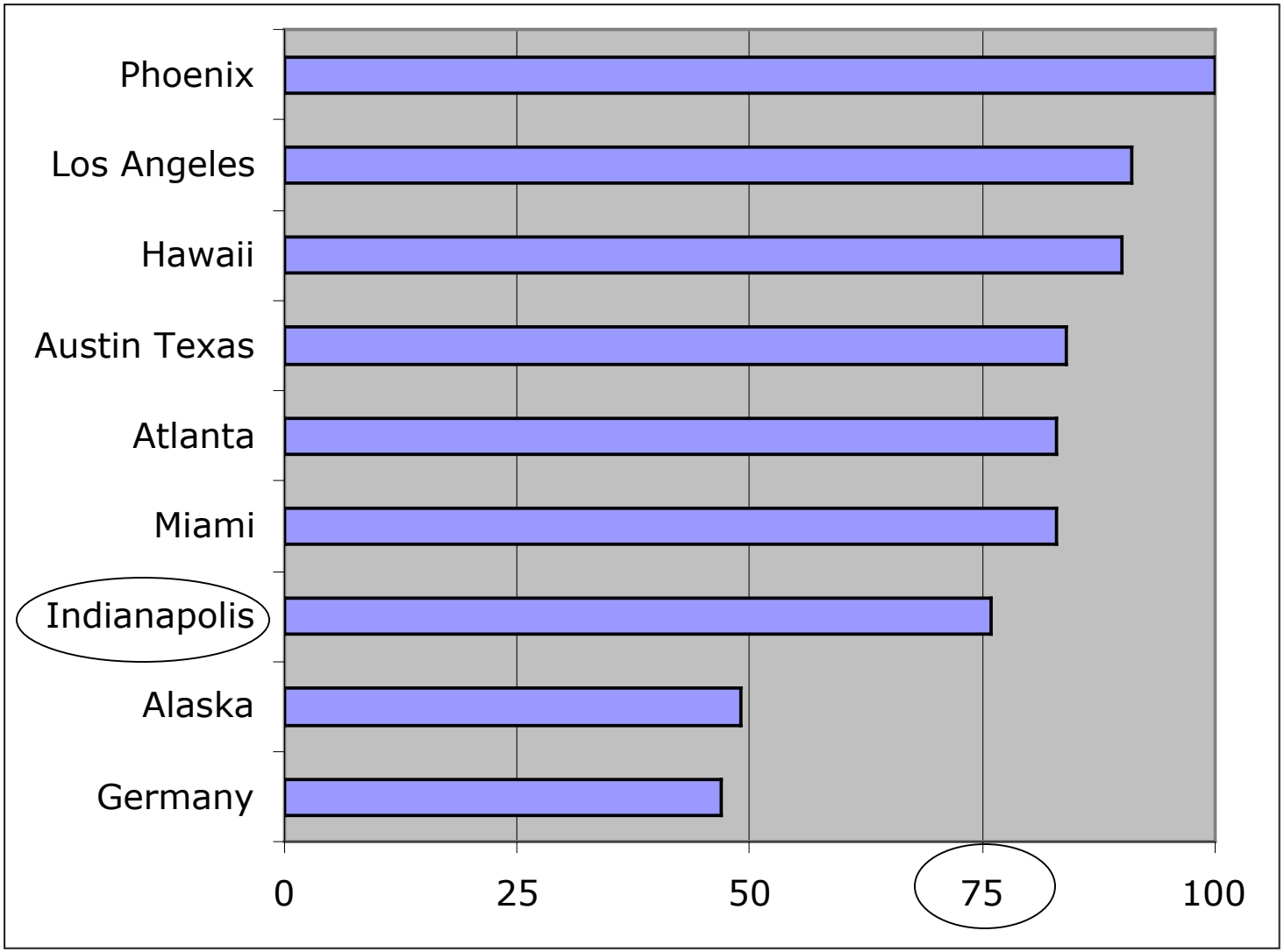


We are like tenant farmers
chopping down the fence
around our house for fuel
when we should be using
Nature's inexhaustible sources
of energy — sun, wind and tide.
I'd put my money on the sun
and solar energy. What a source
of power! I hope we don't have
to wait until oil and coal run out
before we tackle that.

