

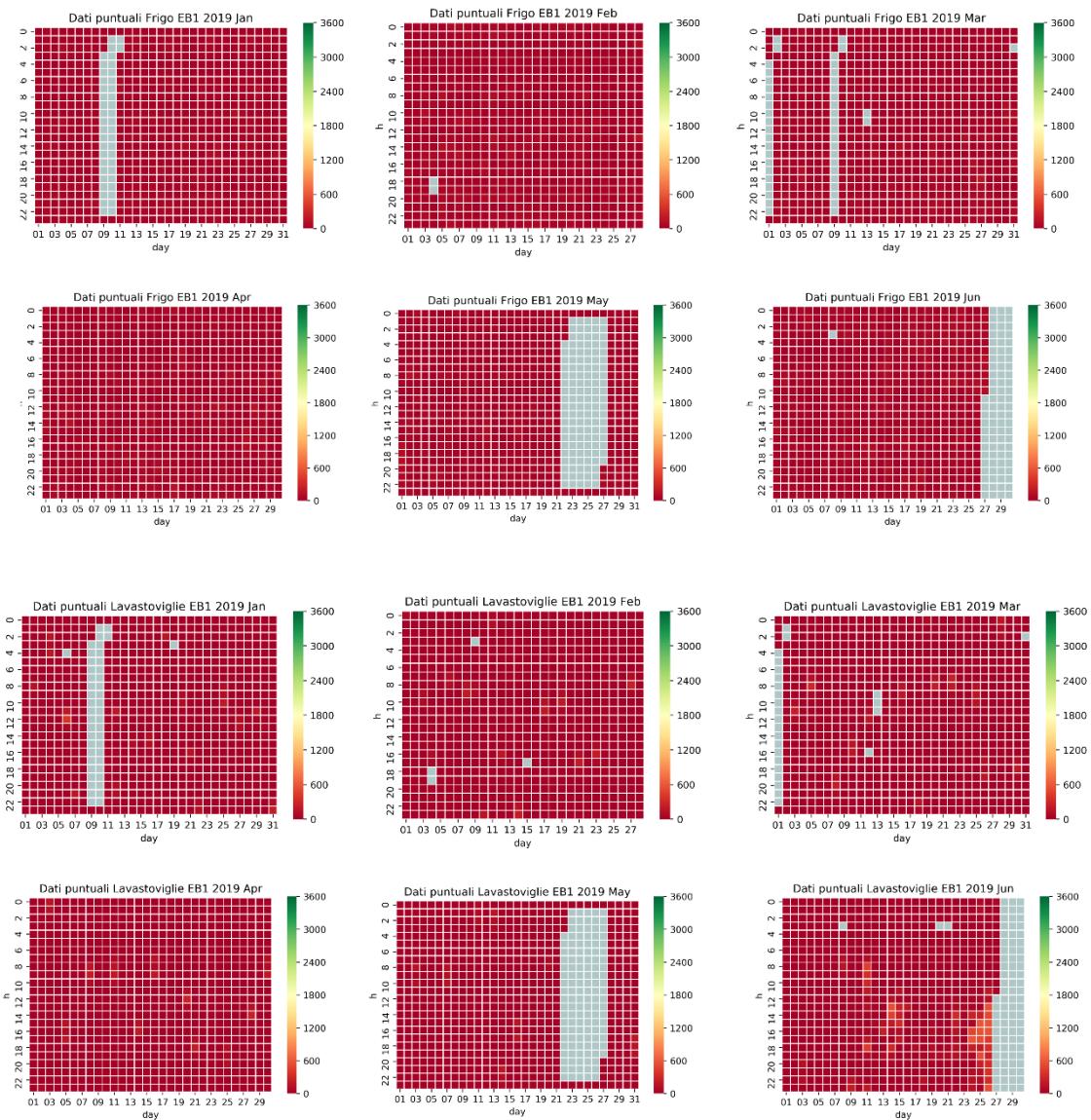
Indice

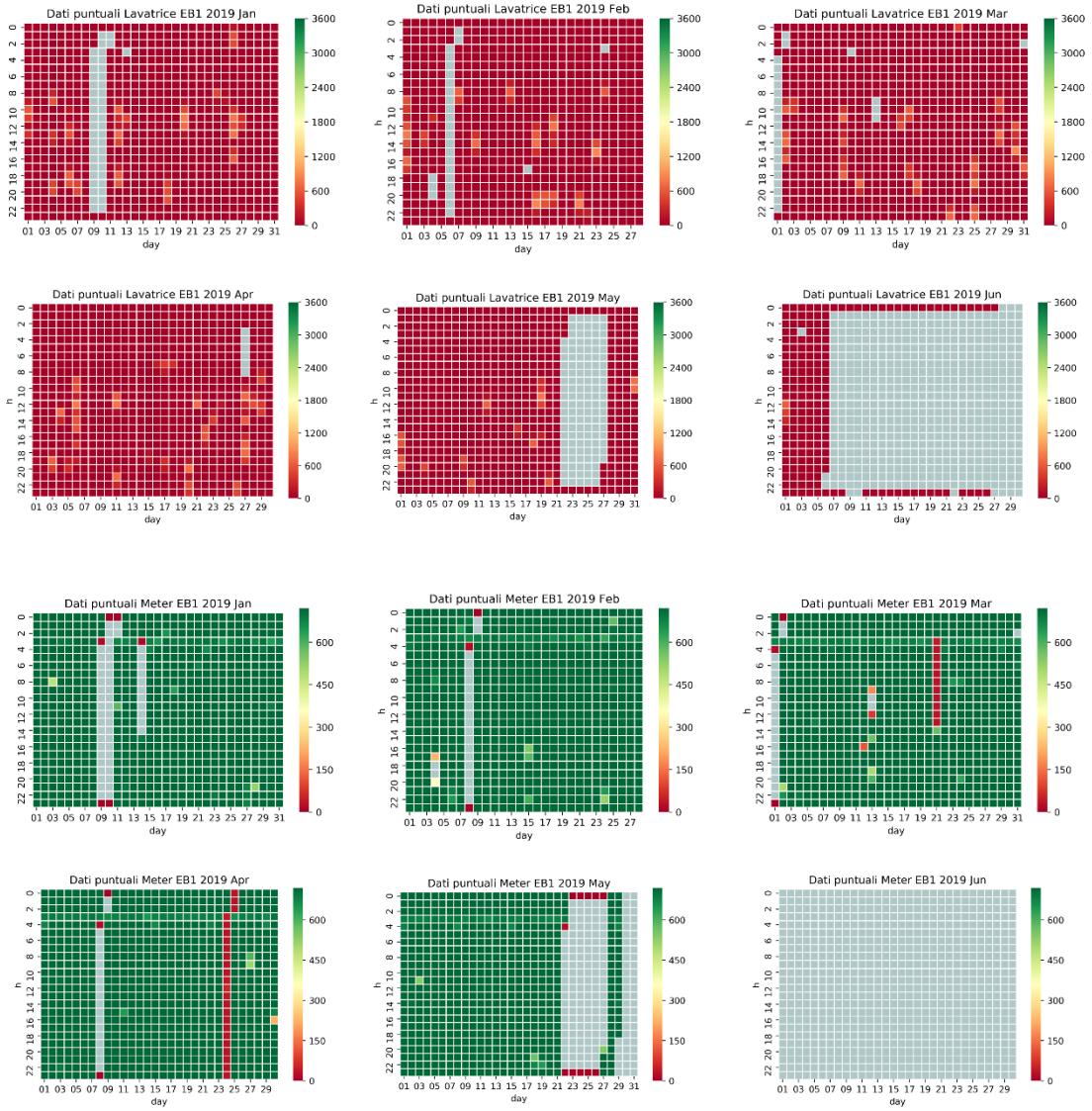
- Heatmap appliance & main
- Dati mancanti per abitazione
- Elenco appliance per abitazione
- Heatmap numero dispositivi
- Commento su case considerate
- Plot delle case considerate
- Rapporto Segnale-Rumore

HEATMAP APPLIANCE & MAIN

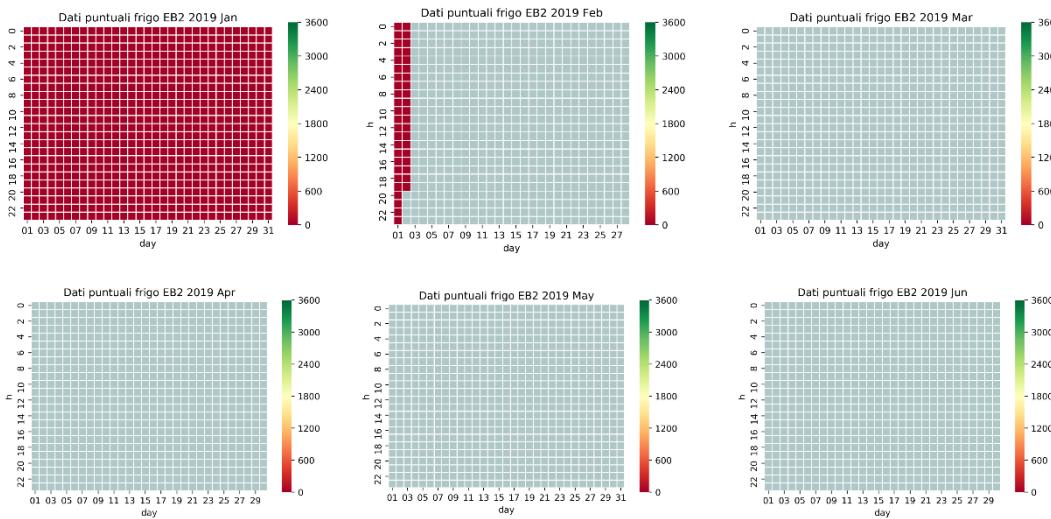
Nelle figure seguenti sono riportate le heatmap dei vari elettrodomestici e del main per le case a disposizione. I valori in grigio corrispondono ai dati mancanti.

