Energy Community of Practice and IEA SHC Task 36. Solar energy user survey, first results

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with apologies to: those who contributed and whom we forgot

The Survey

- Survey to get info about users' requirements for solar energy resource data
- Survey online from June 2006 to February 2007, hosted at the JRC
- Advertised on the PVGIS, SoDa, Satel-Light and Meteotest sites, by GEOSS, and personal effort

Survey questions

Questions in 14 different groupings

1) Name and affiliation
2) Type of profession
3) Interest in which technology?
4) Data for what purpose?
5) Type of data
6) Time resolution
7) Timeliness
8) Synthetic data
9) Sites/gridded data
10) Spatial resolution
11) Manipulation of data
12) Quality of existing data
13) Radiation forecasts
14) Climate change

Results (preliminary)

- Total of 122 entries in the database
- 6 duplicates, 5 completely empty, ~10 practically empty
- Most respondents went all the way through, some respondent fatigue is evident

Repondents by country/region

Number of respondents:

- Spain: 16
- Germany: 8
- France, Italy: 7 each
- Rest of Europe: 28
- U.S.A: 2
- Canada: 1
- Rest of world: 10
- No answer: 31

Europe overall: 83%

Profession of respondents

manufacturer	14	16
engineering company	31	35
utility company	7	8
public research laboratory	7	8
governmental, public agency / service	6	7
private research laboratory	6	7
university	15	17
non-governmental organization or othe	6	7
other (please specify):	15	17

Type of technology / field of interest

	Average points	Answer >3
photovoltaics (PV):	3.39	60
concentrator PV:	1.34	21
solar heating:	2.53	40
solar cooling:	1.55	18
Concentrating (thermal) solar powe	1.95	31
chemical systems:	0.23	2
water desalination:	0.55	6
building engineering, architecture:	1.92	34
others (please specify):	8 replies	

Total number of valid answers: 96

For what purpose are solar radiation data needed?

	Average points	Answer >3
site selection:	2.60	45
feasibility study:	3.33	60
cost assessment:	2.72	46
investment decision:	2.77	52
guarantee/certification/insurance:	1.08	17
system design:	**3.49**	**65**
deployment:	1.06	19
plant operation:	1.42	24
grid operation:	0.88	13
plant maintenance:	0.79	11
plant decomissioning:	0.29	1
monitoring:	1.58	24
fault detection:	0.80	12
research/education/promotion:	2.25	39
policy-making:	0.63	8
energy trading:	0.84	13
Other: (please specify):	5 replies	

Total number of valid answers: 97

Type of data needed

	Average points	Answer >3
global horizontal radiation:	3.77	69
direct radiation:	**4.18**	**75**
diffuse radiation:	3.23	52
radiation on tilted and tracking surfaces:	3.26	59
daylight (illuminance, luminance):	2.22	35
spectral distribution of irradiance:	1.8	27
ambient temperature:	3.44	59
snow cover:	1.17	16
wind speed / wind direction:	2.65	46
relative humidity / dew point:	1.67	27
atmospheric pressure:	1.38	20
Other: (please specify):	4 replies	

Total number of valid answers: 95

Time resolution and timeliness

Temporal resolution	Average points	Answer >3
annual averages:	3.1	53
monthly averages:	**3.75**	**67**
weekly averages:	1.85	31
daily averages:	2.39	38
hourly averages:	2.72	48
15 minute averages:	1.39	21
5 minute averages:	0.96	14
instantaneous values:	0.89	12
Other: (please specify):	1 reply	

Total number of valid answers: 94

Timeliness	Average points	Answer >3
very recent (e.g. last hours/days):	2.15	29
recent (e.g. last month / last year):	**3.61**	**64**
from older archives:	3.33	60

If you are using synthetic data, what type?

	Average points	Answer >3
Typical meteorological years:	**4.05**	**59**
Design reference years:	2.41	37
Test reference years:	1.91	27
Stochastically generated typical years:	1.36	18

Total number of valid answers: 82

Spatial data and resolution

Type of spatial data (92 valid replies)	Average points	Answer >3
A single site:	1.93	33
Several sites, but less than 10:	2.32	39
More than 10 sites:	1.88	28
A grid (map) of point values covering a country/region:	2.53	43
A grid (map) of average values covering a country/region	**3.09**	**54**

Spatial resolution(88 valid replies)	Average points	Answer >3
Values or time-series averaged over regions/countries:	1.48	19
(approx. 300 km x 300 km, global coverage):	1.3	12
(approx. 100 km x 100 km, global/regional coverage):	2.41	35
(approx. 10 km x 10 km):	**2.97**	**48**
5 km x 5 km:	2.43	44
1 km x 1 km:	2.65	42

Use of data

	Average points	Answer >3
When accessing either location-specific or mapped observations do you:		
Use observations themselves for documentation or customized purposes:	2.62	42
Use observations as inputs to a simulator/software:	**3.17**	**54**
Use time-averaged observations for documentation / custom applications:	2.19	32
Use statistical summaries other than averages (e.g., percentiles,		
probability distribution, extremes), for documentation / custom applications:	1.69	23
Use time-averages or statistical summaries as inputs to a simulator/software:	2.23	39

Total number of valid answers: 88

Quality of data available

Is the solar resource and meteorological information currently available satisfactory when considering...