• Thomas Alva Edison, 1931

Indiana has more solar potential than Germany, a solar leader



SIREN

Southern Indiana Renewable Energy Network

sirensolar.org

501C 3 nonprofit

Going Solar Programs

2011 - 2015

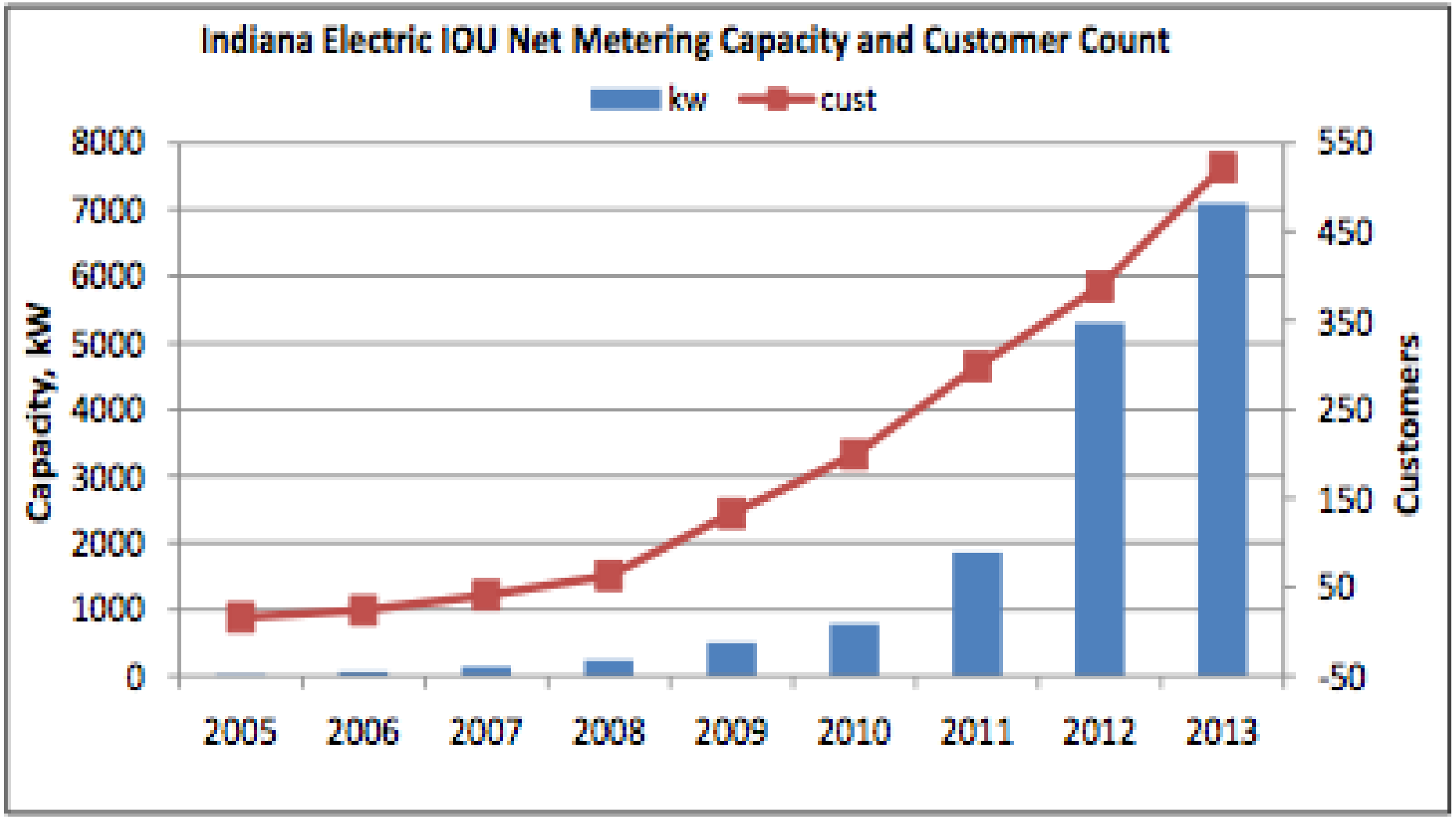
Bloomington, Carmel, Columbus,

Evansville, Indianapolis, Lafayette

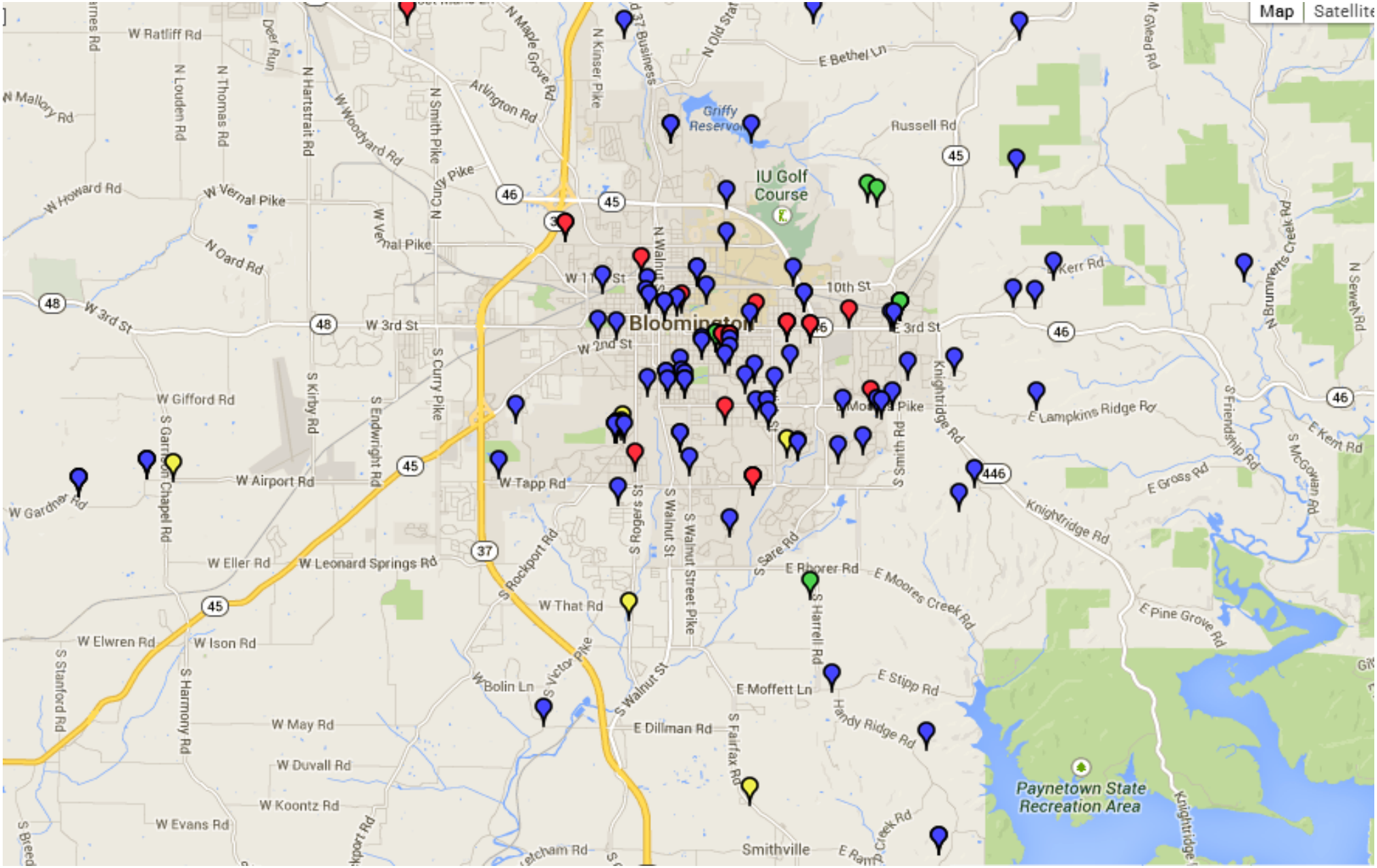
April 9 Bloomington

April 18 Batesville

Figure 1. Number of customer participants and total capacity by year

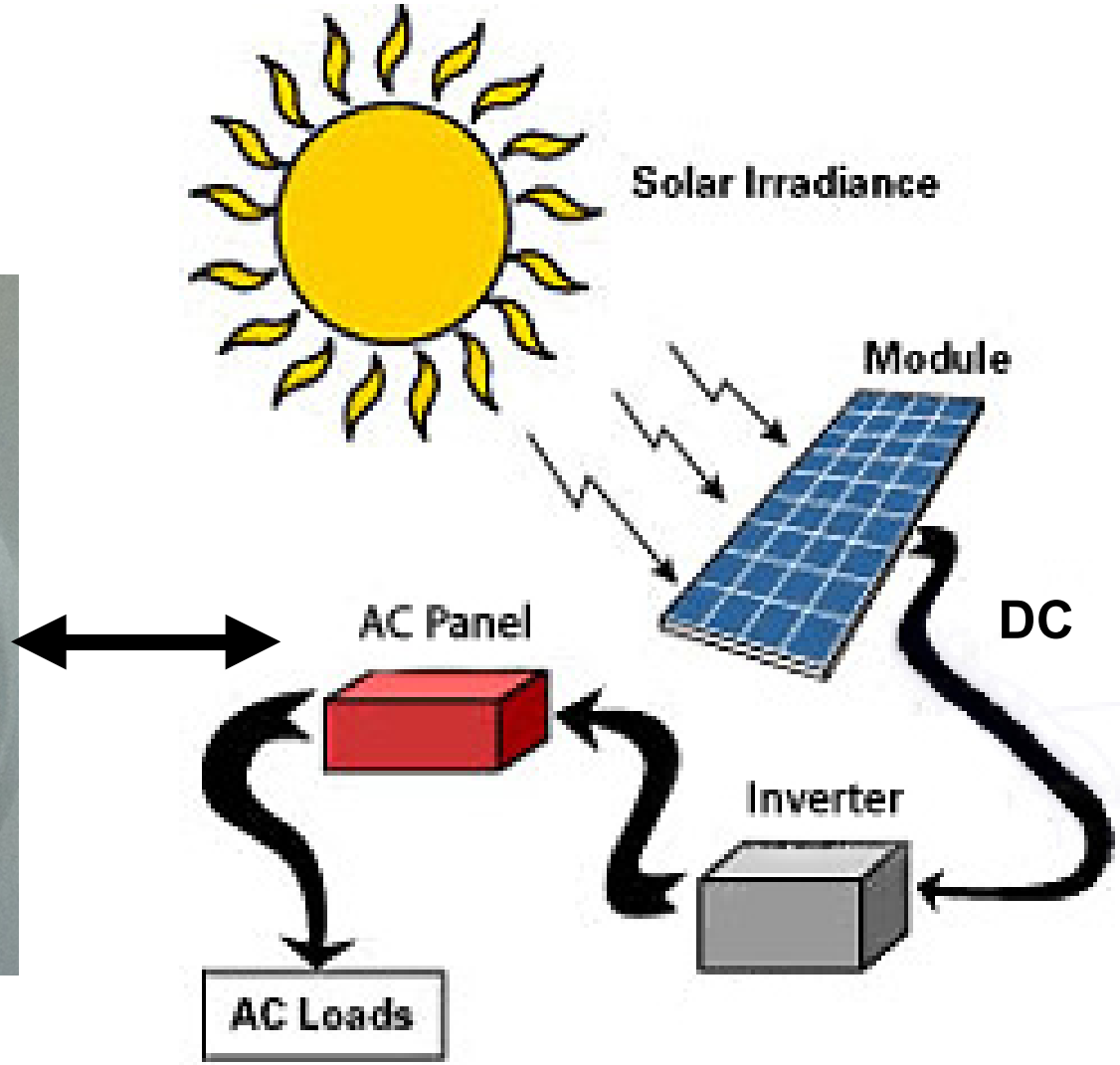


Indiana's renewable energy growth



over 100 PV systems in Monroe county

SOLAR ELECTRIC (PV) photovoltaics



No batteries

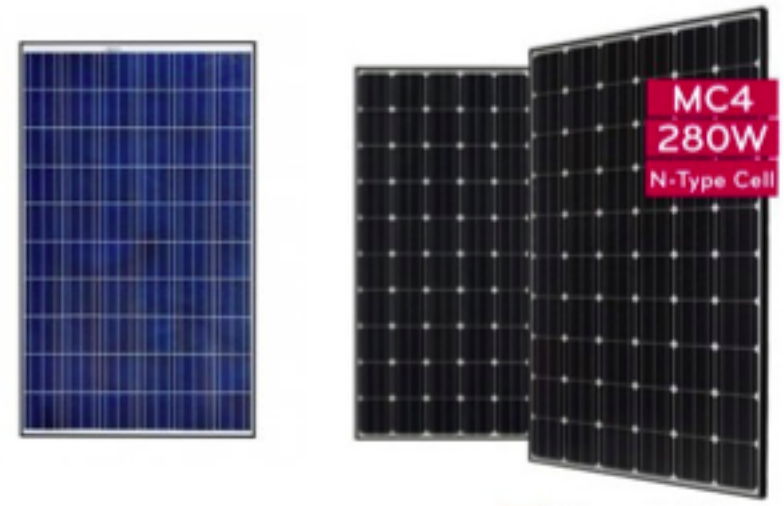
DC > AC micro-inverter for each panel

What's a Watt ?

Measure of Power