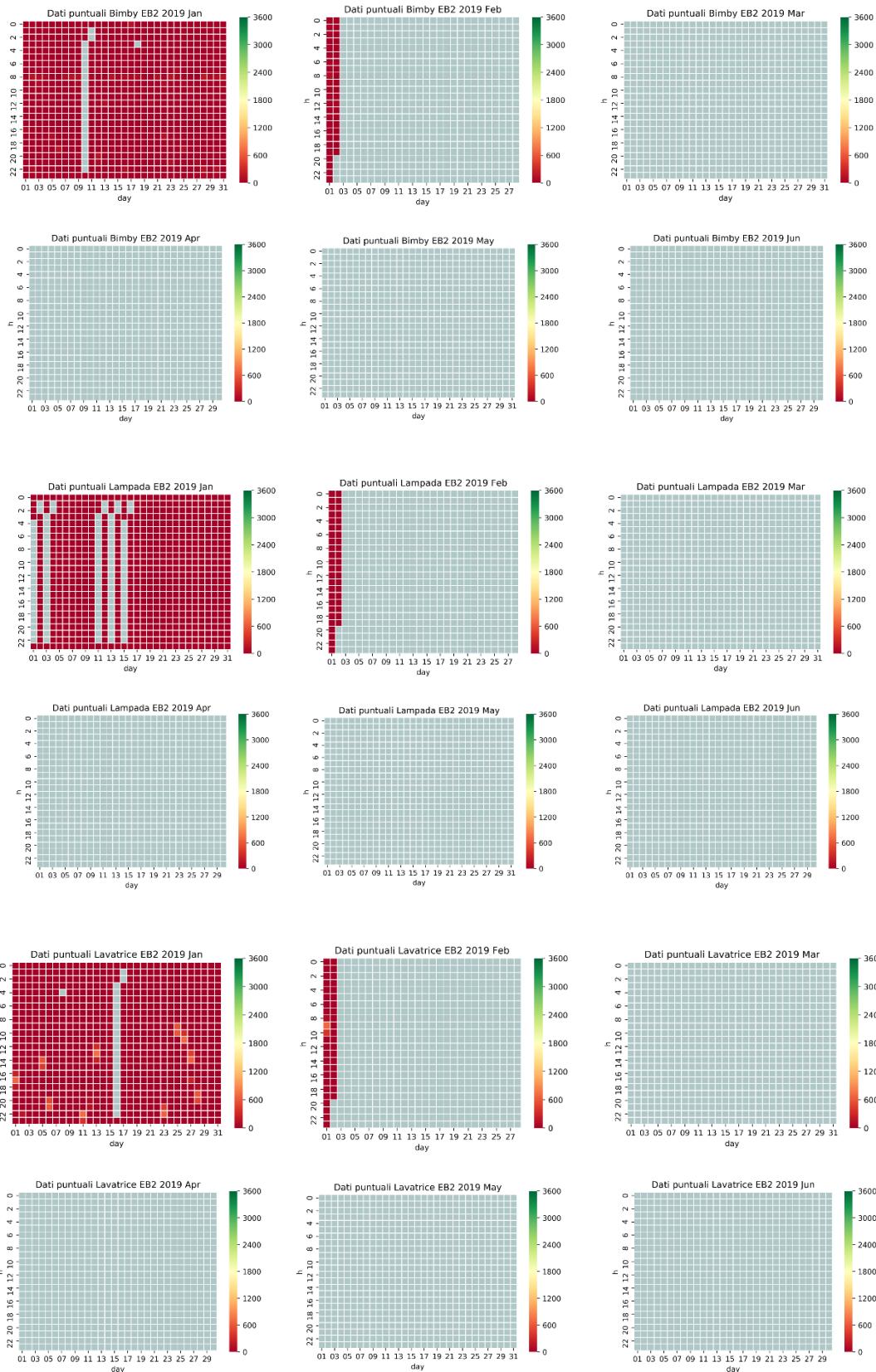
Casa 1

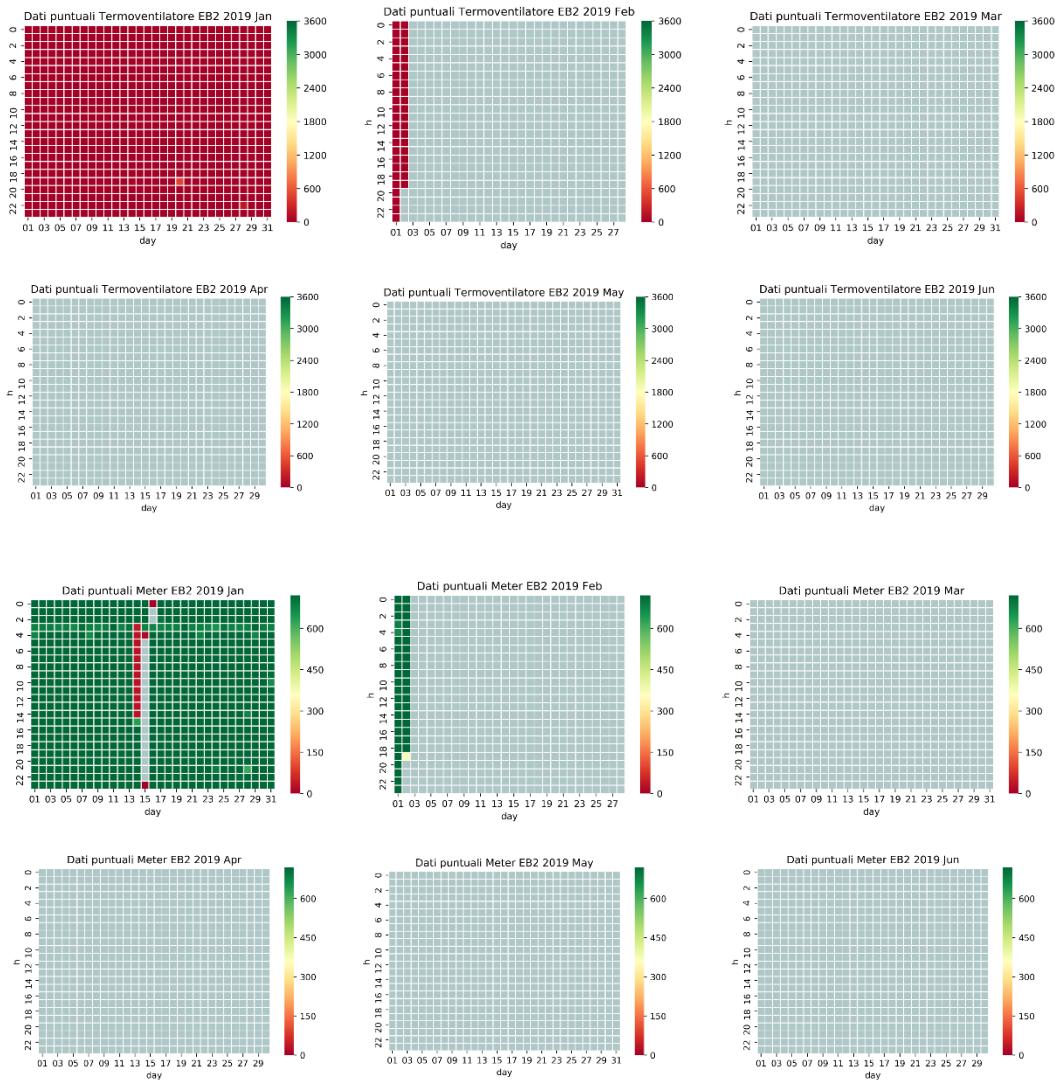




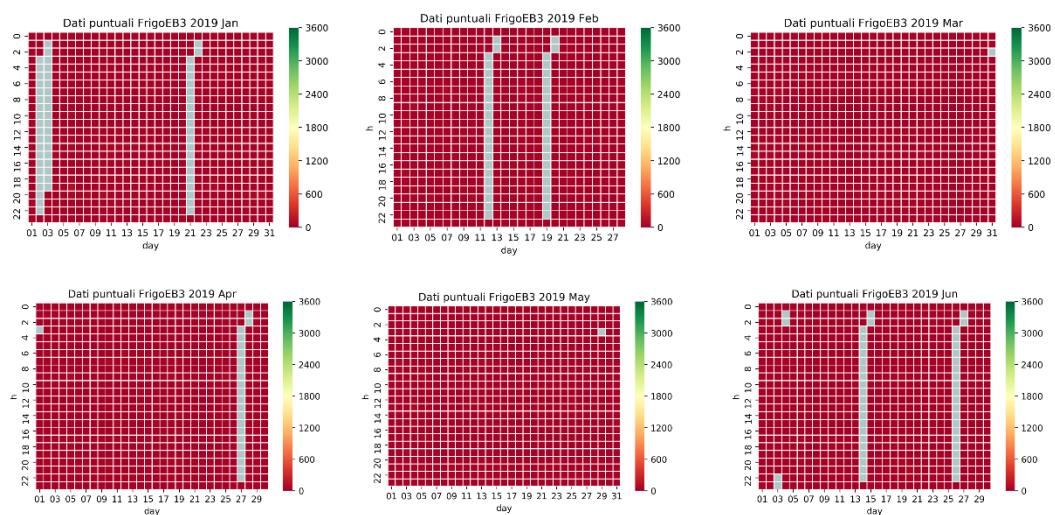
Casa 2

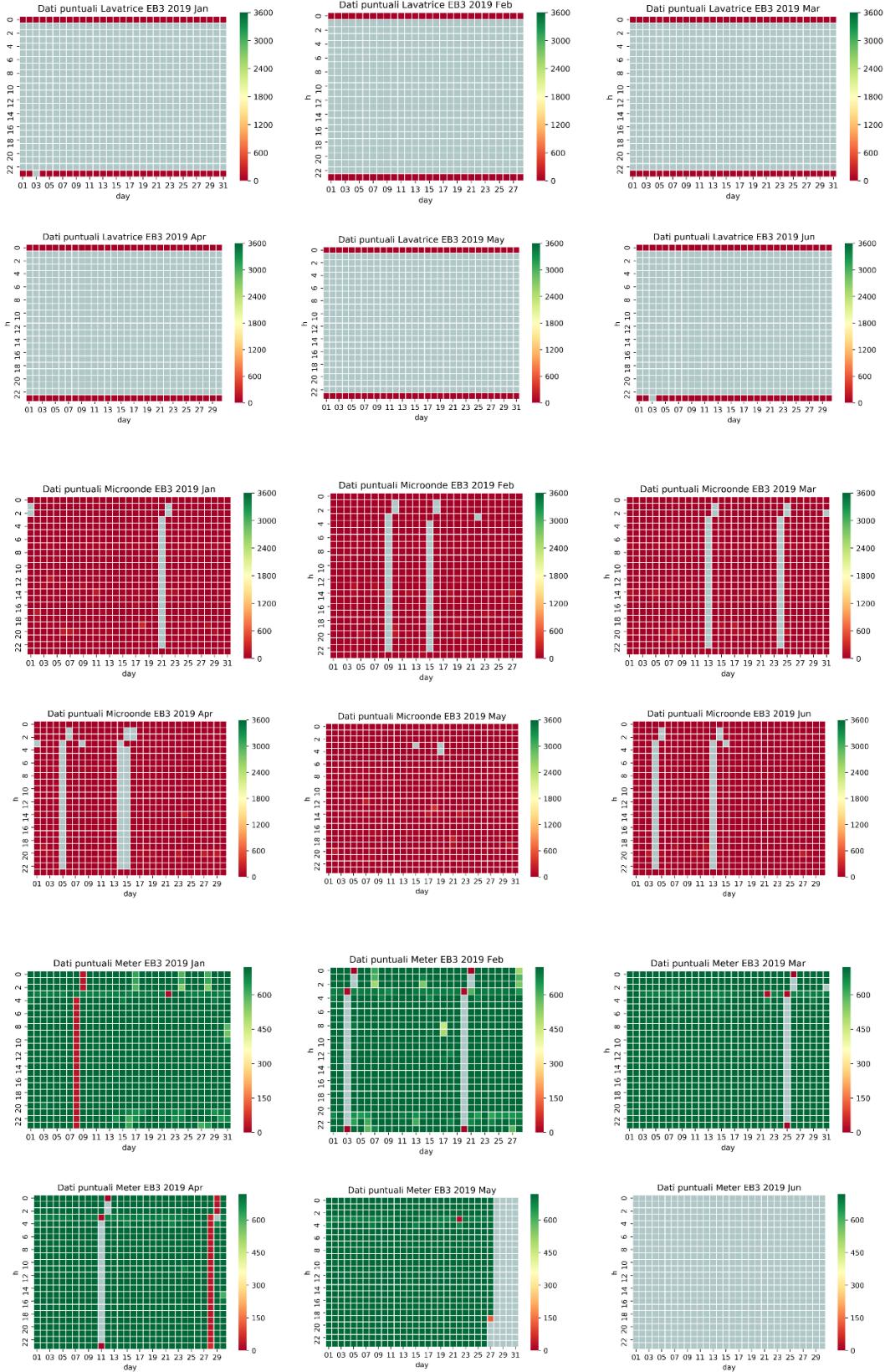




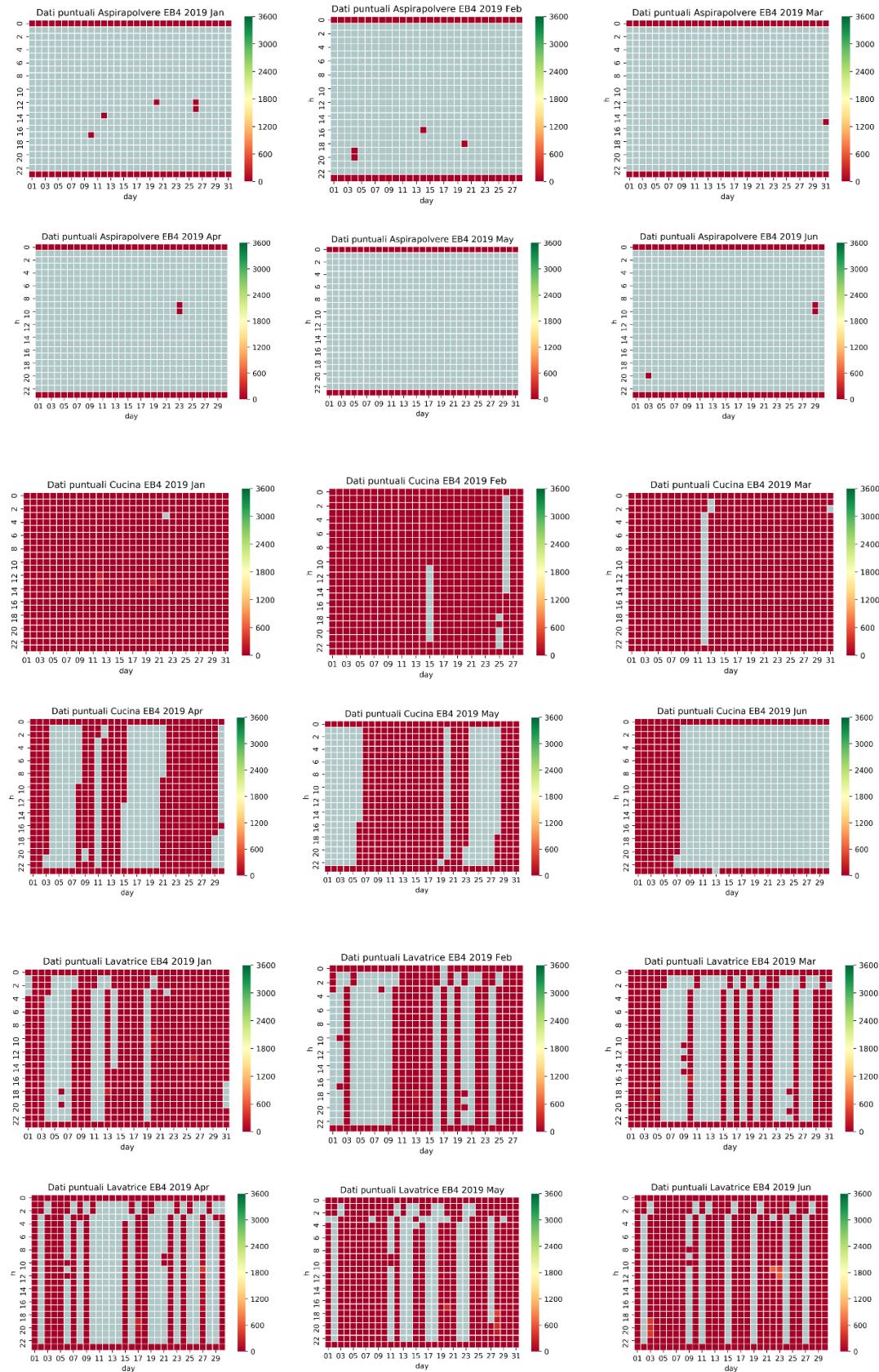


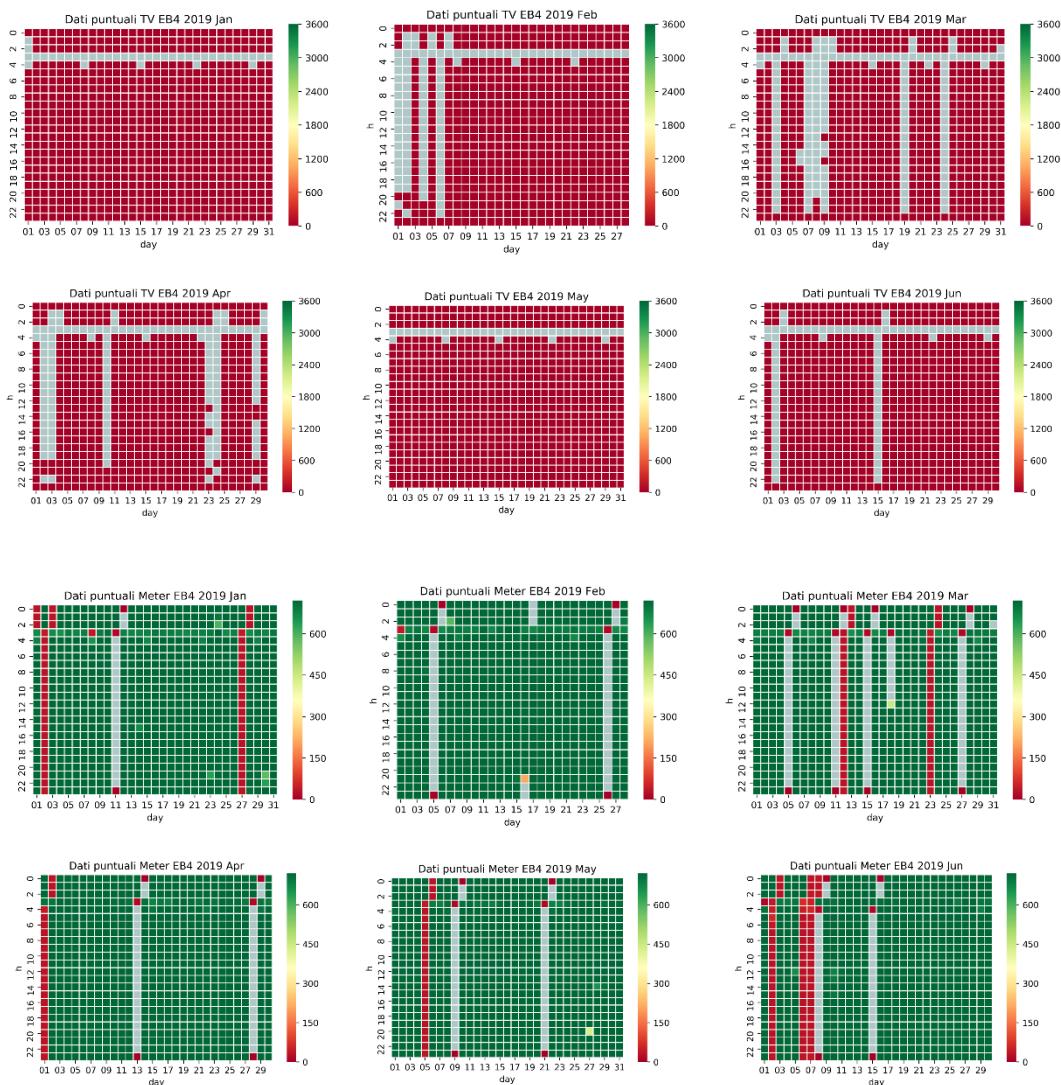
Casa 3



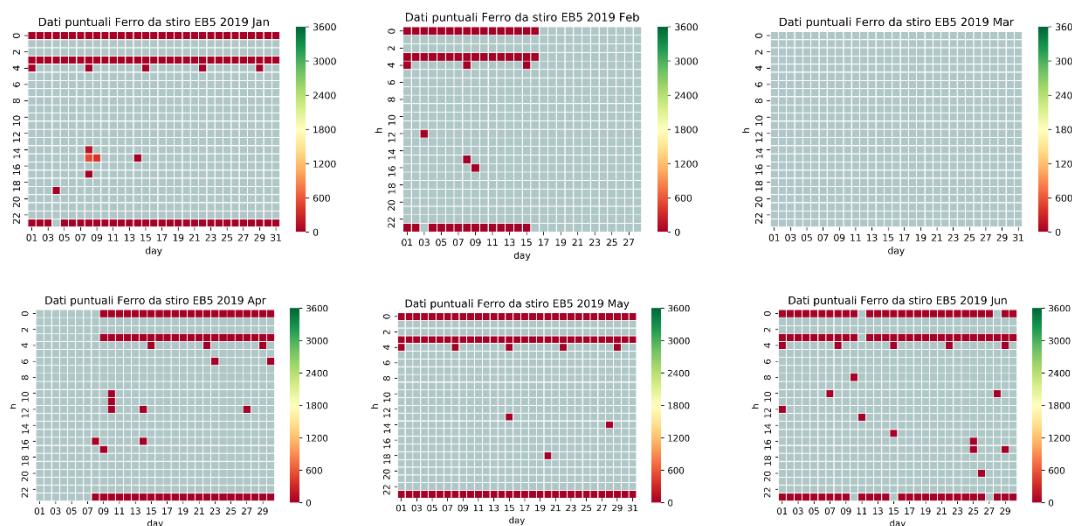


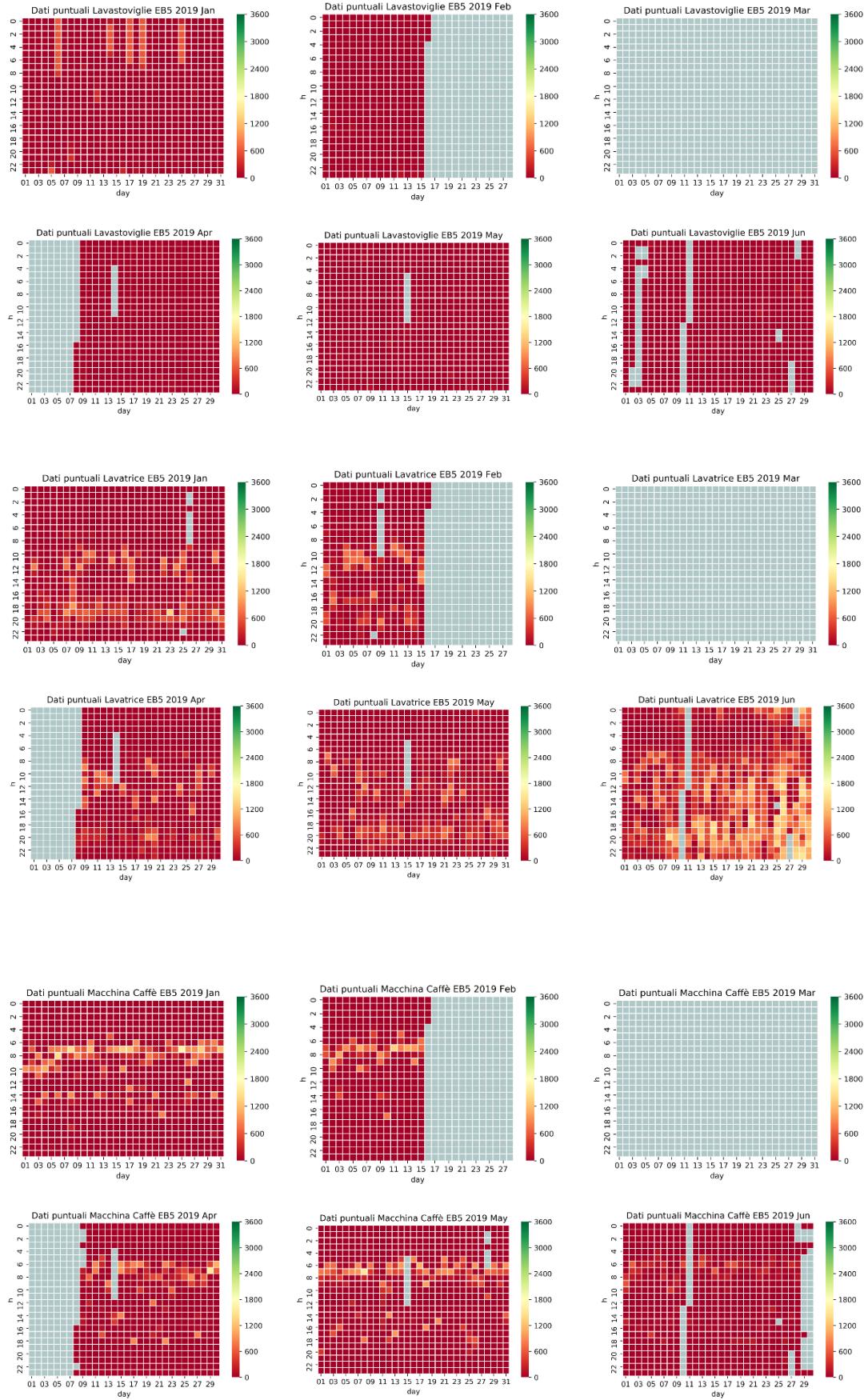
Casa 4

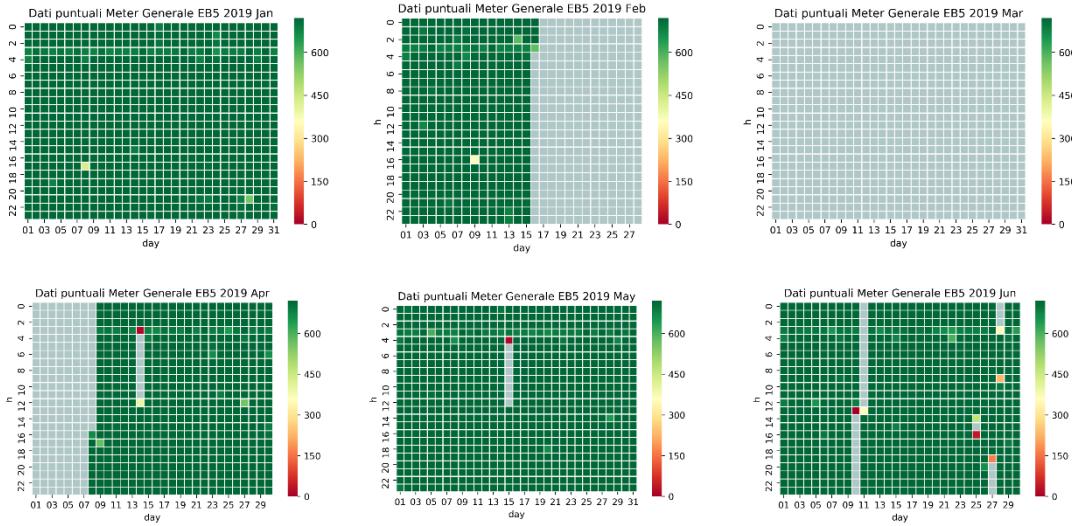




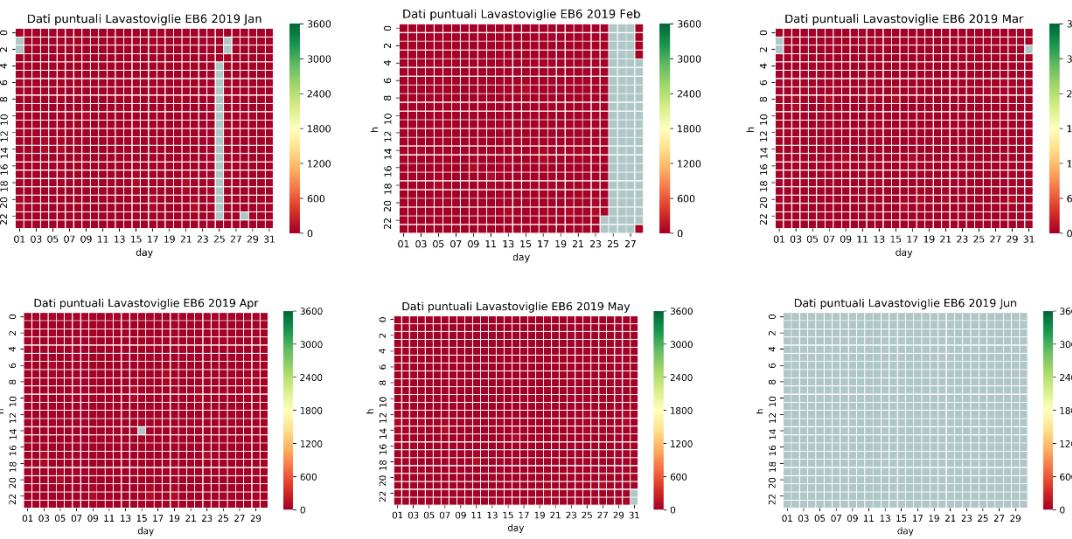
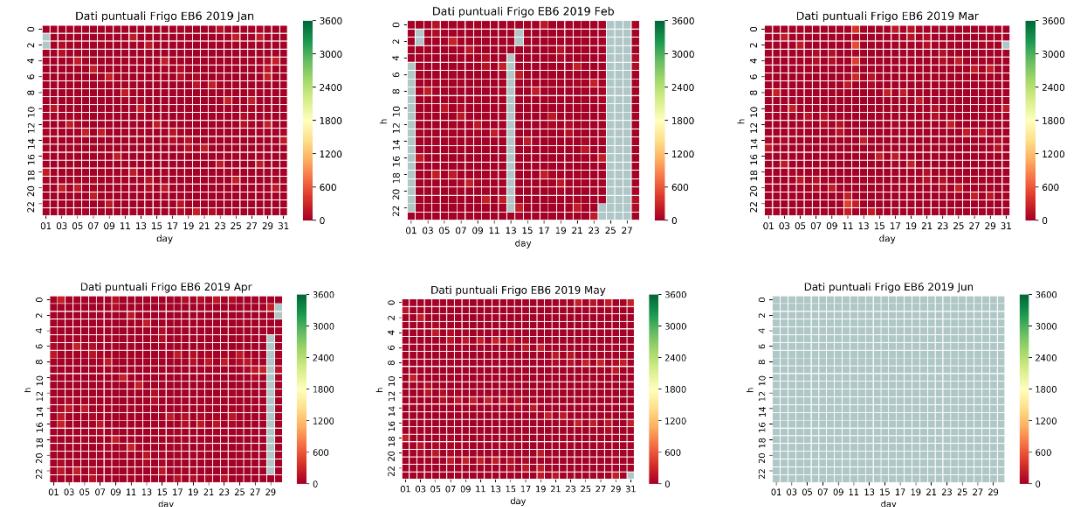
Casa 5

