



UNIVERSITÀ
DEGLI STUDI DI TRIESTE



Rapporti OM

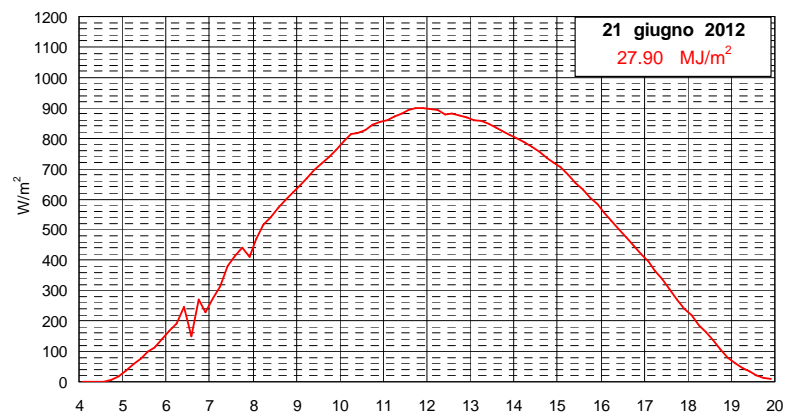
N. 155

Franco Stravisi
Stefano Cirilli

TRIESTE

Irradianza solare globale

2012



Trieste 2013

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TRIESTE

Irradianza solare globale 2012

Franco Stravisi, Stefano Cirilli

Questo rapporto aggiorna i dati orari di irradianza solare globale a tutto il 2012; il piranometro è lo stesso (Kipp&Zonen CM11 n. 882127) usato negli anni precedenti presso la stazione meteorologica di Trieste del Dipartimento di Matematica e Geoscienze, situata sul tetto dell'ISIS Nautico in piazza Hortis, 1. Il 23 febbraio 2012 il piranometro è stato spostato dalla posizione originaria (fig. 2), sul traliccio del radar, sul nuovo palo di sostegno degli anemometri (fig. 3), dove è operativo dal 9 marzo 2012. I dati di irradianza media su intervalli successivi di 10 minuti sono memorizzati da un datalogger Nesa TMF500. La costante di calibrazione determinata in fabbrica il 9/3/1988 era $4.84 \text{ mV}/(\text{W}/\text{m}^2)$; successivamente (Stravisi, 2004 c) lo strumento era stato ricalibrato per confronto con altri piranometri, e la costante usata nei nostri rapporti è $4.95 \text{ mV}/(\text{W}/\text{m}^2)$.

Correzioni. I dati di irradianza solare globale registrati nella vecchia posizione (fig. 1, fig. 2) erano corretti in base all'irradianza diffusa per ovviare al parziale ombreggiamento del radar; questa correzione, pari in media al 4% dell'irradianza globale, è stata applicata, in mancanza dei dati di irradianza diffusa, sino al 23/2/2012. Successivamente la costante definita nel datalogger è quella valida per lo strumento con orizzonte libero (fig. 1, fig. 3), $4.95 \text{ mV}/(\text{W}/\text{m}^2)$. La serie annuale è corretta per l'eventuale deriva dello zero, sommando giornalmente una costante in modo che i dati notturni risultino pari al loro valore medio di $-4 \text{ W}/\text{m}^2$; successivamente i dati degli intervalli di 10 min notturni (elevazione del sole sull'orizzonte astronomico $\leq -1.5^\circ$) sono posti uguali a zero.

I dati di irradianza solare globale medi in 10 min sono memorizzati come numeri interi espressi in watt al metro quadrato (W/m^2); successivamente sono convertiti in dati di irradiazione totale in 10 min ed espressi in kilojoule al metro quadrato (kJ/m^2). I totali giornalieri di irradiazione sono espressi in megajoule al metro quadrato (MJ/m^2) ed arrotondati a due decimali. L'ultima riga di ogni mese riporta l'irradiazione totale mensile. E' usato il tempo medio dell'Europa centrale CET = UTC+1, tempo coordinato universale (tempo medio di Greenwich) più un'ora, ovvero l'ora solare locale.

Sono riportati anche i grafici 2012 della serie di irradianza solare globale consistente in dati medi su intervalli consecutivi di 10 minuti (Stravisi, 2004 d).

Riferimenti

- POLLI S. (1939): *Cinquant'anni di misure eliografiche a Trieste*, Riv. Meteorol., 1, 3/4, 1-8.
 POLLI S. (1940): *Radiazione solare globale a Trieste*, La Ricerca Scient., 10, 706-710.
 STRAVISI F. (1986 a): *Effemeridi del sole per Trieste*, CNR, Istituto Talassografico di Trieste, Rapporti sez. fisica, RF 2, 10 pag.
 STRAVISI F., PIERI G., FERRARO S. (1986): *Irradiazione solare globale a Trieste: dati orari 1981-1985*, CNR, Ist. Talassografico Trieste, Rapporti sez. fisica, RF 13, 106 pag.
 STRAVISI F. (1986 b): *Irradiazione solare globale a Trieste: dati orari 1971-1980*, CNR, Ist. Talassografico Trieste, Rapporti sez. fisica, RF 8, 68 pag.
 STRAVISI F. (2004 a): *La meteorologia a Trieste*, in: G.C. Cortemiglia, "La variabilità del clima locale relazionata ai fenomeni di cambiamento globale", Pàtron ed. Bologna, 245-288.
 STRAVISI F. (2004 b): *Dati orari di eliografia - Trieste 1886-2003*, 104, (04/6), 237 pag.

- STRAVISI F. (2004 c): *Trieste - dati orari di irradianza solare 1971-2003*, 105, (04/7), 154 pag.
- STRAVISI F. (2004 d): *Grafici di irradianza solare, Trieste 1971-2003*, 106, (04/8), 1690 pag.
- STRAVISI F. (2005): *Trieste, dati orari di eliofania e di irradianza solare 2004*, 108, (05/2), 134 pag.
- STRAVISI F. (2006): *Trieste, dati orari di eliofania e di irradianza solare 2005*, 116, (06/3), 134 pag.
- STRAVISI F. (2007): *Trieste, dati orari di eliofania e di irradianza solare 2006*, 124, (07/5), 134 pag.
- STRAVISI F. (2008): *Trieste, dati orari di eliofania e di irradianza solare 2007*, 128, (08/4), 134 pag.
- STRAVISI F. (2009): *Trieste, dati orari di eliofania e di irradianza solare 2008*, 133, (09/4), 134 pag.
- STRAVISI F. (2010): *Trieste, dati orari di eliofania e di irradianza solare 2009*, 138, (10/4), 134 pag.
- STRAVISI F. (2011): *Trieste, dati orari di eliofania e di irradianza solare 2010*, 144, (11/5), 134 pag.
- STRAVISI F., CIRILLI S. (2012): *Trieste - dati orari di irradianza solare 2011*, N. 149, 132 pag.




Fig. 1.- Posizione del piranometro Kipp&Zonen CM11 sul tetto dell'ISIS Nautico in piazza Hortis; (1) mensola sul traliccio del radar sino al 23/2/2012, (2) sul palo degli anemometri, rivolto a sud.




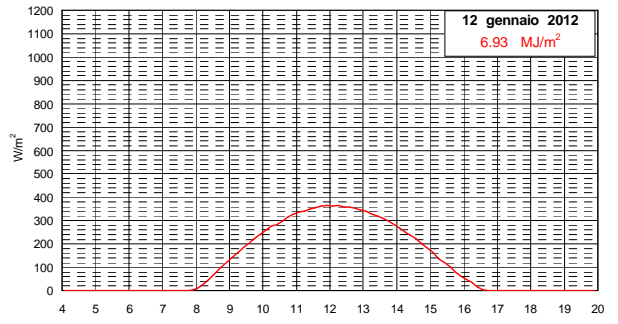
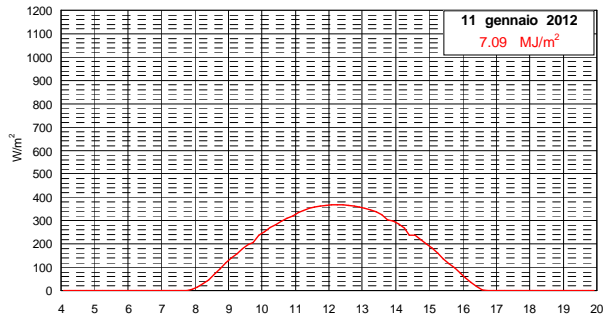
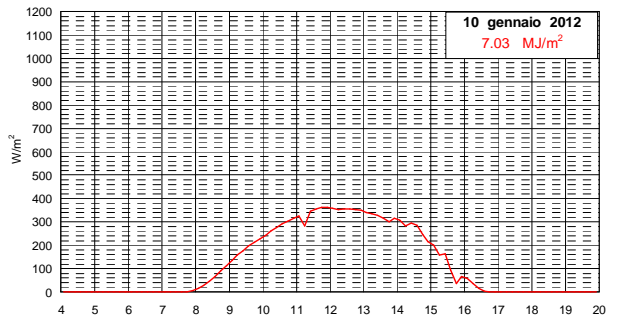
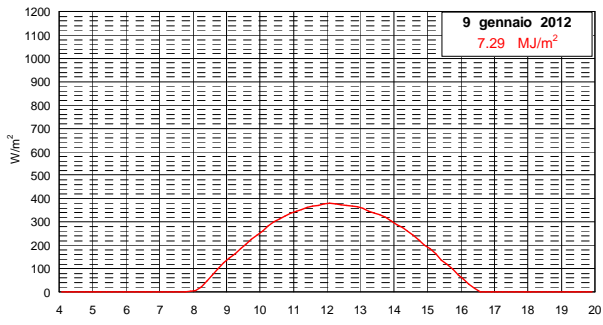
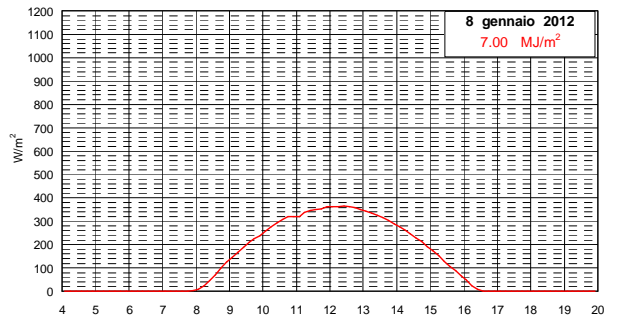
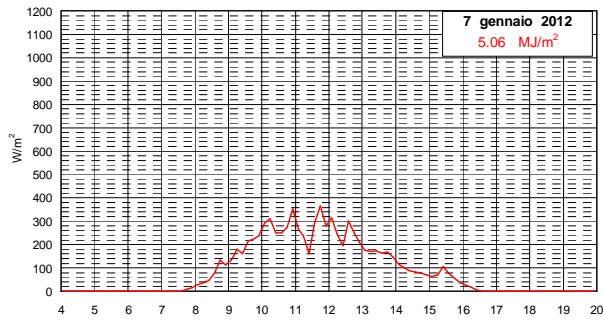
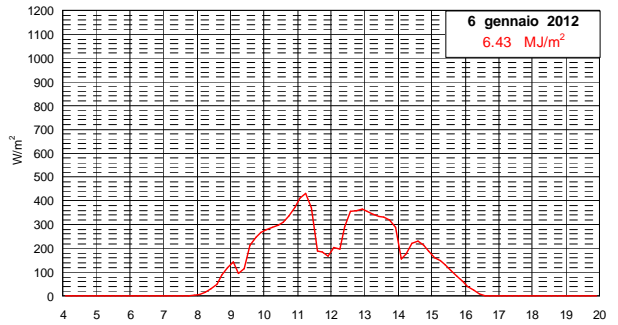
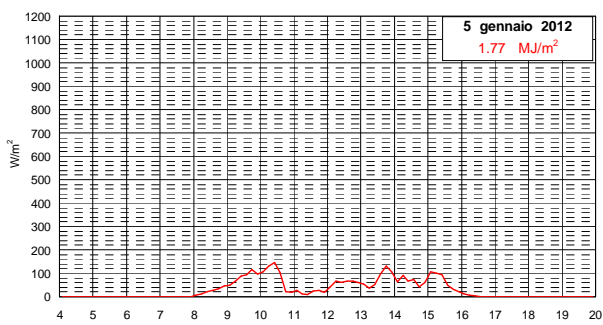
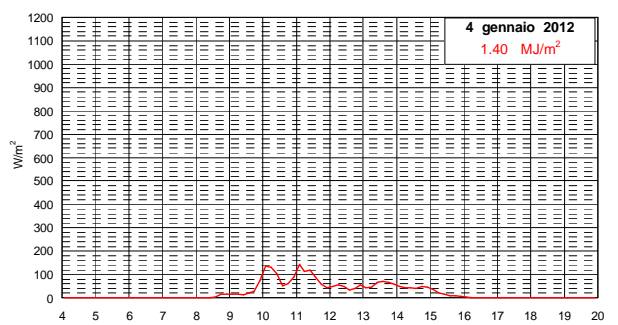
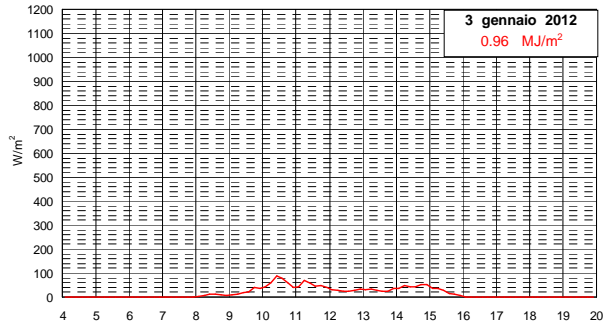
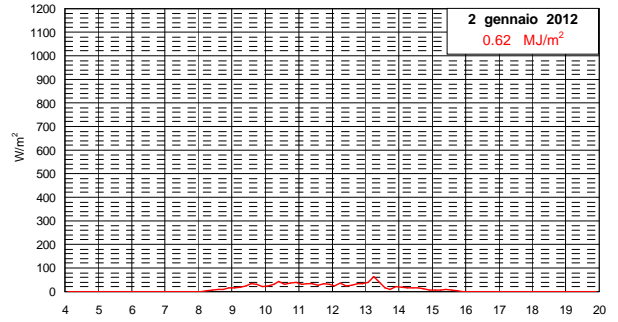
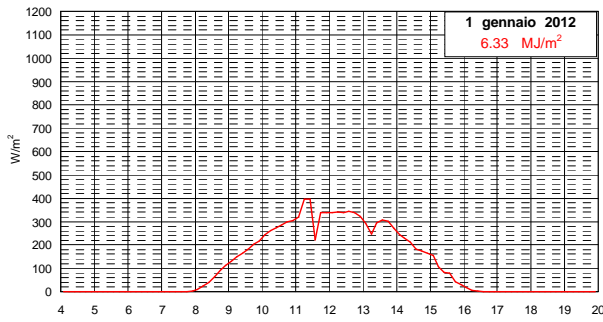
Fig. 2.- Posizione originale del piranometro sul traliccio del radar.

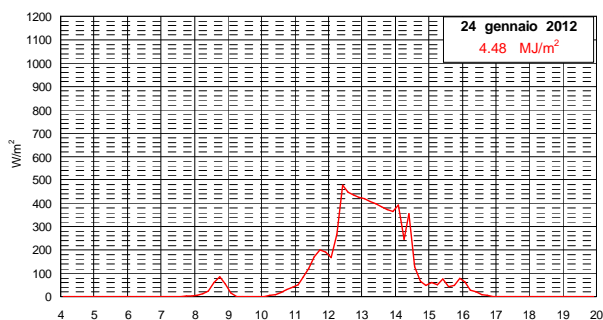
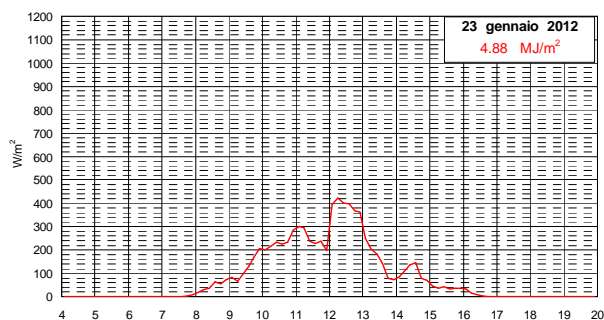
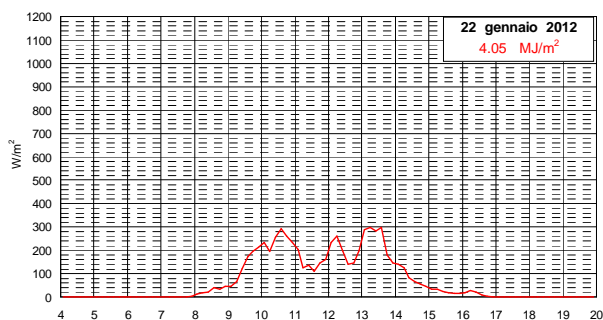
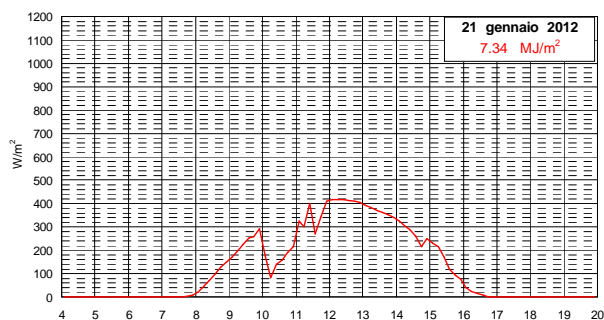
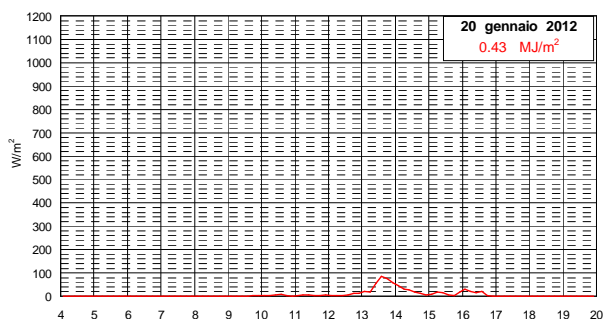
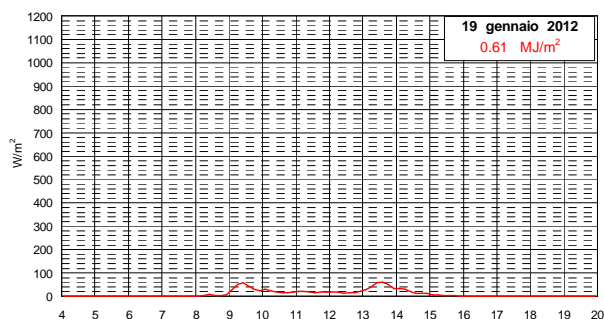
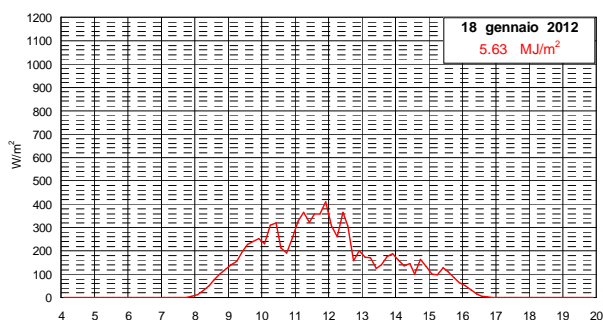
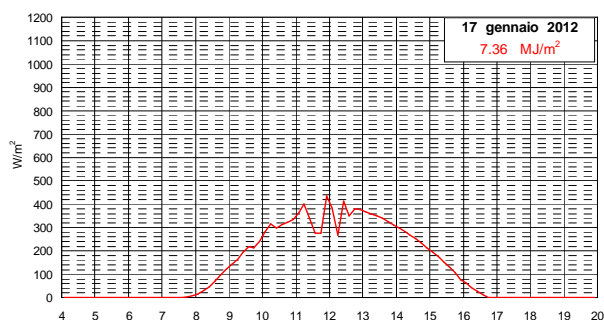
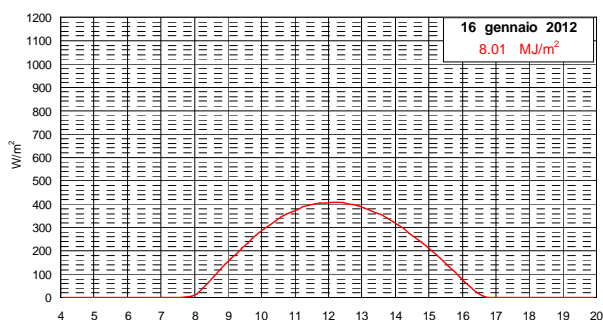
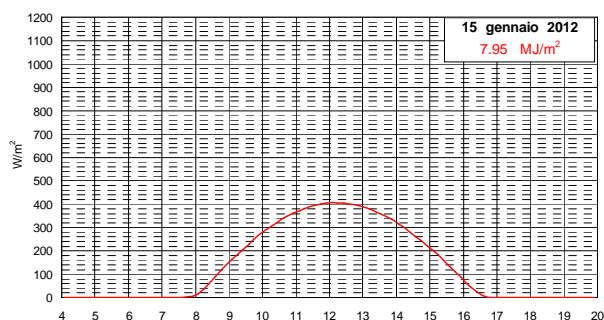
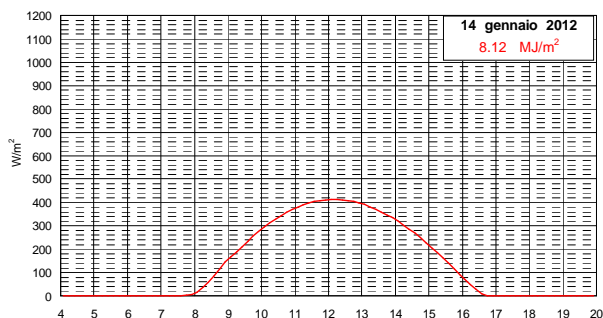
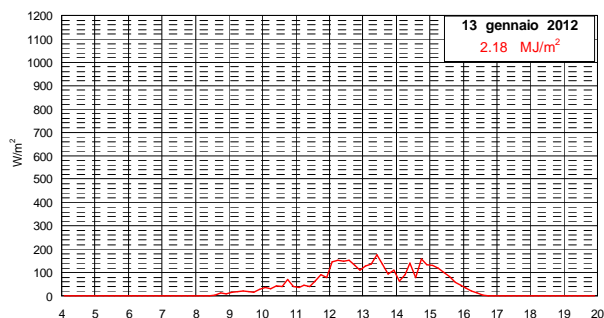


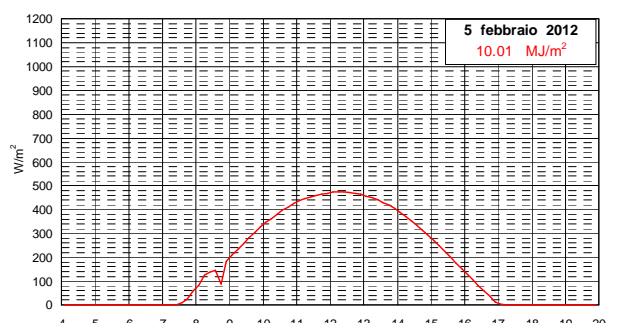
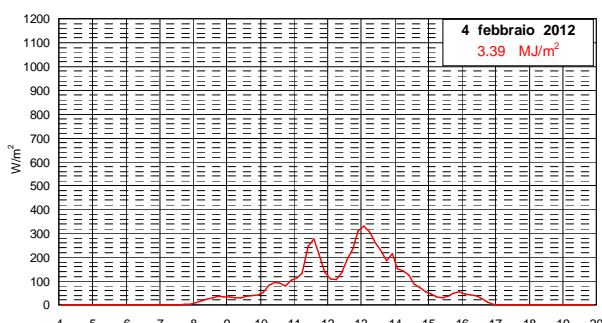
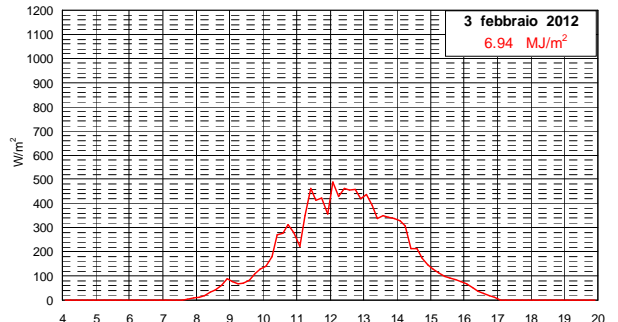
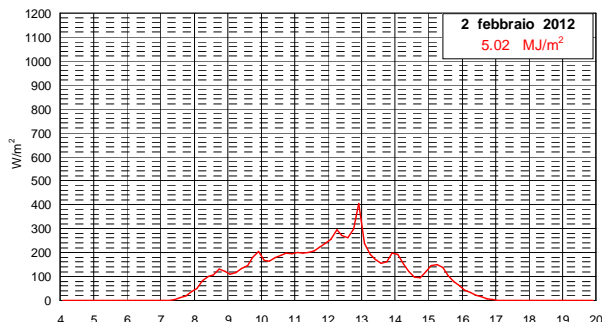
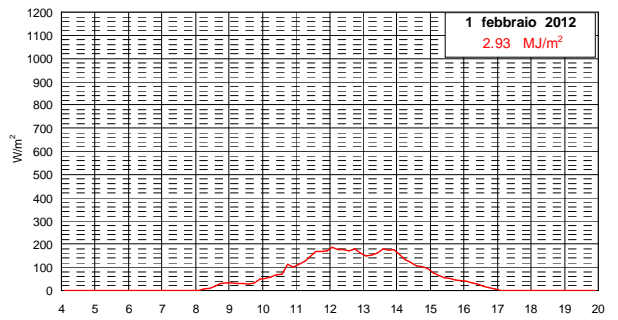
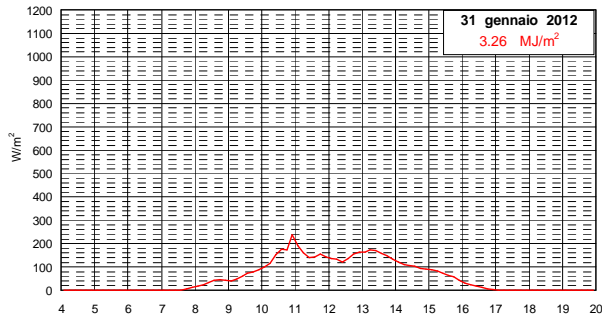
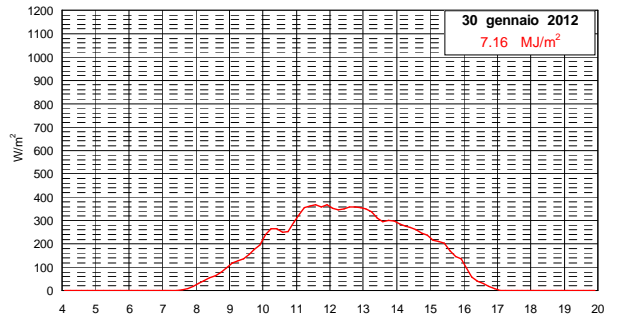
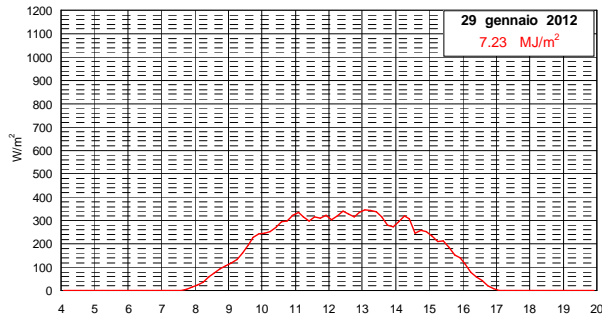
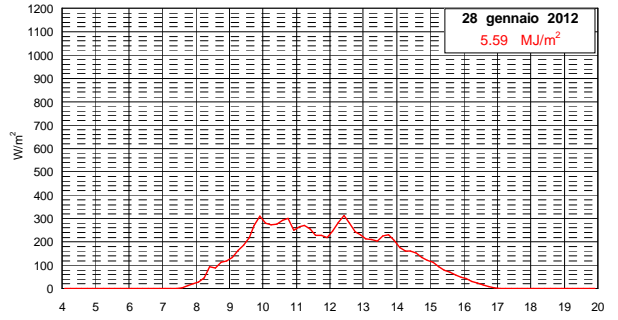
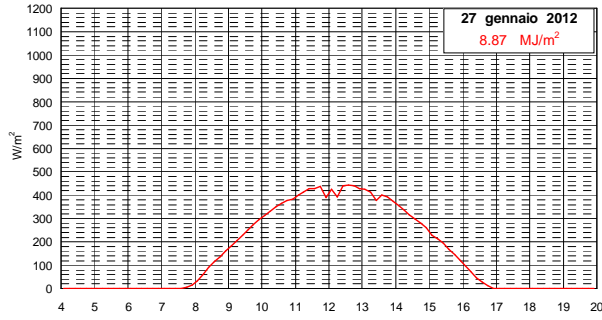
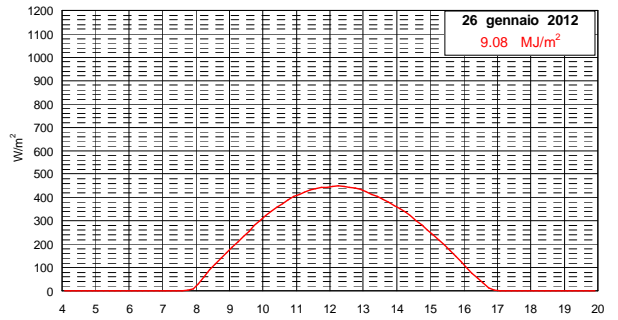
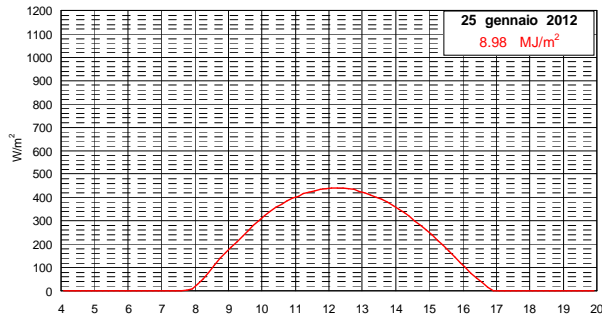
Fig. 3.- Posizione del piranometro dal 23 febbraio 2012.