60, 15 or 9 watts

240, 260 or 280 w solar panels



kilowatt @ 1 hour = 1 kwh

36 solar panels = 12,000 kwh

three 275 watt solar with full sun

make about 1,000 kwh in a year

average house = *12,000 kwh* /year

50 - 50

Replace half with Solar PV and then try to cut your remaining electricity usage with energy conservation

4,000 kwh annually

PVWatts * * *

AC Energy & Cost Savings

Cautions for Interpreting the Results

(Type comments here to appear on printout; maximum 1 row of 80 characters.)

Station Identification	
City:	Indianapolis
State:	Indiana
Latitude:	39.73° N
Longitude:	86.28° W
Elevation:	246 m
PV System Specifications	
DC Rating:	4.0 kW
DC to AC Derate Factor:	0.790
AC Rating:	3.2 kW
Array Type:	Fixed Tilt
Array Tilt:	30.0°
Array Azimuth:	180.0°
Energy Specifications	
Cost of Electricity:	11.0 ¢/kWh

Results			
Month	Solar Radiation (kWh/m ^{2}/day)	AC Energy (kWh)	Energy Value ($)
1	2.98	303	33.33
2	3.96	363	39.93
3	4.41	424	46.64
4	5.26	476	52.36
5	6.01	545	59.95
6	6.20	523	57.53
7	6.24	540	59.40
8	5.85	516	56.76
9	5.19	451	49.61
10	4.53	423	46.53
11	2.91	271	29.81
12	2.24	223	24.53
Year	4.65	5057	556.27

Duke Net Metering

	a	b	c	d
solar kwh	500	500	500	500
kwh used	**600**	**500**	**400**	**600**
kwh billed	100	0	0	0
kwh credit to next month			+ 100	
payment	**$24**	**$10**	**$10**	**$10**

Duke Variable Rates for 300 kwh

9 cents above 1000 kwh = $27

10 cents above 300 kwh = $30

14 cents for first 300 kwh = $42

Net metering solar owners

pay the highest rates

and save at the lowest rates

Your PV savings is the
$$ value of kwh + SREC income

5000 kwh @ $0.20 = $1,000

$0.15 = $ 750

$0.12 = $ 600

$0.10 = $ 500 /year

Renewable Energy Credits

Sell State	System Location	Last Sale
DC	DC	$490
DE	DE	$46
MA	MA (SREC I)	$275
MD	MD	$140
NJ	NJ	$178
OH	OH	$58
OH	IN, KY, MI, PA, WV	$58
PA	PA, VA	$70

~~ $50 / 1,000 kwh (5 cents /kwh)

Indiana RECs can be sold to Ohio utilities

Financing with
Equity Line of Credit

$34 monthly for $10,000 loan

payment of interest only

4 percent = $400 /year

no closing fees

Factors affecting cost

- number of panels
- inverter and product selection
- rooftop, on ground or shaded parking
- roof material, height, slope and access
- location of site and travel time
- government rules