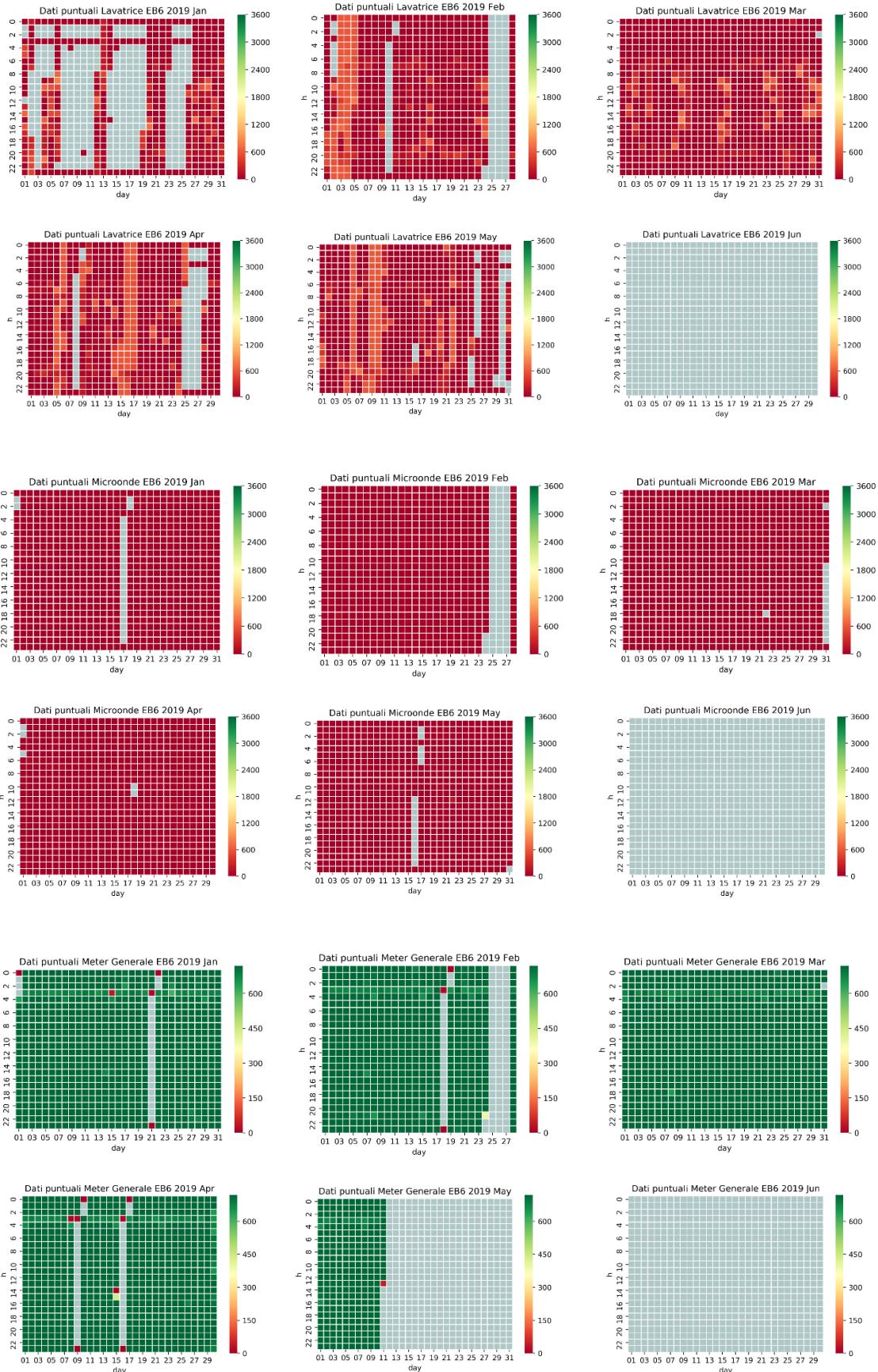




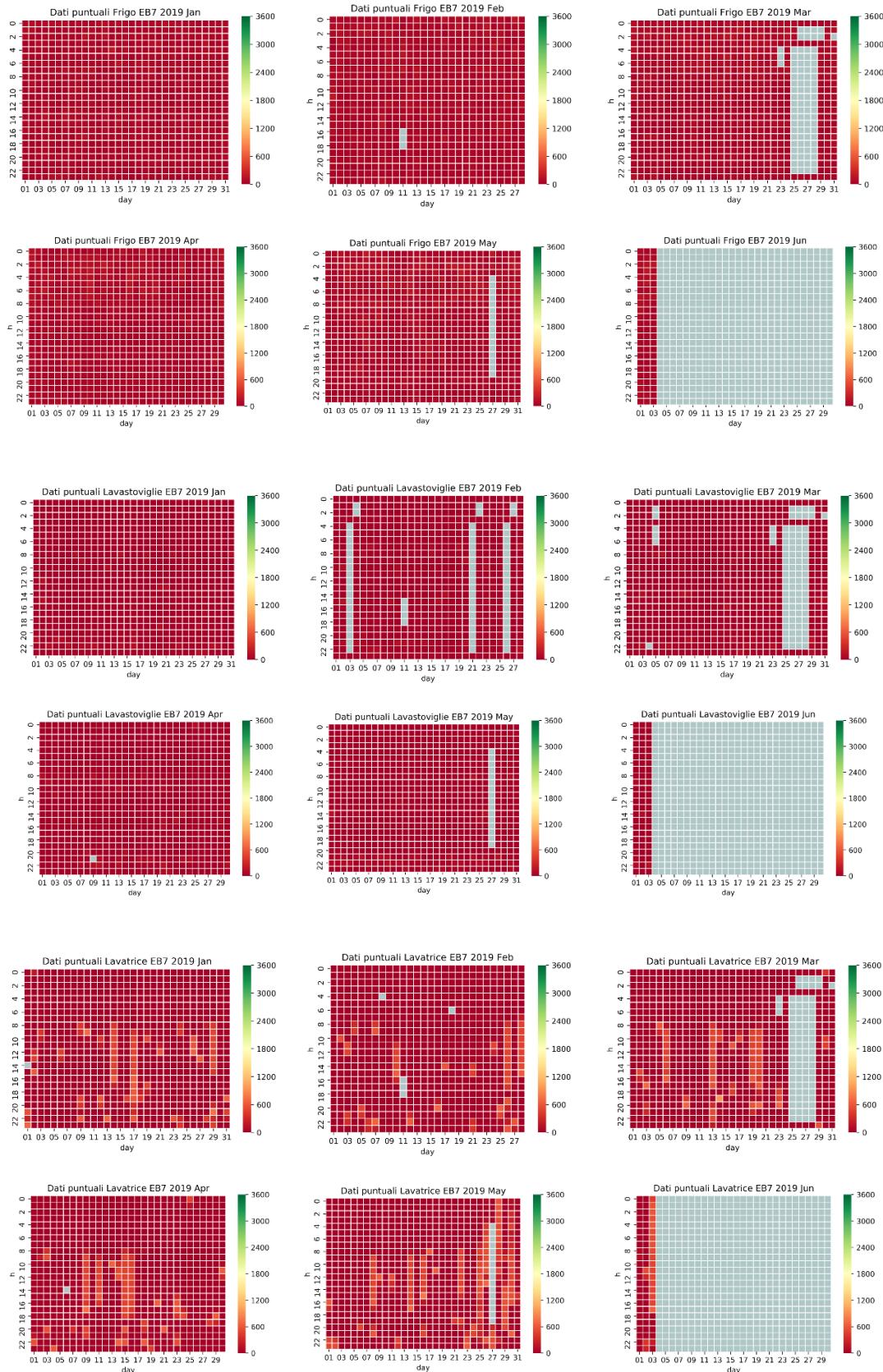


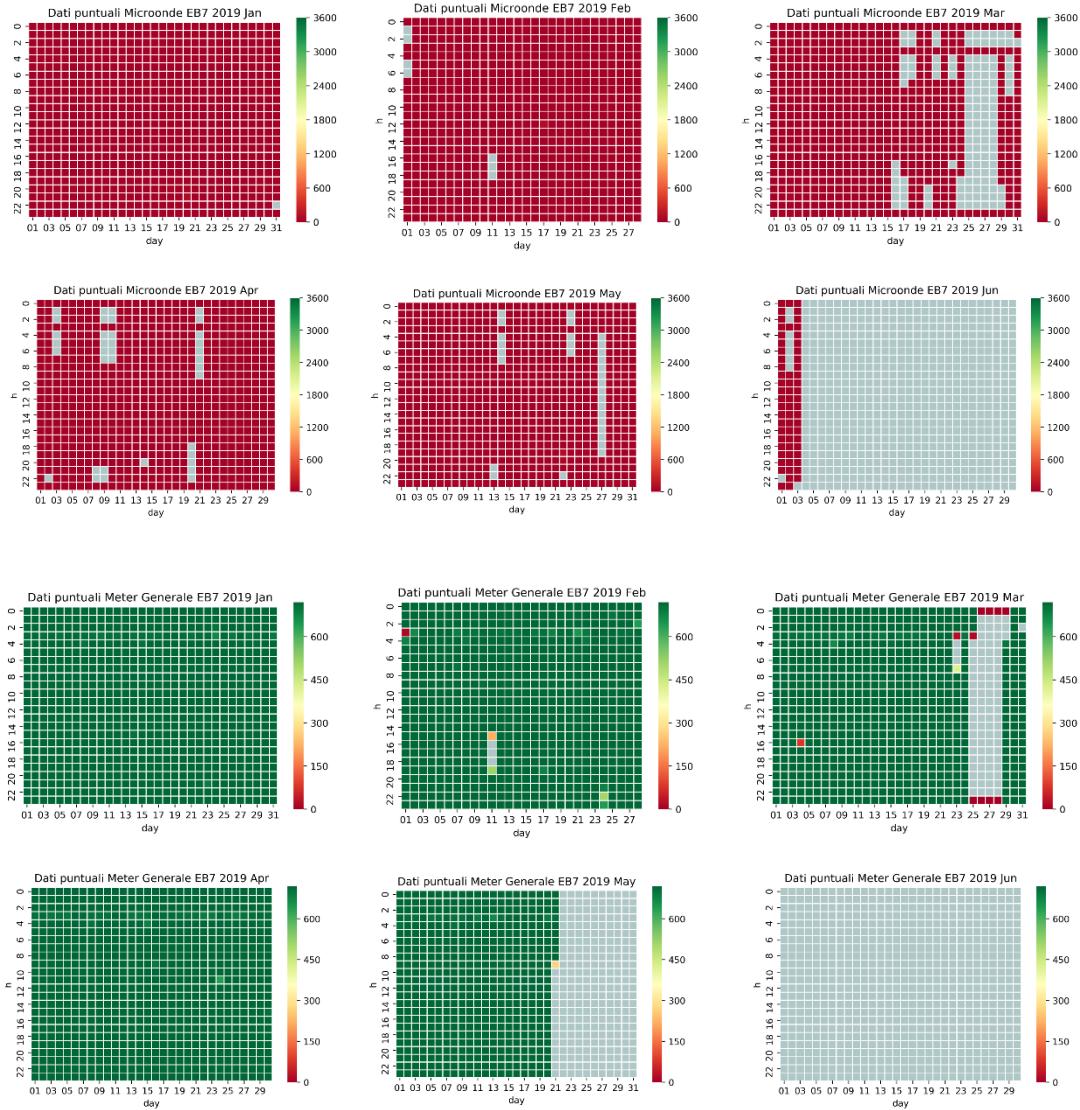
Casa 6



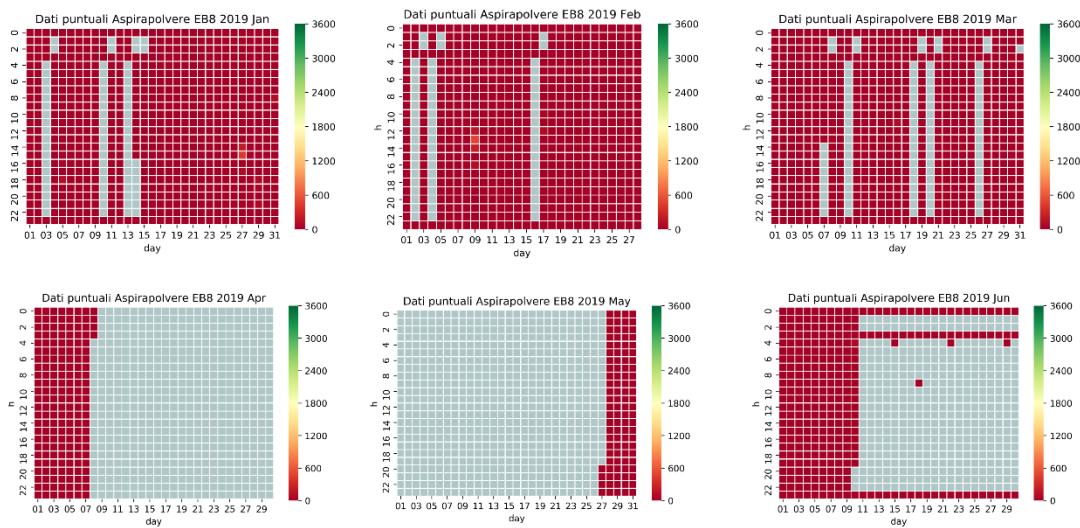


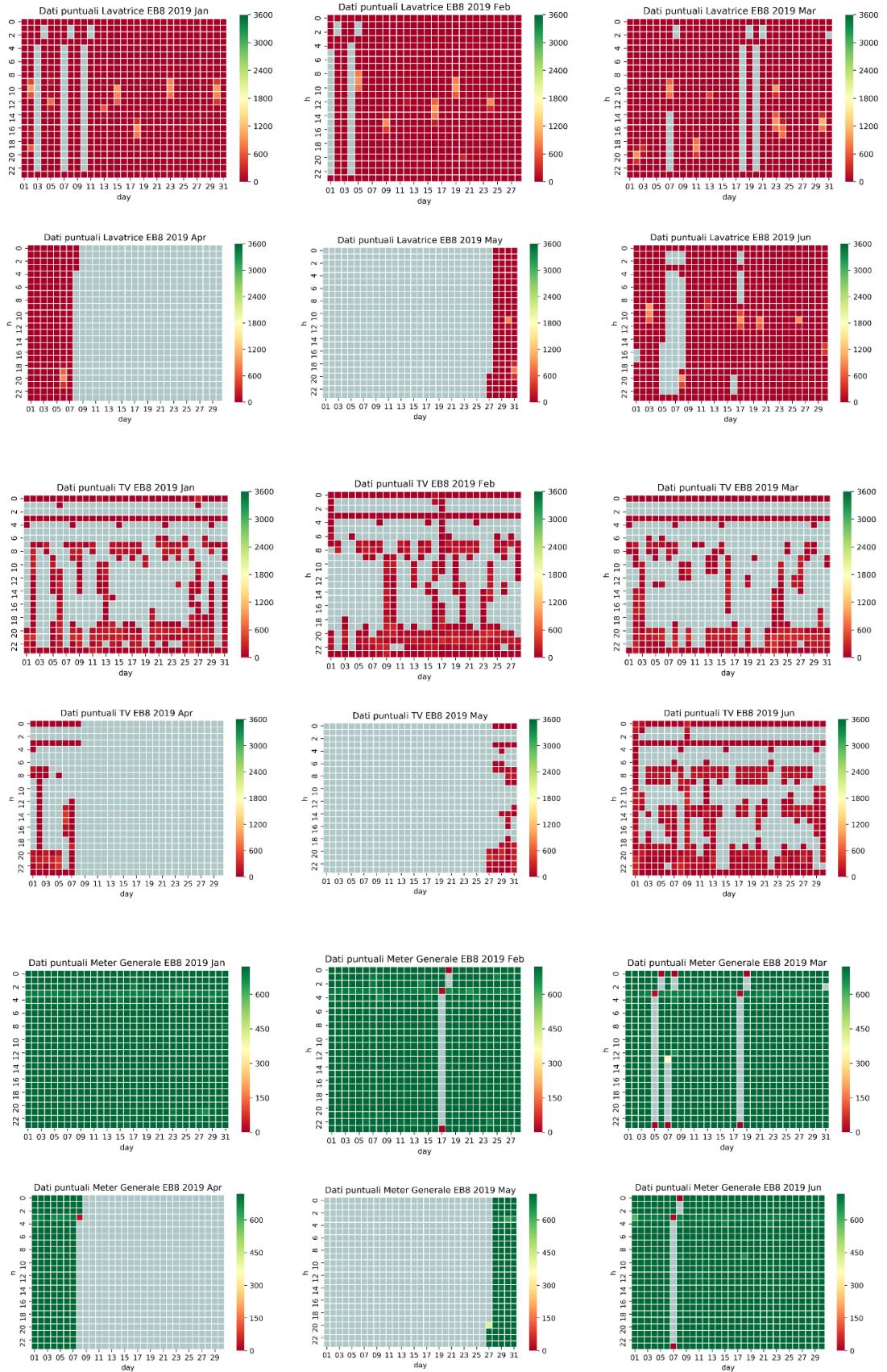
Casa 7



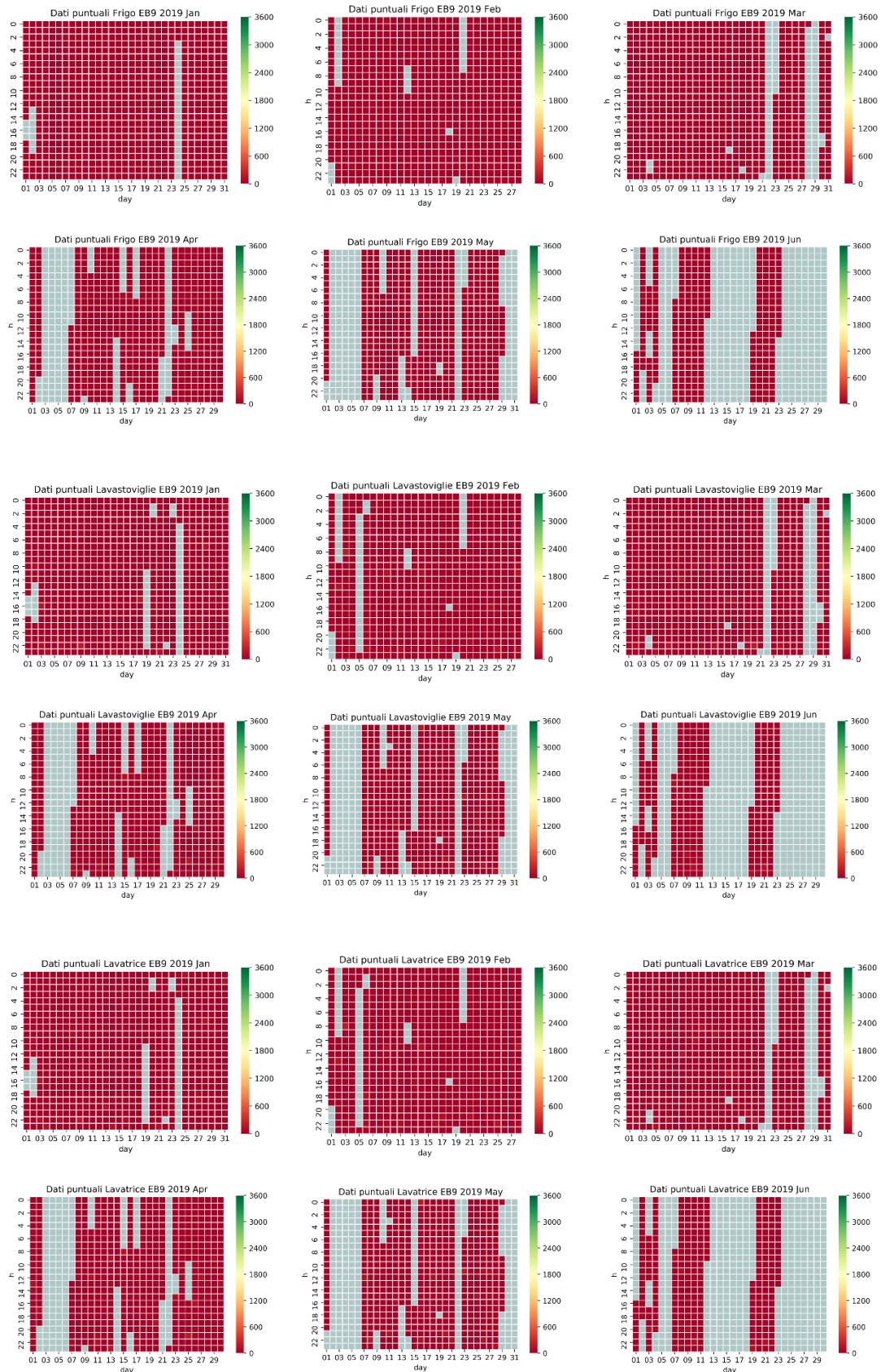


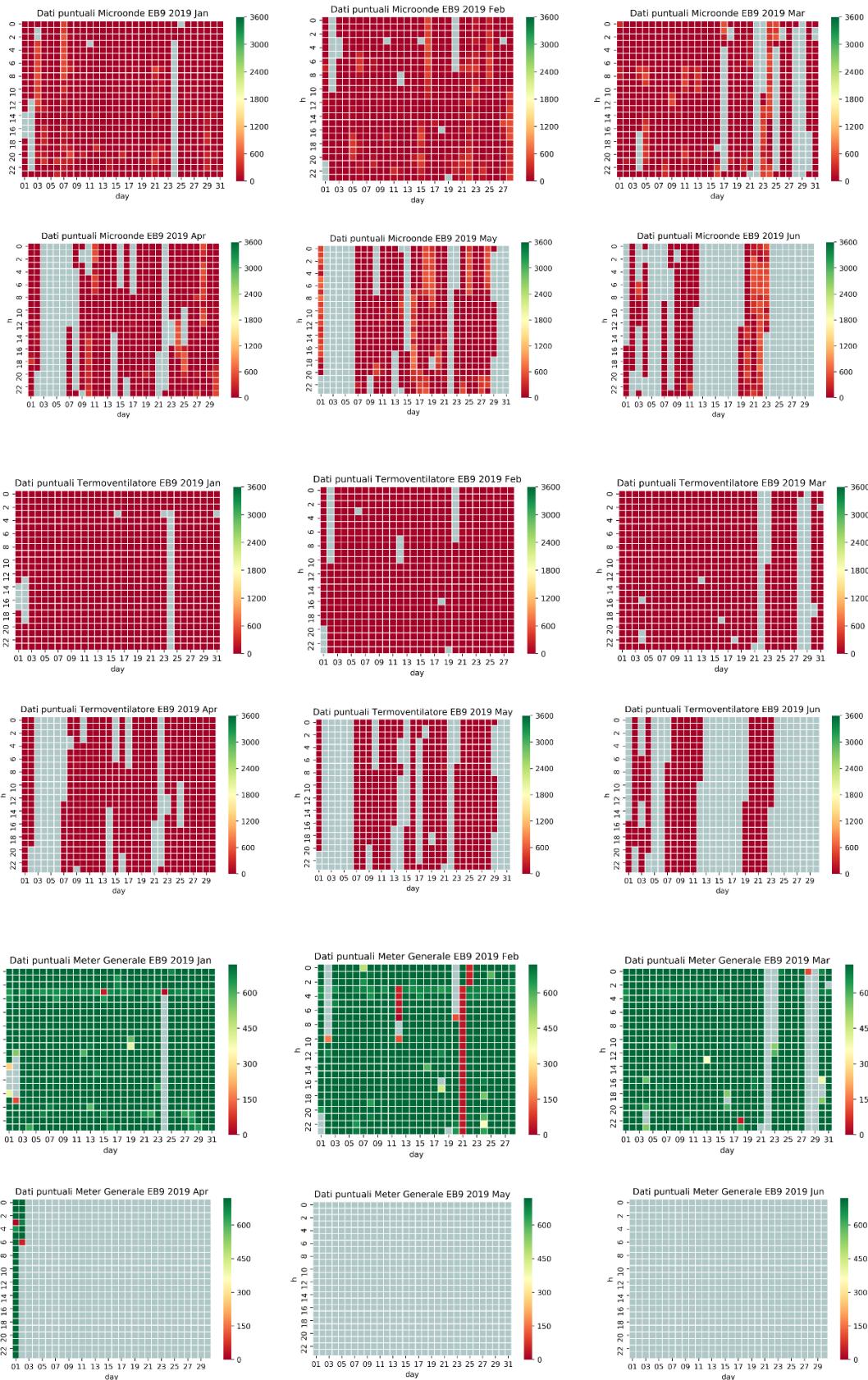