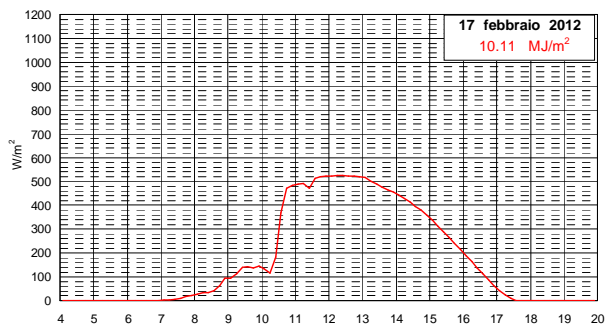
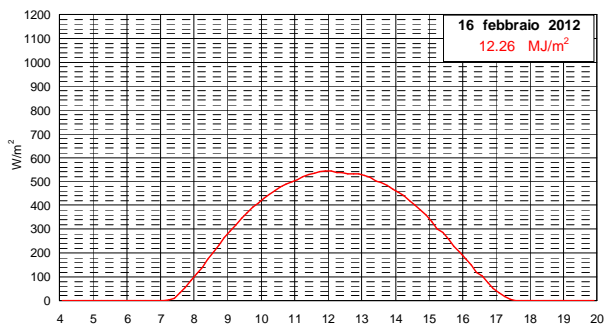
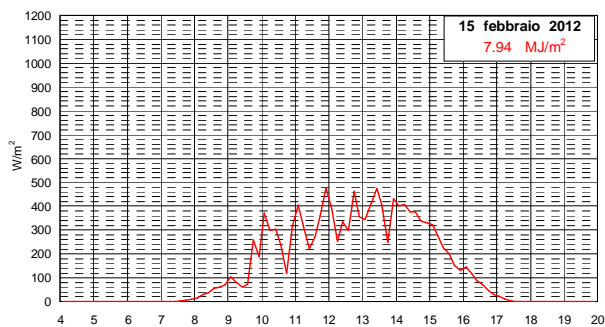
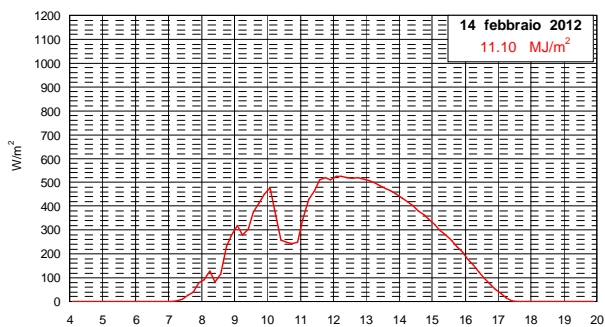
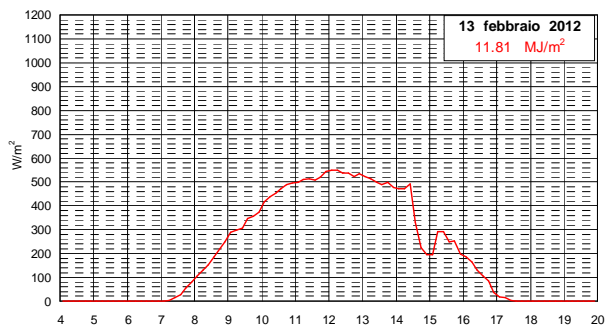
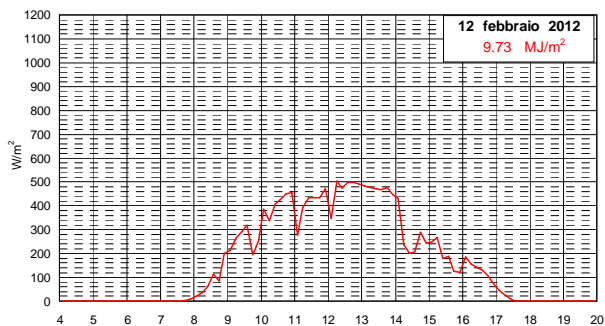
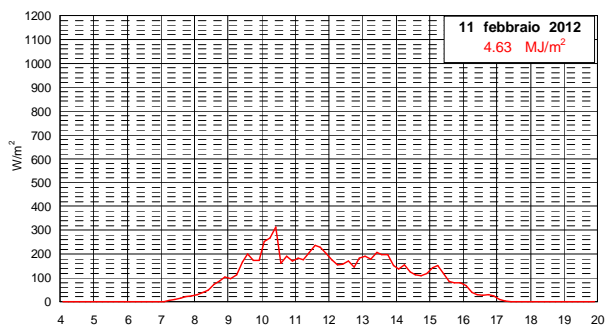
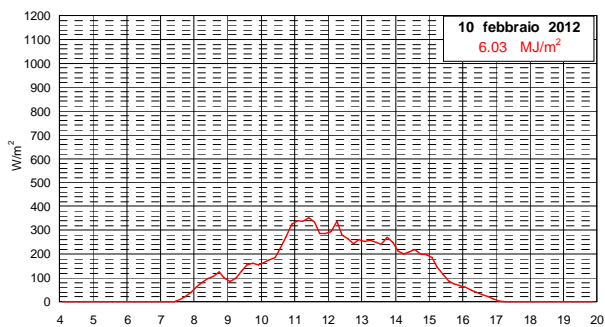
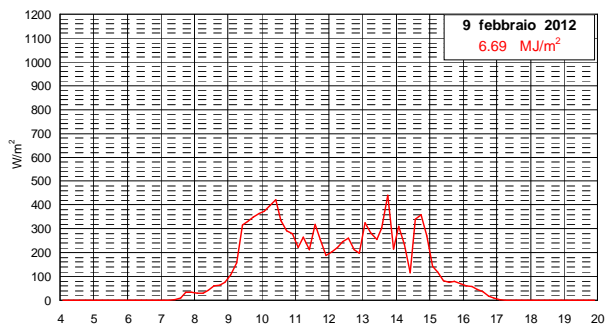
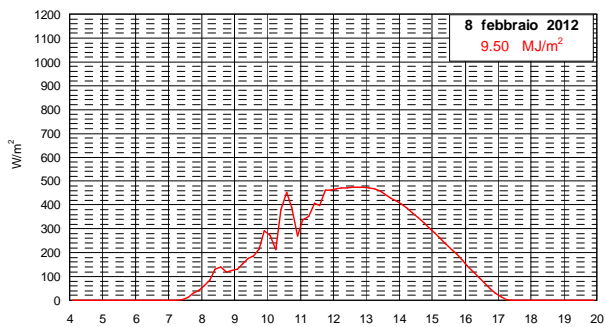
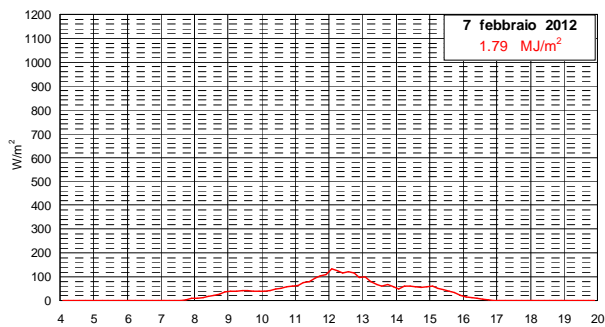
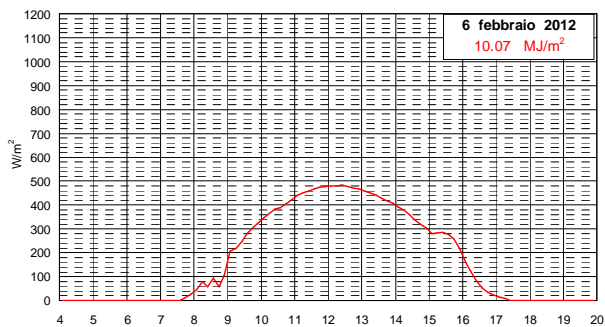
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| GEN | 169.09 |
| FEB | 257.03 |
| MAR | 484.85 |
| APR | 468.88 |
| MAG | 682.18 |
| GIU | 709.38 |
| LUG | 757.62 |
| AGO | 700.26 |
| SET | 406.80 |
| OTT | 293.86 |
| NOV | 151.17 |
| DIC | 131.88 |
| anno | 5212.48 |

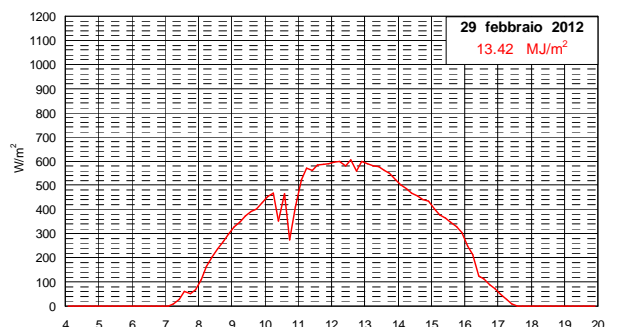
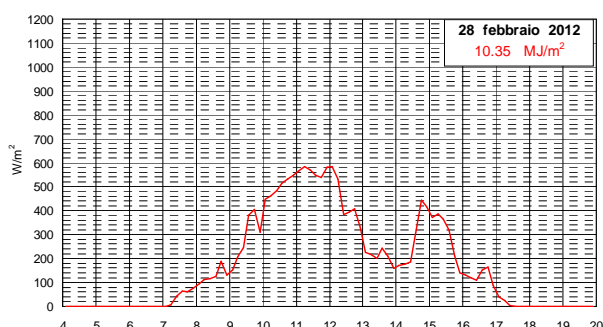
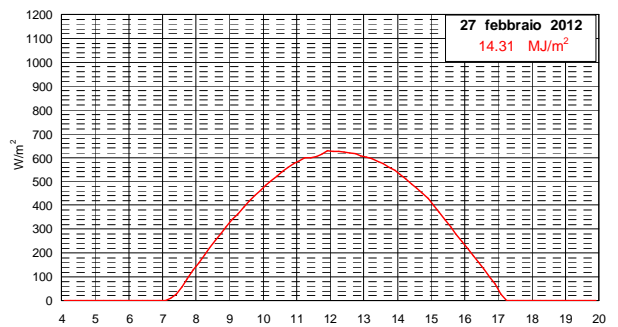
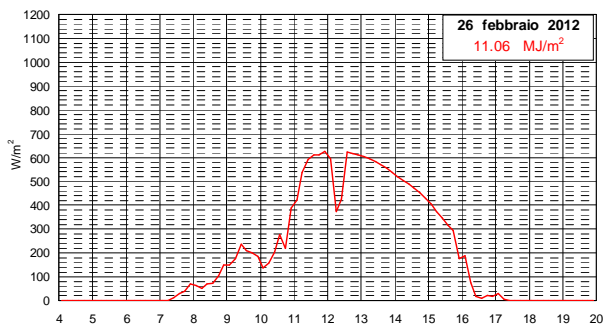
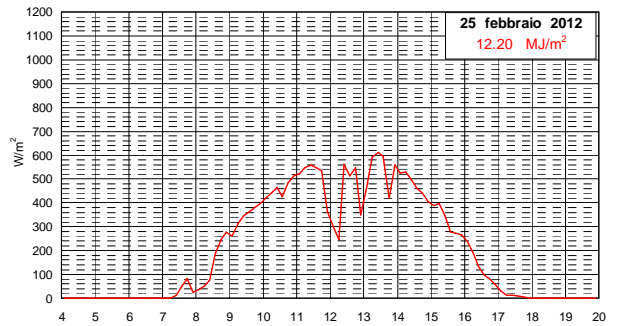
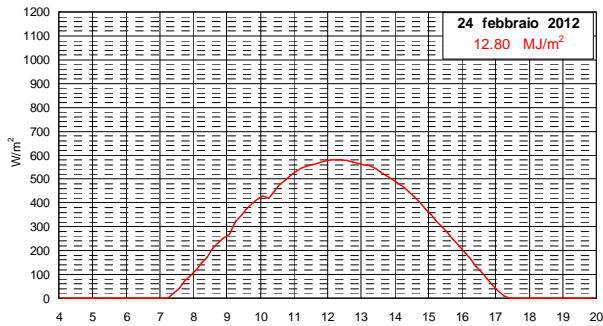
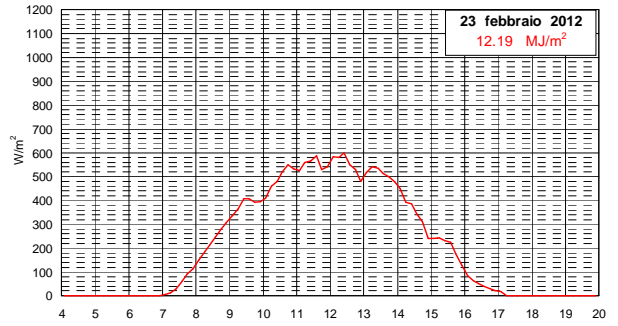
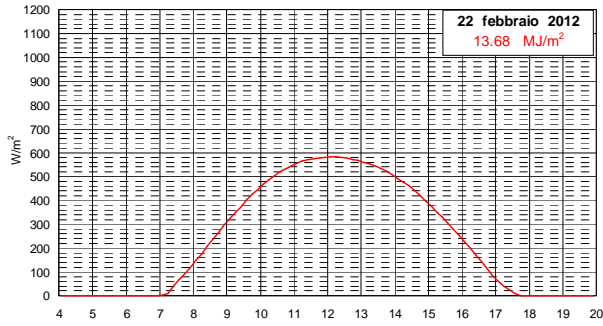
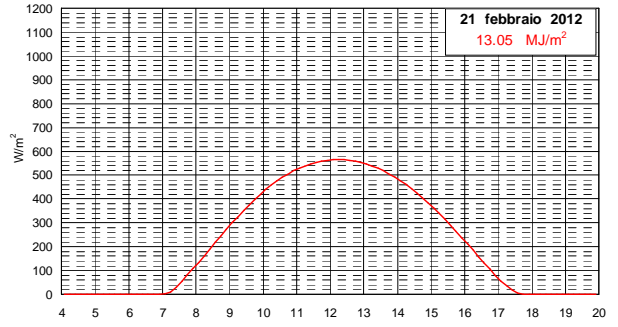
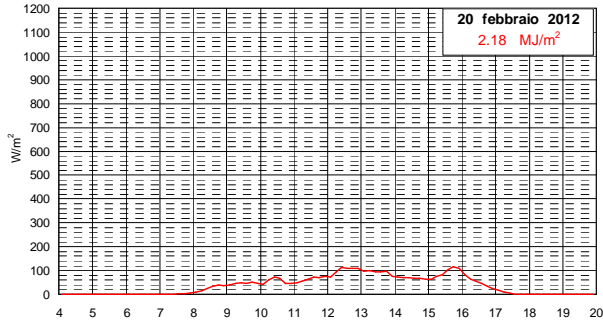
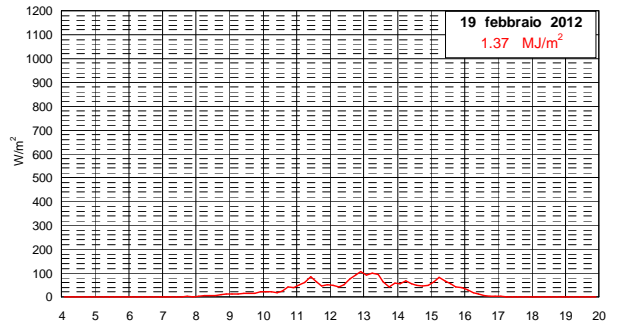
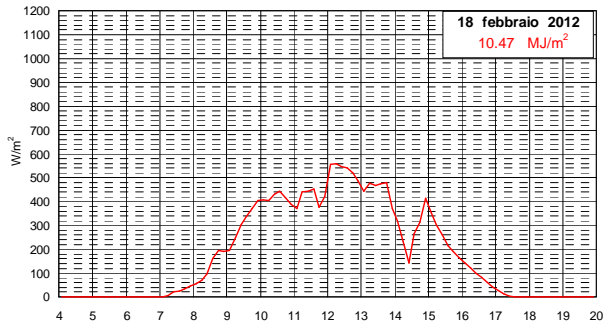
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|---|---|----------------|------------------------|------------------------|
|  | <i>Irradiazione solare</i> /(MJ/m ²) | | <i>rapporto</i> d/g | <i>Eliofania</i> /h |
| | <i>globale</i> | <i>diffusa</i> | % | |
| GEN | 138.74 | 58.79 | 42.4 | 102.9 |
| FEB | 206.51 | 85.64 | 41.5 | 125.6 |
| MAR | 352.30 | 151.09 | 42.9 | 160.9 |
| APR | 479.66 | 190.69 | 39.8 | 195.7 |
| MAG | 626.73 | 236.07 | 37.7 | 266.7 |
| GIU | 674.76 | 248.10 | 36.8 | 274.4 |
| LUG | 719.98 | 224.72 | 31.2 | 319.3 |
| AGO | 606.89 | 198.66 | 32.7 | 287.3 |
| SET | 438.81 | 158.46 | 36.1 | 216.9 |
| OTT | 274.07 | 114.28 | 41.7 | 146.1 |
| NOV | 142.92 | 66.94 | 46.8 | 99.6 |
| DIC | 120.63 | 49.84 | 41.3 | 103.7 |
| anno | 4782.01 | 1783.28 | 37.3 | 2299.0 |

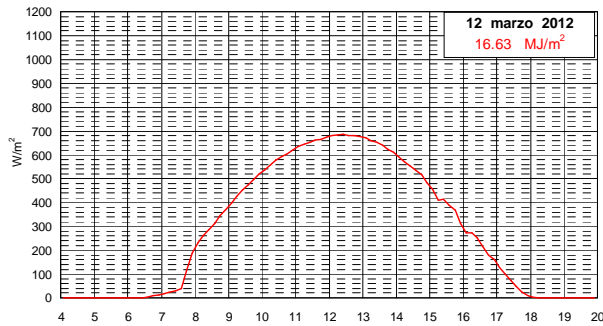
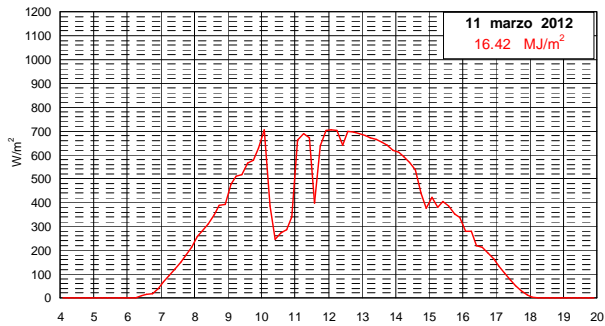
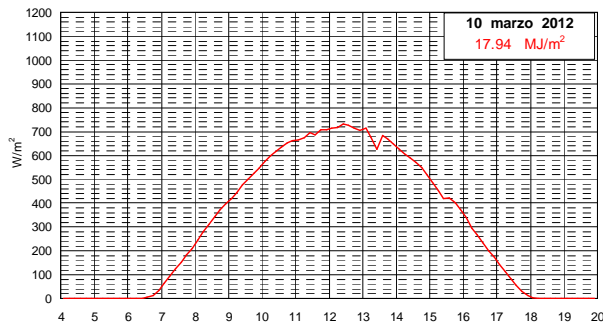
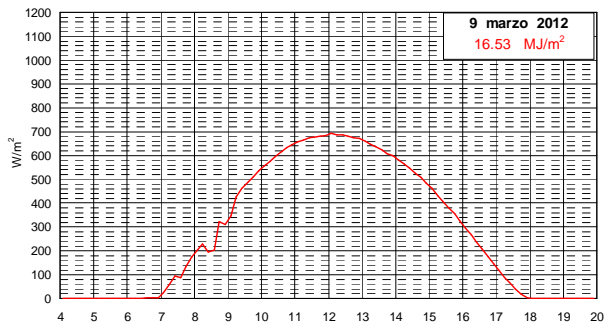
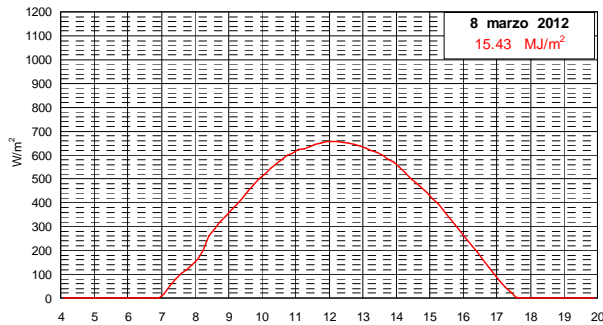
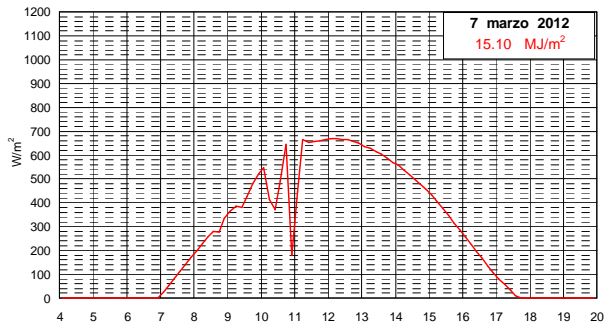
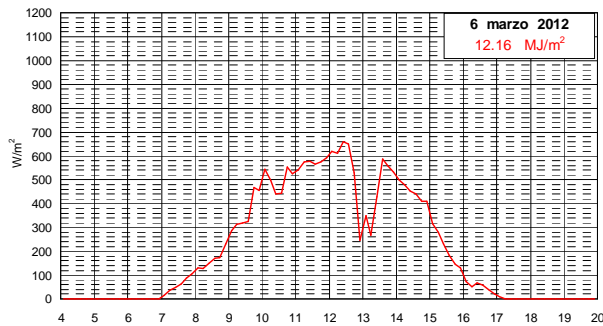
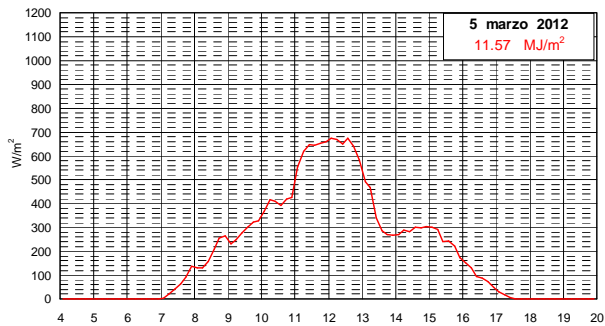
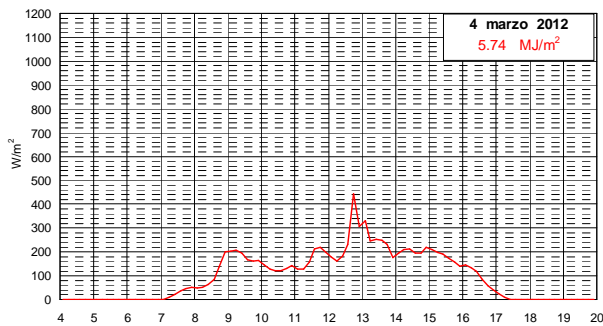
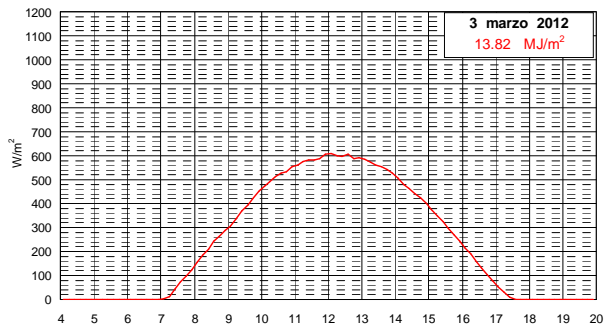
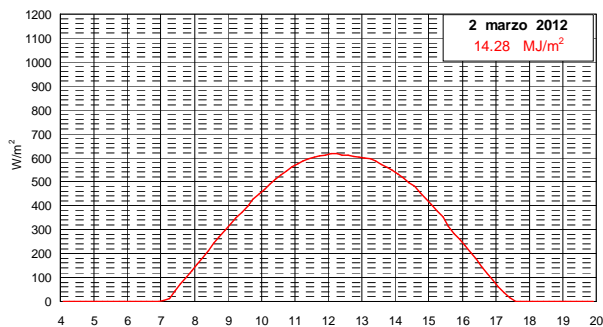
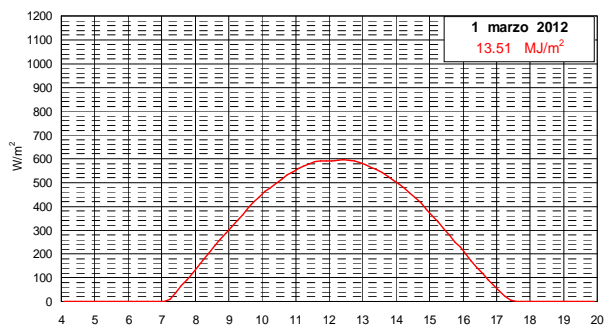


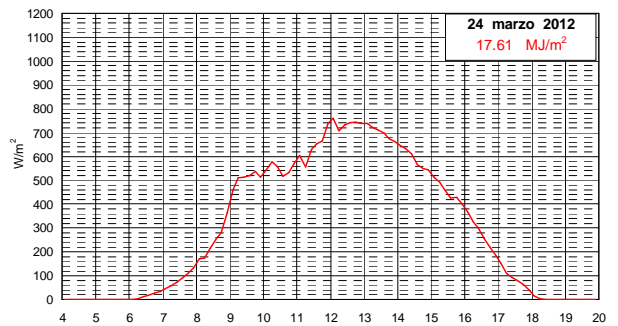
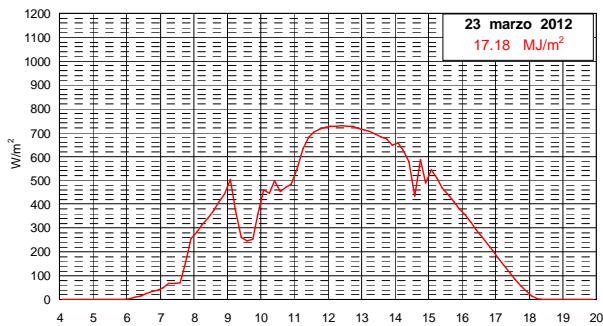
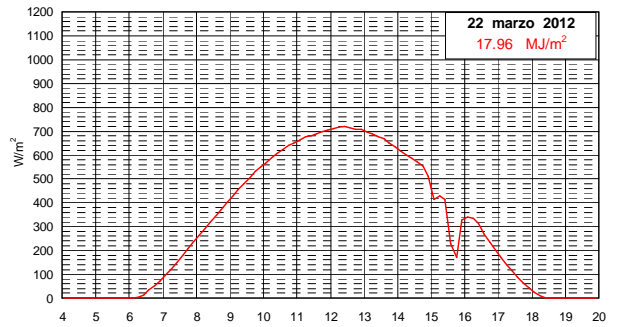
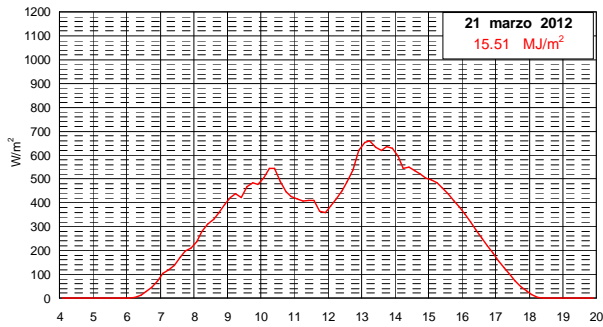
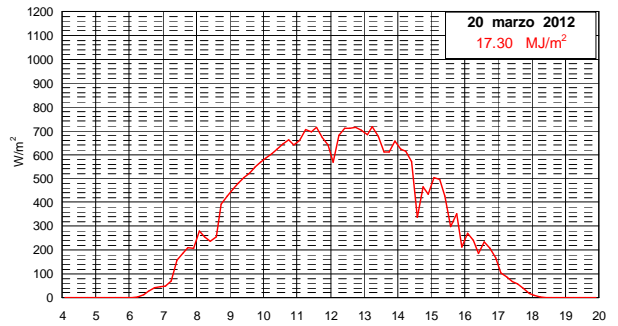
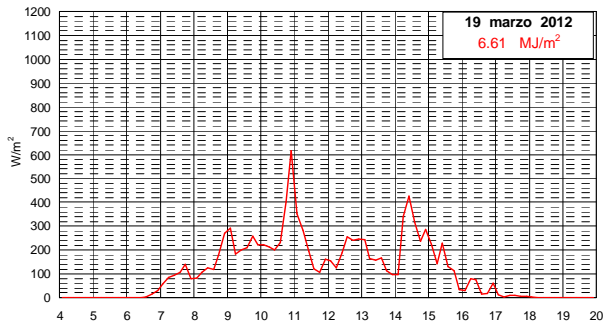
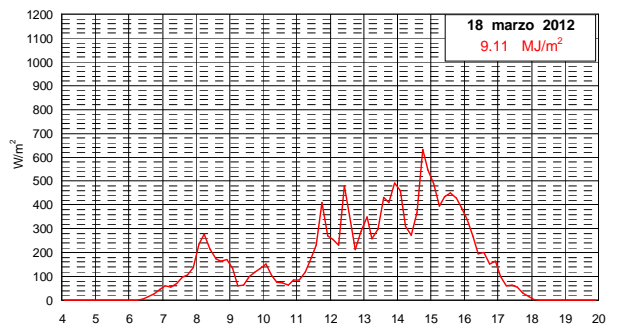
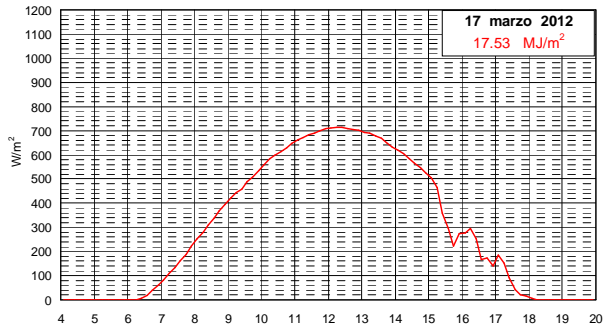
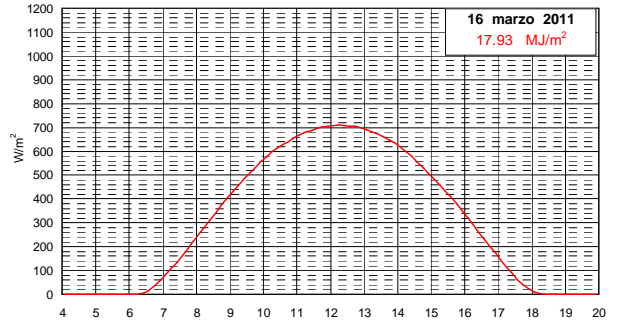
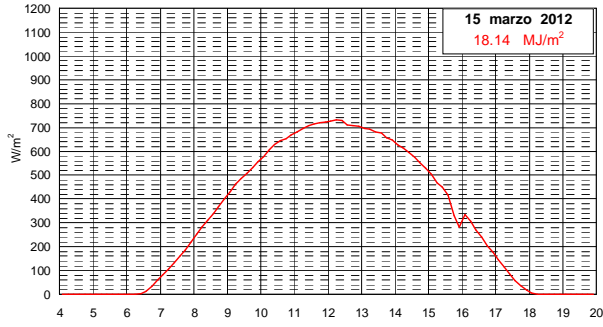
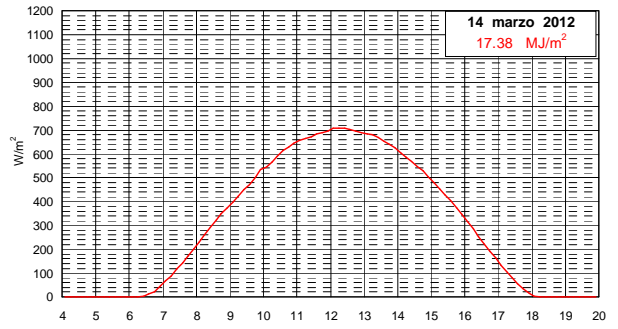
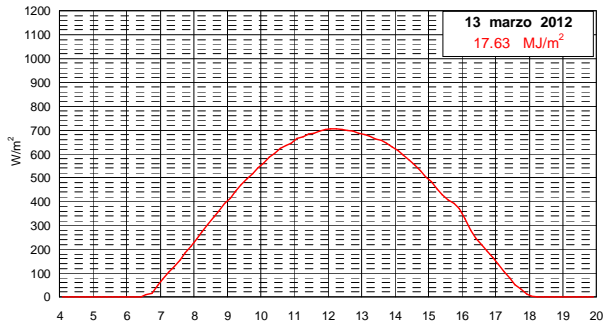