	Average points	Answer >3
Access:	2.72	29
Up-to-date:	3.01	36
Geographical coverage:	3.09	38
Accuracy:	2.83	32
Clarity in description of products	2.76	35
As a whole:	2.65	28

Total number of valid answers: 83

Are Radiation forecasts important to you?

	Average points	Answer >3
Nowcasting (up to 6 hours):	1.32	14
Forecast up to 24 hours:	1.9	23
Forecast up to 3 days:	1.35	12
Forecast up to 1 week:	1.51	8
Forecast up to 1 month:	1.97	21
Seasonal forecast (2-6 months):	**2.66**	**25**

Total number of valid answers: 63

Is climate change an issue for your activities?

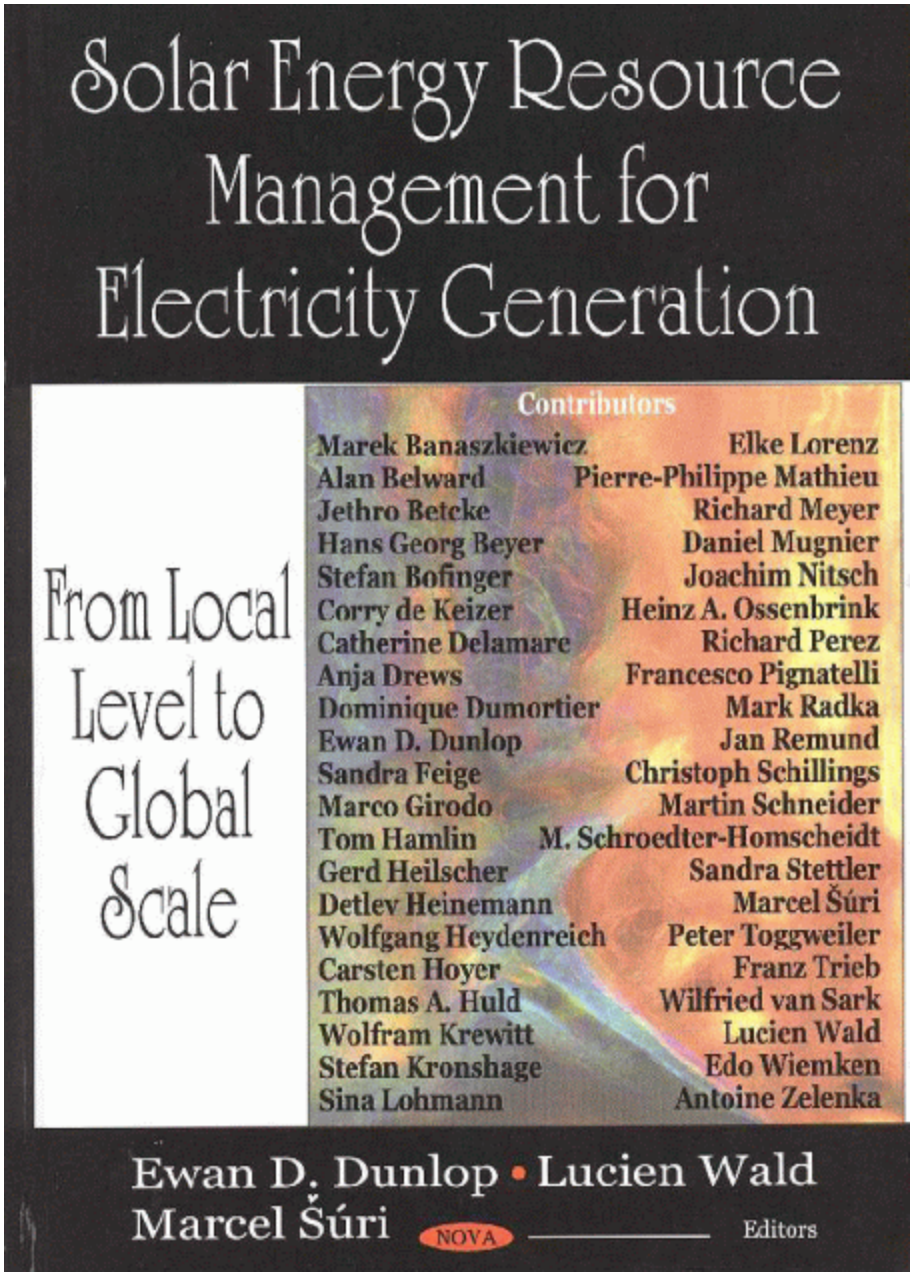
	Yes	No	No answer
Do you expect that regional climate change could influence			
the feasibility of solar applications of concern to you?	65	28	16
Do you expect that regional climate change could influence			
their operational efficacy during the expected operation period?	58	34	17
Would you like better information on how solar installations			
help to reduce greenhouse gases and what this means for our environment?	44	42	23

Problems

- Advertising (and lack of it) gave a regional distortion (5 of every 6 respondents from Europe)
- Also caused the user profile to be skewed towards solar energy, and in particular PV
- Default value of 0 for answers makes it difficult to distinguish negative answers from no answer.

To-Do

- Deeper analysis.
- Translation of users requirements in terms of EO data
- Prospect for GEOSS and link with the 5-10 year strategic plan



Chapters:

Foreword

Solar Data Resources and Methods Presently Available

Current Research and Expected Products

Role and Needs of the Energy Service Providers

First Steps in Management of Distributed Energy Structures

Perspectives of Energy Issues in the Current Earth-Observation Programs

Summary