Casa 8



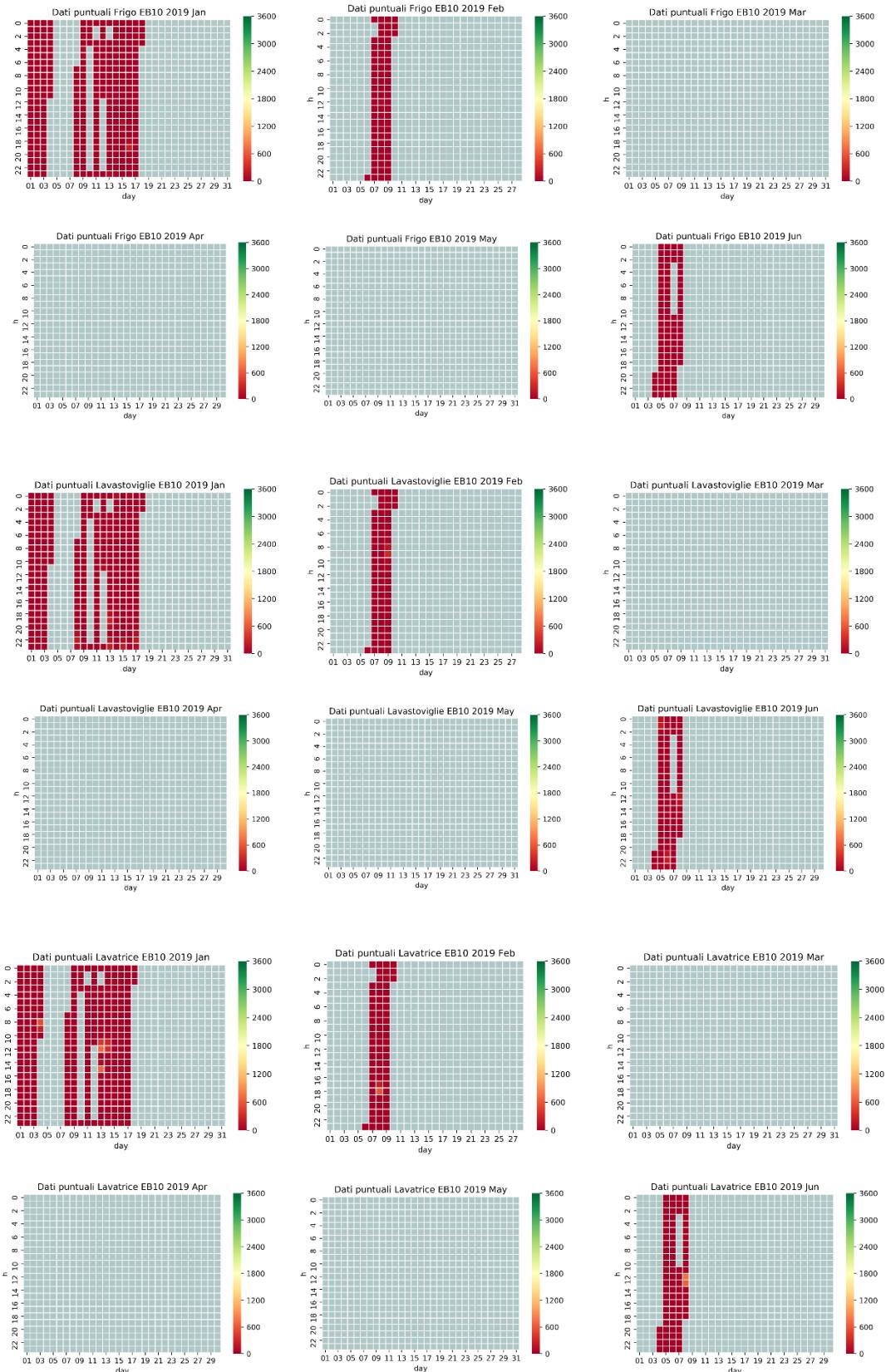


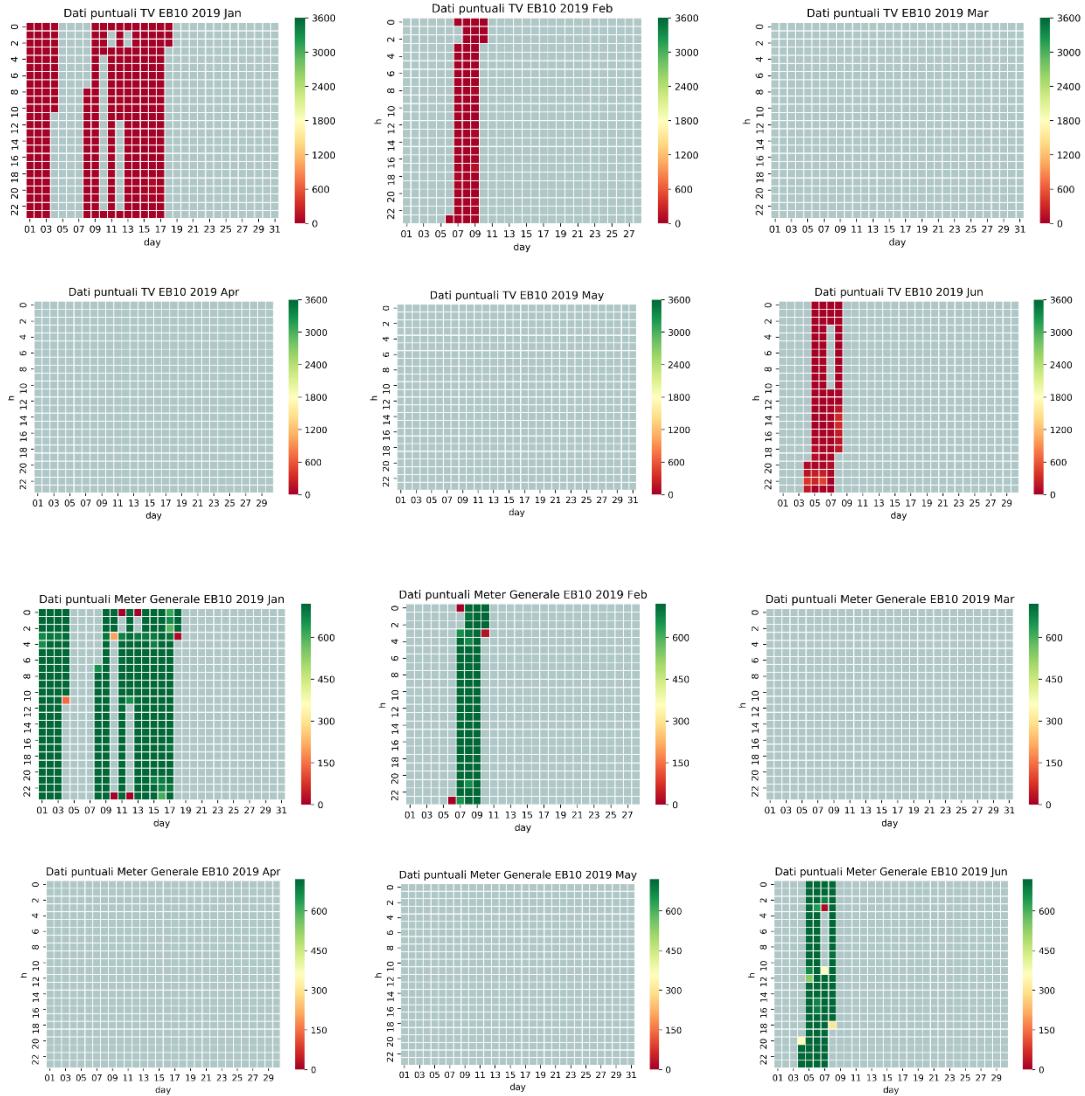
Casa 9





Casa 10





DATI MANCANTI

Nella seguente tabella sono stati riportati per il meter e per ogni elettrodomestico presente in ogni casa i periodi per cui non sono stati registrati dati.