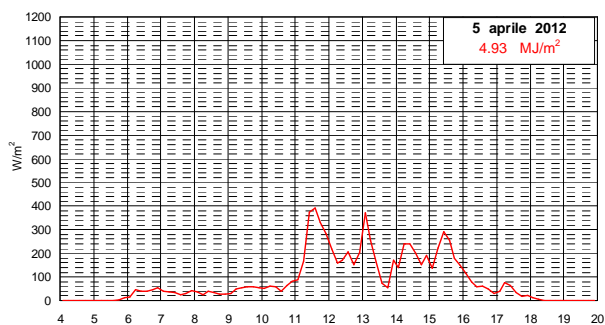
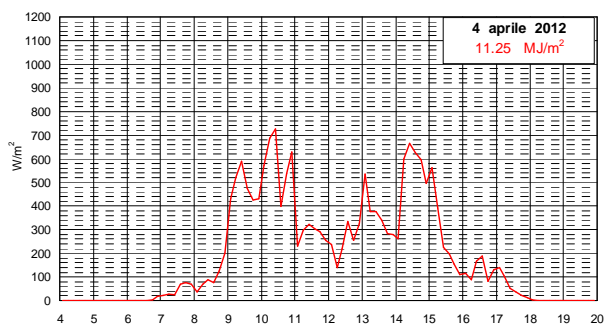
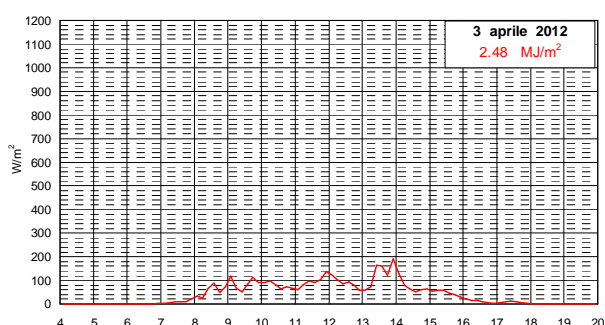
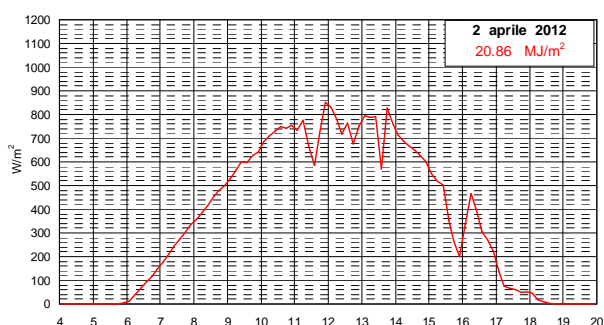
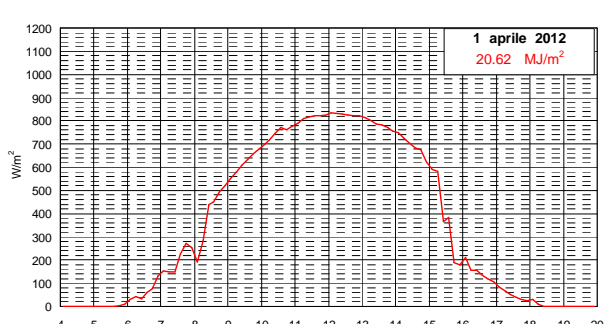
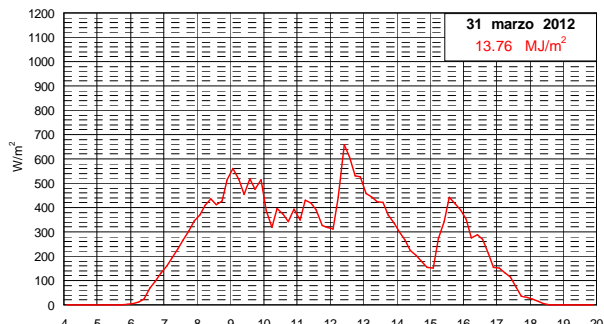
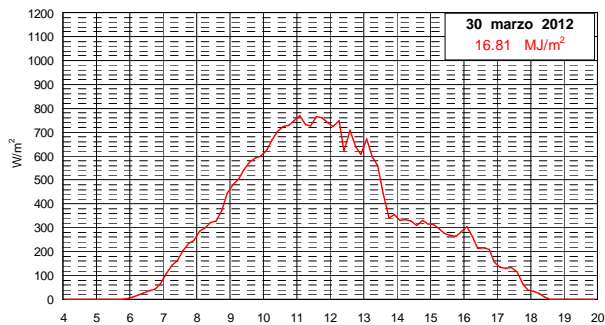
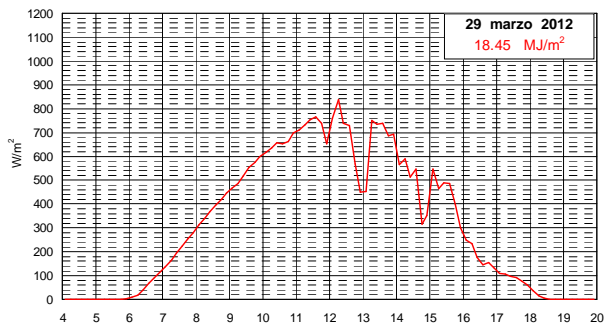
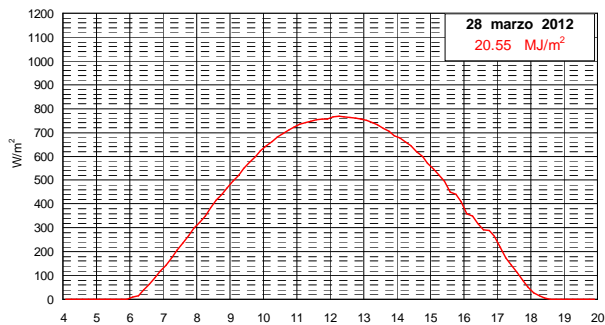
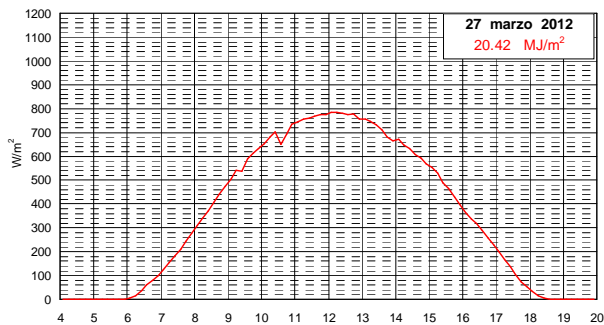
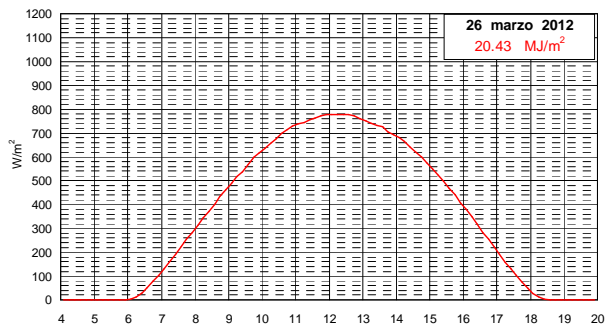
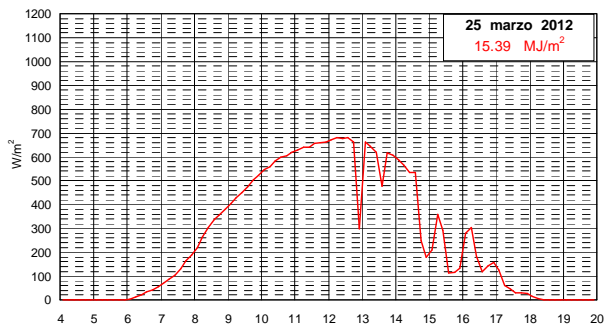


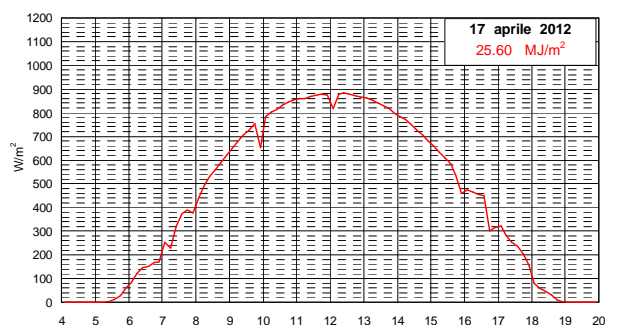
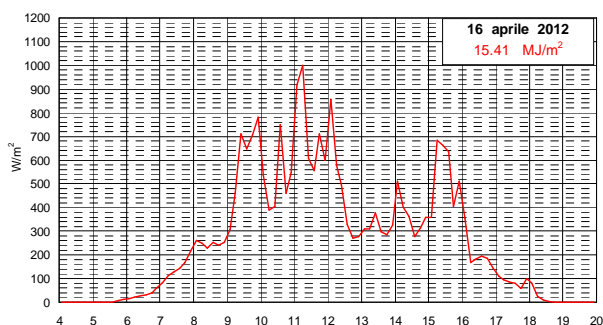
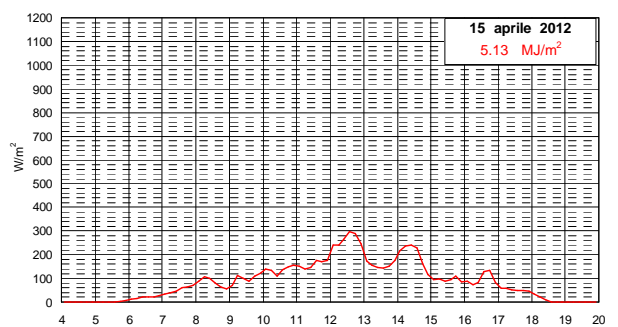
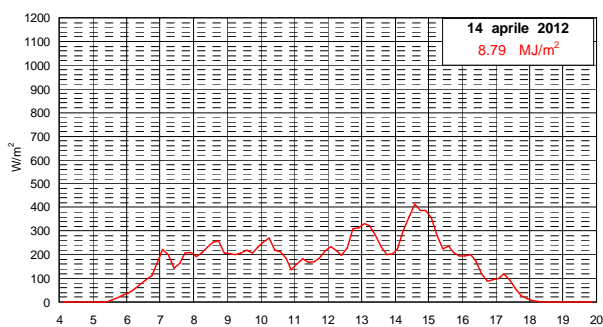
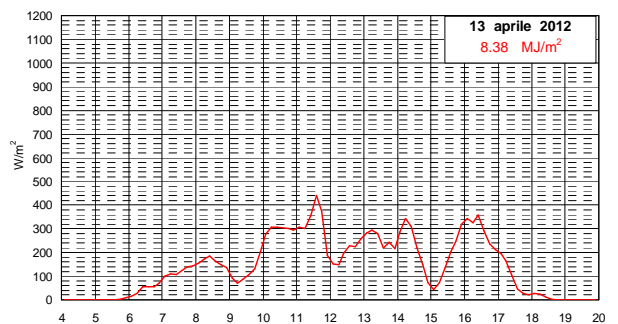
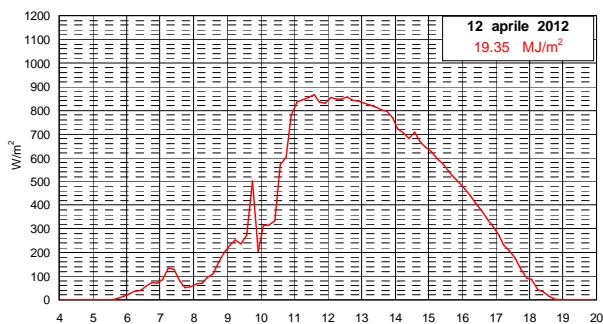
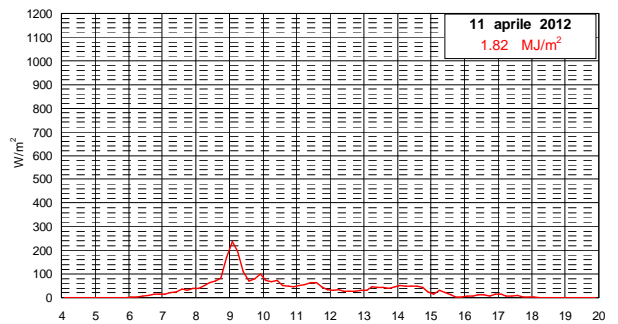
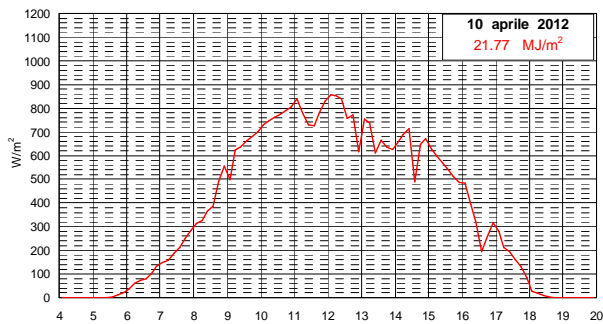
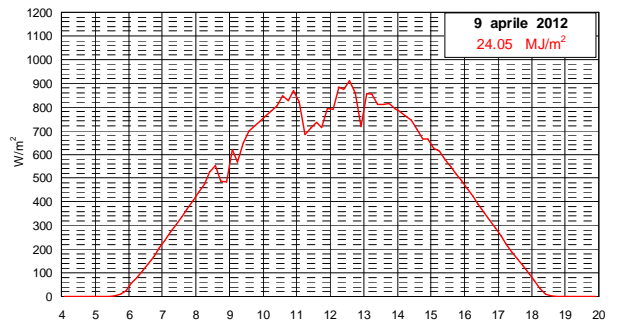
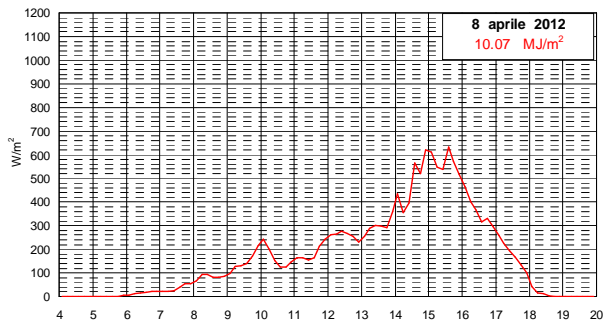
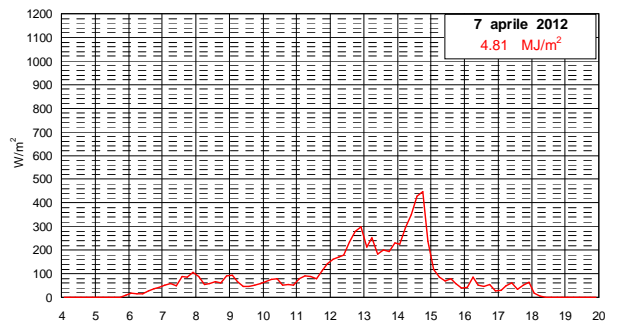
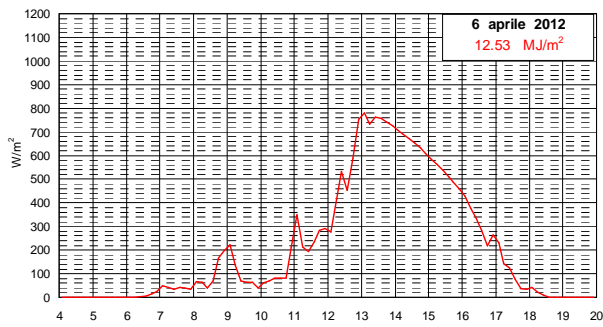


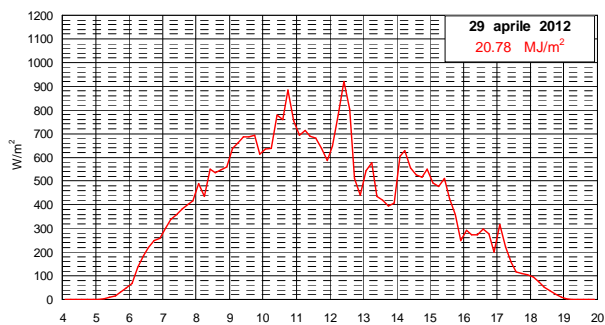
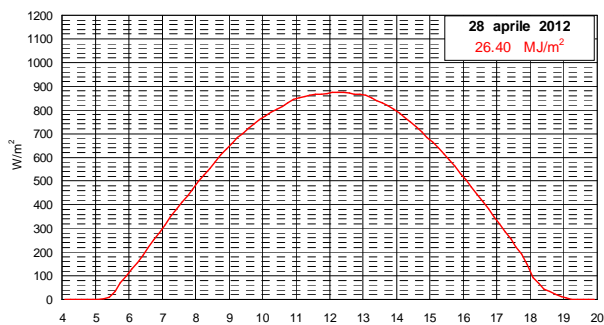
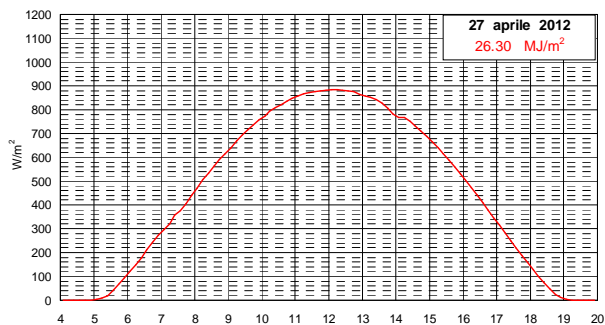
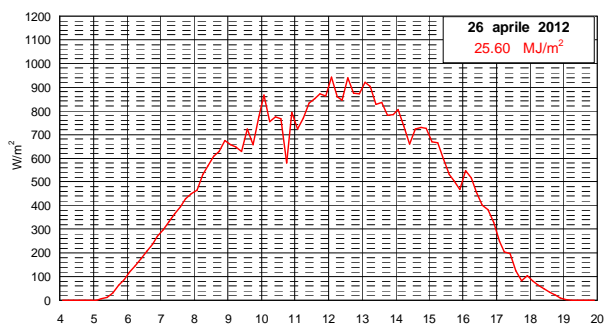
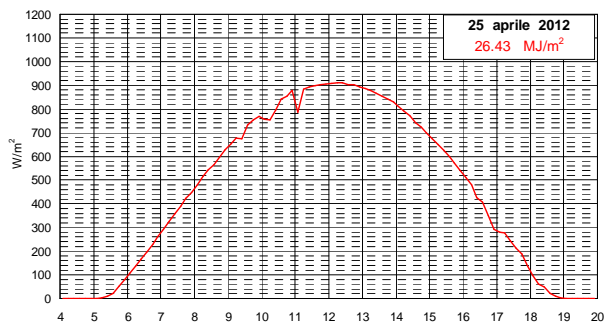
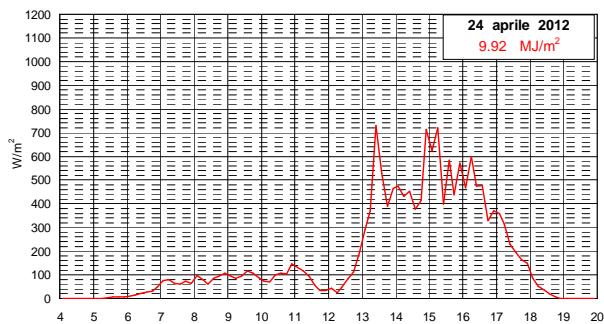
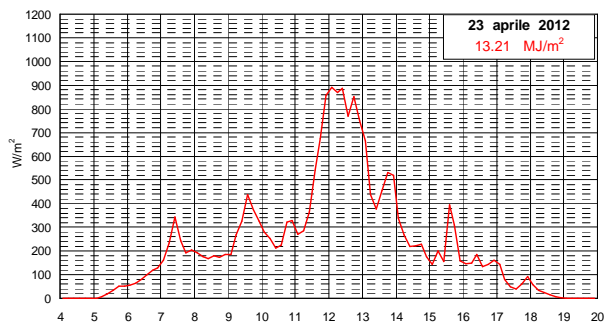
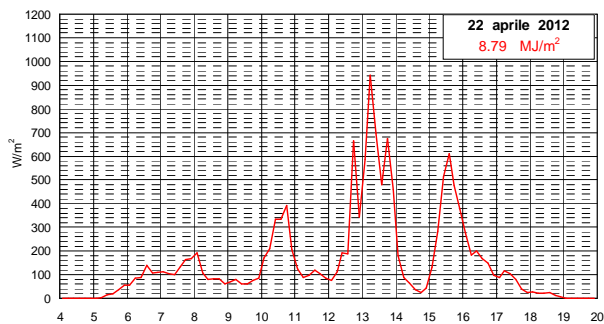
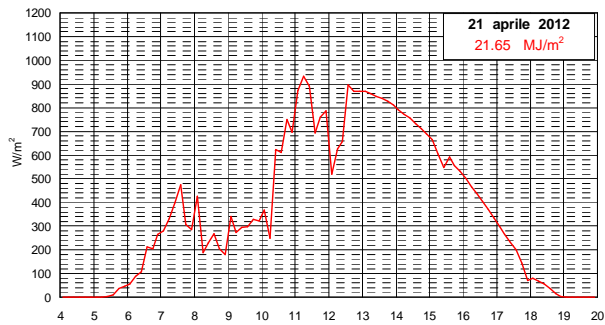
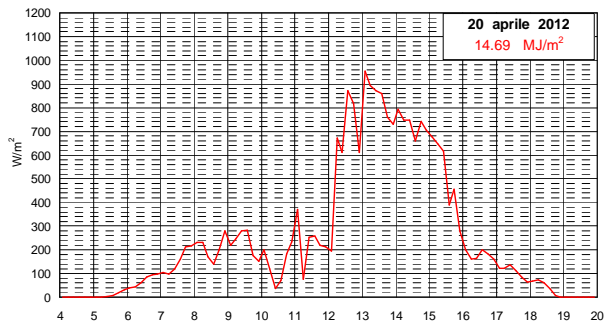
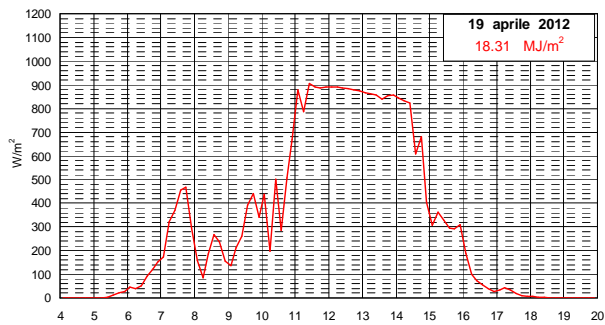
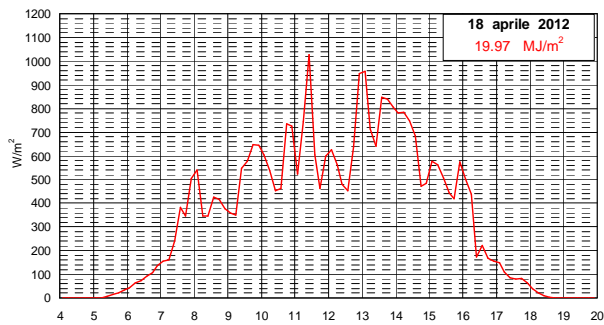


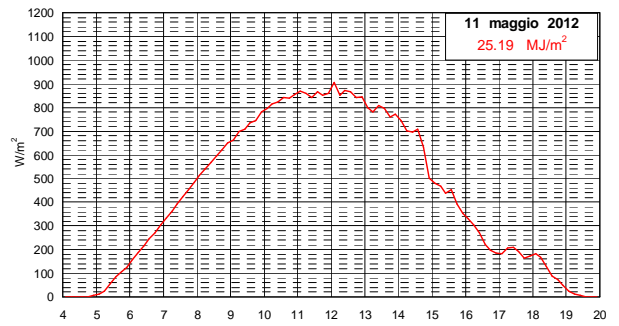
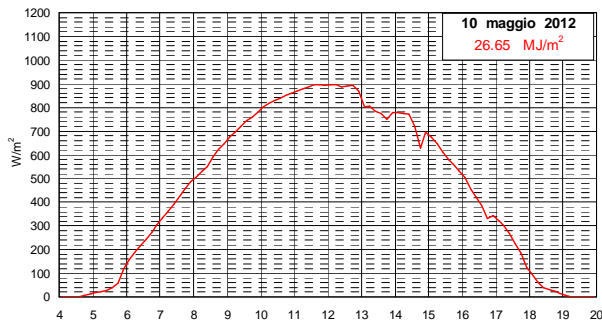
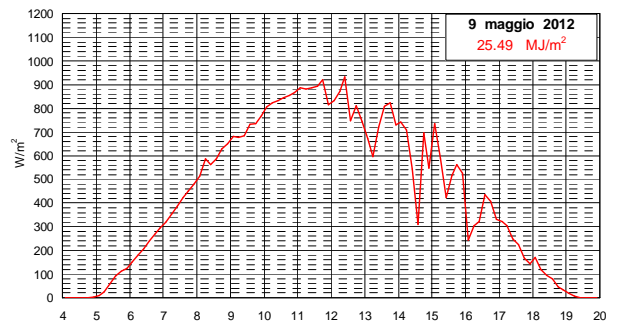
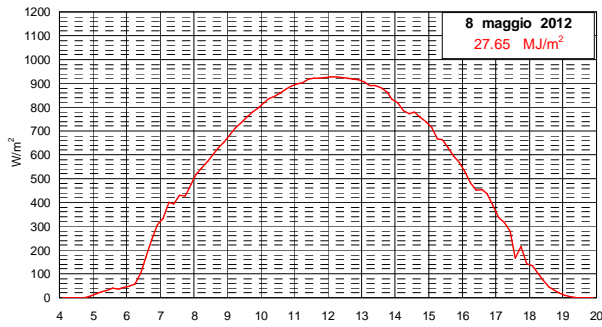
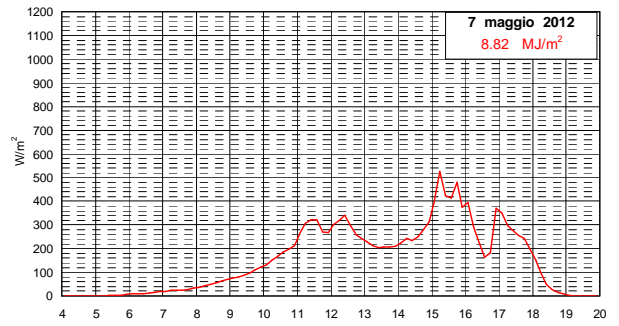
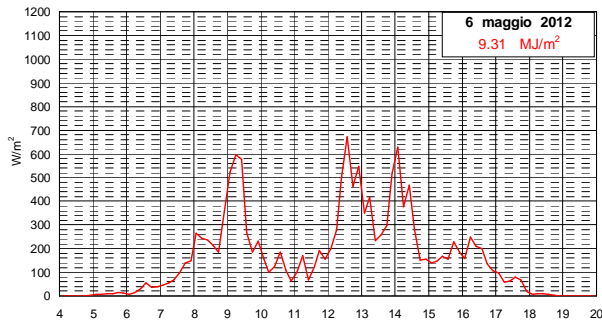
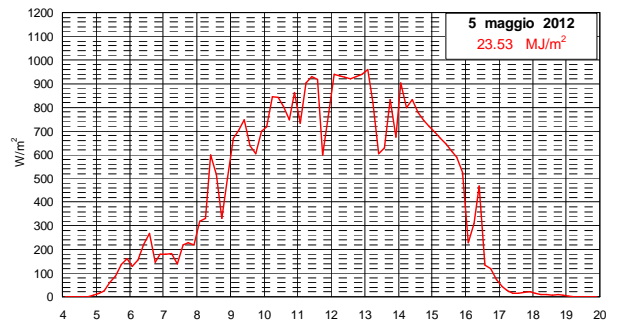
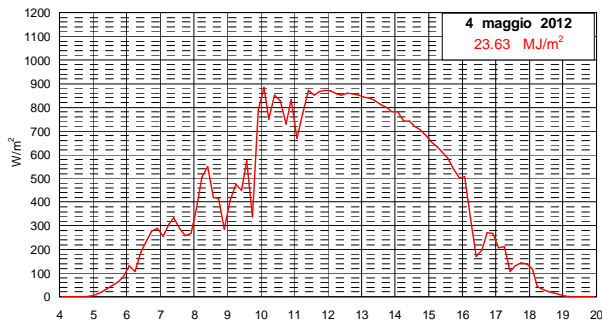
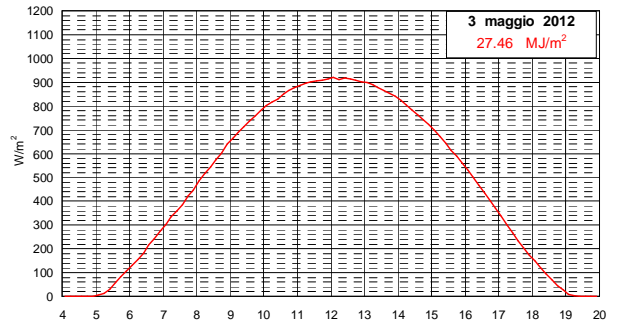
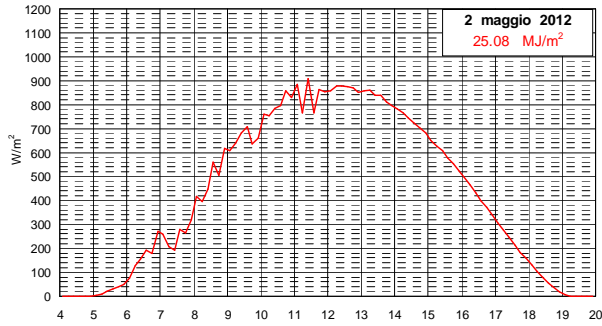
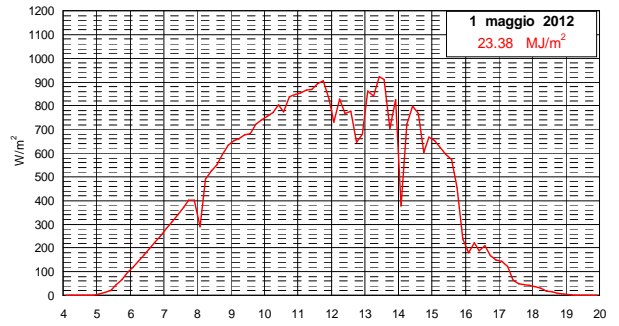
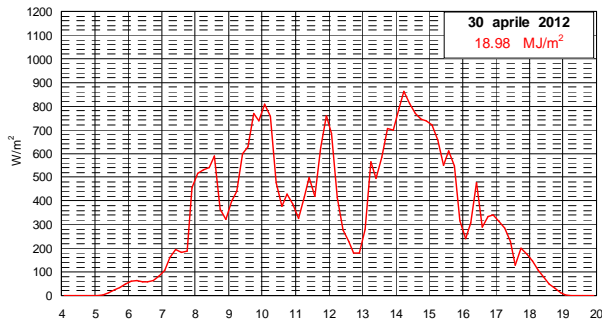