Commercial Site
30% tax credit + depreciation

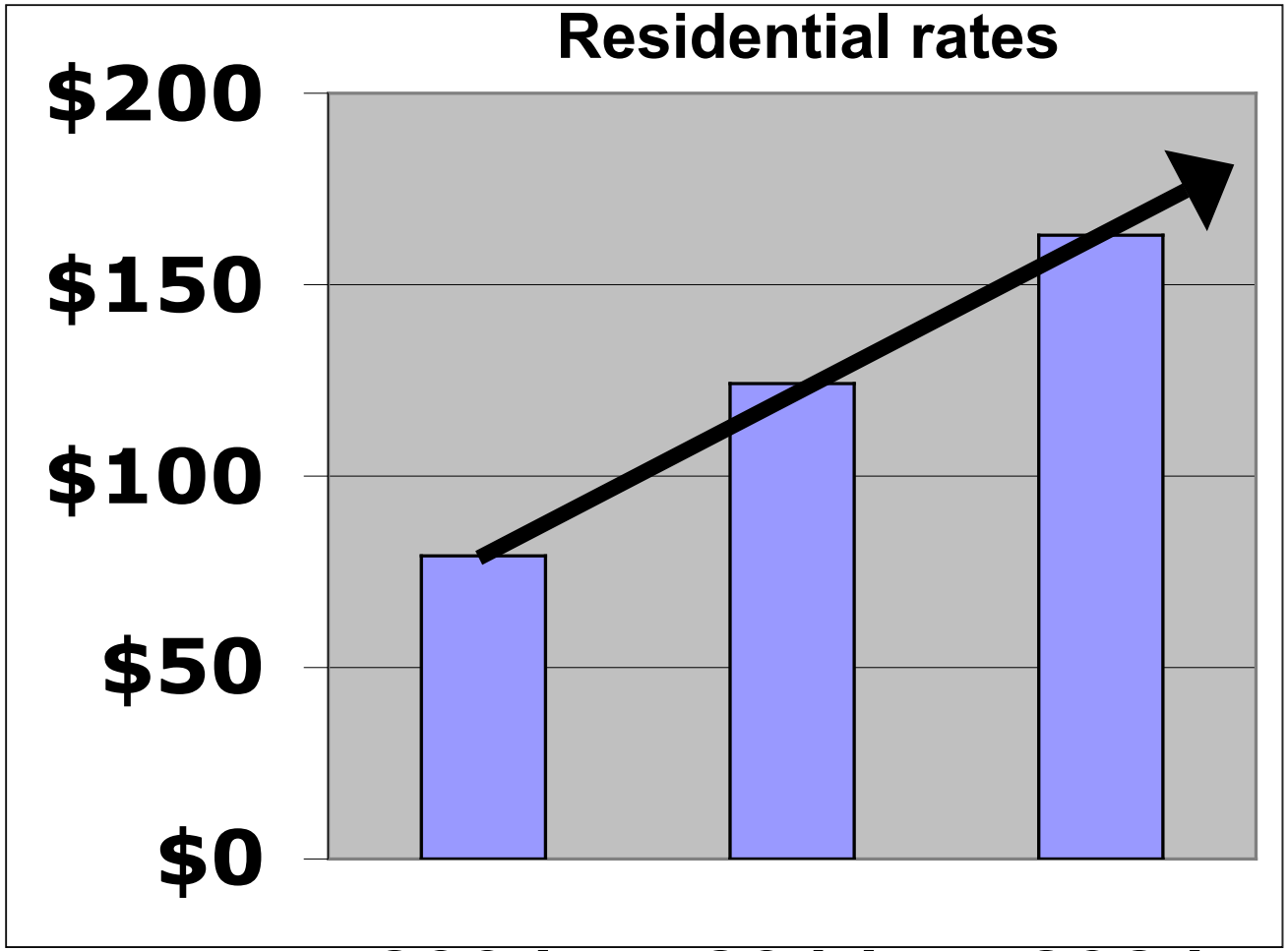
10 kw	100 kw	500 kw
$3 /watt	**$2.70 /watt**	**$2.50 /watt**
$30,000 **($15K)**	$270,000 **($135K)**	$1.2 M **($600K)**
13,000 kwh	**130,000 kwh**	**650,000 kwh**
	kwh savings:	**$70 K +**
	SREC income:	**$30 K**

Federal Site

20 kw	200 kw	1,000 kw
$4 /watt	$3.20 /watt	$2.70 /watt
$80,000	$640,000	$2.7 M
26,000 kwh	260,000 kwh	1.3 M kwh
	kwh savings:	$190 K +
	SREC income:	$60 K

An investment
in renewable energy
is an appreciating asset
that will increase in value
when future utility rates go up

Duke electric price per 1,000 kwh



Solar Performance

80 percent of original output

after 25 years

100,000 kwh >>> 80,000 kwh

more than 40 years life

Indianapolis Airport solar farm

Negotiated Contracts

megawatt projects

feed-in tariff

power purchase agreement