È riportato con la **x** il caso in cui non è presente l'elettrodomestico relativo alla casa in esame, mentre con il – il caso in cui non esistono periodi mancanti.

Casa	Frigo	Lavastoviglie	Lavatrici	TV	Bimby	Lampada	Termoventilatore	Microonde	Aspirapolvere	Cucina	Ferro da stiro	Macchina del caffè	Meter
1	28-30 Jun	28-30 Jun	28-30 Jun	28-30 Jun	x	x	x	x	x	x	x	x	30-31May,Jun
2	3-28 Feb,Mar,Apr,May,Jun	x	3-28 Feb,Mar,Apr,May,Jun	x	3-28 Feb,Mar,Apr,May,Jun	3-28 Feb,Mar,Apr,May,Jun	3-28 Feb,Mar,Apr,May,Jun	x	x	x	x	x	3-28 Feb,Mar,Apr,May,Jun
3	-	x	-	x	x	x	x	-	x	x	x	x	28-31 May,Jun
4	x	x	-	-	x	x	x	x	-	-	x	x	-
5	x	17-28 Feb-Mar,1-7 Apr	17-28 Feb-Mar,1-7 Apr	x	x	x	x	x	x	x	17-28 Feb-Mar,1-7 Apr	17-28 Feb-Mar,1-7 Apr	17-28 Feb-Mar,1-7 Apr
6	25-27Feb,Jun	25-27Feb,Jun	25-27 Feb,Jun	x	x	x	x	27Feb,Jun	x	x	x	x	25-27Feb,12-31May,Jun
7	4-30Jun	4-30Jun	4-30Jun	x	x	x	x	4-30Jun	x	x	x	x	22-31May,Jun
8	x	x	9-30Apr,1-26May	9-30Apr,1-26May	x	x	x	x	9-30Apr,1-26May	x	x	x	9-30Apr,1-26May
9	3-6Apr,2-6/30-31May,5-6/13-18,24-30Jun	3-6Apr,2-6/30-31May,5-6/13-18,24-30Jun	3-6Apr,2-6/30-31May,5-6/13-18,24-30Jun	x	x	x	3-6Apr,2-6/30-31May,5-6/13-18,24-30Jun	3-6Apr,2-6/30-31May,5-6/13-18,24-30Jun	x	x	x	x	3-30Apr,May,Jun
10	5-7/19-31 Jan,1-5/11-28 Feb,Mar,Apr,May,1-3/9-30 Jun	x	x	x	x	x	x	x	x	5-7/19-31 Jan,1-5/11-28 Feb,Mar,Apr,May,1-3/9-30 Jun			

Analizzando la quantità di dati disponibili del meter, si nota che per alcune case vi sono periodi molto estesi per cui non sono stati rilevati dati. In particolare, ciò si nota nelle case 2 e 10. Tali case sono state escluse quindi dalle analisi successive, anche se il meter della casa 2 può essere utilizzato per la fase di previsione.

ELENCO APPLIANCE PER ABITAZIONE

Nella tabella seguente sono invece riportati i dispositivi presenti in ogni casa:

Casa	Frigo	Lavastoviglie	Lavatrice	TV	Bimby	Lampada	Termoventilatore	Microonde	Aspirapolvere	Cucina	Ferro da stiro	Macchina del caffè
1	✓	✓	✓	✓	x	x	x	x	x	x	x	x
2	✓	x	✓	x	✓	✓	✓	x	x	x	x	x
3	✓	x	✓	x	x	x	x	✓	x	x	x	x
4	x	x	✓	✓	x	x	x	x	✓	✓	x	x
5	x	✓	✓	x	x	x	x	x	x	x	✓	✓
6	✓	✓	✓	x	x	x	x	✓	x	x	x	x
7	✓	✓	✓	x	x	x	x	✓	x	x	x	x
8	x	x	✓	✓	x	x	x	x	✓	x	x	x
9	✓	✓	✓	x	x	x	✓	✓	x	x	x	x
10	✓	✓	✓	✓	x	x	x	x	x	x	x	x
Totale	7	6	10	4	1	1	2	4	2	1	1	1

Sono stati quindi scartati tutti gli elettrodomestici con frequenza pari a 1 e 2 per ogni casa. Inoltre, vedendo le heatmap sugli elettrodomestici per alcune abitazioni sono stati esclusi anche dispositivi diversi da quelli con frequenza maggiore di 2.

I dispositivi salvati per ogni casa sono i seguenti:

- **Casa 1:** Frigo, Lavastoviglie, Lavatrice
- **Casa 3:** Frigo, Microonde
- **Casa 4:** Lavatrice, Tv
- **Casa 5:** Lavastoviglie, Lavatrice
- **Casa 6:** Frigo, Lavastoviglie, Lavatrice, Microonde
- **Casa 7:** Frigo, Lavastoviglie, Lavatrice, Microonde
- **Casa 8:** Lavatrice
- **Casa 9:** Frigo, Lavastoviglie, Lavatrice, Microonde

Avendo la tv, con dati accettabili, solo per casa 4 abbiamo deciso di scartarla tra i dispositivi selezionati.

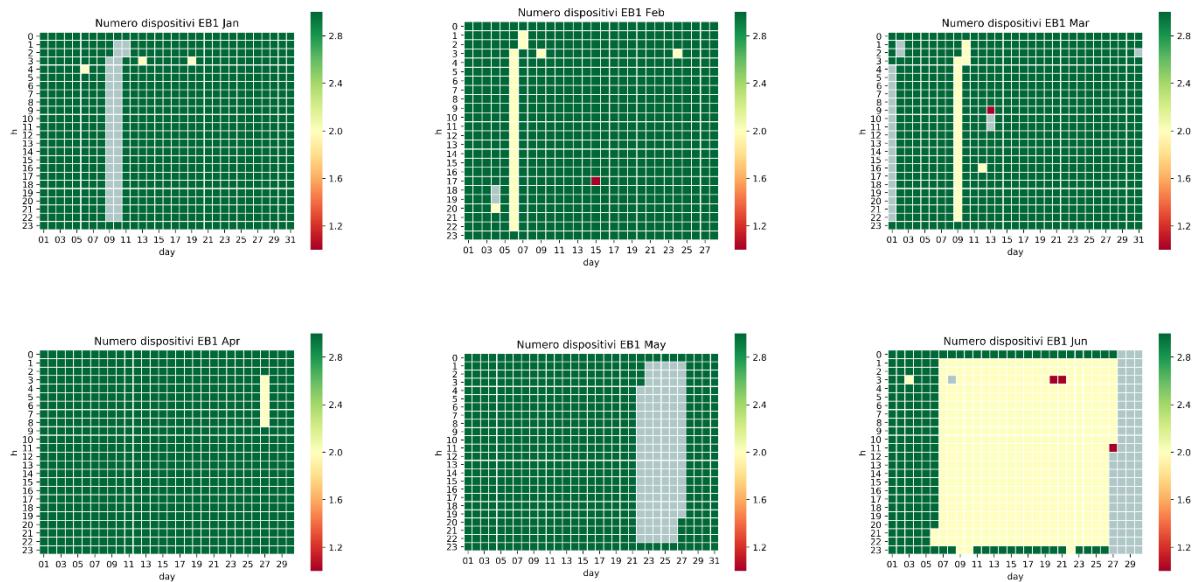
PATTERN NON RIPETUTI TRA METER E DEVICE

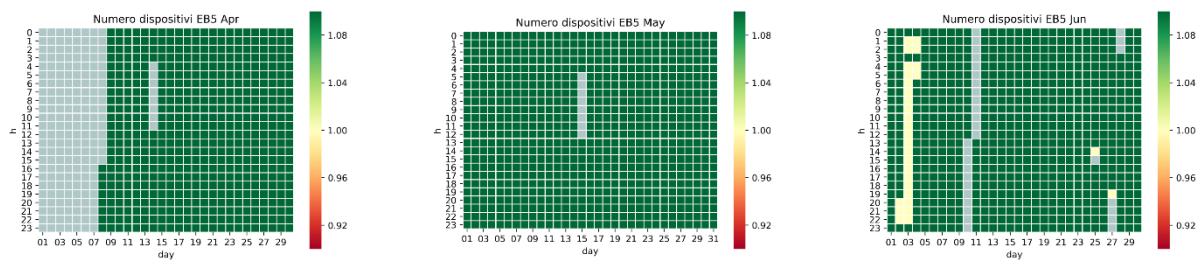
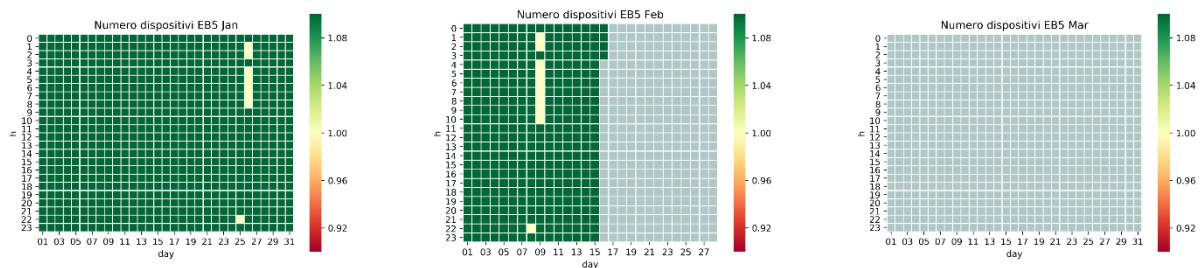
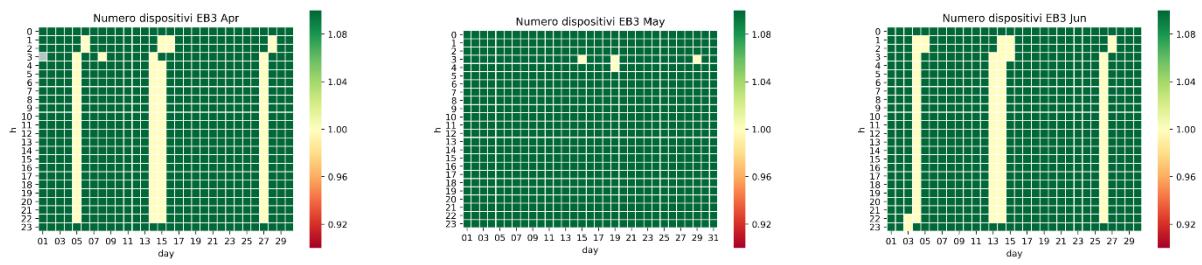
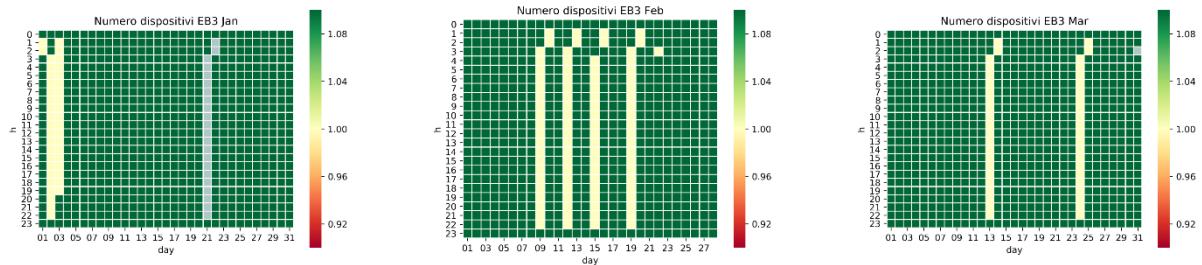
- **Casa 1:** A giugno nel meter mancano dati.
- **Casa 3:** in tutti i mesi non ci sono pattern simili, eccetto similitudini solo tra i device, inoltre mancano nel meter l'ultimo mese di maggio e tutto giugno
- **Casa 4:** vi sono alcuni pattern(11 Jan,5 Feb) , ma la maggior parte non sono simili.

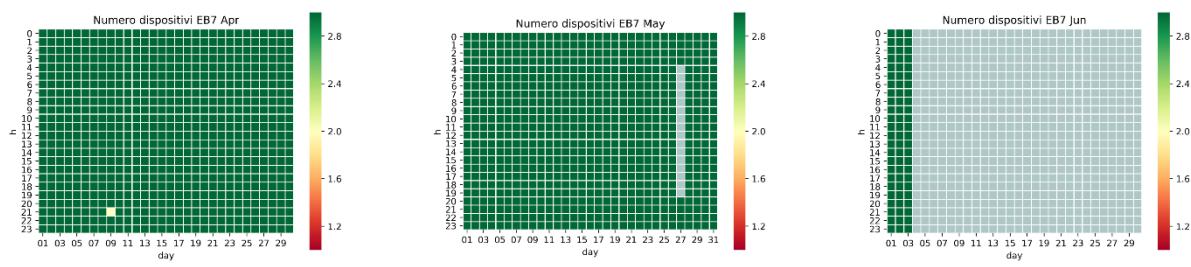
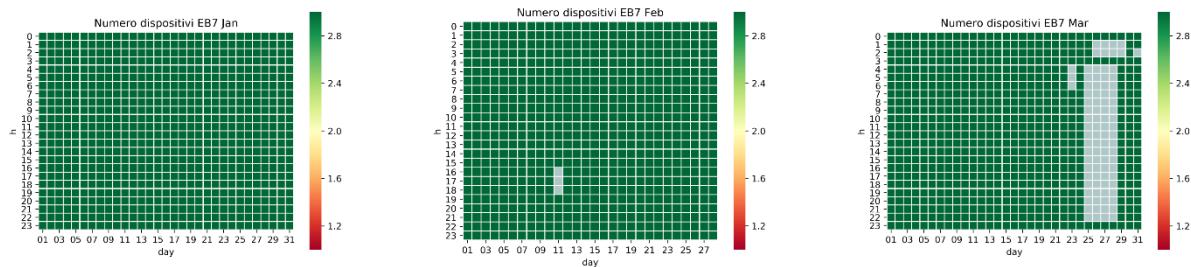
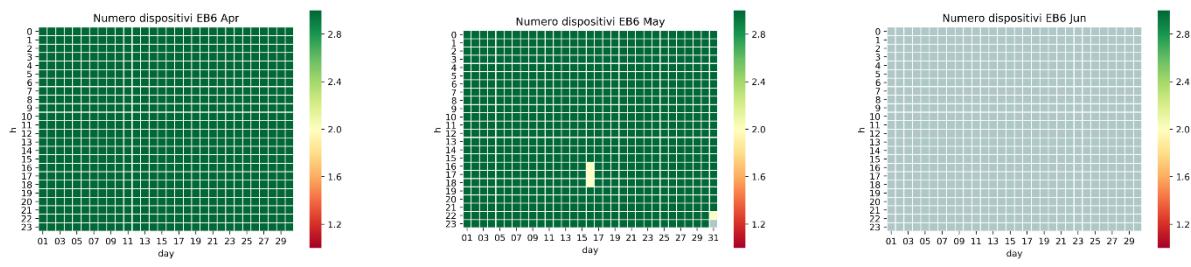
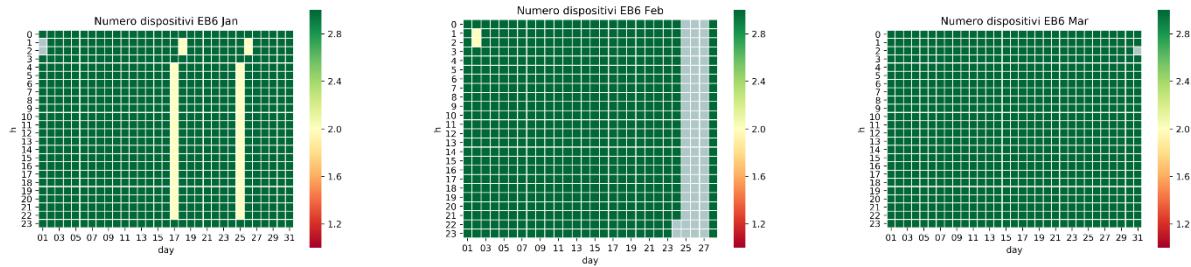
- **Casa 5:** Stessi pattern
- **Casa 6:** Pattern simili, eccetto tra meter e lavatrice
- **Casa 7:** Nel meter manca l'ultima parte di maggio presente nei device, il resto è abbastanza regolare
- **Casa 8:** Ci sono alcuni pattern regolari, ma anche irregolarità ad esempio a gennaio e giugno
- **Casa 9:** Regolarità fino a marzo, poiché da aprile in poi il meter non registra dati.