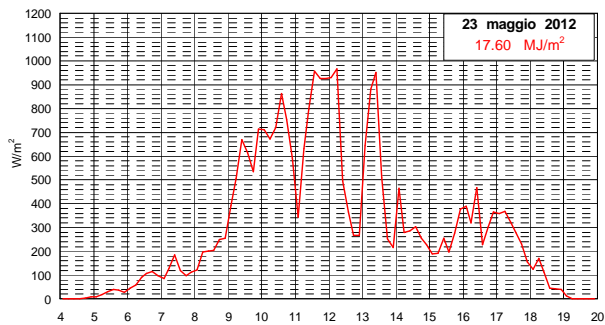
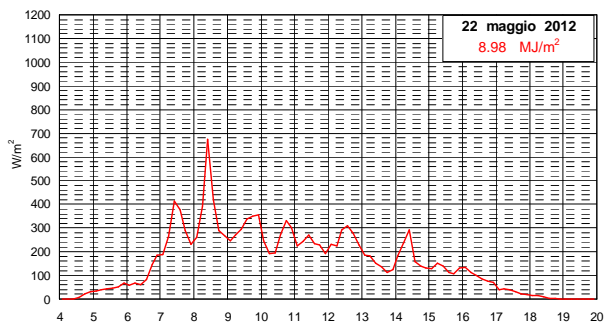
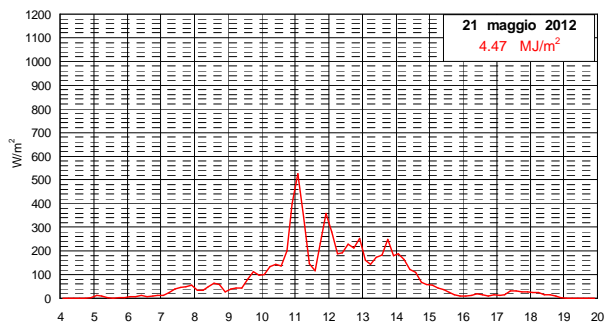
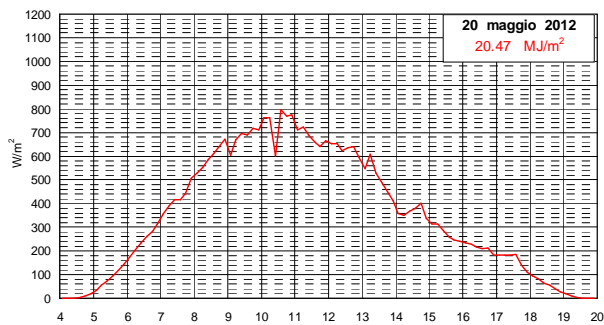
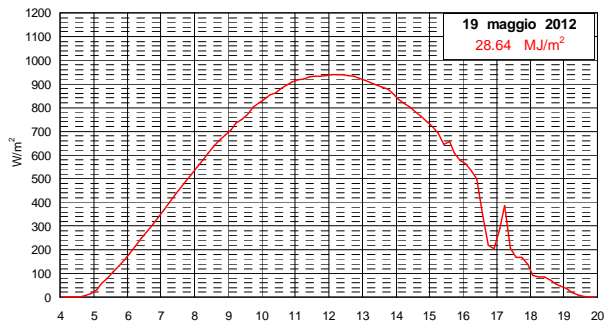
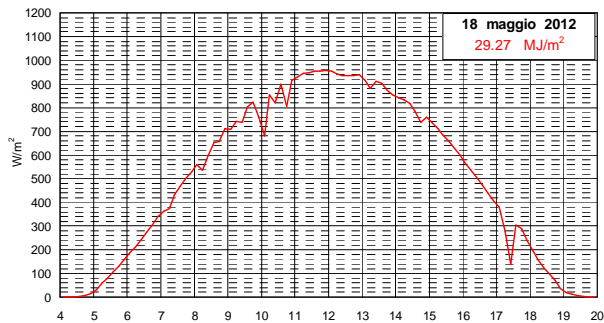
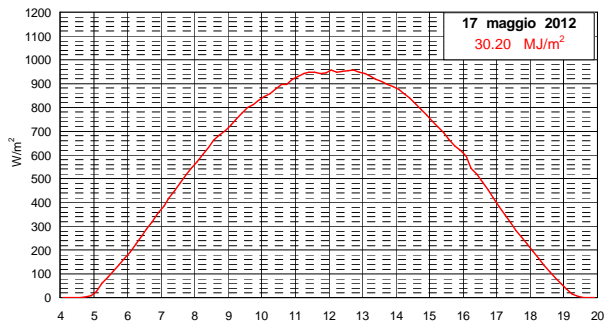
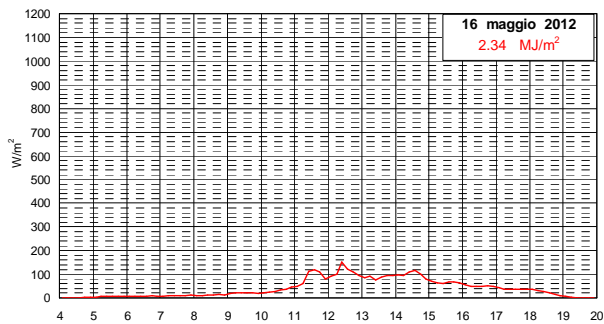
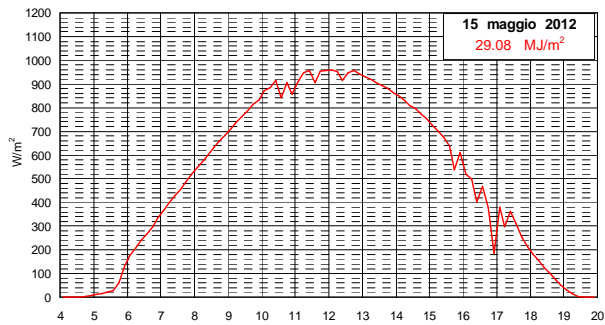
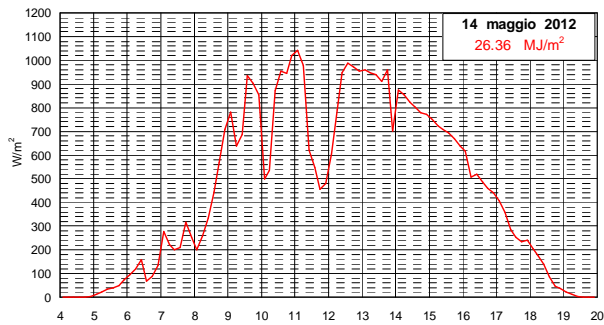
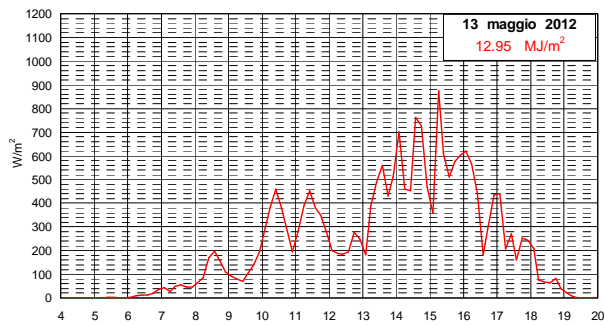
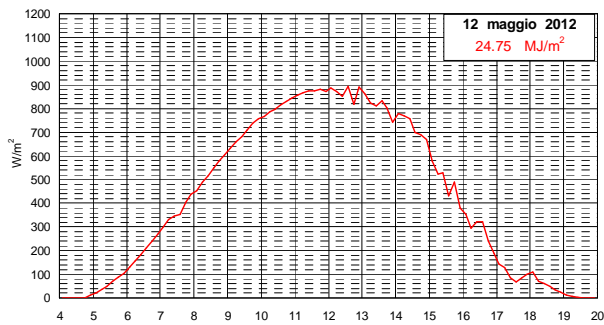


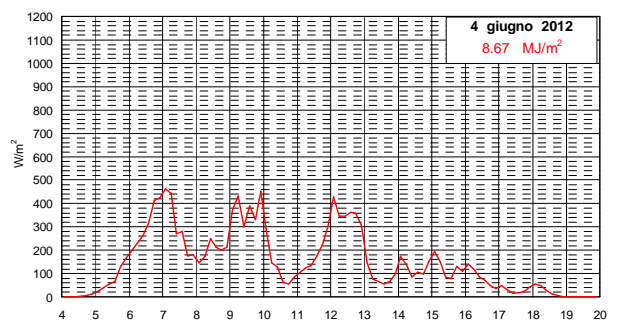
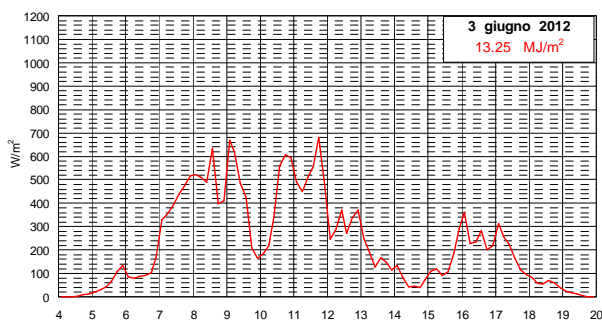
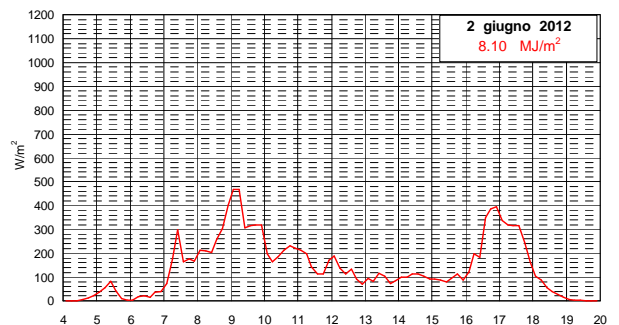
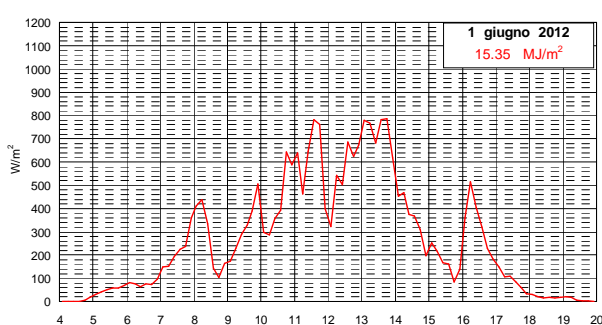
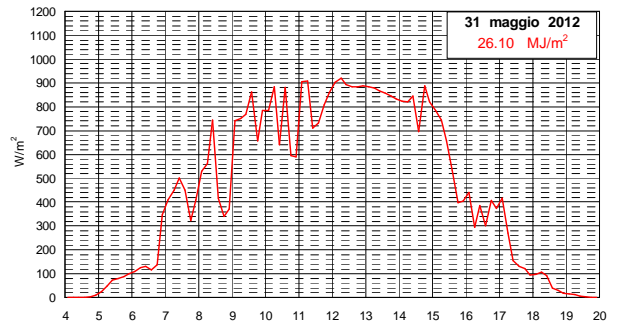
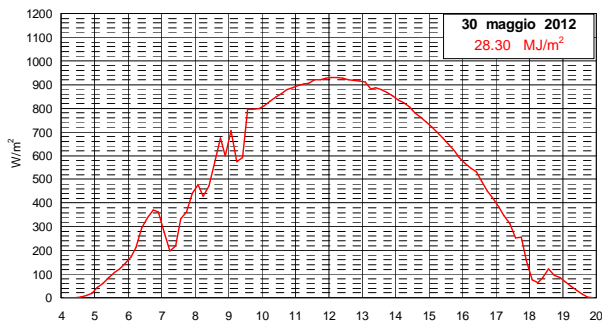
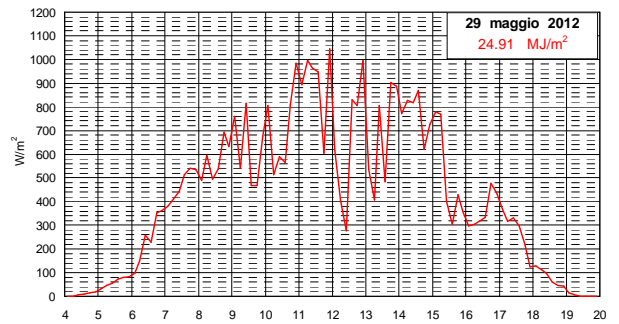
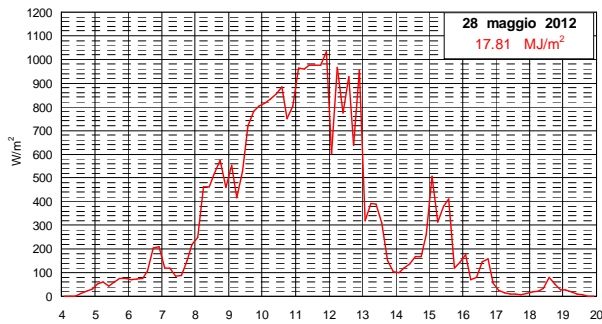
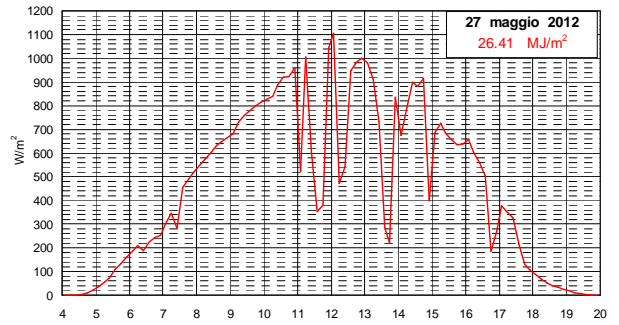
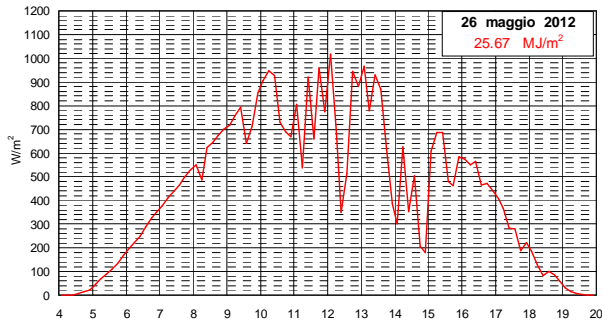
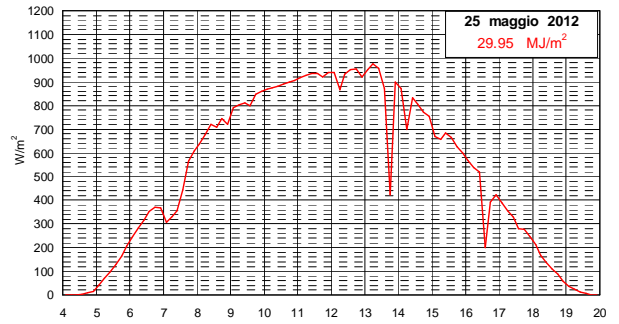
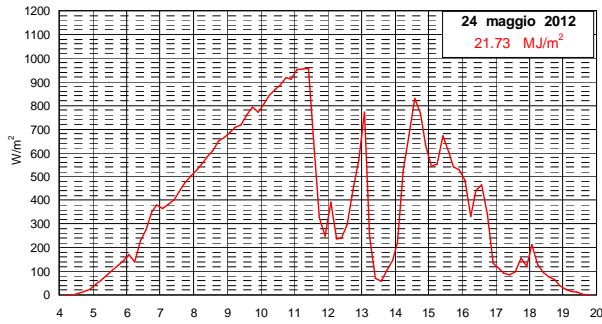


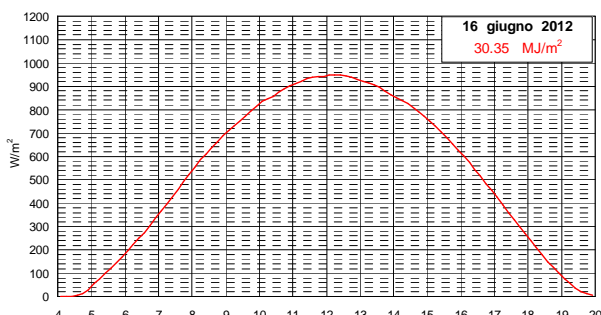
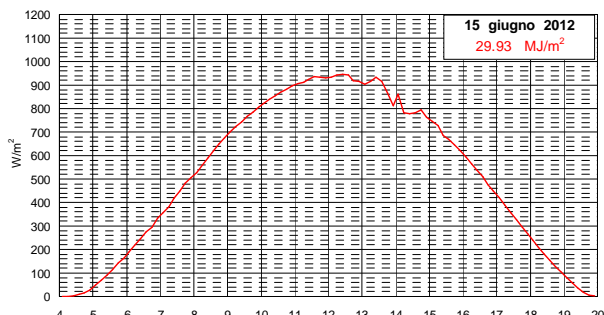
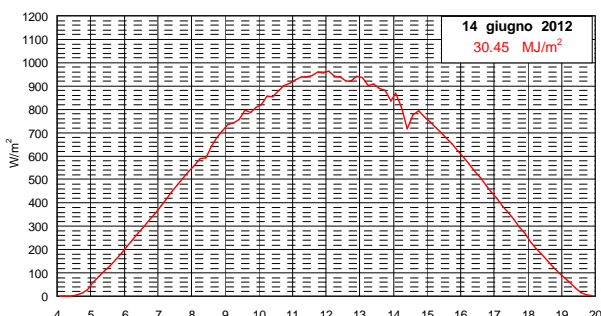
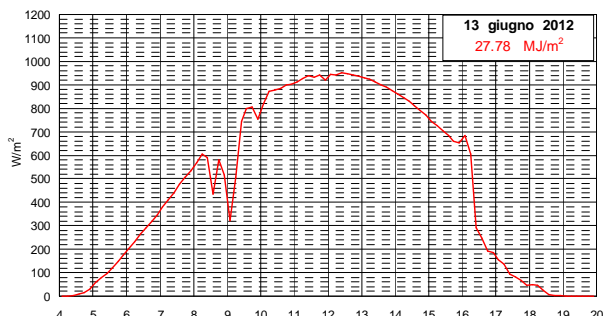
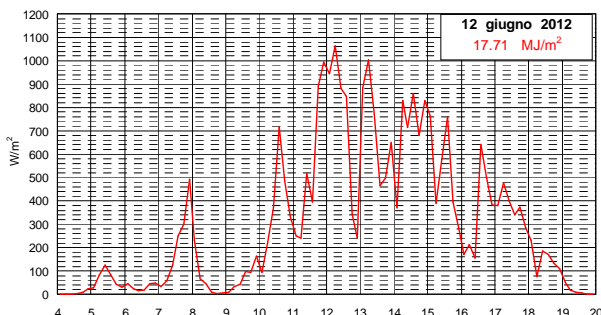
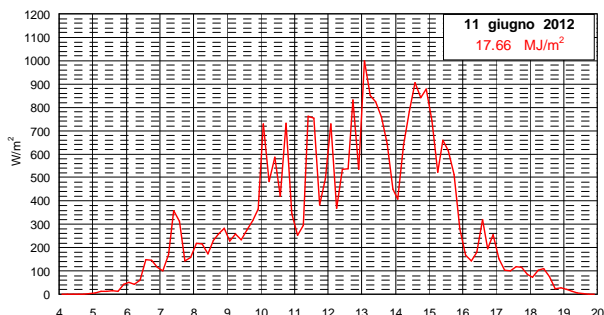
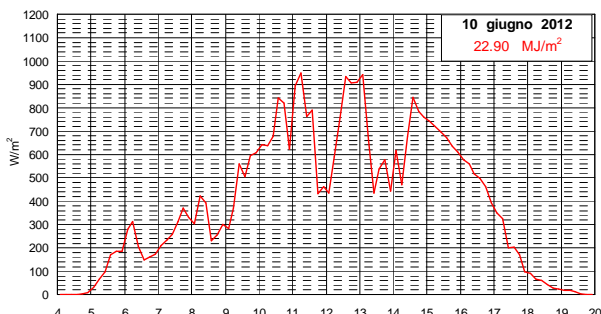
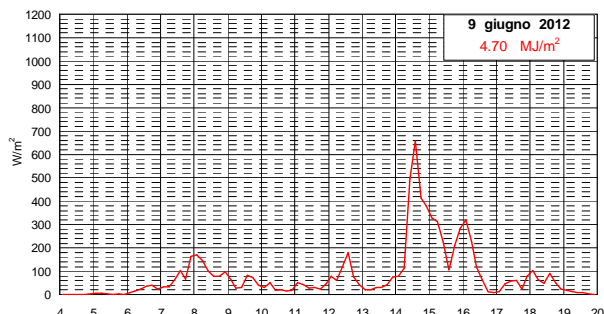
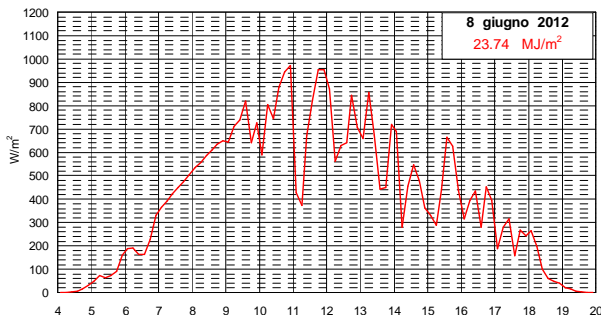
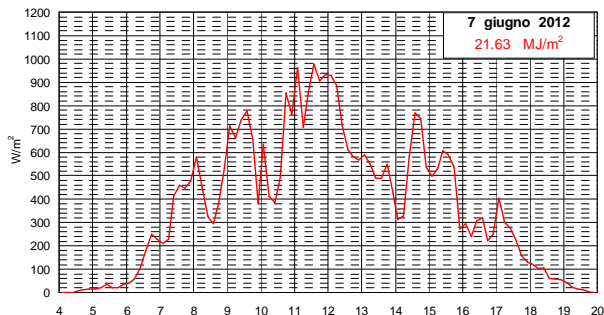
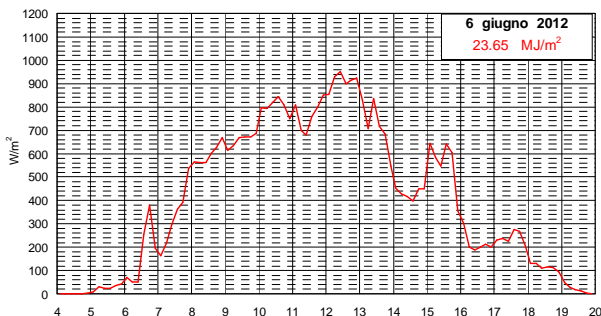
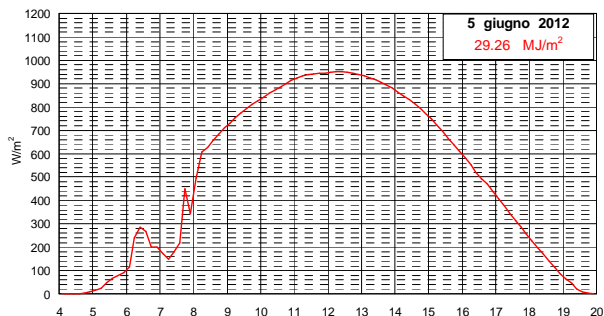


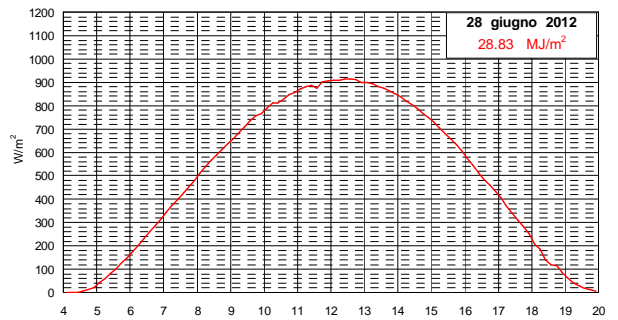
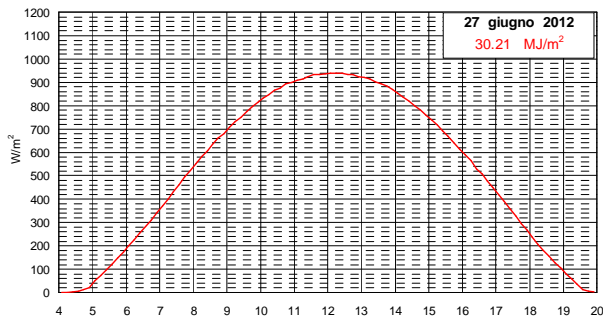
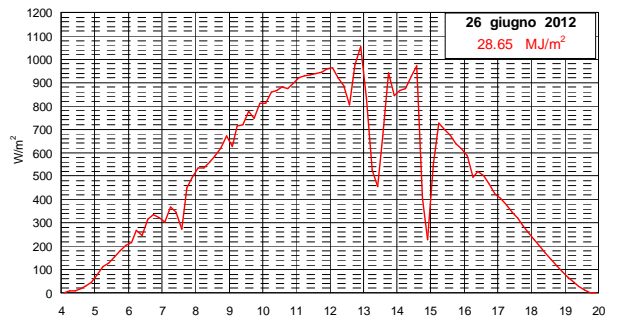
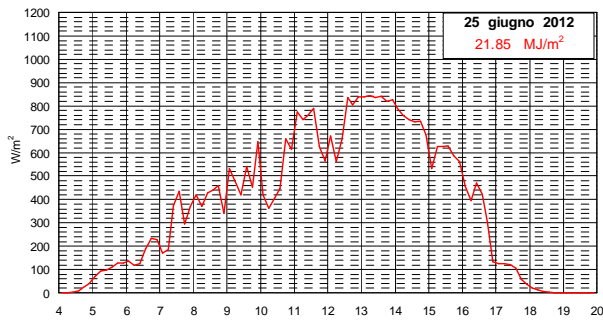
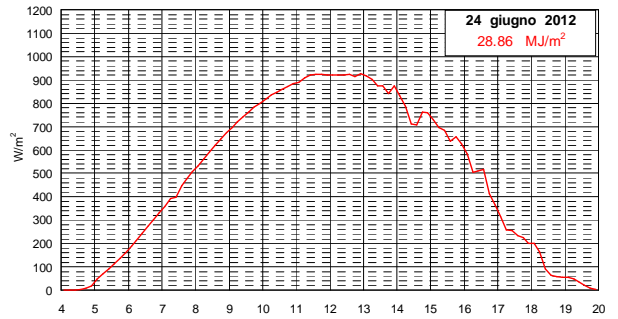
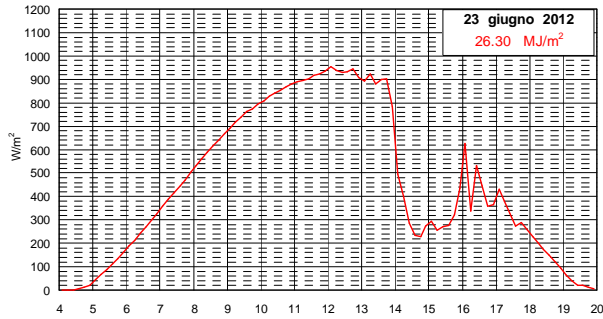
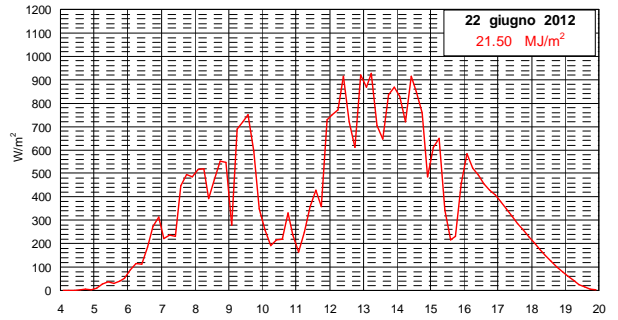
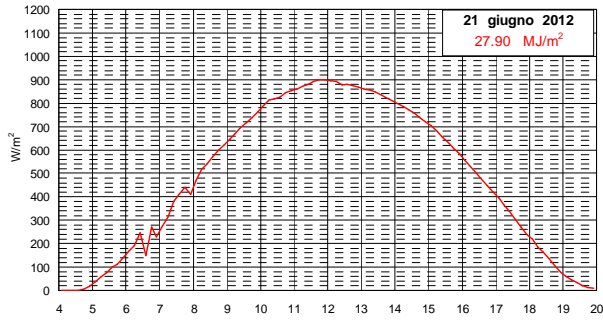
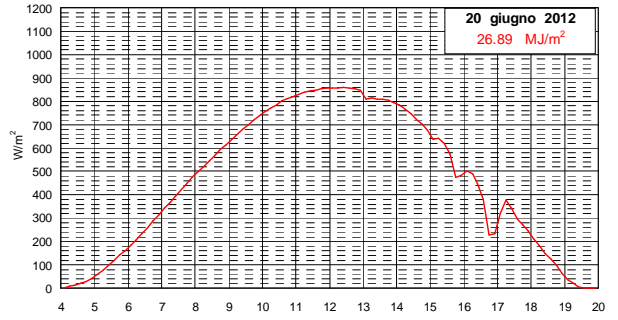
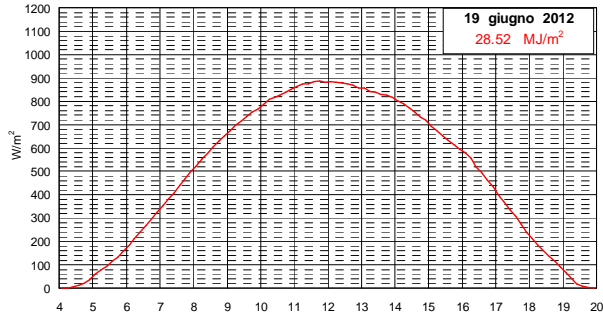
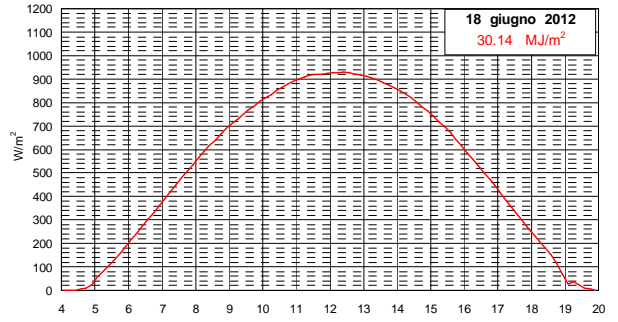
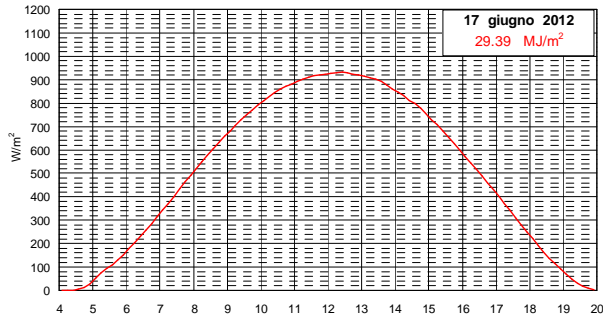


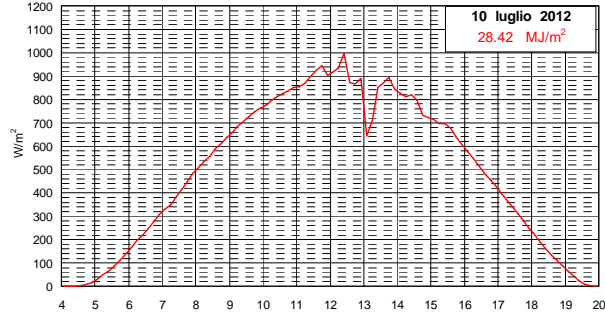
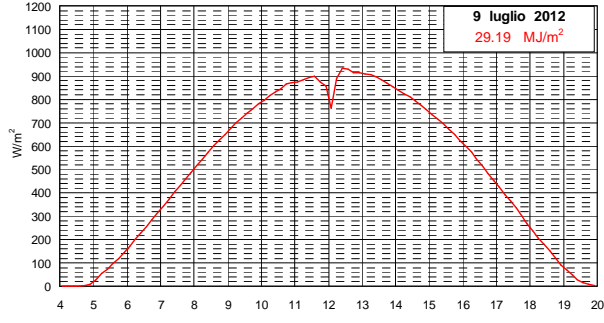
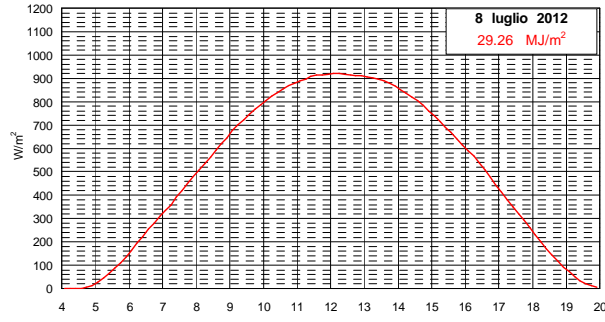
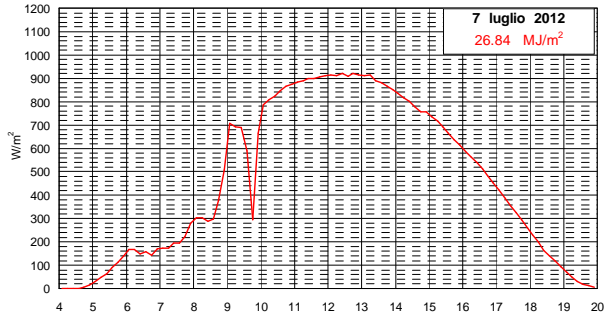
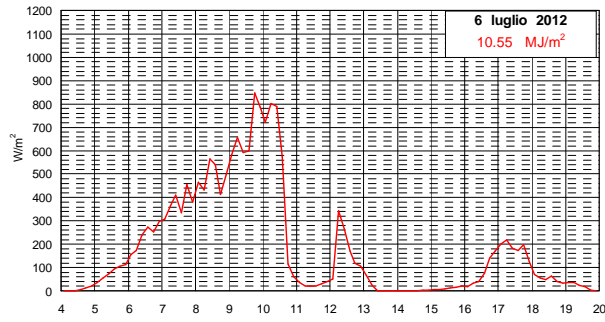
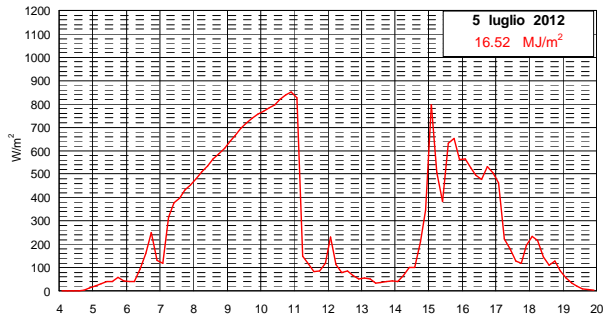
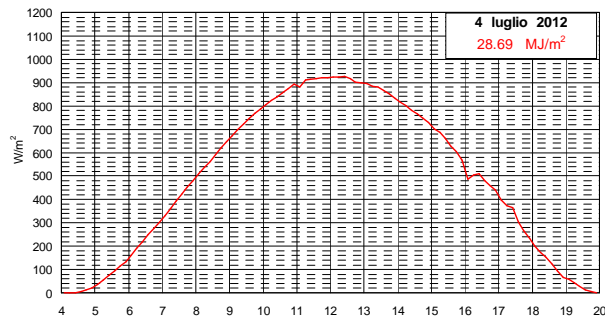
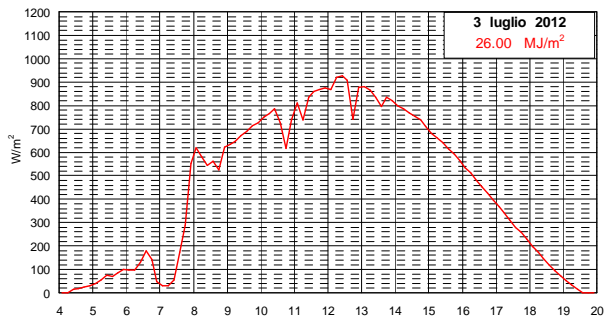
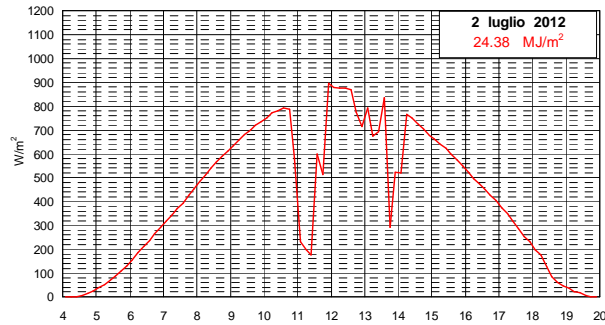
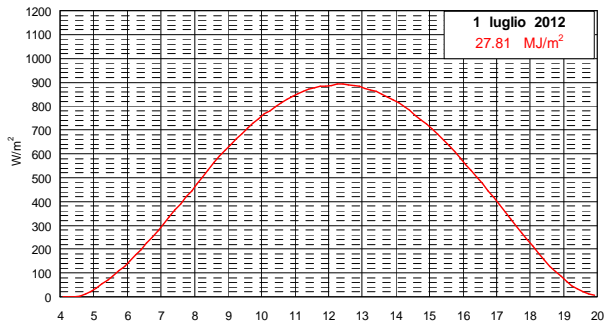
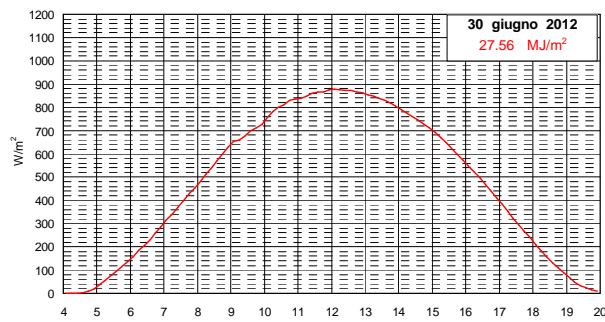
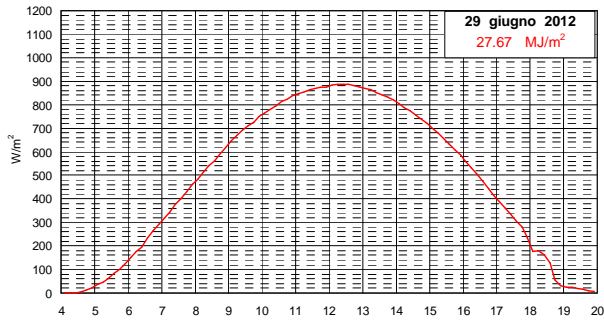


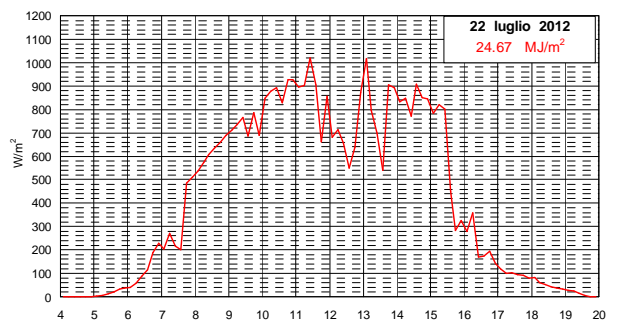
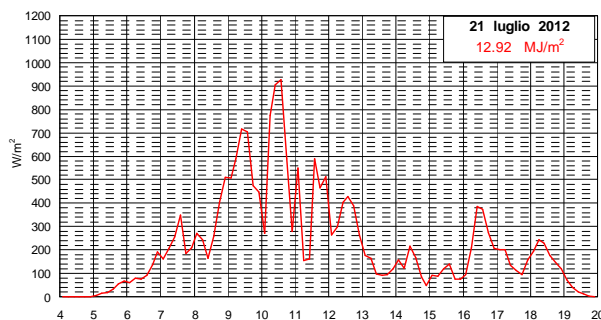
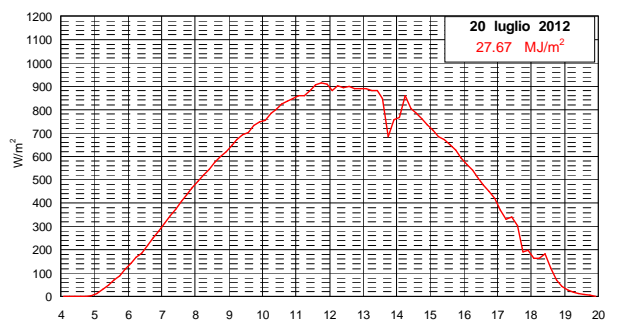
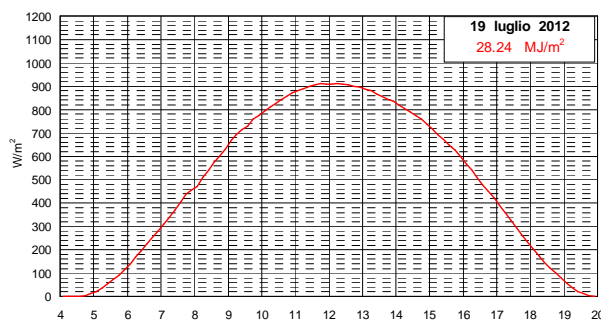
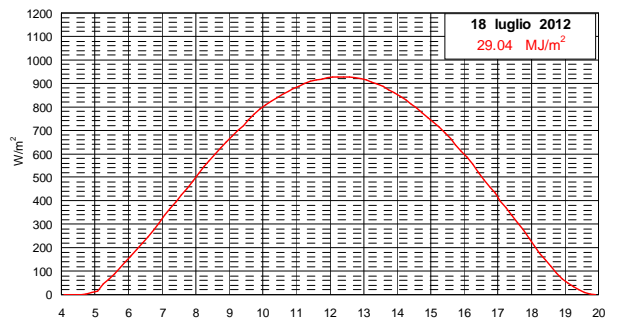
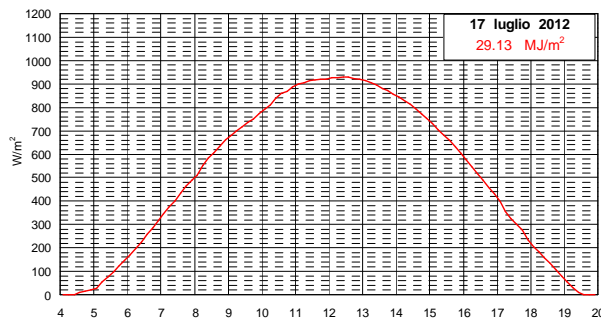
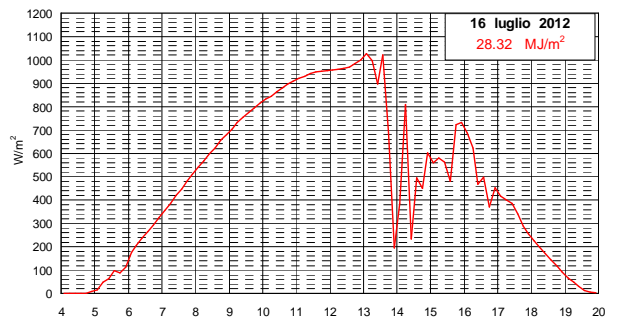
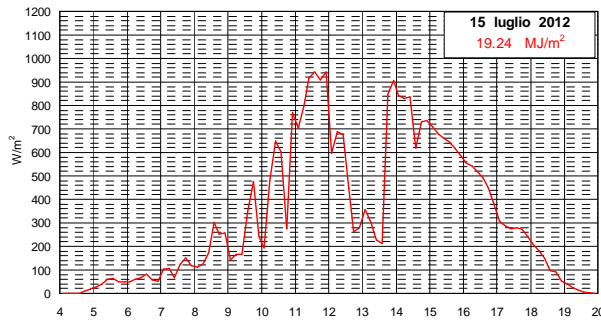
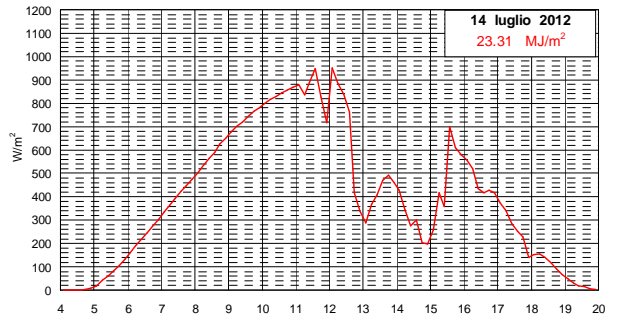
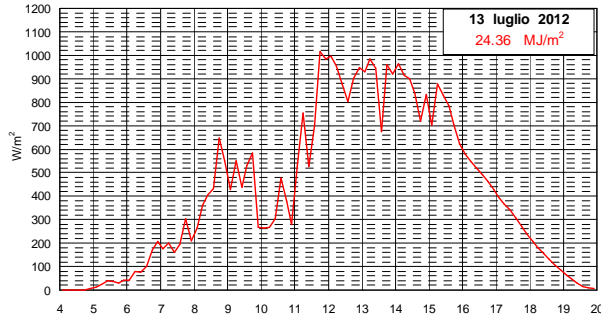
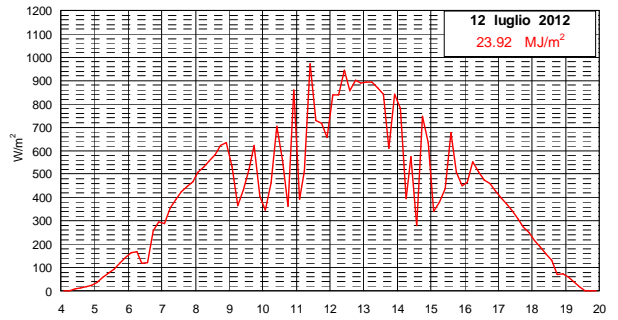
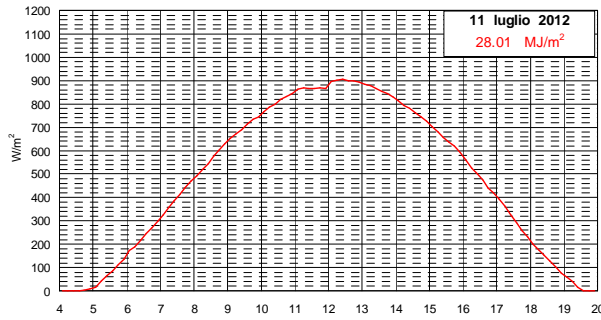


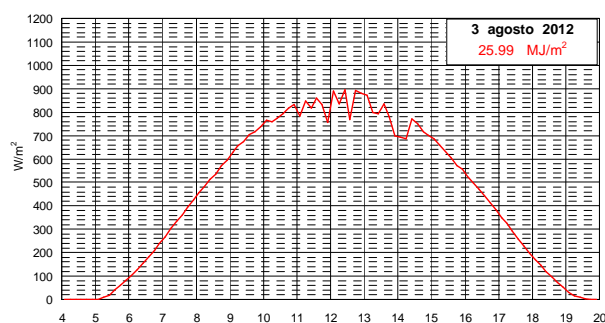
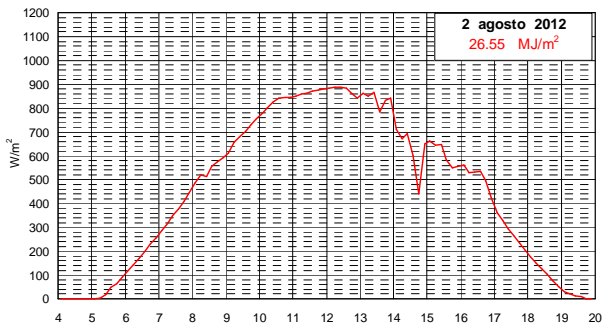
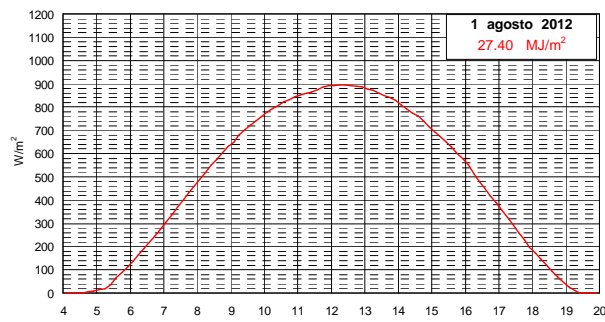
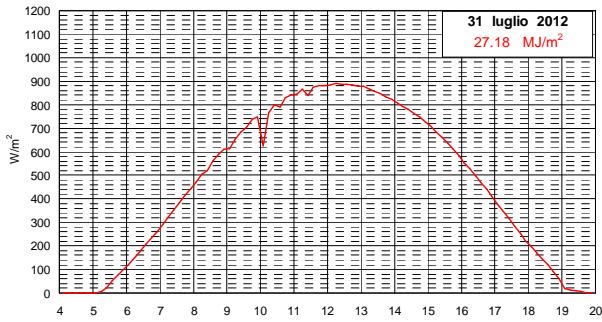
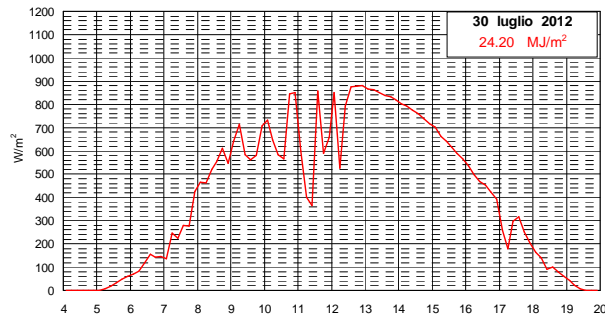
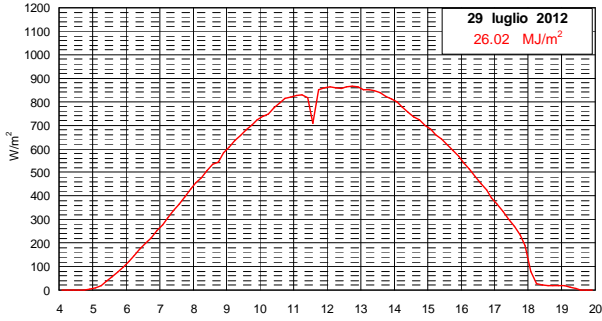
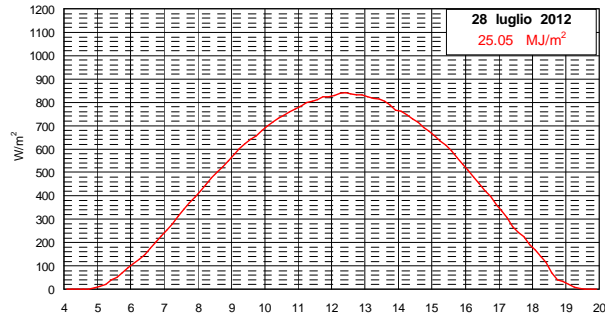
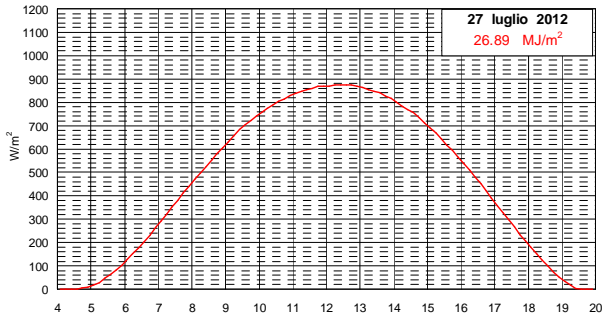
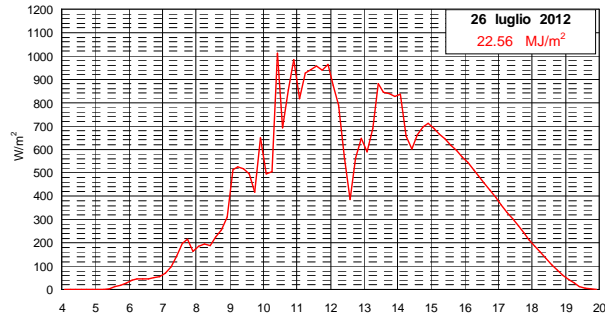
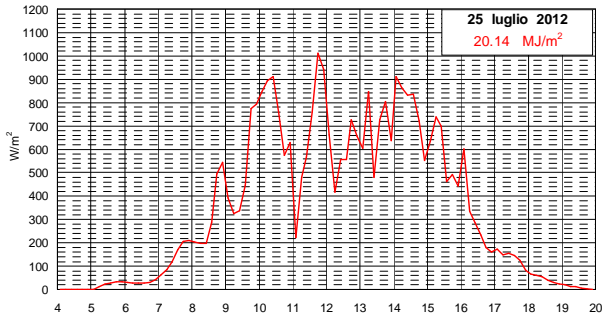
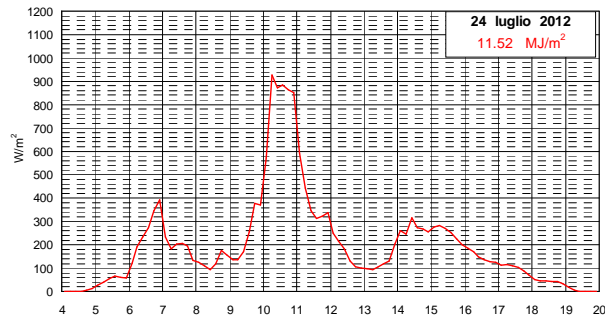
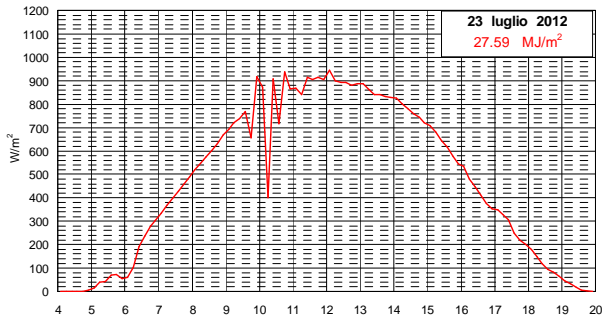


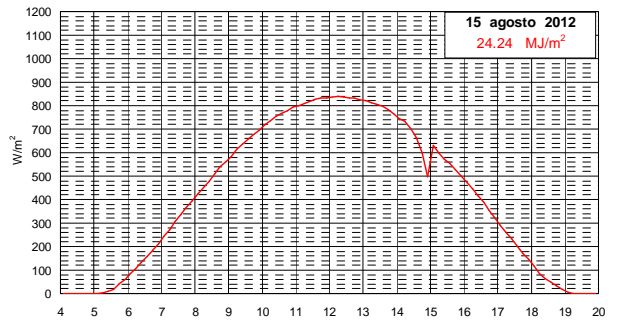
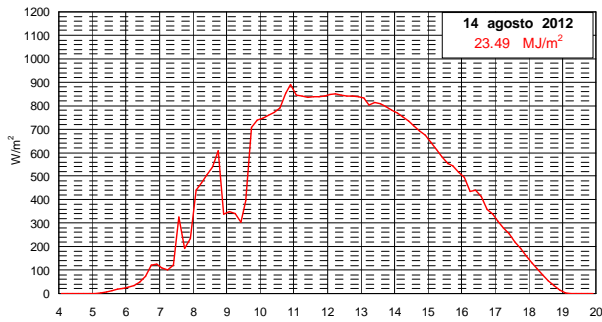
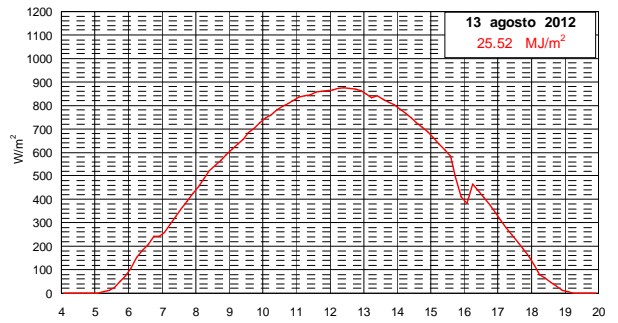
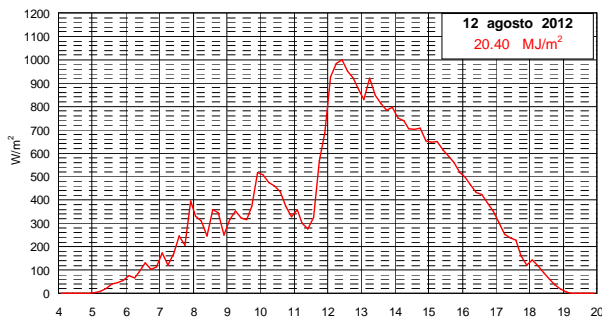
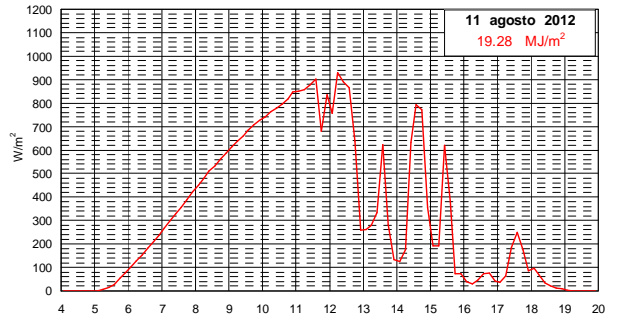
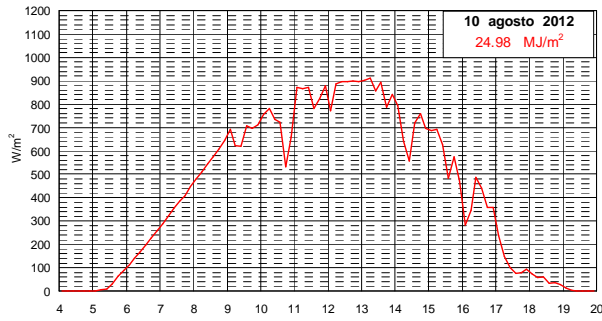
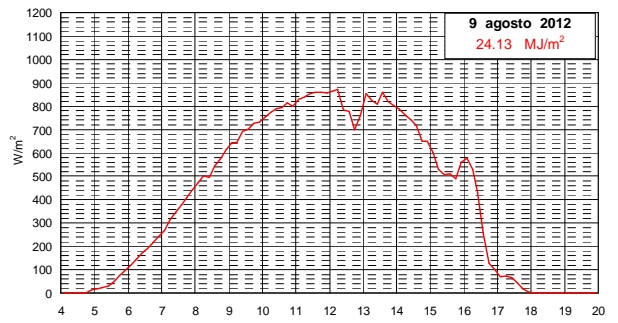
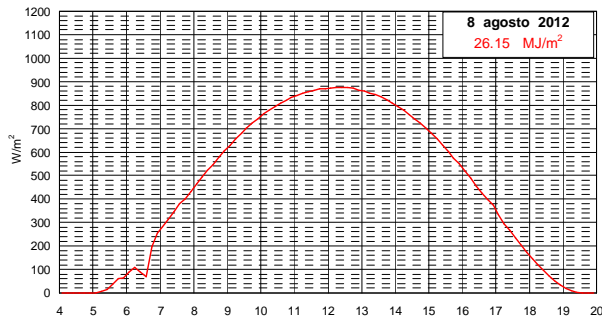
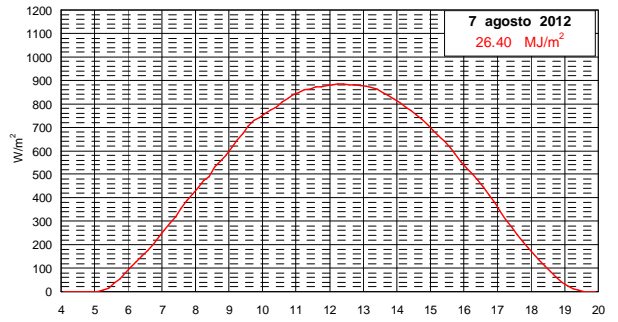
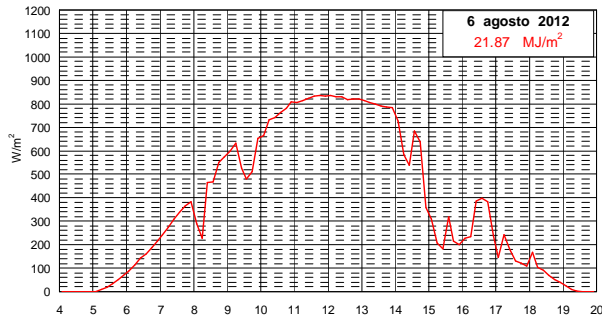
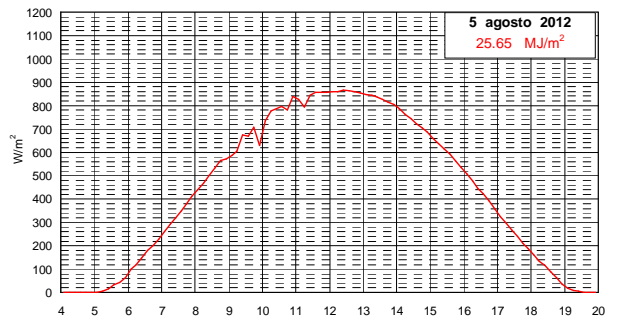
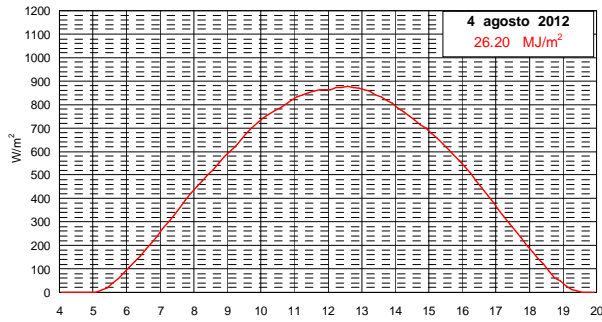