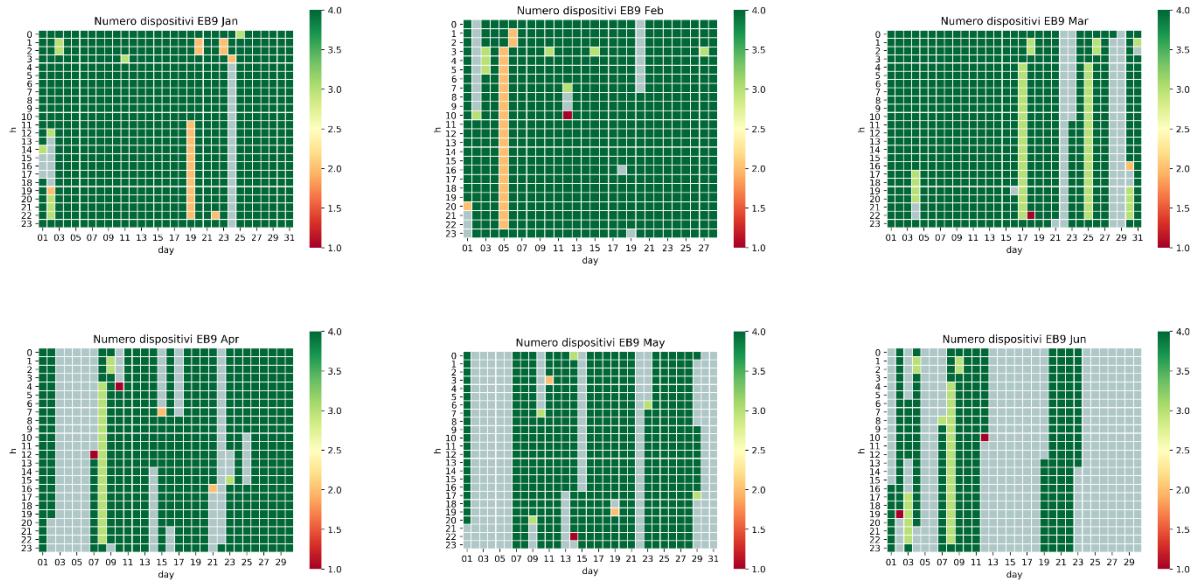
HEATMAP NUMERO DISPOSITIVI

Inoltre, sono state effettuate delle heatmap per contare, per ogni casa, il numero di dispositivi rilevati in ogni ora di ogni giorno.









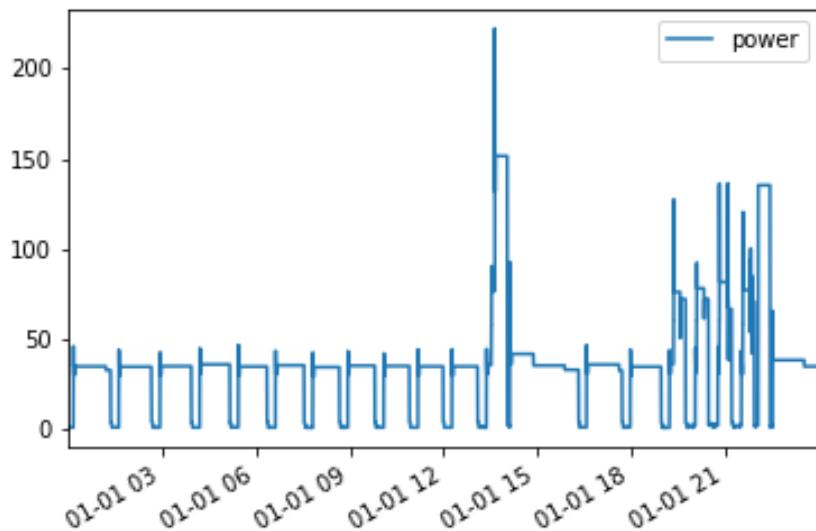
In base a tali heatmap la casa con maggiori problemi è la 9.

PLOT

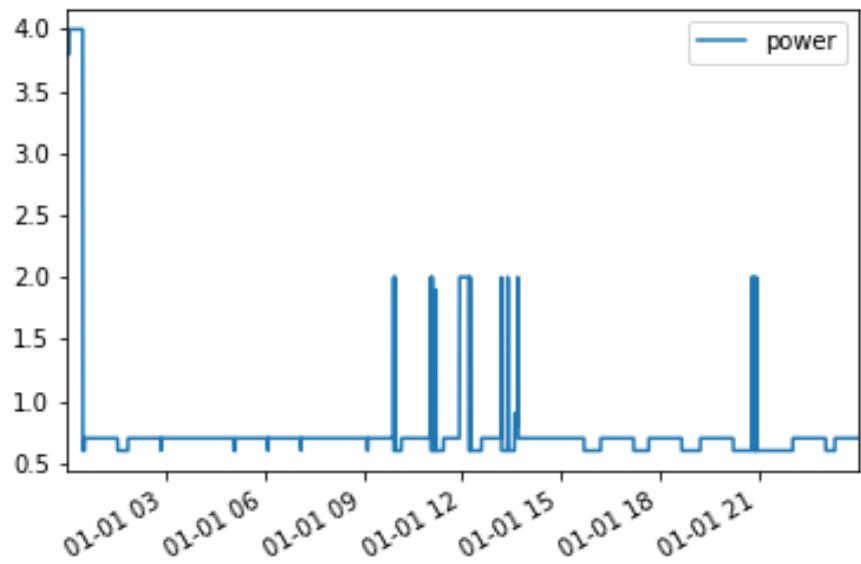
Dopo aver ricostruito i dati al secondo sono stati realizzati i plot relativi ai dispositivi che sono stati salvati per ogni casa così da poter notare dei pattern per i vari elettrodomestici. In seguito, sono riportati alcuni dei plot ottenuti.