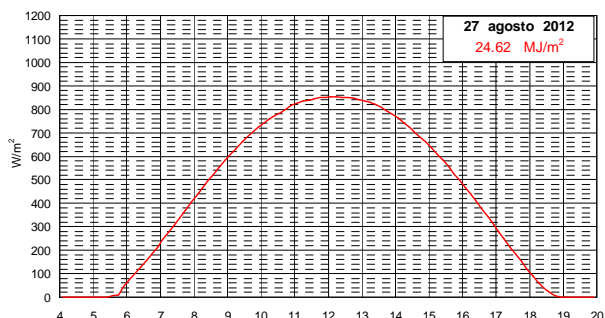
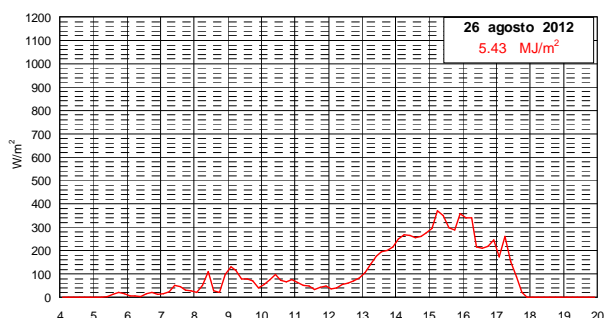
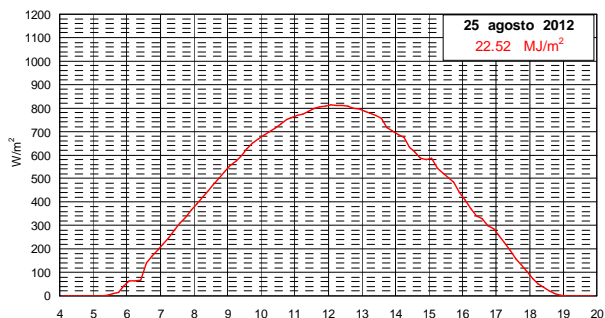
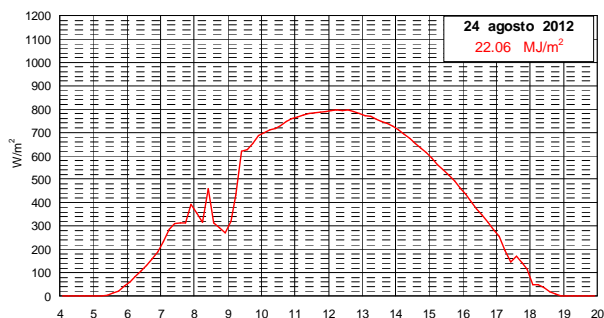
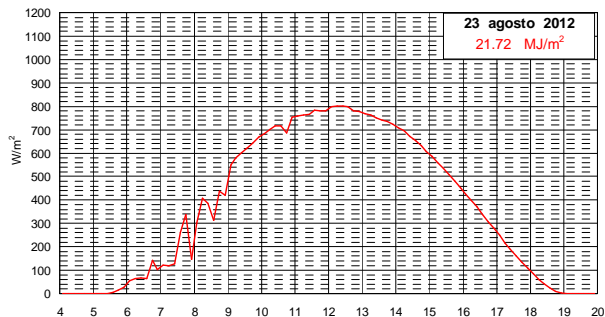
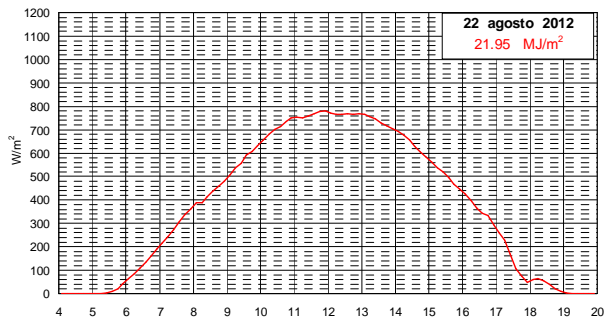
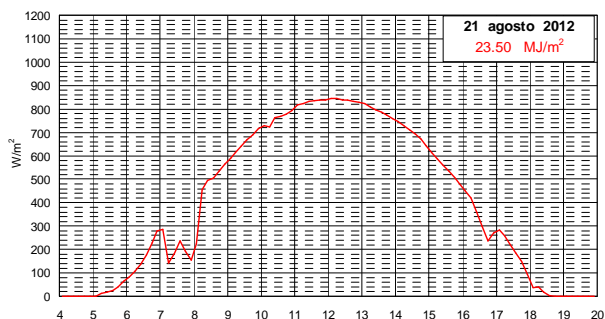
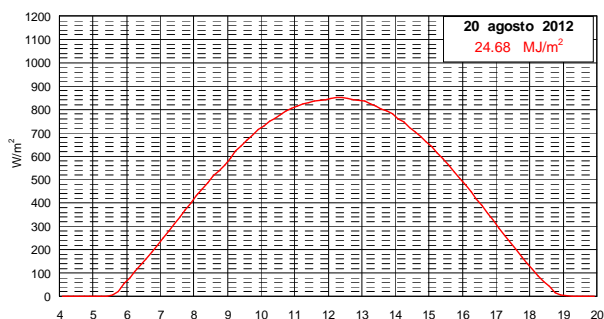
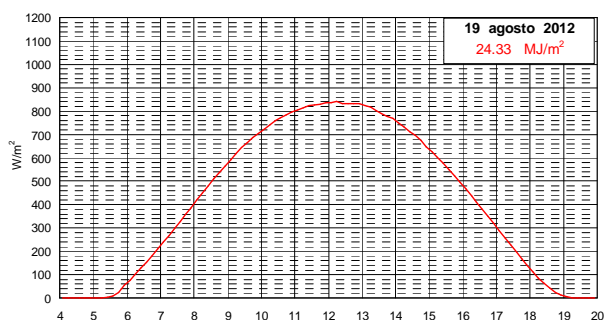
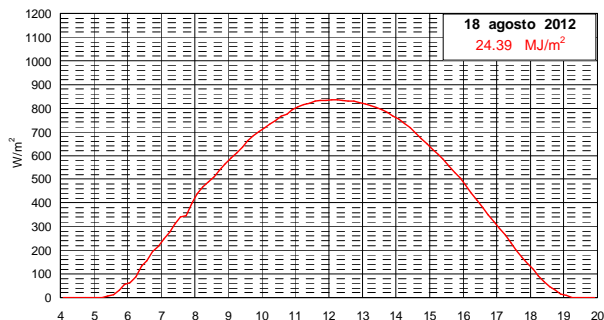
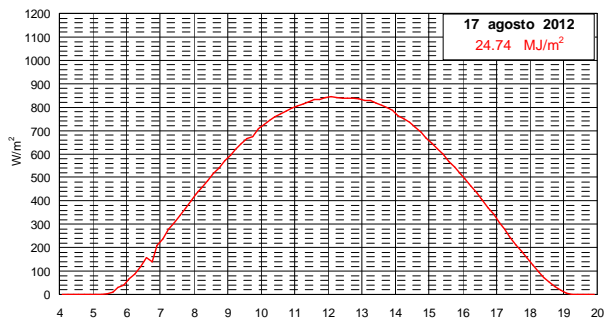
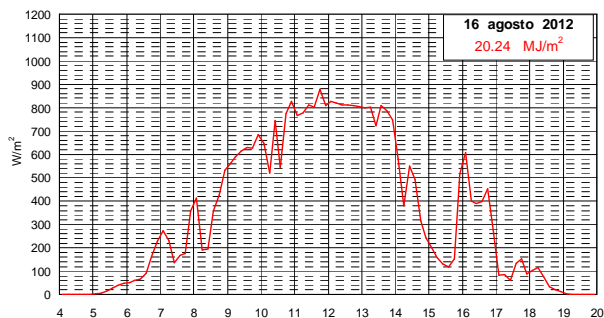


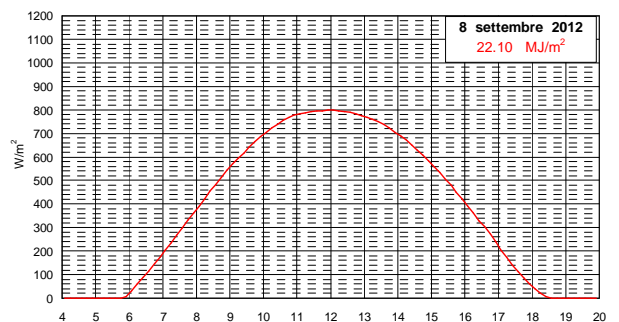
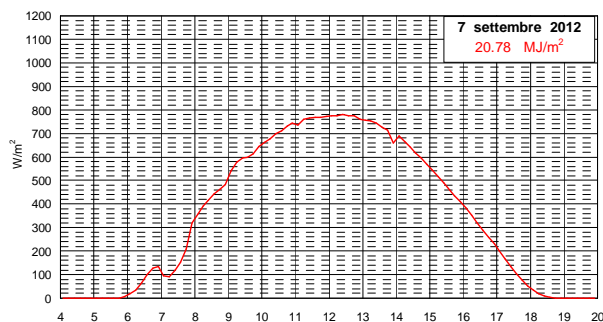
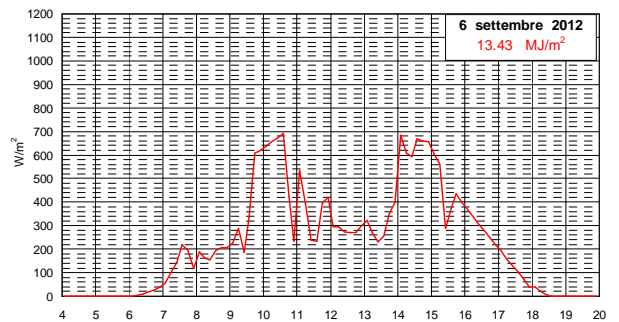
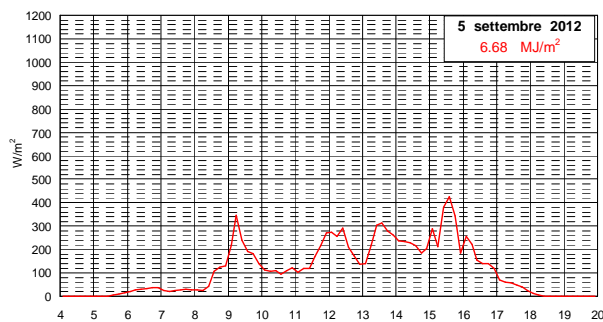
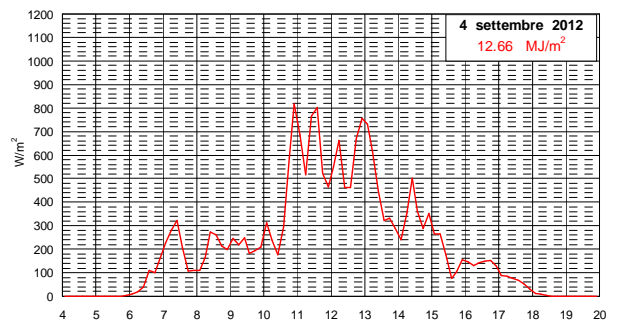
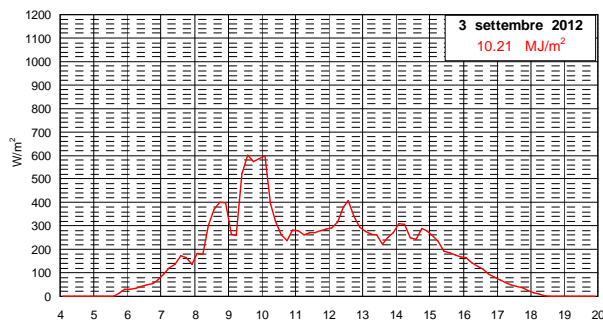
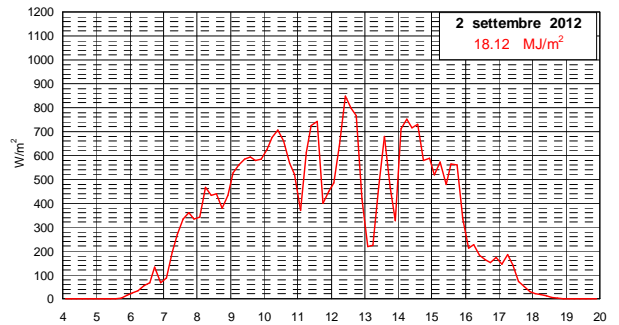
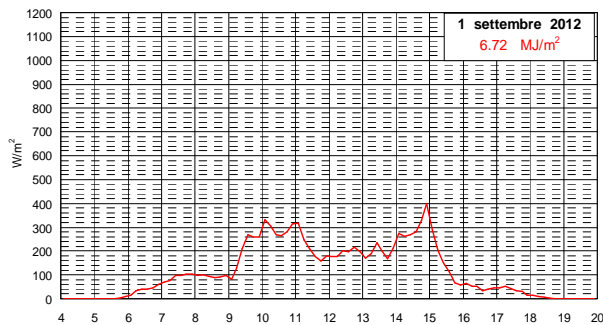
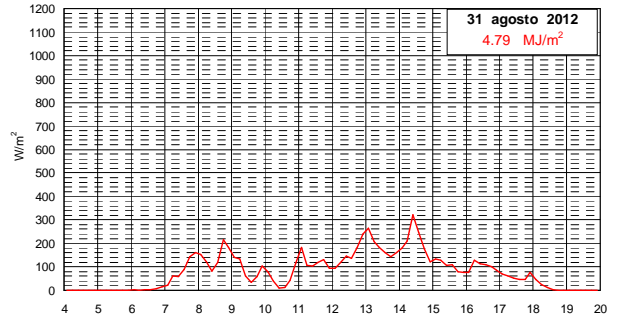
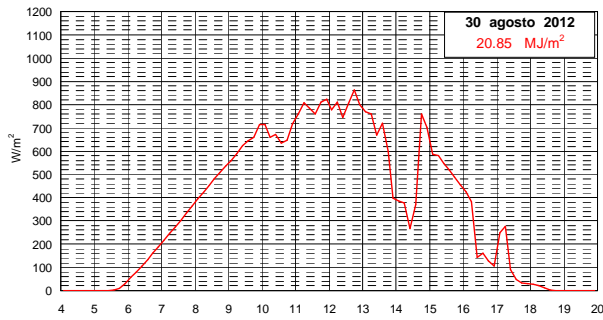
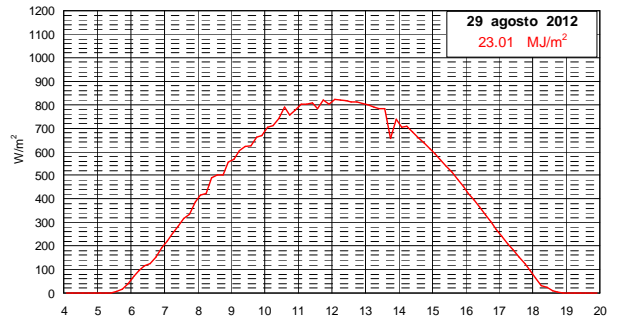
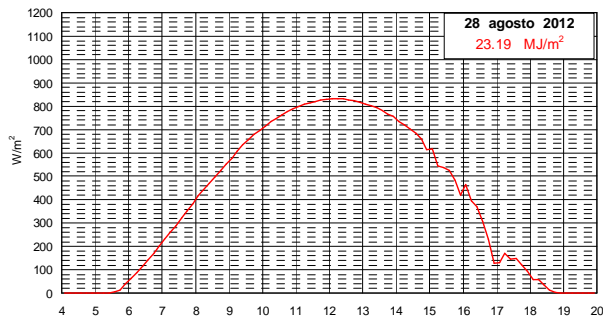


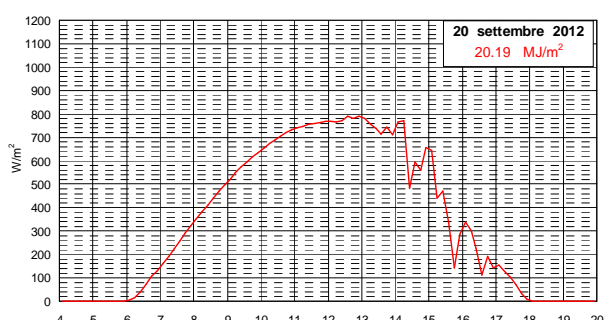
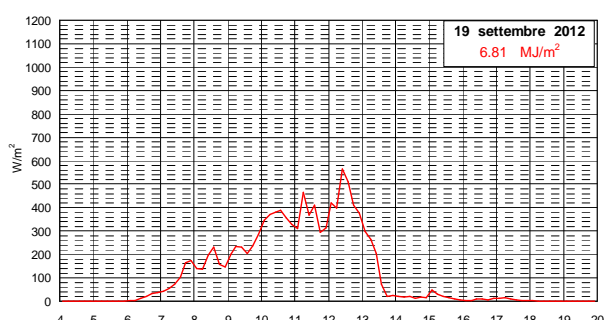
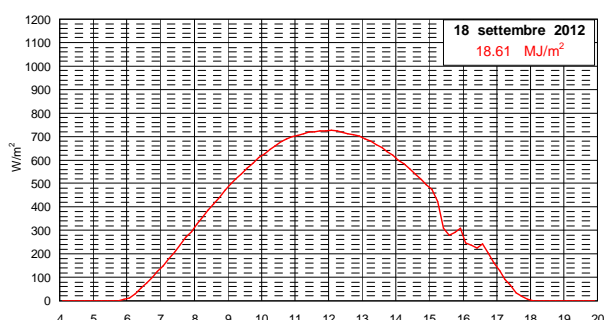
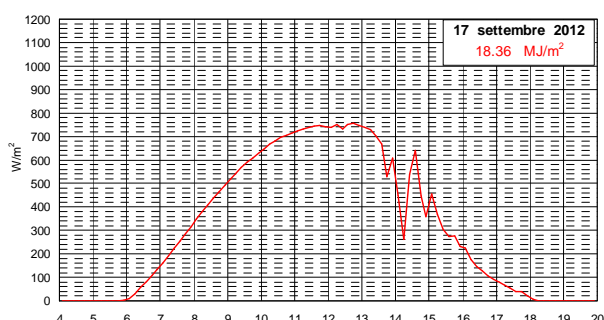
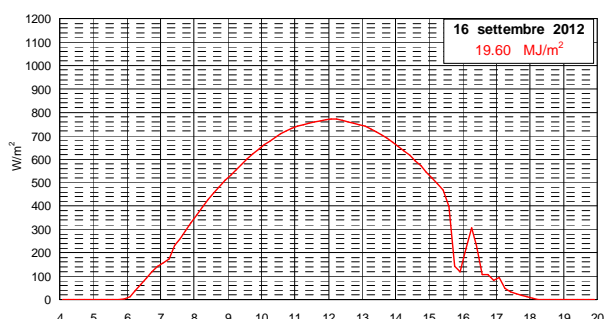
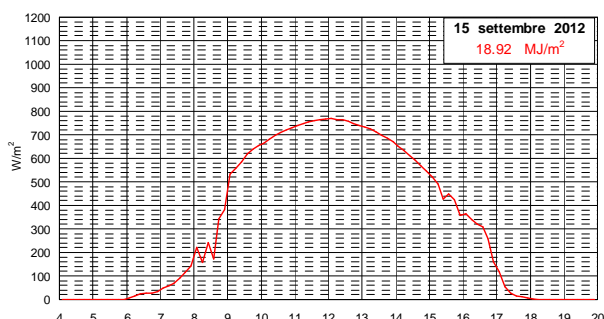
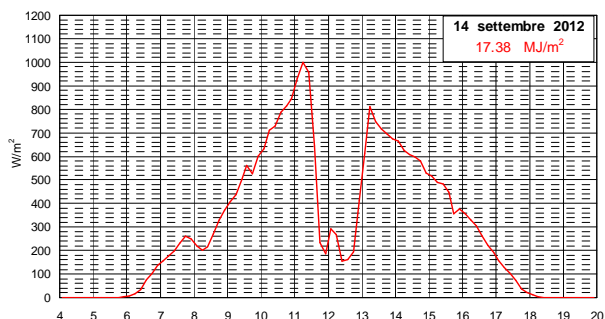
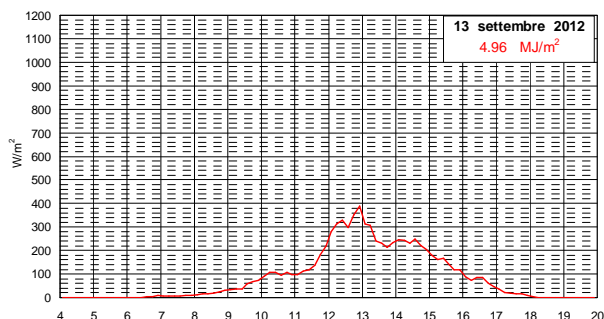
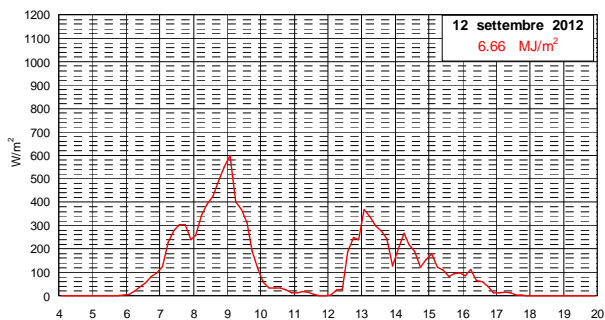
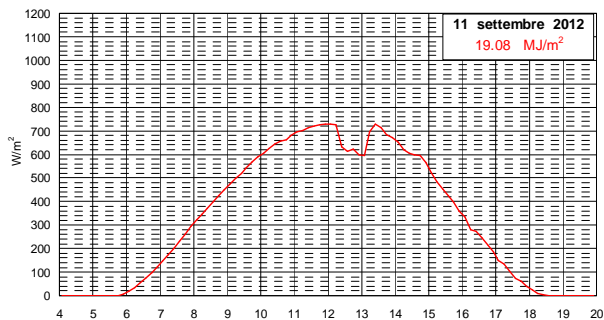
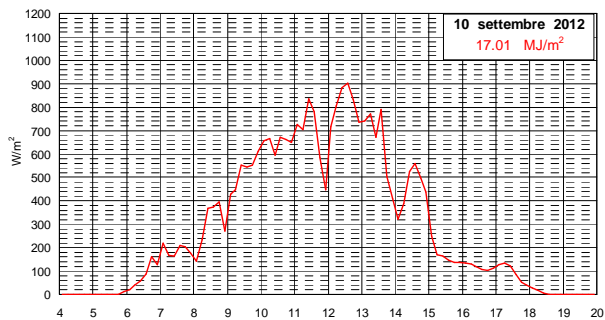
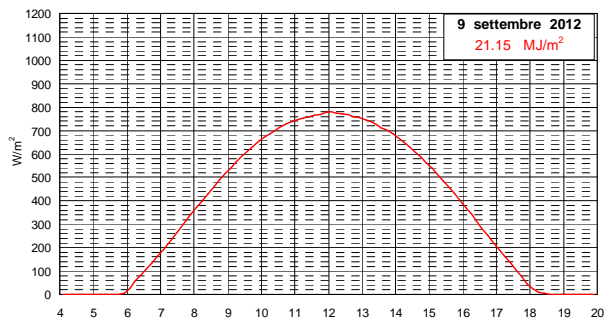


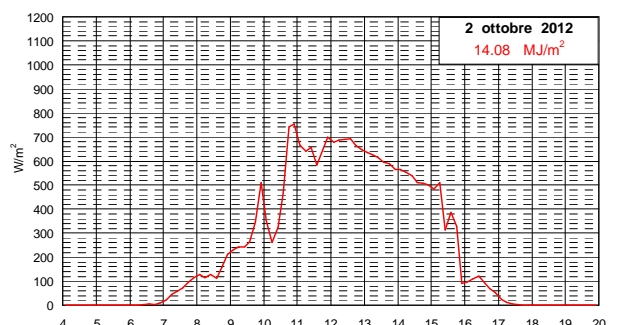
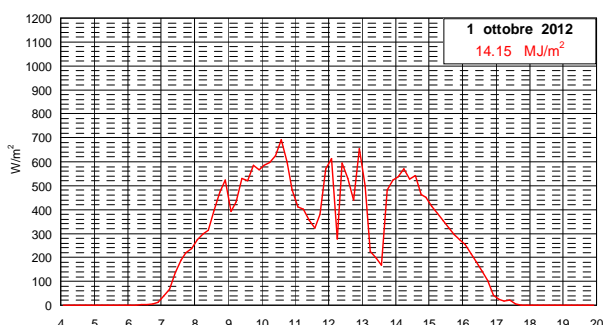
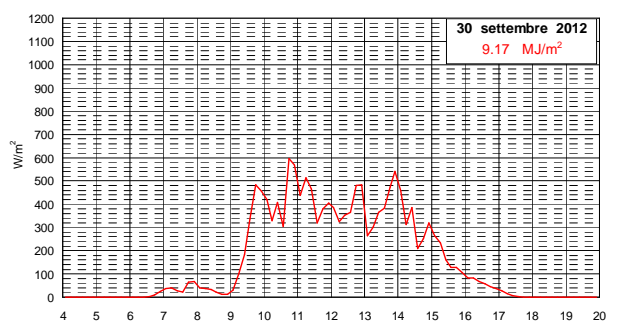
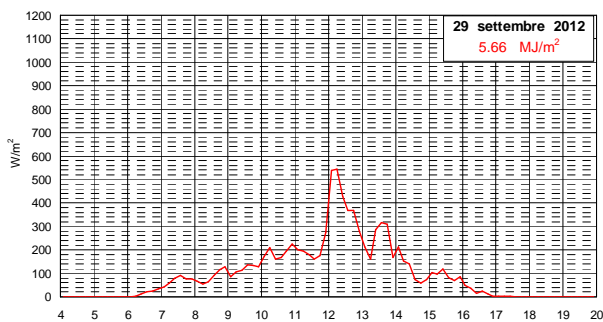
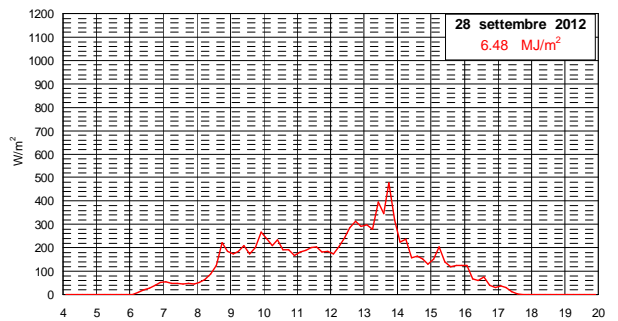
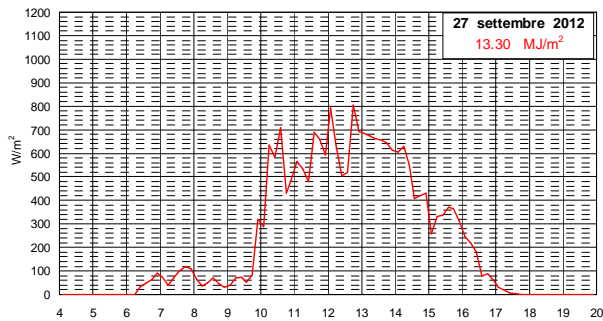
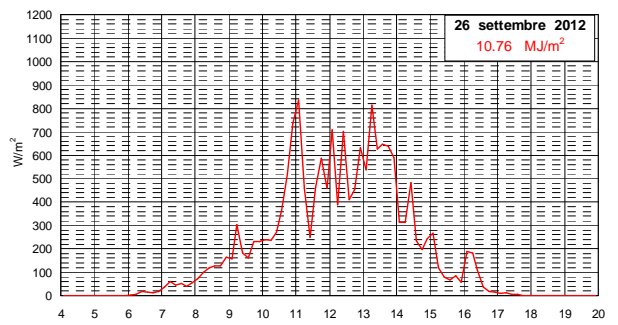
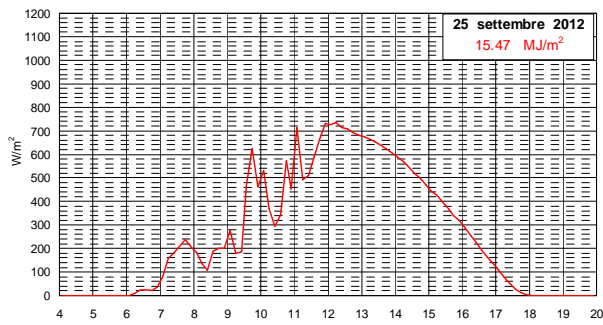
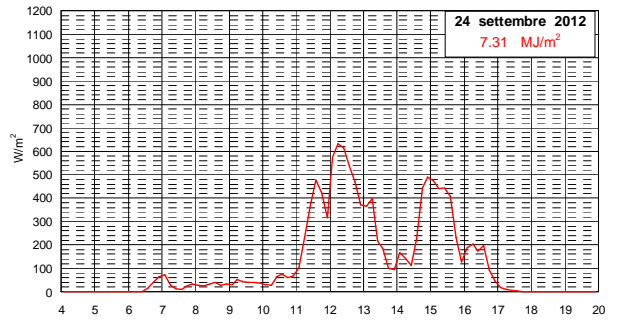
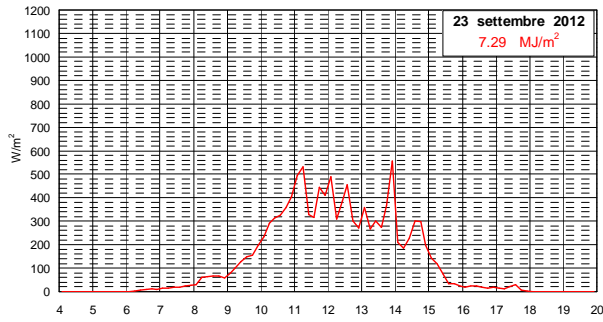
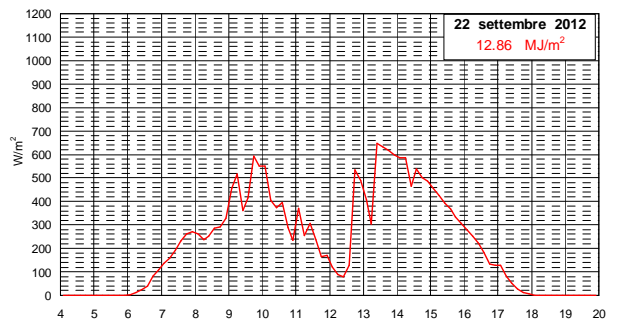
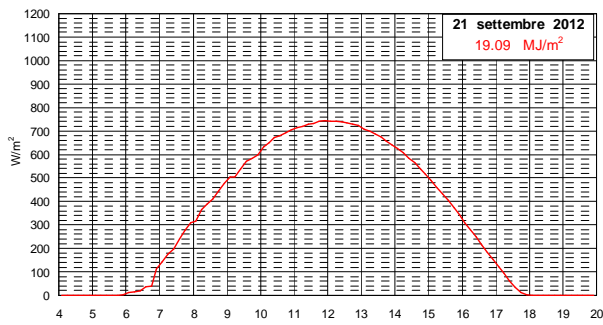