Casa 1

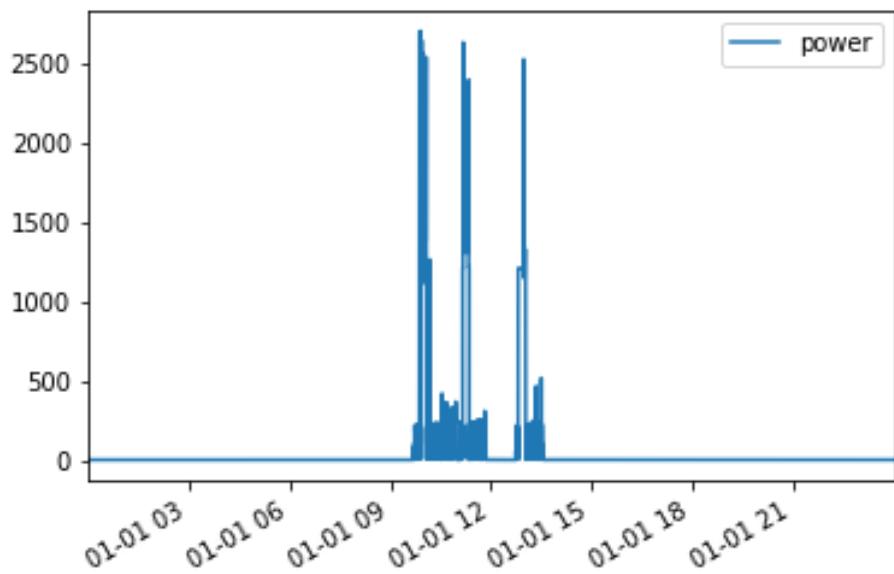
Frigo



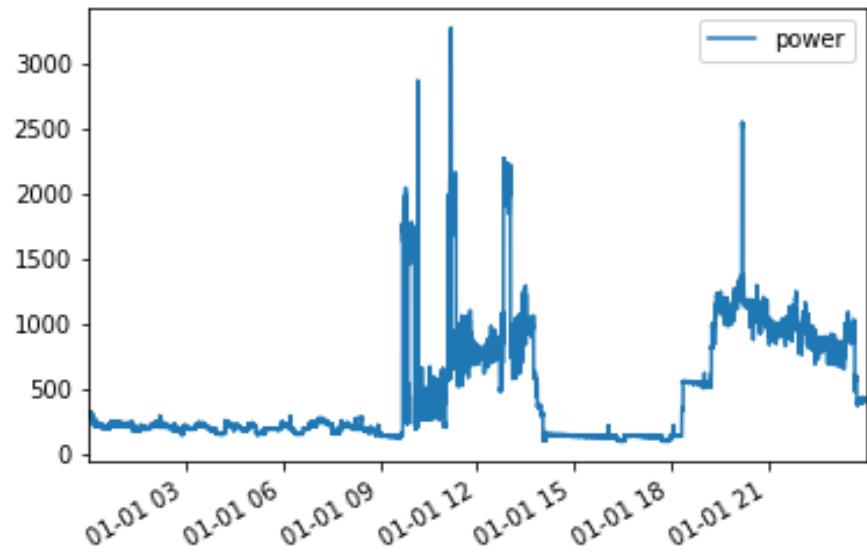
Lavastoviglie



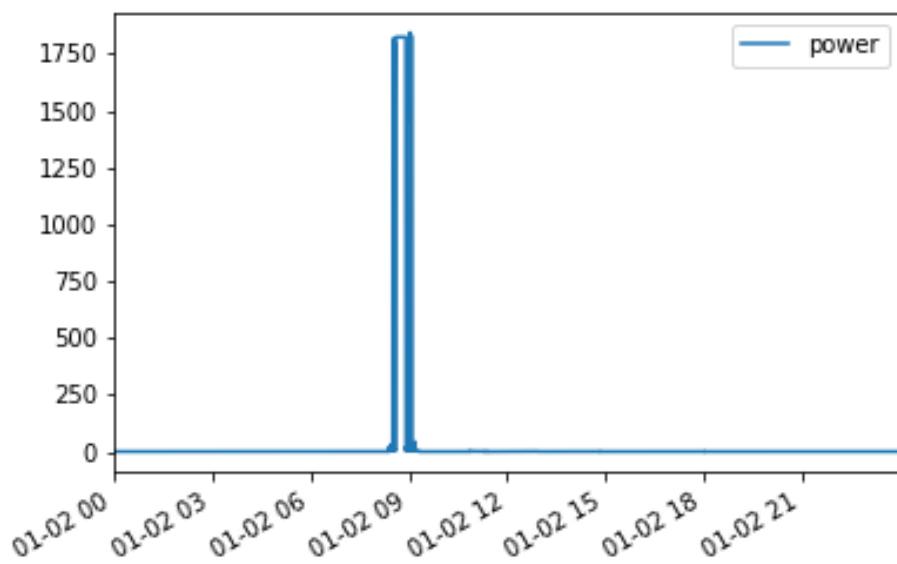
Lavatrice



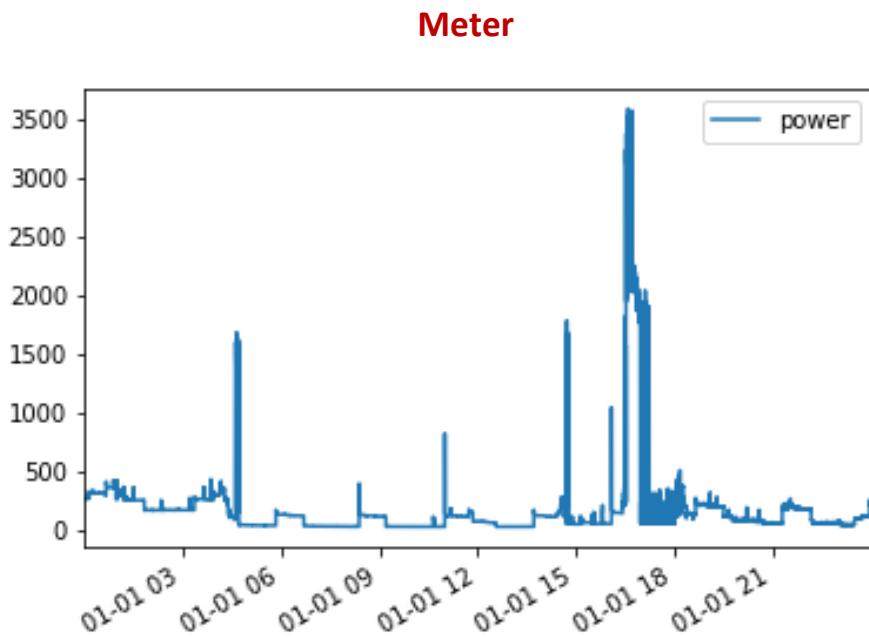
Meter



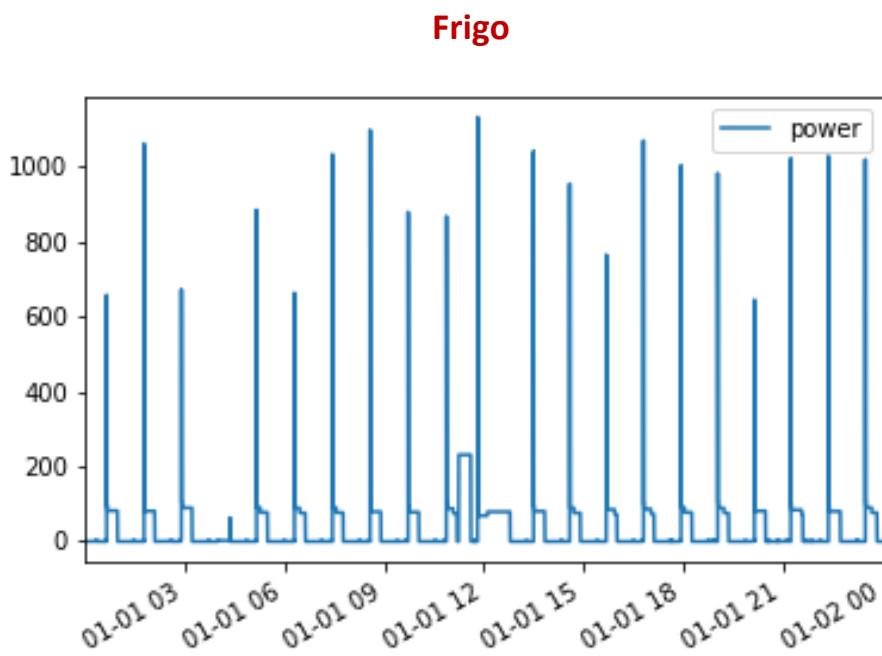
Lavastoviglie



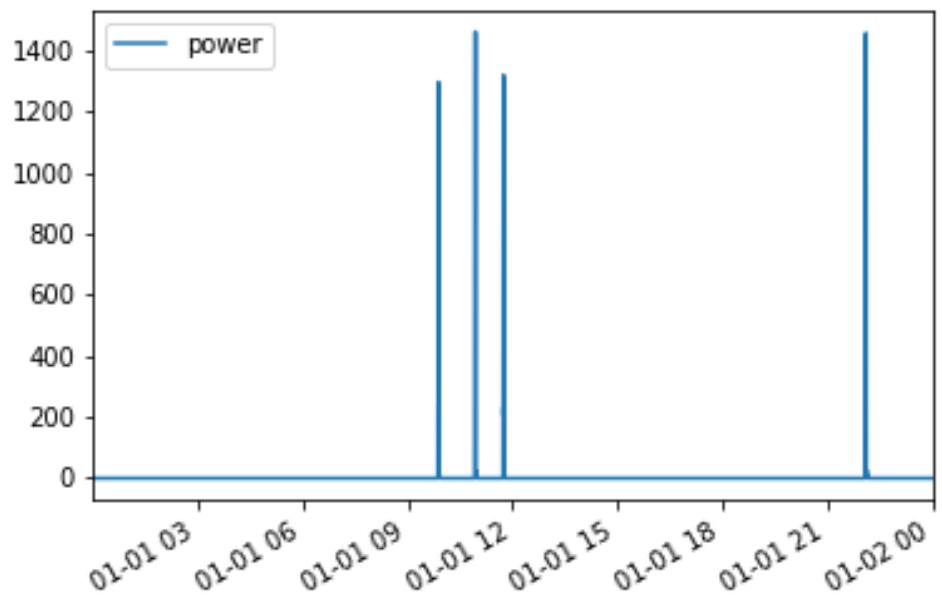
Casa 2



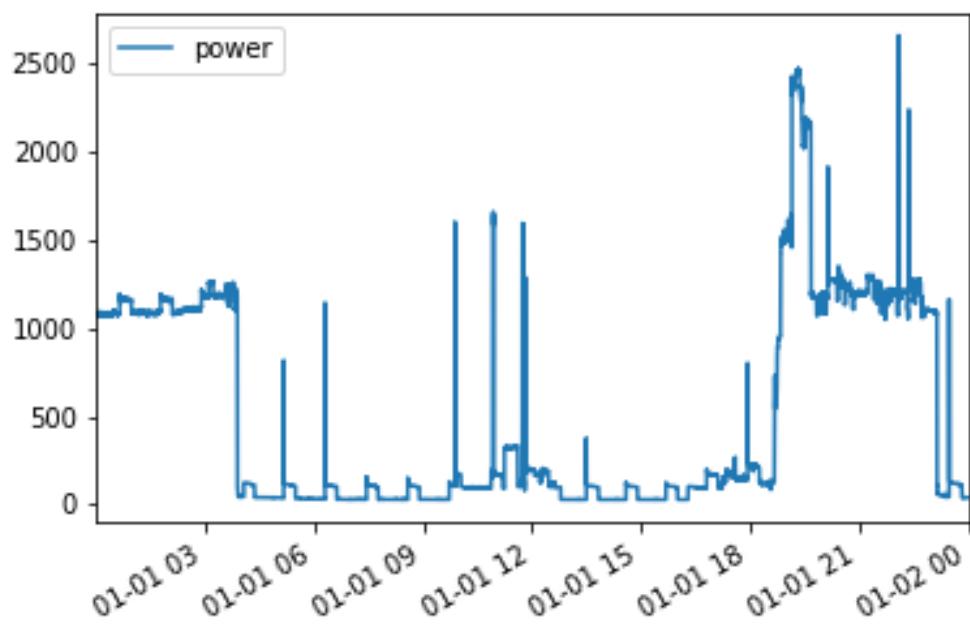
Casa 3



Microonde

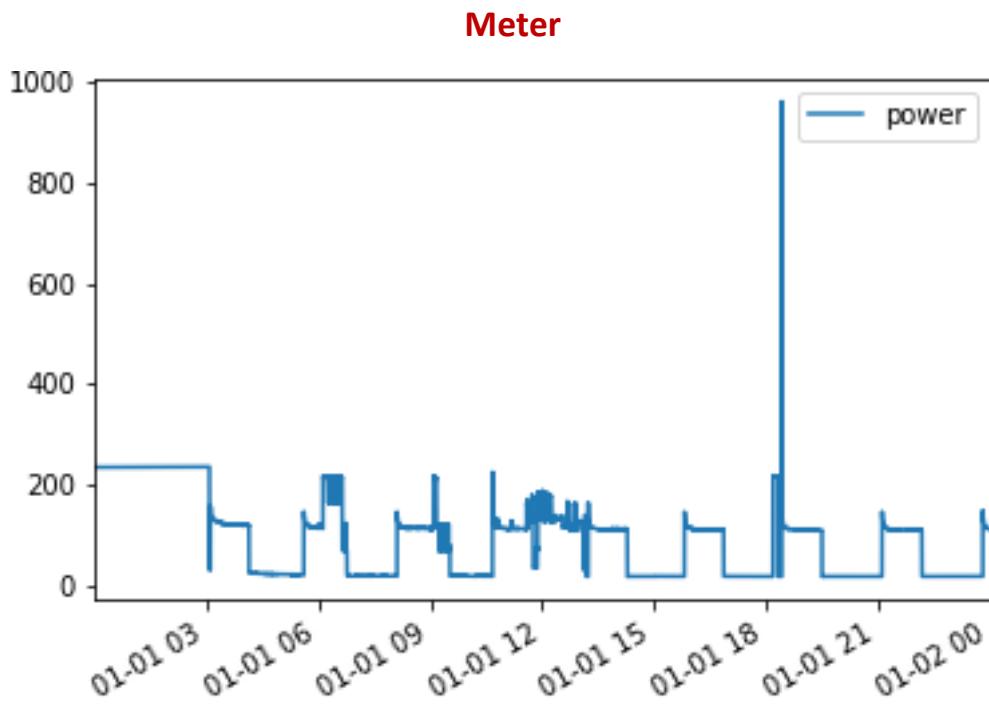


Meter



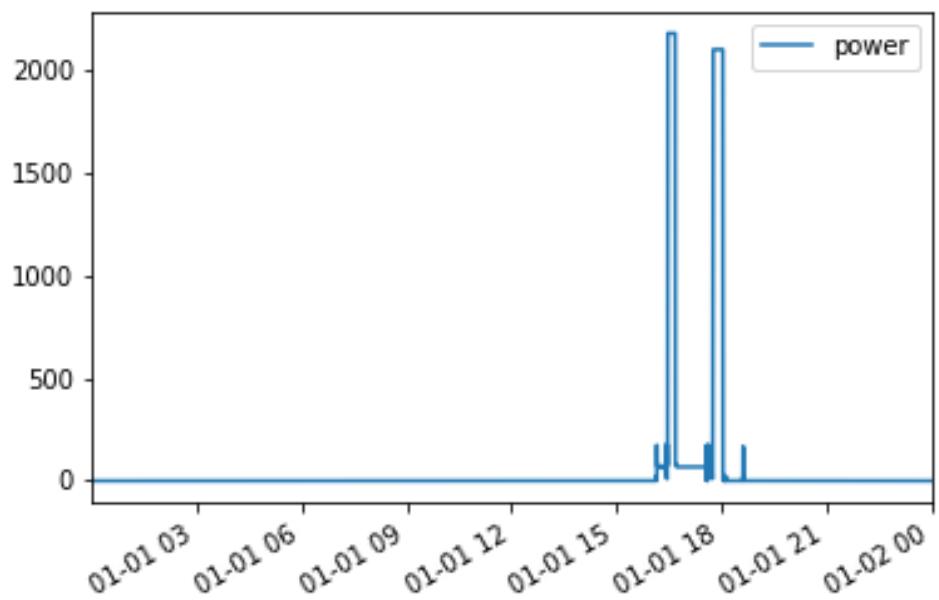
Casa 4

Per i giorni che sono stati provati per la lavatrice si è ottenuto un andamento costante.