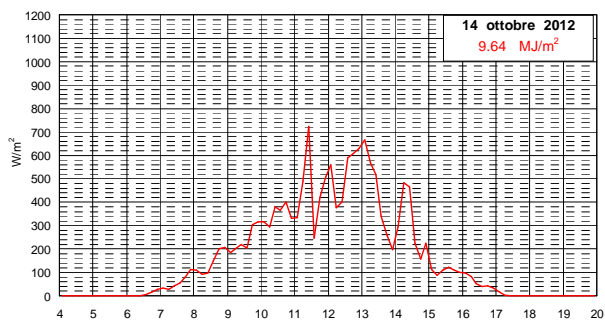
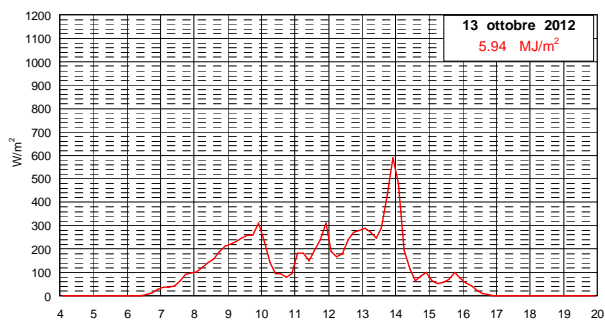
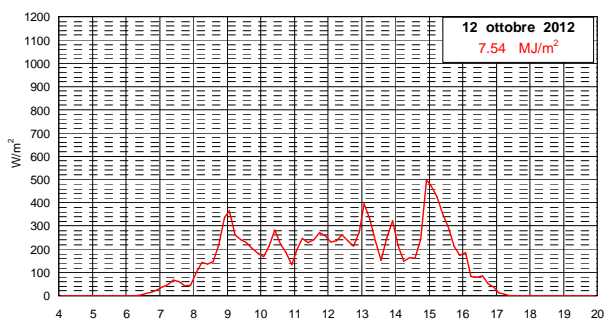
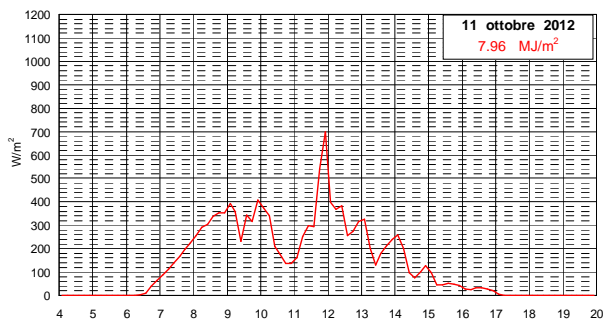
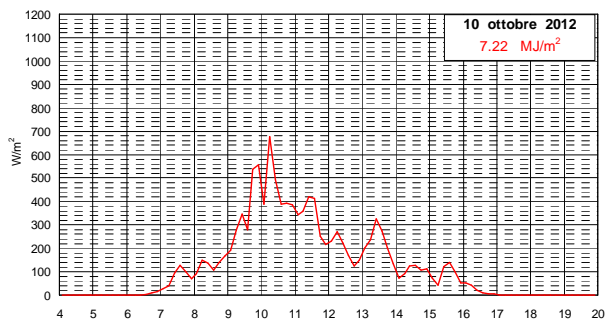
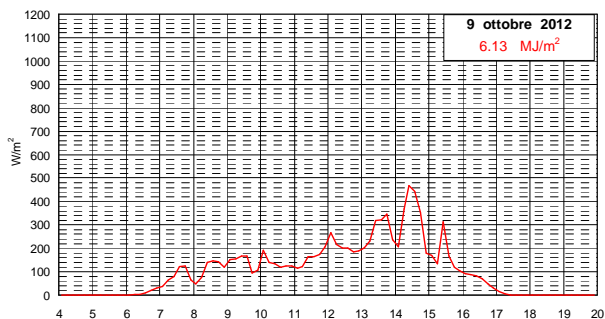
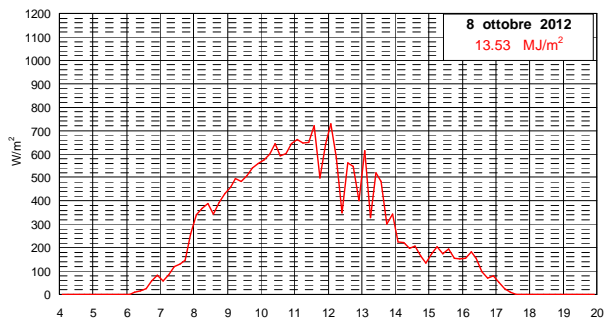
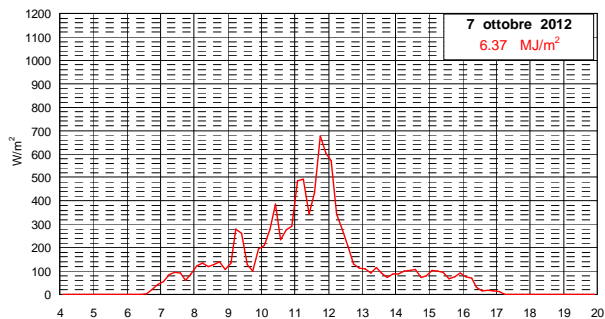
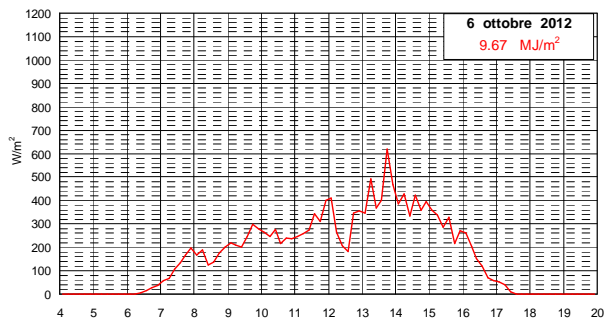
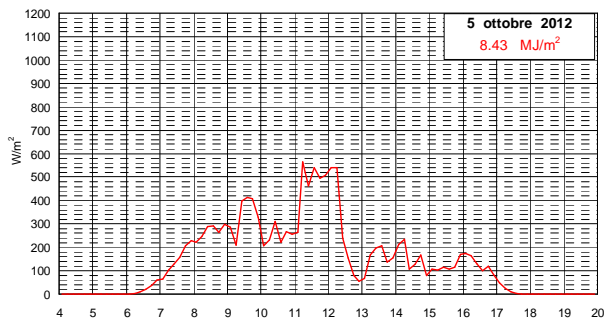
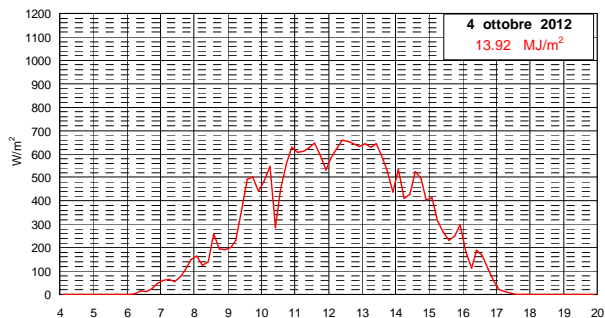
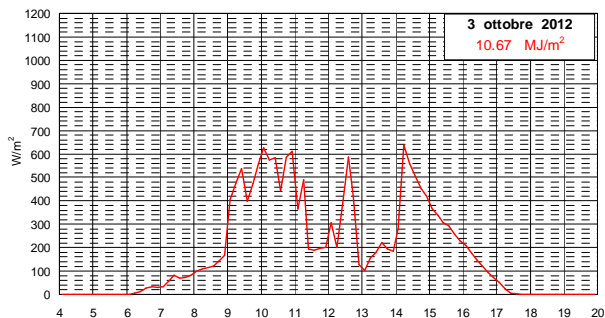


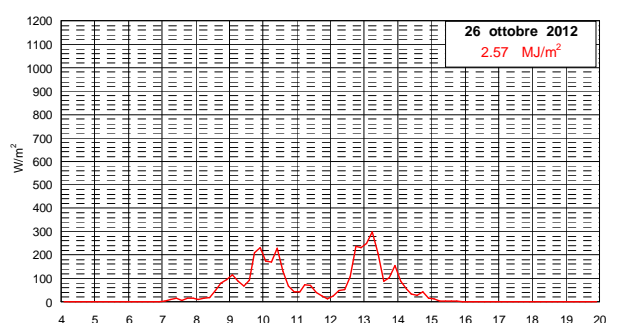
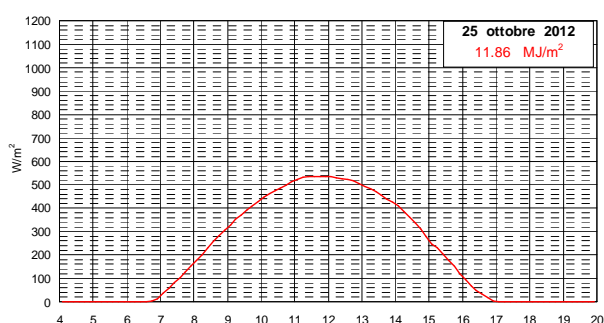
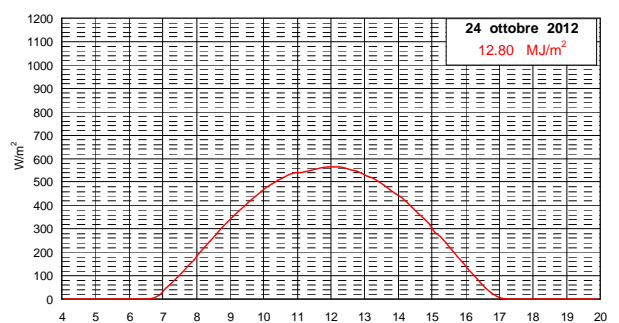
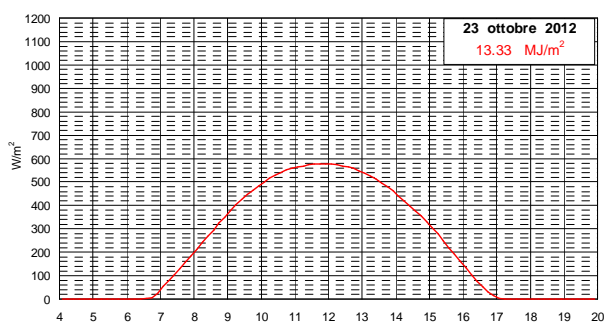
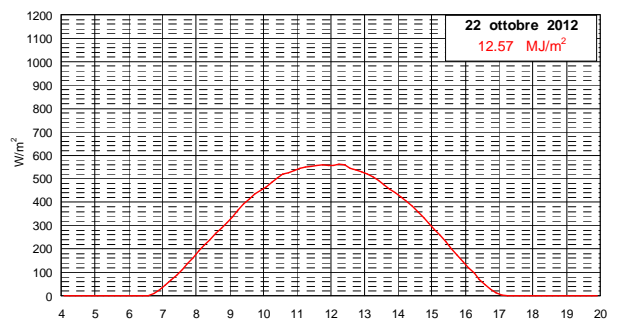
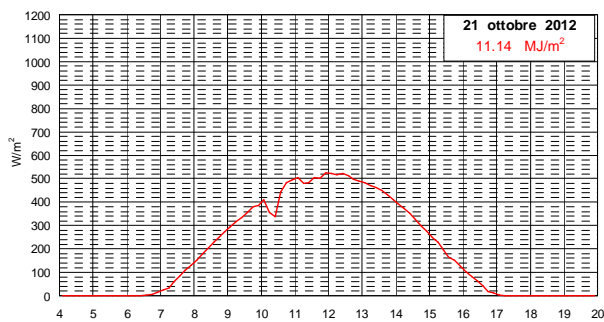
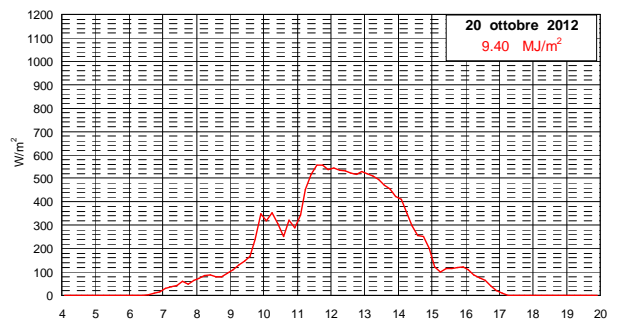
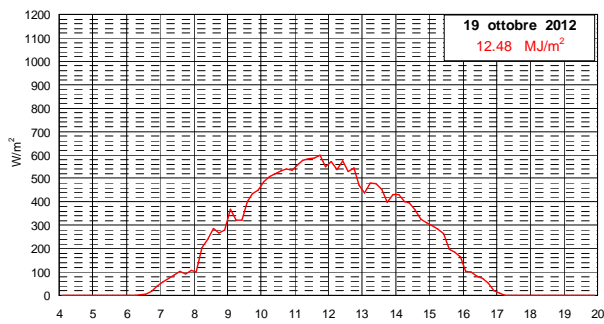
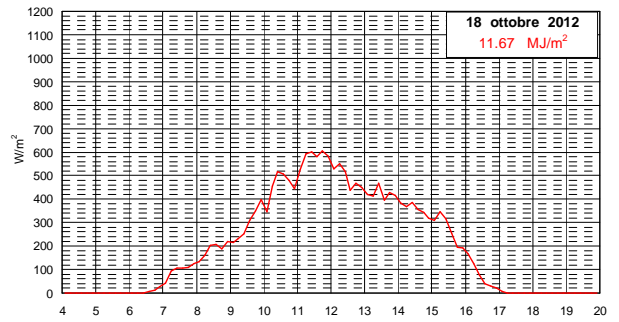
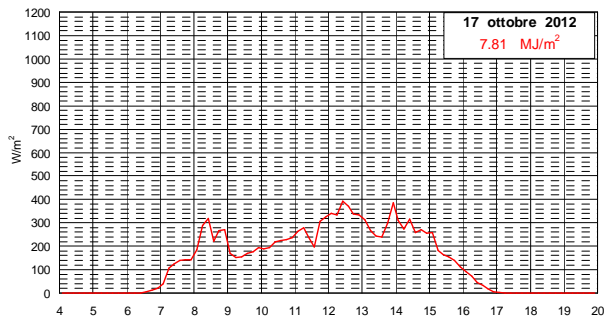
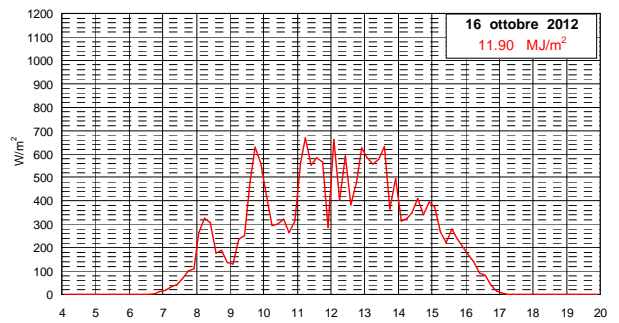
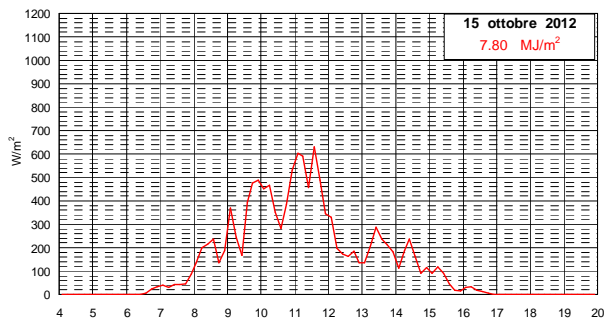


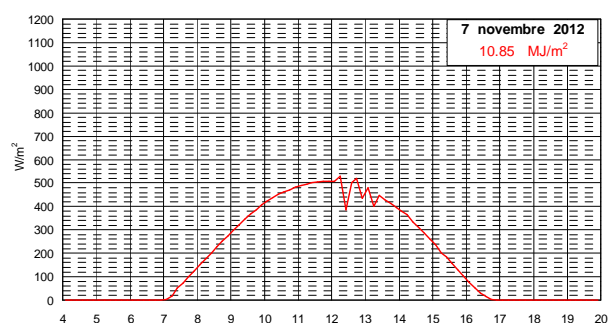
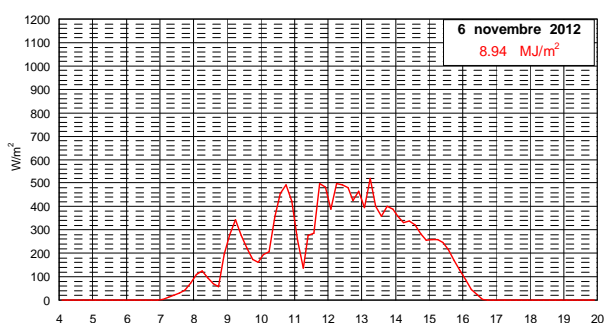
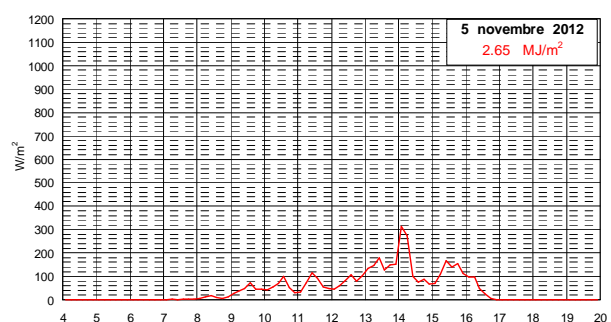
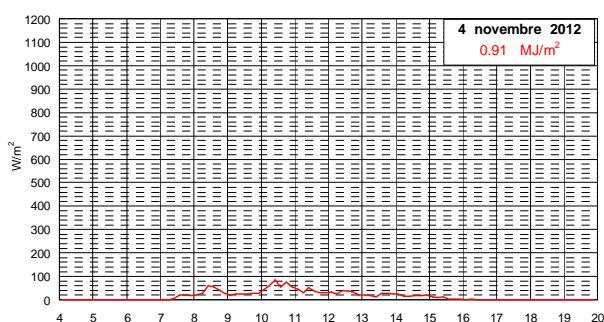
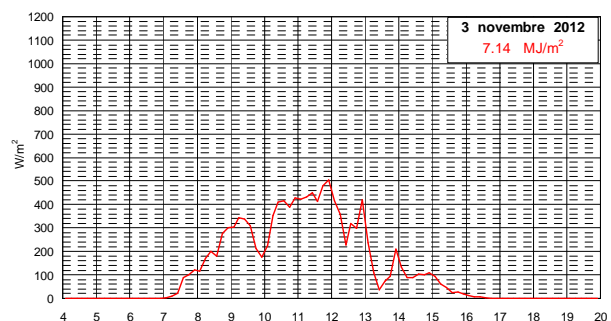
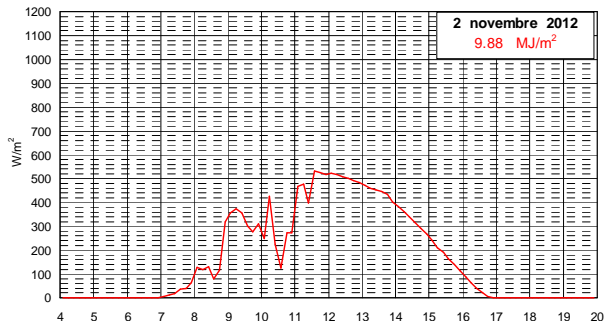
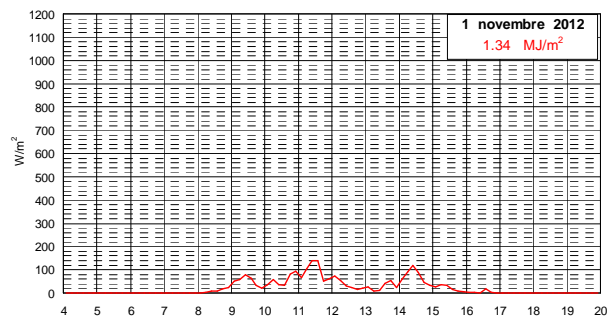
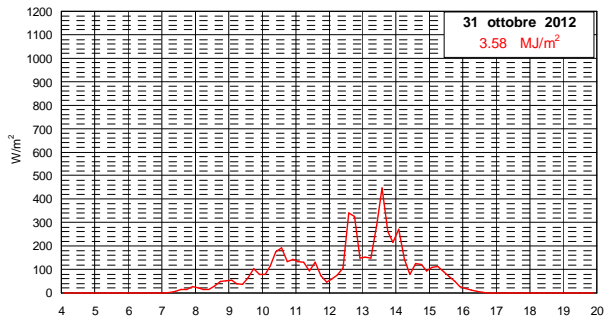
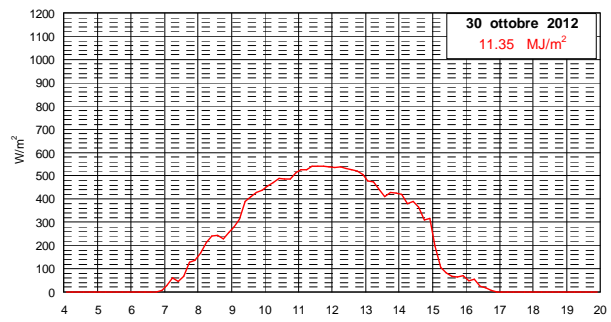
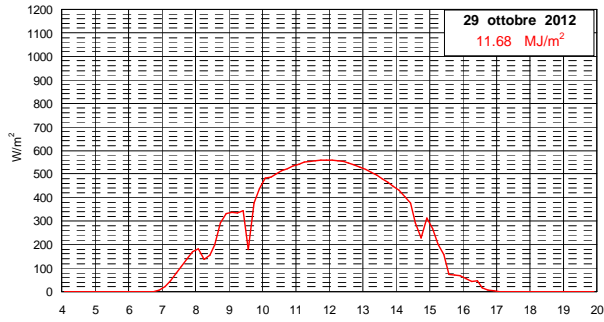
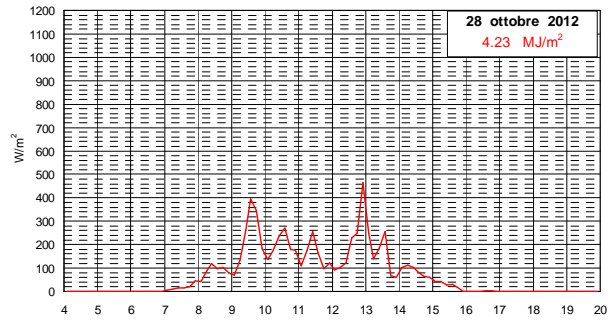
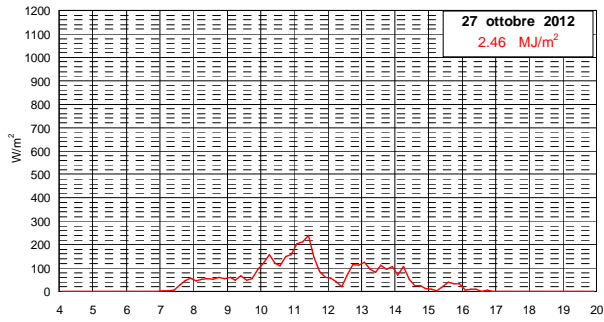


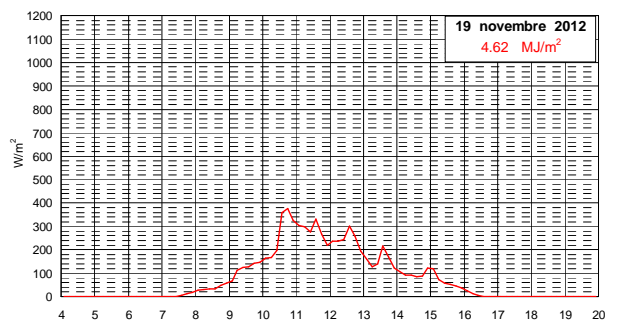
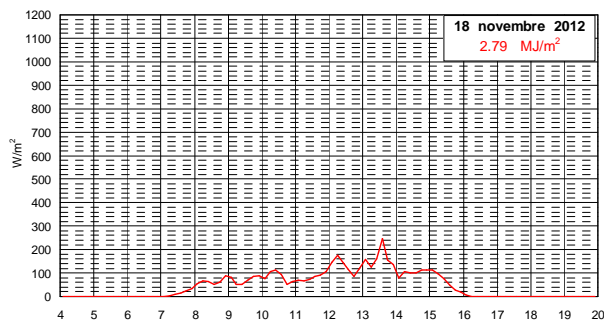
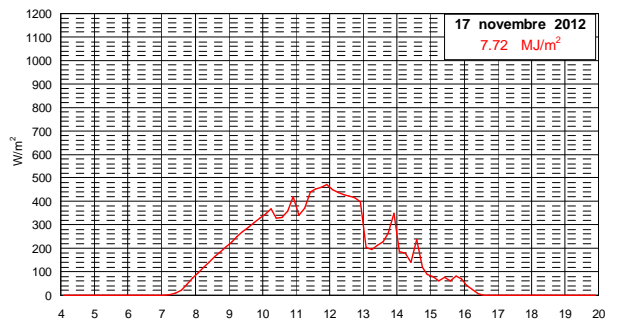
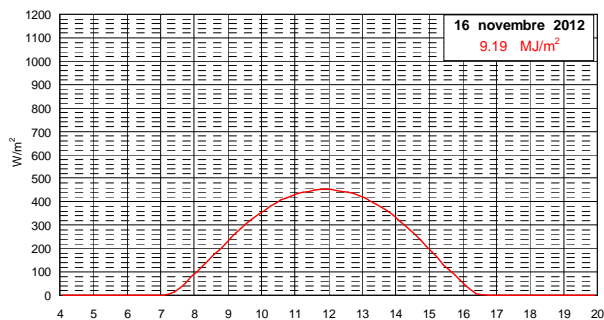
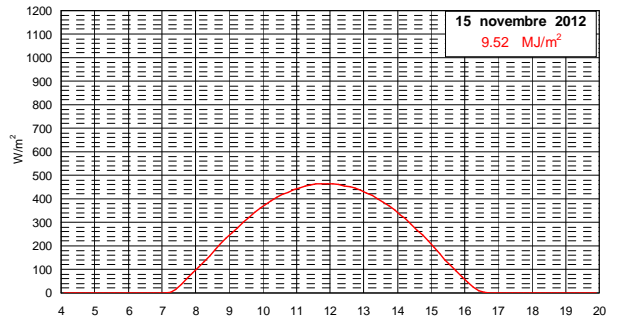
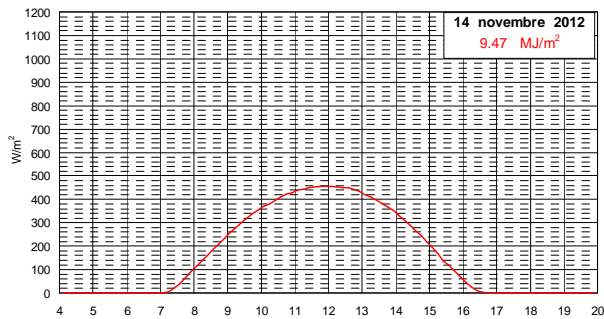
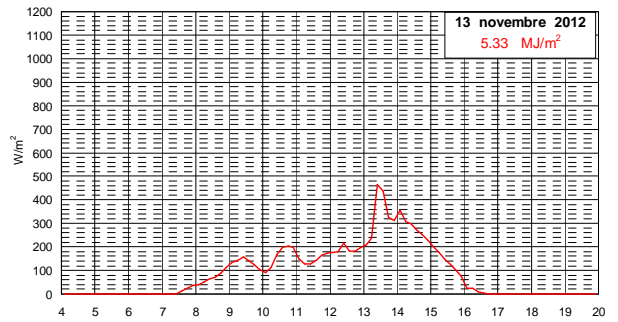
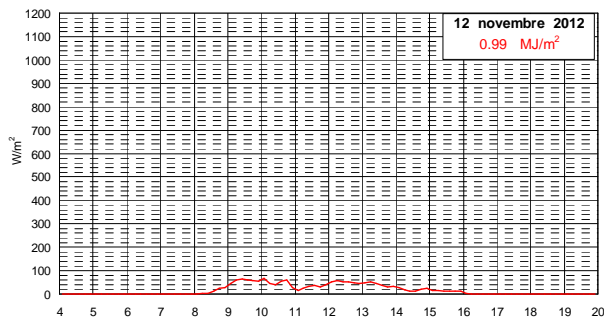
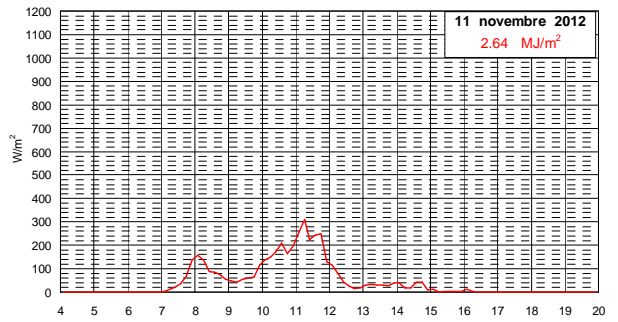
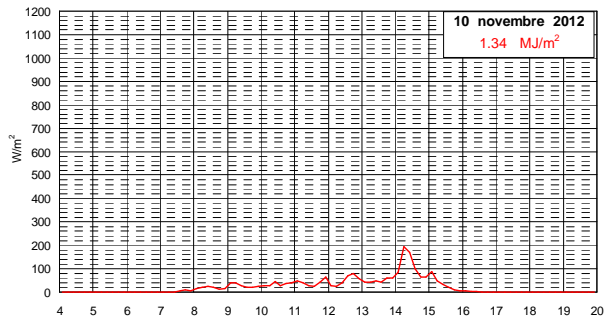
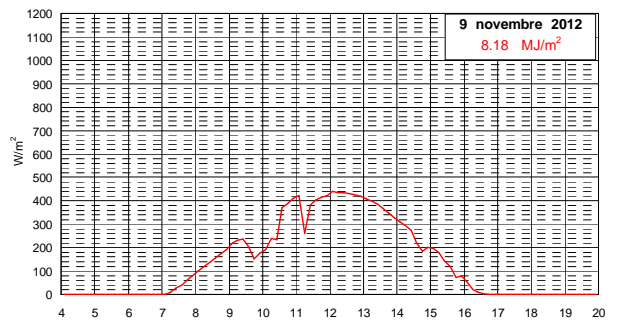
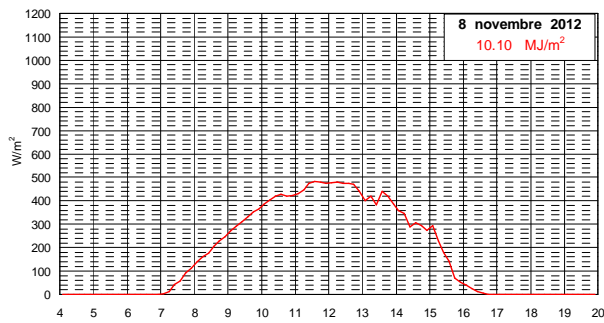