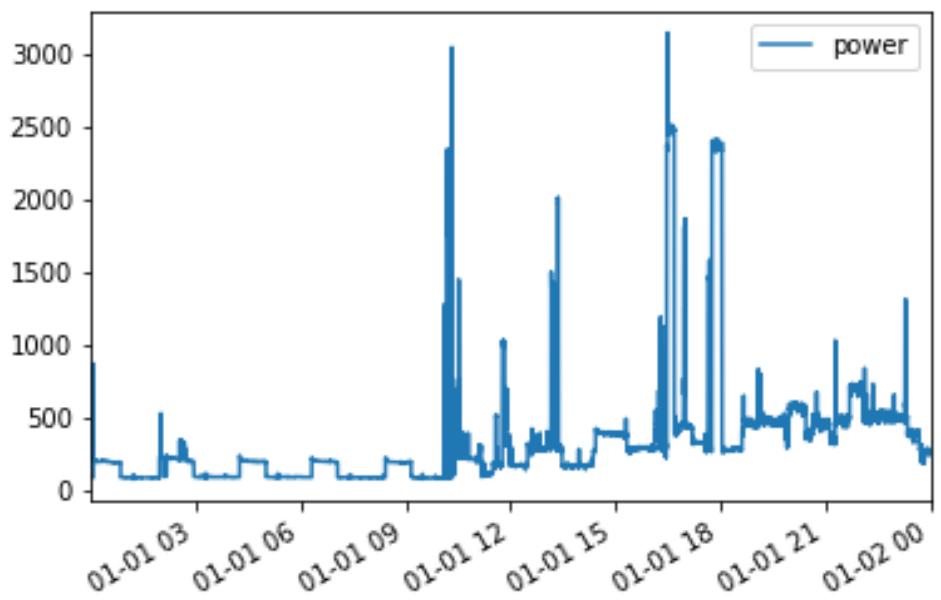


Casa 5

Lavastoviglie

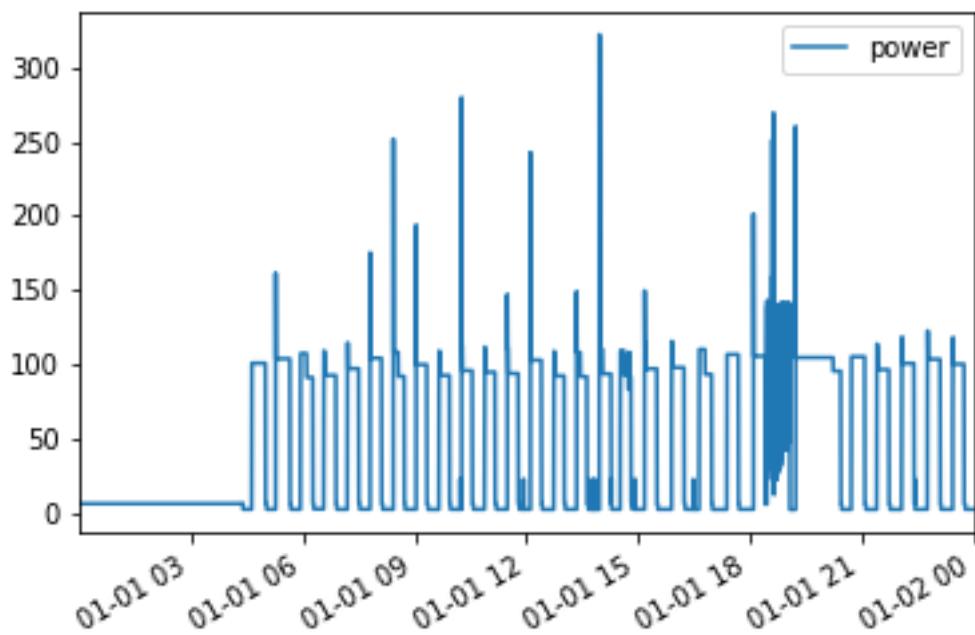


Meter

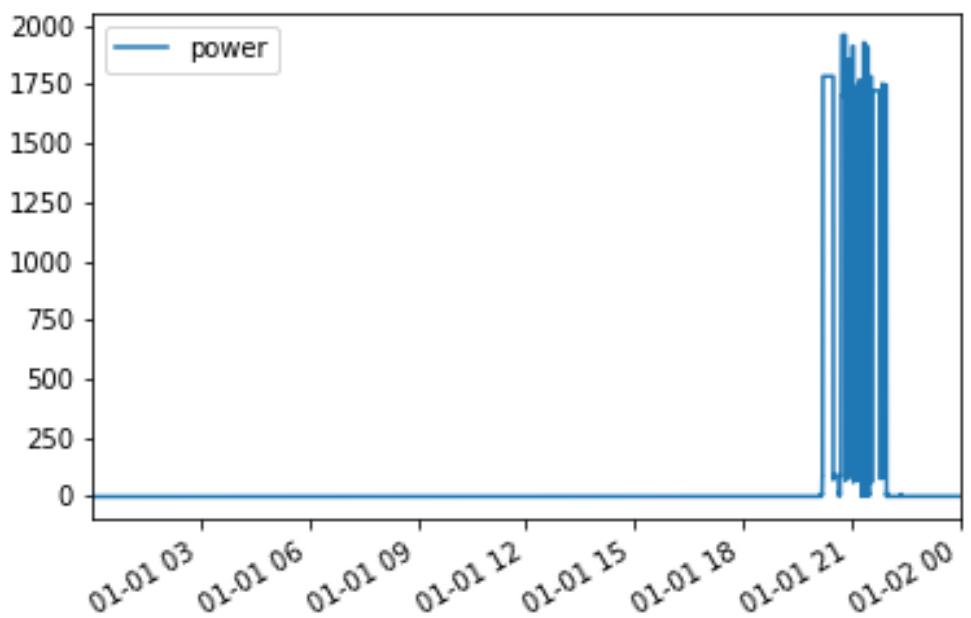


Casa 6

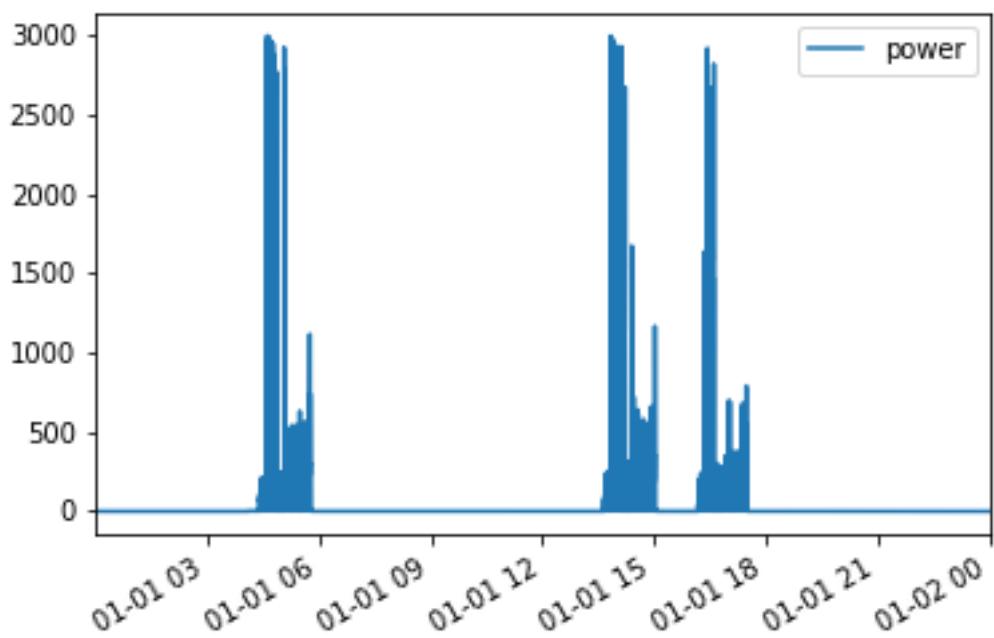
Frigo



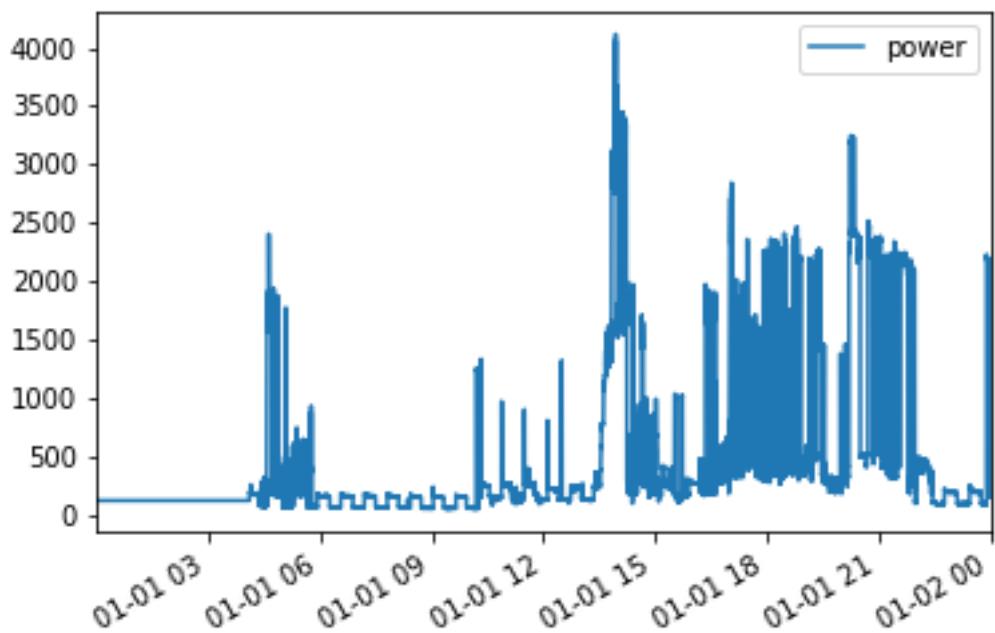
Lavastoviglie



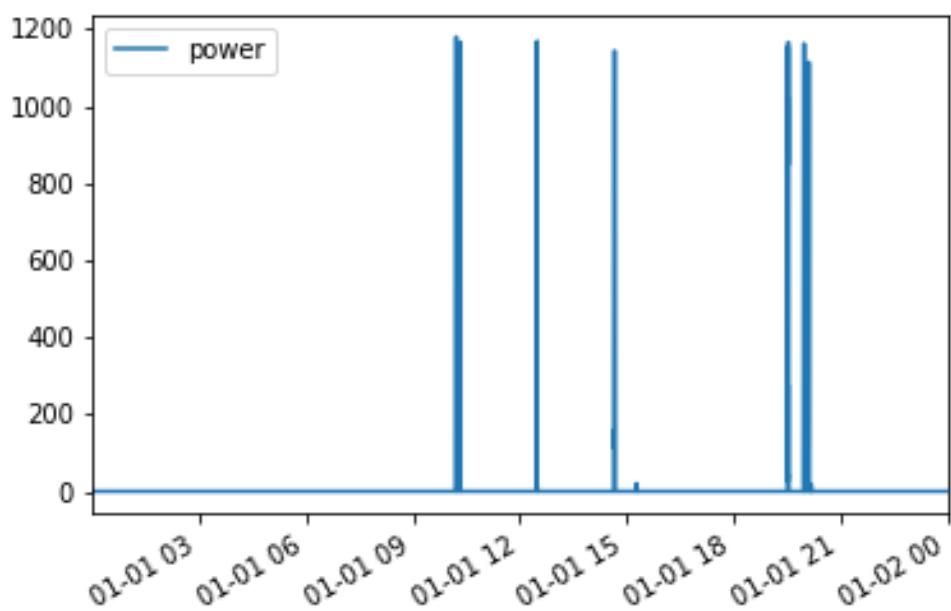
Lavatrice



Meter

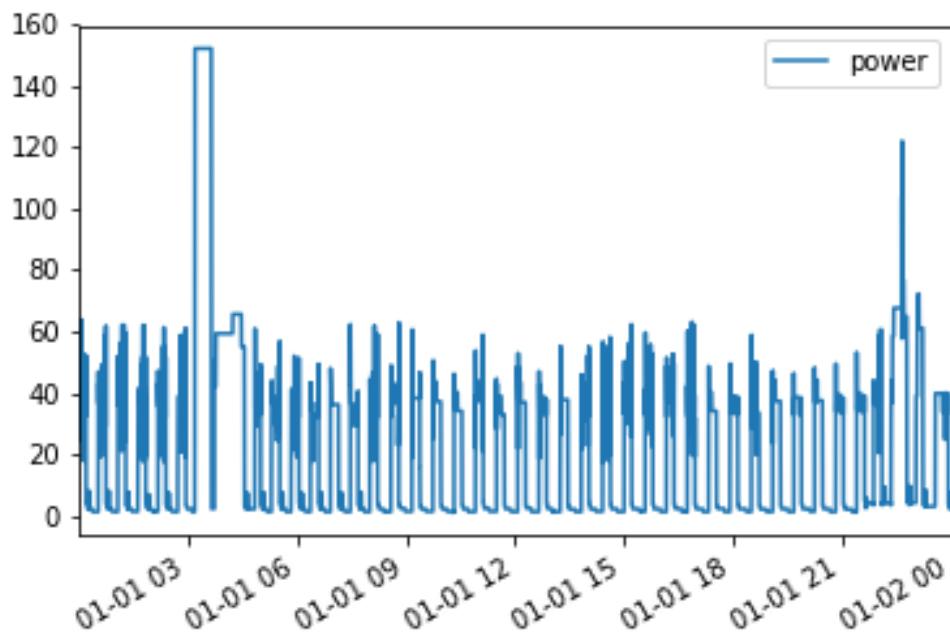


Microonde

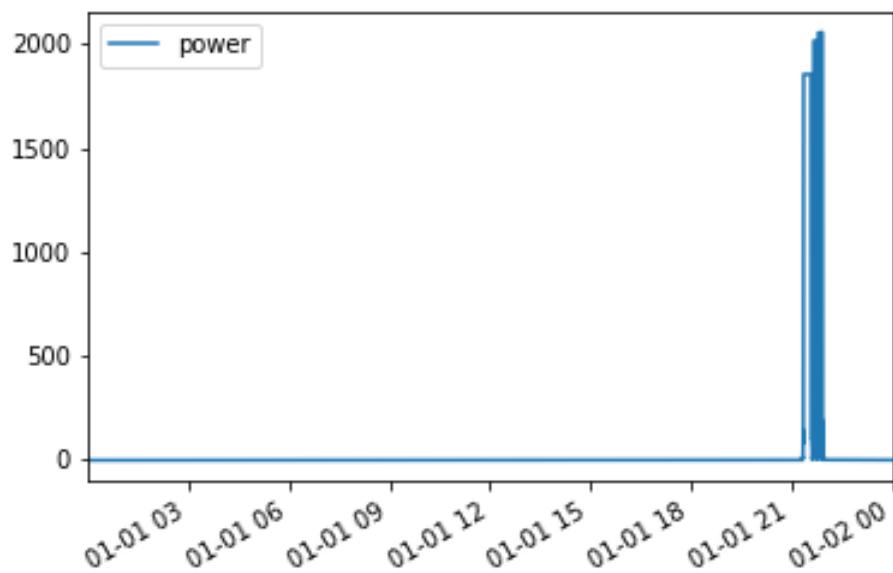


Casa 7

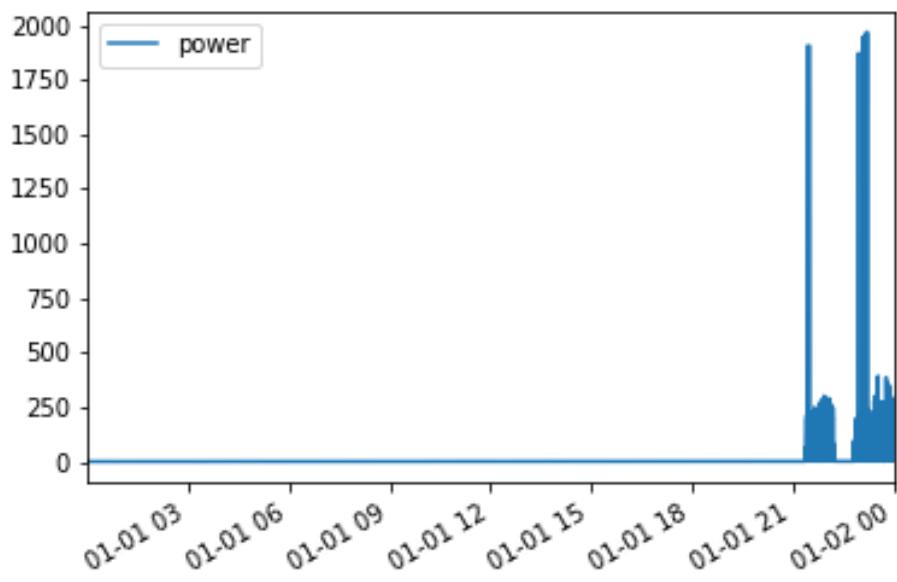
Frigo



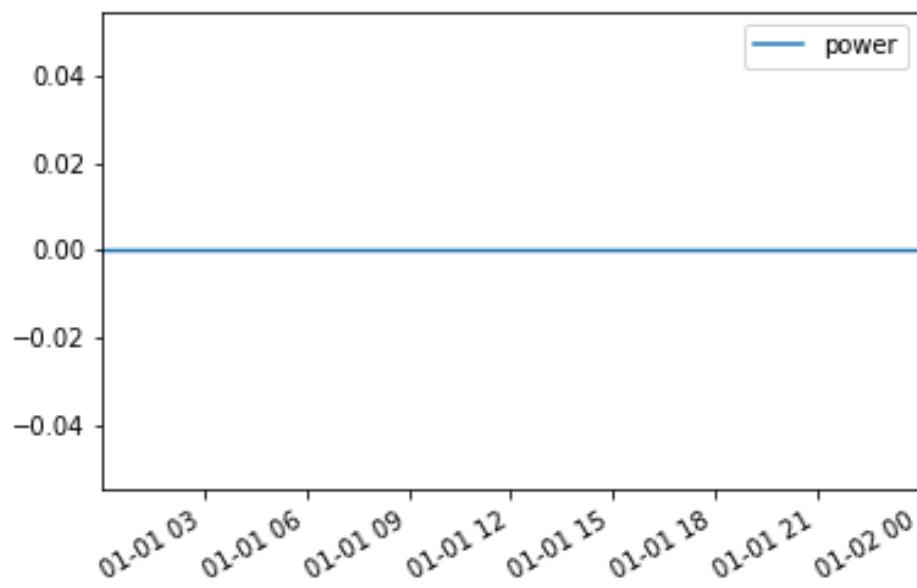
Lavastoviglie



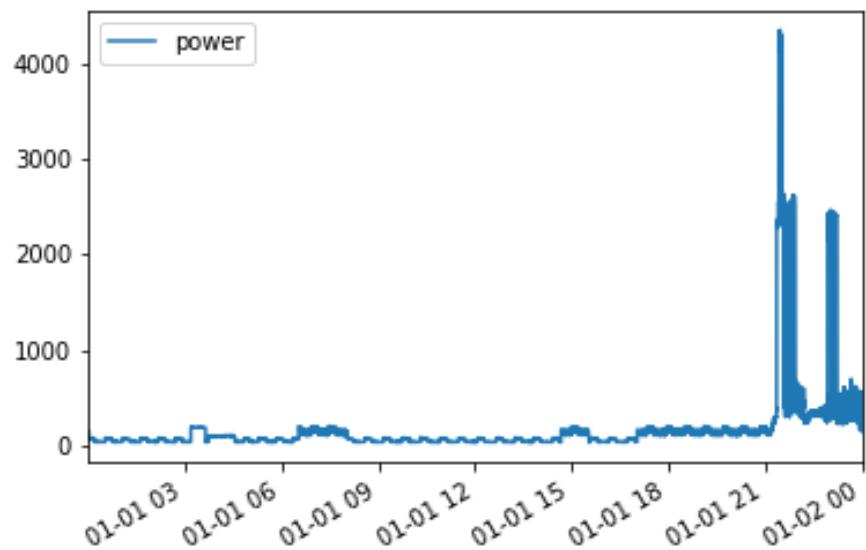
Lavatrice



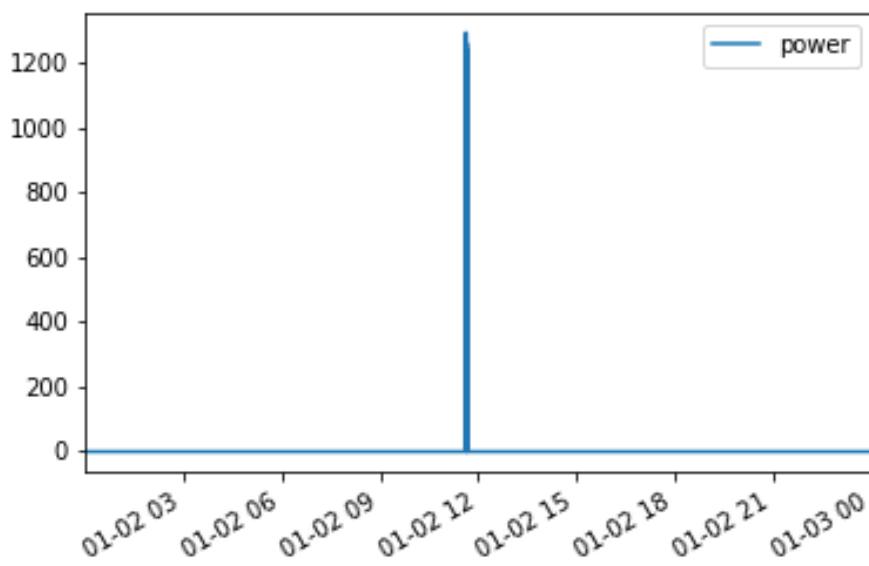
Microonde



Meter

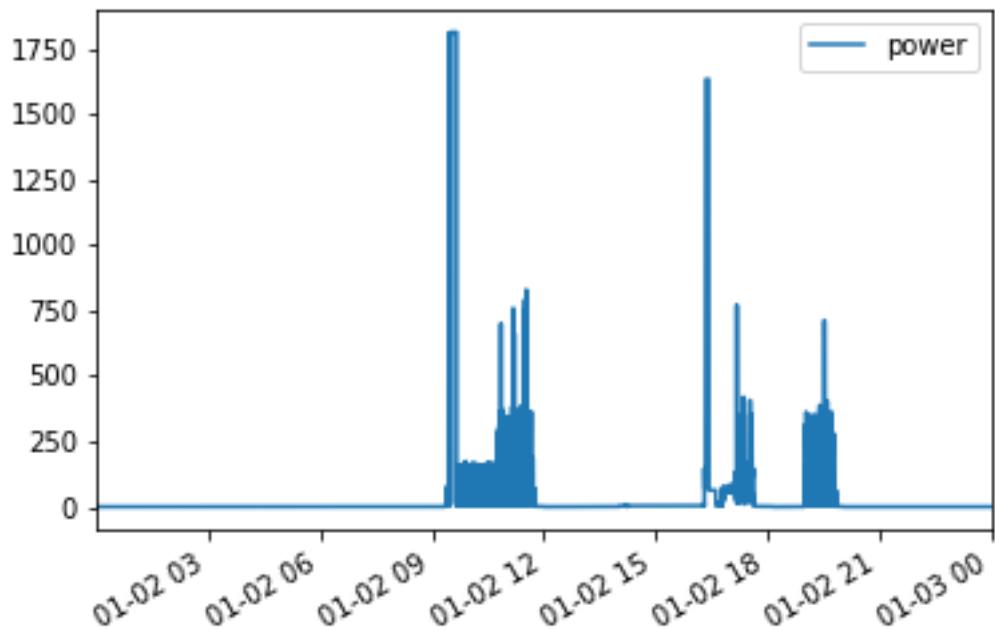


Microonde

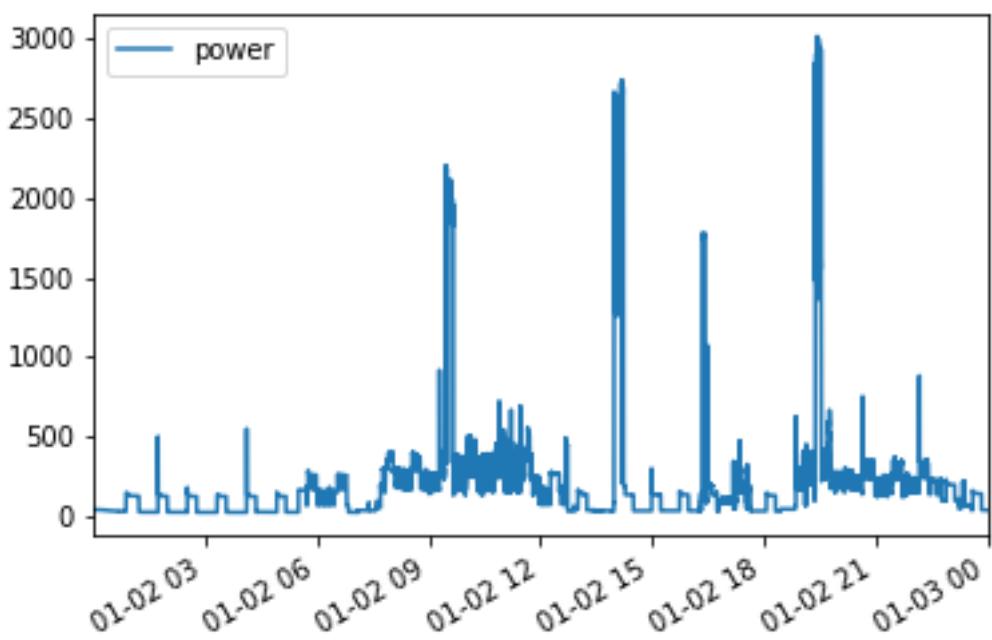


Casa 8

Lavatrice

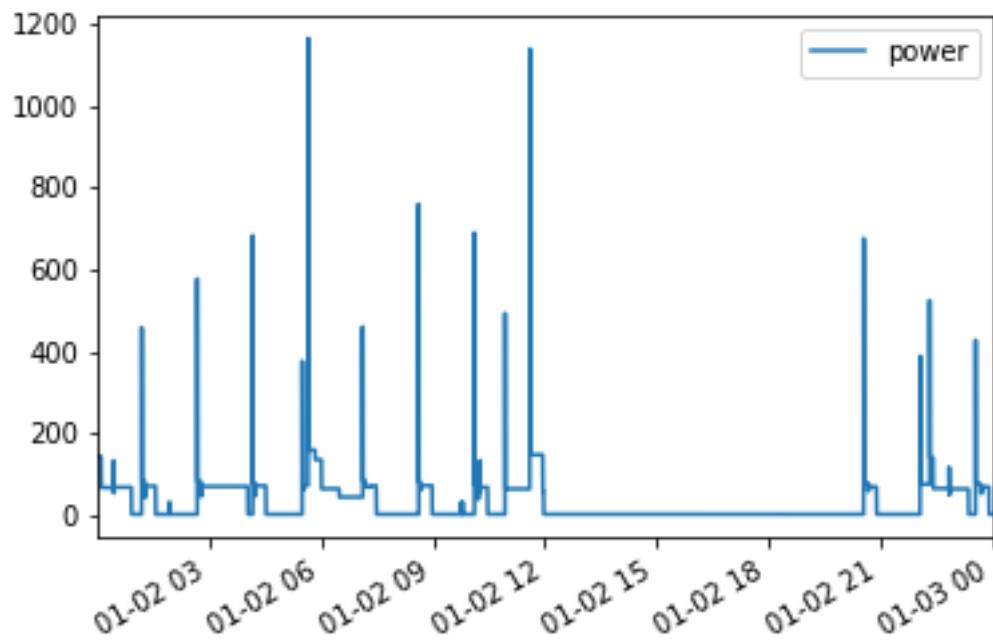


Meter

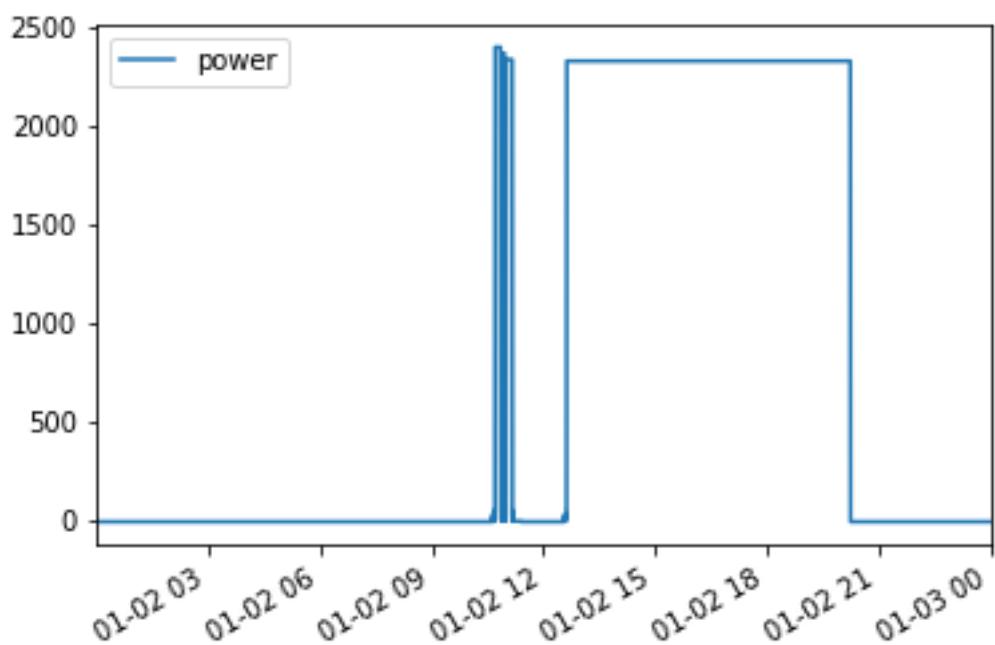


Casa 9

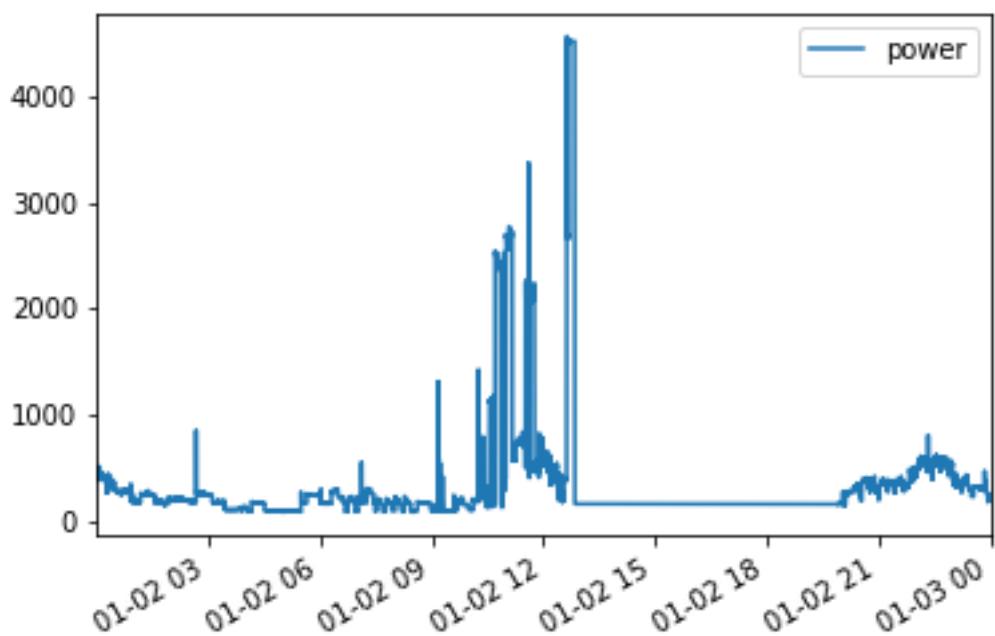
Frigo



Lavatrice



Meter



Microonde