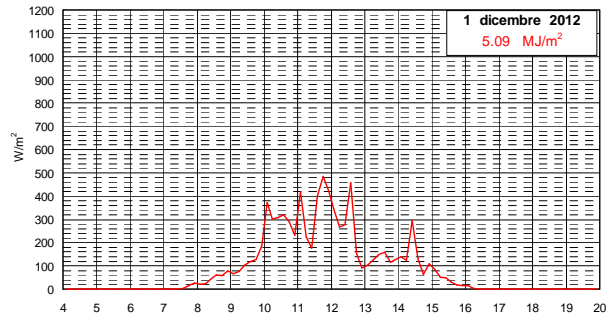
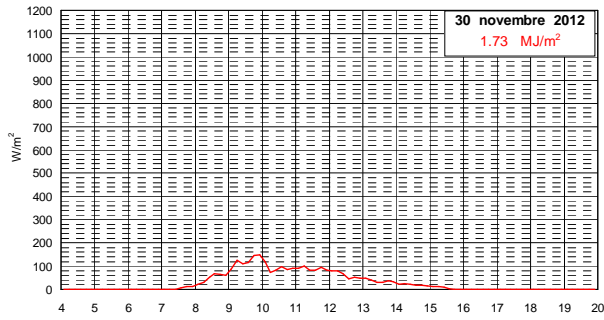
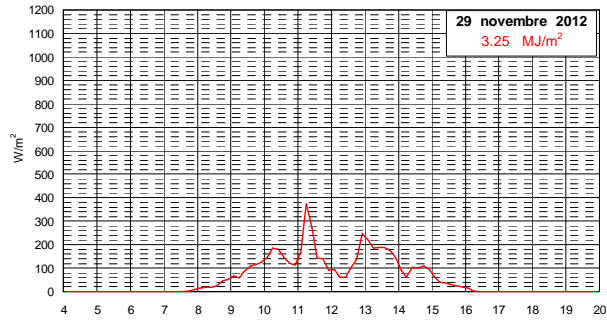
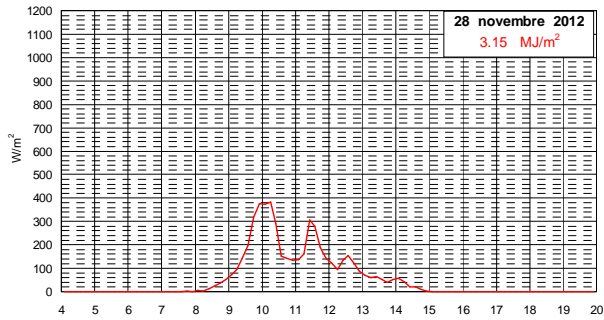
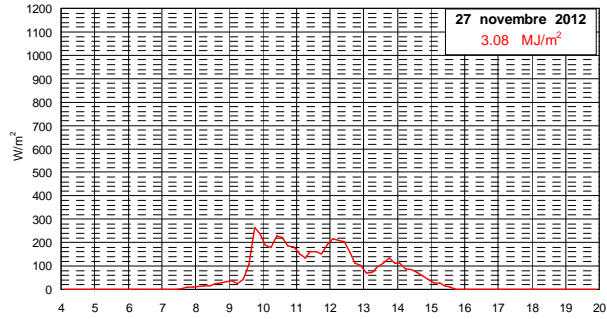
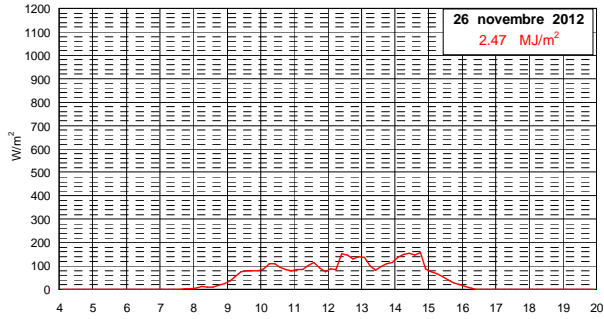
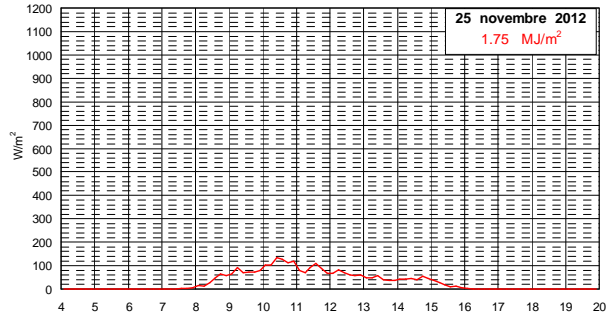
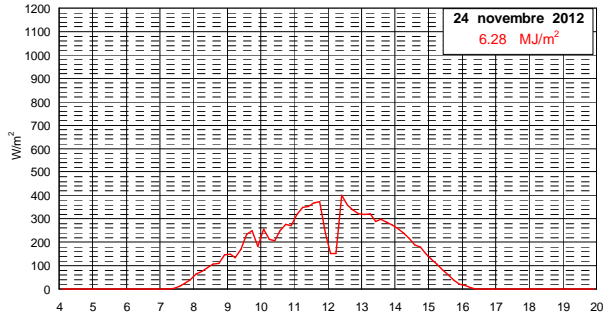
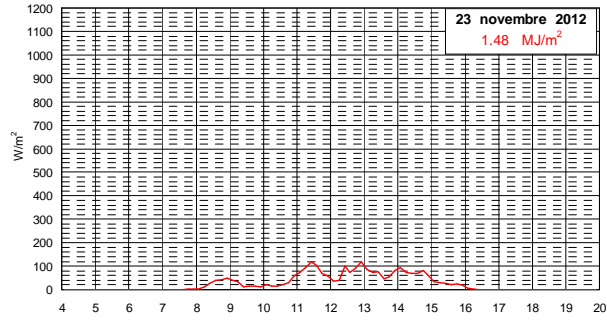
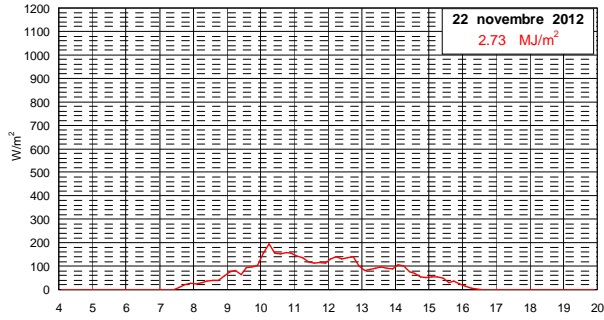
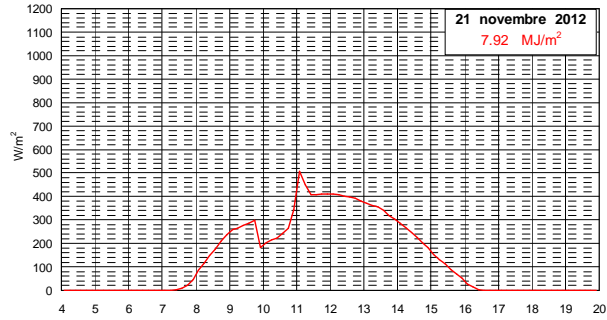
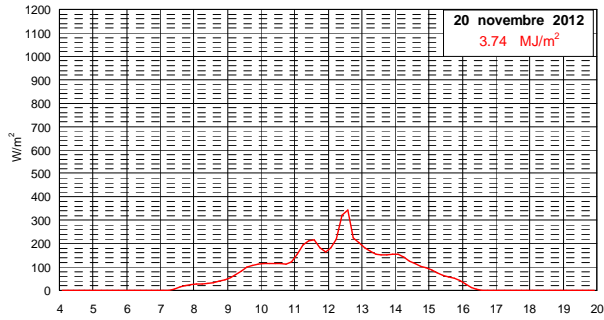


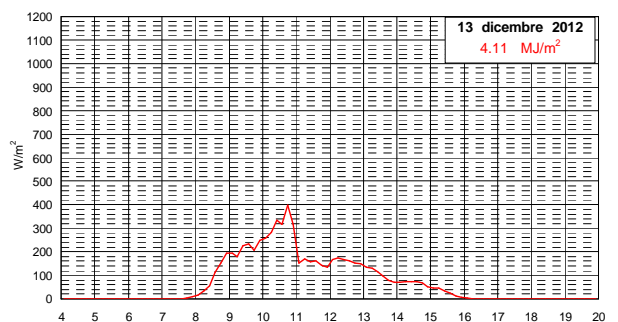
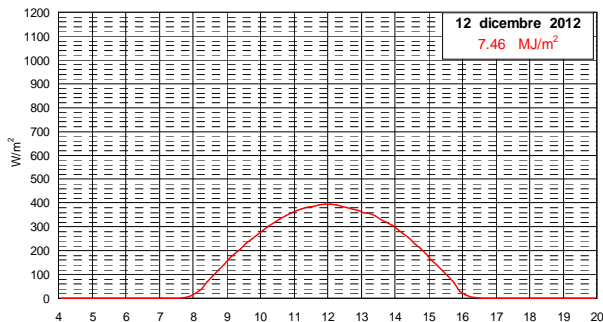
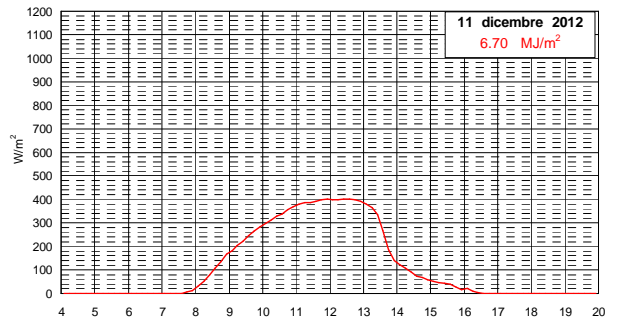
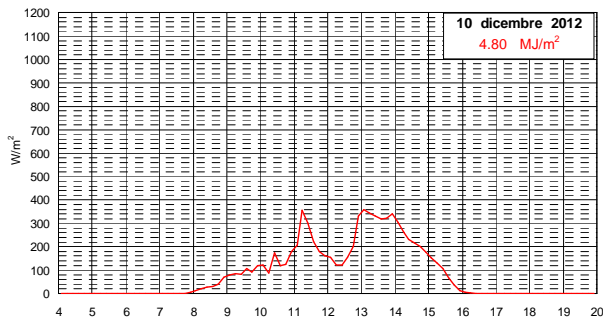
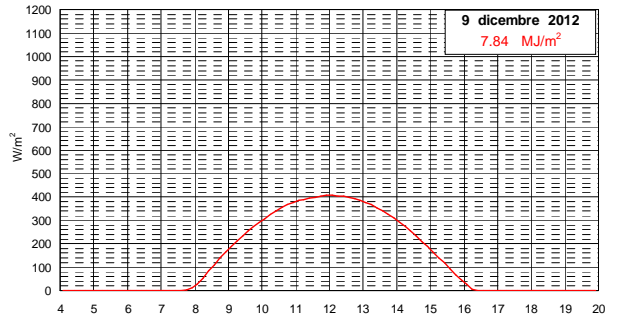
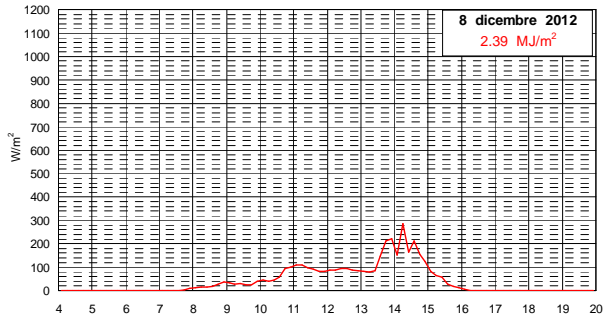
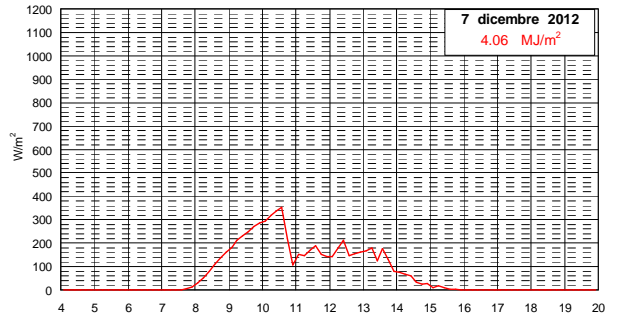
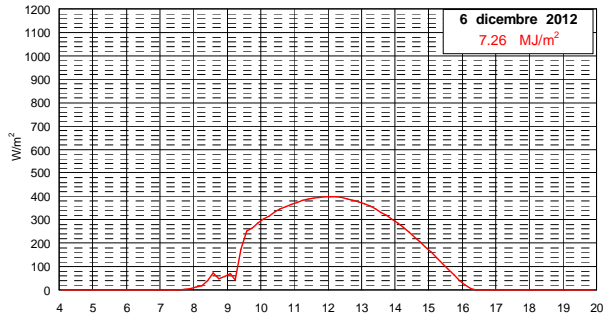
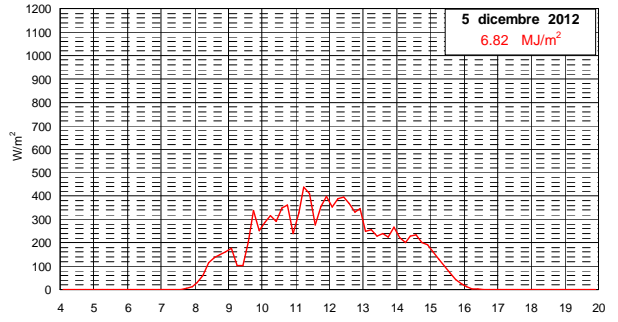
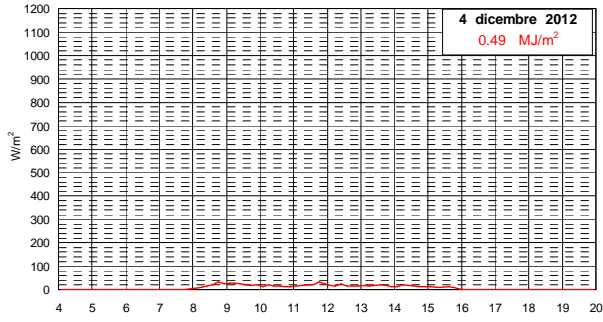
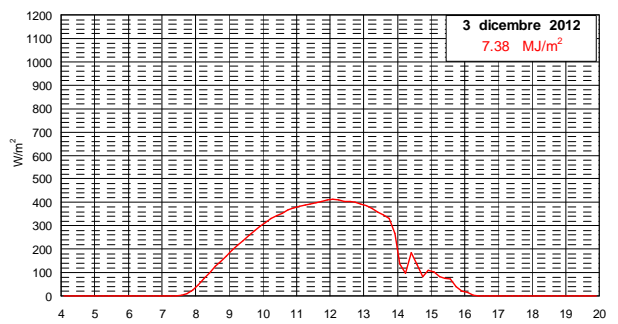
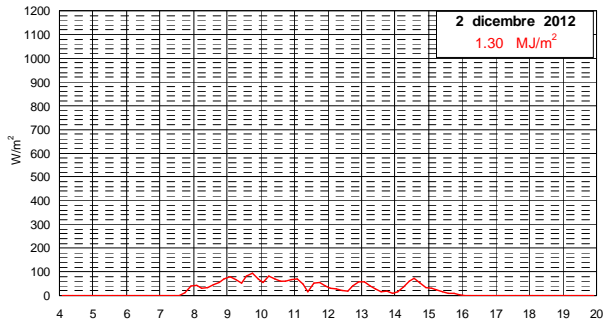


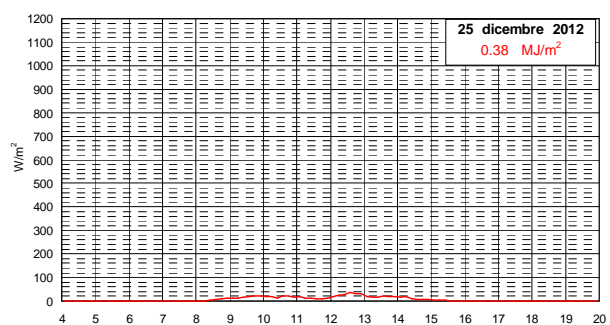
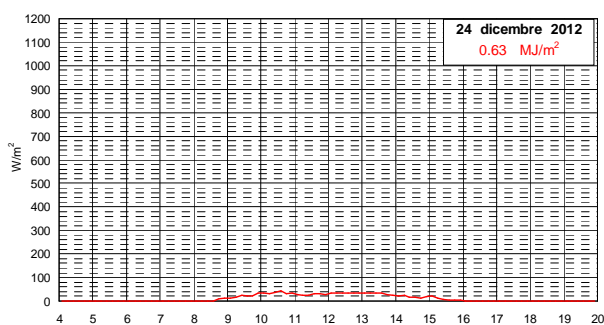
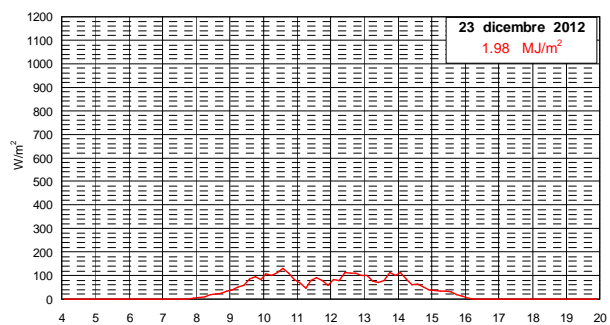
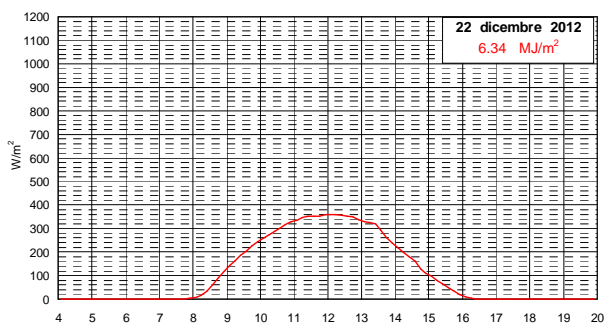
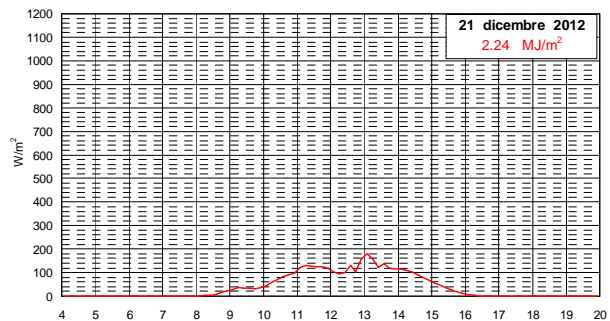
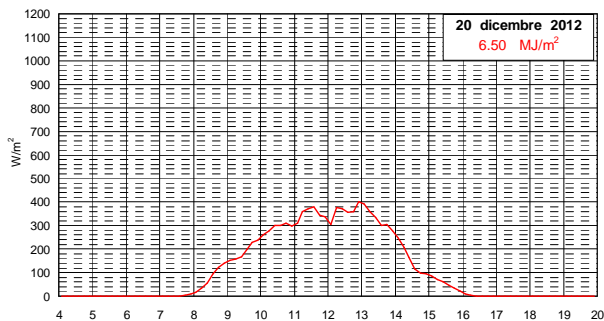
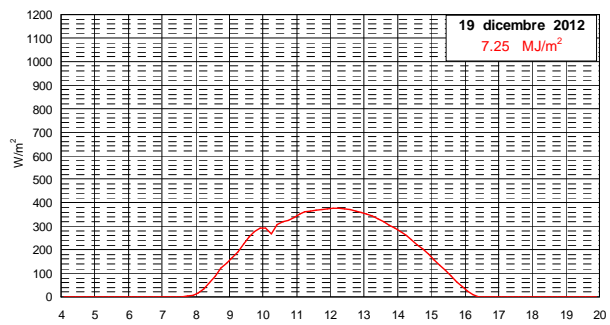
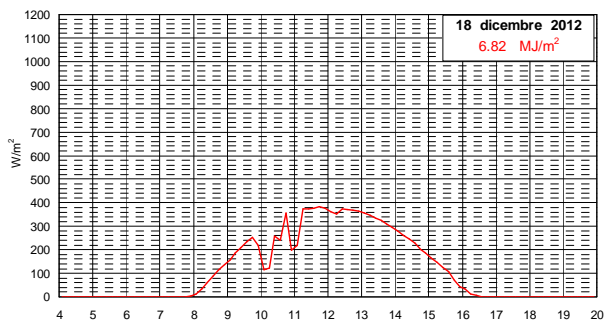
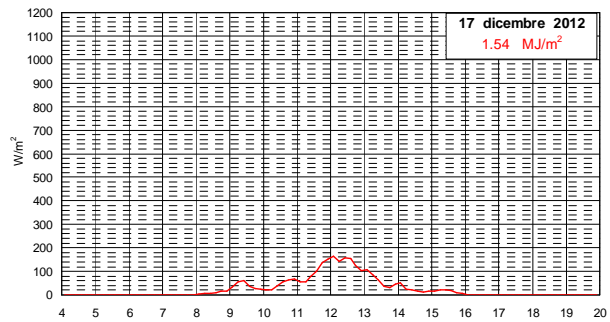
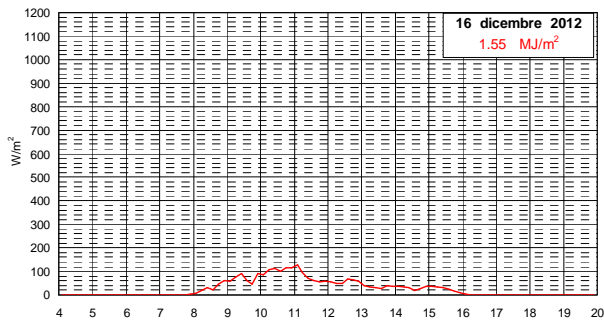
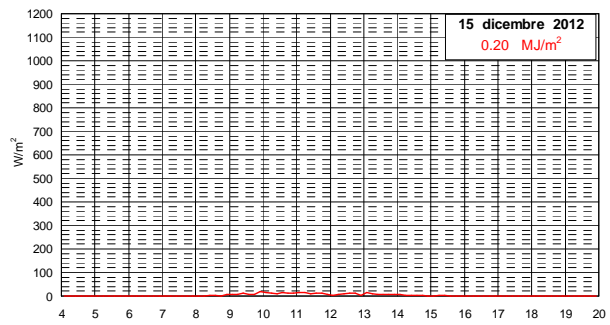
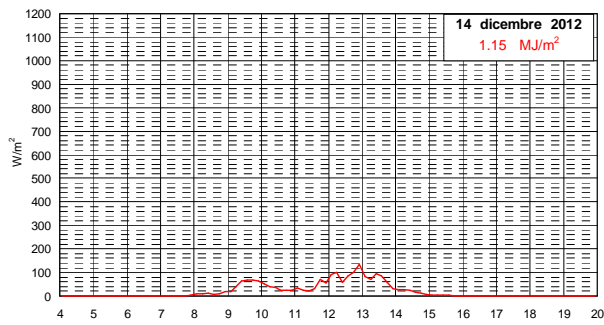


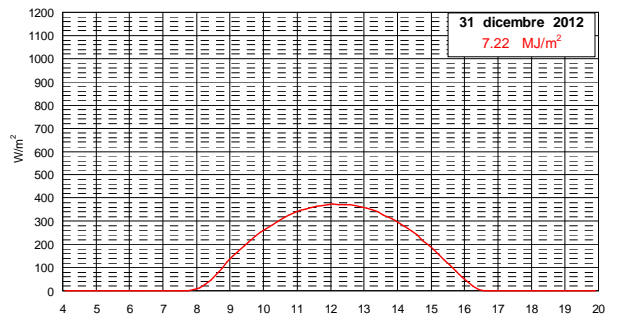
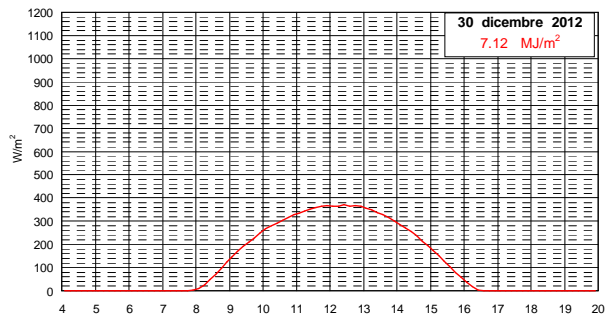
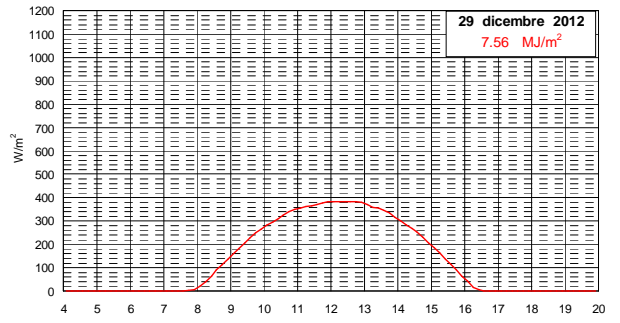
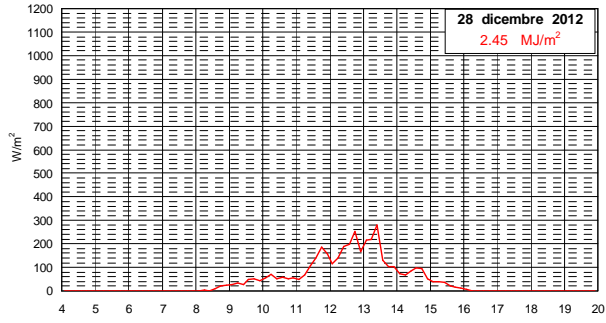
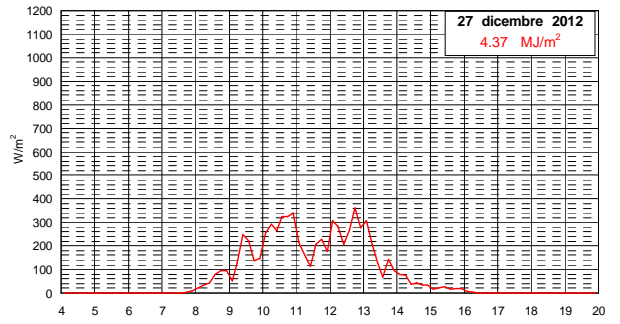
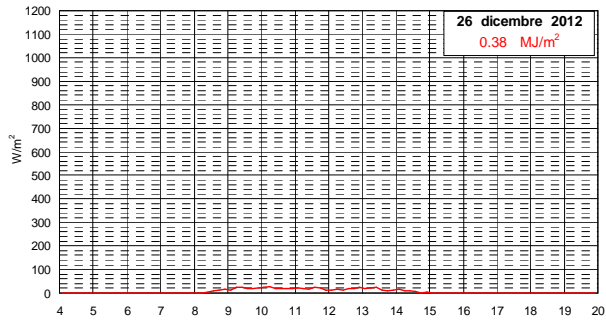












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TRIESTE 2012 Irradiazione solare globale giornaliera /(MJ/m^2) 5212.48 MJ/m^2

| | GEN | FEB | MAR | APR | MAG | GIU | LUG | AGO | SET | OTT | NOV | DIC |
|----|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 1 | 6.33 | 2.93 | 13.51 | 20.62 | 23.38 | 15.35 | 27.81 | 27.40 | 6.72 | 14.15 | 1.34 | 5.09 |
| 2 | 0.62 | 5.02 | 14.28 | 20.86 | 25.08 | 8.10 | 24.38 | 26.55 | 18.12 | 14.08 | 9.88 | 1.30 |
| 3 | 0.96 | 6.94 | 13.82 | 2.48 | 27.46 | 13.25 | 26.00 | 25.99 | 10.21 | 10.67 | 7.14 | 7.38 |
| 4 | 1.40 | 3.39 | 5.74 | 11.25 | 23.63 | 8.67 | 28.69 | 26.20 | 12.66 | 13.92 | 0.91 | 0.49 |
| 5 | 1.77 | 10.01 | 11.57 | 4.93 | 23.53 | 29.26 | 16.52 | 25.65 | 6.68 | 8.43 | 2.65 | 6.82 |
| 6 | 6.43 | 10.07 | 12.16 | 12.53 | 9.31 | 23.65 | 10.55 | 21.87 | 13.43 | 9.67 | 8.94 | 7.26 |
| 7 | 5.06 | 1.79 | 15.10 | 4.81 | 8.82 | 21.63 | 26.84 | 26.40 | 20.78 | 6.37 | 10.85 | 4.06 |
| 8 | 7.00 | 9.50 | 15.43 | 10.07 | 27.65 | 23.74 | 29.26 | 26.15 | 22.10 | 13.53 | 10.10 | 2.39 |
| 9 | 7.29 | 6.69 | 16.53 | 24.05 | 25.49 | 4.70 | 29.19 | 24.13 | 21.15 | 6.13 | 8.18 | 7.84 |
| 10 | 7.03 | 6.03 | 17.94 | 21.77 | 26.65 | 22.90 | 28.42 | 24.98 | 17.01 | 7.22 | 1.34 | 4.80 |
| 11 | 7.09 | 4.63 | 16.42 | 1.82 | 25.19 | 17.66 | 28.01 | 19.28 | 19.08 | 7.96 | 2.64 | 6.70 |
| 12 | 6.93 | 9.73 | 16.63 | 19.35 | 24.75 | 17.71 | 23.92 | 20.40 | 6.66 | 7.54 | 0.99 | 7.46 |
| 13 | 2.18 | 11.81 | 17.63 | 8.38 | 12.95 | 27.78 | 24.36 | 25.52 | 4.96 | 5.94 | 5.33 | 4.11 |
| 14 | 8.12 | 11.10 | 17.38 | 8.79 | 26.36 | 30.45 | 23.31 | 23.49 | 17.38 | 9.64 | 9.47 | 1.15 |
| 15 | 7.95 | 7.94 | 18.14 | 5.13 | 29.08 | 29.93 | 19.24 | 24.24 | 18.92 | 7.80 | 9.52 | 0.20 |
| 16 | 8.01 | 12.26 | 17.93 | 15.41 | 2.34 | 30.35 | 28.32 | 20.24 | 19.60 | 11.90 | 9.19 | 1.55 |
| 17 | 7.36 | 10.11 | 17.53 | 25.60 | 30.20 | 29.39 | 29.13 | 24.74 | 18.36 | 7.81 | 7.72 | 1.54 |
| 18 | 5.63 | 10.47 | 9.11 | 19.97 | 29.27 | 30.14 | 29.04 | 24.39 | 18.61 | 11.67 | 2.79 | 6.82 |
| 19 | 0.61 | 1.37 | 6.61 | 18.31 | 28.64 | 28.52 | 28.24 | 24.33 | 6.81 | 12.48 | 4.62 | 7.25 |
| 20 | 0.43 | 2.18 | 17.30 | 14.69 | 20.47 | 26.89 | 27.67 | 24.68 | 20.19 | 9.40 | 3.74 | 6.50 |
| 21 | 7.34 | 13.05 | 15.51 | 21.65 | 4.47 | 27.90 | 12.92 | 23.50 | 19.09 | 11.14 | 7.92 | 2.24 |
| 22 | 4.05 | 13.68 | 17.96 | 8.79 | 8.98 | 21.50 | 24.67 | 21.95 | 12.86 | 12.57 | 2.73 | 6.34 |
| 23 | 4.88 | 12.19 | 17.18 | 13.21 | 17.60 | 26.30 | 27.59 | 21.72 | 7.29 | 13.33 | 1.48 | 1.98 |
| 24 | 4.48 | 12.80 | 17.61 | 9.92 | 21.73 | 28.86 | 11.52 | 22.06 | 7.31 | 12.80 | 6.28 | 0.63 |
| 25 | 8.98 | 12.20 | 15.39 | 26.43 | 29.95 | 21.85 | 20.14 | 22.52 | 15.47 | 11.86 | 1.75 | 0.38 |
| 26 | 9.08 | 11.06 | 20.43 | 25.60 | 25.67 | 28.65 | 22.56 | 5.43 | 10.76 | 2.57 | 2.47 | 0.38 |
| 27 | 8.87 | 14.31 | 20.42 | 26.30 | 26.41 | 30.21 | 26.89 | 24.62 | 13.30 | 2.46 | 3.08 | 4.37 |
| 28 | 5.59 | 10.35 | 20.55 | 26.40 | 17.81 | 28.83 | 25.05 | 23.19 | 6.48 | 4.23 | 3.15 | 2.45 |
| 29 | 7.23 | 13.42 | 18.45 | 20.78 | 24.91 | 27.67 | 26.02 | 23.01 | 5.66 | 11.68 | 3.25 | 7.56 |
| 30 | 7.16 | | 16.81 | 18.98 | 28.30 | 27.56 | 24.20 | 20.85 | 9.17 | 11.35 | 1.73 | 7.12 |
| 31 | 3.26 | | 13.76 | | 26.10 | | 27.18 | 4.79 | | 3.58 | | 7.22 |
| | 169.09 | 257.03 | 484.85 | 468.88 | 682.18 | 709.38 | 757.62 | 700.26 | 406.80 | 293.86 | 151.17 | 131.38 |